SIXTH FIVE-YEAR REVIEW REPORT FOR CENTRAL CITY, CLEAR CREEK SUPERFUND SITE GILPIN AND CLEAR CREEK COUNTY, COLORADO

Prepared by

Colorado Department of Public Health and Environment
Hazardous Materials and Waste Management Division
In collaboration with the
U.S. Environmental Protection Agency
Region 8
Denver, Colorado

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LIST OF ABBREVIATIONS & ACRONYMS

ARAR	Applicable or Relevant and Appropriate Requirement
ATWTF	Argo Tunnel Water Treatment Facility
AOC	Administrative Order on Consent
CA	Cooperative Agreement
CC/CC	Central City, Clear Creek
CDC	Centers for Disease Control and Prevention
CDOT	Colorado Department of Transportation
CDPHE	Colorado Department of Public Health and Environment
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
COPC	Contaminant of Potential Concern
BRA	Baseline Risk Assessment
DRMS	Colorado Division of Reclamation, Mining and Safety
EPA	United States Environmental Protection Agency
ESD	Explanation of Significant Differences
ft MSL	feet above mean sea level
FYR	Five-Year Review
HDS	High Density Sludge
HI	Hazard Index
HQ	Hazard Quotient
IC	Institutional Control
IEUBK	Integrated Exposure Uptake Bio Kinetic Model for Lead in Children
LTRA	Long-Term Response Action
µg/L	microgram per liter
mg/kg	milligram per kilogram
mg/L	milligram per liter
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
NCCWTP	North Clear Creek Water Treatment Plant
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
O&F	operational and functional
O&M	operation and maintenance
OSWER	U.S. EPA Office of Solid Waste and Emergency Response
OU	Operable Unit
PHE	Public Health Evaluation
PPA	Prospective Purchaser Agreement
RBC	Risk-Based Concentration
RCRA	Resource Conservation and Recovery Act
RI/FS	Remedial Investigation/Feasibility Study
RG	Remediation Goal
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act

SH119	State Highway 119
SHPO	State Historic Preservation Office
UU/UE	Unlimited Use/Unrestricted Exposure
WQCC	Water Quality Control Commission

I. INTRODUCTION

The purpose of a Five-Year Review (FYR) is to evaluate the implementation and performance of a remedy in order to determine if the remedy is, and will continue to be, protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in FYR reports such as this one. In addition, FYR reports identify issues, if any, found during the review and document recommendations to address them.

This FYR is being prepared pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121, consistent with the National Contingency Plan (NCP)(40 CFR Section 300.430(f)(4)(ii)) and considering U.S. Environmental Protection Agency (EPA) policy.

This is the sixth FYR for the Central City, Clear Creek (CC/CC) Superfund site (Site). The triggering action for this **statutory** review is the completion of the fifth FYR on November 3, 2017. The FYR has been prepared due to the fact that hazardous substances, pollutants or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure (UU/UE).

The CDPHE has determined in the FYR that the cleanup at the Central City, Clear Creek Superfund Site is protective of human health and the environment in the short-term for Operable Unit 2 and 4 with Operable Unit 3 as protectiveness deferred. The mine tunnel discharges are being captured and treated with the exception of Gregory Gulch groundwater. Waste and tailings piles have been removed, consolidated, and capped and sediment control features have been installed across the Site. Revisions need to be made to the sampling program, an evaluation needs to be completed for Gregory Gulch groundwater, and an Institutional Control Implementation Assurance Plan (ICIAP) also needs to be completed for the Site.

The Site consists of five Operable Units (OUs), and three OUs will be addressed in this FYR. **Table 1** includes descriptions of the OUs at the site and their status in this FYR.

Table 1: OU Status in this FYR

OU #	Name	Description	Status in FYR
1	Mine Discharge Treatment	Designated to address acid mine drainage from five mine tunnels using passive treatment. OU1 was superseded by the OU3 ROD. The amendment included treatment of two of the five adit discharges as part of OU3. The other three mine discharges were transferred to OU4.	Superseded by the OU3 1991 ROD. OU1 is not assessed independently in this FYR. The status of this OU is included in OU3, per the decision documents.
2	Tailings/ Waste rock/ Remediation	Addresses remediation of mill tailings and mine waste rock piles associated with the five discharging tunnels, except for the Quartz Hill	Included in FYR.

OU #	Name	Description	Status in FYR
		tailings impoundment, which was transferred from OU2 to OU4.	
3	Discharge Control/Phase II	Designated for a more comprehensive evaluation of the Clear Creek watershed, including treatment of two of the five OU1 mine discharges.	Included in FYR.
4	North Clear Creek	Focuses on sources of metals contamination to the North Fork of Clear Creek, a major tributary to Clear Creek, including waste rock and sediment controls on tributaries to the North Fork; the three remaining OU1 adit discharges that impact the North Fork; and the Quartz Hill tailings impoundment, located on Gregory Gulch, a tributary to the North Fork.	Included in FYR.
5	To be Determined	Established to evaluate potential exposures to heavy metals, primarily lead and arsenic, from mine waste piles in residential areas of the Study Area.	Not included in this FYR because this OU is currently undergoing a Remedial Investigation/Feasibility Study (RI/FS)

The Colorado Department of Public Health and Environment (CDPHE), under a cooperative agreement with the EPA, has conducted this FYR of the CC/CC Superfund Site, located in Clear Creek and Gilpin Counties, Colorado.

Site Background

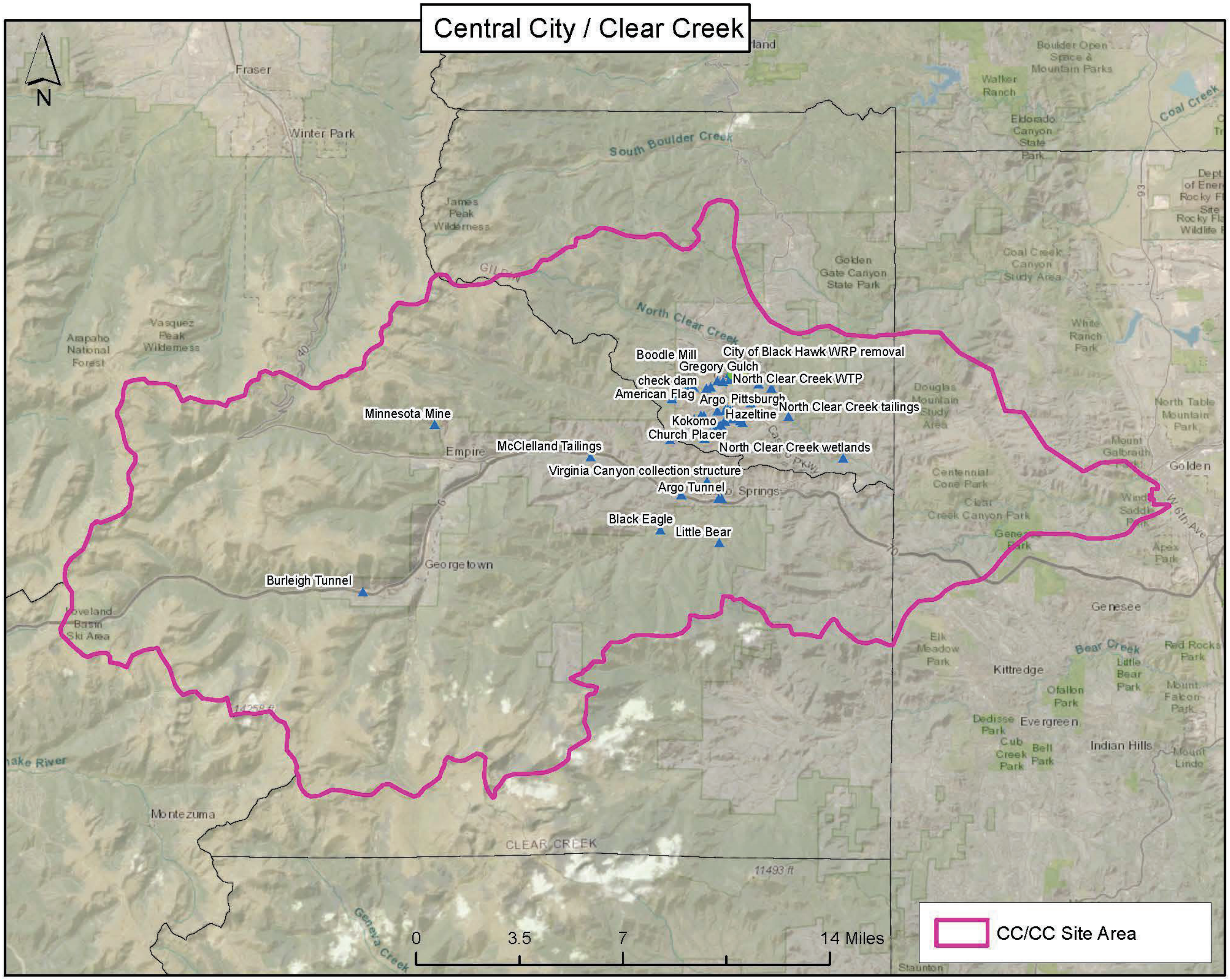
The Site is on the east slope of Colorado's Front Range, approximately 30 miles west of Denver.
The Clear Creek drainage basin encompasses roughly 400 square miles and has elevations ranging from 5,700 feet above mean sea level (ft MSL) to more than 13,000 ft MSL. The cities of Central City, Black Hawk, Idaho Springs, Georgetown, Silver Plume and Empire are located within the watershed near the Clear Creek mainstem and/or its major tributaries. Designated uses of Clear Creek include recreation, agriculture and drinking-water supply. Downstream, Clear Creek empties into the South Platte River just north of Denver.

The Site is transected by the Colorado Mineral Belt; the location of numerous ore bodies developed in the late 1800s and through the 1900s by extensive underground mine workings. Precambrian gneisses and schists are the predominant host rock and are cut by a network of faults. Tertiary Age veins and stocks within the host rock are the sources of sulfide ores that contain deposits of several minerals including gold, silver, iron, copper, lead, nickel, zinc, cadmium, manganese and others. The area has been heavily mined, beginning with the discovery of placer gold in Idaho Springs in 1859 and followed quickly by the first lode discovery in Gregory Gulch.

Historic mining resulted in modern-era environmental problems. Placer mining required the removal of stream substrate and relocation of stream channels. Mine tunnels continue to drain acidic, metals-laden water. Mine-waste and mill-tailings piles were left unprotected throughout the watershed. Dissolved metals including iron, zinc, copper, cadmium, manganese, lead and arsenic, flow into Clear Creek and its tributaries and negatively impact the ecology and water quality of these streams. Ecological risk is the primary driver of cleanup actions at the Site and is mainly associated with direct exposure to metals-contaminated surface water. The Site was placed on the National Priorities List (NPL) in 1983 due to elevated concentrations of metals within the Clear Creek basin.

Modern urbanization has also impacted Clear Creek. The towns of Silver Plume, Georgetown and Idaho Springs have encroached on the stream. Major roadways including U.S. 6, U.S. 40 and Interstate 70 (I-70) have caused significant channelization of Clear Creek and created runoff of vehicle waste, traction sand and chemical de-icer from the roadway. The legalization of gaming in Black Hawk and Central City has increased traffic, impacted the North Fork of Clear Creek, and altered the landscape with the removal of steeply sloped hillsides to allow for casino development.

Figure 1: Site Location



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FIVE-YEAR REVIEW SUMMARY FORM

SITE IDENTIFICATION		
Site Name: Central City, Clear Creek Superfund Site		
EPA ID: COD980717557		
Region: 8	**State:** CO	**City/County:** Clear Creek and Gilpin
SITE STATUS		
NPL Status: Final		
Multiple OUs? Yes	**Has the site achieved construction completion?** No	
REVIEW STATUS		
Lead agency: Colorado Department of Public Health and Environment ***[If "Other Federal Agency", enter Agency name]*:** NA		
Author name (Federal or State Project Manager): Kyle Sandor		
Author affiliation: Colorado Department of Public Health and Environment		
Review period: July 1, 2021- November 3, 2022		
Date of site inspection: August 8-9, 2022		
Type of review: Statutory		
Review number: 6		
Triggering action date: November 3, 2017		
Due date *(five years after triggering action date)*: 11/3/2022		

II. RESPONSE ACTION SUMMARY

Basis for Taking Action

The Site has been the location of mining, mineral processing and milling activities that produced primarily gold and to a lesser extent copper, lead, silver, and zinc. Numerous mining methods generated several types of waste: waste-rock piles, mill tailings, and acid-rock drainage (ARD). Site maps showing the Site study area, response action locations, and sampling locations can be found in **Appendix B.**

The EPA added the Site to the NPL in 1983 in order to address concerns about elevated metals concentrations in surface and ground waters in the Clear Creek watershed basin resulting from mine drainage. The initial Phase I Remedial Investigation/Feasibility Study (RI/FS) was completed in June 1987. The report indicated that mine discharges from five sources (Argo Tunnel, Big Five Tunnel, Gregory Incline Tunnel, Nation Tunnel, and Quartz Hill Tunnel) exceeded Safe Drinking Water Act (SWDA) standards or water quality criteria for aluminum, arsenic, cadmium, copper, iron, lead, manganese, nickel and zinc. Streams receiving the mine discharge were also impacted with metals concentrations exceeding standards. Groundwater taken from monitoring wells near the mine discharges also contained elevated concentrations of metals. Subsequent RI/FS's occurred in the early 1990s and 2000s. Details of the overall site chronology are in **Appendix C**.

CDPHE initiated a comprehensive evaluation of the Site via the Phase II RI/FS, which was completed in September 1991. The Phase II RI/FS expanded the original Study Area to include the approximately 400 square mile Clear Creek drainage basin. The Phase II RI was completed in September 1990, and the Phase II FS was finalized in September 1991. The Phase II RI/FS also includes a Baseline Risk Assessment (BRA) to evaluate risk to human health and the environment from potential contaminants of concern. The BRA identified action levels of 130 mg/kg arsenic and 500 mg/kg lead for tailings and waste piles incorporated in the Phase II RI. These action levels were designated in the OU3 ROD. A more specific summary showing contaminants and the locations in the drainage basin where the contaminant of potential concerns (CPOCs) exceeded State of Colorado table value standards (TVS) can be found in **Appendix D.**

OU1 – Mine Discharge Treatment

Investigations indicated ongoing release of contamination from five mine tunnels (Argo Tunnel, Big Five Tunnel, National Tunnel, Gregory Incline Tunnel and Quartz Hill Tunnel). OU1 was established to address treatment of mine drainage from these tunnels. OU1 was superseded in 1991 to be included in the OU3 ROD and will be discussed as part of OU3.

OU2 – Tailings and Waste Rock Remediation

OU2 was designated under OU1 to address the remediation of waste rock in the immediate proximity of the five discharging tunnels. The National Waste Pile, Gregory Incline Waste Pile, Quartz Hill Waste Pile, and Big Five Waste Pile contributed contaminants in a variety of ways, including runoff from the piles, as well as the potential for collapse of unstable piles into surface waters. The Quartz Hill Waste Pile was transferred to OU4 in 2006.

OU3 – Mine Discharge Treatment and Mine Waste Remediation

Investigations indicated a threat of release from the Argo Tunnel, and OU3 was originally designated to address the control of possible surge events. However, a more comprehensive investigation was conducted to ensure all sources were addressed. The investigation, later referred to as the "Phase II studies," was completed in September 1990.

To address the issues identified in the Phase II studies, the Site was expanded to the approximately 400 square mile Clear Creek drainage basin Study Area. OU3 focused on identifying the nature and extent of heavy-metals contamination to the mainstem of Clear Creek and its major tributaries.

OU4 – North Fork Clear Creek Mine Discharge Treatment and Mine Waste Remediation

The OU3 ROD included interim measures for the Gregory Incline and the National and Quartz Hill Tunnels but delayed the final decision on treatment until treatability studies could be conducted. This decision became the basis for OU4, which focuses on the North Fork of the Clear Creek.

Response Actions

The Site was added to the NPL in September 1983. Over the next several years, the EPA initiated Remedial Investigations and Feasibility Studies (RI/FS) at the Site. The EPA's Emergency Response program conducted several removal actions at the Site.

The objectives of the remedial actions were to protect human health and the environment from the potentially harmful effects of metals present in waste materials associated with historic mining activities. Specific remedial action objectives and remediation goals are listed in the RODs for each OU.

OU1

The OU1 ROD was signed September 30, 1987. Recognizing that the discharges from the tunnels covered under the OU1 were one of several factors contributing to water quality and aquatic-habitat degradation, the EPA noted that the selected remedy in the OU1 ROD was an interim remedy. The interim remedy was to include the construction of passive-treatment systems to treat acid mine drainage discharging from each of the five tunnels (Argo Tunnel, Big Five Tunnel, National Tunnel, Gregory Incline Tunnel and Quartz Hill Tunnel). The selected remedy was contingent on the successful completion of pilot studies. If the pilot studies did not show passive treatment to be effective, the OU1 ROD allowed the flexibility to implement active treatment.

Treatability studies indicated that constructed wetlands would require a large areal extent in order for successful metals removal to occur, rendering this option infeasible. Concurrently with these studies, the Phase II investigation was initiated to evaluate the Site comprehensively. Full-scale application of passive treatment was not implemented at any of the five tunnels. Ultimately, the OU1 ROD was superseded by the September 1991 OU3 ROD and will be discussed as part of OU3.

OU2

OU2 was designated specifically to address the remediation of waste rock in the immediate proximity of the five discharging tunnels designated under OU1, as summarized below.

The OU2 ROD, dated March 31, 1988, selected remedial actions to include:

- Slope stabilization at the Big Five and Gregory Incline waste piles;
- Monitoring of the gabion wall at the Gregory Incline waste pile; and

- Run-on controls at the Argo, Big Five, Gregory Incline, National and Quartz Hill waste rock piles.

Similar to the OU1 ROD, the OU2 ROD indicated the selection remedies were interim remedies. The OU2 ROD states, "The selected remedy for OU2 is an interim remedy because the net beneficial impact to Clear Creek and North Clear Creek will not be realized until the completion of remedial actions for the other operable units." The OU2 ROD called for an interim remedy waiver (SARA Section 121 (d)(4)(A)) from contaminant-specific ARARs listed in the Feasibility Study. While the "interim remedy waver" was initiated in the OU2 ROD, the contaminants were addressed in the OU3 and OU4 RODs. Remedial activities completed to date have adequately addressed all exposure pathways that could result in unacceptable risks. Given the OU2 ROD selected an interim remedy, a final remedy will need to be documented in a decision document.

CDPHE issued an explanation of significant differences (ESD) for OU2 in September 1999 to address new site-specific information developed on risks from lead and arsenic exposure, as well as the newly issued Clean Water Act storm water regulations. The ESD presents the following changes to the selected remedy:

- Regrading of the Argo waste pile to remove the toe from Clear Creek
- Capping and constructing a retaining wall along a portion of the toe of the Argo waste pile
- Constructing run-off controls along the toe of the Argo waste pile
- Capping the top of the Argo waste pile
- Capping the Big Five waste pile
- Constructing a retaining wall and regrading the Big Five waste pile

All of the OU2 response actions are complete. These response actions include slope stabilization, capping, run-on and runoff controls, and/or mine waste removal at the Argo and Big Five waste piles. Removal actions were conducted by private parties to remediate the Gregory Incline and National waste piles as development occurred on the properties. These actions are detailed in previous FYRs.

In June 2006, the Site was reorganized; instead of Quartz Hill being addressed as part of OU2, it was moved into OU4 and will be discussed in OU4 hereafter.

OU3

Operable Unit 3 encompasses the Clear Creek watershed, defined as the Site study area. The RI/FS screened multiple mine tunnels and waste piles to identify the major source of contaminant loading to Clear Creek. Eight draining tunnels (five of which were discussed in OU1 and later moved to OU3) and 21 waste piles (five of which were included in OU2 and later moved to OU3) were selected for further evaluation and a remedial determination.

The OU3 ROD, dated September 1991, updated the decision previously prescribed in the OU1 ROD and detailed the decisions resulting from the Phase II investigation. The surface-water remedial action objectives discussed during the Phase II studies were to "reduce metals loading to streams from point discharges in order to reduce in-stream metals concentrations to levels protective of aquatic life." More specifically, the remedial action objectives (RAOs) were defined in the OU3 ROD as:

Surface Water Remedial Action Objectives

- Reducing contaminant loadings from the mine drainage tunnels, for the contaminants of concern at the Site, to levels which allow state stream standards, and state table value standards (where they have been determined to be relevant and appropriate) to be met.

Tailings/Waste-Rock Remedial Action Objectives

- Preventing incidental ingestion of mine waste posing an excess risk of 1 cancer incidence per 100,000 people or greater and preventing incidental ingestion of mine waste containing more than 500 mg/kg of lead.
- Preventing collapse of unstable mine waste piles through slope stabilization.
- Reducing erosion from mine waste piles to the point where stream standards are not exceeded by storm water runoff from mine waste piles.

Groundwater Remedial Action Objectives

- Preventing ingestion of groundwater having contaminant concentrations in excessing of Primary Drinking Water Standards or exceed health-based levels for contaminants which have no Primary Drinking Water Standards for contaminants of concern at the Site.

Air Remedial Action Objective

- Reducing the excess cancer risk due to inhalation of dust containing heavy metals.

Remedy components of the OU3 ROD included:

- Capping or physical barriers and ICs for select mine-waste piles (Gregory Gulch piles #1 and #2, Clay County, Boodle Mill, McClelland, North Clear Creek, Chase Gulch #1 and #2, Golden Gilpin, Black Eagle, Little Bear and Quartz Hill).
- An alternate drinking water supply where required.
- Treatment of the Burleigh and Argo Tunnel discharges.
- A groundwater pump and treatment system in the Idaho Springs area to address non-point, source-metals loading to surface water.
- Reduction in the heavy metals load from Woods Creek.
- No action to control surge events from tunnel.

The OU3 ROD superseded the OU1 ROD by:

- Replacing constructed wetlands with chemical treatment for the Argo Tunnel discharge.
- Using an interim waiver of applicable or relevant and appropriate requirements (ARARs) for the discharge from the Big Five Tunnel. Although the OU3 ROD called for an interim waiver, the Big Five Tunnel discharge was addressed in the 2005 ESD.
- Collecting the discharges from the Gregory Incline, National and Quartz Hill tunnels and piping the discharges to North Clear Creek to eliminate overland travel and to reduce the potential for direct human contact.
- Invoking an interim remedy waiver of ARARs and delaying a decision on final treatment of the Gregory Incline, National and Quartz Hill tunnels until further investigations were conducted under Operable Unit 4.

Modifications to the OU3 ROD occurred though the following decision documents:

- A ROD Amendment signed on September 22, 2003, which selected a no action alternative for the Burleigh Tunnel discharge.
- A June 2005 ESD to collect the Big Five Tunnel discharge and convey it to the Argo Tunnel Water Treatment Facility.
- A September 2014 ESD, to implement a flow-control bulkhead in the Argo Tunnel.

Response actions taken for OU3 prior to this FYR review period are detailed in previous FYRs.

OU4

The basin or watershed of the North Fork of Clear Creek was designated OU4 and encompassed the North Fork of Clear Creek, its tributaries, and the main stem of Clear Creek from the confluence with the North Fork to the city of Golden, Colorado. The OU4 ROD was signed on September 29, 2004. The RAOs selected for OU4 are the following:

Surface Water Remedial Action Objectives

- Reduce in-stream metals concentrations and sediment transport to minimize water quality and habitat impacts and to maximize reasonably attainable water uses of the North Fork of Clear Creek. These actions will also support the survival of a brown trout population in the North Fork of Clear Creek.
- Reduce in-stream metals concentrations and sediment transport in North Fork of Clear Creek with the purpose of reducing adverse water quality and habitat impacts on the main stem of Clear Creek, to protect aquatic life and to support a viable reproducing brown trout population in the main stem of Clear Creek.
- Ensure that in-stream metals concentrations do not degrade drinking water supplies diverted from the main stem of Clear Creek.
- Reduce the toxicity to benthic aquatic organisms living at the surface water/sediment interface or in sediment to levels that are protective of aquatic life.

Tailings/Waste Rock Remedial Action Objectives

- Control and/or reduce run-on and runoff from tailings/waste-rock piles to minimize generation of contaminated runoff and/or ground water and to reduce sediment loading of streams.
- Reduce exposure to arsenic and lead from incidental ingestion of surface tailings/waste rock and other mine wastes to minimize the potential threat to human health.

Ground Water Remedial Action Objectives

- Control and/or reduce metals loading from ground water to reduce in-stream metals concentrations.
- Ensure that contaminated ground water does not adversely impact human health.

Air Remedial Action Objective

- Control airborne metals contaminants in residential areas.

The selected remedy components outlined in the OU4 ROD included:

- Treatment of Gregory Incline Tunnel discharge and Gregory Gulch ground water at the Bates Hunter Mine Water Treatment Plant;
- Treatment of the National Tunnel discharge at a passive treatment system downstream of Black Hawk along State Highway 119 (SH119);
- Tributary sediment control involving waste pile removal/capping, sediment detention structures on Russell and Nevada Gulches, and other sediment-reduction measures in Russell, Gregory and Nevada Gulches; and
- Improvements to the North Fork of Clear Creek.

The June 2006 administrative restructuring of the Site placed the remaining OU2 and OU3 waste rock pile remedial actions into OU4.

Modifications to the OU4 ROD occurred though the following decision documents:

- A ROD Amendment, signed on September 14, 2006, added an on-site repository.
- A ROD Amendment, signed on April 29, 2010, modified the selected remedy for the treatment of National Tunnel, Gregory Incline and Gregory Gulch waters.

Response actions taken for OU4 prior to this FYR review period are detailed in previous FYRs. A summary of response actions taken during this FYR period is below.

National Tunnel, Gregory Incline and Gregory Gulch waters and North Clear Creek Water Treatment Plant (NCCWTP) - The OU4 ROD called for the National Tunnel, Gregory Inline and Gregory Gulch waters to be treated at the Bates Hunter Mine Water Treatment Plant. However, assessments of the Bates Treatment Plant indicated the facility did not have adequate capacity. Thus, a modification for the collection, conveyance, and active treatment at a new facility were made in the 2010 ROD Amendment. NCCWTP was constructed in March 2017 and began the Operational and Functional period on March 2, 2017. The facility is currently in the long-term response action (LTRA) period of up to 10 years. The NCCWTP effluent is discharged directly to North Clear Creek, and the solid-metal-containing sludge is disposed of at a municipal landfill. Certified operators run the plant under a contract with CDPHE.

On March 22, 2022, CDPHE filed water rights application 22CW3033 to demonstrate CDPHE's ongoing due diligence and to extend the conditional water right. The conditional water right is for the water used for treatment and in-stream flow at the NCCWTP. CDPHE intends to divert the claimed amount of water under priority. However, current limitations in the NCCWTP infrastructure that monitors water in-flows makes water accounting to the degree required to obtain an absolute water right impossible. Modifications are currently being considered by the agencies to improve water accounting accuracy.

On June 10, 2022, CDPHE submitted a Permit Equivalency Document (PED) to the EPA. The PED establishes the requirements for discharging water from the NCCWTP in compliance with Federal and State ARARs set forth in the OU4 ROD. The EPA sent a letter of PED concurrence on June 15, 2022, with an effective date of June 10, 2022.

Status of Implementation

OU1

OU1 was designated to specifically address treatment of acid mine drainage from five tunnels identified in **Table 2**.

Table 2: OU1 Sources

Operable Unit	Source Name	Location	Status
OU1	Argo Tunnel	Idaho Springs	Complete[1]
OU1	Big Five Tunnel	Idaho Springs	Complete[1]
OU1	National Tunnel	Black Hawk	Complete[2]
OU1	Gregory Incline Tunnel	Black Hawk	Complete[2]
OU1	Quartz Hill Tunnel	Central City	Complete[2]

[1]Addressed under OU3
[2]Addressed under OU4

The OU1 ROD called for treatability studies of passive systems of the mine discharge. The subsequent treatability studies indicated that constructed wetlands would require a large areal extent in order for successful metals removal to occur, rendering this option infeasible. Concurrently, with these studies, the Phase II RI/FS was initiated to evaluate the Site comprehensively. Full-scale application of passive treatment has not been implemented at any of the five tunnels, rather the OU1 ROD was superseded by the OU3 ROD. Work started as OU1 but, superseded by the 1991 OU3 ROD, will be discussed as part of OU3 for the remainder of this document. OU1 is included in OU3 and is not subject to FYRs per the OU3 1991 ROD.

OU2

Response actions for OU2 are complete and included slope stabilization, capping, run-on and runoff controls, and/or mine-waste removal at the Argo and Big Five waste piles. Removal actions were conducted by private parties to remediate the Gregory Incline and National waste piles as development occurred on the properties.

Table 3 Summarizes the OU2 sources.

Table 3: OU2 Sources

Operable Unit	Source Name at Time of ROD	Location	Status
OU2	National Waste Pile	Black Hawk	Complete
OU2	Gregory Incline Waste Pile	Black Hawk	Complete
OU2	Quartz Hill Waste Pile	Central City	Complete[1]
OU2	Argo Waste Pile	Idaho Springs	Complete
OU2	Big Five Waste Pile	Idaho Springs	Complete

[1]Addressed under OU4

OU3

All of the OU3 response actions are complete. The response actions completed are summarized in previous FYRs. **Table 4** summarizes the sources and status of completion for OU3.

Table 4: Operable Unit 3 Sources

Operable Unit	Source Name	Location	RA Status
Mine Adit Discharges			
OU4	National	Black Hawk	Complete[1]
OU4	Gregory Incline	Black Hawk	Complete[1]
OU4	Quartz Hill	Central City	Complete[1]
OU3	Argo	Idaho Springs	Complete[1]
OU3	Big Five	Idaho Springs	Complete[1]
OU3	Rockford	Idaho Springs	No Action[2]
OU3	McClelland	Dumont	No Action[2]
OU3	Burleigh	Silver Plume	No Action
OU3	Argo Bulkhead	Idaho Springs	Complete
Waste Piles			
OU3	Urad	Woods Creek	Complete
OU3	Minnesota Mill Tailing	Empire	Complete
OU3	McClelland	Dumont	Complete
OU3	Black Eagle	Chicago Creek	Complete
OU3	Little Bear Creek	Idaho Springs	Complete
OU3	Boodle Mill	Central City	Complete
OU3	Gregory Gulch #1	Central City	Complete
OU3	Gregory Gulch #2	Central City	Complete
OU3	Gregory Gulch #3	Central City	Complete
OU3	Chase Gulch #1	Black Hawk	Complete
OU3	Chase Gulch #2	Black Hawk	Complete
OU3	Golden Gilpin Mill	Black Hawk	Complete
OU3	North Clear Creek	Gilpin County	Complete
OU3	North Clear Creek Dredge	Gilpin County	Complete
OU3	Clay County	Gilpin County	Complete
OU3	Repository	Site wide	Complete
OU3	Golden Gilpin Mill	Gilpin County	Complete
Ground Water			
OU3	Drinking Water	Site wide	Complete
OU3	Virginia Canyon Project	Idaho Springs	Complete

[1]Originally part of OU1, these areas were re-designated under the 1991 OU3 ROD as either OU3 or OU4.
[2]No action for the McClelland and Rockford Tunnels was part of the selected remedy in the 1991 OU3 ROD
[3]No action for the Burleigh was part of the OU3 ROD Amendment (2003).

The CDPHE and the EPA continue to collect surface water samples at the Site to determine the status of the following RAO:

Reducing contaminant loadings from the mine drainage tunnels, for the contaminants of concern at the Site, to levels which allow state stream standards, and state table value standards (where they have been determined to be relevant and appropriate) to be met.

OU4

All of the OU4 response actions are complete with the exception of collection of Gregory Gulch groundwater. The response actions completed are summarized in the previous section. **Table 5** summarizes the sources and status of completion for OU4.

Table 5: Operable Unit 4 Sediment Control Measures and Mine Waste Remediation

Phase	Project	Location	Remedy	Status
I	Gregory Gulch #3	Gregory Gulch	Erosion Control	Complete
I	Gregory Gulch Groundwater	Gregory Gulch	Water management	Not Complete
I	Nevada Gulch Sediment Retention Basin	Nevada Gulch Drainage	Sediment retention	Complete
I	Russell Gulch Sediment Retention Basin	Russell Gulch Drainage	Sediment retention	Complete
I	Hampton Waste Rock Pile	Russell Gulch	Erosion control	Complete
I	Russell Gulch Check Dam	Russell Gulch	Water management	Complete
I	Anchor Waste Rock Pile	Willis Gulch	Erosion control	Complete
I	Powers Waste Rock Pile	Willis Gulch	Erosion control	Complete
I	Silver Dollar Waste Rock Pile	Willis Gulch	Erosion control	Complete
I	Willis Gulch Check Dam	Willis Gulch	Water management	Complete
II	Keystone Waste Rock Pile	Nevada Gulch	Erosion control	Complete
II	Nevada Gulch Check Dams	Nevada Gulch	Water management	Complete
II	Alva Adams Waste Rock Pile	Russell Gulch	Erosion control	Complete
II	Baltimore Waste Rock Pile	Russell Gulch	Erosion control	Complete
II	Mattie May Waste Rock Pile	Russell Gulch	Erosion control	Complete
II	Russell Gulch Drop Structures	Russell Gulch	Water management	Complete
II	Pittsburgh Waste Rock and Tailings Piles	Russell Gulch	Erosion control	Complete
II	South Willis Gulch Check Dams	South Willis Gulch	Water management	Complete
III	Kokomo Waste Rock Pile	South Willis Gulch	DRMS Removal	Complete
III	Old Jordan Waste Rock Pile	South Willis Gulch	Removal	Complete
III	Hazeltine Waste Rock Pile	South Willis Gulch	Erosion control	Complete
III	Iroquois Waste Rock Pile	Russell Gulch	Removal	Complete
III	Section 19 Waste Rock Pile	Russell Gulch	Removal	Complete
III	Argo Waste Rock Pile	Russell Gulch	Removal	Complete
III	Aurora Waste Rock Pile	Russell Gulch	Removal	Complete
III	Centennial East Waste Rock Pile	Russell Gulch	Erosion control	Complete
III	Centennial Waste Rock Pile	Russell Gulch	Erosion control	Complete
III	Niagara Waste Rock Pile	Russell Gulch	Removal	Complete
III	Nevada Gulch Tailings Piles	Nevada Gulch	Removal	Complete
I – III	Church Placer	South Willis Gulch	Site-wide Repository	Complete

The OU4 ROD Amendment selected active treatment of the National Tunnel and Gregory Incline discharges, Gregory Gulch surface water, and Gregory Gulch groundwater at a new water treatment plant. A conveyance system was designed and constructed to capture source water from Gregory Gulch, Gregory Incline and National Tunnel and convey it to the NCCWTP for treatment. The Gregory Gulch lateral utilizes a concrete collection box at the downstream end of the Gregory Gulch Flume and a 12”- diameter PVC pipe carries flows from Gregory Gulch and Gregory Incline to the mainline. This collection system does not currently capture Gregory Gulch groundwater.

During design of the collection system, the CDPHE coordinated with the city of Black Hawk on the design concept for Gregory Gulch groundwater collection. The concept presented to the city included construction of an interceptor wall down to bedrock in the gulch itself and a conveyance pipeline either above or below ground surface. The city expressed concern regarding the anticipated need to shut down Main Street for an extended period, disturbance of aging underground utilities and infrastructure, and potential flooding of the Gregory Gulch culvert if an above ground conveyance pipeline was constructed. Due to the city’s concerns, the CDPHE elected to evaluate surface-water attainment to determine if capture and treatment of Gregory Gulch groundwater is needed for the remedy to be protective of human health and the environment. The evaluation of Gregory Gulch groundwater is ongoing. Remediation goals for OU4 contaminants of concern were established in the 2004 OU4 ROD for selected Segments 11 and 13b. Monitoring at those locations is ongoing and a discussion of those results can be found in the Data Review section of this report. It has not been determined if capture and treatment of the Gregory Gulch groundwater is needed to achieve the remediation goals or attainment of surface water standards.

IC Summary

For OUs 2 and 3, the most commonly utilized institutional controls are requirements embodied in enforcement tools such as administrative orders on consent, unilateral administrative orders, consent decrees, and prospective purchaser agreements. Other ICs, such as contractual agreements and zoning requirements also have been used.

As shown in **Table 6**, CDPHE has secured environmental covenants for all of the OU4 Phase I properties and most of the Phase II and Phase III properties as required per C.R.S. 25-15-318 through 327. The environmental covenant is intended to alert future landowners that an environmental remediation action was completed at the property and to memorialize the associated land-use restrictions resulting from waste remaining. Copies of these covenants were provided to the EPA for its Superfund institutional control tracking system. CDPHE continues to work with the remaining landowners to have them grant their respective covenants. As part of O&M, CDPHE performs annual inspections of all Site properties with environmental covenants to ensure land use is consistent with environmental covenant restrictions. This is reported in the annual O&M inspection reports.

In addition to institutional controls, engineering controls, such as fences, may be used to ensure remedy protectiveness. The Church Placer Operations and Maintenance Plan (June 2011) includes the inspection of fences and gates. Frequent monitoring of the integrity of the fence was conducted during the review period and is reported in the annual O&M inspection reports.

Additionally, the annual O&M report includes a CDPHE review of self-certification forms. Self-certification forms are submitted to CDPHE annually from current property owners with ICs to ensure existing ICs remain in place.

Table 6: Summary of Planned and/or Implemented ICs

Media, engineered controls, and areas that do not support UU/UE based on current conditions	ICs Called for in the Decision Documents	IC Location	IC Objective/ Restrictions	Title of IC Instrument Implemented and Date (or planned)
Alva Adams Waste Rock Pile	OU4 ROD	Alva Adams Lode Claim MS # 6323, Gilpin County	No excavating, grading or construction that disturbs remedy cover or water management structures	HMCOV000118 – 10/04/2014
Anchor Waste Rock Pile	OU4 ROD	Helmer Lode Claim MS# 148 and Martin Lode Claim MS# 147, Gilpin County	Owner cannot disturb engineered structure without submitting plan and receiving approval through HMWMD staff	HMCOV00054 – 6/25/2008, HMCOV00055 – 3/17/2015 , HCMOV00056 – 3/17/2015 , HMCOV00058 – 4/20/2011, HMCOV00059 – 2/29/2012
Argo Mill Site	OU4 ROD	Argo Millsite (MS No 8580B) and Argo Load (MS No 8580A)	Access to Argo Tunnel Bulkhead and O&M	HMCOV00142 – 3/3/2017
Black Eagle	OU3 Unilateral order	Lat: 39.72689 Long: -105.5459	Deed notifications, notify EPA of property transfer and development restrictions.	UAO – CERCLA VIII-94-23 – 7/15/1994
Big Five Waste Rock Pile	OU2 Prospective Purchaser Agreement	Lat: 39.74209 Long: -105.5270	Deed notifications and successor in title requirements	PPA - CERCLA-VIII-2000-06[1]

Media, engineered controls, and areas that do not support UU/UE based on current conditions	ICs Called for in the Decision Documents	IC Location	IC Objective/ Restrictions	Title of IC Instrument Implemented and Date (or planned)
Boodle Mill	OU3 Prospective Purchaser Agreement	Lat: 39.80770 Long: -105.5309	O&M responsibilities, deed notifications and notify EPA of property transfer	PPA[1]
Burleigh Tunnel	OU4 ROD	Parcel 195713415202, Gilpin County (Acct R164372)	No excavation above or adjacent to mine drainage conveyance PVC pipe	HMCOV00131 – 8/17/2017
Centennial East	OU4 ROD	Togo Lode Claim MS # 17945, Gilpin County	No excavating, grading or construction that disturbs remedy cover or water management structures	HMCOV000116 – 10/15/2014
Chase Gulch #2 Waste Rock Pile	OU3 ROD	Lat: 39.803779 Long: -105.5029	None	None[1]
Church Placer/Hazeltine	OU4 ROD	Church Placer MS # 416, Parcels 183524200009, 183524200008, 18352420007, 18352420006, and Tract B, Parcel C, Church Placer Claim	No tilling, excavation, grading, construction, or other activity that disturbs the ground surface or sub-surface, including the cover and erosion control structures, is permitted, allowed or shall be taken with modification of the Covenant.	HMCOV00099 – 11/16/2013, HMCOV000127 – 4/27/2015, HMCOV000128 – 4/27/2015, HMCOV000129 – 4/27/2015, HMCOV000130 – 4/27/2015

Media, engineered controls, and areas that do not support UU/UE based on current conditions	ICs Called for in the Decision Documents	IC Location	IC Objective/ Restrictions	Title of IC Instrument Implemented and Date (or planned)
Clay County Mill	OU3 Administrative order on consent	Lat: 39.80379 Long: -105.5029	Deed notifications, notify the EPA of property transfer and development restrictions.	AOC – VIII-95-18 – 6/9/1995
Gregory Gulch Waste Rock Pile #1	OU3 Administrative order on consent	Lat: 39.80039 Long: -105.5100	Deed notifications, notify the EPA of property transfer and development restrictions.	AOC - CERCLA VIII-95-16[1]
Gregory Gulch Waste Rock Pile #2	OU3 Unilateral administrative order	Lat: 39.80089 Long: -105.5039	Deed notifications, notify the EPA of property transfer.	UAO – CERCLA VIII – 95-74,75,97[1]
Gregory Gulch Waste Rock Pile #3	OU4 ROD	Bates Lode Claim MS# 13391, Gilpin County	Owner cannot disturb engineered structures without submitting a plan and receiving approval through HMWMD staff .	HMCOV00060 – 8/28/2017
Hampton Waste Rock Pile	OU4 ROD	Hampton Lode claim MS# 581, and Rainbow Lode Claim MS# 770, Gilpin County	Owner cannot disturb engineered structures without submitting a plan to HMWMD Staff.	HMCOV00057 – 5/28/2008, HMCOV00067 – 3/6/2003
Iroquois Check Dam	OU4 ROD	Iroquois Lode Claim MS# 4969, Gilpin County	Owner cannot disturb engineered structures without submitting a plan and receiving approval through HMWMD staff .	HMCOV00061 – 5/28/2008

Media, engineered controls, and areas that do not support UU/UE based on current conditions	ICs Called for in the Decision Documents	IC Location	IC Objective/ Restrictions	Title of IC Instrument Implemented and Date (or planned)
Keystone Waste Rock Pile	OU4 ROD	Express Lode Claim MS # 555, Helos Lode Claim MS # 127, Keystone Lode Claim MS # 163, Moon Lode Claim MS # 818, Gilpin County	No excavating, grading, construction that disturbs the remedy cover or water management systems.	HMCOV00095 – 8/29/2013, HMCOV00096 – 8/29/2013, HMCOV00097 – 8/29/2013, HMCOV00098 – 8/29/2013
McClelland Tailings Pile	OU3 Three-party agreement	Lat: 39.76390 Long: -105.5899	O&M requirements & zoning restrictions	Three-party agreement – 11/18/1997
Minnesota Mine	OU3 Administrative order on consent	Lat: 39.77890 Long: -105.6890	Deed notifications, notify the EPA of property transfer. Development restrictions.	AOC CERCLA VIII-95-04[1]
National Tunnel Waste Rock Pile	OU2 Administrative order on consent	Lat: 39.79884, - Long: 105.4843	Deed notifications, notify the EPA of property transfer. Development restrictions	AOC CERCLA VIII-95-14,21,22[1]
North Clear Creek Tailings	OU4 Administrative order on consent	Lat: 39.78659 Long: -105.4660	Deed notifications, notify the EPA of property transfer. Development restrictions.	AOC CERCLA VIII-96-29 – 8/21/1996
Pittsburgh Waste Pile	OU4 ROD	Annie Mary Lode Claim MS # 11571, Mineral Lode Claim MS# 162, Eighty Niner Lode Claim MS# 16779,	No excavating, grading, or construction that disturbs the remedy cover or water	HMCOV00100 – 11/18/2013, HMCOV00101 – 11/15/2013, HMCOV00102 – 11/18/2013,

Media, engineered controls, and areas that do not support UU/UE based on current conditions	ICs Called for in the Decision Documents	IC Location	IC Objective/ Restrictions	Title of IC Instrument Implemented and Date (or planned)
		Dorchester Lode Claim MS # 408, La Place Lode Claim MS # 6003, Gilpin County	management systems.	HMCOV00103 – 11/18/2013, HMCOV00117 – 10/5/2014
Powers Waste Rock Pile	OU4 ROD	Powers Lode Claim MS# 550 and Hope Lode Claim MS# 19873, Gilpin County	Owner cannot disturb engineered structure without submitting plan and receiving approval through HMWMD staff	HMCOV00053 – 5/28/2008, HMCOV00062 – 5/28/2008
Quartz Hill Tailings Pile	OU3 Administrative order on consent	Lat 39.79734, Long -105.51467	Land use restriction ordinance 16-03 (City of Central City) implementation of Quartz Hill overlay district.	AOC CERCLA VIII-2017-0002[1]
Russel Gulch Sediment Dam	OU4 ROD	NW Qtr. Section 19, T 3 SOUTH, R 72 WEST	Sediment dam must not be disturbed and access for maintenance must be maintained.	HMCOV00071 – 4/23/2010
Silver Dollar Waste Rock Pile	OU4 ROD	Silver Dollar Lode Claim MS# 591Gilpin County	Owner cannot disturb engineered structure without submitting plan and receiving approval through HMWMD staff .	HMCOV00052 – 5/28/2008, HMCOV00063 – 12/20/2008
South Willis Gulch Check Dam	OU4 ROD	Parcels 183524200008 and 183524200007	Owner cannot disturb engineered structure without submitting plan and receiving approval	HMCOV00128 – 4/27/2015, HMCOV00129 – 4/27/2015

Media, engineered controls, and areas that do not support UU/UE based on current conditions	ICs Called for in the Decision Documents	IC Location	IC Objective/ Restrictions	Title of IC Instrument Implemented and Date (or planned)
			through HMWMD staff .	

[1]ICs in table are missing information. CDPHE is working with the EPA on development of an Institutional Control Implementation Assurance Plan (ICIP) and compiling additional IC information.

Systems Operations/Operation & Maintenance

OU2

O&M is required at the OU2 waste piles. CDPHE performs O&M inspections and develops an annual report of its findings and corrective actions. The most recent report was completed on March 10, 2022, documenting the September 2021 inspection. All the completed OU2 remedies were inspected. Specific maintenance issues and follow-up activities are detailed in the March 10, 2022, report. No significant maintenance issues were observed that would compromise the protectiveness of the remedy.

OU3

The ATWTP is in O&M status, treating flows from the Argo Tunnel, Big Five Tunnel and Virginia Canyon groundwater. During 2020-2021, the average treated flow was 193 gallons per minute (gpm). Routine and non-routine maintenance is performed by contractors hired by CDPHE.

CDPHE visually inspects the National Tunnel and Gregory Incline Tunnel pipeline inlets for the impoundment of water annually during the O&M inspections. Impounded water is a visual indicator of sediment buildup within the pipeline. When required, CDPHE performs periodic pipeline cleaning. The Big Five Tunnel was emergency jetted in August 2020 and May 2021 following observations of flowing water outside of the collection trough. Normal flow from the tunnel resumed after jetting was completed. During the jetting process, foreign objects (rocks, sticks, etc.) were dislodged along with sediment buildup. It was determined that the foreign objects were likely the result of vandalism at surface access points. Fencing was installed around the surface access points to prevent future vandalism and pipeline blockage.

O&M is required at several of the waste piles. O&M for the OU3 waste piles completed by a third party are the responsibility of private parties, U.S. Forest Service, local cities and counties. CDPHE performs O&M inspections on the remedy components that were completed by CDPHE and the EPA and develops an annual report of its findings and corrective actions for sites managed by CDPHE. The most recent report was completed on March 10, 2022, documenting the September 2021 inspection. All the completed OU3 remedies were inspected. Specific maintenance issues and follow-up activities are detailed in the March 2022 report. No significant maintenance issues were observed that would compromise the protectiveness of the remedy.

For this FYR, all OU3 Site remedies were inspected during the August 8-9, 2022, FYR site visit. Observations were consistent with the annual O&M report.

OU4

The NCCWTP began operation in March 2017 and is currently in LTRA. CDPHE has contracted with Jacobs Engineering Group to provide O&M services at the NCCWTP. Jacobs has held this contract since plant operations began. From 2020-2021 the plant treated approximately 115 gpm with design capacity to treat 200 to 600 gpm based on seasonal variation. Several operational issues were identified in the 2021 *North Clear Creek Water Treatment Plant Annual Report* including plant influent/effluent flow rates, plant influent flow rate accounting, Gregory Gulch valve communication, lime system delivery, and sludge recycle pumps. Recommendations for these issues were made in the 2021 report and changes are being implemented by CDPHE.

O&M is required at several of the waste piles. The O&M for the OU4 waste piles is the responsibility of private parties, U.S. Forest Service, local cities, counties or CDPHE. CDPHE performs O&M inspections and develops an annual report of its findings and corrective actions. The most recent report was completed on March 10, 2022, documenting the September 2021 inspection. All the completed OU4 remedies were inspected. Specific maintenance issues and follow-up activities are detailed in the March 10, 2022, report. No significant maintenance issues were observed that would compromise the protectiveness of the remedy.

For this FYR, OU4 Site remedies were inspected during the August 8-9, 2022, site visit. Observations were consistent with the annual O&M report.

III. PROGRESS SINCE THE LAST REVIEW

This section includes the protectiveness determinations and statements from the last FYR as well as the recommendations from the last FYR and the current status of those recommendations.

Table 7: Protectiveness Determinations/Statements from the 2017 FYR

OU #	Protectiveness Determination	Protectiveness Statement
1	NA	Superseded by Operable Unit 3
2	Will be Protective	The remedy at OU2 is expected to be protective of human health and the environment upon completion. In the interim, remedial activities completed to date have adequately addressed all exposure pathways that could result in unacceptable risks in these areas.
3	Protectiveness Deferred	A protectiveness determination of the remedy at OU3 cannot be made at this time until further information is obtained. Further information will be obtained by taking the following actions: Develop and implement a systematic, representative sampling program, including appropriate arsenic detection limits, to determine compliance with surface water quality criteria. Conduct additional water quality and aquatic life sampling to assess protectiveness. Propose re-segmentation or a site-specific stream standard to the Water Quality Control Commission. Address deficiencies of previous study, including the collection and analysis of more robust location-specific data, and consider current guidance to determine if any changes are warranted to ensure protectiveness. It is expected that these actions will take approximately one year to complete, at which time a protectiveness determination will be made.
4	Protectiveness Deferred	A protectiveness determination for the remedy at OU4 cannot be made at this time until further information is obtained. Further information will be obtained by taking the following actions: Establish long-term, intergovernmental agreement with the city of Black Hawk to provide augmentation water to ensure the new OU4 NCCWTP can operate

OU #	Protectiveness Determination	Protectiveness Statement
		uncurtailed and continue to monitor water rights applications and participate in cases as a stakeholder when appropriate. It is expected that this action will take approximately one year to complete at which time a protectiveness determination will be made.

Table 8: Status of Recommendations from the 2017 FYR

OU #	Issue	Recommendations	Current Status	Current Implementation Status Description	Completion Date (if applicable)
3	Compliance with surface water ARARs cannot be assessed due to bias in sampling program	Develop and implement a systematic, representative sampling program, including appropriate arsenic detection limits, to determine compliance with surface water quality	Ongoing	CDPHE is currently developing a new sampling program to address non-attainment of water quality across the Site.	Anticipated completion of new sampling program December 31, 2024
3	Remedial actions along Clear Creek Segment 2a may not be able to achieve attainment of the water quality standard for zinc	Conduct additional water quality and aquatic life sampling to assess protectiveness. Re-segmentation or site-specific stream standards may be proposed to the Water Quality Control Commission at a future time.	Ongoing	CDPHE is currently developing a new sampling program to address non-attainment of water quality across the Site.	Anticipated completion of new sampling program December 31, 2024
3	Cattle encroachment is occurring at the Church Placer mine waste repository and may impact vegetated cover	Continue frequent site visits and fence repair to avoid cattle encroachment	Completed	Fence repairs were completed, and subsequent site inspections have not identified any fencing issues	July 1, 2017
3	Seep water from the Church Placer mine waste repository is migrating onto an adjacent privately-owned property	Assess nature and extent of seep and mitigate as deemed necessary	Completed	A diversion channel was constructed in December 2017 on the private property adjacent to the seepage area to convey any seepage water to South Willis Gulch	December 20, 2017
3 and 4	The current scientific literature on lead toxicology and epidemiology is evolving.	Run the IEUBK model using the current default values for input parameters and a range of target blood lead levels	Completed	Operable Unit 5 (OU5) was established as a result of the IEUBK results to evaluate potential exposures to heavy	September 17, 2020

OU #	Issue	Recommendations	Current Status	Current Implementation Status Description	Completion Date (if applicable)
		between 5-8 µg/dl. Consider collecting more robust site-specific data to improve the predictive nature of the model. Monitor results of blood lead sampling conducted by local health agencies		metals, primarily lead and arsenic.	
3 and 4	Recent soil sampling indicates areas where lead concentrations exceed the site-specific screening level based on current land use.	Evaluate the need for further data collection and implement appropriate investigations.	Ongoing	CDPHE is currently conducting an RI/FS as part of the new OU 5 to evaluate residential mine waste pile exposure at the Site.	Anticipated completion of the OU5 RI/FS December 31, 2024
4	Exercising of new water rights acquired by local municipalities may substantially dewater portions of North Clear Creek, impacting the ability of the remedy to attain RAOs.	The agencies were unable to obtain an agreement with water rights holders to maintain a minimum instream flow. However, the city of Black Hawk entered into an intergovernmental agreement with the State to provide augmentation water to ensure the new OU4 NCCWTP can operate uncurtailed. Continue to monitor water rights cases impacting Clear Creek	Ongoing	On March 28, 2022, CDPHE submitted an application to make conditional water rights absolute and finding of reasonable diligence. Due to water accounting issues at the WTP it is not possible at this time to provide the data necessary to make the water right absolute. CDPHE is currently looking into WTP upgrades which would allow for more accurate influent and effluent flow rate monitoring.	Anticipated installation of WTP upgrades to resolve water accounting issue December 31, 2024

The last FYR made a protectiveness determination of "Protectiveness Deferred" for OU3 and OU4. This determination resulted in an addendum which was signed on December 28, 2021. **Table 8** summarizes the protectiveness statements from the 2017 FYR addendum for OU3 and OU4.

Table 9: Protectiveness Determinations/Statements from the 2021 FYR Addendum

OU #	Protectiveness Determination	Protectiveness Statement
3	Not Protective	State water quality standards may not be met for all parameters in all segments. Further information will be obtained by taking the following actions: • Assess surface water data and aquatic life sampling for compliance with surface water quality standards and protectiveness of expected aquatic organisms; • Review OU3 water quality data to ensure appropriate arsenic detection limits have been attained to fully assess protectiveness, and; • Consider invoking TI waiver(s) under CERCLA or propose re-segmentation or site-specific stream standard(s) to the Colorado Water Quality Control Commission.
4	Protective	Protective

Table 10: Status of Recommendations from the 2021 FYR Addendum

OU #	Issue	Recommendations	Current Status	Current Implementation Status Description*	Completion Date (if applicable)
3	Evaluation of protectiveness for arsenic in surface water in OU3	Collect additional water samples with an appropriate detection limit. Determine if TI Waiver is necessary or if State will be revising arsenic standard in the near term, then issue ROD Amendment to set	Ongoing	The temporary modification of chronic arsenic is set to expire in June 2024. CDPHE is developing a new sampling program to address non-attainment of water quality across the Site. This recommendation has not been implemented due to resource constraints.	NA

OU #	Issue	Recommendations	Current Status	Current Implementation Status Description*	Completion Date (if applicable)
		human health protective remedy as in-stream standard.			
3	Zinc exceedances at select SW locations	Strategize where points of compliance will be; continue sampling to collect robust location-specific data to support that decision. Coordinate with CDPHE to determine if TI waiver will be necessary.	Ongoing	CDPHE is developing a new sampling program to address non-attainment of water quality across the Site. This recommendation has not been implemented due to resource constraints.	NA
4	Exercising of new water rights acquired by local municipalities may substantially dewater portions of North Clear Creek and may impact the ability of the remedy to attain RAOs	The EPA and CDPHE continue to monitor water rights applications and participate in cases as a stakeholder when appropriate. CDPHE will file a motion with the water court in March 2022 to make the conditional water rights diversions absolute.	Ongoing	On March 28, 2022, CDPHE submitted an application to make conditional water rights absolute and finding of reasonable diligence. Due to water accounting issues at the WTP it is not possible at this time to provide the data necessary to make the water right absolute. CDPHE is currently looking into WTP upgrades which would allow for more accurate influent and effluent flow rate monitoring.	NA
5	Waste-rock piles on residential properties remaining on site	An additional OU, OU5, has been created to investigate the remaining residential waste piles during the RI/FS. Address	Ongoing	On August 25, 2020, CDPHE received CA-96883014 to begin the RI/FS for OU5. CDPHE has hired a contractor to conduct the RI/FS. Fact Sheet issued April 4, 2022, identifying OU5 as a newly designated OU.	NA

OU #	Issue	Recommendations	Current Status	Current Implementation Status Description*	Completion Date (if applicable)
		piles via Time Critical Removal actions for priority piles and initiate RI/FS for remaining OU5 piles		Sampling for the RI began in August 2022.	

IV. FIVE-YEAR REVIEW PROCESS

Community Notification, Involvement & Site Interviews

The review began on July 1, 2021, and was led by Kyle Sandor, Project Manager, CDPHE. CDPHE published notices in the Denver Post, Mountain Ear, Weekly-Register Call, Canyon Courier, and Clear Creek Courant in September 2021 stating that there was an FYR underway and inviting the public to submit any comments. The published notices can be found in **Appendix K.**

During the FYR process, interviews were conducted to document any perceived problems or successes with the remedy that has been implemented to date. In general, the respondents were aware of the environmental issues at the Site and the cleanup activities that have taken place to date. During interviews, a respondent answered that (he or she) had seen vandalism at the water treatment plant along Highway 6 and at some of the mine safety closures installed by the Colorado Division of Reclamation, Mining, and Safety. Additionally, trespassing was stated to have occurred at the water treatment plant. Several of the respondents felt that the agencies keep the community involved and generally use appropriate communication avenues. Ideas for future communications included utilizing local papers, county commissioner meetings, county communications (e.g. newsletters), CSU Extension Gilpin County, a Site email list, and in-person outreach (such as the library and community center in Gilpin County). One respondent felt the agencies needed to strengthen their communication around Operable Unit 5. Additionally, they reported confusion among landowners as to why the EPA is becoming involved again and which entity to contact with specific questions.

When asked for additional comments, suggestions or recommendations regarding the management or operation of the Site's remedy, several respondents raised concerns about the sedimentation accumulating in gulches as older infrastructures erodes, as well as the need to clean out check dams. One respondent recommended that operations and maintenance be prioritized in problem areas or areas that could have a problem if wildfires came through. Others stated that more coordination between the EPA, CDPHE, and others who work in the area would be helpful to make sure on-the-ground efforts are not duplicated. Respondents raised remediation-related concerns when asked about Operable Unit 5, including making sure that remedies blend into the environment and that maintenance is performed.

The results of these interviews and the comments received are further summarized in **Appendix G.**

Data Review

Surface water sampling has been conducted at the CC/CC Superfund Site since the early 1980s. For this FYR, an evaluation of surface water data collected from 2015 to 2021 was evaluated.

OU3

The OU3 ROD identified Colorado Water Quality Control Commission (WQCC) Regulations 31 and 38 as ARARs. In order to determine whether the standards in place when the OU3 ROD was signed remain protective, the EPA first compared the 2021 standards to those cited in the OU3 ROD. For those sections with exceedances to both the new and old standards, the EPA considered additional risk assessment actions, including additional data collection, to evaluate protectiveness.

Stream segment descriptions are provided in **Table 11,** and are depicted in **Appendix B**. Since the WQCC has modified stream segments over time, the table below provides segment descriptions for 1991 (OU3 ROD), 2010 (OU4 ROD) and 2021 (current comparison).

Table 11: Stream Segment Descriptions for 1991, 2010, and 2021

Segment ID	1991	2010	2021
1[1]	Mainstem of Clear Creek, including all tributaries, lakes, and reservoirs, from the source to the I-70 bridge above Silverplume		
2	Mainstem of Clear Creek, including all of the tributaries, lakes and reservoirs, from the I-70 bridge above Silverplume to the Argo Tunnel discharge, except for the specific listings in Segments 3 through 9		
2a		Mainstem of Clear Creek, including all of the tributaries **and wetlands**, from the I-70 bridge above Silver Plume to **a point just above the confluence with West Fork Clear Creek**, except for the specific listings in Segments 3**a and 3b**	
2b		Mainstem of Clear Creek, including all of the tributaries **and wetlands**, from **the confluence with West Fork Clear Creek to a point just below the confluence with Mill Creek**, except for the specific listings in Segments **4 through 8**	
2c		Mainstem of Clear Creek, including all of the tributaries **and wetlands**, from **a point just below the confluence with Mill Creek** to a point just above the Argo Tunnel discharge, except for the specific listings in Segments **9a, 9b, and 10**	

Table 11: Stream Segment Descriptions for 1991, 2010, and 2021

Segment ID	1991	2010	2021
3	Mainstem of South Clear Creek, including all tributaries, lakes, and reservoirs, from the source to the confluence with Clear Creek, except for the specific listing in 3b		
3a		Mainstem of South Clear Creek, including all tributaries **and wetlands**, from the source to the confluence with Clear Creek, except for the specific listing in Segments 3b **and 19**	
3b[1]	Mainstem of Leavenworth Creek from source to confluence with South Clear Creek		
4[1]	Mainstem of West Clear Creek from the source to the confluence with Woods Creek		
5[1]	Mainstem of West Clear Creek from the confluence with Woods Creek to the confluence with Clear Creek		
6[1]	All tributaries to West Clear Creek, including all lakes and reservoirs, from the source to the confluence with Clear Creek, except for the specific listings in Segments 7 and 8		
7	Mainstem of Woods Creek from the outlet of Upper Urad Reservoir to the confluence with West Clear Creek	Mainstem of Woods Creek from the outlet of Upper Urad Reservoir to the confluence with West Clear Creek, **including Lower Urad Reservoir**	
7a			Mainstem of Woods Creek from the outlet of Upper Urad Reservoir to the confluence with West Clear Creek
7b			Lower Urad Reservoir
8[1]	Mainstem of Lion Creek from the source to the confluence with West Clear Creek		
9	Mainstem of Fall River, including all tributaries, lakes, and reservoirs, from the source to the confluence with Clear Creek		
9a		Mainstem of Fall River, including all tributaries **and wetlands**, from the source to the confluence with Clear Creek	
9b		Mainstem **of Trail Creek, including all tributaries and wetlands**, from the source to the confluence with Clear Creek	

Table 11: Stream Segment Descriptions for 1991, 2010, and 2021

Segment ID	1991	2010	2021
10	Mainstem of Chicago Creek, including all tributaries, lakes, and reservoirs, from the source to the confluence with Clear Creek	Mainstem of Chicago Creek, including all tributaries **and wetlands**, from the source to the confluence with Clear Creek**, except for specific listings in Segment 19**	
11	Mainstem of Clear Creek from the Argo Tunnel discharge to the Farmers Highline Canal diversion in Golden	Mainstem of Clear Creek from **a point just above** the Argo Tunnel discharge to the Farmers Highline Canal diversion in Golden, Colorado	
12	All tributaries to Clear Creek, including all lakes and reservoirs, from the Argo Tunnel discharge to the Farmers Highline Canal diversion in Golden, except for specific listings in Segment 13	All tributaries to Clear Creek, including all **wetlands**, from the Argo Tunnel discharge to the Farmers Highline Canal diversion in Golden, Colorado, except for specific listings in Segment **13a and 13b**	
12a			All tributaries to Clear Creek, including all wetlands, from the Argo Tunnel discharge to the Farmers Highline Canal diversion in Golden, Colorado, except for specific listings in Segment 12b, 13a, and 13b
12b			Beaver Brook, from the source to the confluence with Soda Creek, and Soda Creek, from the source to the confluence with Clear Creek.
13	Mainstem of North Clear Creek, including all tributaries, lakes and reservoirs, from the source to the confluence		
13a		Mainstem of North Clear Creek, including all tributaries **and wetlands**, from its source to its confluence **with Chase Gulch, and Four Mile Gulch, including all tributaries and wetlands, from their**	

Table 11: Stream Segment Descriptions for 1991, 2010, and 2021

Segment ID	1991	2010	2021
		sources to their confluence with North Clear Creek and Eureka Gulch, including all tributaries and wetlands, from its source to its confluence with Gregory Gulch	
13b		Mainstem of North Clear Creek, including all tributaries **and wetlands**, from **a point just below the confluence with Chase Gulch to the confluence with Clear Creek, except for the specific listings in Segment 13a**	
19		All tributaries to Clear Creek, including wetlands, within the Mt. Evans Wilderness Area	

[1]Segments with descriptions unchanged from the time of the OU3 ROD Signing.
*Bold text added to highlight changes in text from 1991, 2010 to 2021.

Using the Water Quality Control Division's (WQCD) 2022 303(d) Listing Methodology, an evaluation of attainment of the 1991, 2010 and 2021 water quality standards was performed for each segment. In addition, Macroinvertebrate Multi-Metric Index data was reviewed using methods described in WQCC Policy Statement 10-1.

The general OU3 response action objectives are protecting brown trout and improving water quality in the mainstem and major tributaries of Clear Creek. While no numeric criteria were established in the OU3 ROD, the agencies have continually evaluated the goal of compliance with ARARs by comparing water quality to the water quality criteria outlined in regulations promulgated under the Colorado Water Quality standards (WQS). The agencies are evaluating the need for a relevant decision document that would establish numerical values. **Table 12** details the water quality standards in effect for Clear Creek Basin at the time of the OU3 ROD signing.

Table 12: Water Quality Standards for Clear Creek Basin in effect at OU3 ROD, 1991

Total Recoverable unless otherwise noted (µg/L)

	Arsenic	Cadmium	Chromium		Copper	Iron		Lead	Manganese		Nickel	Silver	Zinc
Segment			**III**	**VI**		**Diss.**	**Total**		**Diss.**	**Total**			
01	50	0.4	50	25	11	300	-	8.0	50	1,000	50	0.1	80
02	50	8.0	100	25	10	-	1,000	5.0	-	1,000	50	0.1	280
03a	50	0.4	50	25	5.0	300	1,000	4.0	50	1,000	50	0.1	90
03b	50	0.4	50	40	50	300	1,000	4.0	50	1,000	50	0.1	450
04	50	3.0	50	25	17	300	1,000	25	50	1,225	100	0.1	60
05	50	3.0	100	25	23	-	1,000	25	-	1,100	100	0.1	100
06	TVS	TVS	TVS	TVS	TVS	TVS	TVS	TVS	TVS	TVS	TVS	TVS	TVS
07	50	14	100	25	23	-	1,000	25	-	9,400	100	0.1	740
08	-	-	-	-	-	-	-	-	-	-	-	-	-
09	TVS	TVS	TVS	TVS	TVS	TVS	TVS	TVS	TVS	TVS	TVS	TVS	TVS
10	50	0.4	50	25	6.0	300	1,000	4.0	50	1,000	50	0.1	110
11	TVS	3.0	TVS	TVS	17	TVS	TVS	TVS	TVS	TVS	TVS	TVS	300
12	50	10	50	50	1,000	300	-	50	50	-	-	50	5,000
13	50	0.4	100	25	64	-	5,400	45	-	1,000	50	0.1	500

TVS – Table Value Standards

Data was not collected for Segments 1, 3a, 3b, 4, 7, 8, 10 and 12 during the period of review (2015 - 2021) due to the limited scope of the current sampling program. The OU3 ROD specifically designated reduction in heavy metals loading in Segment 7, Woods Creek, as part of the selected remedy. CDPHE and the EPA are currently working on a new surface water sampling and analysis plan to address these data gaps.

Historic Segment 2 (currently Segments 2a, 2b and 2c) slightly exceeds the 1991 WQS for zinc, with an 85th percentile of 282 µg/L and a standard of 280 µg/L. Evaluation of the three component segments designated after 1991 demonstrates that the source of zinc is in Segment 2a with an 85^{th} percentile value of 345 µg/L. The 85th percentile for zinc is below the 1991 WQS for Segment 2b and 2c (92 µg/L and 150 µg/L, respectively). As previously noted in the 2017 FYR, a preliminary investigation determined Segment 2a is too steep and aquatic conditions would not provide sufficient habitat to support fish. Further source response actions are not currently planned at this time, and it is anticipated that an ARARs modification or ARARs waiver will be implemented to address historic Segment 2. Segment 6 exceeds the 1991 WQS for both acute and chronic copper. As noted in the 2017 FYR this segment has a low hardness. During the 2015-2021 review period, the average hardness was 12.5 mg/L, which leads to a stringent calculated TVS for copper. Additionally, the sample location used for Segment 6 is on Mad Creek just upstream of the confluence of West Fork and Clear Creek, and only three samples were collected at that location. No source areas were identified along Mad Creek during the Phase II RI/FS.

Historic Segment 9 (currently Segments 9a and 9b) exceeds the WQS for several parameters. These parameters are chronic cadmium, chronic and acute copper, chronic iron, and chronic and acute zinc. Segment 9a exceeds the 1991 WQS for chronic copper and acute/chronic zinc. Segment 9b exceeds the 1991 WQS for chronic cadmium, acute/chronic copper, chronic iron (total recoverable), and acute/chronic zinc. Sample locations for Segment 9a include Fall River, and during the Phase II RI/FS no sources of metals contamination were identified. Segment 9a also had a low average hardness of 31.5 mg/L during the 2015-2021 review period, which results in stringent calculated TVS. Segment 9b is Trail Creek, and, as stated in previous FYRs and during the Phase II RI/FS, the creek exhibits low flow, which is not enough to impact the mainstem of Clear Creek, and no remedial actions were selected or performed.

Segment 11 is in attainment for all metals 1991 WQS. Segment 11 data is reviewed below.

Historic Segment 13 will be discussed below due to the impacts on that segment from remedial action completed as part of OU4.

The chronic arsenic standard for Segments, 1, 2a, 2b, 2c, 3a, 5, 6, 9a, 10, 11, 12b and 13b has been temporarily modified to 0.02 µg/L until 12/31/2024. For Segments 3b, 4 and 9b, the chronic arsenic standard is 0.02 µg/L. The 50^{th} percentile (median) total recoverable arsenic in Segments 2a, 2b, 2c, 5, 6, 9a, 11 and 13b were all non-detect and, therefore, appear to meet 303(D) methodology for attainment. However, the method detection limit for EPA Method 200.8 – *Determination of Trace Elements in Waters and Wastes by Inductively Coupled Plasma – Mass Spectrometry*, used by labs reporting total recoverable arsenic was 2.5 µg/L. This method detection limit is an order of magnitude greater than the 2021 chronic standard. Alternative analytical methods are being considered for the continued arsenic attainment analysis. Additionally, the agencies will be reviewing this change in the standard to determine whether it affects protectiveness as part of the ARAR review mentioned above.

OU4

In order to achieve the OU4 RAOs, numeric remediation goals were established in the OU4 ROD. Due to the significant variation in hardness during high- and low-flow regimens, the numeric goals were established on a seasonal basis of May 1 through August 31 (high flow) and September 1 through April 30 (low flow).

In addition to the OU4 RAOs, the 2010 OU4 ROD amendment identified WQCC Regulations 31 and 38 as ARARs; therefore, surface water standard attainment includes comparison to both current standards and those in place at the signing of the OU4 ROD. In order to determine whether standards promulgated under regulations 31 and 38 after signing of the ROD affect the protectiveness of the OU4 remedy, a comparison of 2021 standards to those in effect at the time of the OU4 ROD amendment was made.

Table 13: Site Remediation Goals and Stream Standards in effect at OU4 ROD, 2004

Metal	Flow Regime	Remediation Goals (µg/L)		Stream Standard (µg/L)	
		North Fork (Segment 13b)	Clear Creek below Idaho Springs (Segment 11)	North Fork (Segment 13b)	Clear Creek below Idaho Springs (Segment 11)
Zinc (dissolved)	High-Flow	381	200	1,864 (740)[1]	339 (300)[1]
	Low-Flow	675	300	1,864 (740)[1]	339 (300)[1]
Copper (dissolved)	High-Flow	7.4	5.2	64	17
	Low-Flow	15.1	9.2	64	17
Cadmium (dissolved)	High-Flow	1.9	1.4	6.0 (1.9)[1]	1.4
	Low-Flow	3.5	2.3	6.0 (3.5)[1]	2.9
Manganese (dissolved)	High-Flow	1,531	600	5,293 (1,431)[1]	861 (600)[1]
	Low-Flow	2,021	600	5,293 (2,021)[1]	861 (600)[1]

[1] Value presented is a temporary modification. The underlying standard is in parenthesis.

In the years that have elapsed since the signing of the OU2 (March 1988), OU3 (September 1991) and OU4 (September 2004) RODs, the WQCC has adopted several changes in Regulation 38, including changes to the water quality standards of the Clear Creek mainstem and tributaries. The historical chronology of development and changes of the stream standards of interest (trace metals) through September 2014 is outlined in the 2017 FYR.

Water quality data were compared to the classification standards for the Clear Creek basin effective December 31, 2021. The standards and amendments to Regulations 31 and 38 are provided in **Appendix J.**

Using the Water Quality Control Division's 2022 303(d) Listing Methodology, the OU4 Remediation Goals (RGs) were also compared to the data collected between 2017 and 2021 for Segment 13b at the confluence with mainstem Clear Creek and for the lower portion of Segment 11. The data is presented in **Table 14**.

The lower portion of Segment 11 is in attainment of the OU4 RGs. The RGs for Segment 13b, North Clear Creek, are in attainment with the exception of copper during high-flow. Data was limited for CC-50 during high flow and included six data points between May 2017 and August 2018. Additional data collection is needed to further evaluate the high-flow copper RG.

It should be noted that analysis of the data included samples collected after the 2017 operational start date of the NCCWTP.

Table 14: Summary of OU4 Remedial Goals and Current Water Quality

Contaminant of Concern	Flow Regime	Remediation Goals (µg/L)		2017 – 2021 85th Percentile (µg/L)	
		North Fork (Segment 13b)	Clear Creek Below North Clear Creek (Segment 11 – lower portion)	CC-50 North Clear Creek above Confluence with Mainstem	CC-60 Clear Creek at Church Ditch
Zinc (dissolved)	High-Flow	381	200	291	79
	Low-Flow	675	300	510	182
Copper (dissolved)	High-Flow	7.4	5.2	**14.0**	4.5
	Low-Flow	15.1	9.2	9.5	5.5
Cadmium (dissolved)	High-Flow	1.9	1.4	1.7	0.3
	Low-Flow	3.5	2.3	1.2	0.6
Manganese (dissolved)	High-Flow	1,531	600	527	57
	Low-Flow	2,021	600	159	329

Bolded values are above applicable standard.

Water treatment at NCCWTP began in March 2017 for Segment 13b of the North Fork of Clear Creek (COSPCL13b). Data for OU4 RGs contaminants of concern was reviewed for sampling sites CC-45 (North Fork Clear Creek downstream of Black Hawk and upstream of the NCCWTP) and CC-50 (North Fork Clear Creek above the confluence with Clear Creek). **Figures 2** through **5** below depict concentration versus time at Sampling Stations CC-45 and CC-50. The figures show that concentrations decreased at both sites following the implementation of active water treatment on the segment. Downstream concentrations (CC-50) of zinc and cadmium have been less consistently reduced following water treatment.

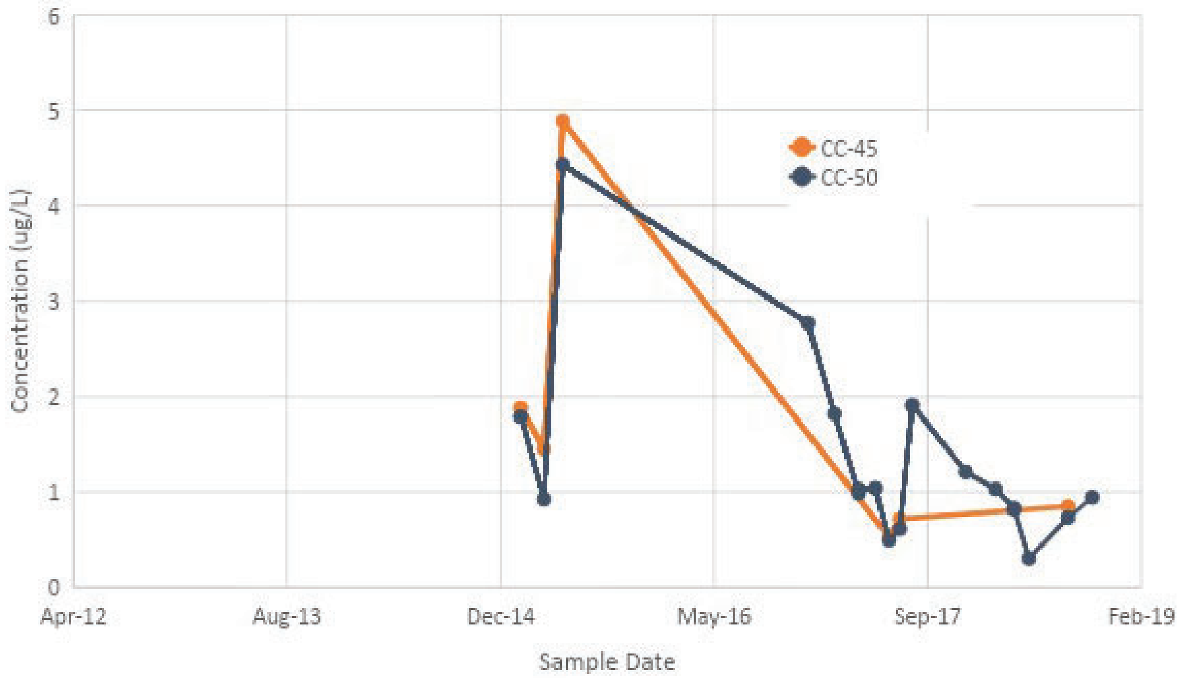

Figure 2: Dissolved Cadmium Concentrations on North Fork Clear Creek (x-axis is month/year)

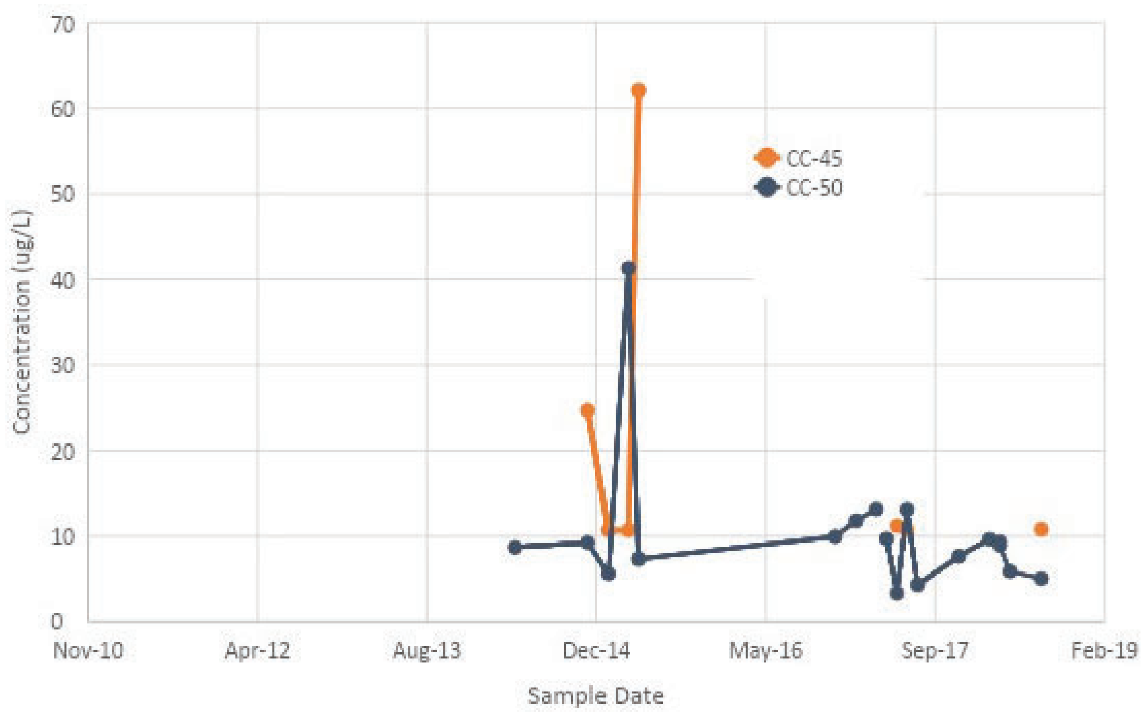

Figure 3: Dissolved Copper Concentrations on North Fork Clear Creek (x-axis is month/year)

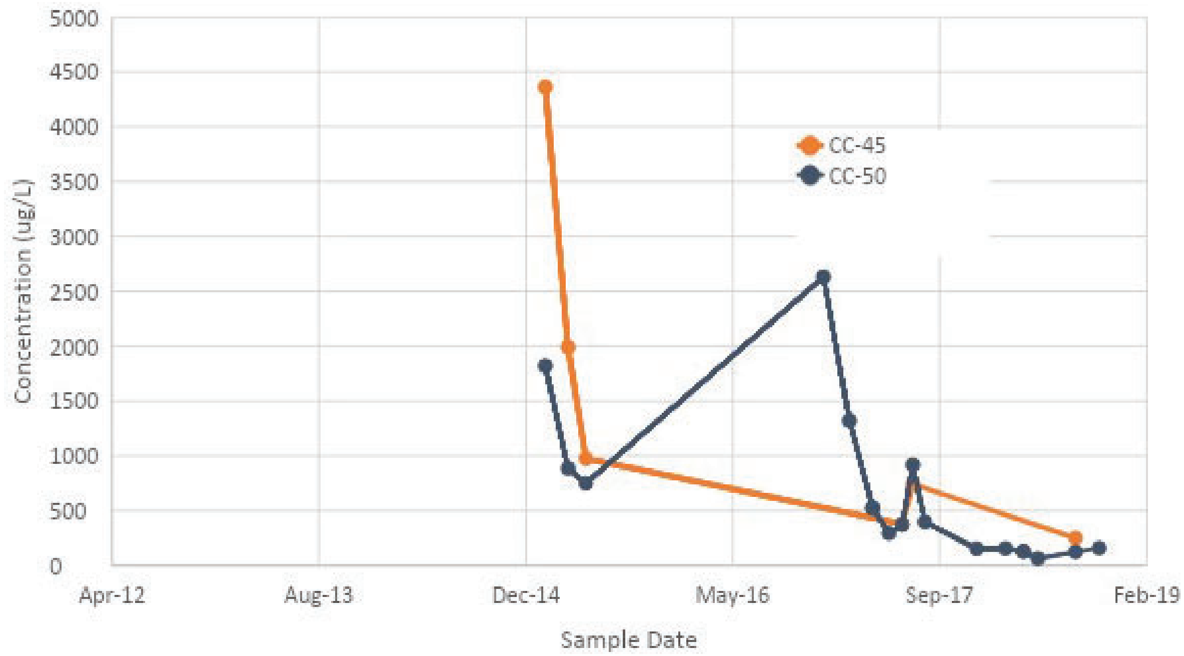

Figure 4: Dissolved Manganese Concentrations on North Fork Clear Creek (x-axis is month/year)

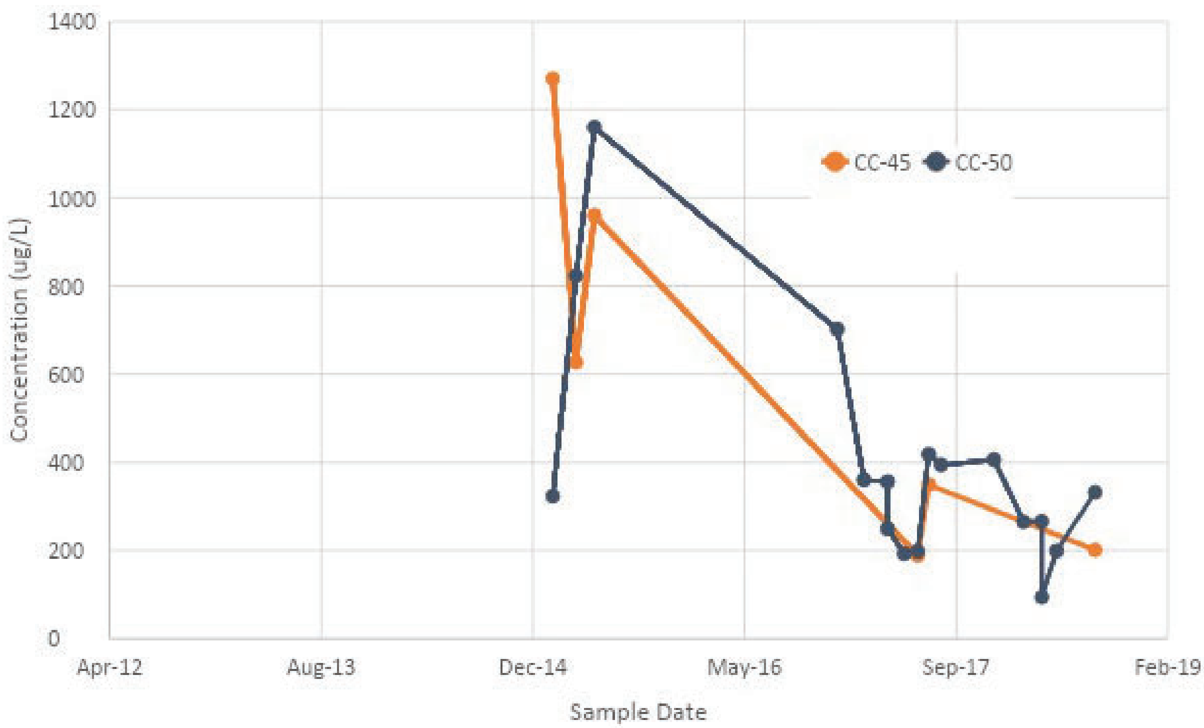

Figure 5: Dissolved Zinc Concentrations on North Fork Clear Creek (x-axis is month/year)

Water Quality Attainment Comparison

Several water quality standards have been modified since the signing of the 1991 OU3 and 2010 OU4 RODs, and the newer adopted standards are generally more stringent. **Table 15** details the attainment of the 2010 and 2021 WQS for the applicable segments and **Table 16** details the attainment of the 1991 WQS for the applicable segments.

Table 15: Summary of Non-Attainment of 2010/2021 Standards in the Clear Creek Watershed Study Area

Segment	Designated Use	Causes of Impairment	
		2010	2021
COSPCL01	Aquatic Life- Cold 1	*No Data*	*No Data*
COSPCL02a	Aquatic Life- Cold 1	Cadmium, Zinc	Cadmium, Zinc
COSPCL02b	Aquatic Life- Cold 1	Zinc	Zinc
COSPCL02c	Aquatic Life- Cold 1	Cadmium	Cadmium, Aquatic Life (MMI)[1]
COSPCL03a	Aquatic Life- Cold 1	*No Data*	*No Data*
COSPCL03b	Aquatic Life- Cold 2	*No Data*	*No Data*
COSPCL04	Aquatic Life- Cold 1	*No Data*	*No Data*
COSPCL05	Aquatic Life- Cold 1	Copper	Copper
COSPCL06	Aquatic Life- Cold 1	Copper	Copper
COSPCL07	Aquatic Life- Cold 2	*No Data*	*No Data*
COSPCL08	Aquatic Life- Cold 2	*No Data/No standards applied in Regulation 38*	*No Data/No standards applied in Regulation 38*
COSPCL09a	Aquatic Life- Cold 1	Cadmium, Copper, Zinc	Copper, Zinc
COSPCL09b	Aquatic Life- Cold 1	Cadmium, Copper, Iron, Zinc	Cadmium, Copper, Iron, Zinc
COSPCL10	Aquatic Life- Cold 1	*No Data*	*No Data*
COSPCL11	Aquatic Life- Cold 1	Copper, Manganese	Copper, Manganese
COSPCL12	Aquatic Life- Cold 2	*No Data*	*No Data*
COSPCL13b	Aquatic Life- Cold 2	Cadmium, Copper, Iron, Manganese, Lead, Zinc	Cadmium, Copper, Iron, Manganese, Lead, Zinc, Aquatic Life (MMI)
COSPCL19	Aquatic Life- Cold 1	*No Data*	*No Data*

[1] MMI data collected on Turkey Gulch

Table 16: Summary of Non-Attainment of 2015-2021 Data Compared to 1991 Water Quality Standards within the Clear Creek Watershed Study Area

Segment	Designated Use	Causes of Impairment[1]
COSPCL01	Aquatic Life- Cold 1	*No Data*
COSPCL02 (a, b & c)[2]	Aquatic Life- Cold 1	Zinc
COSPCL03a	Aquatic Life- Cold 1	*No Data*
COSPCL03b	Aquatic Life- Cold 2	*No Data*
COSPCL04	Aquatic Life- Cold 1	*No Data*
COSPCL05	Aquatic Life- Cold 1	none
COSPCL06	Aquatic Life- Cold 1	Copper
COSPCL07	Aquatic Life- Cold 2	*No Data*
COSPCL08	Aquatic Life- Cold 2	*No Data/No standards applied in Regulation 38*
COSPCL09 (a & b)[2]	Aquatic Life- Cold 1	Cadmium, Copper, Iron, Zinc
COSPCL10	Aquatic Life- Cold 1	*No Data*
COSPCL11	Aquatic Life- Cold 1	Copper, Manganese
COSPCL12	Aquatic Life- Cold 2	*No Data*
COSPCL13	Aquatic Life- Cold 2	Cadmium, Copper, Iron, Manganese, Zinc

Notes:

[1] Causes of impairment based on the water quality standards applicable at the time of the 1991 ROD

[2] Historical (1991) stream segmentation

The causes of impairment when evaluating the current stream segments to 2021 promulgated regulations is similar to the evaluation of the segments to 2010 WQSs. Contaminants that have not met attainment of the 1991, 2010 and 2021 WQS are cadmium, copper, iron, manganese and zinc. The incidences of impairment for these contaminants occur in approximately the same segments when comparing the 1991, 2010 and 2021 WQS. Missing data is due to the limited scope of the current sampling program.

Site Inspection

The inspection of the Site was conducted on August 8-9, 2022. The inspection was performed by Kyle Sandor, CDPHE. The purpose of the inspection was to assess the protectiveness of the remedy. During the site inspection, locations of response actions were visited and inspected for signs of damage, vandalism, and overall functionality. Due to rain prior to the Site visit, loose and muddy trail conditions prevented access to all O&M locations. However, the locations visited were all in working order and showed no obvious needs of maintenance. The areas not visited include the following:

- Anchor Waste Pile
- Hampton Waste Pile
- Hazeltine Pile
- Iroquois Pile
- Russell Gulch Sedimentation Dam
- South Willis Gulch Check Dam

- Willis Gulch Check Dam

A subsequent inspection was not scheduled due to availability of CDPHE staff and the timing of the FYR due date. Additionally, during the 2021 O&M inspection each of these locations were inspected and determined to be operating as expected.

V. TECHNICAL ASSESSMENT

OU2

QUESTION A: Is the remedy functioning as intended by the decision documents?

The intent of the OU2 ROD was to minimize the potential for specific mine waste piles to contribute metal and sediment loading to Clear Creek through collapse of unstable slopes and through runoff. Additionally, the human uptake of metals from the inhalation of dust or ingestion of materials from the piles was to be minimized. These objectives have been accomplished at the five waste piles identified in the OU2 ROD with the exception of the Quartz Hill Waste Pile, which was addressed under OU4.

QUESTION B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?

The Phase I RI/FS for OU2 included a Public Health Evaluation (PHE) to identify contaminants of concern that could pose significant risk to human health and the environment, and to evaluate the potential impacts in absence of any remedial actions being performed. The PHE estimated the total excess upper-bound lifetime cancer risk associated with the following activities:

- Swimming in Clear Creek;
- Consuming fish from Clear Creek or North Clear Creek;
- Inhalation of dust at the Gregory waste pile or Argo waste pile;
- Inhalation of dust caused by motorcycles atop the Gregory waste pile and
- Incidental ingestion of soil from the Gregory waste pile or the Argo waste pile.

During the Phase II investigations, the BRA was completed for the Site and further evaluated the potential exposures that were found to be associated with potential risks in the PHE. The Phase II assessment documented human health action levels for lead and arsenic in soil. The OU3 ROD established action levels of 500 mg/kg for lead and 130 mg/kg for arsenic in soil. These action levels were set based on incidental ingestion of mine waste under a residential exposure scenario. Since the Big Five and Argo mine waste piles exhibited soil concentrations of lead and arsenic greater than the risk-based action levels, the 1999 ESD was issued to incorporate capping into the remedy at these two piles. However, due to concerns of the local State Historic Preservation Office and the property owner, the Argo waste pile was not capped. The Argo waste pile is privately owned, and access to the pile is controlled. Therefore, actual human exposure by incidental ingestion is less than under the residential scenario. Any changes in the land-use scenario will require an updated human health risk assessment. ICs for the Argo waste pile are identified in **Table 6.**

QUESTION C: Has any other information come to light that could call into question the protectiveness of the remedy?

No other information has come to light since the previous FYR that could call into question the protectiveness of the remedy relative to OU2.

OU3

QUESTION A: Is the remedy functioning as intended by the decision documents?

The intent of the interim remedy in the OU3 ROD was to cap or install physical barriers on select mine waste piles, implement alternative drinking water supply where required, treat Burleigh and Argo Tunnel discharges, groundwater pump and treatment of non-point source metals loading to surface water, and reduction of metals load from Woods Creek. A subsequent ESD modified the original ROD to include a no-action alternative for the Burleigh Tunnel discharge, collection of the Big Five Tunnel discharge and conveyance to the ATWTF, and construction of a flow-control bulkhead in the Argo Tunnel.

These objectives have been accomplished, with the exception of the reduction of metals loads from Woods Creek. Water quality data was not available for this segment (COSPCL07) during the FYR review period, and an evaluation of standard attainment could not be made.

QUESTION B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?

The water quality standards in the Clear Creek watershed have changed since the signing of the OU3 ROD. The ROD selected Colorado Water Quality Regulations 31 and 38 as ARARs. Regulations 31 and 38 have changed over time, as has certain water use classification. The EPA needs additional data to determine whether the ARARs identified in the OU3 ROD remain protective. Attainment of applicable water quality standards may not be possible for all parameters in all segments of the watershed without additional remedial action. Further evaluation is needed to determine if ARAR waiver(s) should be developed at the Site or if additional response action is needed. A decision document modification would be required.

Additionally, the Fifth FYR identified an outdated lead exposure scenario used to screen waste piles for response actions in the OU3 ROD. A new Operable Unit 5 was designated to evaluate this further, and additional response actions may be conducted at the Site. However, the exposure assumptions, toxicity data, cleanup levels, and RAOs used to select the actions completed under OU3 are still valid.

QUESTION C: Has any other information come to light that could call into question the protectiveness of the remedy?

No new information has been reviewed that could call into question the protectiveness of the remedy.

OU4

QUESTION A: Is the remedy functioning as intended by the decision documents?

With the construction of the NCCWTP, all remedy components of the OU4 ROD have been implemented with the exception of Gregory Gulch groundwater collection. Data collected from 2017-2021 indicates that operation of the NCCWTP has lowered concentrations of cadmium, copper, manganese and zinc in Segments 11 and 13b of Clear Creek and North Clear Creek respectively. Additionally, remediation goals for the contaminants are being met with the exception of copper (high flow) at CC-50. The copper (high flow) exceedance is likely a result of sampling bias as data from that segment has not been collected since 2018.

QUESTION B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?

The lead exposure scenarios used to screen waste piles for response actions in the OU4 ROD is outdated. A new Operable Unit 5 was designated to evaluate this further, and additional response actions may be conducted at the Site. However, the exposure assumptions, toxicity data, cleanup levels, and RAOs used to select the actions completed under OU4 are still valid.

Additionally, the WQCC added a Water Supply Use Classification and Standards for Clear Creek Segment 13b effective June 30, 2020. This addition is due to evidence demonstrating that surface waters are used for drinking water and/or there is a reasonable potential for a hydrological connection between surface water and alluvial wells used for drinking water. Given the updated classification, this segment of Clear Creek is now available for drinking water use which results in a change to the exposure assumptions previously used for evaluating protectiveness. An evaluation needs to be completed to ensure the remedy is still protective for this new use. The assessment will be captured in the evaluation of stream standards across the watershed.

QUESTION C: Has any other information come to light that could call into question the protectiveness of the remedy?

No new information has been reviewed that could call into question the protectiveness of the remedy.

VI. ISSUES/RECOMMENDATIONS

Issues/Recommendations
OU(s) without Issues/Recommendations Identified in the Five-Year Review:
OU2

Issues and Recommendations Identified in the Five-Year Review:

OU(s): 3	**Issue Category:** Remedy Performance
	Issue: Water Quality Standard non-attainment

	Recommendation: Additional Sampling and possible Technical Impracticability waiver

Affect Current Protectiveness	Affect Future Protectiveness	Party Responsible	Oversight Party	Milestone Date
Yes	Yes	EPA/State	EPA	December 31, 2026

OU(s): 4	**Issue Category:** Monitoring
	Issue: Water Accounting at NCCWTP
	Recommendation: Recommendation: Implement upgrades at NCCWTP to allow for more accurate influent and effluent water accounting. This will allow for the State to apply for an absolute water right instead of the conditional water right currently maintained.

Affect Current Protectiveness	Affect Future Protectiveness	Party Responsible	Oversight Party	Milestone Date
No	Yes	State	EPA	December 31, 2025

OU(s): 4	**Issue Category:** Remedy Performance
	Issue: Gregory Gulch groundwater collection and treatment
	Recommendation: Evaluate attainment of water quality standards and remediation goals to determine if collection and treatment is necessary.

Affect Current Protectiveness	Affect Future Protectiveness	Party Responsible	Oversight Party	Milestone Date
Yes	Yes	EPA/State	EPA	December 31, 2026

OU(s): 4	**Issue Category:** Institutional Controls
	Issue: Implementation of ICs at remaining OU4 source areas
	Recommendation: Work with property owners to add environmental covenants to OU4 source areas.

Affect Current Protectiveness	Affect Future Protectiveness	Party Responsible	Oversight Party	Milestone Date
No	Yes	EPA/State	EPA	December 31, 2025

OU(s): 3 and 4	**Issue Category:** Other			
	Issue: ARARs established for OUs 3 and 4 contain both chemical specific remediation goals and cite Colorado surface water quality classifications and standards which change over time.			
	Recommendation: Review the selected ARARs for OUs 3 and 4 and determine whether they remain protective.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
Yes	Yes	EPA/State	EPA	December 31, 2026

OU(s): 3	**Issue Category:** Institutional Controls			
	Issue: Information pertaining to some ICs is incomplete, including date executed.			
	Recommendation: CDPHE and EPA are completing an ICIAP to identify IC deficiencies.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	EPA/State	EPA	December 31, 2024

VII. PROTECTIVENESS STATEMENT

Protectiveness Statement(s)		
Operable Unit: 2	*Protectiveness Determination:* Short-term Protective	*Planned Addendum Completion Date:* NA
Protectiveness Statement: The OU2 remedy is an interim remedy and is currently protective of human health and the environment because the interim remedial activities to date have adequately addressed all exposure pathways that could result in unacceptable risks in these areas.		

Protectiveness Statement(s)

Operable Unit: 3	*Protectiveness Determination:* Protectiveness Deferred	*Planned Addendum Completion Date:* 12/31/2026
Protectiveness Statement: The protectiveness determination of the remedy at OU3 cannot be made at this time until further information is obtained. Further information will be obtained by taking the following actions: 1) Revising current sampling and analysis program to include the implementation of a systematic, representative sampling program, with appropriate arsenic detection limits, to determine compliance with surface water quality criteria.		

Protectiveness Statement(s)		
Operable Unit: 4	*Protectiveness Determination:* Short-term Protective	*Planned Addendum Completion Date:* NA
Protectiveness Statement: The protective determination of the remedy at OU4 cannot be made at this time until further information is obtained, and additional action taken. Further information will be obtained by: 1) Revising current sampling and analysis program to include the implementation of a systematic, representative sampling program, with appropriate arsenic detection limits, to determine compliance with surface water quality criteria, 2) Evaluating the need for capture, conveyance and treatment of Gregory Gulch groundwater, 3) Completing ICIAP identifying IC deficiencies. Additionally, CDPHE will need to establish an absolute water right for the operation of the NCCWTP facility.		

VIII. NEXT REVIEW

The next five-year review report for the Central City, Clear Creek Superfund Site is required five years from the completion date of this review.

Appendix A: References

General

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OU 3

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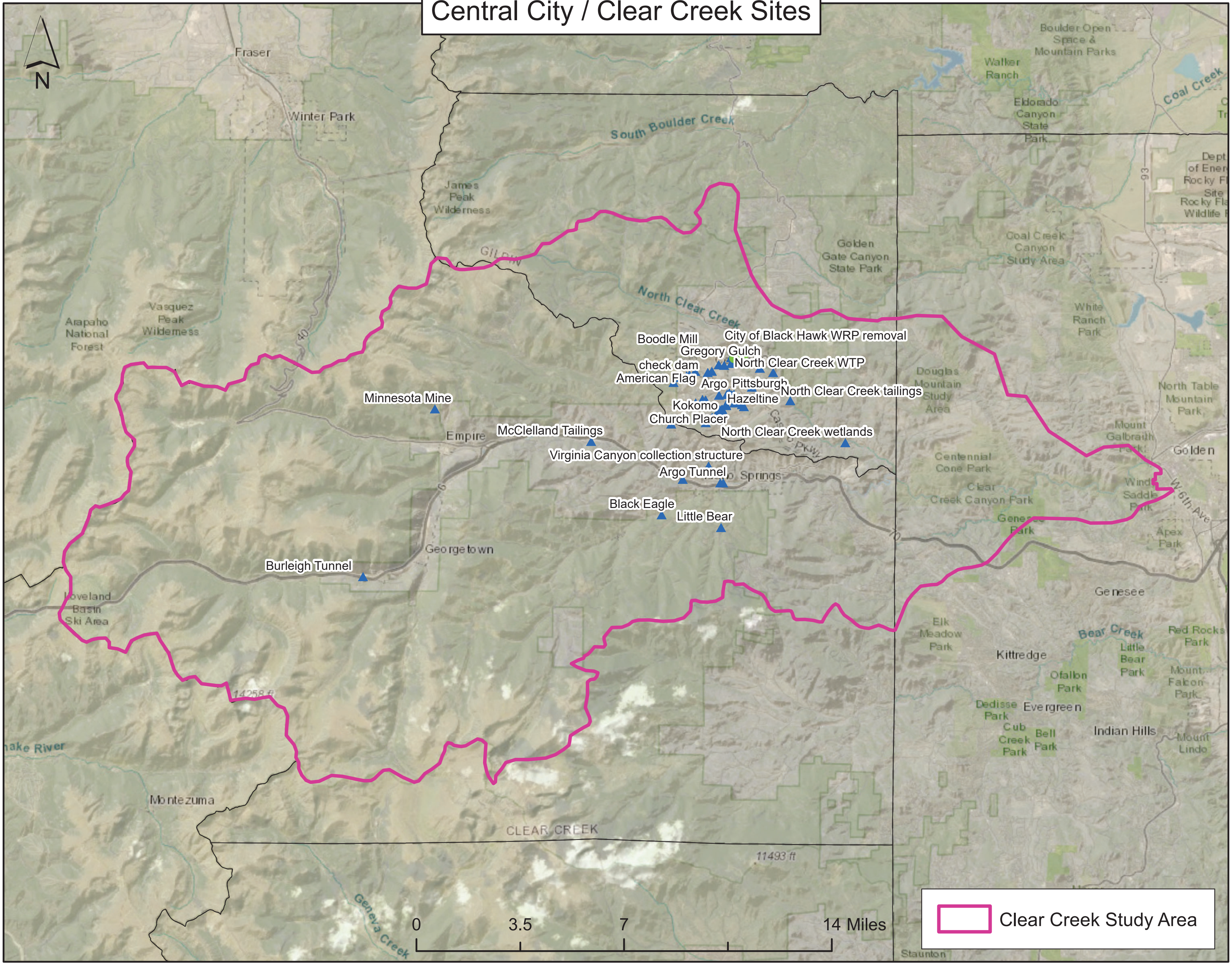
Appendix B: Site Map

Central City / Clear Creek Sites



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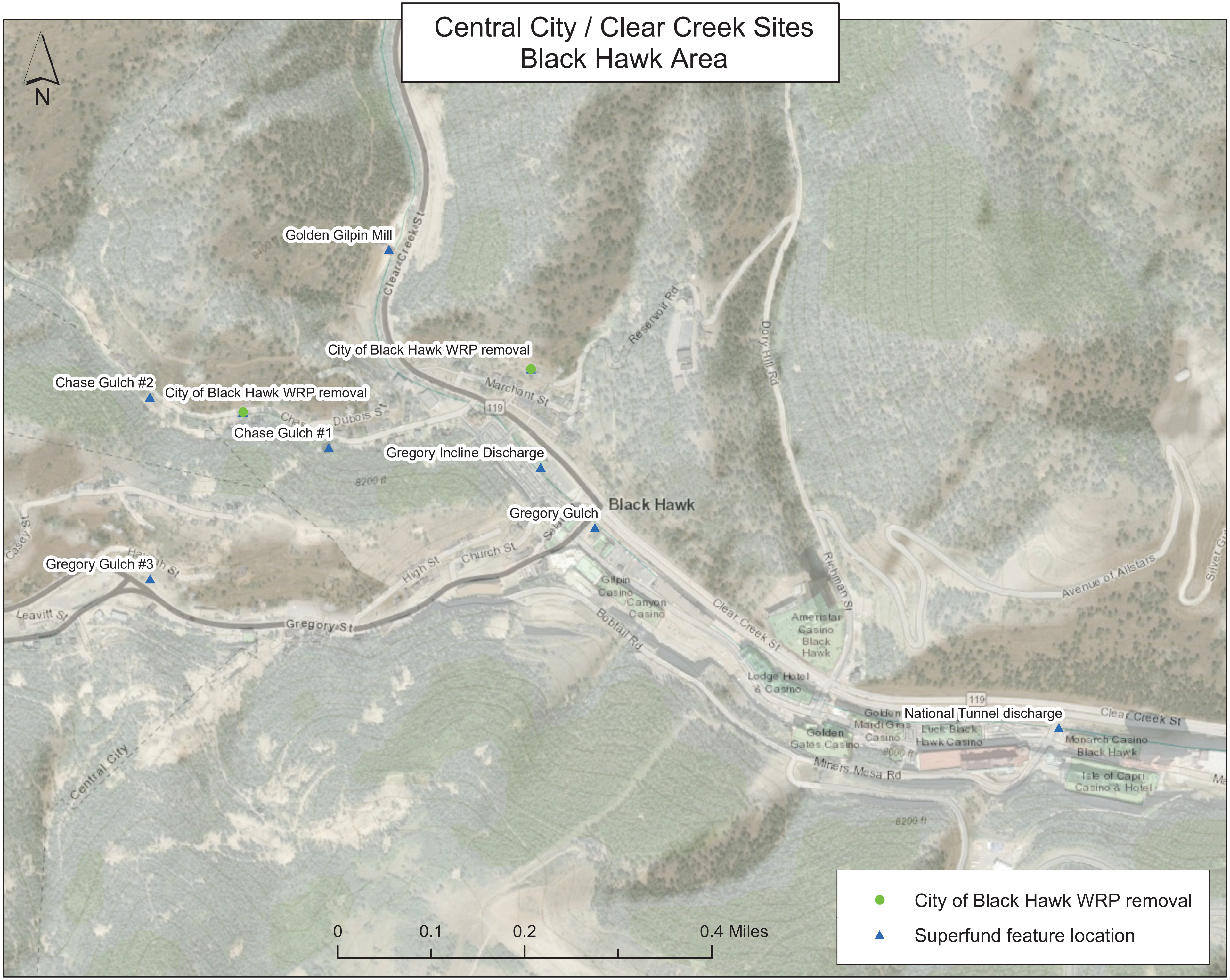

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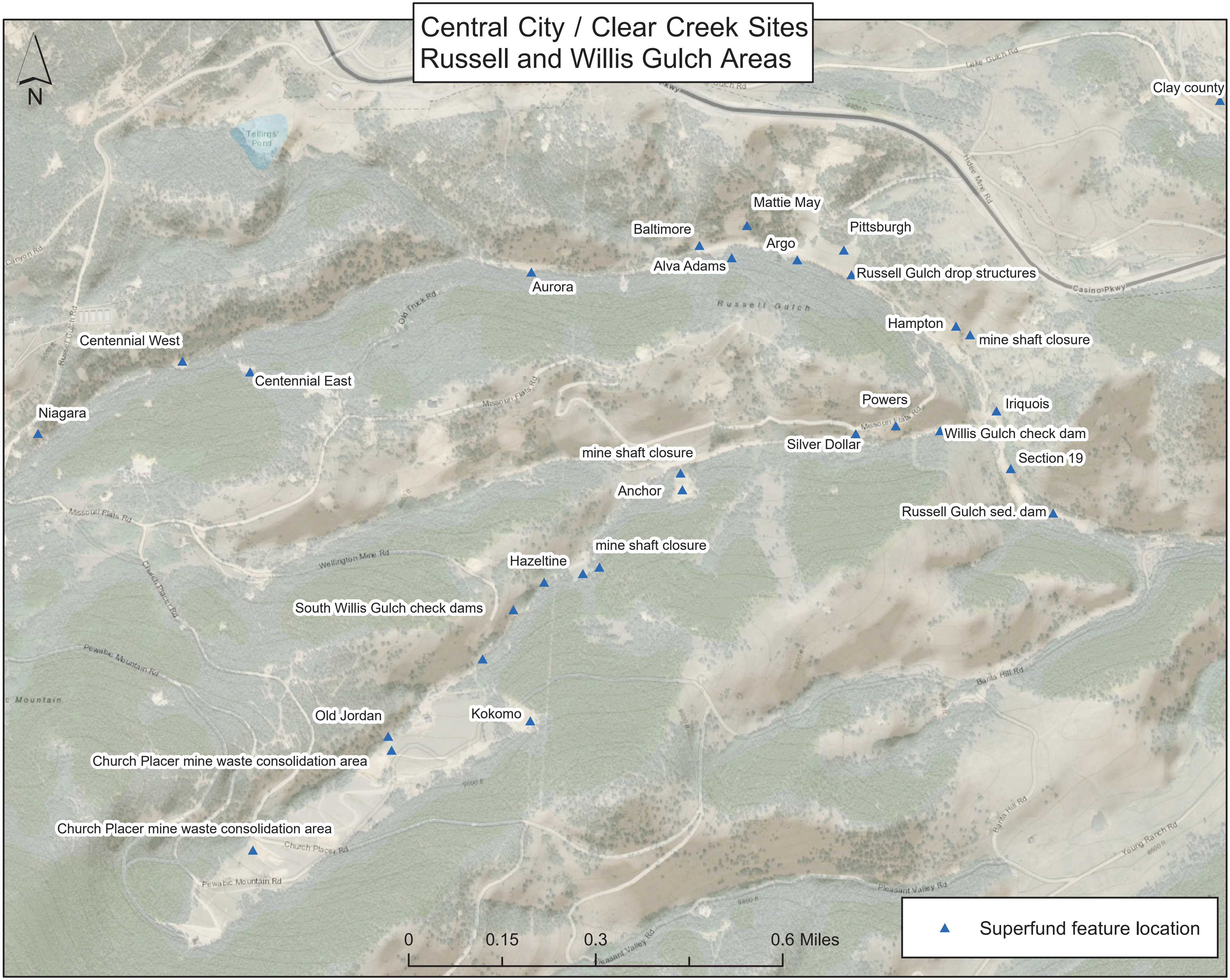

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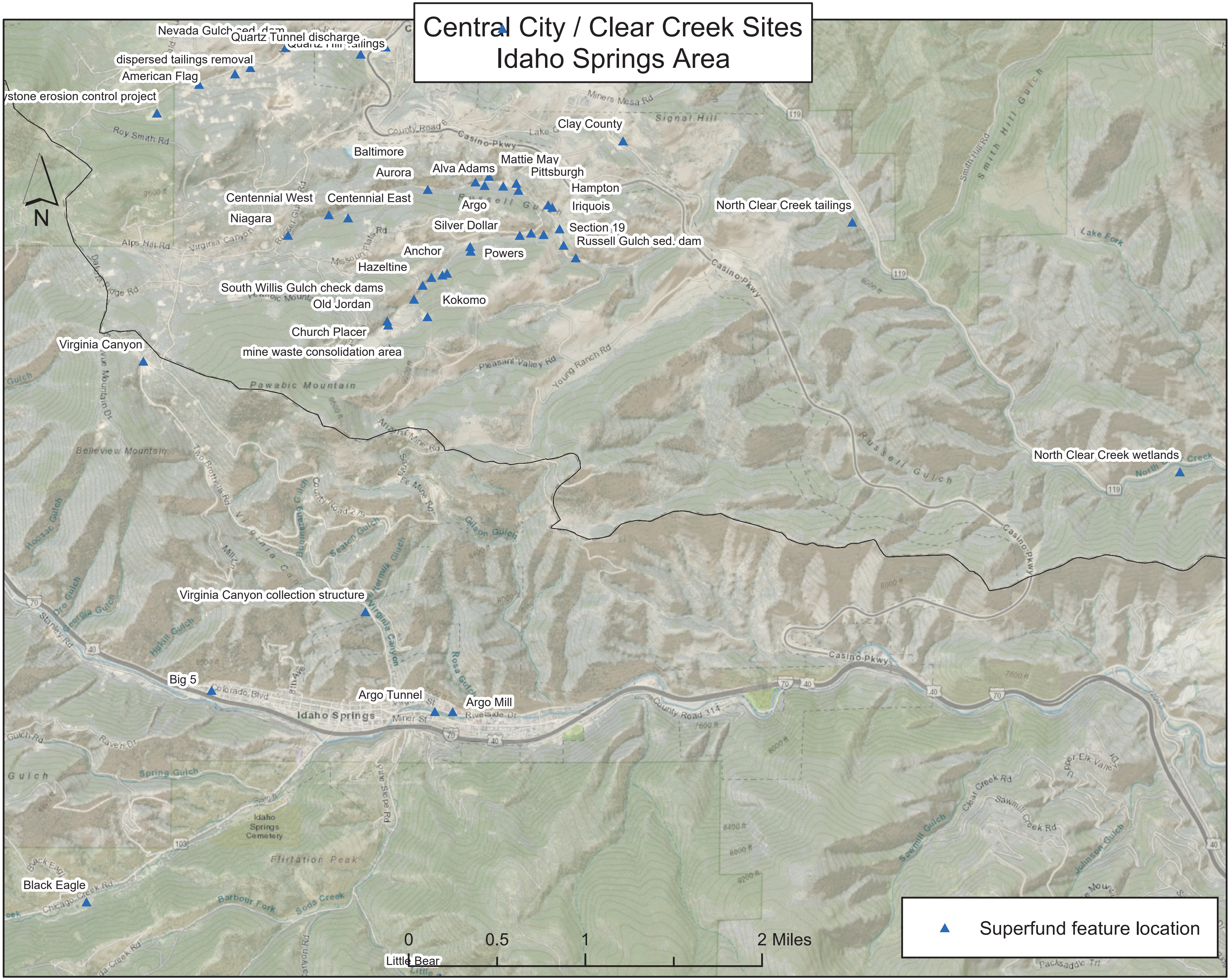

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Central City / Clear Creek Sites
Western Clear Creek Area

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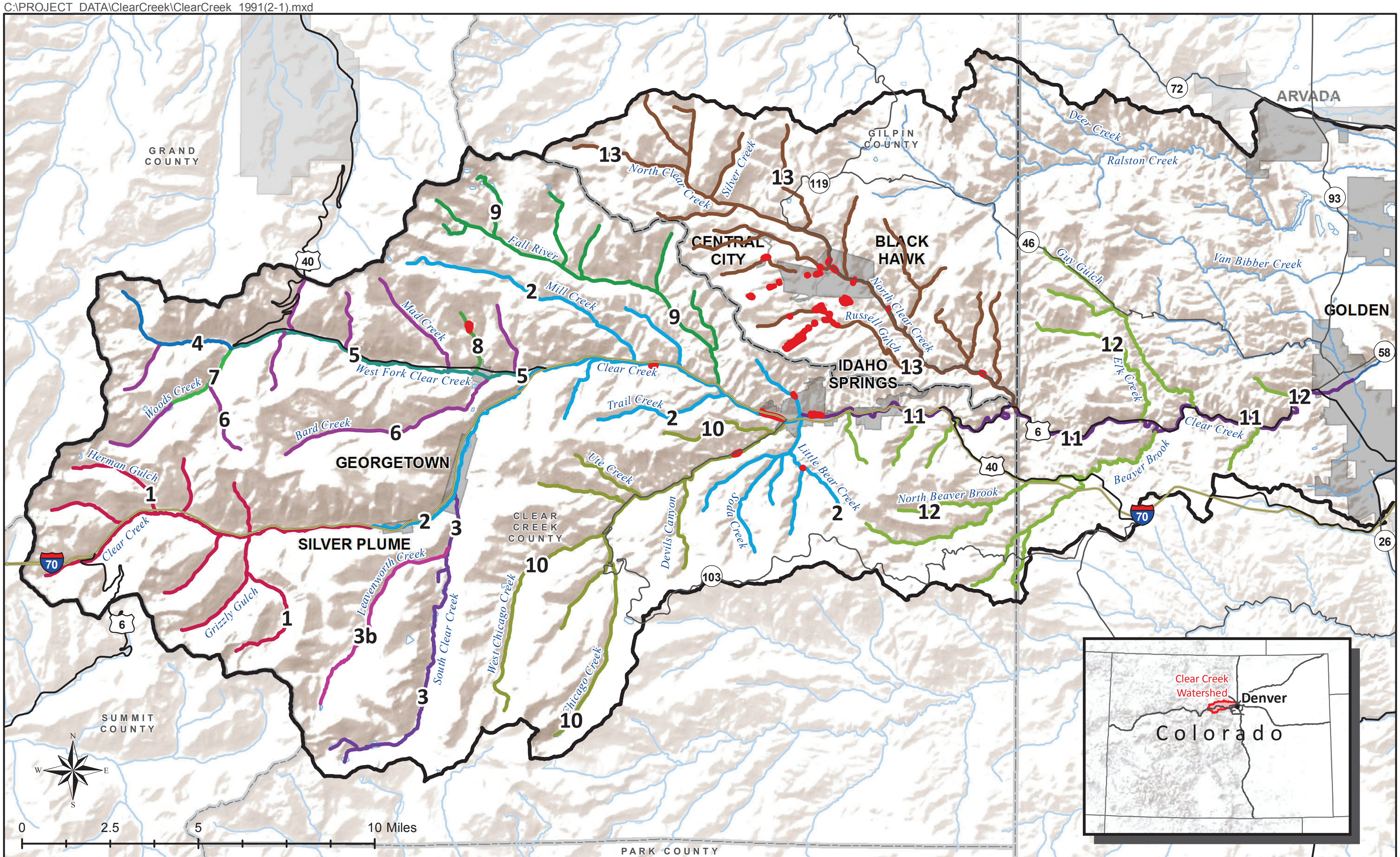
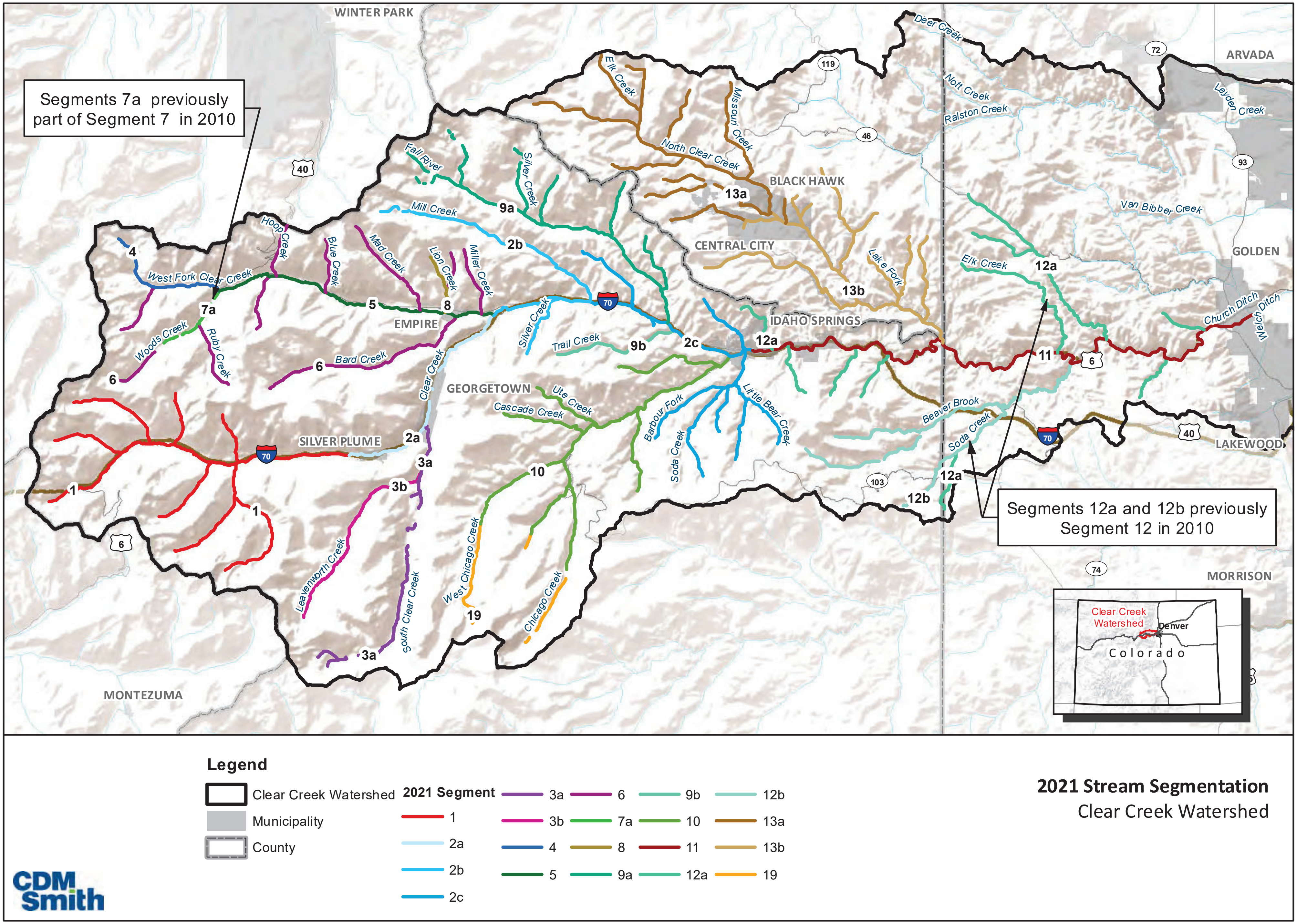


Central City / Clear Creek NPL Site
Municipality
County Boundary

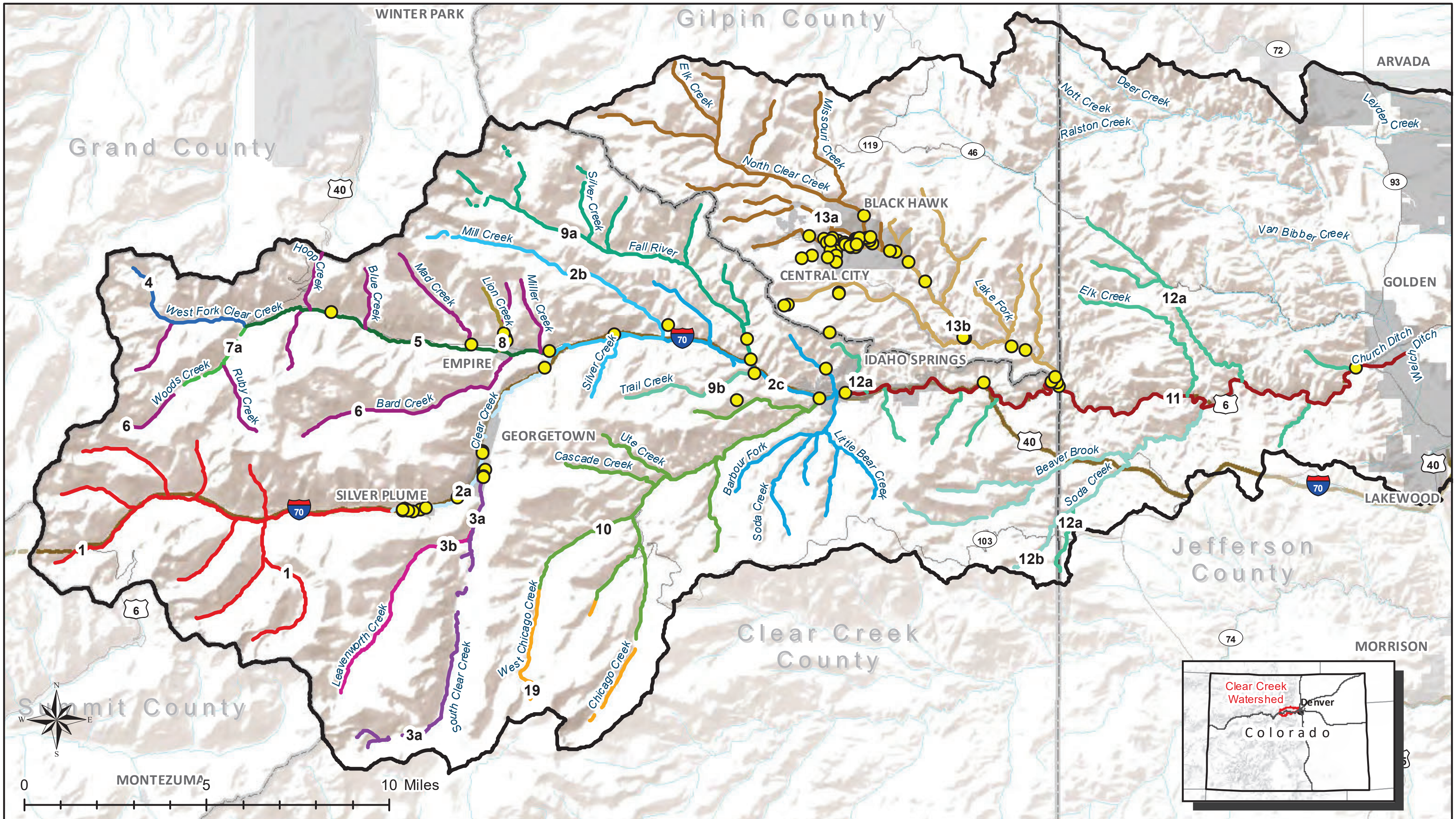
Segment 1
Segment 2
Segment 3
Segment 3b
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Segment 9
Segment 10
Segment 11
Segment 12
Segment 13

CDM Smith

1991 Stream Segmentation
Clear Creek Watershed



2021 Stream Segmentation
Clear Creek Watershed



Legend

- WQ Stations (Scribe)
- Clear Creek Watershed
- Municipality
- County Boundary

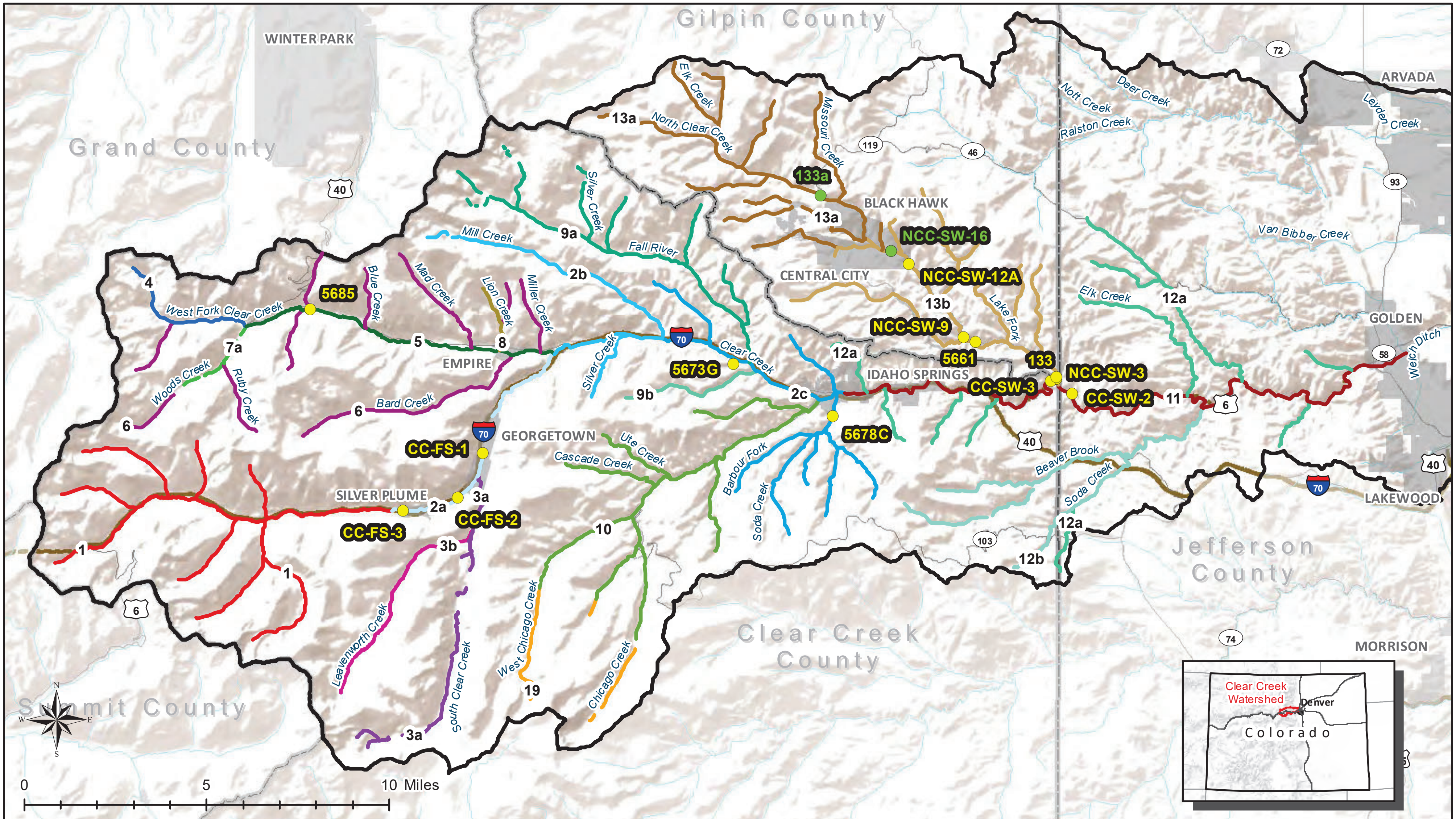
2021 Segment

1, 2a, 2b, 2c, 3a, 3b, 4, 5, 6, 7a, 8, 9a, 9b, 10, 11, 12a, 12b, 13a, 13b, 19

Water Quality Sampling Locations (2015-2021)

Clear Creek Watershed

CDM Smith



Legend

MMI Data Sites

Biotype

- 1
- 2

Clear Creek Watershed

Municipality

County Boundary

2021 Segment

1, 2a, 2b, 2c, 3a, 3b, 4, 5, 6, 7a, 8, 9a, 9b, 10, 11, 12a, 12b, 13a, 13b, 19

CDM Smith

Macroinvertebrate Data Locations

Clear Creek Watershed

Appendix C: Site Chronology

Event	Date
NPL listing	9/8/1983
Time-Critical Removal Actions	3/1987 – 8/1991
Remedial Investigation/Feasibility Study complete	6/8/1987
OU1 ROD signature	9/30/1987
OU2 ROD signature	3/31/1988
Transfer of lead status to CDPHE	6/1988
OU2 Remedial Actions complete	9/1991 – 5/2003
Phase II Remedial Investigation/Feasibility Study complete	9/1991
OU3 ROD signature	9/30/1991
OU3 Administrative Orders on Consent	2/1993 – 9/1998
OU3 Potentially Responsible Party Removals complete	6/1993 – 11/1996
First Five-Year Review	**3/30/1994**
OU3 Unilateral Administrative Orders	7/1994 – 9/1997
OU3 Remedial Actions complete	1/1995 – 9/1999
OU3 Potentially Responsible Party Remedial Action complete	2/1995 – 8/2000
OU3 Non-Time Critical Removal Actions complete	11/1996 – 12/1998
Second Five-Year Review	**3/26/1999**
OU2 ROD Explanation of Significant Differences	9/1/1999
Argo Tunnel Water Treatment Plant operational and functional	9/28/1999
OU3 ROD Amendment (Burleigh Tunnel)	6/5/2003
OU4 Remedial Investigation/Feasibility Study complete	9/29/2004
OU4 ROD signature	9/29/2004
Third Five-Year Review	**9/29/2004**
Reorganize remaining OU2 and 3 projects under OU4	6/2006
Amendment to OU3 & OU4 ROD (On-Site Repository)	9/25/2006
Remediation System Evaluation for Argo Tunnel WTP	9/27/2007
Acquisition of repository property	10/30/2008
Fourth Five-Year Review	**9/30/2009**
OU3 Argo Tunnel Treatment Plant O&M transferred to state	10/1/2009
OU4 ROD Amendment (Active Treatment)	4/29/2010
Quartz Hill Waste Rock Pile completed	9/9/2014
OU3 ROD Explanation of Significant Differences (Argo Tunnel Discharge Flow-Control Bulkhead)	9/12/2014
Tronox Settlement	1/2015
2015 Waste Pile Sampling Event	8/11-12/2015
Argo Tunnel Flo-Control Bulkhead (construction complete)	8/19/2015
Fifth Five-Year Review	**11/3/2017**
2018 Waste Pile Sampling Event	9/11-13/2018
CDPHE Residential Waste Pile Assessment Report	9/30/2020

Appendix D: Phase II Risk Assessment Data

Chronic Health Effects Criteria for Phase II Chemicals of Potential Concern

COPC	Phase II Risk Assessment		
	Reference Dose (RfD) mg/kg-day	Oral Slope Factor (mg/ kg-day)$^{-1}$	alation Slope Factor (mg/ kg-day)$^{-1}$
Aluminum	-	-	-
Arsenic	0.001	1.75	50
Beryllium	0.005	4.3	8.4
Cadmium	0.001 (food) 0.0005 (water)	-	6.1
Chromium (VI)	0.005	-	41
Copper	0.04	-	-
Fluoride	0.06	-	-
Iron	-	-	-
Lead	-	-	-
Manganese	0.2	-	-
Mercury	0.0003[1]	-	-
Nickel	0.02	-	1.7 (as NiS)
Silver	0.003	-	-
Zinc	0.2	-	-

Risk-Based Target Concentrations for Potential Human Exposure

COPC	Phase II Risk Assessment				
	Incidental Ingestion of Surface Water While Swimming (mg/L)	Ingestion of Fish (mg/kg)	Residential Ingestion of Drinking Water (mg/L)	Incidental Ingestion of Tailings (mg/kg)	Residential Inhalation (µg/m^3)
Aluminum[a]	-	-	-	-	-
Arsenic	9.1	NA	0.035	1,600	NC
	0.037[b]	NA	0.000047[b]	13[b]	0.00011[b]
Beryllium	NA	NA	NA	NA	0.00065[b]
Cadmium	4.6	1.3	0.018	1,600	0.00089[b]
Chromium (VI)	46	NA	0.175	7,900	0.00013[b]
Copper	370	NA	1.4	63,000	NC
Fluoride	550	NA	2.1	NA	NA
Iron	-	-	-	-	-
Lead	-	-	-	-	-

Manganese	1,800	NA	7	790,000	NA
Mercury (elemental)	NA	0.40	NA	NA	NA
Nickel	180	NA	0.7	31,000	0.0032[b]
Silver	27	NA	0.11	4,700	NA
Zinc	1,800	NA	7	310,000	NC

[a] – Contaminant of Potential Concern for Aquatic Life only.
[b] – Target concentration derived to protect against carcinogenic effects.
NA – Not analyzed in this medium.
NC – Not calculated. Toxicity criteria are not available.

A**verage Metals Concentrations in Sampled Waste Piles, Phase II RI (mg/kg)**

COPC	Phase II RBC	Black Eagle Tailings	Boodle Mill Tailings	Boodle Mill Waste Rock	Clay County Tailings	Clay County Waste Rock	Empire Tailings
Aluminum	-	2,917	4,510	5,175	6,527	6,770	4,592
Arsenic	1,600 13[a]	299	24	47	84	65	2
Cadmium	1,600	7	18	16	4	2	1
Chromium	7,900	12	11	18	30	34	10
Copper	63,000	435	168	210	314	206	66
Iron	-	44,367	20,850	26,950	29,267	35,200	15,657
Lead	-	2,810	1,117	1,460	938	486	15
Manganese	790,000	1,318	3,490	3,034	1,436	280	225
Nickel	31,000	8	10	15	21	34	6
Silver	4,700	34	5	22	8	5	1
Zinc	310,000	1,557	3,640	3,263	1,322	183	369

COPC	Phase II RBC	Golden Gilpin Tailings	Golden Gilpin Waste Rock	Gregory #2 Waste Rock	Little Bear Waste Rock	McClelland Tailings	NCC Dredge Tailings
Aluminum	-	4,860	20,600	9,660	7,540	2,043	6,220
Arsenic	1,600 13[a]	399	33	62	143	40	47
Cadmium	1,600	12	4	6	1	5	7
Chromium	7,900	26	83	14	21	10	20
Copper	63,000	434	172	365	168	141	776
Iron	-	34,200	49,600	52,150	60,950	21,733	24,525
Lead	-	2,305	613	708	1,004	1,142	515
Manganese	790,000	2,580	1,140	1,807	176	796	205
Nickel	31,000	20	38	16	13	7	12

Silver	4,700	17	6	5	15	19	8
Zinc	310,000	2,480	929	1,117	260	979	803

[a] Target concentration derived to protect against carcinogenic effects.

Appendix E: Inspection Checklist

I. SITE INFORMATION	
Site name: Central City Clear Creek	**Date of inspection:** 8/8-9/2022
Location and Region: Colorado, Region 8	**EPA ID:** COD980717557
Agency, office, or company leading the five-year review: CDPHE	**Weather/temperature:** Clear, 80s

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ■ Access controls
- ■ Institutional controls
- ☐ Groundwater pump and treatment
- ■ Surface water collection and treatment
- ☐ Other Soil contamination, Active water treatment
- ☐ Monitored natural attenuation
- ■ Groundwater containment
- ☐ Vertical barrier walls

Attachments: ☐ Inspection team roster attached ☐ Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** Kyle Sandor (Name) EPS II (Title) ______ (Date)
   Interviewed ☐ at site ■ at office ☐ by phone Phone no. ______
   Problems, suggestions; ☐ Report attached ______

2. **O&M staff** Mary Boardman (Name) Superfund Unit Leader (Title) ______ (Date)
   Interviewed ☐ at site ■ at office ☐ by phone Phone no. ______
   Problems, suggestions; ☐ Report attached ______

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency EPA
Contact Jamie Miller | EPA RPM | |
Name | Title | Date | Phone no.
Problems; suggestions; ☐ Report attached

Agency Trout Unlimited
Contact Lauren Duncan | Abandoned Mines Restoration PM | |
Name | Title | Date | Phone no.
Problems; suggestions; ☐ Report attached

Agency Clear Creek County
Contact Lisa Leben | Special Projects Manager | |
Name | Title | Date | Phone no.
Problems; suggestions; ☐ Report attached

Agency UCCWA
Contact Kerry Major | Water Quality Lab Manager | |
Name | Title | Date | Phone no.
Problems; suggestions; ☐ Report attached

4. **Other interviews** (optional) ☐ Report attached.

Frederick Rollenhagen, Wally Robinson, Jeremy Reineke, Diane Kelty

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)				
1.	**O&M Documents**			
	■ O&M manual	■ Readily available	■ Up to date	☐ N/A
	■ As-built drawings	■ Readily available	☐ Up to date	☐ N/A
	■ Maintenance logs	■ Readily available	☐ Up to date	☐ N/A
	Remarks			
2.	**Site-Specific Health and Safety Plan**	■ Readily available	■ Up to date	☐ N/A
	■ Contingency plan/emergency response plan	■ Readily available	☐ Up to date	☐ N/A
	Remarks			
3.	**O&M and OSHA Training Records**	■ Readily available	■ Up to date	☐ N/A
	Remarks			
4.	**Permits and Service Agreements**			
	☐ Air discharge permit	☐ Readily available	☐ Up to date	■ N/A
	☐ Effluent discharge	☐ Readily available	☐ Up to date	■ N/A
	☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	■ N/A
	■ Other permits PED for WTPs	■ Readily available	☐ Up to date	■ N/A
	Remarks			
5.	**Gas Generation Records**	☐ Readily available	☐ Up to date	■ N/A
	Remarks			
6.	**Settlement Monument Records**	■ Readily available	☐ Up to date	☐ N/A
	Remarks			
7.	**Groundwater Monitoring Records**	☐ Readily available	☐ Up to date	■ N/A
	Remarks			
8.	**Leachate Extraction Records**	☐ Readily available	☐ Up to date	■ N/A
	Remarks			
9.	**Discharge Compliance Records**			
	☐ Air	☐ Readily available	☐ Up to date	■ N/A
	☐ Water (effluent)	■ Readily available	■ Up to date	☐ N/A
	Remarks			
10.	**Daily Access/Security Logs**	☐ Readily available	☐ Up to date	■ N/A
	Remarks			

IV. O&M COSTS

1. **O&M Organization**
   ■ State in-house ■ Contractor for State
   □ PRP in-house □ Contractor for PRP
   □ Federal Facility in-house □ Contractor for Federal Facility
   □ Other

2. **O&M Cost Records**
   ■ Readily available ■ Up to date
   □ Funding mechanism/agreement in place
   Original O&M cost estimate 1,000,000 □ Breakdown attached

   Total annual cost by year for review period if available

   From 7/1/2020 (Date) To 6/30/2021 (Date) $993,440 (Total cost) □ Breakdown attached
   From ____ (Date) To ____ (Date) ____ (Total cost) □ Breakdown attached
   From ____ (Date) To ____ (Date) ____ (Total cost) □ Breakdown attached
   From ____ (Date) To ____ (Date) ____ (Total cost) □ Breakdown attached
   From ____ (Date) To ____ (Date) ____ (Total cost) □ Breakdown attached

3. **Unanticipated or Unusually High O&M Costs During Review Period**
   Describe costs and reasons:

V. ACCESS AND INSTITUTIONAL CONTROLS ■ Applicable □ N/A

A. Fencing Curch Placer Site Repository

1. **Fencing damaged** □ Location shown on site map □ Gates secured ■ N/A
   Remarks

B. Other Access Restrictions

1. **Signs and other security measures** □ Location shown on site map ■ N/A
   Remarks

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented ☐ Yes ■ No ☐ N/A
Site conditions imply ICs not being fully enforced ☐ Yes ■ No ☐ N/A

Type of monitoring (*e.g.*, self-reporting, drive by) self-reporting and CDPHE inspection
Frequency Annually
Responsible party/agency CDPHE and private parties
Contact ______ Name ______ Title ______ Date ______ Phone no.

Reporting is up-to-date ☐ Yes ☐ No ☐ N/A
Reports are verified by the lead agency ☐ Yes ☐ No ☐ N/A

Specific requirements in deed or decision documents have been met ■ Yes ☐ No ☐ N/A
Violations have been reported ☐ Yes ■ No ☐ N/A
Other problems or suggestions: ☐ Report attached

2. **Adequacy** ■ ICs are adequate ☐ ICs are inadequate ☐ N/A
Remarks

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map ■ No vandalism evident
Remarks

2. **Land use changes on site** ☐ N/A
Remarks

3. **Land use changes off site** ☐ N/A
Remarks

VI. GENERAL SITE CONDITIONS

A. Roads ☐ Applicable ■ N/A

1. **Roads damaged** ☐ Location shown on site map ☐ Roads adequate ☐ N/A
Remarks

B. Other Site Conditions

Remarks ____

VII. LANDFILL COVERS ☐ Applicable ■ N/A

A. Landfill Surface

1. **Settlement** (Low spots) ☐ Location shown on site map ☐ Settlement not evident
Areal extent______________ Depth____________
Remarks____

2. **Cracks** ☐ Location shown on site map ☐ Cracking not evident
Lengths____________ Widths___________ Depths__________
Remarks____

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident
Areal extent______________ Depth____________
Remarks____

4. **Holes** ☐ Location shown on site map ☐ Holes not evident
Areal extent______________ Depth____________
Remarks____

5. **Vegetative Cover** ☐ Grass ☐ Cover properly established ☐ No signs of stress
☐ Trees/Shrubs (indicate size and locations on a diagram)
Remarks____

6. **Alternative Cover (armored rock, concrete, etc.)** ☐ N/A
Remarks____

7. **Bulges** ☐ Location shown on site map ☐ Bulges not evident
Areal extent______________ Height____________
Remarks____

8.	**Wet Areas/Water Damage** ☐ Wet areas ☐ Ponding ☐ Seeps ☐ Soft subgrade Remarks______________________	☐ Wet areas/water damage not evident ☐ Location shown on site map ☐ Location shown on site map ☐ Location shown on site map ☐ Location shown on site map	 Areal extent______________ Areal extent______________ Areal extent______________ Areal extent______________
9.	**Slope Instability** ☐ Slides Areal extent______________ Remarks______________________	☐ Location shown on site map	■ No evidence of slope instability
B. Benches	☐ Applicable (Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)	☐ N/A	
1.	**Flows Bypass Bench** Remarks______________________	☐ Location shown on site map	☐ N/A or okay
2.	**Bench Breached** Remarks______________________	☐ Location shown on site map	☐ N/A or okay
3.	**Bench Overtopped** Remarks______________________	☐ Location shown on site map	☐ N/A or okay
C. Letdown Channels	☐ Applicable (Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)	☐ N/A	
1.	**Settlement** Areal extent______________ Remarks______________________	☐ Location shown on site map Depth____________	☐ No evidence of settlement
2.	**Material Degradation** Material type_______________ Remarks______________________	☐ Location shown on site map Areal extent_____________	☐ No evidence of degradation
3.	**Erosion** Areal extent______________ Remarks______________________	☐ Location shown on site map Depth____________	☐ No evidence of erosion

4. **Undercutting** ☐ Location shown on site map ☐ No evidence of undercutting
Areal extent______________ Depth____________
Remarks____
____

5. **Obstructions** Type_____________________ ☐ No obstructions
☐ Location shown on site map Areal extent______________
Size____________
Remarks____
____

6. **Excessive Vegetative Growth** Type____________________
☐ No evidence of excessive growth
☐ Vegetation in channels does not obstruct flow
☐ Location shown on site map Areal extent______________
Remarks____
____

D. Cover Penetrations ☐ Applicable ☐ N/A

1. **Gas Vents** ☐ Active☐ Passive
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance
☐ N/A
Remarks____
____

2. **Gas Monitoring Probes**
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
Remarks____
____

3. **Monitoring Wells** (within surface area of landfill)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
Remarks____
____

4. **Leachate Extraction Wells**
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
Remarks____
____

5. **Settlement Monuments** ☐ Located ☐ Routinely surveyed ☐ N/A
Remarks____
____

E. Gas Collection and Treatment ☐ Applicable ☐ N/A	
1.	**Gas Treatment Facilities** ☐ Flaring ☐ Thermal destruction ☐ Collection for reuse ☐ Good condition ☐ Needs Maintenance Remarks______________________________
2.	**Gas Collection Wells, Manifolds and Piping** ☐ Good condition ☐ Needs Maintenance Remarks______________________________
3.	**Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings) ☐ Good condition ☐ Needs Maintenance ☐ N/A Remarks______________________________
F. Cover Drainage Layer ☐ Applicable ☐ N/A	
1.	**Outlet Pipes Inspected** ☐ Functioning ☐ N/A Remarks______________________________
2.	**Outlet Rock Inspected** ☐ Functioning ☐ N/A Remarks______________________________
G. Detention/Sedimentation Ponds ☐ Applicable ☐ N/A	
1.	**Siltation** Areal extent______________ Depth____________ ☐ N/A ☐ Siltation not evident Remarks______________________________
2.	**Erosion** Areal extent______________ Depth____________ ☐ Erosion not evident Remarks______________________________
3.	**Outlet Works** ☐ Functioning ☐ N/A Remarks______________________________
4.	**Dam** ☐ Functioning ☐ N/A Remarks______________________________

H. Retaining Walls ☐ Applicable ☐ N/A

1. **Deformations** ☐ Location shown on site map ☐ Deformation not evident
Horizontal displacement______________ Vertical displacement_________________
Rotational displacement______________
Remarks____
____

2. **Degradation** ☐ Location shown on site map ☐ Degradation not evident
Remarks____
____

I. Perimeter Ditches/Off-Site Discharge ☐ Applicable ☐ N/A

1. **Siltation** ☐ Location shown on site map ☐ Siltation not evident
Areal extent________________ Depth______________
Remarks____
____

2. **Vegetative Growth** ☐ Location shown on site map ☐ N/A
☐ Vegetation does not impede flow
Areal extent________________ Type______________
Remarks____
____

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident
Areal extent________________ Depth______________
Remarks____
____

4. **Discharge Structure** ☐ Functioning ☐ N/A
Remarks____
____

VIII. VERTICAL BARRIER WALLS ■ Applicable ☐ N/A

1. **Settlement** ☐ Location shown on site map ■ Settlement not evident
Areal extent________________ Depth______________
Remarks____
____

2. **Performance Monitoring** Type of monitoring______________________________
■ Performance not monitored
Frequency____________________________________ ☐ Evidence of breaching
Head differential______________________________
Remarks____
____

IX. GROUNDWATER/SURFACE WATER REMEDIES ■ Applicable □ N/A	
A. Groundwater Extraction Wells, Pumps, and Pipelines ■ Applicable □ N/A	
1.	**Pumps, Wellhead Plumbing, and Electrical** ■ Good condition □ All required wells properly operating □ Needs Maintenance □ N/A Remarks______________________________
2.	**Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances** ■ Good condition □ Needs Maintenance Remarks______________________________
3.	**Spare Parts and Equipment** ■ Readily available □ Good condition □ Requires upgrade □ Needs to be provided Remarks______________________________
B. Surface Water Collection Structures, Pumps, and Pipelines □ Applicable □ N/A	
1.	**Collection Structures, Pumps, and Electrical** ■ Good condition □ Needs Maintenance Remarks______________________________
2.	**Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances** ■ Good condition □ Needs Maintenance Remarks______________________________
3.	**Spare Parts and Equipment** ■ Readily available □ Good condition □ Requires upgrade □ Needs to be provided Remarks______________________________

C. Treatment System ■ Applicable ☐ N/A
1. **Treatment Train** (Check components that apply) ■ Metals removal ☐ Oil/water separation ☐ Bioremediation ☐ Air stripping ☐ Carbon adsorbers ■ Filters____ ■ Additive (*e.g.*, chelation agent, flocculent)____ ☐ Others____ ■ Good condition ☐ Needs Maintenance ■ Sampling ports properly marked and functional ■ Sampling/maintenance log displayed and up to date ■ Equipment properly identified ☐ Quantity of groundwater treated annually____ ☐ Quantity of surface water treated annually approximately 150 million gallons Remarks____
2. **Electrical Enclosures and Panels** (properly rated and functional) ☐ N/A ■ Good condition ☐ Needs Maintenance Remarks____
3. **Tanks, Vaults, Storage Vessels** ☐ N/A ■ Good condition ☐ Proper secondary containment ☐ Needs Maintenance Remarks____
4. **Discharge Structure and Appurtenances** ☐ N/A ■ Good condition ☐ Needs Maintenance Remarks____
5. **Treatment Building(s)** ☐ N/A ■ Good condition (esp. roof and doorways) ☐ Needs repair ☐ Chemicals and equipment properly stored Remarks____
6. **Monitoring Wells** (pump and treatment remedy) ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition ☐ All required wells located ☐ Needs Maintenance ■ N/A Remarks____
D. Monitoring Data
1. Monitoring Data ■ Is routinely submitted on time ■ Is of acceptable quality
2. Monitoring data suggests: ■ Groundwater plume is effectively contained ■ Contaminant concentrations are declining

D. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ All required wells located ☐ Needs Maintenance ■ N/A
Remarks

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy is largely complete

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

B. Adequacy of O&M Remedies functioning as intended.

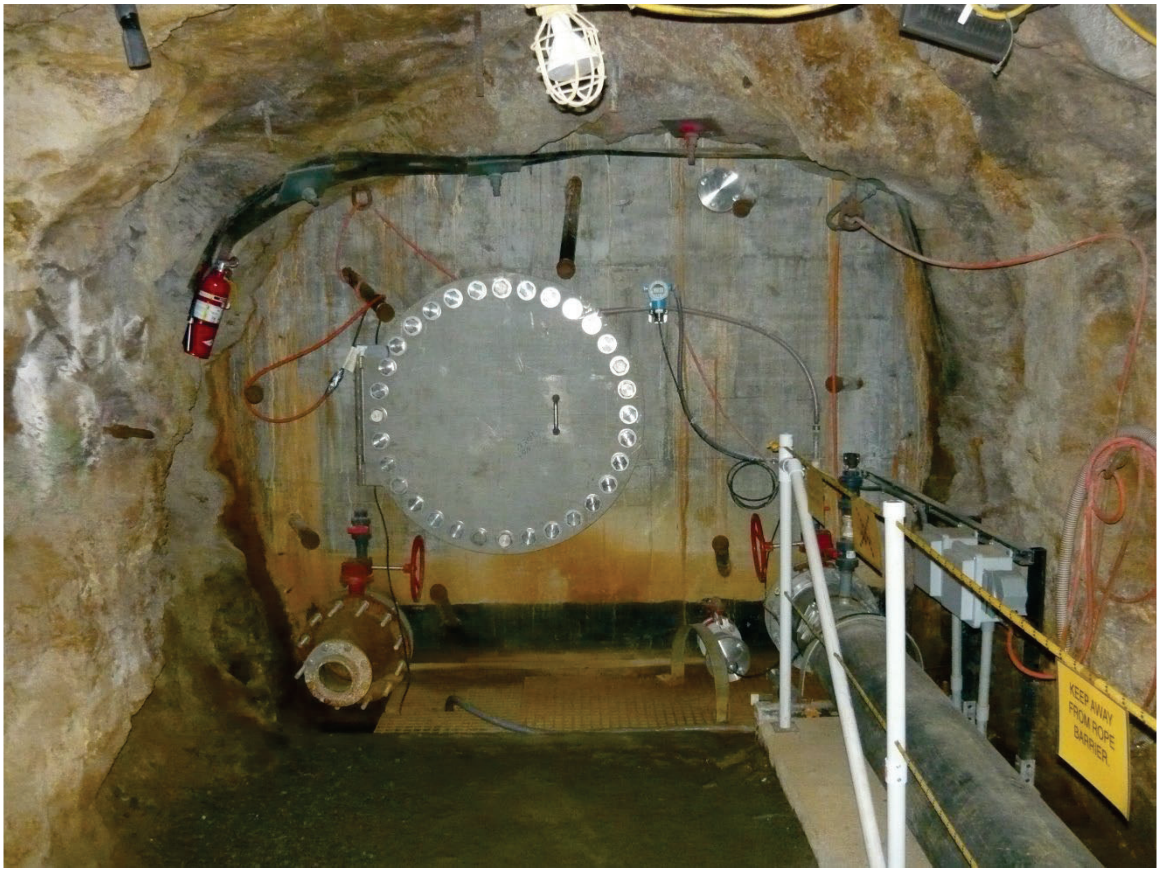
Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

C.	**Early Indicators of Potential Remedy Problems**
	Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.
D.	**Opportunities for Optimization**
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

Appendix F: Site Photographs

Argo Tunnel Water Treatment Plant

Argo Tunnel Water Treatment Plant



Argo Tunnel Flow Control Bulkhead (photo not taken at time of inspection)

North Clear Creek Water Treatment Plant

Big Five Tunnel Portal

Church Placer Site Repository

Church Placer Site Repository

Appendix G: Summary of Community Interviews

CDPHE published notices in several newspapers in September 2021 announcing the Sixth Five Year Review for the Central City, Clear Creek Superfund Site and inviting participation in community interviews. These publications included the Denver Post, the Mountain Ear, the Weekly-Register Call, the Canyon Courier, and the Clear Creek Courant. CDPHE also sent invitations to specific stakeholders that were identified to have potential interest in the site. In total, CDPHE conducted virtual interviews and collected written responses from 10 individuals representing local governments, the local watershed association, business owners, environmental nonprofits, and state and EPA staff. Interview responses are summarized below. (Similar questions used in different templates were combined below for easier interpretation.)

1. Are you aware of the former environmental issues at the Site and the cleanup activities that have taken place to date?
Respondents generally had some familiarity with the site and cleanup activities. Several mentioned historic mining-related spills that impacted the area. Some of the respondents were very aware of site activities due to their involvement in the local watershed association, organizations that work within the site, or having grown up and/or lived in the area.

2. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)? / What is your overall impression of the remedial activities at the Site?
The site's remedial project managers stated that cleanup is largely complete, and the project has accomplished a lot to improve stream quality and facilitate reuse. Defining the Site's boundaries has proven difficult, which can cause uncertainty for property owners and redevelopment efforts.

3. What is your assessment of the current performance of the remedy in place at the Site?
The remedial project managers generally agreed that the Site's remedial features (such as the water treatment plants) have significantly reduced impacts to surface waters. Most if not all remedies are considered to be performing well.

4. Are you aware of any complaints or inquiries regarding Site-related environmental issues or remedial activities from residents in the past five years?
The remedial project managers were not aware of recent complaints. A few residents and other property owners have inquired about the Site, particularly during a transfer of ownership.

5. Have there been any problems with unusual or unexpected activities at the Site, such as emergency response, vandalism or trespassing?
Several respondents were not aware of any of these issues occurring on the site. One reported that the water treatment plant along Highway 6 has seen more vandalism and trespassing. Some of the mine safety closures installed by the Colorado Division of Reclamation, Mining, and Safety (DRMS) have been getting vandalized as well. A couple of respondents mentioned an increase in homelessness in the area.

6. Has your office conducted any Site-related activities or communications in the past five years? If so, please describe the purpose and results of these activities.

Aside from ongoing operation and maintenance, CDPHE's recent communications have pertained to the sampling and results from the 2015 waste pile sampling effort. Efforts are just beginning to increase awareness of the new Operable Unit 5 to address potential risks from lead and/or arsenic in waste piles, particularly in residential settings. The uncertainty in EPA adoption of new CDC blood lead reference levels makes the risk evaluation more difficult.

7. Are you aware of any changes to state laws or local regulations that might affect the protectiveness of the Site's remedy?

A few respondents were not aware of changes to laws or regulations that would affect the Site. However, Colorado's Water Quality Control Commission recently modified their regulations to apply a low arsenic standard to stream segments with a water supply use designation. It is not yet known if this will affect the determination of protectiveness at the Site.

8. Are you comfortable with the status of the institutional controls at the Site? If not, what are the associated outstanding issues?

A couple of the remedial project managers stated they were comfortable with the institutional controls. One pointed out that the institutional control inspection and certification documents are confusing because mining claim names do not necessarily coincide with the common name given to the mine. Also, the creation of the new OU5 will likely call for additional institutional controls.

9. Are you aware of any changes in projected land use(s) at the Site?

Several respondents mentioned developments either planned or in progress in Idaho Springs near the Argo Mill, including a bike park, gondola, hotel, and other facilities/buildings. Several others mentioned a proposed whiskey distillery in Black Hawk. Other developments include the Central City Parkway, a quarry expansion on Highway 6 and I-70, the construction of more casinos, and a surge in residential development. One respondent stated that efforts are being made to encourage visitors in the area to stay and recreate for several days instead of just one.

CDPHE stated they have been working with the property owners to ensure that future land uses will not create unacceptable risks.

One respondent pointed out that they see very few new lots being created, but people are finding and building on existing "dream lots," which they explained as the rezoning of mining claims to allow for residential use completed in 1970s by Clear Creek County.

10. Have the EPA and CDPHE kept involved parties and surrounding neighbors informed of activities at the Site? How can CDPHE and the EPA best provide Site-related information in the future?

Several of the respondents felt that the agencies keep the community involved and generally use the appropriate communication avenues. Several expressed appreciation for CDPHE's involvement in local watershed association meetings. Ideas for future communications included utilizing local papers, county commissioner meetings, county communications (e.g. newsletter), CSU Extension Gilpin County, a Site email list, and in-person outreach (such as the library and community center in Gilpin County).

One respondent felt that the agencies needed to strengthen their communication around the new Operable Unit 5. Also, they reported some confusion among landowners around what the status of the Site is (why the EPA is becoming involved again) and which entity to contact with specific questions.

11. Do you have any comments, suggestions or recommendations regarding the management or operation of the Site's remedy? / Do you have any comments, suggestions or recommendations regarding the project?

One concern raised by a couple of respondents was the sedimentation accumulating in gulches as older infrastructure erodes, as well as the need to clean out check dams. One respondent recommended that operation and maintenance be prioritized in problem areas or areas that could have a problem if wildfires came through. Another thought that more coordination between the EPA, CDPHE, and others who work in the area would be helpful to make sure on-the-ground efforts are not duplicated.

Recommendations for additional groups to reach out to (if they had not been already) included the Upper Clear Creek Watershed Association, Trout Unlimited, county/local government contacts, Frontier Environmental, DRMS, and a newer group called the Clear Creek Watershed and Forest Health Partnership.

A few different documents were also mentioned that may be helpful in regard to the project. These included the Frontier Environmental 2015 study in Clear Creek regarding repositories, the Integrated Watershed Management Plan done by Trout Unlimited, and a wildfire risk assessment.

One respondent discussed a proposal of his to have mills process and extract materials from waste rock in order to fund projects. He expressed an interest in further discussing his proposal with the agencies since he thought it would be beneficial to the community from a health and economic perspective.

The following questions refer to future events:

The Colorado Department of Public Health and Environment and the Environmental Protection Agency will be establishing an Operable Unit 5 for the Site. The purpose of OU5 is to evaluate the potential for human exposure to heavy metals, primarily lead and arsenic, from mine waste piles in residential areas of the Site. This new OU is the result of recommendations for additional investigations from the previous Five-Year Review. The agencies will be investigating mine waste piles in areas currently used and zoned for residential use.

12. What questions or concerns do you have about the new Operable Unit 5?

Respondents pointed out some community attitudes and values to be aware of with the creation of Operable Unit 5. For example, some residents who are entrenched in the mining lifestyle and unaware of human health concerns may be harder to reach. Some landowners may be concerned that the agencies may start dictating what they can and can't do. One respondent said that placing an emphasis on historic preservation will go a long way with the community.

It will be important to continue to engage the local governments and watershed association as Operable Unit 5 progresses. One respondent who works with emergency response in Gilpin County mentioned another issue related to the construction of new homes, which is the lack of egress windows.

Respondents raised some remediation-related concerns, including making sure that remedies blend into the environment and that maintenance is performed. DRMS said they have closed more than 2,000 mining-related holes and are continuing to find them, so if future safety issues arise in the project, they may be able to assist.

13. Are you aware of areas of new residential development in the area?
Several respondents are aware of an increase in residential development, including new homes being built on mining claims. One pointed out that the state demographer's office is expecting population growth in this area.

14. Can you help us identify areas of current or planned residential developments in your jurisdiction?
Areas identified for residential development included York Gulch, Russel Gulch, St. Mary's Glacier, the upper Leavenworth area, and general alpine areas in the greater Clear Creek area. One respondent mentioned that the Clear Creek County Master Plan identifies the I-70 corridor for the most growth, and that county commissioners are discussing the lack of affordable housing for workers in the area.

In addition to residential development, one respondent mentioned an increase in recreational and homeless-related camping in the area.
Trout Unlimited completed a pro bono study ranking waste piles in the area using various metrics, such as size of the waste pile, proximity to homes, storm water infrastructure, and distance to creeks. One respondent said this study may be helpful as Operable Unit 5 progresses.

Central City- Clear Creek Superfund Site Five-Year Review Interview Form	
Site Name: Central City-Clear Creek Superfund Site	
EPA ID: COD980717557	
Subject name: Mary Boardman	Subject affiliation: CDPHE Remedial Project Manager
Subject contact information: mary.boardman@state.co.us	
Interview date: 11/22/2021	
Interview category: State Agency	

1. **What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)?**
   Cleanup is largely complete. The extensive mining in the area has made defining the Site complicated. This can lead to uncertainty for property owners, particularly regarding redevelopment.

2. **What is your assessment of the current performance of the remedy in place at the Site?**
   Remedial features, especially the water treatment plants, have significantly reduced impacts to surface waters. Most, if not all, of the implemented remedies are performing very well.

3. **Are you aware of any complaints or inquiries regarding site-related environmental issues or remedial activities from residents in the past five years?**
   No complaints. There have been a few inquiries from residents and other property owners, particularly during a transfer or ownership.

4. **Has your office conducted any site-related activities or communications in the past five years? If so, please describe the purpose and results of these activities.**
   Aside from ongoing O&M, recent communications have related to the sampling and results from the 2015 waste pile sampling effort, and the newly created OU5. Efforts are just beginning to increase awareness of the Site and potential risks from lead and/or arsenic in waste piles, particularly in residential settings. The uncertainty in EPA adoption of new lead cleanup levels makes the risk evaluation more difficult.

5. **Are you aware of any changes to state laws that might affect the protectiveness of the Site's remedy?**
   Not laws, but water quality control commission regulations have been modified, and a low arsenic standard is being applied to stream segments with a water supply use designation. It is not yet known if this will affect the determination of protectiveness at the Site.

6. **Are you comfortable with the status of the institutional controls at the Site? If not, what are the associated outstanding issues?**

Some of the remedial features covered by ICs have multiple property owners, and the mining claim names do not necessarily coincide with the common name given to the mine. This makes the IC inspection and certification documents confusing. With the creation of the new OU5, additional ICs will likely be necessary.

7. **Are you aware of any changes in projected land use(s) at the Site?**
A few redevelop projects are planned at some locations. CDPHE has been working with the property owners to ensure the future lands will not create unacceptable risks.

7. **Do you have any comments, suggestions or recommendations regarding the management or operation of the Site's remedy?**
No.

8. **Do you consent to have your name included along with your responses to this questionnaire in the FYR report?**
Yes.

Central City- Clear Creek Superfund Site Five-Year Review Interview Form	
Site Name: Central City-Clear Creek Superfund Site	
EPA ID: COD980717557	
Subject name: Kyle Sandor	Subject affiliation: CDPHE Remedial Project Manager
Subject contact information: kyle.sandor@state.co.us	
Interview date: 1/6/2022	
Interview category: State Agency	

1. **What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)?**
   The site clean-up with respect to surface water is nearly complete. The vague site definition and piece-meal covenant application makes enforcement of mining re-use activities challenging.

2. **What is your assessment of the current performance of the remedy in place at the Site?**
   The current remedies in place seem to be effective in their goal to reduce impacts to surface water.

3. **Are you aware of any complaints or inquiries regarding site-related environmental issues or remedial activities from residents in the past five years?**
   No complaints, with a few inquiries from residents and other property owners.

4. **Has your office conducted any site-related activities or communications in the past five years? If so, please describe the purpose and results of these activities.**
   Defer to Mary B. Not familiar with activities and comms over the last 5 years.

5. **Are you aware of any changes to state laws that might affect the protectiveness of the Site's remedy?**
   Potential changes in water quality standards.

6. **Are you comfortable with the status of the institutional controls at the Site? If not, what are the associated outstanding issues?**
   Yes

7. **Are you aware of any changes in projected land use(s) at the Site?**
   CDPHE has been working with several property owners on redevelopment projects across the Site.

8. **Do you have any comments, suggestions or recommendations regarding the management or operation of the Site's remedy?**
   No.

9. Do you have any comments, suggestions or recommendations regarding the management or operation of the Site's remedy?

No.

10. Do you consent to have your name included along with your responses to this questionnaire in the FYR report?

Yes.

Appendix H: 2021 Water Quality Assessment

Final Report

Central City/Clear Creek Superfund Site Five-Year Review Water Quality Assessment

June 2022

CDM Smith

Table of Contents

Appendices

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Acronyms

µg/L	micrograms per liter
CC/CC	Clear Creek/Central City
CDPHE	Colorado Department of Public Health and Environment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CWA	Clean Water Act
ERT	Environmental Response Team
HBI	Hilsenhoff Biotic Index
mg/L	milligrams per liter
MMI	Multi Metric Index
ND	Non-Detect
NPL	National Priorities List
OU	Operational Unit
QA/QC	quality assurance/quality control
RI	remedial investigation
ROD	Record of Decision
Site	Central City/Clear Creek Superfund Site
TVS	Table Value Standards
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey
WQCC, Commission	Water Quality Control Commission
WQCD, Division	Water Quality Control Division
WQS	water quality standards

Section 1
Introduction

Gold was discovered in the Clear Creek watershed in the 1850s and 1860s near Idaho Springs and Central City. For the next two decades, the area was the leading mining center in Colorado. Mining continued to be an important industry in Clear Creek and Gilpin Counties through 1950. Since 1950, mining in the area has been limited with only a handful of mines currently in operation.

The Central City/Clear Creek (CC/CC) Superfund Site (Site) is located in Clear Creek and Gilpin Counties. The Site was added to the National Priorities List (NPL) in 1983 due to environmental and public health threats posed by historical mining activities and the associated contribution of heavy metals. The Site encompasses the Clear Creek watershed, including the mainstem, North Clear Creek, and several tributaries (**Figure 1-1**). Surface waters at the Site were historically impacted by both direct discharges from mine drainage tunnels and from eroding mine waste piles.

According to the US Environmental Protection Agency's (USEPA's) informational website for the Site (USEPA, 2021), the Site consists of four operable units (OUs):

OU1 *was designated to address acid mine drainage from five mine tunnels using passive treatment. The technology was later found to be infeasible due to acreage requirements for the reactors and the inability of the technology to efficiently remove metals from the waste stream. OU1 was superseded by OU3. Remedial components of OU3 included active treatment of two of the five adit discharges. The other three mine discharges were transferred to OU4; OU1 focused on addressing sources of metals contamination within the North Fork of Clear Creek watershed*

OU2 *addresses remediation of mill tailings and mine waste rock piles associated with the five discharging tunnels in OU1. The long-term remedy for the waste rock piles, selected in 1988, included slope stabilization at two of the piles, monitoring of the gabion wall at one of the piles and run-on control at all five piles. A 1999 update to the remedy included a combination of regrading, capping and construction of retaining walls, and runoff controls at two of the five piles. OU2 remedial actions are complete except for the Quartz Hill tailings impoundment, which was transferred to OU4. Operation and maintenance activities are ongoing at several of the OU2 waste piles.*

OU3 *was designated for a more comprehensive evaluation of the Clear Creek watershed, including active treatment of two of the five OU1 mine discharges. The long-term remedy for OU3, selected in 1991, included an alternative drinking water supply for residents, where required; passive treatment of the Burleigh discharge; chemical treatment of the Argo Tunnel discharge; reduction in the heavy metals load from Woods Creek; a groundwater collection system in the Idaho Springs area to address non-point source metals loading to surface water and capping or physical barriers; and institutional controls for select mine waste piles. Construction of the remedy is ongoing. A flow-through bulkhead in the Argo Tunnel was completed in 2015. The completed project included a flow control structure to prevent large releases of contaminated water and sediment from overwhelming the Argo Tunnel water treatment plant.*

OU4 *focuses on sources of metals contamination to the North Fork of Clear Creek, a major tributary to Clear Creek, including waste rock and sediment controls on tributaries to the North Fork; the three* *remaining OU3 adit discharges that impact the North Fork; and the Quartz Hill tailings impoundment, located on Gregory Gulch, a tributary to the North Fork. The long-term remedy, selected in 2004, included treatment of various discharges, sediment control involving capping or removal of waste piles or other measures, construction of an on-site repository, and improvements to the North Fork of Clear Creek.*

Note that the Record of Decision (ROD) for OU4 was amended in 2010 to update the water treatment component for the National Tunnel, Gregory Incline and Gregory Gulch from a combination of passive treatment and active treatment at a privately owned facility to active treatment of all waters at a new water treatment plant. Water treatment for the North Fork Clear Creek came online in 2017.

The RODs are intended to provide flexibility to adapt management practices and implementation to remediate the Site most effectively. This report is the result of a statutory requirement under CERCLA to reevaluate the effectiveness of remedial actions taken at the Site every 5 years.

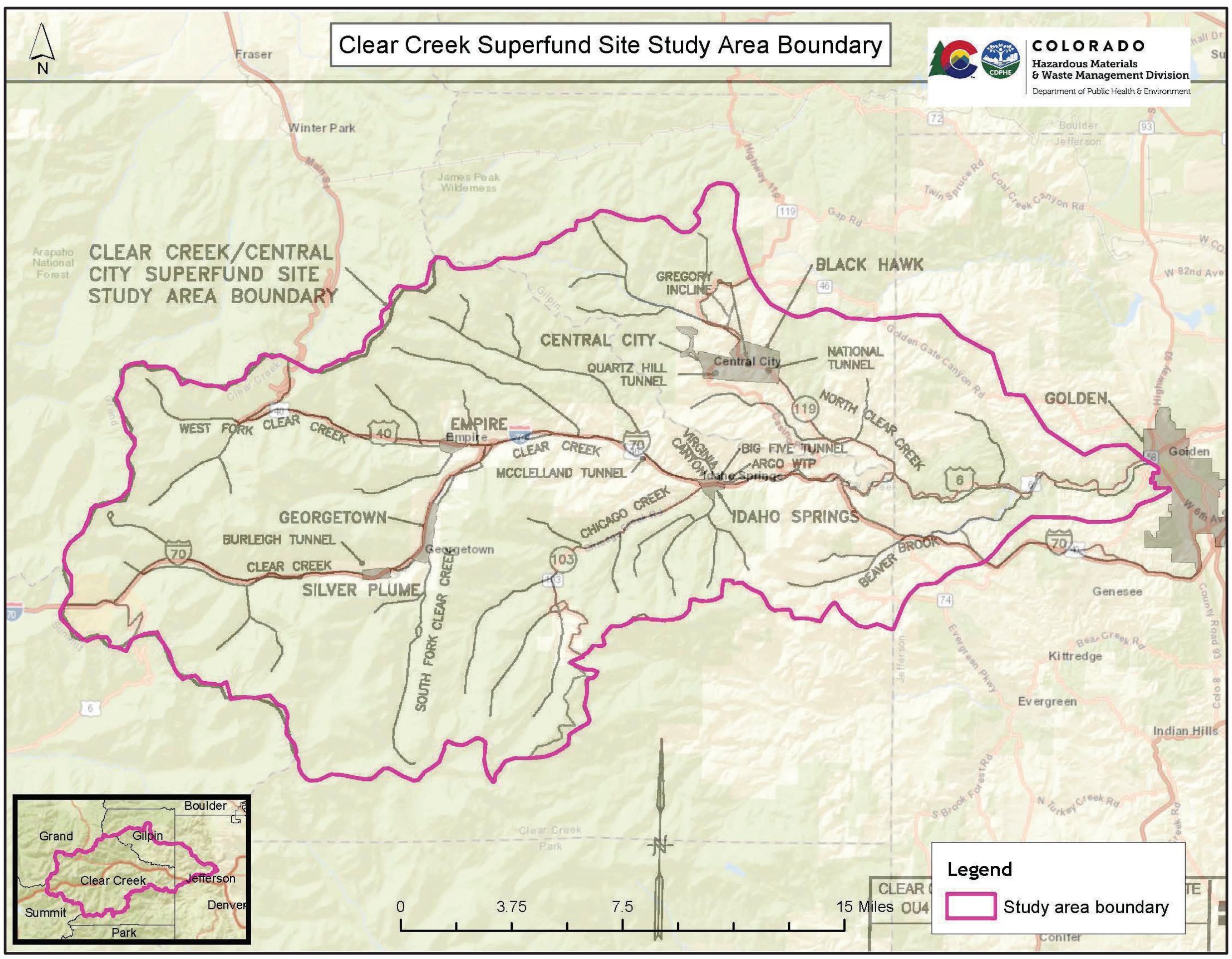

Figure 1-1: Clear Creek/Central City Superfund Site Study Area
Source: CDPHE 2022

1.1 Study Objective

The Colorado Department of Public Health and Environment (CDPHE) is conducting a Five-Year Review of the CC/CC Site. This effort includes an assessment of water quality relative to applicable water quality standards. This document serves to provide a summary of the following:

- Segmentation of streams within the Site study area at the time of the OU3 remedy decision (1991)
- Segmentation of streams within the Site study area at the time of OU4 ROD amendment (2010)
- Current segmentation of streams within the Site study area (2021)
- Applicable water quality standards in effect at the time of the OU3 remedy decision (1991)
- Applicable water quality standards at the time of the OU4 ROD amendment (2010)
- Assessment of current water quality conditions in relation to water quality standards (those applicable in 1991, 2010, and those currently applicable)
- Macroinvertebrate data for the Site
- Water quality conditions for the North Fork of Clear Creek (pre- and post-treatment which came online in 2017).

1.2 Report Overview

The remaining sections of this report contain:

- **Section 2 Water Quality Regulations** provides a description of the historical (1991 and 2010) and current (2021) segmentation, designated uses, and adopted water quality standards for the Clear Creek watershed.
- **Section 3 Data Review and Analysis** presents the available water quality and macroinvertebrate data. The methodologies used to analyze data are summarized and data are assessed with relation to the applicable water quality standards.
- **Section 4 Findings** includes a discussion of results based on information developed in Sections 2 and 3.

Section 2

Water Quality Regulations

Section 303 of the federal Clean Water Act (CWA) establishes the foundation for the protection of surface water quality through the development and implementation of water quality standards. These standards provide the foundation for accomplishing two of the principal goals of the CWA:

- Restore and maintain the chemical, physical, and biological integrity of the nation's waters
- Where attainable, to achieve water quality that promotes protection and propagation of fish, shellfish, and wildlife, and provides for recreation in and on the water

Water quality standards consist of three elements:

- The designated use or uses of a water body or segment of a water body
- The water quality criteria necessary to protect the use or uses of that particular water body
- An antidegradation policy

Examples of designated uses include domestic water supply, recreation, and protection of aquatic life. Water quality criteria describe the quality of water that supports a designated use. Water quality criteria can be expressed as numeric limits or as a narrative statement. Antidegradation policies provide the mechanism for implementing activities in and around waterbodies in a manner that protects water quality.

Under the CWA, each state has the primary responsibility for developing and implementing water quality standards. The CWA requires that each state review their standards at least once every 3 years and submit the results to the USEPA for review as part of the triennial review process. The Colorado triennial review of water quality standards is conducted by the Colorado Water Quality Control Commission (WQCC, or Commission). Water quality standards applicable to the entire State of Colorado are found in *Regulation 31: The Basic Standards and Methodologies for Surface Water* (5 CCR 1002-31). Water quality standards specific to the Clear Creek watershed are found in *Regulation 38: Classifications and Numeric Standards for South Platte River Basin, Laramie River Basin, Republican River Basin, Smoky Hill River Basin* (5 CCR 1002-38).

2.1 Stream Segmentation

As part of the regulatory and assessment process, water bodies are typically segmented into stream lengths or a grouping of tributaries with similar characteristics in order to effectively apply designated uses and their associated water quality standards. Water bodies are identified by a segment number that generally corresponds to the basin in which it is located. Segmentation information also includes a description of the extent of the water body or water bodies.

Regulation 38 contains information on the current (2021) segmentation of the Clear Creek watershed. Segments in Regulation 38 are coded by state, basin, and watershed for identification purposes. All segments in the Clear Creek watershed begin with the code COSPCL (Colorado, South Platte, Clear

Creek). The segmentation of the study area water bodies at the times of interest for this review (1991, 2010, and 2021) are presented in **Table 2-1**.

Information on the segmentation of the study area water bodies in 1991 was available from the OU3 ROD. The 1991 segmentation is presented in **Figure 2-1**. Information on the segmentation of the study area water bodies in 2010 was available through the Colorado Secretary of State website. The OU4 ROD Amendment was signed in April 2010 and the segmentation adopted in January 2010 is also presented in Table 2-1 and on **Figure 2-2**. Figure 2-2 also notes additional minor updates to the segmentation that have occurred between 2010 and 2021.

The watershed area considered for this Five-Year Review remains the same since the remedy decision in 1991. However, several of the 1991 segments were further classified into additional segments by the time of the 2010 amendment, as shown in the table below. Additional minor refinement of segmentation occurred between 2010 and 2021 on Segments 07 and 12. These changes are noted in the table and shown on Figure 2-2. Segments 01, 3b, 04, 05, 06 and 08 are unchanged from the 1991 segment descriptions. An additional segment (Segment 19) is referenced in a number of the current study area segments and was therefore included in Table 2-1 for informational purposes. Note that it is not part of the study area.

Table 2-1: Segmentation of Study Area (1991, 2010, and 2021)

Segment ID	1991 Description	2010/2021 Description
01	Mainstem of Clear Creek, including all tributaries, lakes, and reservoirs, from the source to the I-70 bridge above Silverplume	
02	Mainstem of Clear Creek, including all of the tributaries, lakes and reservoirs, from the I-70 bridge above Silverplume to the Argo Tunnel discharge, except for the specific listings in Segments 3 through 9	
2a		Mainstem of Clear Creek, including all of the tributaries **and wetlands**, from the I-70 bridge above Silver Plume to **a point just above the confluence with West Fork Clear Creek**, except for the specific listings in Segments 3**a and 3b**
2b		Mainstem of Clear Creek, including all of the tributaries **and wetlands**, from **the confluence with West Fork Clear Creek to a point just below the confluence with Mill Creek**, except for the specific listings in Segments **4 through 8**
2c		Mainstem of Clear Creek, including all of the tributaries **and wetlands**, from **a point just below the confluence with Mill Creek** to a point just above the Argo Tunnel discharge, except for the specific listings in Segments **9a, 9b, and 10**
03	Mainstem of South Clear Creek, including all tributaries, lakes, and reservoirs, from the source to the confluence with Clear Creek, except for the specific listing in 3b	
3a		Mainstem of South Clear Creek, including all tributaries **and wetlands**, from the source to the confluence with Clear Creek, except for the specific listing in Segments 3b **and 19**
3b	Mainstem of Leavenworth Creek from source to confluence with South Clear Creek	
04	Mainstem of West Clear Creek from the source to the confluence with Woods Creek	

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Table 2-1: Segmentation of Study Area (1991, 2010, and 2021)

Segment ID	1991 Description	2010/2021 Description
05	Mainstem of West Clear Creek from the confluence with Woods Creek to the confluence with Clear Creek	
06	All tributaries to West Clear Creek, including all lakes and reservoirs, from the source to the confluence with Clear Creek, except for the specific listings in Segments 7 and 8	
07	Mainstem of Woods Creek from the outlet of Upper Urad Reservoir to the confluence with West Clear Creek	**2010**: Mainstem of Woods Creek from the outlet of Upper Urad Reservoir to the confluence with West Clear Creek, **including Lower Urad Reservoir**
07a		**2021**: Mainstem of Woods Creek from the outlet of Upper Urad Reservoir to the confluence with West Clear Creek
07b		**2021**: Lower Urad Reservoir
08	Mainstem of Lion Creek from the source to the confluence with West Clear Creek	
09	Mainstem of Fall River, including all tributaries, lakes, and reservoirs, from the source to the confluence with Clear Creek	
9a		Mainstem of Fall River, including all tributaries **and wetlands**, from the source to the confluence with Clear Creek
9b		Mainstem **of Trail Creek, including all tributaries and wetlands**, from the source to the confluence with Clear Creek
10	Mainstem of Chicago Creek, including all tributaries, lakes, and reservoirs, from the source to the confluence with Clear Creek	Mainstem of Chicago Creek, including all tributaries **and wetlands**, from the source to the confluence with Clear Creek**, except for specific listings in Segment 19**
11	Mainstem of Clear Creek from the Argo Tunnel discharge to the Farmers Highline Canal diversion in Golden	Mainstem of Clear Creek from **a point just above** the Argo Tunnel discharge to the Farmers Highline Canal diversion in Golden, Colorado
12	All tributaries to Clear Creek, including all lakes and reservoirs, from the Argo Tunnel discharge to the Farmers Highline Canal diversion in Golden, except for specific listings in Segment 13	**2010**: All tributaries to Clear Creek, including all **wetlands**, from the Argo Tunnel discharge to the Farmers Highline Canal diversion in Golden, Colorado, except for specific listings in Segment **13a and 13b**
12a		**2021**: All tributaries to Clear Creek, including all wetlands, from the Argo Tunnel discharge to the Farmers Highline Canal diversion in Golden, Colorado, except for specific listings in Segment 12b, 13a, and 13b
12b		**2021**: Beaver Brook, from the source to the confluence with Soda Creek, and Soda Creek, from the source to the confluence with Clear Creek.
13	Mainstem of North Clear Creek, including all tributaries, lakes and reservoirs, from the source to the confluence	
13a		Mainstem of North Clear Creek, including all tributaries **and wetlands**, from its source to its confluence **with Chase Gulch. And Four Mile Gulch, including all tributaries and wetlands, from their sources to their confluence with North Clear Creek and Eureka Gulch, including all tributaries and wetlands, from its source to its confluence with Gregory Gulch**

Table 2-1: Segmentation of Study Area (1991, 2010, and 2021)

Segment ID	1991 Description	2010/2021 Description
13b		Mainstem of North Clear Creek, including all tributaries **and wetlands**, from **a point just below the confluence with Chase Gulch to the confluence with Clear Creek, except for the specific listings in Segment 13a**
19		All tributaries to Clear Creek, including wetlands, within the Mt. Evans Wilderness Area

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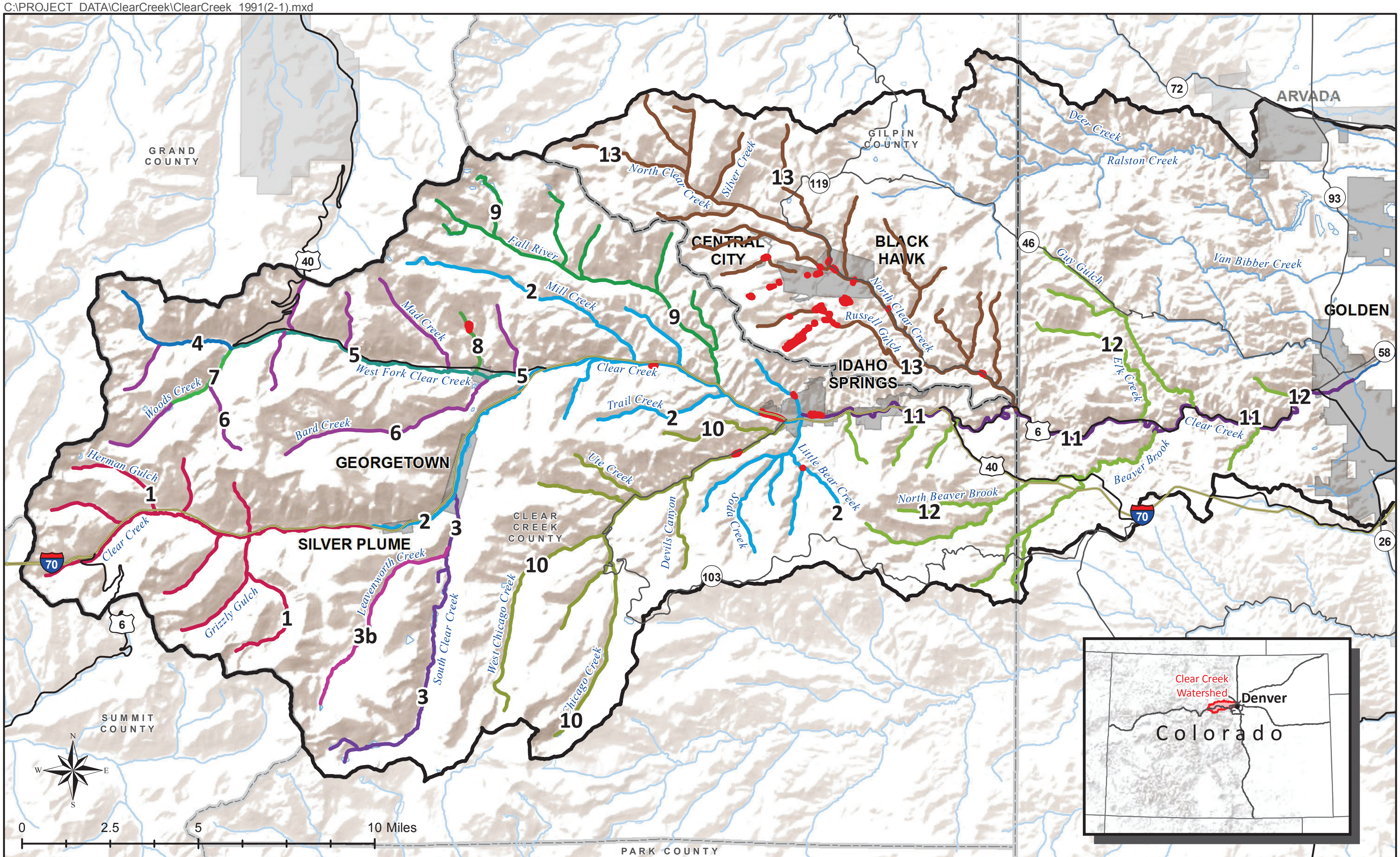

Central City / Clear Creek NPL Site
Municipality
County Boundary

Segment 1
Segment 2
Segment 3
Segment 3b
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Segment 9
Segment 10
Segment 11
Segment 12
Segment 13

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Figure 2-1
1991 Stream Segmentation
Clear Creek Watershed

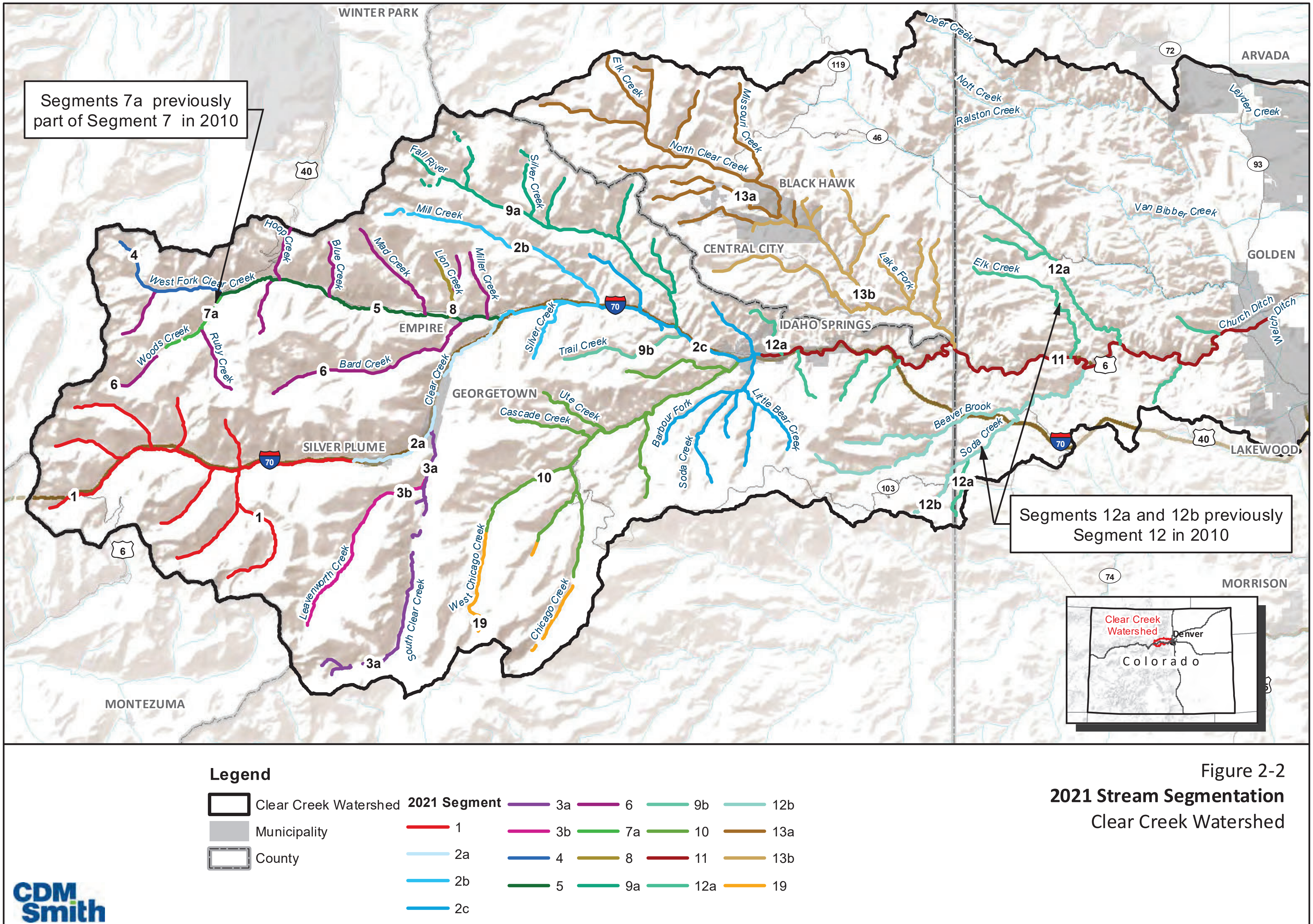


Figure 2-2

2021 Stream Segmentation

Clear Creek Watershed

2.2 Designated Uses

Waters of the state are assigned a use classification based on the existing uses or any uses for which the water is intended to become suitable.

2.2.1 1991 Use Classifications

Appendix B of the 1991 OU3 ROD included information regarding the designated uses applicable at the time of the remedy decision. These included:

- **Recreational Classification –**
  - Class 1 – Primary contact recreation (e.g., swimming).
  - Class 2 – Secondary contact recreation, those not in Class 1.
- **Aquatic Life Classification –**
  - Class 1 – Cold/warm stream segments capable of sustaining cold/warm water biota where physical habitat, water flows, and water quality conditions do not impair biota. Applies to segments with correctable water quality.
  - Class 2 – Cold/warm stream segments not capable of sustaining cold/warm biota where physical habitat, water flows, or uncorrectable water quality conditions impair biota.
- **Domestic Water Supply** – Suitable for potable water supplies after standard water treatment.
- **Agricultural Water Supply** – Suitable for irrigation of crops or watering livestock.

Table 2-2 summarizes the use classifications applicable to each of the 1991 segments.

Table 2-2: 1991 Use Classifications, Clear Creek Basin

Use Classification	1991 Segment Number													
	01	02	03	3b	04	05	06	07	08	09	10	11	12	13
Recreation Class 1			X	X	X		X			X	X			
Recreation Class 2	X	X				X		X	X			X	X	X
Aquatic Life Class 1	X	X	X		X	X	X			X	X	X		
Aquatic Life Class 2				X				X	X				X	X
Domestic Water Supply	X		X	X	X		X			X	X	X	X	
Agricultural Supply	X	X	X	X	X	X	X			X	X	X	X	X

2.2.2 2010 and 2021 Use Classifications

2010 use classifications were available through the Colorado Secretary of State website as listed in the Regulation 38 tables and defined in Regulation 31 (Section 31.13(1)). The designated uses in Colorado (recreation, aquatic life, domestic water supply, and agriculture) remain the same as those in 1991. However, additional definition has been added to the domestic water supply and agricultural uses, and further classification has been adopted for the recreational and aquatic life uses. The definitions found in Regulation 31 that were applicable in 2010 and remain applicable to the study area segments in 2021 are as follows:

- **Recreation** –
  - Class E – Existing Primary Contact Use. These surface waters are used for primary contact recreation or have been used for such activities since November 28, 1975.
  - Class N – Not Primary Contact Use. These surface waters are not suitable or intended to become suitable for primary contact recreation uses. This classification shall be applied only where a use attainability analysis demonstrates that there is not a reasonable likelihood that primary contact uses will occur in the water segment(s) in question within the next 20-year period.
- **Aquatic Life** – These surface waters presently support aquatic life uses as described below, or such uses may reasonably be expected in the future due to the suitability of present conditions, or the waters are intended to become suitable for such uses as a goal:
  - Class 1 – Cold Water Aquatic Life. These are waters that (1) currently are capable of sustaining a wide variety of cold water biota, including sensitive species, or (2) could sustain such biota but for correctable water quality conditions. Waters shall be considered capable of sustaining such biota where physical habitat, water flows or levels, and water quality conditions result in no substantial impairment of the abundance and diversity of species.
  - Class 2 – Cold and Warm Water Aquatic Life. These are waters that are not capable of sustaining a wide variety of cold or warm water biota, including sensitive species due to physical habitat, water flows or levels, uncorrectable water quality conditions that result in substantial impairment of the abundance and diversity of species.
- **Domestic Water Supply** – These surface waters are suitable or intended to become suitable for potable water supplies. After receiving standard treatment (defined as coagulation, flocculation, sedimentation, filtration, and disinfection with chlorine or its equivalent) these waters will meet Colorado drinking water regulations and any revisions, amendments, or supplements thereto.
- **Agriculture** – These surface waters are suitable or intended to become suitable for irrigation of crops usually grown in Colorado and which are not hazardous as drinking water for livestock.

Table 2-3 provides information on the use classifications applicable to each of the 2010 and 2021 segments. As discussed in Section 2.1, Segments 07 and 12 were further segmented between 2010 and 2021. As a result of the additional segmentation, Segment 12b has been changed from Aquatic Life Class 2- Cold to Aquatic Life Class 1 – Cold. The Domestic Water Supply Use was also adopted for Segment 13b between 2010 and 2021. Note that additional classification exists for recreational uses (potential primary contact use (P) and undetermined use (U)), aquatic life use (Class 1 warm water aquatic life), and domestic water supply (direct use water supply lakes and reservoirs). The definitions for these use classifications were not included in this document because they do not apply to any of the study area segments.

Table 2-3: 2010 and 2021 Use Classifications, Clear Creek Basin

Use Classification	2010/2021 Segment Number																			
	01	2a	2b	2c	3a	3b	04	05	06	7a*	7b*	08	9a	9b	10	11	12a*	12b*	13b	19
Recreation Class E	X	X	X	X	X	X	X	X	X			X	X	X	X	X	X	X	X	X
Recreation Class N										X	X									
Aquatic Life Class 1 - Cold	X	X	X	X	X		X	X	X				X	X	X	X		X		X
Aquatic Life Class 2 - Cold						X				X	X	X					X		X	
Domestic Water Supply	X	X	X	X	X	X	X		X				X	X	X	X	X	X	X(1)	X
Agriculture	X	X	X	X	X	X	X	X	X				X	X	X	X	X	X	X	X

*These segments were not divided into a/b in 2010. The use classifications shown in the table for 07a/b and 12a were also applicable in 2010 to Segments 07 and 12.

(1) The Domestic Water Supply Use is currently applicable to Segment 13b (2021) but was not applicable in 2010.

2.3 Water Quality Standards

The CDPHE's WQCC is the administrative agency responsible for developing specific water quality policies and adopts water quality classifications and standards for waters of the state. The statewide standards are contained within *Regulation 31 – The Basic Standards and Methodologies for Surface Water* (5 CCR 1002-31). Segment-specific standards applicable to given stream segments are published by basin. Standards specifically applicable to the Clear Creek study area are found in Regulation 38 (5 CCR 1002-38). The historical (1991, and current (2010/2021) water quality standards applicable for each segment in the Clear Creek watershed relevant to the available water quality dataset used for this study are discussed in the following sections.

2.3.1 1991 Water Quality Standards

Water quality standards applicable during completion of the OU3 ROD and remedial investigation (RI) reports were originally put forth in the August 7, 1989 amended Regulation 31 and Regulation 38 (effective September 30, 1989). Further amendments to the standards were made on October 8, 1991 (effective November 30, 1991). Regulation 31 and 38 were amended many times between 1991, 2010, and 2021. Regulations applicable during 1991 were published in Appendix B of the OU3 ROD for the Site. A copy of the summary of 1991 Regulation 31 Table Value Standards (TVS) tables and Regulation 38 segment-specific standards published as Appendix B of the OU3 ROD for the Clear Creek watershed along with the Regulation 38 tables and Regulation 31 tables applicable at the time of the Clear Creek RI publication are provided in **Appendix A** of this document. The minimum applicable historical (1991) water quality standards used for the water quality analyses in Section 3 of this document are provided on a segment-by-segment basis within the tables in Section 3.3.2.

2.3.2 2010 Water Quality Standards

The water quality standards applicable to stream segments in the Clear Creek watershed at the time of the OU4 ROD Amendment (April 2010) were published in the amended Regulation 31 and Regulation 38 adopted by WQCC on August 10, 2009 and effective on January 1, 2010. A number of the applicable standards in Regulation 31 and 38 in 2010 differ significantly from those applicable at the time of the 1991 OU3 ROD. A copy of the Regulation 38 tables for the Clear Creek watershed as well as an excerpt from the Regulation 31 document showing the applicable TVS at the time of the OU4 ROD Amendment (April 2010) is provided in **Appendix B** of this document. The 2010 minimum applicable water quality standards used for the water quality analyses in Section 3 of this document are provided on a segment-by-segment basis within the tables in Section 3.3.2.

2.3.3 2021 Water Quality Standards

The current (2021) water quality standards applicable to stream segments in the Clear Creek are published in the amended Regulation 31 and Regulation 38 adopted by WQCC on August 09, 2021, and effective on December 31, 2021. Water quality standards have been amended a number of times over the last decade and updates and additions representing the 2021 minimum applicable water quality standards used for the water quality analyses in Section 3 of this document are provided on a segment-by-segment basis within the tables in Section 3.3.2. A copy of the 2021 Regulation 38 tables for the Clear Creek watershed as well as an excerpt from the Regulation 31 document showing the 2021 TVS is provided in **Appendix C** of this document.

2.3.4 Changes in Water Quality Standards

A number of changes have been made to Regulation 31 and Regulation 38 water quality standards since the 1991 OU3 ROD was released. Beyond the changes to the reach designation in the Clear Creek watershed, significant changes have occurred to segment-specific standards listed in Regulation 38 for every segment in the study area. Modifications to the Regulation 31 and 38 standards that have occurred since the 1991 ROD are reflected in the water quality assessment tables and calculations discussed in Section 3 of this document

2.3.4.1 1991 to 2010

Changes to a number of metal standards included changes to which sample fraction (dissolved/total/total recoverable) was used to assess the standard. Other modifications involved removal of site-specific standard values and application of TVSs (e.g., most metals on Segments 01 and 02). Changes were also adopted within the TVSs and included significant alterations to the formulas used for calculating hardness-specific standards. Another noted change was the adoption of Fish and Water Ingestion Standards in the 1991 revisions. The standards are applicable to all Class 1 aquatic life segments which also have a water supply classification or Class 2 aquatic life segments which also have a water supply classification designated by the Commission after the rulemaking hearing.

In addition, the temporary modifications in place prior to 1991 have expired (cadmium, manganese, and zinc in segment 07) and in some cases, new temporary modifications have been applied for select parameters at specific segments. Temporary modifications in the Clear Creek watershed study area in place at the time of the OU4 ROD Amendment (2010) included:

- Segment 02a: Zinc (acute/chronic), and cadmium (chronic)
- Segment 02c: Copper (chronic)
- Segment 09a: Copper (chronic)
- Segment 11: Cadmium (chronic)
- Segment 13b: Cadmium (chronic), iron (chronic), manganese (chronic), and zinc (chronic)

2.3.4.2 2010 to 2021

Since 2010, additional edits have been adopted to the TVSs as well as to segment-specific standards. Hardness-based equations for cadmium and zinc have been modified while uranium standards have been applied. Applicable temperature standards have changed slightly, and some nutrient standards have been adopted in headwater streams (above treatment facilities listed in Regulation 38.5(4)). Segment-specific equations for calculating hardness-based zinc standards have been adopted for segments 2a, 2c, 3a, 3b, 5, and 11.

Many of the temporary modifications in place in 2010 have expired while new temporary modifications have been applied. Temporary modifications that are applicable to the study area in 2021 include:

- Segments 1, 2a, 2b, 2c, 3a, 5, 6, 9a, 10, 11, and 12b – Arsenic (chronic) – expires 12/31/2024
- Segments 7a and 7b: Temperature – expires 6/30/2023

Changes applied to each amendment of Regulation 31 are published in the current edition of Regulation 31 available at:
https://www.sos.state.co.us/CCR/GenerateRulePdf.do?ruleVersionId=8793&fileName=5%20CCR%201002-31

Section 3
Data Review and Analysis

3.1 Data Sources

Background information, geographic information, and analytical data were obtained from a number of sources for use in this report. Primary sources of data include the CDPHE, the USEPA, as well as relevant historical documents such as the CC/CC Site OU3 ROD, OU4 ROD Amendment, and RI reports.

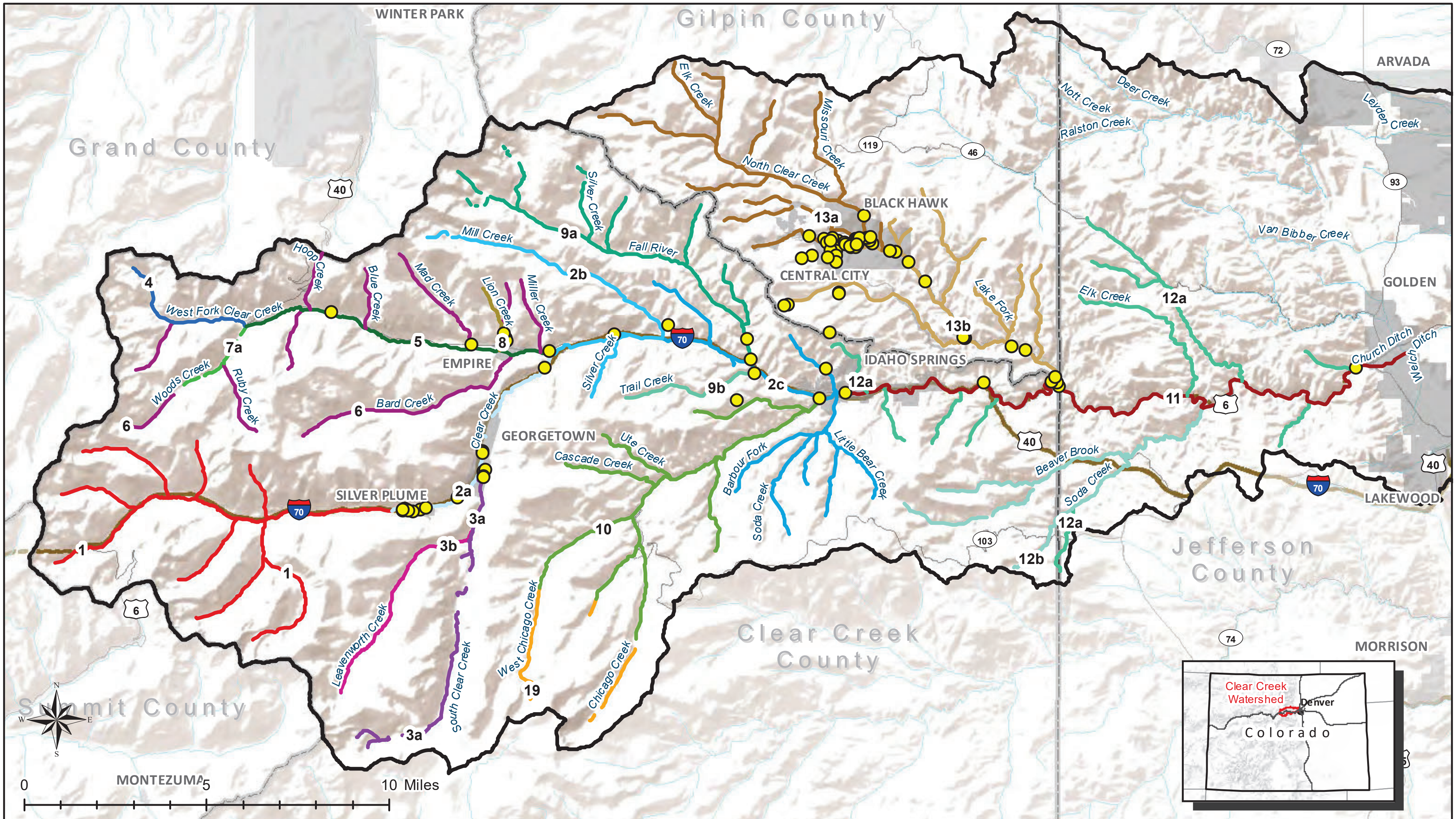
3.1.1 Water Quality Data – Scribe Database

Water quality data for the study area were provided by CDPHE and USEPA via access to the Site's online *Scribe* database. The *Scribe* database platform was developed by the USEPA's Environmental Response Team (ERT) to assist with managing environmental data by providing a consistent platform for storing and retrieving sampling, observational, and monitoring field data collected during water, soil, air, or biota sampling events. *Scribe* databases are stored online using Scribe.NET, which allows for simple data sharing among various user groups.

CDPHE provided access to a database containing water quality data collected from Clear Creek and its tributaries. Data collected between 2015 and 2021 within the study area included nearly 19,000 data points collected from approximately 107 separate locations and along 10 stream segments within the Clear Creek watershed. Eighty-four sampling locations were located on segments of interest for this study (**Figure 3-1**). Information on the sampling locations available for review on each study area segment is contained in **Appendix D**. The robust and thorough nature of the data collection and resulting *Scribe* dataset (**Appendix E**) provide a viable dataset for assessing water quality conditions along each of the sampled stream segments.

3.1.2 Macroinvertebrate Data

A limited set of macroinvertebrate data for the Clear Creek watershed were provided by CDPHE in *Excel* format and by USEPA in PDF format (**Appendix F**). The macroinvertebrate sampling locations within the study area are shown on **Figure 3-2**. Data were collected by CDPHE in 2017 and by USEPA in 2021. Data provided include scores for the Colorado Multi Metric Index (MMI), the Hilsenhoff Biotic Index (HBI), and Shannon Diversity Index. The MMI is composed of several metrics that represent categories of benthic community characteristics including richness, composition, functional feeding group, mode of locomotion, and pollution tolerance. The MMI is designed to detect impacts from environmental stressors that may alter the biological community. The HBI provides information on potential impacts from organic pollution, while the Shannon Diversity Index provides information on community diversity.



Legend

- WQ Stations (Scribe)
- Clear Creek Watershed
- Municipality
- County Boundary

2021 Segment: 1, 2a, 2b, 2c, 3a, 3b, 4, 5, 6, 7a, 8, 9a, 9b, 10, 11, 12a, 12b, 13a, 13b, 19

CDM Smith

Figure 3-1
Water Quality Sampling Locations (2015-2021)
Clear Creek Watershed

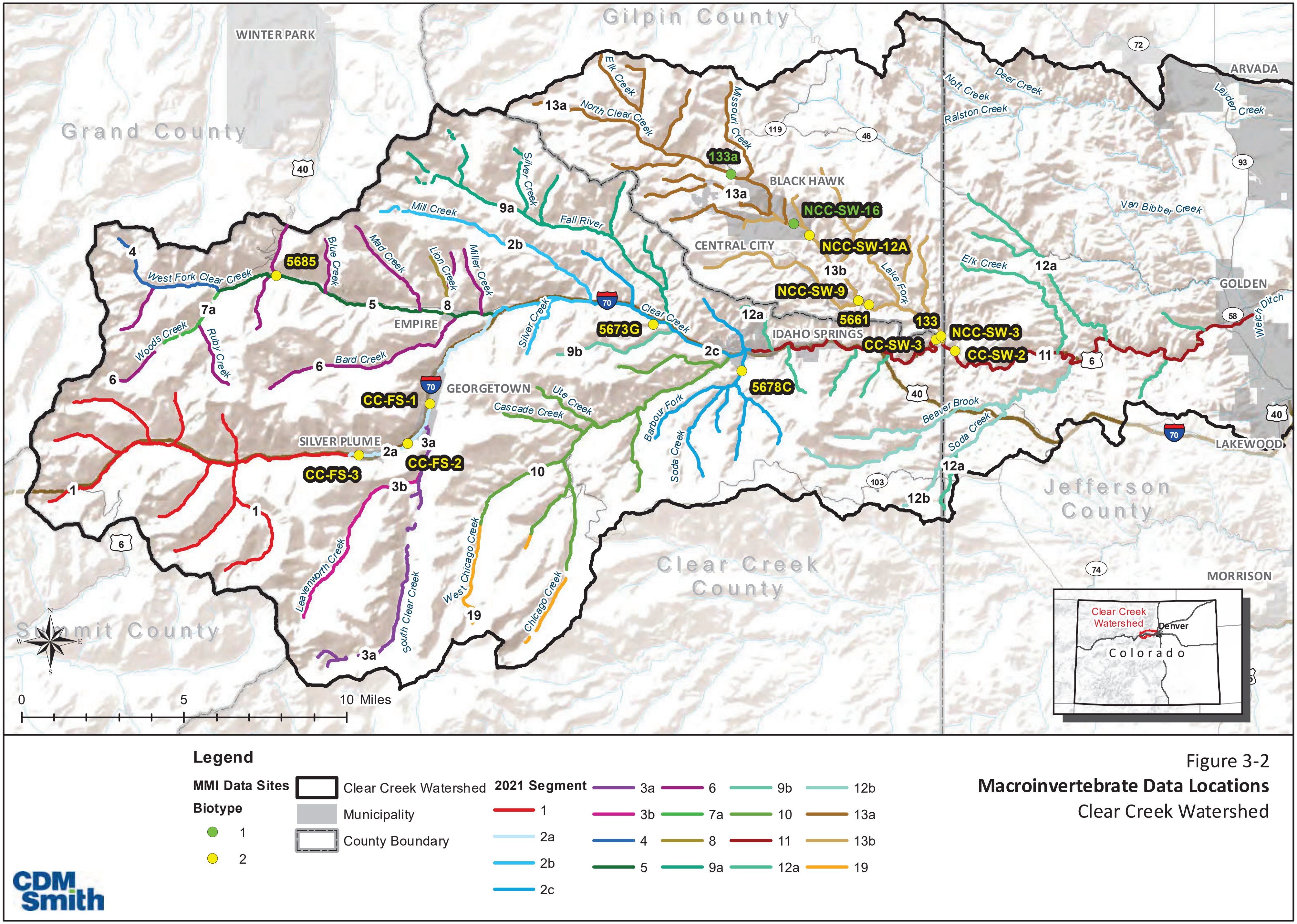


Figure 3-2
Macroinvertebrate Data Locations
Clear Creek Watershed

3.2 Methodology

Assessment of the current water quality and biological community conditions within the Clear Creek watershed in relation to applicable water quality standards and aquatic life use attainment was guided by methodology provided by CDPHE and the Commission. Water quality assessments generally followed guidance provided in the CDPHE Water Quality Control Division's (WQCD) *Section 303(d) Listing Methodology 2022 Listing Cycle* document (CDPHE 2022). Assessment of macroinvertebrate data was performed using the guidance provided in Policy Statement 10-1: *Aquatic Life Use Attainment – Methodology to Determine Use Attainment for Rivers and Streams* (CDPHE 2020).

3.2.1 303(d) Listing Methodology

The *Section 303(d) Listing Methodology 2022 Listing Cycle* document (CDPHE 2022) provides a general framework for the determination of attainment or non-attainment of the water quality standards and designated uses assigned to each waterbody in the state. Procedures outlined in the document were followed during CDPHE's data collection process and were reviewed to guide calculations described in Section 3.3.1 of this report. Data interpretation methods outlined in Section 5 Subparts A and B of the guidance document describe how the WQCD determines attainment of chronic and acute numeric standards.

Attainment of most chronic standards, including all hardness-based metal standards and all dissolved metal standards, is based upon the 85th percentile of the ranked data, where percentile values are calculated by ranking individual data points in order of magnitude. All hardness-based metal standards are typically evaluated by comparing the 85th percentile against the assigned hardness-based equation using the mean (average) hardness value available for a water body. Total recoverable metals are evaluated against the median value, or the 50th percentile.

Acute standards are evaluated by comparison of individual sample results to the assigned standard. For the assessment of metals standards, CDPHE calculates the acute TVS for each paired hardness/concentration and attainment is determined for each data pair. Due to the volume of data and for purposes of this report, mean hardness values for each segment were used to calculate acute TVSs that were then compared to maximum segment concentrations to provide an overview of segments that may have issues meeting an acute standard. Note that lower hardness concentrations result in more stringent calculated acute standards than higher hardness concentrations.

The WQCD document also provides some guidance on the treatment of sample results reported below the laboratory detection limit. The guidance states that sample results reported below the detection limit (non-detects or NDs) will generally be treated as zeroes during assessment of attainment calculations. This practice was used for calculations presented in Section 3.3.

3.2.2 Aquatic Life Use Attainment Policy Statement 10-1

The most recent Policy Statement 10-1 was approved by the Commission in August 2020. The Policy Statement provides a methodology to determine aquatic life use attainment for rivers and streams. The procedure described in the document relies on direct measurement of the aquatic life use rather than on a strict comparison of water quality data results to numeric criteria. Aquatic life thresholds for the MMI, HBI, and Shannon Diversity Index have been established based on analysis of the biological condition at reference sites in each of three biotypes (mountains, transition, and plains/xeric). The MMI score is used as the primary indicator of aquatic life use attainment. Where duplicate samples have been taken, the scores are averaged to produce a result representative of the sample location on a particular date. Thresholds are established for both attainment and impairment. The aquatic life use is attained when the MMI score exceeds the attainment threshold. If MMI scores fall between the established values for attainment and impairment and the stream is classified as Class 2 aquatic life, then the aquatic life use is attained. If the stream is classified as Class 1 aquatic life use and the MMI score falls between the attainment and impairments thresholds, auxiliary metric thresholds for the HBI and the Shannon Diversity Index are then reviewed to determine attainment. **Tables 3-1** and **3-2** contain the thresholds established for each metric for each biotype. Note that these thresholds have been updated since the previous water quality assessment was performed for the Site in 2014.

Table 3-1: Aquatic Life Use Thresholds for MMI Scores

Biotype	Attainment Threshold	Impairment Threshold
1. Transition	45	34
2. Mountains	48	40
3. Plains & Xeric	42	29

Table 3-2: Auxiliary Metric Thresholds for Class 1 Waters

Biotype	HBI	Shannon Diversity Index
1. Transition	<5.8	>2.1
2. Mountains	<4.9	>3.2
3. Plains & Xeric	<7.6	>2.4

Appendix B of Policy 10-1 includes information on Standard Operating Procedures for sampling benthic communities. Appendix B states that "the standard index period utilized by the Water Quality Control Division ("division") in Biotypes 1 and 2 shall be late June to November 30. For Biotype 3, the index period shall be May 1 to November 30. These periods are congruent with the central tendency of sample dates of macroinvertebrate replicates used to regionally calibrate the multimetric indices." All sample results provided by the Division and USEPA were collected within the prescribed timeframe.

3.3 Results

Analyses of water quality and macroinvertebrate data collected between 2015 and 2021 were completed following the guidelines described in Section 3.2. Descriptions of the data calculation results including a comparison of the current dataset to the applicable 1991, 2010 and 2021 water quality standards for Study Area segments with available data are provided in Section 3.3.1. Additional temporal data review was performed for Segment 13b to assess what effects, if any, were apparent as a result of water treatment that came online March 2017. Macroinvertebrate results are provided in Section 3.3.2.

3.3.1 Water Quality Data Analysis

3.3.1.1 Water Quality Conditions of Upper Clear Creek and Tributaries

The water quality conditions for Study Area segments of Upper Clear Creek were evaluated using instream data collected from 2015 – 2021. Data were assessed based on both historical (1991 and 2010) and current (2021) stream segmentation. Available data were reviewed and are presented in the following ways:

- A statistical summary showing the data count, minimum, maximum, mean, median, and 85th percentile values; and

- A comparison of available data to applicable 1991, 2010, and 2021 standards from Regulation 38 using mean hardness values for the segment.

Data used for these evaluations were queried from the *Scribe* database and evaluated using the methodology described in Section 3.2.1. Non-detect results were treated as zeros for calculation purposes. Calculations that resulted in zero for the minimum, maximum, median, average, and/or 85th percentile are presented in the table as non-detects (NDs). Data for parameters presented in the following subsections are those that have numeric criteria available for comparison purposes.

3.3.1.1.1 Clear Creek Segment COSPCL01

No sample data was available for Segment COSPCL01 from the 2015 – 2021 dataset and water quality data representing instream conditions on Segment COSPCL01 were not identified from the 2015 – 2021 *Scribe* dataset.

3.3.1.1.2 Clear Creek Historical Segment COSPCL02

Historical segment COSPCL02 represents the stream segmentation which includes all portions of current segments 02a, 02b, and 02c of Clear Creek. The segment includes the mainstem of Clear Creek, including all of the tributaries, lakes and reservoirs, from the I-70 bridge above Silver Plume to the Argo Tunnel discharge. A total of 4,997 data points were included in the *Scribe* dataset from 12 separate locations within Segment COSPCL02 of the Clear Creek watershed. Data collection occurred on 21 separate dates between February 2015 and September 2020. A summary of the available data from COSPCL02 for parameters with numeric water quality standards is provided in **Table 3-3.**

Table 3-3: Sample Count, Statistical Summary, and Historical (1991) Water Quality Standards for the 2015-2021 Analytical Dataset for Segment COSPCL02.

Analyte	Units	Number of Samples	Min	Max	Mean	Median	85th Percentile	1991 WQS
Arsenic, Dissolved	µg/L	142	ND	0.89	0.10	ND	0.52	50
Cadmium, Dissolved	µg/L	142	ND	3.47	0.58	0.36	1.19	2
Chromium, Dissolved	µg/L	50	ND	2.44	0.42	ND	1.77	25
Copper, Dissolved	µg/L	80	ND	8.68	1.25	ND	3.01	10
Iron, Total Recoverable	µg/L	137	ND	585	142	139	233	1,000
Lead, Dissolved	µg/L	142	ND	2.36	0.40	0.34	0.64	5
Manganese, Total Recoverable	µg/L	137	5.39	248	47.5	18.1	117	1,000
Nickel, Dissolved	µg/L	142	ND	1.91	0.10	ND	ND	50
Selenium, Dissolved	µg/L	142	ND	3.54	0.56	ND	1.62	80
Silver, Dissolved	µg/L	142	ND	0.75	0.01	ND	ND	0.1
Zinc, Dissolved	µg/L	142	20.5	803	162	111	282	280

ND = Non-Detect.

Preliminary analyses of attainment of water quality standards are provided in **Table 3-4** for 1991 standards.

Table 3-4: Historical (1991) Water Quality Standards Determinations of Attainment for Segment COSPCL02 (Stream segmentation from Regulation 38), based on the 2015-2021 Dataset.

Analyte	Units	Number of Samples	1991 Attainment
Arsenic, Dissolved	µg/L	142	TRUE
Cadmium, Dissolved	µg/L	142	TRUE
Chromium, Dissolved	µg/L	50	TRUE
Copper, Dissolved	µg/L	80	TRUE
Iron, Total Recoverable	µg/L	137	TRUE
Lead, Dissolved	µg/L	142	TRUE
Manganese, Total Recoverable	µg/L	137	TRUE
Nickel, Dissolved	µg/L	142	TRUE
Selenium, Dissolved	µg/L	142	TRUE
Silver, Dissolved	µg/L	142	TRUE
Zinc, Dissolved	µg/L	142	**FALSE**

Historical (1991) standards for the combined COSPCL02 segment were attained for all constituents except for dissolved zinc, based on the 2015-2021 dataset.

3.3.1.1.3 Clear Creek Segment COSPCL02a

Clear Creek segment COSPCL02a includes the mainstem of Clear Creek, including all of the tributaries and wetlands, from the I-70 bridge above Silver Plume to a point just above the confluence with West Fork Clear Creek. A total of 3,198 data points were included in the *Scribe* dataset from 10 separate locations within Segment COSPCL02a of the Clear Creek watershed. Data collection occurred on 21 separate dates between February 2015 and September 2020. A summary of the available data from COSPCL02a for parameters with numeric water quality standards is provided in **Table 3-5.**

Table 3-5: Sample Count, Statistical Summary, and Calculated Water Quality Standards for the 2015-2021 Analytical Dataset for Segment COSPCL02a.

Analyte	Units	Number of Samples	Min	Max	Mean	Median	85th Percentile	1991 WQS	2010 Acute WQS	2010 Chronic WQS	2021 Acute WQS	2021 Chronic WQS
Arsenic, Dissolved	µg/L	94	ND	0.89	0.15	ND	0.56	50	340	-	340	-
Arsenic, Total Recoverable	µg/L	92	ND	3.53	0.07	ND	ND	-	-	0.02	-	0.02[3]
Cadmium, Dissolved	µg/L	94	ND	3.47	0.78	0.54	1.59	2	1.37[1]	1.54[2]	1.42[1]	0.59[1]
Cadmium, Total Recoverable	µg/L	92	ND	3.53	0.07	ND	ND	-	-	-	5	-
Chloride, Total	mg/L	43	3.6	268	37.7	20.1	57.6	-	-	250	-	250
Chromium, Dissolved (VI)	µg/L	27	ND	2.44	0.45	ND	1.91	25	16	11	16	11
Chromium, Total Recoverable (III)	µg/L	25	ND	ND	ND	ND	ND	-	50	-	50	-
Copper, Dissolved	µg/L	56	ND	5	0.54	ND	2.12	10	10.6[1]	7.21[1]	10.6[1]	7.21[1]
Hardness, Total	mg/L	94	30	240	77.6	80.5	101	-	-	-	-	-
Iron, Dissolved	µg/L	94	ND	109	2.30	ND	ND	-	-	300	-	300
Iron, Total Recoverable	µg/L	92	ND	585	125	132	221	1,000	-	1,000	-	1,000
Lead, Dissolved	µg/L	94	ND	2.36	0.47	0.36	0.69	5	49[1]	1.91[1]	49[1]	1.91[1]
Lead, Total Recoverable	µg/L	92	ND	12.3	1.94	1.24	3.72	-	-	-	50	-
Manganese, Dissolved	µg/L	94	ND	30	9.92	9.01	13.8	-	2,744[1]	1,516[1]	2,744[1]	1,516[1]
Manganese, Total Recoverable	µg/L	92	5.39	92.3	16.6	14.2	21.4	1,000	-	-	-	-
Mercury, Total	µg/L	4	ND	ND	ND	ND	ND	-	-	0.01	-	0.01
Nickel, Dissolved	µg/L	94	ND	1.77	0.10	ND	ND	50	378[1]	42[1]	378[1]	42[1]
Nickel, Total Recoverable	µg/L	92	ND	27.4	0.43	ND	ND	-	-	-	-	100
Selenium, Dissolved	µg/L	94	ND	3.54	0.79	ND	1.92	80	18.4	4.6	18.4	4.6
Silver, Dissolved	µg/L	94	ND	0.75	0.01	ND	ND	0.1	1.31[1]	0.05[1]	1.31[1]	0.05[1]
Sulfate as SO4, Total	mg/L	43	6	26.8	14.1	12.4	20.7	-	-	250	-	250
Uranium, Dissolved	µg/L	6	0.52	1.74	1.08	1.04	1.53	-	-	-	[4]	[4]
Zinc, Dissolved	µg/L	94	33.5	803	203	136	345	280	586[2]	353[2]	281[1, 5]	246[1, 5]

ND = Non-Detect

[1] Hardness-dependent standard calculated using site-wide mean hardness.

[2] Temporary modifications to the WQS exist: Cd (ch), Zn (ch)/(ac); expiration date of 07/01/2014

[3] Arsenic (ch) = hybrid.

[4] Uranium standard = varies*. See 38.5(3) for details.

[5] Segment-specific equation. See Regulation 38.

Preliminary analysis of attainment of the 1991, 2010, and 2021 acute and chronic water quality standards are provided in **Table 3-6**. Hardness-dependent water quality standards were calculated using the mean hardness for this segment (78 mg/L).

Table 3-6: Historical (1991 and 2010) and Current (2021) Chronic Water Quality Standard Attainment Calculated Using Mean Hardness Values for Segment COSPCL02a, based on the 2015-2021 Dataset.

Analyte	Units	Number of Samples	1991 WQS	2010 Acute	2010 Chronic	2021 Acute	2021 Chronic
Arsenic, Dissolved	µg/L	94	TRUE	TRUE		TRUE	
Arsenic, Total Recoverable	µg/L	92			TRUE		TRUE
Cadmium, Dissolved	µg/L	94	TRUE	**FALSE**	**FALSE**	**FALSE**	**FALSE**
Cadmium, Total Recoverable	µg/L	92				TRUE	
Chloride, Total	mg/L	43			TRUE		TRUE
Chromium, Dissolved (VI)	µg/L	27	TRUE	TRUE	TRUE	TRUE	TRUE
Chromium, Total Recoverable (III)	µg/L	25		TRUE		TRUE	
Copper, Dissolved	µg/L	56	TRUE	TRUE	TRUE	TRUE	TRUE
Iron, Dissolved	µg/L	94			TRUE		TRUE
Iron, Total Recoverable	µg/L	92	TRUE		TRUE		TRUE
Lead, Dissolved	µg/L	94	TRUE	TRUE	TRUE	TRUE	TRUE
Lead, Total Recoverable	µg/L	92				TRUE	
Manganese, Dissolved	µg/L	94		TRUE	TRUE	TRUE	TRUE
Manganese, Total Recoverable	µg/L	92	TRUE				
Mercury, Total	µg/L	4			TRUE		TRUE
Nickel, Dissolved	µg/L	94	TRUE	TRUE	TRUE	TRUE	TRUE
Nickel, Total Recoverable	µg/L	92					TRUE
Selenium, Dissolved	µg/L	94	TRUE	TRUE	TRUE	TRUE	TRUE
Silver, Dissolved	µg/L	94	TRUE	TRUE	TRUE	TRUE	TRUE
Sulfate as SO4, Total	mg/L	43			TRUE		TRUE
Zinc, Dissolved	µg/L	94	**FALSE**	**FALSE**	TRUE	**FALSE**	**FALSE**

Note: Hardness-dependent standards and attainment values based on mean hardness and comparison of the 85th percentile (dissolved metals and hardness-dependent standards) and median analytical result values (total recoverable metals) for chronic attainment and comparison of maximum analytical result values for acute attainment.

Historical (1991) standards were attained for all constituents except for dissolved zinc. Historical (2010) standards were not attained for dissolved cadmium (acute/chronic) or dissolved zinc (acute only) while current (2021) standards were not attained for dissolved cadmium (acute/chronic), or dissolved zinc (acute/chronic) based on the 2015 – 2021 analytical data.

3.3.1.1.4 Clear Creek Segment COSPCL02b

Segment COSPCL02b includes the mainstem of Clear Creek, including all of the tributaries and wetlands, from the confluence with West Fork Clear Creek to a point just below the confluence with Mill Creek. A total of 844 data points were included in the *Scribe* dataset from one location within Segment COSPCL02b of the Clear Creek watershed (sampling site CC-26). Data collection occurred on 21 separate dates between February 2015 and September 2020. A summary of the available data and the calculated 1991, 2010, and 2021 acute and chronic water quality standards applicable to segment COSPCL02b for parameters with numeric water quality standards is provided in **Table 3-7.**

Table 3-7: Sample Count, Statistical Summary, and Calculated Water Quality Standards for the 2015-2021 Analytical Dataset for Segment COSPCL02b.

Analyte	Units	Number of Samples	Min	Max	Mean	Median	85th Percentile	1991 WQS	2010 Acute WQS	2010 Chronic WQS	2021 Acute WQS	2021 Chronic WQS
Arsenic, Dissolved	µg/L	23	ND	ND	ND	ND	ND	50	340	-	340	-
Arsenic, Total Recoverable	µg/L	22	ND	ND	ND	ND	ND	-	-	0.02	-	0.02[2]
Cadmium, Dissolved	µg/L	23	ND	0.36	0.12	0.12	0.22	2	1.51[1]	0.38[1]	1.57[1]	0.65[1]
Cadmium, Total Recoverable	µg/L	22	ND	ND	ND	ND	ND	-	-	-	5	-
Chloride, Total	mg/L	15	ND	80.5	27.7	18.7	25.5	-	-	250	-	250
Chromium, Dissolved (VI)	µg/L	10	ND	1.98	0.37	ND	1.10	25	16	11	16	11
Chromium, Total Recoverable (III)	µg/L	9	ND	ND	ND	ND	ND	-	50	-	50	-
Copper, Dissolved	µg/L	12	ND	8.68	1.15	ND	2.43	10	11.8[1]	7.95[1]	11.8[1]	7.95[1]
Hardness, Total	mg/L	23	31	144	87	98	119	-	-	-	-	-
Iron, Dissolved	µg/L	23	ND	102	8.78	ND	ND	-	-	300	-	300
Iron, Total Recoverable	µg/L	22	104	401	191	181	240	1,000	-	1,000	-	1,000
Lead, Dissolved	µg/L	23	ND	1.1	0.32	0.33	0.52	5	55.5[1]	2.16[1]	55.5[1]	2.16[1]
Lead, Total Recoverable	µg/L	22	ND	6.53	1.66	1.41	2.34	-	-	-	50	-
Manganese, Dissolved	µg/L	23	33.2	355	108	95.2	196	-	2,850[1]	1,575[1]	2,850[1]	1,575[1]
Manganese, Total Recoverable	µg/L	22	49.4	248	121	111	172	1,000	-	-	-	-
Mercury, Total	µg/L	2	ND	ND	ND	ND	ND	-	-	0.01	-	0.01
Nickel, Dissolved	µg/L	23	ND	0.95	0.08	ND	ND	50	416[1]	46.2[1]	416[1]	46.2[1]
Nickel, Total Recoverable	µg/L	22	ND	6.97	0.32	ND	ND	-	-	-	-	100
Selenium, Dissolved	µg/L	23	ND	1.28	0.16	ND	ND	80	18.4	4.6	18.4	4.6
Silver, Dissolved	µg/L	23	ND	ND	ND	ND	ND	0.1	1.60[1]	0.06[1]	1.60[1]	0.06[1]
Sulfate as SO4, Total	mg/L	15	13	85.3	46.1	34.8	76.1	-	-	250	-	250
Uranium, Dissolved	µg/L	3	0.66	1.17	0.95	1.03	1.13	-	-	-	[3]	[3]
Zinc, Dissolved	µg/L	23	20.5	166	69.3	72.5	92.1	280	127[1]	110[1]	141[1]	107[1]

ND = Non-Detect

[1] Hardness-dependent standard calculated using site-wide mean hardness.

[2] Temporary modifications to the WQS exist: Arsenic (ch) = hybrid.

[3] Uranium standard = varies*. See 38.5(3) for details.

Preliminary analysis of attainment of the 1991, 2010, and 2021 acute and chronic water quality standards are provided in **Table 3-8**. Hardness-dependent water quality standards were calculated using the mean hardness for this segment (87 mg/L).

Table 3-8: Current (2021) and Historical (1991, 2010) Acute and Chronic Determinations of Attainment Calculated Using Mean Hardness Values for Segment COSPCL02b, Based on the 2015-2021 Dataset.

Analyte	Units	Number of Samples	1991 WQS	2010 Acute	2010 Chronic	2021 Acute	2021 Chronic
Arsenic, Dissolved	µg/L	23	TRUE	TRUE		TRUE	
Arsenic, Total Recoverable	µg/L	22			TRUE		TRUE
Cadmium, Dissolved	µg/L	23	TRUE	TRUE	TRUE	TRUE	TRUE
Cadmium, Total Recoverable	µg/L	22				TRUE	
Chloride, Total	mg/L	15			TRUE		TRUE
Chromium, Dissolved (VI)	µg/L	10	TRUE	TRUE	TRUE	TRUE	TRUE
Chromium, Total Recoverable (III)	µg/L	9		TRUE		TRUE	
Copper, Dissolved	µg/L	12	TRUE	TRUE	TRUE	TRUE	TRUE
Iron, Dissolved	µg/L	23			TRUE		TRUE
Iron, Total Recoverable	µg/L	22	TRUE		TRUE		TRUE
Lead, Dissolved	µg/L	23	TRUE	TRUE	TRUE	TRUE	TRUE
Lead, Total Recoverable	µg/L	22				TRUE	
Manganese, Dissolved	µg/L	23		TRUE	TRUE	TRUE	TRUE
Manganese, Total Recoverable	µg/L	22	TRUE				
Mercury, Total	µg/L	2	TRUE		TRUE		TRUE
Nickel, Dissolved	µg/L	23	TRUE	TRUE	TRUE	TRUE	TRUE
Nickel, Total Recoverable	µg/L	22					TRUE
Selenium, Dissolved	µg/L	23	TRUE	TRUE	TRUE	TRUE	TRUE
Silver, Dissolved	µg/L	23	TRUE	TRUE	TRUE	TRUE	TRUE
Sulfate as SO4, Total	mg/L	15			TRUE		TRUE
Zinc, Dissolved	µg/L	23	**FALSE**	**FALSE**	TRUE	**FALSE**	TRUE

Note: Hardness-dependent standards and attainment values based on mean hardness and comparison of the 85th percentile (dissolved metals and hardness-dependent standards) and median analytical result values (total recoverable metals) for chronic attainment and comparison of maximum analytical result values for acute attainment.

All historical (1991) standards were attained except for dissolved zinc. Conversely, the dissolved zinc standard was attained for both historical 2010 and current 2021 chronic standards but were not attained for the acute water quality standard. All other parameters attained both chronic and acute water quality standards for 2010, and 2021 based on the 2015-2021 data.

3.3.1.1.5 Clear Creek Segment COSPCL02c

Segment COSPCL02c includes the mainstem of Clear Creek, including all of the tributaries and wetlands, from a point just below the confluence with Mill Creek to a point just above the Argo Tunnel discharge. Data collection occurred on approximately 21 separate dates between February 2015 and September 2020. A summary of the available data from COSPCL02c for parameters with numeric water quality standards along with the calculated 1991, 2010, and 2021 water quality standards is provided in **Table 3-9.**

Table 3-9: Sample Count, Statistical Summary, and Calculated Water Quality Standards for the 2015-2021 Analytical Dataset for Segment COSPCL02c.

Analyte	Units	Number of Samples	Min	Max	Mean	Median	85th Percentile	1991 WQS	2010 Acute WQS	2010 Chronic WQS	2021 Acute WQS	2021 Chronic WQS
Arsenic, Dissolved	µg/L	25	ND	0.55	0.02	ND	ND	50	340	-	340	-
Arsenic, Total Recoverable	µg/L	23	ND	ND	ND	ND	ND	-	-	0.02	-	0.02[4]
Cadmium, Dissolved	µg/L	25	ND	0.50	0.24	0.21	0.43	2	1.40[1]	0.36[1]	1.45[1]	0.61[1]
Cadmium, Total Recoverable	µg/L	23	ND	0.54	0.05	ND	ND	-	-	-	5	-
Chloride, Total	mg/L	17	3.9	66.8	21.1	16.7	40.1	-	-	250	-	250
Chromium, Dissolved (VI)	µg/L	13	ND	1.89	0.4	ND	1.56	25	16	11	16	11
Chromium, Total Recoverable (III)	µg/L	11	ND	ND	ND	ND	ND	-	50	-	50	-
Copper, Dissolved	µg/L	13	ND	1.89	0.4	ND	1.56	10	10.9[1]	11.4[2]	10.9[1]	7.39[1]
Hardness, Total	mg/L	25	30	133	79.9	76	110	-	-	-	-	-
Iron, Dissolved	µg/L	25	ND	278	19.4	ND	ND	-	-	300	-	300
Iron, Total Recoverable	µg/L	23	ND	395	160	138	218	1,000	-	1,000	-	1,000
Lead, Dissolved	µg/L	25	ND	0.54	0.22	0.18	0.43	5	50.5[1]	1.97[1]	50.5[1]	1.97[1]
Lead, Total Recoverable	µg/L	23	0.56	3.82	1.26	0.83	2.01	-	-	-	50	-
Manganese, Dissolved	µg/L	25	22.9	1,240	158	83.3	125	-	2,771[1]	1,531[1]	2,770[1]	1,530[1]
Manganese, Total Recoverable	µg/L	23	32.7	190	101	111	148	1,000	-	-	-	-
Mercury, Total	µg/L	3	ND	ND	ND	ND	ND	-	-	0.01	-	0.01
Nickel, Dissolved	µg/L	25	ND	1.91	0.14	ND	ND	50	387[1]	43[1]	387[1]	43[1]
Nickel, Total Recoverable	µg/L	23	ND	5.26	0.23	ND	ND	-	-	-	-	100
Selenium, Dissolved	µg/L	25	ND	1.18	0.09	ND	ND	80	18.4	4.6	18.4	4.6
Silver, Dissolved	µg/L	25	ND	ND	ND	ND	ND	0.1	1.38[1]	0.05[1]	1.38[1]	0.05[1]
Sulfate as SO4, Total	mg/L	17	12.2	81.6	44.2	47.2	71.3	-	-	250	-	250
Uranium, Dissolved	µg/L	5	0.51	1.02	0.75	0.63	1.00	-	-	-	[5]	[5]
Zinc, Dissolved	µg/L	23	44.6	177	104	108	150	280	288[1,3]	252[1,3]	288[1, 6]	252[1, 6]

ND = Non-Detect

1 Hardness-dependent standard calculated using site-wide mean hardness.

2 Temporary modification to the WQS for Copper (Ch) = 11.4 µg/L; expires 7/1/2014

3 Segment specific standard (per Reg. 38 tables)

4 Temporary modifications to the WQS exist: Arsenic (ch) = hybrid.

5 Uranium standard = varies*. See 38.5(3) for details.

6 Site-specific equation. See Regulation 38.

Preliminary analysis of attainment of the 1991, 2010, and 2021 acute and chronic water quality standards are provided in **Table 3-10**. Hardness-dependent water quality standards were calculated using the mean hardness for this segment (80 mg/L).

Table 3-10: Current (2021) and Historical (1991 and 2010) Acute and Chronic Determinations of Attainment Calculated Using Mean Hardness Values for Segment COSPCL02c, Based on the 2015-2021 Dataset.

Analyte	Units	Number of Samples	1991 WQS	2010 Acute	2010 Chronic	2021 Acute	2021 Chronic
Arsenic, Dissolved	µg/L	25	TRUE	TRUE		TRUE	
Arsenic, Total Recoverable	µg/L	23			TRUE		TRUE
Cadmium, Dissolved	µg/L	25	TRUE	TRUE	**FALSE**	TRUE	TRUE
Cadmium, Total Recoverable	µg/L	23				TRUE	
Chloride, Total	mg/L	17			TRUE		TRUE
Chromium, Dissolved (VI)	µg/L	13	TRUE	TRUE	TRUE	TRUE	TRUE
Chromium, Total Recoverable (III)	µg/L	11		TRUE		TRUE	
Copper, Dissolved	µg/L	13	TRUE	TRUE	TRUE	TRUE	TRUE
Iron, Dissolved	µg/L	25			TRUE		TRUE
Iron, Total Recoverable	µg/L	23	TRUE		TRUE		TRUE
Lead, Dissolved	µg/L	25	TRUE	TRUE	TRUE	TRUE	TRUE
Lead, Total Recoverable	µg/L	23				TRUE	
Manganese, Dissolved	µg/L	25		TRUE	TRUE	TRUE	TRUE
Manganese, Total Recoverable	µg/L	23	TRUE				
Mercury, Total	µg/L	3			TRUE		TRUE
Nickel, Dissolved	µg/L	25	TRUE	TRUE	TRUE	TRUE	TRUE
Nickel, Total Recoverable	µg/L	23					TRUE
Selenium, Dissolved	µg/L	25	TRUE	TRUE	TRUE	TRUE	TRUE
Silver, Dissolved	µg/L	25	TRUE	TRUE	TRUE	TRUE	TRUE
Sulfate as SO4, Total	mg/L	17		TRUE	TRUE		TRUE
Zinc, Dissolved	µg/L	23	TRUE	TRUE	TRUE	TRUE	TRUE

Note: Hardness-dependent standards and attainment values based on mean hardness and comparison of the 85th percentile (dissolved metals and hardness-dependent standards) and median analytical result values (total recoverable metals) for chronic attainment and comparison of maximum analytical result values for acute attainment.

All parameters attained water quality standards for 1991, 2010, and 2021 standards with the exception of the dissolved cadmium chronic 2010 standard based on the 2015 – 2021 data.

3.3.1.1.6 Clear Creek Segment COSPCL03a

No analytical data were available for sampling locations along Segment COSPCL03a in the 2015-2021 *Scribe* dataset

3.3.1.1.7 Clear Creek Segment COSPCL03b

No analytical data were available for sampling locations along Segment COSPCL03b in the 2015-2021 *Scribe* dataset.

3.3.1.1.8 Clear Creek Segment COSPCL04

No analytical data were available for sampling locations along Segment COSPCL04 in the 2015-2021 *Scribe* dataset.

3.3.1.1.9 Clear Creek Segment COSPCL05

Segment COSPCL05 includes the mainstem of West Clear Creek from the confluence with Woods Creek to the confluence with Clear Creek. A total of 1,013 data points were included in the *Scribe* dataset from two separate locations within Segment COSPCL05 of the Clear Creek watershed. Data collection occurred on 19 separate dates between February 2015 and October 2018. A summary of the available data from COSPCL05 for parameters with numeric water quality standards as well as calculations of the 1991, 2010, and 2021 acute and chronic water quality standards applicable to this segment is provided in **Table 3-11.**

Table 3-11: Sample Count, Statistical Summary, and Calculated Water Quality Standards for the 2015-2021 Analytical Dataset for Segment COSPCL05.

Analyte	Units	Number of Samples	Min	Max	Mean	Median	85th Percentile	1991 WQS	2010 Acute WQS	2010 Chronic WQS	2021 Acute WQS	2021 Chronic WQS
Arsenic, Dissolved	µg/L	30	ND	ND	ND	ND	ND	50	340	-	340	-
Arsenic, Total Recoverable	µg/L	30	ND	ND	ND	ND	ND	-	-	7.6	-	0.02[3]
Cadmium, Dissolved	µg/L	30	ND	0.64	0.08	ND	0.18	3	1.75[1]	0.43[1]	1.84[1]	0.73[1]
Cadmium, Total Recoverable	µg/L	30	ND	0.75	0.02	ND	ND	-	-	-	5	-
Chloride, Total	mg/L	17	2.7	42.5	15.7	13.1	21.6	-	-	-	-	250
Chromium, Dissolved (VI)	µg/L	8	ND	ND	ND	ND	ND	25	16	11	16	11
Chromium, Total Recoverable (III)	µg/L	8	ND	ND	ND	ND	ND	-	50	-	50	-
Copper, Dissolved	µg/L	19	ND	16	2.81	2.42	4.72	23	13.8[1]	9.19[1]	13.8[1]	9.19[1]
Hardness, Total	mg/L	30	28	260	103	98	158	-	-	-	-	-
Iron, Dissolved	µg/L	30	ND	113	10.9	ND	ND	-	-	-	-	300
Iron, Total Recoverable	µg/L	30	106	5,090	369	200	291	1,000	-	1,000	-	1,000
Lead, Dissolved	µg/L	30	ND	0.44	0.05	ND	0.12	25	66.7[1]	2.60[1]	66.7[1]	2.60[1]
Lead, Total Recoverable	µg/L	30	ND	3.53	0.46	ND	1.07	-	-	-	50	-
Manganese, Dissolved	µg/L	30	63.4	1,180	352	269	516	-	3,015[1]	1,666[1]	3,015[1]	1,666[1]
Manganese, Total Recoverable	µg/L	30	105	1,200	395	307	561	1,100	-	-	-	-
Mercury, Total	µg/L	0						-	-	0.01	-	0.01
Nickel, Dissolved	µg/L	30	ND	1.75	0.22	ND	0.70	100	480[1]	53.3[1]	480[1]	53.3[1]
Nickel, Total Recoverable	µg/L	30	ND	9.55	0.55	ND	ND	-	-	-	-	100
Selenium, Dissolved	µg/L	30	ND	1.08	0.04	ND	ND	80	18.4	4.6	18.4	4.6
Silver, Dissolved	µg/L	30	ND	1.04	0.03	ND	ND	0.1	2.14[1]	0.08[1]	2.14[1]	0.08[1]
Sulfate as SO4, Total	mg/L	17	19.9	166	92.1	68.8	151	-	-	-	-	-
Uranium, Dissolved	µg/L	0						-	-	-	[4]	[4]
Zinc, Dissolved	µg/L	30	ND	179	41.9	31.6	80.1	100	322[1,2]	223[1,2]	315[1,5]	220[1,5]

ND = Non-Detect

1 Hardness-dependent standard calculated using site-wide mean hardness.

2 Segment specific standard (per Reg. 38 tables)

3 Temporary modifications to the WQS exist: Arsenic (ch) = hybrid.

4 Uranium standard = varies*. See 38.5(3) for details.

5 Site-specific equation. See Regulation 38.

Preliminary analysis of attainment of the 1991, 2010, and 2021 acute and chronic water quality standards are provided in **Table 3-12**. Hardness-dependent water quality standards were calculated using the mean hardness for this segment (103 mg/L).

Table 3-12: Current (2021) and Historical (1991 and 2010) Determinations of Attainment Calculated Using Mean Hardness Values for Segment COSPCL05 Based on the 2015-2021 Dataset.

Analyte	Units	Number of Samples	1991 WQS	2010 Acute	2010 Chronic	2021 Acute	2021 Chronic
Arsenic, Dissolved	µg/L	30	TRUE	TRUE		TRUE	
Arsenic, Total Recoverable	µg/L	30			TRUE		TRUE
Cadmium, Dissolved	µg/L	30	TRUE	TRUE	TRUE	TRUE	TRUE
Cadmium, Total Recoverable	µg/L	30				TRUE	
Chloride, Total	mg/L	17					TRUE
Chromium, Dissolved (VI)	µg/L	8	TRUE	TRUE	TRUE	TRUE	TRUE
Chromium, Total Recoverable (III)	µg/L	8		TRUE		TRUE	
Copper, Dissolved	µg/L	19	TRUE	**FALSE**	TRUE	**FALSE**	TRUE
Iron, Dissolved	µg/L	30					TRUE
Iron, Total Recoverable	µg/L	30	TRUE		TRUE		TRUE
Lead, Dissolved	µg/L	30	TRUE	TRUE	TRUE	TRUE	TRUE
Lead, Total Recoverable	µg/L	30				TRUE	
Manganese, Dissolved	µg/L	30		TRUE	TRUE	TRUE	TRUE
Manganese, Total Recoverable	µg/L	30	TRUE				
Nickel, Dissolved	µg/L	30	TRUE	TRUE	TRUE	TRUE	TRUE
Nickel, Total Recoverable	µg/L	30					TRUE
Selenium, Dissolved	µg/L	30	TRUE	TRUE	TRUE	TRUE	TRUE
Silver, Dissolved	µg/L	30	TRUE	TRUE	TRUE	TRUE	TRUE
Sulfate as SO4, Total	mg/L	17					
Zinc, Dissolved	µg/L	30	TRUE	TRUE	TRUE	TRUE	TRUE

Note: Hardness-dependent standards and attainment values based on mean hardness and comparison of the 85th percentile (dissolved metals and hardness-dependent standards) and median analytical result values (total recoverable metals) for chronic attainment and comparison of maximum analytical result values for acute attainment.

Historical (1991) standards were attained for all parameters. Historical (2010) and current (2021) standards were attained for all parameters except for acute standards for dissolved copper based on the 2015 – 2021 data.

3.3.1.1.10 Clear Creek Segment COSPCL06

Segment COSPCL06 includes all tributaries to West Clear Creek, including all lakes and reservoirs, from the source to the confluence with Clear Creek (excluding segments in COSPCL07 and 08). A total of 116 data points were included in the Scribe dataset from a single sampling location on Segment COSPCL06 of the Clear Creek watershed (CC-24). Data collection occurred on 4 separate dates between February and June 2015. A summary of the available data from COSPCL06 for parameters with numeric water quality standards as well as the calculated 1991, 2010, and 2021 water quality standards for this segment is provided in **Table 3-13.**

Table 3-13: Sample Count, Statistical Summary, and Calculated Water Quality Standards for the 2015-2021 Analytical Dataset for Segment COSPCL06.

Analyte	Units	Number of Samples	Min	Max	Mean	Median	85th Percentile	1991 Acute WQS	1991 Chronic WQS	2010 Acute WQS	2010 Chronic WQS	2021 Acute WQS	2021 Chronic WQS
Arsenic, Dissolved	µg/L	4	ND	ND	ND	ND	ND	360	150	340	-	340	-
Arsenic, Total Recoverable	µg/L	4	ND	ND	ND	ND	ND	-	-	-	0.02	-	0.02[2]
Cadmium, Dissolved	µg/L	4	ND	ND	ND	ND	ND	0.36[1]	0.21[1]	0.27[1]	0.09[1]	0.25[1]	0.15[1]
Cadmium, Total Recoverable	µg/L	4	ND	ND	ND	ND	ND	-	-	-	-	5	-
Chloride, Total	mg/L	0						-	-	-	250	-	250
Chromium, Dissolved (VI)	µg/L	4	ND	ND	ND	ND	ND	16	11	16	11	16	11
Chromium, Total Recoverable (III)	µg/L	4	ND	ND	ND	ND	ND	-	-	50	-	50	-
Copper, Dissolved	µg/L	3	ND	7.6	2.53	ND	5.32	2.41[1]	1.93[1]	1.82[1]	1.46[1]	1.82[1]	1.46[1]
Hardness, Total	mg/L	4	ND	14	12	12.5	13.6	-	-	-	-	-	-
Iron, Dissolved	µg/L	4	ND	ND	ND	ND	ND	-	-	-	300	-	300
Iron, Total Recoverable	µg/L	4	ND	121	30.25	ND	66.6	-	1,000	-	1,000	-	1,000
Lead, Dissolved	µg/L	4	ND	0.14	0.07	0.06	0.13	3.12[1]	0.19[1]	6.04[1]	0.24[1]	6.04[1]	0.24[1]
Lead, Total Recoverable	µg/L	4	ND	ND	ND	ND	ND	-	-	-	-	50	-
Manganese, Dissolved	µg/L	4	ND	2.14	0.54	ND	1.18	-	-	1,473[1]	814[1]	1,473[1]	814[1]
Manganese, Total Recoverable	µg/L	4	ND	3.72	1.51	1.17	3.09	-	1,000	-	-	-	-
Mercury, Total	µg/L	0						-	-	-	0.01	-	0.01
Nickel, Dissolved	µg/L	4	ND	ND	ND	ND	ND	184[1]	19.1[1]	77.9[1]	8.65[1]	77.9[1]	8.65[1]
Nickel, Total Recoverable	µg/L	4	ND	ND	ND	ND	ND	-	-	-	-	-	100
Selenium, Dissolved	µg/L	4	ND	ND	ND	ND	ND	135	17	18.4	4.6	18.4	4.6
Silver, Dissolved	µg/L	4	ND	ND	ND	ND	ND	0.05[1]	0.002[1]	77.9[1]	8.65[1]	0.05[1]	0.002[1]
Sulfate as SO4, Total	mg/L	0						-	-	-	250	-	-
Uranium, Dissolved	µg/L	0						-	-	-	-	[3]	[3]
Zinc, Dissolved	µg/L	4	ND	12.2	3.05	ND	6.71	19.6[1]	0.20[1]	23.5[1]	20.4[1]	23.3[1]	17.6[1]

ND = Non-Detect

[1] Hardness-dependent standard calculated using site-wide mean hardness.

[2] Temporary modifications to the WQS exist: Arsenic (ch) = hybrid.

[3] Uranium standard = varies*. See 38.5(3) for details.

Preliminary analysis of attainment of the 1991, 2010, and 2021 acute and chronic water quality standards are provided in **Table 3-14**. Hardness-dependent water quality standards were calculated using the mean hardness for this segment (12 mg/L).

Table 3-14: Current (2021) and Historical (1991 and 2010) Acute and Chronic Water Quality Standard Determinations of Attainment Calculated Using Mean Hardness Values for Segment COSPCL06 Based on the 2015-2021 Dataset.

Analyte	Units	Number of Samples	1991 Acute	1991 Chronic	2010 Acute	2010 Chronic	2021 Acute	2021 Chronic
Arsenic, Dissolved	µg/L	4	TRUE	TRUE	TRUE		TRUE	
Arsenic, Total Recoverable	µg/L	4				TRUE		TRUE
Cadmium, Dissolved	µg/L	4	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Cadmium, Total Recoverable	µg/L	4					TRUE	
Chromium, Dissolved (VI)	µg/L	4	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Chromium, Total Recoverable (III)	µg/L	4			TRUE		TRUE	
Copper, Dissolved	µg/L	3	TRUE	**FALSE**	TRUE	**FALSE**	**FALSE**	**FALSE**
Iron, Dissolved	µg/L	4				TRUE		TRUE
Iron, Total Recoverable	µg/L	4		TRUE		TRUE		TRUE
Lead, Dissolved	µg/L	4	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Lead, Total Recoverable	µg/L	4					TRUE	
Manganese, Dissolved	µg/L	4			TRUE	TRUE	TRUE	TRUE
Nickel, Dissolved	µg/L	4	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Nickel, Total Recoverable	µg/L	4						TRUE
Selenium, Dissolved	µg/L	4	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Silver, Dissolved	µg/L	4	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Zinc, Dissolved	µg/L	4	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE

Note: Hardness-dependent standards and attainment values based on mean hardness and comparison of the 85th percentile (dissolved metals and hardness-dependent standards) and median analytical result values (total recoverable metals) for chronic attainment and comparison of maximum analytical result values for acute attainment.

Historical (1991 and 2010) standards were not attained for dissolved copper (chronic) and current (2021) acute and chronic standards for dissolved copper were not achieved based on the 2015 – 2021 data.

3.3.1.1.11 Clear Creek Segment COSPCL07

No analytical data were available for sampling locations along Segment COSPCL07 in the 2015 – 2021 *Scribe* dataset.

3.3.1.1.12 Clear Creek Segment COSPCL08

No analytical data were available for sampling locations along Segment COSPCL08 in the 2015 – 2021 *Scribe* dataset. Note that this segment does not have water quality standards adopted for metals and other parameters of concern for this study.

3.3.1.1.13 Clear Creek Historical (1991) Segment COSPCL09

Segment COSPCL09 includes the mainstem of Fall River, including all tributaries, lakes, and reservoirs, from the source to the confluence with Clear Creek represents the historical stream segmentation which includes all portions of current segments 9a and 9b of Clear Creek. A total of 817 data points were included in the *Scribe* dataset from two sampling locations on Segment COSPCL09 of the Clear Creek watershed. Data collection occurred on 19 separate dates between February 2015 and October 2018. A summary of the available data from COSPCL09 for parameters with numeric water quality standards (based on standards assigned to segment COSPCL09a) is provided in **Table 3-15.**

Table 3-15: Sample Count, Statistical Summary, and Calculated Water Quality Standards for the 2015-2021 Analytical Dataset for Segment COSPCL09

Analyte	Units	Number of Samples	Min	Max	Mean	Median	85th Percentile	1991 Acute WQS	1991 Chronic WQS
Arsenic, Dissolved	µg/L	24	ND	0.68	0.10	ND	0.29	360	150
Cadmium, Dissolved	µg/L	24	ND	6.78	2.00	2.03	2.60	3.05[1]	0.95[1]
Chromium, Dissolved (VI)	µg/L	7	ND	ND	ND	ND	ND	16	11
Copper, Dissolved	µg/L	15	2.91	93	35.3	31.4	56.9	14.4[1]	9.77[1]
Iron, Total Recoverable	µg/L	24	ND	19,300	1,264	83.5	1,512	-	1,000
Lead, Dissolved	µg/L	24	ND	1.71	0.70	0.54	1.25	66.8[1]	2.84[1]
Manganese, Total Recoverable	µg/L	24	8.84	1,340	238	88.7	502	-	1,000
Nickel, Dissolved	µg/L	24	ND	15.4	5.82	6.15	7.99	778[1]	80.7[1]
Selenium, Dissolved	µg/L	24	ND	ND	ND	ND	ND	135	17
Silver, Dissolved	µg/L	24	ND	ND	ND	ND	ND	1.38[1]	0.05[1]
Zinc, Dissolved	µg/L	24	ND	1,280	524	581	721	90.9[1]	7.68[1]

ND = Non-Detect

[1] Hardness-dependent standard calculated using site-wide mean hardness.

Preliminary analysis of attainment of the 1991, 2010, and 2021 acute and chronic water quality standards are provided in **Table 3-16**. Hardness-dependent water quality standards were calculated using the mean hardness for this segment (80 mg/L).

Table 3-16: Historical (1991) Acute and Chronic Water Quality Standard Determinations of Attainment Calculated Using Mean Hardness Values for Segment COSPCL09 (1991 stream segmentation) Based on the 2015-2021 Dataset.

Analyte	Units	Number of Samples	1991 Acute WQS	1991 Chronic WQS
Arsenic, Dissolved	µg/L	24	TRUE	TRUE
Cadmium, Dissolved	µg/L	24	TRUE	**FALSE**
Chromium, Dissolved (VI)	µg/L	7	TRUE	TRUE
Copper, Dissolved	µg/L	15	**FALSE**	**FALSE**
Iron, Total Recoverable	µg/L	24		**FALSE**
Lead, Dissolved	µg/L	24	TRUE	TRUE
Manganese, Total Recoverable	µg/L	24		TRUE
Nickel, Dissolved	µg/L	24	TRUE	TRUE
Selenium, Dissolved	µg/L	24	TRUE	TRUE
Silver, Dissolved	µg/L	24	TRUE	TRUE
Zinc, Dissolved	µg/L	24	**FALSE**	**FALSE**

Historical (1991) standards for dissolved cadmium (chronic), dissolved copper (acute/chronic), total recoverable iron (chronic), and dissolved zinc (acute/chronic) were not attained.

3.3.1.1.14 Clear Creek Segment COSPCL09a

The 2010 and 2021 segmentation of COSPCL09a includes the mainstem of Fall River, including all tributaries and wetlands, from the source to the confluence with Clear Creek while 09b includes the mainstem of Trail Creek, including all tributaries and wetlands, from the source to the confluence with Clear Creek. A total of 116 data points were included in the *Scribe* dataset from a single sampling location on Segment COSPCL09a of the Clear Creek watershed (CC-30). Data collection occurred on four separate dates between February and June 2015. A summary of the available data from COSPCL09a for parameters with numeric water quality standards as well as applicable 1991, 2010, and 2021 standards is provided in **Table 3-17.**

Table 3-17: Sample Count, Statistical Summary, and Calculated Water Quality Standards for the 2015-2021 Analytical Dataset for Segment COSPCL09a

Analyte	Units	Number of Samples	Min	Max	Mean	Median	85th Percentile	1991 Acute WQS	1991 Chronic WQS	2010 Acute WQS	2010 Chronic WQS	2021 Acute WQS	2021 Chronic WQS
Arsenic, Dissolved	µg/L	4	ND	ND	ND	ND	ND	360	150	340	-	340	-
Arsenic, Total Recoverable	µg/L	4	ND	ND	ND	ND	ND	-	-	-	0.02	-	0.02[3]
Cadmium, Dissolved	µg/L	4	ND	0.38	0.09	ND	0.21	0.97[1]	0.43[1]	0.58[1]	0.17[1]	0.56[1]	0.28[1]
Cadmium, Total Recoverable	µg/L	4	ND	ND	ND	ND	ND	-	-	-	-	5	-
Chloride, Total	mg/L	0						-	-	-	250	-	250
Chromium, Dissolved (VI)	µg/L	0						16	11	16	11	16	11
Chromium, Total Recoverable (III)	µg/L	0						-	-	50	-	50	-
Copper, Dissolved	µg/L	3	2.91	5.31	3.86	3.36	4.73	5.52[1]	4.11[1]	4.19[1]	9.60[2]	4.19[1]	3.11[1]
Hardness, Total	mg/L	4	15	38	29	31.5	36.2	-	-	-	-	-	-
Iron, Dissolved	µg/L	4	ND	ND	ND	ND	ND	-	-	-	300	-	300
Iron, Total Recoverable	µg/L	4	ND	674	210	83.5	446	-	1,000	-	1,000	-	1,000
Lead, Dissolved	µg/L	4	ND	0.10	0.03	ND	0.06	13[1]	0.67[1]	16.4[1]	0.64[1]	16.4[1]	0.64[1]
Lead, Total Recoverable	µg/L	4	ND	0.69	0.17	ND	0.38	-	-	-	-	50	-
Manganese, Dissolved	µg/L	4	5.95	75.5	24.0	7.33	45.3	-	-	1,977[1]	1,092[1]	1,977[1]	1,092[1]
Manganese, Total Recoverable	µg/L	4	8.84	90.5	31.1	12.4	56.5	-	1,000	-	-	-	-
Mercury, Total	µg/L	0						-	-	-	0.01	-	0.01
Nickel, Dissolved	µg/L	0						360[1]	37.3[1]	164[1]	18.3[1]	164[1]	18.3[1]
Nickel, Total Recoverable	µg/L	4	ND	2.11	0.53	ND	1.16	-	-	-	-	-	100
Selenium, Dissolved	µg/L	4	ND	ND	ND	ND	ND	135	17	18.4	4.6	18.4	4.6
Silver, Dissolved	µg/L	4	ND	ND	ND	ND	ND	0.24[1]	0.01[1]	0.002[1]	0.01[1]	0.24[1]	0.01[1]
Sulfate as SO4, Total	mg/L	0						-	-	-	250	-	250
Thallium, Dissolved	µg/L	0						-	15	-	-	-	-
Uranium, Dissolved	µg/L	0						-	-	-	-	[4]	[4]
Zinc, Dissolved	µg/L	4	ND	68.5	27.5	20.7	48.5	40[1]	1.09[1]	49.9[1]	43.3[1]	51.9[1]	39.3[1]

ND = Non-Detect

[1] Hardness-dependent standard calculated using site-wide mean hardness.

[2] Temporary modification to the WQS expires for copper (ch) = 9.6 µg/L; 7/1/2014

[3] Temporary modifications to the WQS exist: Arsenic (ch) = hybrid.

[4] Uranium standard = varies*. See 38.5(3) for details.

Preliminary analysis of attainment of the 1991, 2010, and 2021 acute and chronic water quality standards are provided in **Table 3-18**. Hardness-dependent water quality standards were calculated using the mean hardness for this segment (29 mg/L).

Table 3-18: Current (2021) and Historical (1991 and 2010) Acute and Chronic Water Quality Standards and Determinations of Attainment Calculated Using Mean Hardness Values for Segment COSPCL09a based on the 2015-2021 Dataset.

Analyte	Units	Number of Samples	1991 Acute	1991 Chronic	2010 Acute	2010 Chronic	2021 Acute	2021 Chronic
Arsenic, Dissolved	µg/L	4	TRUE	TRUE	TRUE		TRUE	
Arsenic, Total Recoverable	µg/L	4				TRUE		TRUE
Cadmium, Dissolved	µg/L	4	TRUE	TRUE	TRUE	**FALSE**	TRUE	TRUE
Cadmium, Total Recoverable	µg/L	4					TRUE	
Copper, Dissolved	µg/L	3	TRUE	**FALSE**	**FALSE**	TRUE	**FALSE**	**FALSE**
Iron, Dissolved	µg/L	4				TRUE		TRUE
Iron, Total Recoverable	µg/L	4		TRUE		TRUE		TRUE
Lead, Dissolved	µg/L	4	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Lead, Total Recoverable	µg/L	4					TRUE	
Manganese, Dissolved	µg/L	4			TRUE	TRUE	TRUE	TRUE
Manganese, Total Recoverable	µg/L	4		TRUE				
Nickel, Total Recoverable	µg/L	4						TRUE
Selenium, Dissolved	µg/L	4	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Silver, Dissolved	µg/L	4	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Zinc, Dissolved	µg/L	4	**FALSE**	**FALSE**	**FALSE**	**FALSE**	**FALSE**	**FALSE**

Note: Hardness-dependent standards and attainment values based on mean hardness and comparison of the 85th percentile (dissolved metals and hardness-dependent standards) and median analytical result values (total recoverable metals) for chronic attainment and comparison of maximum analytical result values for acute attainment.

Historical (1991) chronic standards for dissolved copper and acute and chronic standards for dissolved zinc were not attained. Historical (2010) chronic standards for dissolved cadmium, acute standards for dissolved copper, and acute and chronic standards for dissolved zinc were not attained. Current (2021) acute and chronic standards for dissolved copper and dissolved zinc were also not achieved based on the 2015-2021 data.

3.3.1.1.15 Clear Creek Segment COSPCL09b

Segment COSPCL09b includes the mainstem of Trail Creek, including all tributaries and wetlands, from the source to the confluence with Clear Creek. A total of 701 data points were included in the *Scribe* dataset from a single sampling location along Segment COSPCL09b of the Clear Creek watershed (CC-31). Data collection occurred over 19 separate dates between February 2015 and October 2018. A summary of the available data from COSPCL09b for parameters with numeric water quality standards along with applicable 1991, 2010, and 2021 standards is provided in **Table 3-19.**

Table 3-19: Sample Count, Statistical Summary, and Calculated Water Quality Standards for the 2015-2021 Analytical Dataset for Segment COSPCL09b

Analyte	Units	Number of Samples	Min	Max	Mean	Median	85th Percentile	1991 Acute WQS	1991 Chronic WQS	2010 Acute WQS	2010 Chronic WQS	2021 Acute WQS	2021 Chronic WQS
Arsenic, Dissolved	µg/L	20	ND	0.68	0.12	ND	0.52	360	150	340	-	340	-
Arsenic, Total Recoverable	µg/L	20	ND	11.5	0.58	ND	ND	-	-	-	0.02	-	0.02
Cadmium, Dissolved	µg/L	20	1.5	6.78	2.39	1.08	2.84	3.50[1]	1.05[1]	1.56[1]	0.39[1]	1.63[1]	0.67[1]
Cadmium, Total Recoverable	µg/L	20	1.39	6.83	2.48	2.15	3.11	-	-	-	-	5	-
Chloride, Total	mg/L	14	1.9	9.2	4.27	3.85	6.04	-	-	-	250	-	250
Chromium, Dissolved (VI)	µg/L	7	ND	ND	ND	ND	ND	16	11	16	11	16	11
Chromium, Total Recoverable (III)	µg/L	7	ND	ND	ND	ND	ND	-	-	50	-	50	-
Copper, Dissolved	µg/L	12	15.1	93	43.18	43.1	60.3	16.1[1]	10.9[1]	12.2[1]	8.22[1]	12.2[1]	8.22[1]
Hardness, Total	mg/L	20	43	115	90.5	94	103	-	-	-	-	-	-
Iron, Dissolved	µg/L	20	ND	ND	ND	ND	ND	-	-	-	300	-	300
Iron, Total Recoverable	µg/L	20	ND	19,300	1,475	134	1,704	-	1,000	-	1,000	-	1,000
Lead, Dissolved	µg/L	20	0.19	1.71	0.84	0.82	1.28	81.6[1]	3.38[1]	57.9[1]	2.26[1]	57.9[1]	2.26[1]
Lead, Total Recoverable	µg/L	20	0.73	309	25.1	3.49	35.5	-	-	-	-	-	-
Manganese, Dissolved	µg/L	20	50.2	834	187	89.3	358	-	-	2,888[1]	1,596[1]	2,888[1]	1,596[1]
Manganese, Total Recoverable	µg/L	20	56.2	1,340	278	97.6	576	-	1,000	-	-	-	-
Mercury, Total	µg/L	0						-	-	-	-	-	0.01
Nickel, Dissolved	µg/L	20	4.54	15.4	6.88	6.37	8.03	855[1]	88.6[1]	430[1]	47.8[1]	430[1]	47.8[1]
Nickel, Total Recoverable	µg/L	20	5.05	25.5	8.97	7.38	11.3	-	-	-	-	-	100
Selenium, Dissolved	µg/L	20	ND	ND	ND	ND	ND	135	17	18.4	4.6	18.4	4.6
Silver, Dissolved	µg/L	20	ND	ND	ND	ND	ND	1.71[1]	0.06[1]	1.71[1]	0.06[1]	1.71[1]	0.06[1]
Sulfate as SO4, Total	mg/L	14	59.9	121	98.4	102	117	-	-	-	250	-	250
Uranium, Dissolved	µg/L	0						-	-	-	-	[4]	[4]
Zinc, Dissolved	µg/L	20	393	1,280	624	604	729	100[1]	9.73[1]	132[1]	200[3]	146[1]	111[1]

ND = Non-Detect

[1] Hardness-dependent standard calculated using site-wide mean hardness.

[2] Dissolved chromium standards are established using the Chromium VI (hexavalent) criteria when chromium valence stability is not determined (per Reg. 31)

[3] Segment specific standard (per Reg. 38 tables)

[4] Uranium standard = varies*. See 38.5(3) for details.

Preliminary analysis of attainment of the 1991, 2010, and 2021 acute and chronic water quality standards are provided in **Table 3-20**. Hardness-dependent water quality standards were calculated using the mean hardness for this segment (90.5 mg/L).

Table 3-20: Current (2021) and Historical (1991 and 2010) Acute and Chronic Water Quality Standards Determinations of Attainment Calculated Using Mean Hardness Values for Segment COSPCL09b Based on the 2015-2021 Dataset.

Analyte	Units	Number of Samples	1991 Acute	1991 Chronic	2010 Acute	2010 Chronic	2021 Acute	2021 Chronic
Arsenic, Dissolved	µg/L	20	TRUE	TRUE	TRUE		TRUE	
Arsenic, Total Recoverable	µg/L	20				TRUE		TRUE
Cadmium, Dissolved	µg/L	20	TRUE	**FALSE**	**FALSE**	**FALSE**	**FALSE**	**FALSE**
Cadmium, Total Recoverable	µg/L	20					TRUE	
Chloride, Total	mg/L	14				TRUE		TRUE
Chromium, Dissolved (VI)	µg/L	7	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Chromium, Total Recoverable (III)	µg/L	7			TRUE		TRUE	
Copper, Dissolved	µg/L	12	**FALSE**	**FALSE**	**FALSE**	**FALSE**	**FALSE**	**FALSE**
Iron, Dissolved	µg/L	20				TRUE		TRUE
Iron, Total Recoverable	µg/L	20		**FALSE**		**FALSE**		**FALSE**
Lead, Dissolved	µg/L	20	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Lead, Total Recoverable	µg/L	20						
Manganese, Dissolved	µg/L	20			TRUE	TRUE	TRUE	TRUE
Manganese, Total Recoverable	µg/L	20		TRUE				
Mercury, Total	µg/L	0						TRUE
Nickel, Dissolved	µg/L	20	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Nickel, Total Recoverable	µg/L	20						TRUE
Selenium, Dissolved	µg/L	20	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Silver, Dissolved	µg/L	20	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Sulfate as SO4, Total	mg/L	14				TRUE		TRUE
Zinc, Dissolved	µg/L	20	**FALSE**	**FALSE**	**FALSE**	**FALSE**	**FALSE**	**FALSE**

Note: Hardness-dependent standards and attainment values based on mean hardness and comparison of the 85th percentile (dissolved metals and hardness-dependent standards) and median analytical result values (total recoverable metals) for chronic attainment and comparison of maximum analytical result values for acute attainment.

Historical (1991) standards were not attained for dissolved cadmium (chronic), dissolved copper (acute/chronic), total recoverable iron (chronic), and dissolved zinc (acute/chronic). Historical (2010) and current (2021) standards were not attained for dissolved cadmium (acute/chronic), dissolved copper (acute/chronic,), total recoverable iron (chronic), and dissolved zinc (acute chronic) based on the 2015 – 2021 data.

3.3.1.1.16 Clear Creek Segment COSPCL10

No analytical data were available for sampling locations along Segment COSPCL10 in the 2015 – 2021 *Scribe* dataset.

3.3.1.1.17 Clear Creek Segment COSPCL11

The description of the 1991 segment COSPCL11 states that the segment includes the mainstem of Clear Creek from the Argo Tunnel discharge to the Farmers Highline Canal diversion in Golden while the 2010 and 2021 segmentation specifies that the segment begins "just above" the Argo Tunnel discharge. A total of 3,981 data points were included in the *Scribe* dataset from five separate sampling locations along Segment COSPCL11 of the Clear Creek watershed. Data collection occurred over 22 separate dates between February 2015 and September 2020. A summary of the available data from COSPCL11 for parameters with numeric water quality standards is provided in **Table 3-21.**

Table 3-21: Sample Count, Statistical Summary, and Calculated Water Quality Standards for the 2015-2021 Analytical Dataset for Segment COSPCL11

Analyte	Units	Number of Samples	Min	Max	Mean	Median	85th Percentile	1991 Acute WQS	1991 Chronic WQS	2010 Acute WQS	2010 Chronic WQS	2021 Acute WQS	2021 Chronic WQS
Arsenic, Dissolved	µg/L	107	ND	0.75	0.02	ND	ND	360	150	340	-	340	-
Arsenic, Total Recoverable	µg/L	102	ND	3.66	0.04	ND	ND	-	-	-	0.02	-	0.02[4]
Cadmium, Dissolved	µg/L	107	ND	2.18	0.41	0.29	0.67	-	3	2.52[1]	1.42[2]	2.73[1]	1.01[1]
Cadmium, Total Recoverable	µg/L	102	ND	2.08	0.28	ND	0.72	-	-	-	-	5	-
Chloride, Total	mg/L	74	3.9	65.3	19.2	17.8	30.9	-	250	-	250	-	250
Chromium, Dissolved (VI)	µg/L	49	ND	1.88	0.20	ND	ND	16	11	16	11	16	11
Chromium, Total Recoverable (III)	µg/L	44	ND	ND	ND	ND	ND	-	-	50	-	50	-
Copper, Dissolved	µg/L	53	1.67	24.9	4.95	3.24	5.63	-	17	20.6[1]	13.2[1]	20.6[1]	13.2[1]
Hardness, Total	mg/L	107	31	2,220	157	86	130	-	-	-	-	-	-
Iron, Dissolved	µg/L	107	ND	867	18.7	ND	ND	-	-	-	300	-	300
Iron, Total Recoverable	µg/L	102	ND	4,340	287	176	467	-	1,000	-	1,000	-	1,000
Lead, Dissolved	µg/L	107	ND	7.02	0.25	0.17	0.39	199[1]	7.37[1]	105[1]	4.10[1]	105[1]	4.10[1]
Lead, Total Recoverable	µg/L	102	ND	40.2	1.92	1.12	3.01	-	-	-	-	50	-
Manganese, Dissolved	µg/L	107	ND	7,450	208	84.6	241	-	-	3,470[1]	1,917[1]	3,470[1]	1,917[1]
Manganese, Total Recoverable	µg/L	102	20	1,160	189	134	280	-	1,000	-	-	-	-
Mercury, Total	µg/L	10	ND	ND	ND	ND	ND	2.4	0.01	-	0.01	-	0.01
Nickel, Dissolved	µg/L	107	ND	7.45	0.41	ND	0.84	1,299[1]	135[1]	686[1]	76.2[1]	686[1]	76.2[1]
Nickel, Total Recoverable	µg/L	102	ND	5.75	0.54	ND	ND	-	-	-	-	-	100
Selenium, Dissolved	µg/L	107	ND	1.12	0.06	ND	ND	135	17	18.4	4.6	18.4	4.6
Silver, Dissolved	µg/L	107	ND	ND	ND	ND	ND	4.41[1]	0.16[1]	4.41[1]	0.16[1]	4.41[1]	0.16[1]
Sulfate as SO4, Total	mg/L	74	13.2	98.2	47.1	38.4	81.6	-	250	-	250	-	-
Uranium, Dissolved	µg/L	15	0.23	2.45	0.81	0.61	1.06	-	-	-	-	[5]	[5]
Zinc, Dissolved	µg/L	107	ND	442	116	86.3	186	-	300	513[1,3]	448[1,3]	513[1,6]	448[1,6]

ND = Non-Detect

1 Hardness-dependent standard calculated using site-wide mean hardness.

2 Temporary modification to the WQS exists for dissolved cadmium (ch) = 1.42 µg/L; expires 7/1/2014

3 Segment specific standard (per Reg. 38 tables)

4 Temporary modifications to the WQS exist: Arsenic (ch) = hybrid.

5 Uranium standard = varies*. See 38.5(3) for details.

6 Site-Specific Standard. See Regulation 38.

Preliminary analysis of attainment of the 1991, 2010, and 2021 acute and chronic water quality standards are provided in **Table 3-22**. Hardness-dependent water quality standards were calculated using the mean hardness for this segment (157 mg/L).

Table 3-22: Current (2021) and Historical (1991 and 2010) Acute and Chronic Water Quality Standards Determinations of Attainment Calculated Using Mean Hardness Values for Segment COSPCL11 Based on the 2015-2021 Dataset.

Analyte	Units	Number of Samples	1991 Acute	1991 Chronic	2010 Acute	2010 Chronic	2021 Acute	2021 Chronic
Arsenic, Dissolved	µg/L	107	TRUE	TRUE	TRUE		TRUE	
Arsenic, Total Recoverable	µg/L	102				TRUE		TRUE
Cadmium, Dissolved	µg/L	107		TRUE	TRUE	TRUE	TRUE	TRUE
Cadmium, Total Recoverable	µg/L	102					TRUE	
Chloride, Total	mg/L	74		TRUE		TRUE		TRUE
Chromium, Dissolved (VI)	µg/L	49	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Chromium, Total Recoverable (III)	µg/L	44			TRUE		TRUE	
Copper, Dissolved	µg/L	53	**FALSE**	TRUE	**FALSE**	TRUE	**FALSE**	TRUE
Iron, Dissolved	µg/L	107				TRUE		TRUE
Iron, Total Recoverable	µg/L	102		TRUE		TRUE		TRUE
Lead, Dissolved	µg/L	107	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Lead, Total Recoverable	µg/L	102					TRUE	
Manganese, Dissolved	µg/L	107			**FALSE**	TRUE	**FALSE**	TRUE
Manganese, Total Recoverable	µg/L	102		TRUE				
Mercury, Total	µg/L	10	TRUE	TRUE		TRUE		TRUE
Nickel, Dissolved	µg/L	107	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Nickel, Total Recoverable	µg/L	102						TRUE
Selenium, Dissolved	µg/L	107	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Silver, Dissolved	µg/L	107	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Sulfate as SO4, Total	mg/L	74		TRUE		TRUE		
Zinc, Dissolved	µg/L	107		TRUE	TRUE	TRUE	TRUE	TRUE

Note: Hardness-dependent standards and attainment values based on mean hardness and comparison of the 85th percentile (dissolved metals and hardness-dependent standards) and median analytical result values (total recoverable metals) for chronic attainment and comparison of maximum analytical result values for acute attainment.

Historical (1991, 2010) and current (2021) standards were not attained for acute dissolved copper. Historical (2010) and current (2021) standards were also not met for acute dissolved manganese based on the 2015 – 2021 data.

3.3.1.1.18 Clear Creek Segment COSPCL12

No analytical data were available for sampling locations along Segment COSPCL12 in the 2015 – 2021 *Scribe* dataset.

3.3.1.1.19 Clear Creek Segment COSPCL13

Segment COSPCL13 (North Fork Clear Creek) represents the stream segmentation which includes all portions of current segments 13a and 13b of Clear Creek. Segments 13a and 13b are divided as follows:

- COSPCL13a – the mainstem of North Clear Creek, including all tributaries and wetlands, from its source to its confluence with Chase Gulch. And Four Mile Gulch, including all tributaries and wetlands, from their sources to their confluence with North Clear Creek and Eureka Gulch, including all tributaries and wetlands, from its source to its confluence with Gregory Gulch
- COSPCL13b – the mainstem of North Clear Creek, including all tributaries and wetlands, from a point just below the confluence with Chase Gulch to the confluence with Clear Creek, except for the specific listings in Segment 13a

A total of 3,602 data points were included in the Scribe dataset from 22 separate sampling locations along Segment COSPCL13 of the Clear Creek watershed. The majority of data collected for Segment COSPCL13 is for Segment COSPCL13b (North Fork Clear Creek). Data was only collected on one day for Segment COSPCL13a in June of 2015 at two separate locations. Calculated water quality assessments for Segment COSPCL13 are based on standards for the North Fork Clear Creek Segment COSPCL13b. Data collection occurred on 22 separate dates between February 2015 and September 2020. A summary of the available data from COSPCL13 for parameters with numeric water quality standards is provided in **Table 3-23.**

Table 3-23: Sample Count, Statistical Summary, and Calculation of Water Quality Standards for the 2015-2021 Analytical Dataset for Segment COSPCL13 (1991) and COSPCL13b (2010 and 2021)

Analyte	Units	Number of Samples	Min	Max	Mean	Median	85th Percentile	1991 WQS	2010 Acute WQS	2010 Chronic WQS	2021 Acute WQS	2021 Chronic WQS
Arsenic, Dissolved	µg/L	100	ND	23.5	0.44	ND	ND	-	340	-	340	-
Arsenic, Total Recoverable	µg/L	97	ND	25	0.61	ND	ND	50	-	100	-	0.02[3]
Cadmium, Dissolved	µg/L	100	ND	329	6.33	1.28	3.63	-	2.62[1]	4.70[2]	2.85[1]	1.04[1]
Cadmium, Total Recoverable	µg/L	97	ND	358	6.92	1.40	3.81	0.4	-	-	5	-
Chloride, Total	mg/L	59	4.4	208	38.9	25.8	59.1	-	-	250	-	250
Chromium, Dissolved (VI)	µg/L	36	ND	1.63	0.16	ND	ND	-	16	11	16	11
Chromium, Total Recoverable (III)	µg/L	33	ND	ND	ND	ND	ND	100	50	-	50	-
Copper, Dissolved	µg/L	61	ND	7,320	232	21.2	69.5	64	21.4[1]	13.7[1]	21.4[1]	13.7[1]
Hardness, Total	mg/L	100	17	829	164	95.5	293	-	-	-	-	-
Iron, Dissolved	µg/L	100	ND	129,000	3,748	54	2,933	-	-	300	-	300
Iron, Total Recoverable	µg/L	97	ND	123,000	5,260	1,290	6,184	5,400	-	7,941[2]	-	1,000
Lead, Dissolved	µg/L	100	ND	120	2.78	0.34	1.27	-	110[1]	4.29[1]	110[1]	4.29[1]
Lead, Total Recoverable	µg/L	97	0.50	129	7.03	3.19	7.99	45	-	-	50	-
Manganese, Dissolved	µg/L	100	2.38	24,800	1,609	451	2,086	-	3,521[1]	3,841[2]	3,521[1]	1,945[1]
Manganese, Total Recoverable	µg/L	97	12.9	23,900	1,679	507	2,418	1,000	-	-	-	-
Mercury, Total	µg/L	6	ND	ND	ND	ND	ND	-	-	0.01	-	0.01
Nickel, Dissolved	µg/L	100	ND	294	14.4	2.88	16.3	-	712[1]	79.0[1]	712[1]	79.0[1]
Nickel, Total Recoverable	µg/L	97	ND	285	15.4	4.46	18.2	50	-	-	-	100
Selenium, Dissolved	µg/L	100	ND	6.22	0.14	ND	ND	20	18.4	4.6	18.4	4.6
Silver, Dissolved	µg/L	100	ND	ND	ND	ND	ND	0.100	4.75[1]	0.18[1]	4.75[1]	0.18[1]
Sulfate as SO4, Total	mg/L	59	7.6	434	111	69.8	245	-	-	250	-	250
Uranium, Dissolved	µg/L	9	ND	1.33	0.32	0.20	0.37	-	-	-	[4]	[4]
Zinc, Dissolved	µg/L	100	ND	57,600	1,480	377	990	500	219[1]	1,582[2]	-	740

ND = Non-Detect

1 Hardness-dependent standard calculated using site-wide mean hardness.

2 Temporary Modifications exist: Cadmium (ch) = 4.7 ug/L, Manganese (ch) = 3841 ug/L, Zinc (ch) = 1582 ug/L, Iron (ch) = 7941 ug/L, expires 7/01/2014

3 Temporary modifications to the WQS exist: Arsenic (ch) = hybrid.

Uranium standard = varies*. See 38.5(3) for details.

Preliminary analysis of attainment of the 1991, 2010, and 2021 acute and chronic water quality standards are provided in **Table 3-24**. Hardness-dependent water quality standards were calculated using the mean hardness for this segment (164 mg/L).

Table 3-24: Current (2021) and Historical (1991 and 2010) Acute and Chronic Water Quality Standards Determinations of Attainment Calculated Using Mean Hardness Values for Segment COSPCL13 Based on the 2015-2021 Dataset.

Analyte	Units	Number of Samples	1991 WQS	2010 Acute	2010 Chronic	2021 Acute	2021 Chronic
Arsenic, Dissolved	µg/L	100	TRUE	TRUE		TRUE	
Arsenic, Total Recoverable	µg/L	97			TRUE		TRUE
Cadmium, Dissolved	µg/L	100	**FALSE**	**FALSE**	TRUE	**FALSE**	**FALSE**
Cadmium, Total Recoverable	µg/L	97				**FALSE**	
Chloride, Total	mg/L	59			TRUE		TRUE
Chromium, Dissolved (VI)	µg/L	36	TRUE	TRUE	TRUE	TRUE	TRUE
Chromium, Total Recoverable (III)	µg/L	33		TRUE		TRUE	
Copper, Dissolved	µg/L	61	**FALSE**	**FALSE**	**FALSE**	**FALSE**	**FALSE**
Iron, Dissolved	µg/L	100			**FALSE**		**FALSE**
Iron, Total Recoverable	µg/L	97	**FALSE**		TRUE		**FALSE**
Lead, Dissolved	µg/L	100	TRUE	**FALSE**	TRUE	**FALSE**	TRUE
Lead, Total Recoverable	µg/L	97				**FALSE**	
Manganese, Dissolved	µg/L	100		**FALSE**	TRUE	**FALSE**	**FALSE**
Manganese, Total Recoverable	µg/L	97	**FALSE**				
Mercury, Total	µg/L	6	TRUE		TRUE		TRUE
Nickel, Dissolved	µg/L	100	TRUE	TRUE	TRUE	TRUE	TRUE
Nickel, Total Recoverable	µg/L	97					TRUE
Selenium, Dissolved	µg/L	100	TRUE	TRUE	TRUE	TRUE	TRUE
Silver, Dissolved	µg/L	100	TRUE	TRUE	TRUE	TRUE	TRUE
Sulfate as SO4, Total	mg/L	59			TRUE		TRUE
Zinc, Dissolved	µg/L	100	**FALSE**	**FALSE**	TRUE	**FALSE**	**FALSE**

Note: Hardness-dependent standards and attainment values based on mean hardness and comparison of the 85th percentile (dissolved metals and hardness-dependent standards) and median analytical result values (total recoverable metals) for chronic attainment and comparison of maximum analytical result values for acute attainment.

Historical (1991) standards were not attained for dissolved cadmium, dissolved copper, total recoverable iron, total recoverable manganese, and dissolved zinc. Historical (2010) standards were not attained for dissolved cadmium (acute), dissolved copper (acute/chronic), dissolved iron (chronic), dissolved lead (acute), dissolved manganese (acute), and dissolved zinc (acute). Current (2021) standards for dissolved cadmium (acute/chronic), total recoverable cadmium (acute), dissolved copper (acute/chronic), dissolved iron (chronic), total recoverable iron (chronic), dissolved lead (acute), total recoverable lead (acute), dissolved manganese (acute/chronic), and dissolved zinc (acute/chronic) were also not attained based on the 2015 – 2021 data.

Water treatment began in March 2017 for Segment 13b of the North Fork of Clear Creek (COSPCL13b). Data for select parameters were reviewed for sampling sites CC-45 (North Fork Clear Creek downstream of Black Hawk) and CC-50 (North Fork Clear Creek above the confluence with

Clear Creek). **Figures 3-3** through **3-6** show that concentrations decreased at both sites following the implementation of active water treatment on the segment. Downstream concentrations (CC-50) of zinc and cadmium have been less consistently reduced following water treatment.

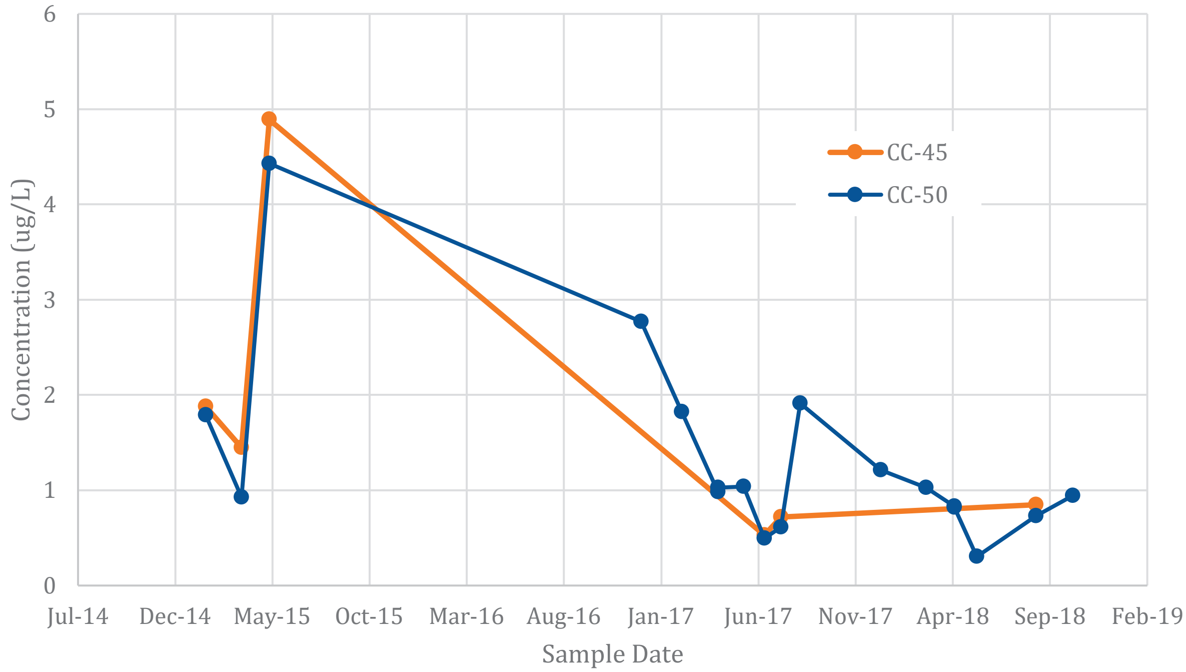


Figure 3-3: Dissolved Cadmium Concentrations on North Fork Clear Creek

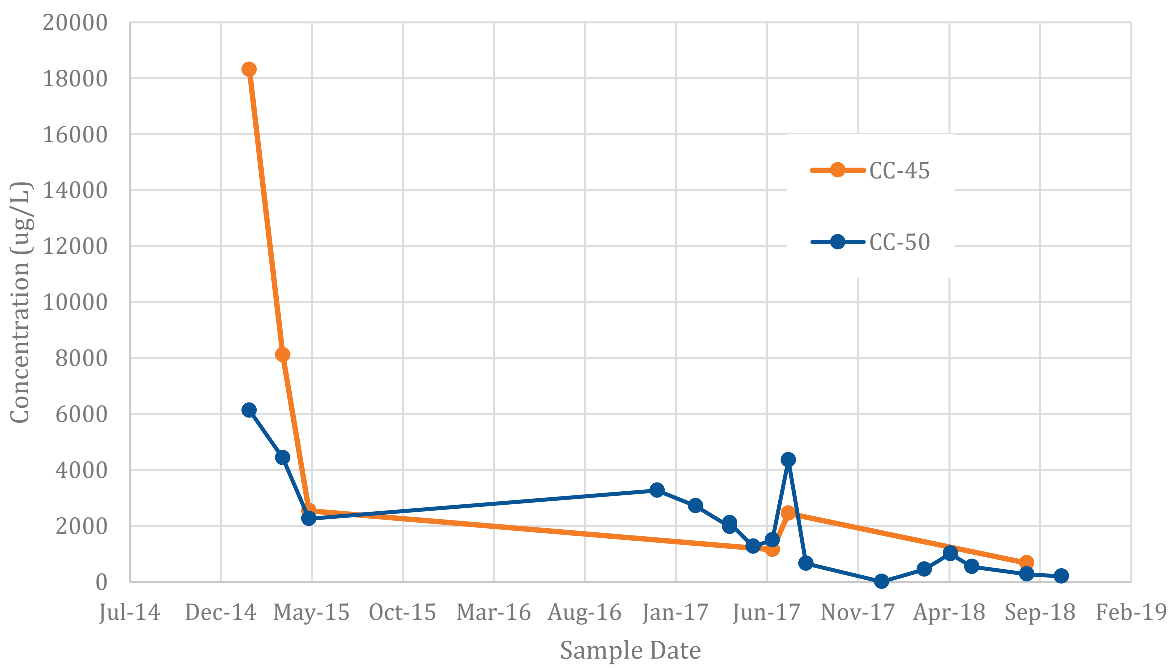


Figure 3-4: Total Recoverable Iron Concentrations on North Fork Clear Creek

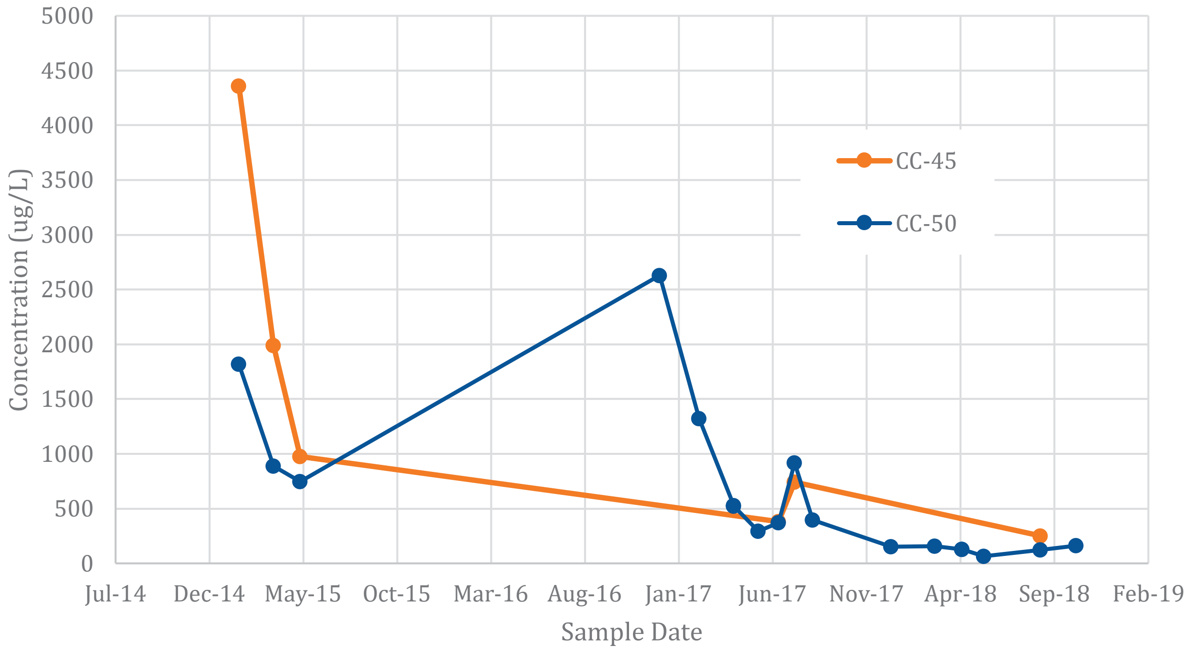


Figure 3-5: Dissolved Manganese Concentrations on North Fork Clear Creek

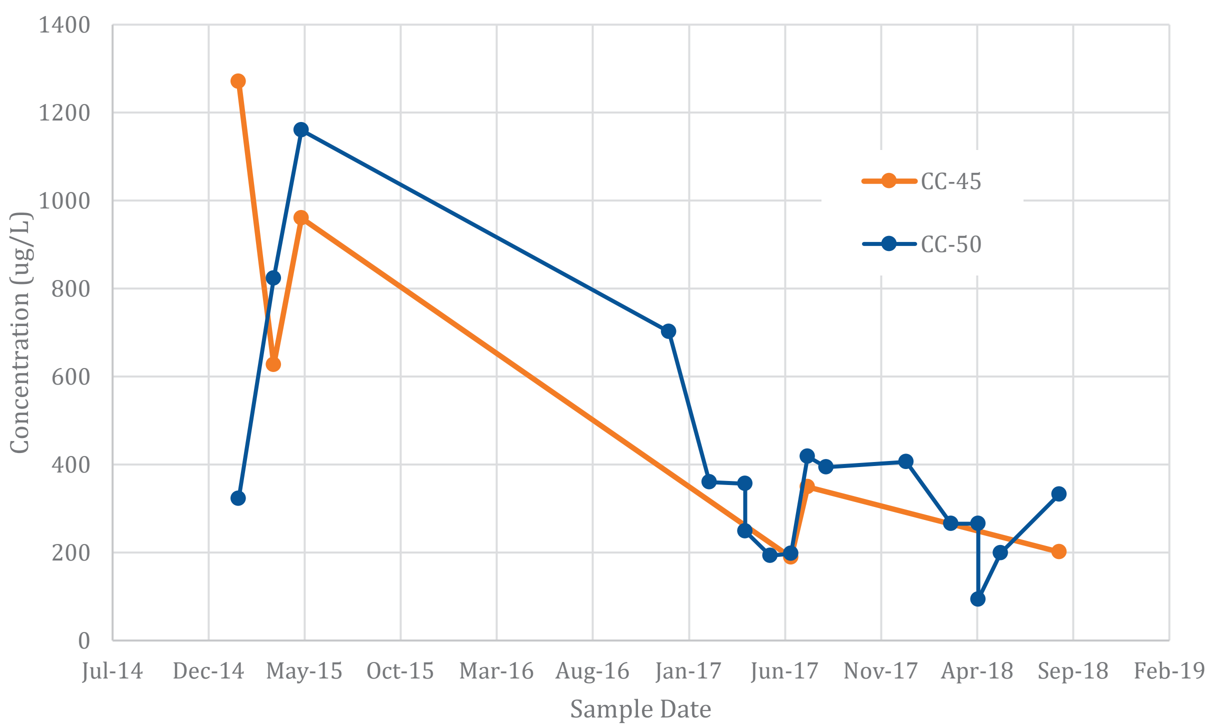


Figure 3-6: Dissolved Zinc Concentrations on North Fork Clear Creek

3.3.1.1.20 Clear Creek Segment COSPCL19

No sampling locations were monitored along Segment COSPCL19 in the 2015 – 2021 *Scribe* dataset.

3.3.2 Macroinvertebrate Analyses

Attainment of the aquatic life use for Segments COSPCL2a, 2c, 06, 11, 13a and 13b of Clear Creek was evaluated using the MMI, HBI, and Shannon Diversity Index data collected in 2017 and 2021. No data were collected between 2015 and 2021 on the remaining Site segments. Data were first sorted by segment. Scores that were calculated based on an average of duplicate samples have been bolded (Site NCC-SW-3). The index scores were then compared to the biological thresholds appropriate for each segment's biotype (biotype information was described in Section 3.2.2; information on each segment's biotype is included in the following subsections). The biotype for each segment was included in the data that were provided by CDPHE and USEPA. A color-coding system has been used to graphically display attainment information. MMI scores that exceeded the attainment threshold were shaded green while MMI scores that fell below the impairment threshold were shaded red. No MMI scores fell between the thresholds for attainment however the HBI and Shannon Diversity Index scores were included for reference.

Table 3-25 contains information on the macroinvertebrate data collected within the Site between 2015 and 2021.

Table 3-25: Macroinvertebrate Data 2015-2021

Station ID	Agency	Stream	Segment ID	Biotype	Sample Date	Results		
						MMI	HBI	SDI
CC-FS-3	EPA	Clear Creek	COSPCL02a	2	10/20/2021	63	3.36	3.37
CC-FS-2	EPA	Clear Creek	COSPCL02a	2	10/20/2021	52.4	3.18	3.76
CC-FS-1	EPA	Clear Creek	COSPCL02a	2	10/20/2021	58.6	2.39	3.66
5673G	WQCD	Turkey Gulch	COSPCL02c	2	7/26/2018	2.4	2.18	0.32
5678C	WQCD	Soda Creek	COSPCL02c	2	7/26/2018	49.4	4.77	4.22
5685	WQCD	Hoop Creek	COSPCL06	2	8/24/2017	57.3	5.51	3.75
CC-SW-3	EPA	Clear Creek	COSPCL11	2	10/20/2021	58.3	3.37	3.2
CC-SW-2	EPA	Clear Creek	COSPCL11	2	10/19/2021	70.5	2.44	3.53
133a	WQCD	North Fork Clear Creek	COSPCL13a	1	8/25/2017	71.1	4.44	4.21
5661	WQCD	North Fork Clear Creek	COSPCL13b	2	8/25/2017	21.2	5.04	1.39
133	WQCD	North Fork Clear Creek	COSPCL13b	2	9/11/2019	29	4.78	2.59
NCC-SW-16	EPA	North Fork Clear Creek	COSPCL13b	1	10/19/2021	55.8	4.36	3.22
NCC-SW-12A	EPA	North Fork Clear Creek	COSPCL13b	2	10/19/2021	50.8	3.62	3.38
NCC-SW-9	EPA	North Fork Clear Creek	COSPCL13b	2	10/19/2021	35	3.86	1.97
NCC-SW-3	EPA	North Fork Clear Creek	COSPCL13b	2	10/19/2021	32.45	4.05	2.06

Results show that MMI values fell below the impairment threshold on Turkey Creek (Segment COSPCL02c) in 2018. The MMI values were also below the threshold on North Fork Clear Creek in 2017, 2019, and in 2021. North Fork Clear Creek data were all collected after water treatment was implemented on the segment. North Fork Clear Creek sites that exceeded the MMI threshold values for attainment are located further upstream on the segment.

Section 4

Summary

The following tables provide a summary of the data analyses presented in Section 3. **Table 4-1** includes information on each parameter not attaining 2021 and 2010 water quality standards, respectively, for each segment while **Table 4-2** summarizes attainment of the 1991 water quality standards for each segment (using current 2015-2021 data). Metals continue to be parameters of concern, particularly in Clear Creek between Silver Plume and the Argo Tunnel (segments 02a, b, and c), Fall River and Trail Creek (segments 9a and b), and North Fork Clear Creek (segment 13b). These results are similar to those documented in the 2014 water quality analysis performed for the Study Area. While elevated concentrations of metals remain in North Fork Clear Creek (segment 13b), concentrations have decreased following the activation of water treatment in 2017.

Table 4-1: Summary of Non-Attainment of 2010/2021 Standards in the Clear Creek Watershed Study Area

Segment	Designated Use	Causes of Impairment	
		2010	**2021**
COSPCL01	Aquatic Life- Cold 1	*No Data*	*No Data*
COSPCL02a	Aquatic Life- Cold 1	Cadmium, Zinc	Cadmium, Zinc
COSPCL02b	Aquatic Life- Cold 1	Zinc	Zinc
COSPCL02c	Aquatic Life- Cold 1	Cadmium	Cadmium, Aquatic Life (MMI)[1]
COSPCL03a	Aquatic Life- Cold 1	*No Data*	*No Data*
COSPCL03b	Aquatic Life- Cold 2	*No Data*	*No Data*
COSPCL04	Aquatic Life- Cold 1	*No Data*	*No Data*
COSPCL05	Aquatic Life- Cold 1	Copper	Copper
COSPCL06	Aquatic Life- Cold 1	Copper	Copper
COSPCL07	Aquatic Life- Cold 2	*No Data*	*No Data*
COSPCL08	Aquatic Life- Cold 2	*No Data/No standards applied in Regulation 38*	*No Data/No standards applied in Regulation 38*
COSPCL09a	Aquatic Life- Cold 1	Cadmium, Copper, Zinc	Copper, Zinc
COSPCL09b	Aquatic Life- Cold 1	Cadmium, Copper, Iron, Zinc	Cadmium, Copper, Iron, Zinc
COSPCL10	Aquatic Life- Cold 1	*No Data*	*No Data*
COSPCL11	Aquatic Life- Cold 1	Copper, Manganese	Copper, Manganese
COSPCL12	Aquatic Life- Cold 2	*No Data*	*No Data*
COSPCL13b	Aquatic Life- Cold 2	Cadmium, Copper, Iron, Manganese, Lead, Zinc	Cadmium, Copper, Iron, Manganese, Lead, Zinc, Aquatic Life (MMI)
COSPCL19	Aquatic Life- Cold 1	*No Data*	*No Data*

[1] MMI data collected on Turkey Gulch

Table 4-2: Summary of Non-Attainment of 2015-2021 Data Compared to 1991 Water Quality Standards within the Clear Creek Watershed Study Area

Segment	Designated Use	Causes of Impairment[1]
COSPCL01	Aquatic Life- Cold 1	*No Data*
COSPCL02 (a,b,&c)[2]	Aquatic Life- Cold 1	Zinc
COSPCL03a	Aquatic Life- Cold 1	*No Data*
COSPCL03b	Aquatic Life- Cold 2	*No Data*
COSPCL04	Aquatic Life- Cold 1	*No Data*
COSPCL05	Aquatic Life- Cold 1	none
COSPCL06	Aquatic Life- Cold 1	Copper
COSPCL07	Aquatic Life- Cold 2	*No Data*
COSPCL08	Aquatic Life- Cold 2	*No Data/No standards applied in Regulation 38*
COSPCL09 (a & b)[2]	Aquatic Life- Cold 1	Cadmium, Copper, Iron, Zinc
COSPCL10	Aquatic Life- Cold 1	*No Data*
COSPCL11	Aquatic Life- Cold 1	Copper, Manganese
COSPCL12	Aquatic Life- Cold 2	*No Data*
COSPCL13	Aquatic Life- Cold 2	Cadmium, Copper, Iron, Manganese, Zinc

Notes:

1 Causes of impairment based on the water quality standards applicable at the time of the 1991 ROD

2 Historical (1991) stream segmentation

Section 5

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Appendices

Appendices available in electronic format.

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Appendix I: Evaluation of Risk-based Screening Levels for Mining-related Waste Piles on Residential Properties within the Central City, Clear Creek Superfund Site

MEMORANDUM

DATE: September 17, 2020

TO: Mary Boardman, Project Manager, Hazardous Materials and Waste Management Division, Colorado Department of Public Health and Environment

FROM: Thomas Simmons, Health Assessor, Toxicology and Risk Assessment Unit, Colorado Department of Public Health and Environment

RE: Evaluation of Risk-based Screening Levels for Mining-related Waste Piles on Residential Properties within the Central City/Clear Creek Superfund Site

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1.0. Introduction and Scope

The purpose of this memorandum is to evaluate the potential health risks from exposure to mining-related waste piles located on or near residential properties in the Central City/Clear Creek Superfund Site. The site is a historic mining district, located approximately 30 miles west of Denver, in a 400-square mile watershed extending from the Continental Divide on the west to Golden, Colorado to the east (Figure 1). The study area includes the municipalities of Black Hawk, Central City, Idaho Springs, Silver Plume, Georgetown, Dumont, and Empire.

The site was listed on the National Priorities List (Superfund) in September 1983 and extensive investigation and remedial efforts have been underway since. Remedial actions have included removal or containment of waste piles, slope stabilization, run-on and runoff controls, collection and piping of tunnel discharges, and chemical treatment of acid mine drainage. Two active water treatment plants are operating to prevent heavy metals from entering surface water in the watershed. However, an abundance of smaller waste piles are located throughout the site that are on or near residential and commercial properties. The potential risks associated with exposure to these smaller waste piles has not been characterized and is the focus of this evaluation.

In 2015 and 2018, the CDPHE and EPA sampled approximately 45 waste piles located near residential or commercial properties within the site and analyzed the samples for Target Analyte List (TAL) metals. The results indicate that arsenic and lead are the primary contaminants of potential concern based on comparison with EPA Regional Screening Levels (RSLs) of 0.68 milligram per kilogram (mg/kg) and 400 mg/kg, respectively.

A number of factors determine if peoples' health would be effected by exposure to arsenic and lead in the waste material. In general, the amount of a contaminant in the environment, route of exposure, exposure duration and the health status and lifestyle of the exposed individual are important factors in determining the potential for adverse health impacts. Another important factor is the bioavailability of the metals in the environment. This is particularly true for arsenic and lead found in mining-related waste in this region. Bioavailability refers to the amount of an ingested dose that crosses the intestines, enters the blood stream, and can be distributed to target organs. Low bioavailability indicates that most of the ingested dose passes through the body and is eliminated before the substance can affect peoples' health.

In vitro Bioaccessibility Analysis (IVBA) was performed on a subset of the samples to estimate the relative bioavailability of arsenic and lead in the waste piles. The results of the IVBA indicate the bioavailability for both metals is low (generally less than 20%) relative to the standard default assumption of 60% Relative Bioavailability (RBA). Therefore, the use of default assumptions for bioavailability and established screening levels appears to overestimate the potential health hazards of site-specific exposures to the waste material. This evaluation incorporates the site-specific bioavailability data to determine risk-based screening levels for arsenic and lead.

In addition, a number of changes have been made to the assessment of health risks associated with exposure to lead in the environment. Mainly, this includes target blood lead levels (BLLs) of concern and updated inputs to the biokinetic model that is used to evaluate lead exposures. The current screening level listed in the RSL tables for lead in soil is 400 mg/kg. This value is based on USEPA Office of Solid Waste and Emergency Response (currently Office of Land and Emergency Management or OLEM) Directive #9355.4-12 (USEPA 1994) and was derived for residential exposures with a target blood lead level of 10 micrograms per deciliter (μg/dL). The current scientific literature on lead toxicology and epidemiology provides evidence that adverse health effects are associated with blood lead levels (BLLs) less than 10 μg/dL. Consistent with OLEM Directive #9200.2-167 (USEPA 2016), this evaluation will include screening values for a range of target BLLs (2-8 μg/dL) to inform risk management decisions. The latest guidance on recommended input parameters for the Integrated Exposure Uptake Biokinetic Model (IEUBK) will also be used to establish risk-based screening levels for lead.

2.0 Waste Pile Sampling

In 2018, CDPHE identified a number of waste piles located on residential properties based on aerial imagery and site reconnaissance. A mailing that included a letter and a Consent for Access form was sent to approximately 55 property owners. Permission to sample was obtained for 27 waste piles (Figures 2 and 3). The sampling data used as the basis for this evaluation was collected in September 11-13, 2018. Field personnel included staff from CDPHE and USEPA. Composite samples were collected from the surface (0-1 inch) at all 27 waste piles. Depth samples up to 18 inches below ground surface were also collected at four of the waste piles. In addition, two duplicate samples were also collected for a total of 37 samples. The samples were analyzed for TAL metals as described below. It should be noted that for duplicate samples, the highest concentration of the two was selected for statistical purposes. The concentration of arsenic at the surface of the waste piles ranged from 4.4 milligram per kilogram (mg/kg) to 1,440 mg/kg with a mean concentration of 159 mg/kg. The concentration of lead at the surface ranged from 32.9 mg/kg to 25,600 mg/kg with a mean concentration of 2,653 mg/kg.

Previous investigation at the site has also shown high concentrations of arsenic and lead in the waste piles. In 2015, samples were collected from 20 waste piles located in and around Central City, Colorado. The samples were all collected from 0-2 inches below ground surface and analyzed for TAL metals. The concentration of arsenic in these samples ranged from 4.5 to 117 mg/kg with a mean concentration of 35.5 mg/kg. The concentration of lead ranged from 70.6 mg/kg to 14,400 mg/kg with a mean concentration 2,021 mg/kg. It should be noted the mean concentration of arsenic found in the waste piles sampled in 2018 was approximately 4.5 times higher than was found in the waste piles sampled in 2015.

Due to differences in the sampling locations, potential exposure scenarios, and analytical methodology in the 2015 and 2018 sampling events, the two data sets were not combined in this evaluation. The screening levels derived in this evaluation are based on the data collected in 2018. However, notable comparisons between the two sets of data will be discussed in this evaluation where appropriate.

2.1 Sampling Methods

As mentioned previously, samples were collected from the waste piles using a composite sampling technique. Composite sampling is a structured sampling protocol that reduces data variability and increases sample representativeness. The objective of composite sampling is to obtain a single sample for analysis that has a mean analyte concentration representative of the waste pile. Twenty-four of the mine waste piles were characterized using a 5-point composite. The individual sample points within the composite were loosely arranged in a systematic random 5-point star pattern and adjusted as necessary to take specific features into account. Three waste piles had a surface area of greater than approximately 10,000 square feet and were characterized using a 30-point incremental composite sample. The 30 individual sample points were collected using a simple random sampling design (CDPHE 2018).

Samples were collected from the surface (0 to 1 inch) at all 27 waste piles. At four locations, composite samples were also collected from 1-6" and 6-12" and at two of these, an additional sample was collected from the 12"-18" depth. Two field duplicate samples were also collected. The samples were collected using a stainless steel spoon and placed into a new, quart-sized Ziploc bag. Shovels and pick axes were used when necessary to collect samples at depth. Reusable stainless steel spoons and tools used during sampling were decontaminated using an Alconox solution and deionized water. Samples were immediately stored in coolers on ice and kept at approximately 4ºC until shipment to the contract laboratory.

The samples were sent to ACZ Laboratories Inc. in Steamboat Springs, CO, under chain-of-custody protocol, for processing. ACZ performed sample preparation (drying and sieving), digestion and analysis. Each sample was homogenized, dried and sieved to 150 micrometers (µm) using a #100 mesh sieve prior to total recoverable metals analysis. Sieving was performed using the American Society of Agronomy (ASA) method No. 9 15-4.2.2. Samples were prepared and analyzed for total recoverable metals in accordance with EPA *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, also known as SW-846, Method 7473, Revision 0, January 1998, Method 200.7 *Determination of Metals and Trace Elements in Water and Wastes by Inductively Coupled Plasma-Atomic Emission Spectrometry*, Revision 4.4, May 1994, and Method 200.8 *Determination of Trace Elements in Waters and Wastes by Inductively Coupled Plasma-Mass Spectrometry*, Revision 5.4, May 1994.

2.2 Lead Sampling Results

Summary statistics on the concentrations of lead found in the waste piles is shown below in Table 1. The complete sampling results are shown in Attachment 1. The waste pile sample locations and associated lead concentrations are shown in Figure 2.

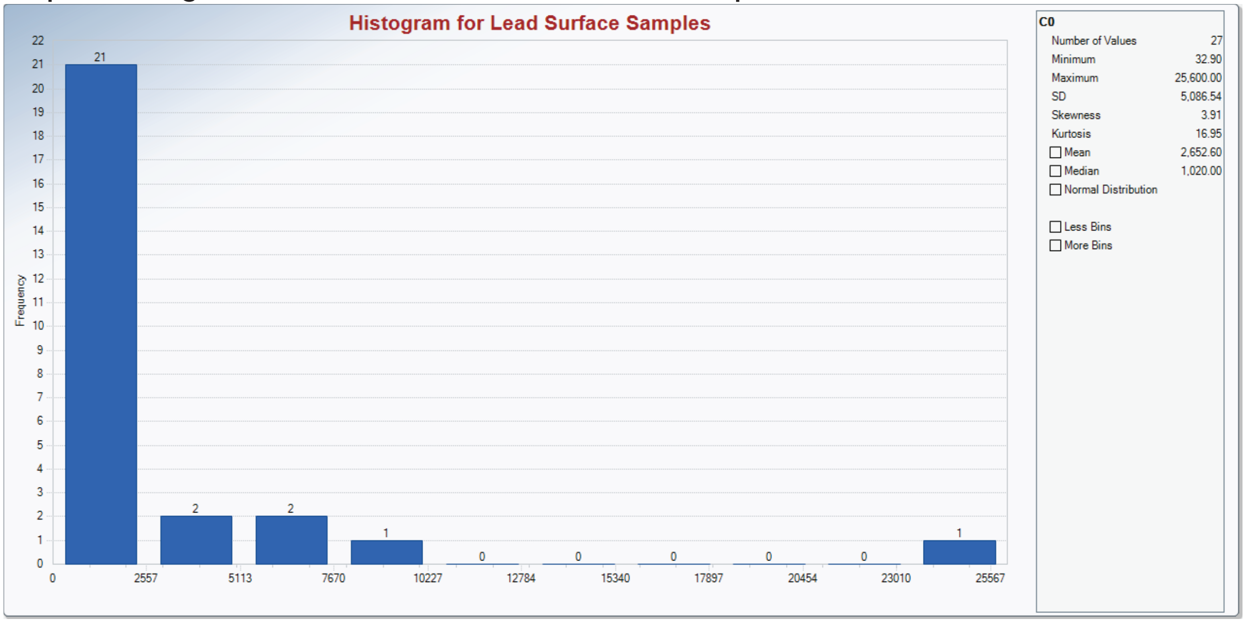
Table 1. Waste Pile Sampling Results for Lead (September 2018)

Analyte	Depth (inches)	Number of Samples	Minimum (in mg/kg)	Median (in mg/kg)	Mean (in mg/kg)	Maximum (in mg/kg)
Lead	All	37	32.6	1,220	3,177	25,600
	0-1	27	32.9	963	2,653	25,600
	1-6	4	824	1,906	3,111	8,940
	6-12	4	845	1,839	3,404	10,500
	12-18	2	1,580	N/a	9,940	18,300

NOTE: milligram per kilogram, N/a = Not applicable

The amount of lead found in the waste piles is highly variable with concentrations ranging from 32.6 mg/kg to 25,600 mg/kg and an average concentration of 3,177 mg/kg. Roughly half of the samples have lead concentrations in excess of 1,220 mg/kg. The highest concentration of lead of 25,600 mg/kg was found in a sample collected at the surface (0-1 inch) at location 17CC. This result is a statistical outlier and every other sample collected from the surface interval had lead concentrations less than half this value. A histogram displaying the distribution of lead concentrations found in the waste pile samples is shown below in Graph 1. Twenty-one of the 27 waste piles sampled contain concentrations of lead in excess of the current default RSL for lead of 400 mg/kg, which indicates additional evaluation is necessary.

Graph 1. Histogram of Lead Concentrations in Surface Samples



At four of the waste piles, depth samples up to 18 inches were collected in addition to the samples collected from the surface (Table 2). At three of the locations, the concentration of lead at depth is fairly consistent with the levels found on the surface. At waste pile 16CC, the concentration of lead increased with depth from 5,620 mg/kg at the surface to 18,300 mg/kg in the 12-18 inch interval.

Table 2. Waste Pile Depth Sampling Results for Lead (September 2018)

Analyte	Depth (inches)	Location			
		05CC (in mg/kg)	16CC (in mg/kg)	19CC (in mg/kg)	22CC (in mg/kg)
Lead	0-1	690	5,620	1,670	894
	1-6	824	8,940	1,290	1,390
	6-12	845	10,500	1,120	1,150
	12-18	NS	18,300	1,580	NS

NOTE: mg/kg = milligram per kilogram, NS = Not Sampled

Overall, the lead concentration in the waste piles appears to be highly variable, which indicates that the composition of mining-related waste is heterogeneous. No clear pattern of lead concentration in the subsurface sampling data is evident. In general, the concentration of lead would be expected to slightly increase with depth due to oxidation and weathering at the surface. However, this only appeared to be the case at one (25%) of the waste piles where depth sampling occurred.

2.3 Arsenic Sampling Results

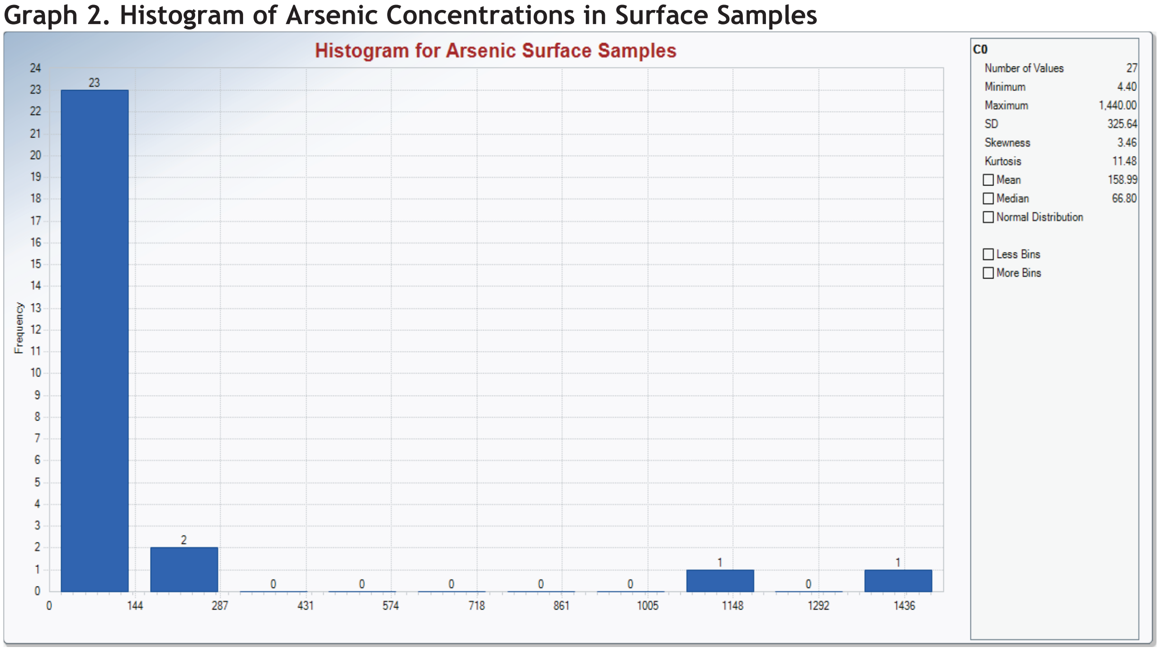
Summary statistics on the concentrations of arsenic found in the waste piles is shown below in Table 3. The complete sampling results are found in Attachment 1. The waste pile sampling locations and associated arsenic concentrations are shown in Figure 3. The distribution of arsenic concentrations in the waste piles closely mirrors the distribution of lead in that the levels vary significantly in the waste material sampled. The concentration of arsenic in all samples ranges from 4.4 mg/kg to 1,440 mg/kg with an average concentration of 168 mg/kg. The highest concentration of arsenic, at 1,440 mg/kg, was found in the surface sample collected from pile 10CC. This concentration appears to be a statistical outlier. However, the concentration of arsenic found at the surface on pile 09CC was 1,090 mg/kg. The arsenic concentration in all other samples collected from the surface were more than five times lower than these samples (i.e. <200 mg/kg). This distribution is reflected in the histogram shown in graph 2 below.

Table 3. Waste Pile Sampling Results for Arsenic (September 2018)

Analyte	Depth (inches)	Number of Samples	Minimum (in mg/kg)	Median (in mg/kg)	Mean (in mg/kg)	Maximum (in mg/kg)
	All	37	4.4	81.2	168	1,440
	0-1	27	4.4	65.4	159	1,440
Arsenic	1-6	4	65.2	141	187	452
	6-12	4	49.5	122	164	392
	12-18	2	124	N/a	256	388

NOTE: mg/kg= milligram per kilogram, N/a = not applicable, limited number of samples

Graph 2. Histogram of Arsenic Concentrations in Surface Samples



As previously mentioned, depth samples up to 18 inches were also collected and analyzed for arsenic at four waste piles (Table 4). At three of the locations, the concentration of arsenic at depth is fairly consistent with the levels found on the surface. At waste pile 16CC, the concentration of arsenic generally increased with depth from 200 mg/kg at the surface to 388 mg/kg in the 12-18 inch interval.

It should be noted that this is the same pattern observed for lead in depth samples. This could indicate that the composition of waste pile 16CC is highly variable.

Table 4. Waste Pile Depth Sampling Results for Arsenic (September 2018)

Analyte	Depth (inches)	Location			
		05CC (in mg/kg)	16CC (in mg/kg)	19CC (in mg/kg)	22CC (in mg/kg)
Arsenic	0-1	40.5	200	99.8	66.8
	1-6	65.2	119	119	111
	6-12	49.5	392	127	89.2
	12-18	NS	388	124	NS

NOTE: mg/kg = milligram per kilogram, NS = Not Sampled

Overall, the arsenic concentration in the waste piles also appears to be highly variable, which supports the observation that the composition of mining-related waste sampled in this event is heterogeneous in nature. There is no clear distinction in the arsenic concentrations between the samples collected at the surface and those collected at depth. Twenty-three of the samples exceeded the RSL for non-carcinogenic risk for arsenic, which indicates additional evaluation is necessary.

3.0 *In vitro* Bioaccessibility Analysis of Waste Pile Samples

Reliable analysis of the potential health hazards from ingestion of lead and arsenic in the environment depends on accurate information on a number of key parameters, including (1) concentration of metal in environmental media (soil, dust, water, food, air, etc.), (2) intake rates of each medium, and (3) the rate and extent of absorption of lead or arsenic (i.e., "bioavailability") from each medium. Knowledge of bioavailability is important because the amount of lead or arsenic that actually enters the blood and body tissues from an ingested medium depends on the physical-chemical properties of both the contaminants and the medium. For example, lead in soil may exist, at least in part, as poorly water-soluble minerals, and may also exist inside particles of inert matrices such as rock or slag of variable size, shape, and association. These chemical and physical properties may tend to influence (usually decrease) the bioavailability of lead when ingested. Thus, equal ingested amounts of different forms of lead in different media may not be of equal health concern (USEPA 2017).

Previous investigation has indicated that the bioaccessibility of arsenic and lead in waste material sampled at the site is low relative to the default bioavailability assumption of 60%. Therefore, a subset of the samples were selected for *in-vitro* bioaccessibility analysis for lead and arsenic. Since solubilization is usually required for absorption across membranes, poorly soluble forms of metals, with low bioaccessibility, may also have low bioavailability. In certain circumstances, if solubility is the major determinant of absorption at the portal of entry, bioaccessibility may be a predictor of bioavailability. Lead and arsenic in soil and soil-like materials are examples of this (USEPA 2007).

The *in vitro* bioaccessibility assay provides a rapid and relatively inexpensive alternative to *in vivo* assays for predicting RBA of lead and arsenic in soils and soil-like materials (i.e., sediments, mining materials). The method, which measures the extent of metal solubilization in an extraction solvent that resembles gastric fluid, is based on the concept that solubilization of metals in gastrointestinal fluid is likely to be an important determinant of bioavailability *in vivo*. The IVBA is used to estimate the *in vivo* RBA. Measurements of IVBA using this assay have been shown to be a reliable predictor of *in vivo* RBA of lead and arsenic in a wide range of soil types and phases from a variety of different sites (USEPA 2007; 2017).

After the concentration of arsenic and lead in the waste piles was determined, 18 of the 37 samples were selected for IVBA. The samples selected for IVBA were representative of a wide range of arsenic and lead concentrations found in the waste piles. The samples were sent to ACZ laboratory in Steamboat Springs, CO for IVBA. The IVBA samples were digested using EPA Method 1340 Modified and the leachate was analyzed for arsenic and lead by EPA Method 6020B. The IVBA was determined using EPA Method 9200.1-86 (USEPA 2008).

In order for an *in vitro* bioaccessibility test system to be useful in predicting the *in vivo* RBA of a test material, it is necessary to empirically establish that a strong correlation exists between the *in vivo* and the *in vitro* results across many different samples. The currently preferred models for predicting RBA from IVBA for lead (USEPA 2007) and arsenic (Diamond *et al.*, 2016; USEPA 2017) are:

Equation 1. $RBA_{lead} = (0.88 \bullet IVBA) - 0.028$ ($R^2 = 0.92$)

Equation 2. $RBA_{arsenic} = (0.79 \bullet IVBA) + 0.03$ ($R^2 = 0.87$)

where RBA and IVBA are expressed as fractions (not percentages). It is important to recognize that use of this equation to calculate RBA from a given IVBA measurement will yield the "typical" RBA value expected for a test material with that IVBA, and the true RBA may be somewhat different (either higher or lower).

3.1 *In vitro* Bioaccessibilty Results for Lead

The results of the IVBA analysis for lead range from 0.7-57% with a mean IVBA of 14.4% (Table 5). This corresponds to a calculated RBA of 0-48%. The 95% upper confidence level (UCL) on the mean IVBA results is 24.5% with a corresponding RBA of 18.8%. Due to the large variance in the IVBA results, the 95% UCL value of 18.8% RBA was selected for use in the screening level evaluation to be protective. It should be noted that IVBA results for lead below approximately 3.2% will yield negative RBA estimates. This occurred at four of the waste piles sampled (02CC0-1, 09CC-01, 20CC0-1, and 23CC0-1). Theoretically, the lead in these piles would not be absorbed in the body and it appears that the potential risk of ingesting waste material in these piles is low despite respective lead concentrations of 477; 5,570; 2,680; and 645 mg/kg. However, the biological significance of IVBA results less than approximately 3.2% is not clear and should be interpreted with caution. The use of the 95% UCL of the mean IVBA results accounts for some of this uncertainty, but the inclusion of these results in the dataset remains a noted area of ambiguity in this evaluation. It should also be noted that the only RBA results, which exceed the 95% UCL of 18.8%, are at the piles with the top three highest lead concentrations (11CC, 16CC, and 17CC).

At two of the waste piles, samples were collected from the surface and at depth and sent for IVBA (16CC and 22CC). The IVBA results for 16CC indicate the sample collected from 12-18 inches was nearly three times more bioaccessible (41%) than the surface sample (15%). At 22CC, the bioaccessibility of lead in the sample collected from the 1-6 inch interval (5%) is lower than the sample collected on the surface (6.6%). Therefore, no conclusions can be made on the bioaccessibility of lead at various depths with the available data.

Table 5. Lead *In Vitro* Bioaccessibility Analysis (IVBA) Results

Sample ID	Lead (mg/kg)	IVBA (%)	RBA (%)
01CC0-1	1470	18	13.0
02CC0-1	477	2	0.0
04CC0-1	1020	4	0.7
09CC0-1	5570	2.5	0.0
10CC0-1	253	5.1	1.7
11CC0-1	10100	31	25.0
13CC0-1	115	5.7	2.2
16CC0-1	5620	15	10.0
16CC12-18	18300	41	33.0
17CC0-1	25600	57	48.0
19CC0-1	1670	24	18.0
20CC0-1	2680	1.3	0.0
21CC0-1	2140	10	6.1
22CC0-1	894	6.6	3.0
22CC1-6	1390	5	1.6
23CC0-1	645	0.682	0.0
25CC0-1	924	5.6	2.1
26CC0-1	2140	24	18.0
95% UCL		24.5*	18.8**

NOTE: mg/kg = milligram per kilogram, UCL = Upper confidence limit, *95% Adjusted Gamma UCL, **Calculated value, IVBA = *In vitro* Bioaccessibility, RBA = Relative Bioavailability

3.2 IVBA Results for Arsenic

The IVBA results for arsenic are shown below in Table 6. The bioaccessibility of arsenic in the waste piles that were sampled ranged from 0.5 to 15% with a mean IVBA of 3.5%. These results indicate that the bioaccessibility of arsenic in the waste piles is variable, although not to the same degree as lead. To account for this variability, the 95% UCL of IVBA results were used to estimate the relative bioavailability. The 95% UCL of the IVBA is 5.4%, which corresponds to a relative bioavailability of 6.9% using equation 2. The IVBA results for arsenic at the surface and at depth appear to be nearly identical in both waste piles (16CC and 22CC) that had surface and subsurface samples selected for IVBA.

Table 6. Arsenic *In Vitro* Bioaccessibility Analysis (IVBA) Results

Sample ID	Arsenic (mg/kg)	IVBA (%)	RBA (%)
01CC0-1	61.3	4.1	6.2
02CC0-1	52.1	1.2	3.9
04CC0-1	90.4	1.2	3.9
09CC0-1	1,090	15.0	14.9
10CC0-1	1,440	3.9	6.1
11CC0-1	108	2.7	5.1
13CC0-1	14.8	2.7	5.1
16CC0-1	200	1.0	3.8
16CC12-18	388	0.8	3.6
17CC0-1	7.4	6.8	8.4
19CC0-1	99.8	6.4	8.1
20CC0-1	62.8	1.0	3.8
21CC0-1	84.9	7.2	8.7
22CC0-1	66.8	2.7	5.1
22CC1-6	111	2.5	5.0
23CC0-1	47.5	2.1	4.7
25CC0-1	133	1.5	4.2
26CC0-1	86.5	0.5	3.4
95% UCL		5.4*	6.9**

NOTE: UCL = Upper confidence limit, mg/kg = milligram per kilogram, IVBA = *In vitro* Bioaccessibility, RBA = Relative Bioavailability, * 95% Adjusted Gamma UCL, ** 95% Students'-t UCL

4.0 Estimation of Risk-based Screening Levels for Lead and Arsenic in Mining Waste Piles

The EPA recommends the use of toxicokinetic models to correlate blood lead concentrations with exposure and adverse health effects. Specifically, the EPA recommends the use of the Integrated Exposure Uptake Biokinetic (IEUBK) model to evaluate exposures from lead-contaminated media for children in a residential setting (USEPA 1994a,b; 1998). The IEUBK model can be used to predict blood lead concentrations in exposed individuals and to estimate the probability of a blood lead concentration exceeding the target blood lead level (BLL), as described in more detail below. This model allows users to input data on the levels of lead in soil, dust, water, air, and diet at a particular location as well as data on the amounts of these media ingested or inhaled by a child living at that location. The IEUBK model was used in this assessment to evaluate risks from exposures to lead in mining-related waste piles and indoor dusts that could occur from track-in of fine waste pile particles.

The recommended approach to assess risks of arsenic in soil differs from lead in that biokinetic models are not generally used by the EPA or CDPHE to assess exposure to arsenic in soil or soil-like materials. The exposure assessment of arsenic in soil (and waste piles) follows a simple dose equation that includes incidental ingestion, inhalation of dust, and dermal exposure. The most important route of exposure is incidental ingestion of mining related wastes. This evaluation utilizes default exposure assumptions for residential soil exposures presented in the EPA Exposure Factors Handbook (USEPA 2011). The estimated exposure dose to arsenic was calculated using the EPA RSL Calculator. The screening level evaluation of lead and arsenic is discussed in more detail in the following sections.

4.1 IEUBK Modeling for Lead Screening Values

Lead risks for the child resident were calculated using the IEUBK model. The IEUBK model developed by USEPA predicts the likely range of BLLs in a population of young children (aged 0-84 months) exposed to a user-specified set of environmental lead levels (EPA 1994a). All of these inputs to the IEUBK model are central tendency point estimates (USEPA 1994a, 1994b). These point estimates are used to calculate an estimate of the central tendency (the geometric mean) of the distribution of BLLs that might occur in a population of children exposed to the specified conditions. Assuming the distribution is lognormal, and given (as input) an estimate of the variability between different children (this is specified by the geometric standard deviation or GSD), the model calculates the expected distribution of BLLs, and estimates the probability that any random child exposed to the site conditions might have a BLL over the selected target BLL the user-specified exposure conditions.

Based on information provided in the USEPA OLEM Policy Directive 9200.2-167, "clear evidence of cognitive function decrements" has been reported over the range of child blood lead levels (2-8 μg/dL) measured in studies (USEPA, 2016). At the low end of the target BLLs (2 μg/dL), the risk target goal (no more than 5% probability of exceeding 2 μg/dL) is exceeded by the current default exposures in the IEUBK model (i.e., exposure to lead in food and drinking water) even when the soil lead concentration is zero (0 ppm). Since the low-end target BLL of 2 μg/dL does not provide any relevant information in this context, the target BLLS from 3-8 μg/dL were used in this evaluation (Table 7).

Table 7. Waste Pile Residential Screening Level Values for Lead (RBA set at 19%)

Blood Lead Cutoff Level (no more than 5% of the population exceeds the BLL)	Screening Level for 12-72 month age group (in mg/kg)
3 μg/dL	189 **(23)**
4 μg/dL	471 **(21)**
5 μg/dL	758 **(17)**
6 μg/dL	1,053 **(13)**
7 μg/dL	1,353 **(12)**
8 μg/dL	1,661 **(11)**

NOTE: number in **(Bold)** indicates the number of piles out of 27 that would be flagged with screening level RBA = Relative Bioavailability, BLL = Blood Lead Level in children ages 12-72 months, mg/kg = milligram per kilogram, μg/dL= micrograms per deciliter

4.2 Arsenic Screening Value Estimation for Waste Rock Piles

The screening level evaluation for arsenic were determined using the RSL calculator and adjusting for the RBA factors that were discussed previously. The default assumptions for arsenic exposure account for 350 days per year of exposure over the course of 26 years. Arsenic is a carcinogen and the estimated screening levels are based on the target cancer risk level and a non-cancer Hazard Quotient (HQ) of 1 (Table 8).

Table 8. Waste Pile Residential Screening Level Values for Arsenic (RBA set at 7%)

Arsenic Screening Level based on Non-cancer Child HQ = 1 (in mg/kg)	Arsenic Screening Level based on Cancer Risk at 10E-06 Theoretical Risk (in mg/kg)	Arsenic Screening Level based on Cancer Risk at 10E-05 Theoretical Risk (in mg/kg)	Arsenic Screening Level based on Cancer Risk at 10E-04 Theoretical Risk (in mg/kg)
165 **(4)**	3.0 **(27)**	30.0 **(23)**	300 **(3*)**

NOTE: number in **(Bold)** indicates the number of piles out of 27 that would be flagged with screening level, RBA = Relative Bioavailability, HQ = Hazard Quotient, mg/kg = milligram per kilogram, *Pile 16CC only exceeds 300 mg/kg arsenic at depth

5.0 Conclusions and Recommendations

The results of this evaluation clearly indicate there is a potential health concern from exposure to arsenic and lead in the mining-related waste piles considered in this evaluation. Table 9, below, shows the overall breakdown of the waste piles by varying cutoff levels of potential concern. From a risk assessment perspective the selected cutoff levels for risk management should not exceed 5 μg/dL for lead or the non-cancer Hazard Quotient of 1 for arsenic. At these cutoff levels, actions would be necessary at 17/27 waste piles due to lead exposure and 4/27 waste piles due to arsenic exposure. The only waste pile that would be targeted for action due to arsenic exposures only is pile 10CC. However, considering that there is no established “safe” level of lead exposure and the potential long-term cancer risks from exposure to arsenic in the waste piles, the lowest cutoff levels that are reasonably achievable through remedial action should be considered.

In addition, the number of waste piles included in this evaluation represent only a small fraction of the waste piles that are thought to exist throughout the Central City/Clear Creek site. The results of this evaluation indicate that further investigation and analysis of the other waste piles located at the site should be conducted.

Table 9. Summary of Risk-based Screening Level Analysis

Sample ID	Arsenic					Lead						
	Concentration (mg/kg)	N/C HQ = 1	10E-06 CR	10E-05 CR	10E-04 CR	Concentration (mg/kg)	3 µg/dL	4 µg/dL	5 µg/dL	6 µg/dL	7 µg/dL	8 µg/dL
00CC0-1	80.8		X	X		661	X	X				
01CC0-1	61.3		X	X		1470	X	X	X	X	X	
02CC0-1	52.1		X	X		477	X	X				
03CC0-1	74.5		X	X		1910	X	X	X	X	X	X
04CC0-1	90.4		X	X		1020	X	X	X			
05CC0-1	40.5		X	X		690	X	X				
06CC0-1	76		X	X		1910	X	X	X	X	X	X
07CC0-1	53.6		X	X		1060	X	X	X	X		
08CC0-1	50		X	X		192	X					
09CC0-1	1090	X	X	X	X	5570	X	X	X	X	X	X
10CC0-1	1440	X	X	X	X	253	X					
11CC0-1	108		X	X		10100	X	X	X	X	X	X
12CC0-1	6.9		X			50.3						
13CC0-1	14.8		X			115						
14CC0-1	4.4		X			32.9						
15CC0-1	50.1		X	X		836	X	X	X			
16CC0-1	200	X	X	X	X	5620	X	X	X	X	X	X

Table 9 (cont). Summary of Risk-based Screening Level Analysis

Sample ID	Arsenic					Lead						
	Concentration (mg/kg)	N/C HQ = 1	10E-06 CR	10E-05 CR	10E-04 CR	Concentration (mg/kg)	3 µg/dL	4 µg/dL	5 µg/dL	6 µg/dL	7 µg/dL	8 µg/dL
17CC0-1	7.4		X			25600	X	X	X	X	X	X
18CC0-1	39.7		X	X		150						
19CC0-1	99.8		X	X		1670	X	X	X	X	X	X
20CC0-1	62.8		X	X		2680	X	X	X	X	X	X
21CC0-1	84.9		X	X		2140	X	X	X	X	X	X
22CC0-1	66.8		X	X		894	X	X	X			
23CC0-1	47.5		X	X		645	X	X				
24CC0-1	171	X	X	X		2810	X	X	X	X	X	X
25CC0-1	133		X	X		924	X	X	X			
26CC0-1	86.5		X	X		2140	X	X	X	X	X	X
Total	--	4/27	27/27	23/27	3/27	--	23/27	21/27	17/27	13/27	12/27	11/27

NOTES: mg/kg = milligram per kilogram, N/C HQ = Noncancer Hazard Quotient, CR = Estimated Excess Cancer Risk, µg/dL = micrograms per deciliter

6.0 References

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USEPA 2017c. Update of the Adult Lead Methodology's Default Baseline Blood Lead Concentration and Geometric Standard Deviation Parameter. OLEM Directive 9285.6-56. May.

Figure 1. Approximate Site Boundary of the Clear Creek Central City Superfund Site

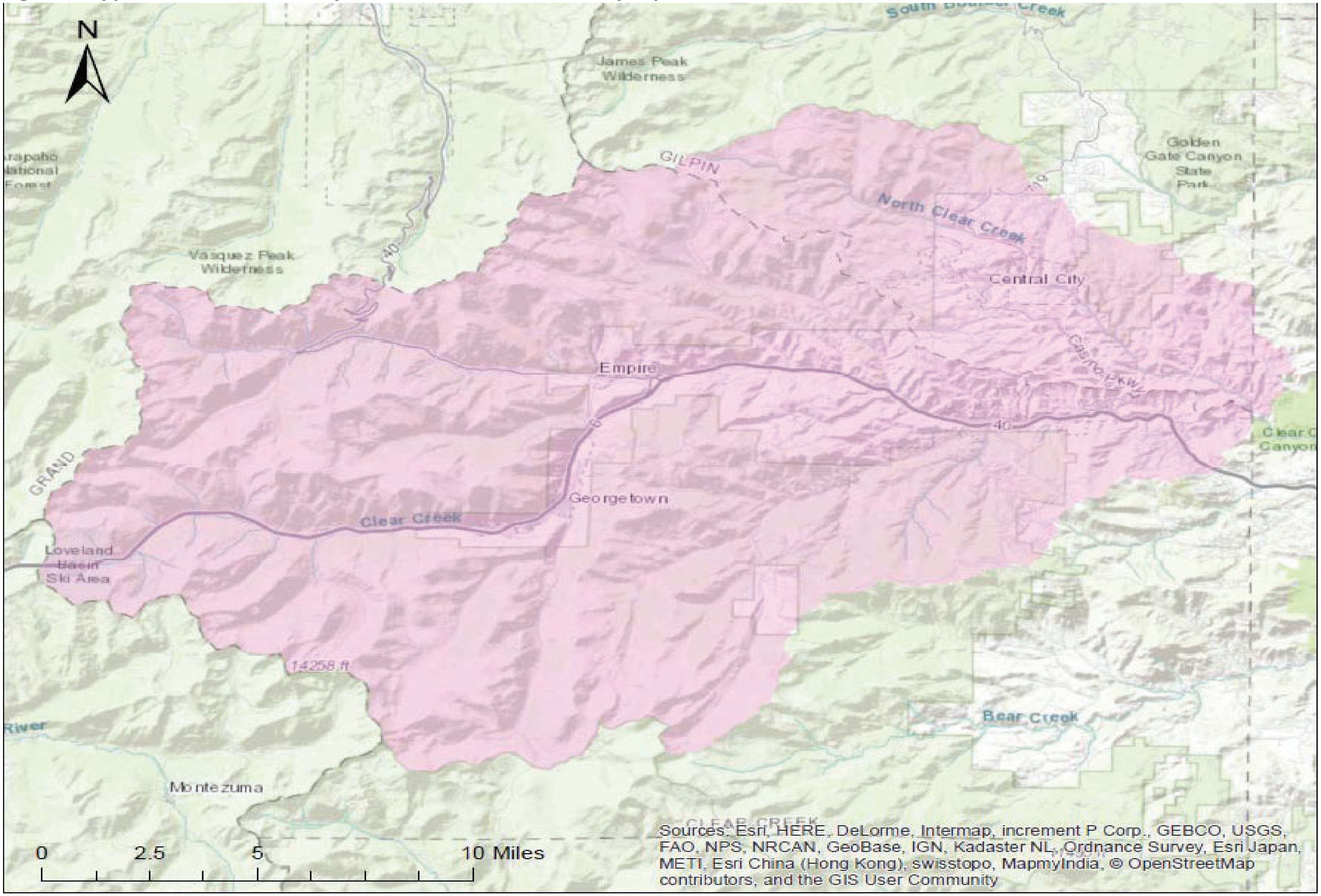
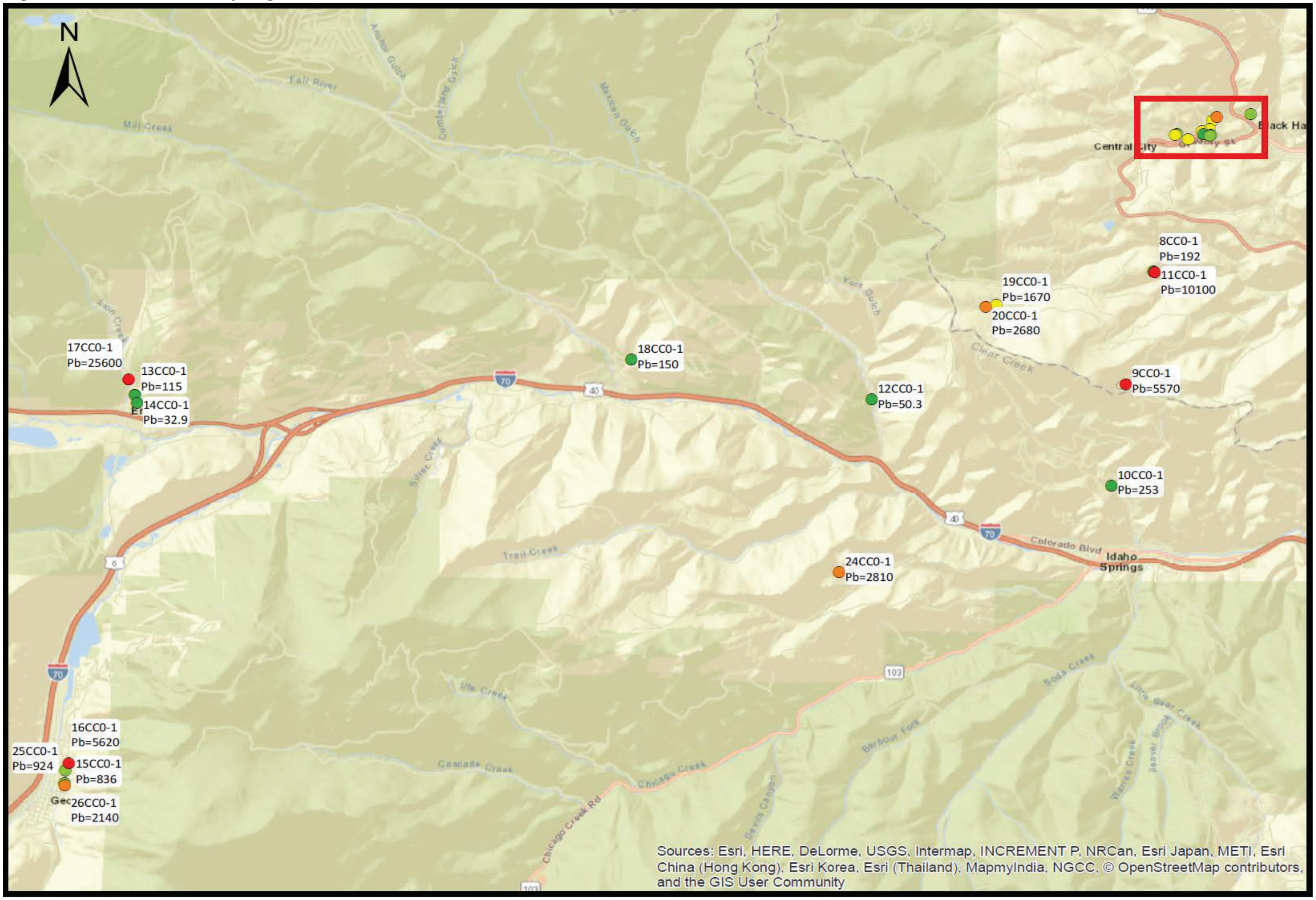
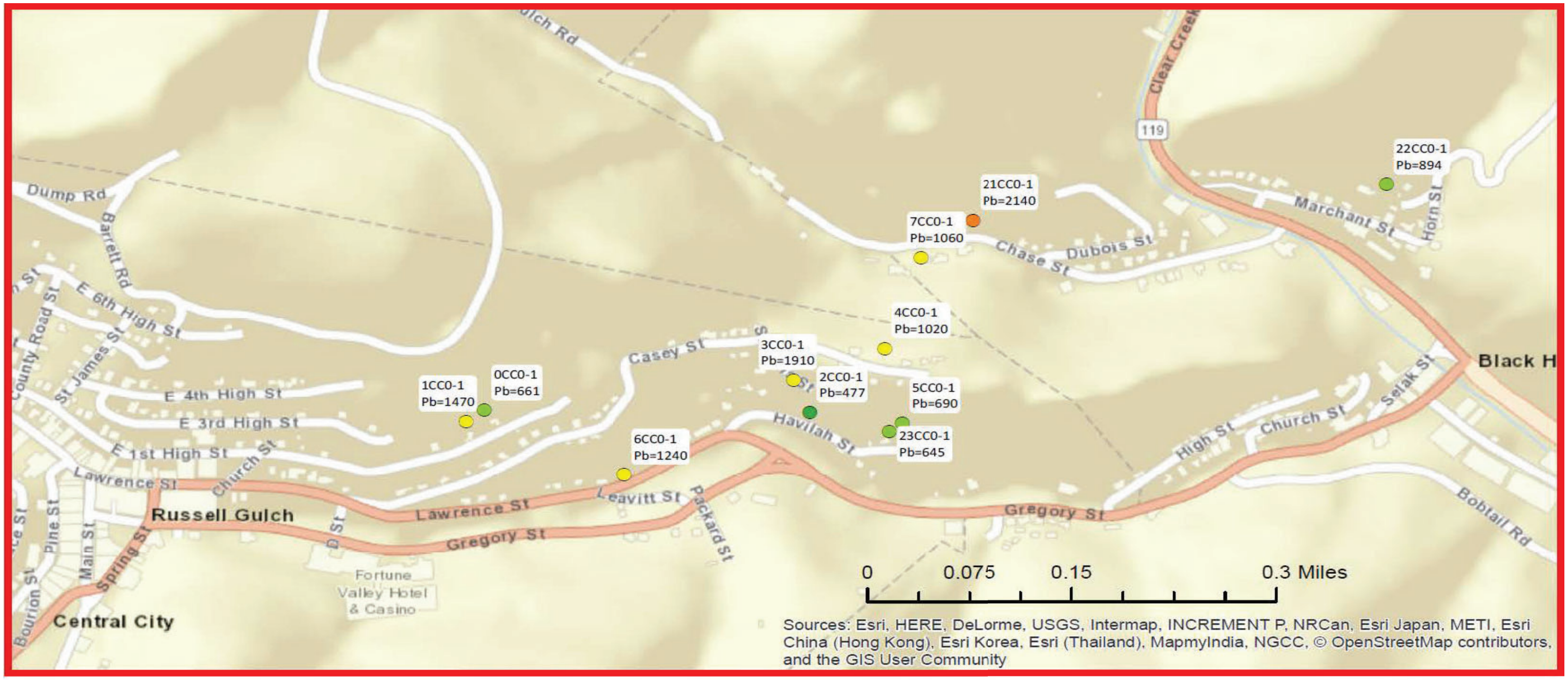


Figure 2. Waste Pile Sampling Locations and Lead Results





Legend

WastePileSampleLocations

Lead

- 32.9 - 500.0
- 500.1 - 1000.0
- 1000.1 - 2000.0
- 2000.1 - 5000.0
- 5000.1 - 25600.0

Central City/Clear Creek Superfund Site

Analytical Results Report

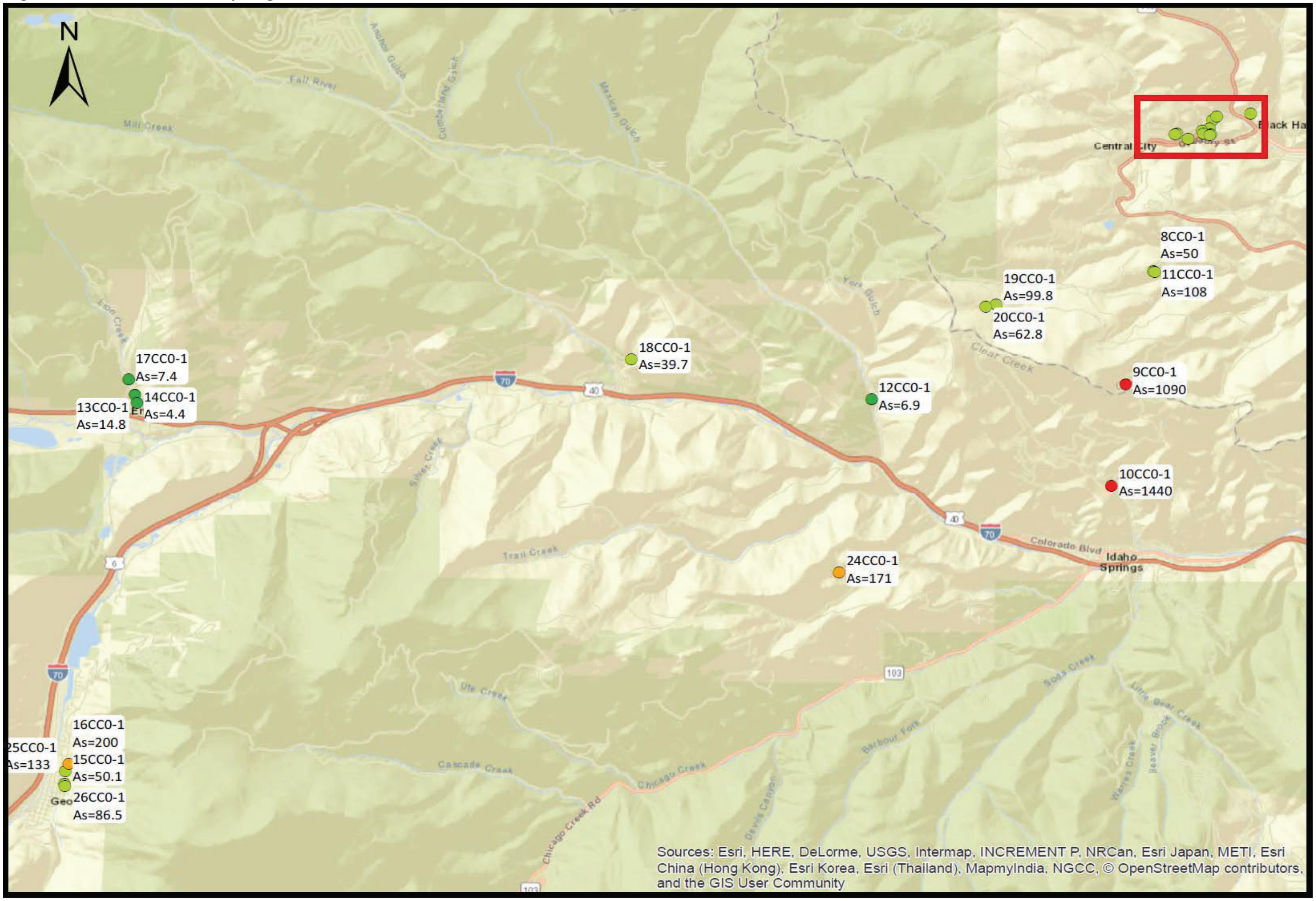
2018 Waste Pile Sampling Event

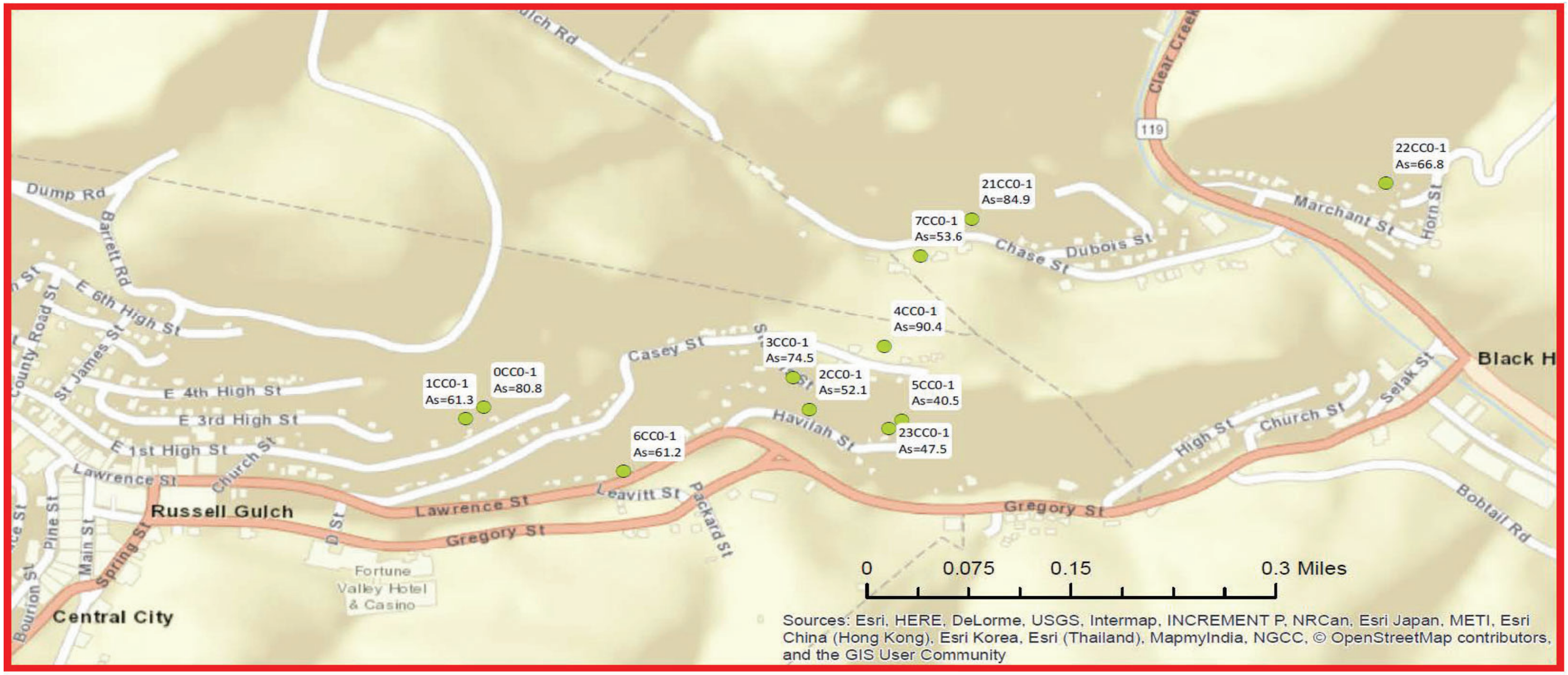
Clear Creek/Gilpin Counties

Figure 2

Sampling Locations and Lead Results

Figure 3. Waste Pile Sampling Locations and Arsenic Results





Legend

WastePileSampleLocations

Arsenic

- 4.4 - 30.0
- 30.1 - 165.0
- 165.1 - 300.0
- 300.1 - 1440.0

Central City/Clear Creek Superfund Site

Analytical Results Report

2018 Waste Pile Sampling Event

Clear Creek/Gilpin Counties

Figure 3

Sampling Locations and Arsenic Results

Attachment 1. Waste Pile Sampling Results (September 2018)

Surface Results (mg/kg)

Sample ID	Depth (inches)	Aluminum	Antimony	Arsenic	Beryllium	Cadmium	Chromium	Copper	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
00	0-1	7020	2.2	80.8	0.31	0.43	13.8	64	50300	661	154	0.398	8.2	0.47	5.8	0.43	171
01	0-1	8970	3.9	61.3	0.35	0.49	12.3	122	59800	1470	178	1.14	6.8	0.28	7.1	0.70	235
02	0-1	9490	1.4	52.1	0.53	0.48	22.4	110	43500	477	239	0.080	6.7	0.22	4.1	0.49	162
03	0-1	5010	3.1	74.5	0.29	0.86	7.5	169	39800	1910	130	0.296	2.5	0.21	16.5	0.54	147
04	0-1	9080	1.5	90.4	0.44	0.47	16.5	122	56100	1020	226	0.207	5.8	0.51	5.5	0.52	163
05	0-1	2880	1.0	40.5	0.17	0.18	4.1	106	43100	690	43.6	0.066	1.5 B	0.13	7.3	0.80	49
06	0-1	8250	1.9	61.2	0.42	0.48	11.6	88	56300	1240	359	0.236	5.8	0.61	5.8	0.57	181
07	0-1	3980	0.7	53.6	0.29	1.29	6.3	124	46300	1060	149	0.109	3.5	0.24	6.9	0.76	364
08	0-1	20600	1.9	50.0	0.48	0.60	64.0	161	59100	192	294	0.048	24.8	0.75	2.9	0.68	163
09	0-1	5330	48.2	1090	0.23	4.66	17.0	598	48700	5570	87.5	1.25	5.1	0.52	56.0	3.02	736
10	0-1	11000	3.8	1440	0.60	1.49	23.2	80	56500	253	492	0.965	9.3	0.53	9.2	2.93	235
11	0-1	4440	1.4	108	0.24	3.58	9.1	155	46100	10100	138	0.141	3.8	0.15	16.0	0.53	1210
12	0-1	19600	0.3 B	6.9	0.92	0.51	86.4	96	47300	50.3	742	0.015	42.7	0.42	0.5	0.63	103
13	0-1	14300	0.2 U	14.8	1.42	0.53	74.7	351	87600	115	422	0.102 H	33.9	0.58	2.5	0.67	187
14	0-1	13800	0.2 U	4.4	0.76	0.75	31.8	83	40600	32.9	618	0.551 H	24.6	0.27	0.3 B	0.40 B	102
15	0-1	6570	17.2	50.1	0.39	2.42	13.1	200	46200	836	241	0.656 H	5.5	0.27	5.2	0.44	424
16	0-1	7440	42.6	200	0.50	31.6	20.8	628	76700	5620	3370	1.34 H	10.4	0.30	50.0	0.89	6120
17	0-1	11800	1.0	7.4	1.74	41.1	26.4	380	60100	25600	8210	0.043	18.5	0.37	14.7	1.08	8630
18	0-1	10700	2.8	39.7	0.55	0.70	39.9	76	34700	150	438	0.237	18.3	0.25	2.0	0.46	159
19	0-1	5970	8.0	99.8	0.32	0.91	5.7	254	44900	1670	97.5	0.917	3.8	0.20	43.6	1.11	162
20	0-1	4780	0.8 B	62.8	0.18	0.84	4.0	259	53800	2680	65	1.25	2.2	5.36	19.0	0.50	689
21	0-1	4450	1.9	84.9	0.27	0.71	4.0	74	33800	2140	92.1	0.184	1.9 B	0.20	11.3	0.55	218
22	0-1	9040	1.1	66.8	0.94	1.68	15.2	79	44700	894	919	0.477	9.3	0.40	7.0	0.62	562
23	0-1	7420	2.0	47.5	0.34	0.32	13.5	152	47500	645	168	0.117	5.8	0.30	6.4	0.54	141
24	0-1	19000	10.0	171	0.99	3.74	123	467	71400	2810	1010	0.946	67.3	4.23	8.9	1.77	651
25	0-1	4610	27.2	133	0.33	2.01	5.9	157	35800	924	109	0.229	2.2	0.18	13.9	0.60	316
26	0-1	6060	26.5	86.5	0.64	3.12	7.8	249	39500	2140	343	0.227	3.8	0.15	8.6	0.46	777
SCDM Benchmarks																	
Cancer				0.77													
Non-Cancer		70000	30	30	100	30	200	3000	50000		10000	12	1000	300	300	0.7	20000
Residential Screening Level, TR=1E-06, HQ=1																	
Cancer				0.68	160	2100							15000				
Non-Cancer		77000	31	35	1600	71		3100	55000	400		11	1500	390	390	0.78	23000

Depth Sampling Results (mg/kg)

Sample ID	Depth (inches)	Aluminum	Antimony	Arsenic	Beryllium	Cadmium	Chromium	Copper	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Silver	Thallium	
05	0-1	2880	1.0	40.5	0.17	0.18	4.1	106	43100	690	43.6	0.066	1.5	0.13	7.3	0.80	49
05	1-6	3370	1.8	65.2	0.21	0.19	3.4	167	55900	824	42.6	0.127	1.2	0.14	17.2	0.98	72
05	6-12	5220	1.3	49.5	0.26	0.22	6.2	134	48100	845	89.5	0.129	2.7	0.15	7.5	0.69	93
16	0-1	7440	42.6	200.0	0.5	31.60	20.8	628	76700	5620	3370	1.34	10.4	0.30	50	0.89	6120
16	1-6	7290	89.9	452.0	0.32	24.70	27.4	676	118000	8940	2040	1.25	8.8	0.31	384	0.90	3820
16	6-12	5120	91.1	392.0	0.32	15.90	17.3	709	114000	10500	1410	2.11	6.0	0.30	147	0.91	2820
16	12-18	7180	40.1	388.0	0.61	40.60	35.2	1070	82600	18300	1230	2.32	11.1	0.28	258	2.62	6260
19	0-1	5970	8.0	99.8	0.32	0.91	5.7	254	44900	1670	97.5	0.917	3.8	0.20	43.6	1.11	162
19	1-6	6080	4.6	119.0	0.26	0.48	8.2	167	40500	1290	70.7	1.15	2.8	0.24	22.0	1.22	92
19	6-12	7280	4.3	127.0	0.27	0.48	11.1	156	41400	1120	80.6	1.3	3.3	0.25	16.7	1.14	113
19	12-18	6290	5.4	124.0	0.24	0.49	10.5	161	39900	1580	63.4	0.651	3.4	0.25	20.2	1.31	104
22	0-1	9040	1.1	66.8	0.94	1.68	15.2	79	44700	894	919	0.477	9.3	0.40	7.0	0.62	562
22	1-6	9220	1.2	111.0	0.98	2.00	16.4	88	62700	1390	1720	0.402	9.6	0.38	8.7	0.74	617
22	6-12	8560	1.2	89.2	1.09	1.98	13.9	82	51000	1150	1990	0.766	9.8	0.39	7.7	0.69	569
SCDM Benchmarks																	
Cancer				0.77													
Non-Cancer		70000	30	30	100	30	200	3000	50000		10000	12	1000	300	300	0.7	20000
Residential Screening Level, TR=1E-06, HQ=1																	
Cancer				0.68	160	2100							15000				
Non-Cancer		77000	31	35	1600	71		3100	55000	400		11	1500	390	390	0.78	23000

NOTE: Shaded cells indicate an exceedance of noncancer screening levels, mg/kg = milligram per kilogram, SCDM = Superfund Chemical Data Matrix, TR = Target Risk, HQ = Hazard Quotient

Attachment 2. Input Parameters for the IEUBK Model

Table 2.1 Default and Site-Specific IEUBK Input Parameters

Parameter	Value	Basis
Relative Bioavailability (waste material)	18.8%	Site-specific IVBA (95% UCL)
Absorption Fractions		
Soil	9.4%	Site-specific
Dust	9.4%	Site-specific
Water	50%	IEUBK Default (EPA 1994)
Diet	50%	IEUBK Default (EPA 1994)
Soil/Dust Ingestion Weighting Factor	45% Soil/55% Dust	IEUBK Default (EPA 1994)
Drinking Water Concentration	0.9 μg/L	IEUBK Default (EPA 1994)
Air Concentration	0.1 μg/m^3	IEUBK Default (EPA 1994)
Indoor Air Lead Concentration	30% of outdoor	IEUBK Default (EPA 1994)
Mothers Blood Lead at Childbirth	1 μg/dL	IEUBK Default (EPA 1994)
Geometric Standard Deviation (GSD)	1.6	IEUBK Default (EPA 1994)

NOTES: IVBA = *In vitro* Bioaccessibility, UCL = Upper Confidence Limit, μg/L = micrograms per liter, μg/m^3 = micrograms per cubic meters, μg/dL = micrograms per deciliter

Table 2.2 Age-Dependent IEUBK Input Parameters

Age (years)	Soil and Dust	Water	Air		Diet
	Ingestion Rate (g/day)	Daily Intake (Liters)	Time Outdoors (hours)	Ventilation Rate (m^3/day)	Dietary Intake (μg/day)
0-1	0.086	0.40	1.0	3.22	2.66
1-2	0.094	0.43	2.0	4.97	5.03
2-3	0.067	0.51	3.0	6.09	5.21
3-4	0.063	0.54	4.0	6.95	5.38
4-5	0.067	0.57	4.0	7.68	5.64
5-6	0.052	0.60	4.0	8.32	6.04
6-7	0.055	0.63	4.0	8.89	5.95

NOTES: g/day = grams per day, m^3/day = cubic meters per day, μg/day = micrograms per day

Appendix J: Water Quality Standards 1991, 2010, and 2021

APPENDIX B

Federal and State of Colorado Applicable or Relevant and Appropriate Requirements

The stream segments numbers referenced in the following tables are based on State of Colorado designations for the Clear Creek basin. A narrative description of the specific segment numbers is presented below.

Segment 1	Mainstem of Clear Creek, including all tributaries, lakes and reservoirs, from the source to the Interstate 70 bridge above Silverplume.
Segment 2	Mainstem of Clear Creek, including all of the tributaries, lakes and reservoirs, from the Interstate 70 bridge above Silverplume to the Argo Tunnel discharge, except for the specific listings in Segments 3 through 9.
Segment 3	Mainstem of South Clear Creek, including all tributaries, lakes and reservoirs, from the source to the confluence with Clear Creek, except for the specific listing in 3b.
Segment 3b	Mainstem of Leavenworth Creek from source to confluence with South Clear Creek.
Segment 4	Mainstem of West Clear Creek from the source to the confluence with Woods Creek.
Segment 5	Mainstem of West Clear Creek from the confluence with Woods Creek to the confluence with Clear Creek.
Segment 6	All tributaries to West Clear Creek, including all lakes and reservoirs, from the source to the confluence with Clear Creek, except for the specific listings in Segments 7 and 8.
Segment 7	Mainstem of Woods Creek from the outlet of Upper Urad Reservoir to the confluence with West Clear Creek.
Segment 8	Mainstem of Lion Creek from the source to the confluence with West Clear Creek.
Segment 9	Mainstem to the Fall River, including all tributaries, lakes and reservoirs, from the source to the confluence with Clear Creek.
Segment 10	Mainstem of Chicago Creek, including all tributaries, lakes and reservoirs, from the source to the confluence with Clear Creek.

Segment 11	Mainstem of Clear Creek from the Argo Tunnel discharge to the Farmers Highline Canal diversion in Golden, Colorado.
Segment 12	All tributaries to Clear Creek, including all lakes and reservoirs, from the Argo Tunnel discharge to the Farmers Highline Canal diversion in Golden, Colorado, except for specific listings in Segment 13.
Segment 13	Mainstem of North Clear Creek, including all tributaries, lakes and reservoirs, from the source to the confluence with Clear Creek.

TABLE 1.1-1

STREAM CLASSIFICATIONS FOR CLEAR CREEK BASIN SEGMENTS 1-13

	Segment Number													
	1	2	3a	3b	4	5	6	7	8	9	10	11	12	13
Recreational Classification														
Class 1			X	X	X		X			X	X			
Class 2	X	X				X		X	X			X	X	X
Aquatic Life Classification														
Class 1 Cold	X	X	X		X	X	X			X	X	X		
Warm														
Class 2 Cold				X				X	X				X	X
Warm														
Use Classification														
Domestic Water Supply	X		X	X	X		X			X	X	X	X	
Agricultural Supply	X	X	X	X	X	X	X			X	X	X	X	X

Recreational classification:
Class 1 = Primary contact recreation (e.g. swimming)
Class 2 = Secondary contact recreation, those not in Class 1

Aquatic Life Classification:
Class 1 = Cold/warm stream segments capable of sustaining cold/warm water biota where physical habitat, water flows, and water quality conditions do not impair biota. Applies to segments with correctable water quality.
Class 2 = Cold/warm stream segments not capable of sustaining cold/warm water biota where physical habitat, water flows, or uncorrectable water quality conditions impair biota.

Use Classification:
Domestic water supply = suitable for potable water supplies after standard water treatment
Agricultural water supply = suitable for irrigation of crops or watering livestock.

TABLE 2.2-1

CLEAR CREEK SITE
POTENTIAL FEDERAL AND STATE CHEMICAL-SPECIFIC ARARs

Standard, Requirement Criteria, or Limitation	Citation	Description	Applicable/ Relevant and Appropriate?	Comments/Justification for Elimination from Further Consideration
FEDERAL				
• SAFE DRINKING WATER ACT	42 USC § 300G			
National Primary Drinking Water Standards	40 CFR Part 141	Establishes health based standards for public water systems (MCLs).	No/Yes	Applicable at free flowing outlet of public water supply system, relevant and appropriate for surface water designated for drinking water use and for ground water which is a current or potential drinking water supply. Defer to state regulations because delegated program.
• CLEAN WATER ACT	33 USC § 1251-1376			
Water Quality Criteria	40 CFR Part 131 Quality Criteria for Water 1986	Sets criteria for water quality based on toxicity to aquatic organisms and human health.	No/Yes	State standards have been adopted. This is a delegated program. Defer to state Table Value Standards (TVS).
Ore Mining and Dressing Point Source	40 CFR Part 440	Establishes effluent limitations on certain mining and milling operations New source performance standards.	No/Yes	Relevant and appropriate for inactive mine sites.
• SOLID WASTE DISPOSAL ACT (Resource Conservation and Recovery Act)	42 USC §§ 6901-6987			

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TABLE 2.2-1 (continued)

CLEAR CREEK SITE
POTENTIAL FEDERAL AND STATE CHEMICAL-SPECIFIC ARARs

Standard, Requirement Criteria, or Limitation	Citation	Description	Applicable/ Relevant and Appropriate?	Comments/Justification for Elimination from Further Consideration
• SUBTITLE C	Sec. 3001-3020			
Identification and Listing of Hazardous Waste	40 CFR Part 261	Defines those solid wastes which are subject to regulation as hazardous waste.	No/Yes	
Standards for Owners and Operators of Hazardous Waste Treatment, Storage and Disposal Facilities	40 CFR Part 264	Defines minimal national requirements for treatment, storage, and disposal of hazardous waste.	No/Yes	Relevant and appropriate. Defer to state standards.
• CLEAN AIR ACT	442 USC §§ 7401-7642			
National Primary and Secondary Ambient Air Quality Standards	40 CFR Part 50	Establishes standards for ambient air quality to protect human health and welfare.	No/Yes	Lead is a contaminant of concern at the site. Lead standard is relevant and appropriate.
National Emission Standards for Hazardous Air Pollutants	40 CFR Part 61	Sets emission standards for designated hazardous pollutants	No/No	Requirements are promulgated for emissions of particular air pollutants from specific sources. Will be reconsidered as a potential action-specific ARAR.

TABLE 2.2-1 (continued)

CLEAR CREEK SITE
POTENTIAL FEDERAL AND STATE CHEMICAL-SPECIFIC ARARs

Standard, Requirement Criteria, or Limitation	Citation	Description	Applicable/ Relevant and Appropriate?	Comments/Justification for Elimination from Further Consideration
STATE OF COLORADO				
• COLORADO SAFE DRINKING WATER AUTHORITIES	CRS 24-4-104 to -105 CRS 25-1-101, -107, -109, -114, 114.1			
Primary Drinking Water	5 CCR 1003-1	Establishes standards for public water systems (MCLs).	No/Yes	Applicable at free flowing outlet of public water supply system, relevant and appropriate for surface water designated for drinking water use and for ground water which is a current or potential drinking water supply. Defer to state regulations because delegated program.
• COLORADO WATER QUALITY CONTROL ACT	CRS 25-8-101 to -703			
Basic Standards for Ground Water	5CCR 1002-8, Section 3.11.0	Establishes a system for classifying ground water and adopting water quality standards to protect existing and potential beneficial uses.	No/Yes	Clear Creek site aquifers have not been classified. Organic statewide standards have been adopted but organics are not chemicals of concern at the site.

TABLE 2.2-1 (continued)

CLEAR CREEK SITE
POTENTIAL FEDERAL AND STATE CHEMICAL-SPECIFIC ARARs

Standard, Requirement Criteria, or Limitation	Citation	Description	Applicable/ Relevant and Appropriate?	Comments/Justification for Elimination from Further Consideration
Basic Standards and Methodologies for Surface Water	5 CCR 1002-8 Section 3.1.0	Establishes basic standards, antidegradation standard, system for classifying state waters.	Yes/No	Applicable to any discharge to state waters, e.g., mine adit discharges.
Classifications and Numeric Standards, South Platte River Basin, et al.	5 CCR 1002-8, Section 3.8.0	Used in conjunction with Basic Standards and Methodologies (Sec. 3.1.0).	Yes/No	Applicable for classified surface water stream segments.
• COLORADO HAZARDOUS WASTE ACT	CRS 25-15-101 to-313			
Rules and Regulations Pertaining to Hazardous Waste	6 CCR 1007-3, Parts 260, 261, 262.11	Defines hazardous waste, requires waste characterization.	No/Yes	
• COLORADO AIR QUALITY CONTROL ACT	CRS 25-7-101 to-512			
Ambient Air Quality Standards	5 CCR 1001-2 to-1001-14	Sets ambient standards for TSP, SO_2, oxidants, CO, NO_2, Pb.	Yes/No	Only an ARAR if current site conditions or remedial activities are a major source of emissions.
Regulation No. 3	5 CCR 1001-5	Restricts exeedance in any attainment area of any National Ambient Air Quality Standards (NAAQS).	Yes/No	The site is located within an attainment area.

TABLE 2.2-2

CHEMICAL-SPECIFIC ARARs AND TBCs FOR CHEMICALS OF CONCERN (COCs)

A. Drinking Water (μg/L)[a]					
	Federal Primary Standards	Colorado Primary Standards	RCRA Ground Water Maximums	Colorado Ground Water Standards[e]	Federal Maximum Contaminant Level Goals[b,f]
Ag	50	50	50	50	-
As	50	50	50	50	0
Be	1	-[g]	-	-	0[p]
Cd	10(5)[1]	10	10	10	5
Cr	100	50	50	50	100
Cu	-(1,300)[2]	-	-	-	1,300[p]
Fl	4,000	4,000	-	-	4,000
Mn	-	-	-	-	-
Ni	100	-	-	-	100
Pb	50(15)[2]	50	50	50	0[p]
Zn	-	-	-	-	-

[a]All values are total values, unless otherwise noted
[b]Safe Drinking Water Act: Drinking Water Regulations, April 1991
[c]Colorado Primary Drinking Water Regulation Part I of Title 25, CRS 1973
[d]40 CFR Part 264.94, July 1990.
[e]Dissolved values
[f]MCLGs above zero are relevant and appropriate
[g]"-" non established
[p]Proposed
[1]The Federal Primary Standard for Cadmium is relevant and appropriate and is currently 10 μg/L. In July 1992 the standard for cadmium will become 5 μg/L. The 5 μg/L concentration is a "to be considered" (TBC) concentration until July 1992.
[2]The concentrations of 1300 μg/L copper and 15 μg/L lead are TBCs.

TABLE 2.2-2 (cont.)

CHEMICAL-SPECIFIC ARARs FOR CHEMICALS OF CONCERN (COCs)

B. Federal Ambient Water Quality Criteria for Protection of Aquatic Life[a]

Chemical	μg/L	
	Acute[b]	Chronic[c]
As III	360[d]	190[d]
Cd	3.9[c,d]	1.1[c,d]
Cr III	1,700[c,d]	210[c,d]
Cr VI	16[d]	11[d]
Cu	18[c,d]	12[c,d]
Pb	82[c,d]	3.2[c,d]
Ni	1,800[c,e]	96[c,e]
Ag	4.1[c,e]	0.12[e]
Zn	320 [c,e]	47[e]
Fe	-	1,000
pH	6.5-9.0	6.5-9.0

Note: No AQWC listed for aluminum and fluoride; criteria for manganese is for marine molluses only.

[a] Relevant and Appropriate Standards; Defer to State Table Value Standards (TVS).
[b] One-hour maximum.
[c] 4-day maximum. Values are hardness dependent; hardness of 100 mg $CaCO_3$/L assumed.
[d] Acid-soluble value.
[e] Total recoverable value.

TABLE 2.2-2 (cont.)

CHEMICAL-SPECIFIC LEGALLY APPLICABLE REQUIREMENTS FOR CHEMICALS OF CONCERN

C. State of Colorado Water Quality Standards for Clear Creek Stream Segments

SEG-MENT	DESCRIPTOR	PH-MIN (SU)	PH-MAX (SU)	AS (UG/L)	CD (UG/L)	CR(tri) (UG/L)	CR(hex) (UG/L)	CU (UG/L)	PB (UG/L)	FE D (UG7L)	FE T (UG7L)	MN D (UG7L)	MN T (UG7L)	NI (UG/L)	AG (UG/L)	ZN (UG/L)
1	CC MNSTEM, SOURCE TO I-70 BRDG ABV SLVPL	6.5	9.0	50	0.4	50	25	11.0	8.0	300	1000	50	1000	50.0	0.100	80
2	CC MNSTEM, BRDG ABV SLVPLM TO ARGO TUNNL	6.5	9.0	50	2.0	100	25	10.0	5.0	---	1000	---	1000	50.0	0.100	280
3	S. CC TO CONFLUENCE WITH CC	6.5	9.0	50	0.4	50	25	5.0	4.0	300	1000	50	1000	50.0	0.100	90
5	MNSTEM W.CC, CONF W\WOODS TO CONF W\CC	6.5	9.0	50	3.0	100	25	23.0	25.0	---	1000	---	1100	100.0	0.100	100
6	ALL TRIBS TO W.CC EXCEPT ITEMS 7&8	6.5	9.0	150	2.0	50	33	1.8	1.7	---	1000	---	1000	18.0	0.002	45
7	WOODS CREEK MAIN	6.5	9.0	50	14.0	100	25	23.0	25.0	---	1000	---	9400	100.0	0.100	740
8	LION CREEK MAIN	3.0	9.0	---	---	---	---	---	---	---	---	---	---	---	---	---
9	FALL RIVER MNSTEM TO CONFLUENCE W\CC	6.5	9.0	150	2.0	50	33	1.8	1.7	---	1000	---	---	18.0	0.002	45
10	CHI.CREEK MNSTEM TO CONFLUENCE W\CC	6.5	9.0	50	0.4	50	25	6.0	4.0	300	1000	50	1000	50.0	0.100	110
11	CC MNSTEM FROM ARGO TO GLDN GAUGING STA.	6.5	9.0	150	3.0	50	123	17.0	1.6	---	1000	---	1000	59.0	0.030	300
12	TRIBS IN SECTION 10	6.5	9.0	50	10.0	50	50	1000.0	50.0	300	---	50	---	---	50.000	5000
13	N.CC FROM SOURCE TO CONFL. W\CC	6.5	9.0	50	0.4	100	25	64.0	45.0	---	5400	---	1000	50.0	0.100	500

Note: No stream standards are available for aluminum and fluoride.

a) Colorado Department of Health - Water Quality Control Division
Classification and Numeric Standards, South Platte River Basin, Laramie River Basin, Republican River Basin, Smokey Hill River Basin. Amended:Feb 5,1990 (Effective March 30 1990): All existing water quality standards are total recoverable metals with the exception of TVSs as noted below.

b) Cd (14.0 ug/L), Mn T (9400 ug/L), and Zn (740 ug/L) are temporary modifications on Woods Creek mainstem; underlying standards for Woods Creek are Cd, 0.2 ug/L, Mn, 1100 ug/L, and Zn, 100 ug/L.

c) Table value standards (TVSs) are promulgated for all metals in Segments 6,9, and for all metals in Segment 11 except Cd (3.0 ug/L), Cu (17.0 ug/L) and Zn (300 ug/L). TVSs are dissolved metals except for Fe and Mn which are total recoverable and ar based on low flow TVSs are based on low flow hardness sampled in the Phase II RI sampling, September 1989 (CDM 1990).

d) All numeric and TVS standards presented here are legally applicable.

TABLE 2.2-2 (cont.)

CHEMICAL-SPECIFIC RELEVANT AND APPROPRIATE REQUIREMENTS FOR CHEMICALS OF CONCERN

D. State of Colorado Water Quality Criteria During Low Flow for Clear Creek Stream Segments

SEG-MENT	DESCRIPTOR	PH-MIN (SU)	PH-MAX (SU)	AL (UG/L)	AS (UG/L)	CD (UG/L)	CR(tri) (UG/L)	CR(hex) (UG/L)	CU (UG/L)	PB (UG/L)	FE D (UG7L)	FE T (UG7L)	MN D (UG7L)	MN T (UG7L)	NI (UG/L)	AG (UG/L)	ZN (UG/L)
AQUATIC LIFE CHRONIC TABLE VALUE STANDARDS																	
1	CC MNSTEM, SOURCE TO I-70 BRDG ABV SLVPL	6.5	9.0	150	150	0.8	151	11	8.5	2.3	---	1000	---	1000	71.3	0.038	45
2	CC MNSTEM, BRDG ABV SLVPLM TO ARGO TUNNL	6.5	9.0	150	150	0.8	151	11	8.5	2.3	---	1000	---	1000	7.3	0.038	45
3	S. CC TO CONFLUENCE WITH CC	6.5	9.0	150	150	0.6	112	11	6.2	1.3	---	1000	---	1000	53.9	0.021	45
5	MNSTEM W.CC, CONF W\WOODS TO CONF W\CC	6.5	9.0	150	150	1.0	181	11	10.3	3.1	---	1000	---	1000	84.5	0.057	45
6	ALL TRIBS TO W.CC EXCEPT ITEMS 7&8	6.5	9.0	150	150	0.2	34	11	1.8	0.2	---	1000	---	1000	17.7	0.002	45
7	WOODS CREEK MAIN	6.5	9.0	150	150	1.6	296	11	17.2	7.2	---	1000	---	1000	133.4	0.160	45
8	LION CREEK MAIN	3.0	9.0	150	150	2.6	483	11	28.6	16.9	---	1000	---	1000	209.8	0.445	87
9	FALL RIVER MNSTEM TO CONFLUENCE W\CC	6.5	9.0	150	150	0.2	35	11	1.9	0.2	---	1000	---	1000	18.4	0.002	45
10	CHI.CREEK MNSTEM TO CONFLUENCE W\CC	6.5	9.0	150	150	0.4	69	11	3.7	0.6	---	1000	---	1000	34.3	0.007	45
11	CC MNSTEM FROM ARGO TO GLDN GAUGING STA.	6.5	9.0	150	150	0.7	123	11	6.9	1.6	---	1000	---	1000	59.0	0.025	45
12	TRIBS IN SECTION 10	6.5	9.0	150	150	0.7	123	11	6.9	1.6	---	1000	---	1000	59.0	0.025	45
13	N.CC FROM SOURCE TO CONFL. W\CC	6.5	9.0	150	150	1.3	232	11	13.3	4.7	---	1000	---	1000	106.3	0.095	45
AQUATIC LIFE ACUTE TABLE VALUE STANDARDS																	
1	CC MNSTEM, SOURCE TO I-70 BRDG ABV SLVPL	6.5	9.0	950	360	2.5	1266	16	12.2	51.4	---	---	---	---	687.9	1.050	80
2	CC MNSTEM, BRDG ABV SLVPLM TO ARGO TUNNL	6.5	9.0	950	360	2.5	1266	16	12.2	51.4	---	---	---	---	687.9	1.050	80
3	S. CC TO CONFLUENCE WITH CC	6.5	9.0	950	360	1.7	936	16	8.6	28.3	---	---	---	---	519.6	0.553	59
5	MNSTEM W.CC, CONF W\WOODS TO CONF W\CC	6.5	9.0	950	360	3.3	1520	16	15.1	73.7	---	---	---	---	815.1	1.530	95
6	ALL TRIBS TO W.CC EXCEPT ITEMS 7&8	6.5	9.0	950	360	0.3	283	16	2.2	2.7	---	---	---	---	171.1	0.045	18
7	WOODS CREEK MAIN	6.5	9.0	950	360	6.4	2486	16	26.5	194.5	---	---	---	---	1286.7	4.310	155
8	LION CREEK MAIN	3.0	9.0	950	360	12.6	4050	16	46.4	509.2	---	---	---	---	2023.9	1.202	251
9	FALL RIVER MNSTEM TO CONFLUENCE W\CC	6.5	9.0	950	360	0.3	293	16	2.3	2.9	---	---	---	---	177.0	0.048	19
10	CHI.CREEK MNSTEM TO CONFLUENCE W\CC	6.5	9.0	950	360	0.9	576	16	5.0	10.9	---	---	---	---	331.3	0.200	37
11	CC MNSTEM FROM ARGO TO GLDN GAUGING STA.	6.5	9.0	950	360	1.9	1032	16	9.7	34.4	---	---	---	---	569.2	0.680	65
12	TRIBS IN SECTION 10	6.5	9.0	950	360	1.9	1032	16	9.7	34.4	---	---	---	---	569.2	0.680	65
13	N.CC FROM SOURCE TO CONFL. W\CC	6.5	9.0	950	360	4.6	1947	16	20.0	120.1	---	---	---	---	1025.6	2.580	122

Note: No Table Value Standards available for fluoride.

a) Taken from existing Table Value Standards (Appendix 4I), reported from Basic Standards and Methodologies for Surface Water, Section 3.1.0(August 17,1989)

b) TVSs are not adopted for all stream segments: Criteria are Relevant and Appropriate where not adopted: see Table 2.2-2 for segments where TVSs have been promulgated and are applicable ARARs.

c) TVSs based on low flow hardness value sampled in Phase II RI, September 1989 (CDM 1990).

d) TVSs are dissolved metals except for Fe and Mn which are total recoverable.

TABLE 2.2-2 (cont.)

CHEMICAL-SPECIFIC RELEVANT AND APPROPRIATE REQUIREMENTS FOR CHEMICALS OF CONCERN

E. State of Colorado Water Quality Criteria During High Flow for Clear Creek Stream Segments

SEG-MENT	DESCRIPTOR	PH-MIN (SU)	PH-MAX (SU)	AL (UG/L)	AS (UG/L)	CD (UG/L)	CR(tri) (UG/L)	CR(hex) (UG/L)	CU (UG/L)	PB (UG/L)	FE D (UG/L)	FE T (UG/L)	MN D (UG/L)	MN T (UG/L)	NI (UG/L)	AG (UG/L)	ZN (UG/L)
AQUATIC LIFE CHRONIC TABLE VALUE STANDARDS																	
1	CC MNSTEM, SOURCE TO I-70 BRDG ABV SLVPL	6.5	9.0	150	150	0.5	86	11	4.7	0.8	---	1000	---	1000	42.1	0.012	45
2	CC MNSTEM, BRDG ABV SLVPLM TO ARGO TUNNL	6.5	9.0	150	150	0.5	86	11	4.7	0.8	---	1000	---	1000	42.1	0.012	45
3	S. CC TO CONFLUENCE WITH CC	6.5	9.0	150	150	0.5	86	11	4.7	0.8	---	1000	---	1000	42.0	0.012	45
5	MNSTEM W.CC, CONF W\WOODS TO CONF W\CC	6.5	9.0	150	150	0.5	86	11	4.7	0.8	---	1000	---	1000	42.0	0.012	45
6	ALL TRIBS TO W.CC EXCEPT ITEMS 7&8	6.5	9.0	150	150	0.2	42	11	2.2	0.2	---	1000	---	1000	21.8	0.003	45
7	WOODS CREEK MAIN	6.5	9.0	150	150	0.7	132	11	7.4	1.8	---	1000	---	1000	63.2	0.029	45
8	LION CREEK MAIN	3.0	9.0	150	150	0.9	164	11	9.3	2.6	---	1000	---	1000	77.1	0.046	45
9	FALL RIVER MNSTEM TO CONFLUENCE W\CC	6.5	9.0	150	150	0.2	42	11	2.2	0.2	---	1000	---	1000	21.8	0.003	45
10	CHI.CREEK MNSTEM TO CONFLUENCE W\CC	6.5	9.0	150	150	0.5	86	11	4.7	0.8	---	1000	---	1000	42.0	0.012	45
11	CC MNSTEM FROM ARGO TO GLDN GAUGING STA.	6.5	9.0	150	150	0.5	86	11	4.7	0.8	---	1000	---	1000	42.0	0.012	45
12	TRIBS IN SECTION 10	6.5	9.0	150	150	0.5	86	11	4.7	0.8	---	1000	---	1000	42.0	0.012	45
13	N.CC FROM SOURCE TO CONFL. W\CC	6.5	9.0	150	150	0.5	86	11	4.7	0.8	---	1000	---	1000	42.0	0.012	45
AQUATIC LIFE ACUTE TABLE VALUE STANDARDS																	
1	CC MNSTEM, SOURCE TO I-70 BRDG ABV SLVPL	6.5	9.0	950	360	1.2	718	16	6.4	16.8	---	---	---	---	406.2	0.320	91
2	CC MNSTEM, BRDG ABV SLVPLM TO ARGO TUNNL	6.5	9.0	950	360	1.2	718	16	6.4	16.8	---	---	---	---	406.2	0.320	91
3	S. CC TO CONFLUENCE WITH CC	6.5	9.0	950	360	1.2	718	16	6.4	16.8	---	---	---	---	406.2	0.320	91
5	MNSTEM W.CC, CONF W\WOODS TO CONF W\CC	6.5	9.0	950	360	1.2	718	16	6.4	16.8	---	---	---	---	406.2	0.320	91
6	ALL TRIBS TO W.CC EXCEPT ITEMS 7&8	6.5	9.0	950	360	0.4	353	16	2.8	4.2	---	---	---	---	210.0	0.071	23
7	WOODS CREEK MAIN	6.5	9.0	950	360	2.1	1111	16	10.5	39.8	---	---	---	---	609.0	0.800	70
8	LION CREEK MAIN	3.0	9.0	950	360	2.9	1377	16	13.5	60.8	---	---	---	---	744.0	1.240	87
9	FALL RIVER MNSTEM TO CONFLUENCE W\CC	6.5	9.0	950	360	0.4	353	16	2.8	4.2	---	---	---	---	210.0	0.071	23
10	CHI.CREEK MNSTEM TO CONFLUENCE W\CC	6.5	9.0	950	360	1.2	718	16	6.4	16.8	---	---	---	---	406.0	0.320	91
11	CC MNSTEM FROM ARGO TO GLDN GAUGING STA.	6.5	9.0	950	360	1.2	718	16	6.4	16.8	---	---	---	---	406.0	0.320	91
12	TRIBS IN SECTION 10	6.5	9.0	950	360	1.2	718	16	6.4	16.8	---	---	---	---	406.0	0.320	91
13	N.CC FROM SOURCE TO CONFL. W\CC	6.5	9.0	950	360	1.2	718	16	6.4	16.8	---	---	---	---	406.0	0.320	91

Note: No table value standards available for fluoride.

a) Taken from existing Table Value Standards (Appendix 4I), reprinted from Basic Standards and Methodologies for Surface Water, Section 3.1.0 (August 17, 1989)
b) TVSs based on high flow hardness sampled in the Phase II RI in June 1989 (CDM 1990).
c) TVSs are not adopted for all segments: Criteria are Relevant and Appropriate where not adopted: See Table 2.2-2C for segments where TVSs are promulgated and are applicable ARARs.
d) TVSs are dissolved metals except for Fe and Mn which are total recoverable.

TABLE 2.2-3

NATIONAL AMBIENT AIR QUALITY STANDARDS[a]
(NAAQS)

Criteria Pollutant	Primary Standards	Averaging Time
Carbon Monoxide	9 ppm 35 ppm	8-hour[b] 1-hour[b]
Lead	1.5 $\mu g/m^3$	Quarterly average
Nitrogen dioxide	0.053 ppm	Annual (arithmetic mean)
Particular Matter (PM_{10})	50 $\mu g/m^3$ 150 $\mu g/m^3$	Annual (arithmetic mean)[c] 24-hour[d]
Ozone	0.12 ppm	1-hour[e]
Sulfur oxides	0.03 ppm 0.14 ppm	Annual (arithmetic mean) 24-hour[b] 3-hour[b]

a Federal requirements have become State requirements in Colorado by means of the State Implementation Plan (SIP) approval process established under the CAA.

b Not to be exceeded more than once per year.

c The standard is attained where the expected annual arithmetic mean concentration, as determined in accordance with 52 Federal Register 24667, July 1, 1987, is less than or equal to 50 $\mu g/m^3$.

d The standard is attained when the expected number of days per calendar year with a 24-average concentration above 150 $\mu g/m^3$ is equal to or less than 1.

e The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is equal to or less than 1.

TABLE 2.2-4

CLEAR CREEK SITE
POTENTIAL FEDERAL AND STATE LOCATION-SPECIFIC ARARs

Standard, Requirement Criteria, or Limitation	Citation	Description	Applicable/ Relevant and Appropriate?	Comments/Justification for Elimination from Further Consideration
FEDERAL				
FISH AND WILDLIFE COORDINATION ACT	16 USC §§ 661-666, 40 CFR Part 6.302(g)	Requires consultation when a Federal agency proposes or authorizes any modification of any stream to provide protection of fish and wildlife resources.	Yes/No	
ENDANGERED SPECIES ACT	16 USC §§ 1531-1543, 50 CFR Part-402, 40 CFR Part 6.302(h)	Requires that Federal agencies insure that any action by the agency is not likely to jeopardize endangered species or adversely modify their habitat.	Yes/No	Federally endangered Greenback trout has been identified within the site.
RIVERS AND HARBORS ACT	33 USC § 540	Prohibits unauthorized obstruction or alteration of any navigable water of the U.S.	Yes/No	
EXECUTIVE ORDER ON FLOODPLAIN MANAGEMENT	Executive Order 11988 40 CFR § 6.302(b) and Appendix A	Requires evaluation of potential effects of action on floodplains.	Yes/No	
EXECUTIVE ORDER ON PROTECTION OF WETLANDS	Executive Order 11990, 40 CFR § 6.302(a) and Appendix A	Prohibits discharge of dredged or fill material into wetlands or navigable waters of the U.S. without permit. Preserves and enhances wetlands.		

TABLE 2.2-4 (continued)

CLEAR CREEK SITE
POTENTIAL FEDERAL AND STATE LOCATION-SPECIFIC ARARs

Standard, Requirement Criteria, or Limitation	Citation	Description	Applicable/ Relevant and Appropriate?	Comments/Justification for Elimination from Further Consideration
CLEAN WATER ACT	Section 404 40 CFR 230 33 CFR 320-330	Prohibits discharge of dredged or fill material into wetlands or navigable waters of the U.S. without permit. Preserves and enhances wetlands.	Yes/No	
ARCHAEOLOGICAL AND HISTORIC PRESERVATION ACT	16 USC § 469 40 CFR 6.301(c)	Establishes procedures to provide for preservation of historical and archaeological data that might be destroyed through alteration of terrain as the result of a Federal or Federally licensed construction activity.	Yes/No	There are historic features in the vicinity of the site.
NATIONAL HISTORIC PRESERVATION ACT	16 USC § 470 40 CFR § 6.301(b) 36 CFR Part 800	Requires Federal agencies to consider effects on historic places.	Yes/No	There are historic places within the vicinity of the site.
HISTORIC SITES, BUILDINGS AND ANTIQUITIES ACT	16 USC § 461-467	Requires Federal agencies to consider effects on natural landmarks.	Yes/No	There are natural landmarks in the vicinity of the site.

TABLE 2.2-4 (continued)

CLEAR CREEK SITE
POTENTIAL FEDERAL AND STATE LOCATION-SPECIFIC ARARs

Standard, Requirement Criteria, or Limitation	Citation	Description	Applicable/ Relevant and Appropriate?	Comments/Justification for Elimination from Further Consideration
STATE OF COLORADO				
WILDLIFE, NONGAME, ENDANGERED, AND THREATENED SPECIES	CRS 33-2-101 to-108	Provides for regulation of nongame wildlife and threatened and endangered species.	Yes/No	
HISTORIC PLACES REGISTER	CRS 24-80.1-101 to-108	Establishes requirements protecting properties of historical significance.	Yes/No	There are historic places in the vicinity of the site.
HISTORICAL, PREHISTORICAL, AND ARCHAEOLOGICAL RESOURCES ACT	CRS 24-80-401 to-410	Regulates historical, prehistorical, and archaeological resources.	Yes/No	There are historical resources in the vicinity of the site.
COLORADO STATE HISTORICAL SOCIETY	CRS 25-80-201 to-211	Requires preservation of historic character for sites within state or federal historic preservation areas.	Yes/No	There are historic sites in the vicinity of the site.

TABLE 2.2-5

CLEAR CREEK SITE
POTENTIAL FEDERAL AND STATE ACTION-SPECIFIC ARARs

Standard, Requirement Criteria, or Limitation	Citation	Description	Alternatives That May Trigger ARAR		Comments/Justification for Elimination from Further Consideration
			Tailings	Water	
FEDERAL					
•CLEAN AIR ACT	42 USC § 7401				
National Primary and Secondary Ambient Air quality Standards	40 CFR Part 50	Establishes standards for ambient air quality to protect human health.	2,3,5,6, s.a.	None	No remedial alternatives are expected to be a major source of emissions. Some of the tailing/waste rock alternatives may require monitoring to demonstrate that NAAQS are not exceeded.
National Emission Standards for Hazardous Air Pollutants	40 CFR Part 61	Sets emission standards for designated hazardous pollutants.	None	None	Source types for which standards are promulgated are not expected to part of any remedial alternative. Arsenic standard may be a TBC for some tailings/waste rock alternatives.
•CLEAN WATER ACT	33 USC § 1251-1376				
Dredge and Fill Requirements	Section 404 40 CFR 230 33 40 CFR 320-330	Prohibits discharge of dredged or fill material into wetlands or navigable waters of the U.S. without permit. Preserves and enhances wetlands.	All except no action		All alternatives, except no action, may result in activities in the vicinity of wetlands.

TABLE 2.2-5 (continued)

CLEAR CREEK SITE
POTENTIAL FEDERAL AND STATE ACTION-SPECIFIC ARARs

Standard, Requirement Criteria, or Limitation	Citation	Description	Alternatives That May Trigger ARAR		Comments/Justification for Elimination from Further Consideration
			Tailings	Water	
Ore Mining and Dressing Point Source	40 CFR Part 440	Establishes effluent limitations on certain mining and milling operations.	3	None	Relevant and appropriate for reprocessing alternatives.
The National Pollutant Discharge Elimination System (NPDES)	40 CFR Part 122	Requires permits for the discharge of pollutants from any point source into waters of the U.S.	3	2,3,4,5, s.a.	
NPDES - Stormwater Discharges	40 CFR Part 122.26	Establishes permitting processes and discharge regulations for storm water.	1,2,3,4,5, s.a.	None	Relevant and appropriate for alternatives where mine material comes into contact with stormwater or snowmelt.
•DOT HAZARDOUS MATERIALS TRANSPORTATION ACT	49 USC § 1801; 49 CFR Parts 107, 171-177	Regulates transportation of hazardous materials.	3,6	2A, s.a.	
•SOLID WASTE DISPOSAL ACT (Resource Conservation and Recovery Act)	42 USC § 6901-6987				
SUBTITLE C	40 CFR 264.258(b) (Waste Piles) 40	Regulates placement of a cap over RCRA hazardous waste.	3	2,3,4,5, s.a.	If reprocessing or passive treatment results in production of a RCRA hazardous waste.

TABLE 2.2-5 (continued)

CLEAR CREEK SITE
POTENTIAL FEDERAL AND STATE ACTION-SPECIFIC ARARs

Standard, Requirement Criteria, or Limitation	Citation	Description	Alternatives That May Trigger ARAR		Comments/Justification for Elimination from Further Consideration
			Tailings	Water	
	40 CFR 264.310(a) (Landfills)	Regulates closure/consolidation of land units with RCRA hazardous waste.	3	2,3,4,5 s.a.	If reprocessing or passive treatment results in production of a RCRA hazardous waste.
	40 CFR Part 263	Establishes standards which apply to persons transporting hazardous waste within the U.S.	3	2,3,4,5, s.a.	If reprocessing or passive treatment results in production and transportation of RCRA hazardous waste.
SUBTITLE D	Section 4001-4010 40 CFR Part 241	Guidelines for the land disposal of non-hazardous solid waste.	3,4,5,6,7, s.a.	2B,3,4,5, s.a.	
STATE OF COLORADO					
•AIR QUALITY CONTROL ACT	CRS 2507-101 TO-512				
Ambient Air Quality Standards	5 CCR 1001-14	Sets ambient standards for TSP, SO_2, oxidants, CO, NO_2, Pb.	2,3,5,6	None	If remedial activities are a major source of emissions.
Regulation No. 1	5 CCR 1001-3 Reg. 1, Sec. III D	Minimize fugitive particulate omission control plant.	2,3,5,6	None	Non-specific sources including construction activities, storage and handling operation, haul roads and tracks.

CLEAR CREEK SITE
POTENTIAL FEDERAL AND STATE ACTION-SPECIFIC ARARs

Standard, Requirement Criteria, or Limitation	Citation	Description	Alternatives That May Trigger ARAR		Comments/Justification for Elimination from Further Consideration
			Tailings	Water	
Regulation No. 3	5 CCR 1001-5 Reg. 3, Sec. IVD	Restricts exceedance in any attainment area of any NAAQS and requires an Air Pollution Emission Notice.			
Regulation No. 8	5 CCR 1001-10	Sets forth emission control requirements for hazardous air pollutants, including beryllium, mercury, and lead	3	None	
•COLORADO WATER QUALITY CONTROL ACT	CRS 25-8-101-TO-703 5CCR 1002-8,3.1.14 5CCR 1002-3,10.1.3	Regulates discharges to surface waters.	None	2,3,4,5, s.a.	
•HAZARDOUS WASTE ACT	CRS 25-15-101 TO-313				
Rules and Regulations Pertaining to Hazardous Waste	6 CCR 1007-3, Parts 260, 261, 262.11	Defines hazardous waste, requires waste characterization	3	2,3,4,5, s.a.	Only an ARAR if reprocessing or passive treatment results in production of a hazardous waste.

TABLE 2.2-5 (continued)

CLEAR CREEK SITE
POTENTIAL FEDERAL AND STATE ACTION-SPECIFIC ARARs

Standard, Requirement Criteria, or Limitation	Citation	Description	Alternatives That May Trigger ARAR		Comments/Justification for Elimination from Further Consideration
			Tailings	Water	
•SOLID WASTES DISPOSAL SITES AND FACILITIES ACT	CRS 30-20-101 to-118	Solid waste regulations. Establishes broad siting criteria and site evaluation procedures for individual storage and disposal units. Requires consideration of local land uses.	3,4,5,6, s.a.	2,3,4,5, s.a.	Only an ARAR if reprocessing or passive treatment results in production of a hazardous waste.
Solid Waste Regulations, Capping	6CCR 1007-2 Secs. 2.4.1, 2.4.2, 2.4.5, 2.4.6, 4.2.6	Final cover required to establish vegetative erosion protection and waste isolation for operation of solid waste facility. Submit closure plan and notify the Colorado Department of Health.	3,4,5,6, s.a.	2,3,4,5, s.a.	
Solid Waste Regulations, Surface Water Control	6 CCR 1007-2 Section 2.1.4	Provide drainage to prevent ponding, erosion, water, and air pollution	3,4,5,6, s.a.	2,3,4,5, s.a.	
Solid Waste Regulations	6 CCR 1007-2 Secs. 1.1, 1.2, 1.3.2, 2.1.1	Siting must maximize wind protection and minimize upstream drainage. No disposal in 100 year floodplain or into or below surface water or ground water.	3,4,5,6, s.a.	2,3,4,5, s.a.	

s.a. - Selected Alternative

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APPENDIX 4H

Stream Classifications and Water Quality Standards

REGION: 3

BASIN: Clear Creek

Stream Segment Description	HIGH QUAL. CLASS 1	HIGH QUAL. CLASS 2	REC. CLASS 1	REC. CLASS 2	AQUATIC LIFE CL. 1 COLD	AQUATIC LIFE CL. 1 WARM	AQUATIC LIFE CL. 2 COLD	AQUATIC LIFE CL. 2 WARM	WATER SUPPLY	AGRICULTURE	NUMERIC STANDARDS: PHYSICAL and BIOLOGICAL	NUMERIC STANDARDS: INORGANIC mg/l	NUMERIC STANDARDS: METALS mg/l		TEMPORARY MODIFICATION and QUALIFIERS
1. Mainstem of Clear Creek, including all tributaries, lakes, and reservoirs, from the source to the I-70 bridge above Silverplume.				X	X				X	X	D.O. = 6.0 mg/l. 7.0 mg/l spawning pH = 6.5 - 9.0 Fecal Coliforms = 2000/100 ml	NH_3 = 0.02, unionized Residual Cl_2 = 0.003 Cyanide (free) = .005 S as H_2S = 0.002 undis Boron ≤ 0.75 Nitrite (NO_2) = 0.05 Nitrate (NO_3) = 10.0 Chloride (Cl) = 250.0 Sulfate (SO_4) = 250.0	Arsenic (As) = 0.05 Cadmium (Cd) = 0.0004 Chromium (tri) = 0.05 Chromium (hex) = 0.025 Copper (Cu) = 0.011 Lead (Pb) = 0.008 Iron (Fe, sol) = 0.3 Manganese (Mn, sol) = .05	Mercury (Hg) = 0.00005 Nickel (Ni) = 0.05 Selenium (Se) = 0.01 Silver (Ag) = 0.0001 Zinc (Zn) = 0.08 Iron (Fe, tot) = 1.0 Manganese (Mn, tot) = 1.0	
2. Mainstem of Clear Creek, including all tributaries, lakes, and reservoirs, from the I-70 bridge above Silverplume to the Argo Tunnel discharge, except for specific listings in Segments 3 through 10.				X	X					X	D.O. = 6.0 mg/l. 7.0 mg/l spawning pH = 6.5 - 9.0 Fecal Coliforms = 2000/100 ml	NH_3 = 0.02* unionized Residual Cl_2 = 0.003 Cyanide (free) = .005 S as H_2S = 0.002 undis Boron ≤ 0.75 Nitrite (NO_2) = 0.05*	Arsenic (As) = 0.05 Cadmium (Cd) = 0.002 Chromium (tri) = 0.1 Chromium (hex) = 0.025 Copper (Cu) = 0.01 Lead (Pb) = 0.005	Mercury (Hg) = 0.00005 Nickel (Ni) = 0.05 Selenium (Se) = 0.02 Silver (Ag) = 0.0001 Zinc (Zn) = 0.280 Iron (Fe, tot) = 1.0 Manganese (Mn, tot) = 1.0	NH_3, NO_2* see footnot
3.a. Mainstem of South Clear Creek, including all tributaries, lakes, and reservoirs, from the source to the confluence with Clear Creek, except for the specific listing in 3.b.			X		X				X	X	D.O. = 6.0 mg/l. 7.0 mg/l spawning pH = 6.5 - 9.0 Fecal Coliforms = 200/100 ml	NH_3 = 0.02 unionized Residual Cl_2 = 0.003 Cyanide (free) = .005 S as H_2S = 0.002 undis Boron ≤ 0.75 Nitrite (NO_2) = 0.05 Nitrate (NO_3) = 10.0 Chloride (Cl) = 250.0 Sulfate (SO_4) = 250.0	Arsenic (As) = 0.05 Cadmium (Cd) = 0.0004 Chromium (tri) = 0.05 Chromium (hex) = 0.025 Copper (Cu) = 0.005 Lead (Pb) = 0.004 Iron (Fe, sol) = 0.3 Manganese (Mn, sol) = .05	Mercury (Hg) = 0.00005 Nickel (Ni) = 0.05 Selenium (Se) = 0.01 Silver (Ag) = 0.0001 Zinc (Zn) = 0.09 Iron (Fe, tot) = 1.0 Manganese (Mn, tot) = 1.0	
3.b. Mainstem of Leavenworth Creek from source to confluence with South Clear Creek.			X				X		X	X	D.O. = 6.0 mg/l. 7.0 mg/l spawning pH = 6.5 - 9.0 Fecal Coliforms = 200/100 ml	NH_3 = 0.02, unionized Residual Cl_2 = 0.003 Cyanide (free) = .005 S as H_2S = 0.002 undis Boron ≤ 0.75 Nitrite (NO_2) = 0.05 Nitrate (NO_3) = 10.0 Chloride (Cl) = 250.0 Sulfate (SO_4) = 250.0	Arsenic (As) = 0.05 Cadmium (Cd) = 0.004 Chromium (tri) = 0.05 Chromium (hex) = 0.04 Copper (Cu) = 0.05 Lead (Pb) = 0.004 Iron (Fe, sol) = 0.3 Manganese (Mn, sol) = .05	Mercury (Hg) = 0.00005 Nickel (Ni) = 0.05 Selenium (Se) = 0.01 Silver (Ag) = 0.0001 Zinc (Zn) = 0.45 Iron (Fe, tot) = 1.0 Manganese (Mn, tot) = 1.0	
4. Mainstem of West Clear Creek from the source to the confluence with Woods Creek.			X		X				X	X	D.O. = 6.0 mg/l. 7.0 mg/l spawning pH = 6.5 - 9.0 Fecal Coliforms = 200 /100 ml	NH_3 = 0.02, unionized Residual Cl_2 = 0.003 Cyanide (free) = .005 S as H_2S = 0.002 undis Boron ≤ 0.75 Nitrite (NO_2) = 0.05 Nitrate (NO_3) = 10.0 Chloride (Cl) = 250.0 Sulfate (SO_4) = 250.0	Arsenic (As) = 0.05 Cadmium (Cd) = 0.003 Chromium (tri) = 0.05 Chromium (hex) = 0.025 Copper (Cu) = 0.017 Lead (Pb) = 0.025 Iron (Fe, sol) = 0.3 Manganese (Mn, sol) = .05	Mercury (Hg) = 0.00005 Nickel (Ni) = 0.9 Selenium (Se) = 0.01 Silver (Ag) = 0.0001 Zinc (Zn) = 0.06 Iron (Fe, tot) = 1.0 Manganese (Mn, tot) = 1.225	

STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS

REGION: 3

BASIN: Clear Creek

Stream Segment Description	High Qual. Class 1	High Qual. Class 2	Rec. Class 1	Rec. Class 2	Aquatic Life Cl. 1 Cold	Aquatic Life Cl. 1 Warm	Aquatic Life Cl. 2 Cold	Aquatic Life Cl. 2 Warm	Water Supply	Agriculture	Physical and Biological	Inorganic mg/l	Metals mg/l	Metals mg/l	Temporary Modifications and Qualifiers
5. Mainstem of West Clear Creek from the confluence with Woods Creek to the confluence with Clear Creek.				X	X					X	D.O. = 6.0 mg/l. 7.0 mg/l spawning pH = 6.5 - 9.0 Fecal Coliforms = 2000/100 ml	NH_3 = 0.02, unionized Residual Cl_2 = 0.003 Cyanide (free) = .005 S as H_2S = 0.002 undis Boron ≤ 0.75 Nitrite (NO_2) = 0.05	Arsenic (As) = 0.05 Cadmium (Cd) = 0.003 Chromium (tri) = 0.1 Chromium (hex) = 0.025 Copper (Cu) = 0.023 Lead (Pb) = 0.025	Mercury (Hg) = 0.00005 Nickel (Ni) = 0.1 Selenium (Se) = 0.02 Silver (Ag) = 0.0001 Zinc (Zn) = 0.10 Iron (Fe, tot) = 1.0 Manganese (Mn, tot) = 1.1	
6. All tributaries to West Clear Creek, including all lakes and reservoirs, from the source to the confluence with Clear Creek, except for specific listings in Segments 7 and 8.			X		X				X	X	D.O. = 6.0 mg/l. 7.0 mg/l spawning pH = 6.5 - 9.0 Fecal Coliforms = 200 /100 ml	NH_3 = 0.02, unionized Residual Cl_2 = 0.003 Cyanide (free) = .005 S as H_2S = 0.002 undis Boron ≤ 0.75 Nitrite (NO_2) = 0.05 Nitrate (NO_3) = 10.0 Chloride (Cl^-) = 250.0 Sulfate (SO_4) = 250.0	Arsenic (As) = TVS Cadmium = TVS(TROUT) Chromium (tri) = TVS Chromium (hex) = TVS Copper (Cu) = TVS Lead (Pb) = TVS Iron (Fe, sol) = TVS Manganese (Mn, sol) = TVS (ACUTE AND CHRONIC STANDARDS ADOPTED)	Mercury (Hg) = TVS Nickel (Ni) = TVS Selenium (Se) = TVS Silver = TVS(TROUT) Zinc = TVS(TROUT) Iron (Fe, tot) = TVS Manganese (Mn, tot) = TVS	
7. Mainstem of Woods Creek from the outlet of Upper Urad Reservoir to the confluence with West Clear Creek.				X			X				D.O. = 6.0 mg/l. 7.0 mg/l spawning pH = 6.5 - 9.0 Fecal Coliforms = 2000/100 ml	NH_3 = 0.02, unionized Residual Cl_2 = 0.003 Cyanide (free) = .005 S as H_2S = 0.002 undis Nitrite (NO_2) = 0.05	Arsenic (As) = 0.05 Cadmium (Cd) = 0.002 Chromium (tri) = 0.1 Chromium (hex) = 0.025 Copper (Cu) = 0.023 Lead (Pb) = 0.025	Mercury (Hg) = 0.00005 Nickel (Ni) = 0.1 Selenium (Se) = 0.05 Silver (Ag) = 0.0001 Zinc (Zn) = 0.1 Iron (Fe, tot) = 1.0 Manganese (Mn, tot) = 1.1	Temporary Modifications Cadmium (Cd) = 0.014 Zinc (Zn) = 0.74 Manganese (Mn, tot) = 9.4
8. Mainstem of Lion Creek from the source to the confluence with West Clear Creek.				X			X				D.O. = 6.0 mg/l, 7.0 mg/l spawning pH = 3.0 - 9.0 Fecal Coliforms = 2000/100 ml				
9. Mainstem of the Fall River, including all tributaries, lakes, and reservoirs, from the source to the confluence with Clear Creek.			X		X				X	X	D.O. = 6.0 mg/l. 7.0 mg/l spawning pH = 6.5 - 9.0 Fecal Coliforms = 200 /100 ml	NH_3 = 0.02, unionized Residual Cl_2 = 0.003 Cyanide (free) = .005 S as H_2S = 0.002 undis Boron ≤ 0.75 Nitrite (NO_2) = 0.05 Nitrate (NO_3) = 10.0 Chloride (Cl^-) = 250.0 Sulfate (SO_4) = 250.0	Arsenic (As) = TVS Cadmium = TVS(TROUT) Chromium (tri) = TVS Chromium (hex) = TVS Copper (Cu) = TVS Lead (Pb) = TVS Iron (Fe, sol) = TVS Manganese (Mn, sol) = TVS (ACUTE AND CHRONIC STANDARDS ADOPTED)	Mercury (Hg) = TVS Nickel (Ni) = TVS Selenium (Se) = TVS Silver = TVS(TROUT) Zinc = TVS(TROUT) Iron (Fe, tot) = TVS Manganese (Mn, tot) = TVS	

STREAM CLASSIFICATIONS ‥ WATER QUALITY STANDARDS

BASIN: Clear Creek

Stream Segment Description	CLASSIFICATIONS: HIGH QUAL. CLASS 1	HIGH QUAL. CLASS 2	REC. CLASS 1	REC. CLASS 2	AQUATIC LIFE CL. 1 COLD	CL. 1 WARM	CL. 2 COLD	CL. 2 WARM	[illegible]	AGRICULTURE	NUMERIC STANDARDS: PHYSICAL and BIOLOGICAL	INORGANIC mg/l	METALS mg/l		TEMPORARY MODIFICATIONS and QUALIFIERS
10. Mainstem of Chicago Creek, including all tributaries, lakes, and reservoirs, from the source to the confluence with Clear Creek.			X		X				X	X	D.O. = 6.0 mg/l. 7.0 mg/l spawning pH = 6.5 - 9.0 Fecal Coliforms = 200 /100 ml	NH_3 = 0.02, unionized Residual Cl_2 = 0.003 Cyanide (free) = .005 S as H_2S = 0.002 undis Boron = 0.75 Nitrite (NO_2) = 0.05 Nitrate (NO_3) = 10.0 Chloride (Cl) = 250.0 Sulfate (SO_4) = 250.0	Arsenic (As) = 0.05 Cadmium (Cd) = 0.0004 Chromium (tri) = 0.05 Chromium (hex) = 0.025 Copper (Cu) = 0.006 Lead (Pb) = 0.004 Iron (Fe, sol) = 0.3 Manganese (Mn,sol)=.05	Mercury (Hg) = 0.00005 Nickel (Ni) = 0.05 Selenium (Se) = 0.01 Silver (Ag) = 0.0001 Zinc (Zn) = 0.11 Iron (Fe,tot) = 1.0 Manganese (Mn,tot)=1.0	
11. Mainstem of Clear Creek from the Argo Tunnel discharge to the Farmers Highline Canal diversion in Golden, Colorado.				X	X				X	X	D.O. = 6.0 mg/l 7.0 mg/l spawning pH = 6.5 - 9.0 Fecal Coliforms = 200 /100 ml	NH_3 = 0.02, unionized Residual Cl_2 = 0.003 Cyanide (free) = .005 S as H_2S = 0.002 undis Boron = 0.75 Nitrite (NO_2) = 0.05 Nitrate (NO_3) = 10.0 Chloride (Cl) = 250.0 Sulfate (SO_4) = 250.0	Arsenic (As) = TVS Cadmium (Cd)= 0.003 Chromium (tri) = TVS Chromium (hex) = TVS Copper (Cu) = 0.017 Lead (Pb) = TVS Iron (Fe, sol) = TVS Manganese (Mn,sol)-TVS (ACUTE AND CHRONIC STANDARDS ADOPTED)	Mercury (Hg) = TVS Nickel (Ni) = TVS Selenium (Se) = TVS Silver (Ag) =TVS(TROUT) Zinc (Zn) = 0.30 Iron (Fe,tot) = TVS Manganese (Mn,tot)-TVS	
12. All tributaries to Clear Creek, including all lakes and reservoirs, from the Argo Tunnel discharge to the Farmers Highline Canal diversion in Golden, Colorado, except for specific listings in Segment 13.				X			X		X	X	D.O. = 5.0 mg/l pH = 6.5 - 9.0 Fecal Coliforms = 2000/100 ml	Cyanide (tot) = 0.2 Nitrate (NO_3) = 10.0 Chloride (Cl) = 250.0 Sulfate (SO_4) = 250.0 Boron = 0.75 S as H_2S = 0.05	Cadmium (Cd) = 0.01 Arsenic (As) = 0.05 Chromium (tri) = 0.05 Chromium (hex) = 0.05 Copper (Cu) = 1.0 Lead (Pb) = 0.05	Mercury (Hg) = 0.002 Selenium (Se) = 0.01 Silver (Ag) = 0.05 Zinc (Zn) = 5.0 Iron (Fe,sol) = 0.3 Manganese (Mn,sol)=.05	
13. Mainstem of North Clear Creek, including all tributaries, lakes, and reservoirs, from the source to the confluence with Clear Creek.				X			X			X	D.O. = 6.0 mg/l. 7.0 mg/l spawning pH = 6.5 - 9.0 Fecal Coliforms = 2000/100 ml	NH_3 = 0.02, unionized Residual Cl_2 = 0.003 Cyanide (free) = .005 S as H_2S = 0.002 undis Boron = 0.75 Nitrite (NO_2) = 0.05	Arsenic (As) = 0.05 Cadmium (Cd) = 0.0004 Chromium (tri) = 0.1 Chromium (hex) = 0.025 Copper (Cu) = 0.064 Lead (Pb) = 0.045	Mercury (Hg) = 0.00005 Nickel (Ni) = 0.05 Selenium (Se) = 0.02 Silver (Ag) =0.0001 Zinc (Zn) = 0.5 Iron (Fe, tot) = 5.4 Manganese (Mn,tot)=1.0	
14. Mainstem of Clear Creek from the Farmers Highline Canal diversion in Golden, Colorado, to Youngfield Street in Wheatridge, Colorado.				X				X	X	X	D.O. = 5.0 mg/l pH = 6.5 - 9.0 Fecal Coliforms = 2000/100 ml	NH_3 = 0.1, unionized Residual Cl_2 = 0.003 Cyanide (free)= 0.005 S as H_2S = 0.002 undis Boron = 0.75 Nitrite (NO_2) = 0.5 Nitrate (NO_3) = 10.0 Chloride (Cl) = 250.0 Sulfate (SO_4) = 250.0	Arsenic (As) = 0. 05 Cadmium (Cd) = 0.001 Chromium (tri) = 0.05 Chromium (hex) = 0.025 Copper (Cu) = 0.04 Lead (Pb) = 0.025 Iron (Fe,sol) = 0.3 Manganese (Mn,sol)=.05	Mercury (Hg) = .00005 Nickel (Ni) - 0.1 Selenium (Se) = 0.01 Silver (Ag) = 0.0001 Zinc (Zn) = 0.36 Iron (Fe,tot) = 1.4 Manganese(Mn,tot)= 1.0 Below Croke Canal: Zinc(Zn)-0.18 Copper (Cu)-0.014	NH_3,NO_2: see footnote Temporary Modifications below Croke Canal: Cadmium(Cd)-0.0033 Zinc(Zn)-0.5 Copper(Cu)-0.04 Effective from 6-30-88 to 6-30-94 Mercury(Hg)-0.00013 Effective from 6-30-88 to 6-30-89

STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS

REGION: 3

BASIN: Clear Creek

Stream Segment Description	High Qual. Class 1	High Qual. Class 2	Rec. Class 1	Rec. Class 2	Aquatic Life Cl. 1 Cold	Aquatic Life Cl. 1 Warm	Aquatic Life Cl. 2 Cold	Aquatic Life Cl. 2 Warm	Water Supply	Agriculture	Physical and Biological	Inorganic mg/l	Metals mg/l	Metals mg/l (cont.)	Temporary Modifications and Qualifiers
15. Mainstem of Clear Creek from Youngfield Street in Wheatridge, Colorado, to the confluence with the South Platte River.			X			(X)			X	X	D.O. = 5.0 mg/l pH = 6.5 - 9.0 Fecal Coliforms = 2000/100 ml	NH_3 = 0.06*, unionized Residual Cl_2 = 0.003 Cyanide (free) = 0.005 S as H_2S = 0.002 undis Boron = 0.75 Nitrite (NO_2) = 0.5* Nitrate (NO_3) = 10.0 Chloride (Cl) = 250.0 Sulfate (SO_4) = 250.0	Arsenic (As) = 0.05 Cadmium (Cd) = 0.001 Chromium (tri) = 0.05 Chromium (hex) = 0.025 Copper (Cu) = 0.014 Lead (Pb) = 0.025 Iron (Fe,sol) = 0.65 Manganese (Mn,sol) = .50	Mercury (Hg) = 0.00005 Nickel (Ni) = 0.1 Selenium (Se) = 0.01 Silver (Ag) = 0.0001 Zinc (Zn) = 0.17 Iron (Fe,tot) = 1.2 Manganese (Mn,tot) = 1.0	NH_3, NO_2: See footnote Temporary Modifica. Cadmium(Cd)=0.0033 Zinc(Zn)=0.425 Copper(Cu)=0.04 Effective from 6-30-88 to 6-30-94 Mercury(Hg)=0.00013 NH_3 = 0.15 unionized Effective from 6-30-88 to 6-30-89
16. All tributaries to Clear Creek from the Farmers Highline Canal diversion in Golden, Colorado, to the confluence with the South Platte River, except for specific listings in Segments 16, 17, and 18.				X				X		X	D.O. = 5.0 mg/l pH = 6.5 - 9.0 Fecal Coliforms = 2000/100 ml				
17. Mainstem of Ralston Creek from the source to the outlet of Arvada Reservoir, including Ralston Reservoir, Upper Long Lake, and Arvada Reservoir.				X			X		X	X	D.O. = 6.0 mg/l 7.0 mg/l spawning pH = 6.5 - 9.0 Fecal Coliforms = 2000/100 ml	NH_3 = 0.02, unionized Residual Cl_2 = 0.003 Cyanide (free) = .005 S as H_2S = 0.002 undis Boron = 0.75 Nitrite (NO_2) = 0.05 Nitrate (NO_3) = 10.0 Chloride (Cl) = 250.0 Sulfate (SO_4) = 250.0 (Sulfate to be measured in reservoirs)	Arsenic (As) = 0.05 Cadmium (Cd) = 0.0004 Chromium (tri) = 0.05 Chromium (hex) = 0.025 Copper (Cu) = .005* Lead (Pb) = .005** Iron (Fe, sol) = .3*** Manganese (Mn,sol) = .05	Mercury (Hg) = 0.00014 Nickel (Ni) = 0.05 Selenium (Se) = 0.01 Silver (Ag) = 0.0001 Zinc (Zn) = 0.05 Iron (Fe,tot) = 1.0**** Manganese (Mn,tot) = 1.0 Uranium (U) = 40 picoCuries/l as radiation from (U)	* measured as soluble **Lead=.025 when streamflow exceeds 50 cfs. ***Iron(sol)=0.5 during months of May and June. ****Iron(tot)standard does not apply when streamflows exceed 50 cfs.
18. Mainstem of Ralston Creek from the outlet of Arvada Reservoir to the confluence with Clear Creek. All tributaries to Ralston Creek, including all lakes and reservoirs, from the source of Ralston Creek to the confluence with Clear Creek, except for specific listings in Segment 17.				X				X		X	D.O. = 5.0 mg/l pH = 6.5 - 9.0 Fecal Coliforms = 2000/100 ml				
19. All tributaries to Clear Creek, including lakes and reservoirs, within the Mt. Evans Wilderness Area.		::											EXISTING	QUALITY	

APPENDIX 4I

Numerical Criteria for Establishing Table Value Standards Based on Hardness

T A B L E III

M E T A L P A R A M E T E R S
(Concentrations in ug/l)

METAL(1)	AQUATIC LIFE (1)(3)(4)(J)	AGRICULTURE(2)	DRINKING WATER SUPPLY(2)
Aluminum	Acute = 950 Chronic = 150		
Arsenic	Acute = 360 Chronic = 150	100(A) (30-DAY)	50(E) (1-DAY)
Barium			1,000(E) (1-DAY)
Beryllium		100(A,B) (30-DAY)	
Cadmium	Acute = $e^{(1.128[\ln(\text{hardness})]-2.905)}$ "(Trout) = $e^{(1.128[\ln(\text{hardness})]-3.828)}$ Chronic = $e^{(0.7852[\ln(\text{hardness})]-3.490)}$	10(B) (30-DAY)	10(E) (1-DAY)
Chromium III(5)	Acute = $e^{(0.819[\ln(\text{hardness})]+3.688)}$ Chronic = $e^{(0.819[\ln(\text{hardness})]+1.561)}$	100(B) (30-DAY)	50(E) (1-DAY)
Chromium VI(5)	Acute = 16 Chronic = 11	100(B) (30-DAY)	50(E) (1-DAY)
Copper	Acute = $\frac{1}{2}e^{(0.9422[\ln(\text{hardness})]-0.7703)}$ Chronic = $e^{(0.8545[\ln(\text{hardness})]-1.465)}$	200(B) (30-DAY)	1,000(F) (30-DAY)
Iron	Chronic = 1,000(tot.rec.)(A,C)		300(dis)(F) (30-DAY)

(Continued on Next Page)

TABLE III (CONTINUED)

METAL(1)	AQUATIC LIFE (1)(3)(4)(J)	AGRICULTURE(2)	DRINKING WATER SUPPLY(2)
Lead	Acute = $\frac{1}{2} e^{(1.6148[\ln(hardness)]-2.1805)}$ Chronic = $e^{(1.417[\ln(hardness)]-5.167)}$	100(B) (30-DAY)	50(E) (1-DAY)
Manganese	Chronic = 1,000(tot. rec.)(C)	200(B) (30-DAY)	(F) 50(dis) (30-DAY)
Mercury	Acute = 2.4 Chronic = 0.1 FRV(fish) (6) = 0.01		2.0(E) (1-DAY)
Nickel	Acute = $\frac{1}{2} e^{(0.76[\ln(hardness)]+4.02)}$ Chronic = $e^{(0.76[\ln(hardness)]+1.06)}$	200(B) (30-DAY)	
Selenium	Acute = 135 Chronic = 17	20(B,D) (30-DAY)	10(E) (1-DAY)
Silver	Acute = $\frac{1}{2} e^{(1.72[\ln(hardness)]-6.52)}$ Chronic = $e^{(1.72[\ln(hardness)]-9.06)}$ "(Trout) = $e^{(1.72[\ln(hardness)]-10.51)}$		50(E) (1-DAY)
Thallium	Chronic = 15(C)		
Uranium	Acute = $e^{(1.1021[\ln[hardness)]+2.7088)}$ Chronic = $e^{(1.1021[\ln(hardness)]+2.2382)}$		
Zinc	Acute = $\frac{1}{2} e^{(0.809(\ln[hardness)]+2.351)}$ Acute (Trout) = 1/2 Acute Chronic (hardness>200 mg/l) = $e^{(1.924[\ln(hardness)]-6.393)}$ Chronic(hardness $\leq$ 200 mg/l) = 45	2000(B) (30-DAY)	5000(F) (30-DAY)

NOTE: Capital letters in parentheses refer to references listed in Section 3.1.16(3); Numbers in parentheses refer to Table III footnotes.

TABLE III - FOOTNOTES

(1) Metals for aquatic life use are stated as dissolved unless otherwise specified.

(2) Metals for agricultural and domestic uses are stated as total recoverable unless otherwise specified.

(3) Hardness values to be used in equations are in mg/l as calcium carbonate. The hardness values used in calculating the appropriate metal standard should be based on the the lower 95 per cent confidence limit of the mean hardness value at the periodic low flow criteria as determined from a regression analysis of site-specific data. Where insufficient site-specific data exists to define the mean hardness value at the periodic low flow criteria, representative regional data shall be used to perform the regression analysis. Where a regression analysis is not appropriate, a site-specific method should be used. In calculating a hardness value, regression analyses should not be extrapolated past the point that data exist.

(4) Both acute and chronic numbers adopted as stream standards are levels not to be exceeded more than once every three years on the average.

(5) Unless the stability of the chromium valence state in receiving waters can be clearly demonstrated, the standard for chromium should be in terms of chromium VI. In no case can the sum of the instream levels of Hexavalent and Trivalent Chromium exceed the water supply standard of 50ug/l total chromium in those waters classified for domestic water use.

(6) FRV means final residual value. This value, based on the maximum allowed concentration of a material in the water that can affect marketability through bioaccumulation or bioconcentration, is to be applied as a 30-day average in all water supporting populations of fish or shellfish with a potential for human consumption.

Fe(ch)	=	WS(dis)
Mn(ch)	=	WS(dis)
SO_4	=	WS

These abbreviations mean: For all surface waters with an actual water supply use, the less restrictive of the following two options shall apply as numerical standards, as specified in the Basic Standards and Methodologies at 31.11(6);

(i) existing quality as of January 1, 2000; or

(ii)

Iron	=	300 µg/l (dissolved)
Manganese	=	50 µg/l (dissolved)
SO_4	=	250 mg/l

For all surface waters with a "water supply" classification that are not in actual use as a water supply, no water supply standards are applied for iron, manganese or sulfate, unless the Commission determines as the result of a site-specific rulemaking hearing that such standards are appropriate.

(c) As used in the "Temporary Modifications and Qualifiers" column of the tables, the term "type i" refers to a temporary modification adopted pursuant to subsection 31.7(3)(a)(i) of the Basic Standards and Methodologies for Surface Water (i.e., "where the standard is not being met because of human-induced conditions deemed correctable within a twenty (20) year period"). The term "type iii" refers to a temporary modification adopted pursuant to subsection 31.7(3)(a)(iii) of the Basic Standards and Methodologies for Surface Water (i.e., "where there is significant uncertainty regarding the appropriate long-term underlying standard").

(3) Table Value Standards

In certain instances in the attached tables, the designation "TVS" is used to indicate that for a particular parameter a "table value standard" has been adopted. This designation refers to numerical criteria set forth in the Basic Standards and Methodologies for Surface Water. The criteria for which the TVS are applicable are on the following table.

TABLE VALUE STANDARDS
(Concentrations in µg/l unless noted)

PARAMETER[(1)]	TABLE VALUE STANDARDS [(2)(3)]
Ammonia [(4)]	Cold Water = (mg/l as N)Total $acute = \frac{0.275}{1+10^{7.204-pH}} + \frac{39.0}{1+10^{pH-7.204}}$ $chronic = \left(\frac{0.0577}{1+10^{7.688-pH}} + \frac{2.487}{1+10^{pH-7.688}}\right) * MIN\left(2.85,\ 1.45 * 10^{0.028(25-T)}\right)$
	Warm Water = (mg/l as N)Total $acute = \frac{0.411}{1+10^{7.204-pH}} + \frac{58.4}{1+10^{pH-7.204}}$
	$chronic\ (Apr1 - Aug31) = \left(\frac{0.0577}{1+10^{7.688-pH}} + \frac{2.487}{1+10^{pH-7.688}}\right) * MIN\left(2.85,\ 1.45 * 10^{0.028(25-T)}\right)$ $chronic\ (Sep1 - Mar31) = \left(\frac{0.0577}{1+10^{7.688-pH}} + \frac{2.487}{1+10^{pH-7.688}}\right) * 1.45 * 10^{0.028*\left(25-MAX(T,\ 7)\right)}$
NH_3 = old TVS	Cold Water Acute = 0.43/FT/FPH/2[(4 old)] in mg/l (N)

	Warm Water Acute = 0.62/FT/FPH/2$^{(4\ old)}$ in mg/l (N)
Cadmium	Acute = $\cancel{(1.13667-[\ln (hardness)*(0.04184)])*e^{(1.128[\ln(hardness)]-3.6867)}}$ $\underline{(1.136672-[\ln(hardness) \times (0.041838)])*e^{(0.9151[\ln(hardness)]-3.1485)}}$ Acute(Trout) = $\cancel{(1.13667-[\ln (hardness)*(0.04184)])*e^{(1.128[\ln(hardness)]-3.828)}}$ $\underline{(1.136672-[\ln(hardness) \times (0.041838)])*e^{(0.9151[\ln(hardness)]-3.6236)}}$ Chronic = $\cancel{(1.10167-[\ln(hardness)*(0.04184)])*e^{(0.7852[\ln(hardness)]-2.715)}}$ $\underline{(1.101672-[\ln(hardness) \times (0.041838)])*e^{(0.7998[\ln(hardness)]-4.4451)}}$
Chromium III[5]	Acute = $e^{(0.819[\ln(hardness)]+2.5736)}$ Chronic = $e^{(0.819[\ln(hardness)]+0.5340)}$
Chromium VI[5]	Acute = 16 Chronic = 11
Copper	Acute = $e^{(0.9422[\ln(hardness)]-1.7408)}$ Chronic = $e^{(0.8545[\ln(hardness)]-1.7428)}$
Lead	Acute = $(1.46203-[\ln(hardness)*(0.145712)])*e^{(1.273[\ln(hardness)]-1.46)}$ Chronic = $(1.46203-[(\ln hardness)* (0.145712)])*e^{(1.273[\ln(hardness)]-4.705)}$
Manganese	Acute= $e^{(0.3331[\ln(hardness)]+6.4676)}$ Chronic= $e^{(0.3331[\ln(hardness)]+5.8743)}$
Nickel	Acute = $e^{(0.846[\ln(hardness)]+2.253)}$ Chronic = $e^{(0.846[\ln(hardness)]+0.0554)}$
Selenium[6]	Acute = 18.4 Chronic = 4.6
Silver	Acute = ½ $e^{(1.72[\ln(hardness)]-6.52)}$ Chronic = $e^{(1.72[\ln(hardness)]-9.06)}$ Chronic(Trout) = $e^{(1.72[\ln(hardness)]-10.51)}$

	TEMPERA-TURE TIER	**TIER CODE**	**SPECIES EXPECTED TO BE PRESENT**	**APPLICABLE MONTHS**	**TEMPERATURE STANDARD (^{o}C)**	
Temperature					(MWAT)	(DM)
	Cold Stream Tier I	CS-I	Brook trout, cutthroat trout	June – Sept.	17.0	21.2
				Oct. - May	9.0	13.0
	Cold Stream Tier II	CS-II	Brown trout, rainbow trout, mottled sculpin, mountain whitefish, longnose sucker, Arctic grayling	April – Oct.	18.2	23.8
				Nov. - March	9.0	13.0

Temperature	Cold Lake	CL	Brook trout, brown trout, cutthroat trout, lake trout, rainbow trout, Arctic grayling, sockeye salmon	April – Dec.	17.0	21.2
				Jan. - March	9.0	13.0
	Cold Large Lake (>100 acres surface area)	CLL	Rainbow trout	April – Dec.	18.2	23.8
				Jan. - March	9.0	13.0
	Warm Stream Tier I	WS-I	Common shiner, Johnny darter, orangethroat darter	March – Nov.	24.2	29.0
				Dec. – Feb.	12.1	14.5
	Warm Stream Tier II	WS-II	Brook stickleback, central stoneroller, creek chub, longnose dace, Northern redbelly dace, finescale dace, white sucker	March – Nov.	27.5	28.6
				Dec. – Feb.	13.7	14.3
	Warm Stream Tier III	WS-III	Razorback sucker	March – Nov.	27.7	31.3
				Dec. – Feb.	13.9	15.2
	Warm Stream Tier IV	WS-IV	Other Warmwater Species	March – Nov.	28.7	31.3
				Dec. – Feb.	14.3	15.2
	Warm Lakes	WL	Yellow perch, walleye, pumpkinseed, smallmouth bass, striped bass, white bass, largemouth bass, bluegill, spottail shiner, Northern pike, tiger muskellunge, black crappie, common carp, gizzard shad, sauger, white crappie, wiper	April – Dec.	26.5	29.3
				Jan. - March	13.3	14.6
Uranium	Acute = $e^{(1.1021[\ln(hardness)]+2.7088)}$ Chronic = $e^{(1.1021[\ln(hardness)]+2.2382)}$					
Zinc	Acute = $e^{\cancel{(0.8473[\ln(hardness)]+0.8618)}}$ $0.978\ e^{(0.8525[\ln(hardness)]+1.0617)}$ Chronic = $\cancel{e^{(0.8473[\ln(hardness)]+0.8699)}}$ $0.986\ e^{(0.8525[\ln(hardness)]+0.9109)}$					

TABLE VALUE STANDARDS - FOOTNOTES

(1) Metals are stated as dissolved unless otherwise specified.

(2) Hardness values to be used in equations are in mg/l as calcium carbonate and shall be no greater than 400 mg/L. The hardness values used in calculating the appropriate metal standard should be based on the lower 95 per cent confidence limit of the mean hardness value at the periodic low flow criteria as determined from a regression analysis of site-specific data. Where insufficient site-specific data exists to define the mean hardness value at the periodic low flow criteria, representative regional data shall be used to perform the regression analysis. Where a regression analysis is not appropriate, a site-specific method should be used. In calculating a hardness value, regression analyses should not be extrapolated past the point that data exist.

(3) Both acute and chronic numbers adopted as stream standards are levels not to be exceeded more than once every three years on the average.

(4) $FT = 10^{0.03(20-TCAP)}$;

Where TCAP is ≤ T ≤ 30

$FT = 10^{0.03(20-T)}$;

Where 0 is ≤ T ≤ TCAP

TCAP = 20^{o} *C cold water aquatic life species present*

TCAP = 25^o C cold water aquatic life species absent

FPH = 1; Where 8 ≤ pH ≤ 9

FPH = $\frac{1 + 10(7.4\text{-}pH)}{1.25}$; Where 6.5 ≤ pH ≤ 8

FPH means the acute pH adjustment factor, defined by the above formulas.

FT Means the acute temperature adjustment factor, defined by the above formulas.

T means temperature measured in degrees celsius.

TCAP means temperature CAP; the maximum temperature which affects the toxicity of ammonia to salmonid and non-salmonid fish groups.

NOTE: If the calculated acute value is less than the calculated chronic value, then the calculated chronic value shall be used as the acute standard.

(5) Unless the stability of the chromium valence state in receiving waters can be clearly demonstrated, the standard for chromium should be in terms of chromium VI. In no case can the sum of the instream levels of Hexavalent and Trivalent Chromium exceed the water supply standard of 50 µg/l total chromium in those waters classified for domestic water use.

(6) Selenium is a bioaccumulative metal and subject to a range of toxicity values depending upon numerous site-specific variables.

(4) Assessment Criteria

The following criteria shall be used when assessing whether a specified waterbody is in attainment of the specified standard.

(a) Upper South Platte ~~s~~Segment 6b, Chatfield Reservoir: Assessment Thresholds

chlorophyll = 11.2 µg/l, summer average, 1 in 5 year allowable exceedance frequency
phosphorus(Tot) = 0.035 mg/l, summer average, 1 in 5 year allowable exceedance frequency.

(b) Upper South Platte ~~s~~Segment 16h: Selenium Assessment Locations

- Toll Gate Creek (TG6): Downstream of the confluence of East and West Toll Gate Creeks, at 6th Avenue near the gage station.

- East Toll Gate Creek (ET1): Upstream of the confluence with West Toll Gate Creek, at Chambers Road and 1st Avenue.

- West Toll Gate Creek (WT1): Upstream of the confluence with East Toll Gate Creek, at 2nd Avenue.

(c) Upper South Platte Segment 15 and Middle South Platte Segment 1a: Dissolved Oxygen Assessment Locations

For the purpose of determining attainment of the standard, dissolved oxygen measurements shall only be taken in the flowing portion of the stream and at mid depth, and at least six inches above the bottom of the channel. Dissolved oxygen measurements in man-made pools are not to be used for determination of attainment of the standards.

(d) Big Dry Creek Segment 1: Selenium Assessment Locations

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS

REGION: 3 AND 4 BASIN: **CLEAR CREEK** Stream Segment Description	DESIG	CLASSIFICATIONS	NUMERIC STANDARDS PHYSICAL and BIOLOGICAL	INORGANIC mg/l		METALS µg/l			TEMPORARY MODIFICATIONS AND QUALIFIERS
1. Mainstem of Clear Creek, including all tributaries~~,~~ ~~lakes, reservoirs~~ and wetlands, from the source to the I-70 bridge above Silver Plume.	9/30/00 Baseline does not apply	Aq Life Cold 1 Recreation ~~1a~~E Water Supply Agriculture	T=TVS (CS-I)°C D.O.=6.0 mg/l D.O.(sp)=7.0 mg/l pH=6.5-9.0 ~~F.Coli=200/100ml~~ E.Coli=126/100ml	NH_3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.011 CN=0.005	S=0.002 B=0.75 NO_2=0.05 NO_3=10 Cl=250 SO_4=WS	As(ac)=~~50(Trec)~~ 340 As(ch)=0.02(Trec) Cd(ac)=TVS(tr) Cd(ch)=TVS CrIII(ac)=50(Trec) CrIII(ch)=TVS CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1000(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis) Hg(ch)=0.01(Tot)	Ni(ac/ch)=TVS Se(ac/ch)=TVS Ag(ac)=TVS Ag(ch)=TVS(tr) Zn(ac/ch)=TVS	
2a. Mainstem of Clear Creek, including all tributaries~~,~~ ~~lakes, reservoirs~~ and wetlands, from the I-70 bridge above Silver Plume to ~~the Argo Tunnel discharge~~ a point just above the confluence with West Fork Clear Creek,except for specific listings in Segments ~~3 through 10~~, 3a and 3b.	9/30/00 Baseline does not apply	Aq Life Cold 1 Recreation ~~1a~~E Water Supply Agriculture	T=TVS (CS-I)°C D.O.=6.0 mg/l D.O.(sp)=7.0 mg/l pH=6.5-9.0 ~~F.Coli =200/100ml~~ E.Coli=126/100ml	NH_3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.011 CN=0.005	S=0.002 B=0.75 NO_2=0.05 NO_3=10 SO_4=WS Cl=250	As(ac)=~~50(Trec)~~ 340 As(ch)=0.02(Trec) Cd(ac)=TVS(tr) Cd(ch)=TVS CrIII(ac)=50(Trec) CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1000(Trec) Pb(ac/ch)=TVS Mn(ac/ch) = TVS Mn(ch)=WS(dis) Hg(ch)=0.01(Tot) $Zn(ac)= 0.978e^{(0.8537[\ln(hardness)]+1.9467)}$ $Zn(ch)= 0.986e^{(0.8537[\ln(hardness)]+1.8032)}$	Ni(ac/ch)=TVS Se(ac/ch)=TVS Ag(ac)=TVS Ag(ch)=TVS(tr) ~~Zn(ac)=TVS~~ ~~Zn(ch)=200~~	Temporary modifications: ~~Cu(ch)=7.4 µg/l (dis),~~ Zn(ch)=~~254~~ 353 µg/l (dis), Zn(ac)=586 µg/l (dis), (Type i) Cd(ch)=1.54(dis) (type iii) Expiration date of 7/01/2014.
2b. Mainstem of Clear Creek, including all tributaries and wetlands, from the confluence with West Fork Clear Creek to a point just below the confluence with Mill Creek, except for specific listings in Segments 4 through 8.	9/30/00 Baseline does not apply	Aq Life Cold 1 Recreation E Water Supply Agriculture	T=TVS (CS-I)°C D.O.=6.0 mg/l D.O.(sp)=7.0 mg/l pH=6.5-9.0 E.Coli=126/100ml	NH_3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.011 CN=0.005	S=0.002 B=0.75 NO_2=0.05 NO_3=10 SO_4=WS Cl=250	As(ac)=340 As(ch)=0.02(Trec) Cd(ac)=TVS(tr) Cd(ch)=TVS CrIII(ac)=50(Trec) CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1000(Trec) Pb(ac/ch)=TVS Mn(ac/ch) = TVS Mn(ch)=WS(dis) Hg(ch)=0.01(Tot)	Ni(ac/ch)=TVS Se(ac/ch)=TVS Ag(ac)=TVS Ag(ch)=TVS(tr) Zn(ac)=TVS Zn(ch)=TVS	
2c. Mainstem of Clear Creek, including all tributaries and wetlands, from a point just below the confluence with Mill Creek to a point just above the Argo Tunnel discharge, except for specific listings in Segments 9a, 9b, and 10.	9/30/00 Baseline does not apply	Aq Life Cold 1 Recreation E Water Supply Agriculture	T=TVS (CS-I)°C D.O.=6.0 mg/l D.O.(sp)=7.0 mg/l pH=6.5-9.0 E.Coli=126/100ml	NH_3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.011 CN=0.005	S=0.002 B=0.75 NO_2=0.05 NO_3=10 SO_4=WS Cl=250	As(ac)=340 As(ch)=0.02(Trec) Cd(ac)=TVS (tr) Cd(ch)=TVS CrIII(ac)=50(Trec) CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1000(Trec) Pb(ac/ch)=TVS Mn(ac/ch) = TVS Mn(ch)=WS(dis) Hg(ch)=0.01(Tot) $Zn(ac)= 0.978e^{(0.8537[\ln(hardness)]+1.9467)}$ $Zn(ch)= 0.986e^{(0.8537[\ln(hardness)]+1.8032)}$	Ni(ac/ch)=TVS Se(ac/ch)=TVS Ag(ac)=TVS Ag(ch)=TVS(tr)	Temporary modifications: Cu(ch)=11.4 µg/l (dis), (Type iii) Expiration date of 7/01/2014.
3a. Mainstem of South Clear Creek, including all tributaries~~, lakes, reservoirs~~ and wetlands, from the source to the confluence with Clear Creek, except for the specific listings in Segments 3b and 19.	9/30/00 Baseline does not apply	Aq Life Cold 1 Recreation ~~1a~~E Water Supply Agriculture	T=TVS (CS-I)°C D.O.=6.0 mg/l D.O.(sp)=7.0 mg/l pH=6.5-9.0 ~~F.Coli=200/100ml~~ E.Coli=126/100ml	NH_3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.011 CN=0.005	S=0.002 B=0.75 NO_2=0.05 NO_3=10 Cl=250 SO_4=WS	As(ac)=~~50(Trec)~~ 340 As(ch)=0.02(Trec) Cd(ac)=TVS(tr) Cd(ch)=TVS CrIII(ac)=50(Trec) CrIII(ch)=TVS CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1000(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis) $Zn(ac)= 0.978e^{(0.8537[\ln(hardness)]+1.9467)}$ $Zn(ch)= 0.986e^{(0.8537[\ln(hardness)]+1.8032)}$	Hg(ch)=0.01(Tot) Ni(ac/ch)=TVS Se(ac/ch)=TVS Ag(ac)=TVS Ag(ch)=TVS(tr) ~~Zn(ac/ch)=TV~~	
3b. Mainstem of Leavenworth Creek from source to confluence with South Clear Creek.	9/30/00 Baseline does not apply	Aq Life Cold 2 Recreation ~~1a~~E Water Supply Agriculture	T=TVS (CS-I)°C D.O.=6.0 mg/l D.O.(sp)=7.0 mg/l pH=6.5-9.0 ~~F.Coli=200/100ml~~ E.Coli=126/100ml	NH_3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.011 CN=0.005	S=0.002 B=0.75 NO_2=0.05 NO_3=10 Cl=250 SO_4=WS	As(ac)=~~50(Trec)~~ 340 As(ch)=0.02-10 (Trec) As(ac)=50(Trec) Cd(ac)=TVS(tr) Cd(ch)=TVS CrIII(ac)=50(Trec) CrIII(ch)=TVS CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1000(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis) Hg(ch)=0.01(Tot) $Zn(ac)= 0.978e^{(0.8537[\ln(hardness)]+1.9467)}$ $Zn(ch)= 0.986e^{(0.8537[\ln(hardness)]+1.8032)}$	Ni(ac/ch)=TVS Se(ac/ch)=TVS Ag(ac)=TVS Ag(ch)=TVS(tr) ~~Zn(ac/ch)=TVS~~	

REGION: 3 AND 4 BASIN: **CLEAR CREEK** Stream Segment Description		DESIG	CLASSIFICATIONS	NUMERIC STANDARDS PHYSICAL and BIOLOGICAL	INORGANIC mg/l		METALS µg/l			TEMPORARY MODIFICATIONS AND QUALIFIERS
4.	Mainstem of West Clear Creek from the source to the confluence with Woods Creek.	9/30/00 Baseline does not apply	Aq Life Cold 1 Recreation ~~1a~~E Water Supply Agriculture	T=TVS (CS-I)ºC D.O.=6.0 mg/l D.O.(sp)=7.0 mg/l pH=6.5-9.0 ~~F.Coli=200/100ml~~ E.Coli=126/100ml	NH_3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.011 CN=0.005	S=0.002 B=0.75 NO_2=0.05 NO_3=10 Cl=250 SO_4=WS	As(ac)=~~50(Trec)~~ 340 As(ch)=0.02(Trec) Cd(ac)=TVS(tr) Cd(ch)=TVS CrIII(ac)=50(Trec) CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1000(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis) Hg(ch)=0.01(Tot)	Ni(ac/ch)=TVS Se(ac/ch)=TVS Ag(ac)=TVS Ag(ch)=TVS(tr) Zn(ac/ch)=TVS	
5.	Mainstem of West Clear Creek from the confluence with Woods Creek to the confluence with Clear Creek.	~~UP~~	Aq Life Cold 1 Recreation ~~1a~~E Agriculture	T=TVS (CS-I)ºC D.O.=6.0 mg/l D.O.(sp)=7.0 mg/l pH=6.5-9.0 ~~F.Coli=200/100ml~~ E.Coli=126/100ml	NH_3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.011 CN=0.005	S=0.002 B=0.75 NO_2=0.05	As(ac)=340 As(ch)=~~100~~7.6(Trec) Cd(ac)=TVS(tr) Cd(ch)=TVS CrIII(ac/ch)=TVS CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=1000(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Hg(ch)=0.01(Tot) Ni(ac/ch)=TVS Zn(ac)=$e^{(0.8404[\ln(hardness)]+1.8810)}$ Zn(ch)=$e^{(08404[\ln(hardness)]+1.5127)}$	Se(ac/ch)=TVS Ag(ac)=TVS Ag(ch)=TVS(tr)	
6.	All tributaries to West Clear Creek, including all ~~lakes, reservoirs and~~ wetlands, from the source to the confluence with Clear Creek, except for specific listings in Segments 7 and 8.	9/30/00 Baseline does not apply	Aq Life Cold 1 Recreation ~~1a~~E Water Supply Agriculture	T=TVS (CS-I)ºC D.O.=6.0 mg/l D.O.(sp)=7.0 mg/l pH=6.5-9.0 ~~F.Coli=200/100ml~~ E.Coli=126/100ml	NH_3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.011 CN=0.005	S=0.002 B=0.75 NO_2=0.05 NO_3=10 Cl=250 SO_4=WS	As(ac)=~~50(Trec)~~ 340 As(ch)=0.02(Trec) Cd(ac)=TVS(tr) Cd(ch)=TVS CrIII(ac)=50(Trec) CrIII(ch)=TVS CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1000(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis) Hg(ch)=0.01(Tot)	Ni(ac/ch)=TVS Se(ac/ch)=TVS Ag(ac)=TVS Ag(ch)=TVS(tr) Zn(ac/ch)=TVS	
7.	Mainstem of Woods Creek from the outlet of Upper Urad Reservoir to the confluence with West Clear Creek, including Lower Urad Reservoir.	UP	Aq Life Cold 2 Recreation 2N	T=TVS(CS-I/CL)ºC D.O.=6.0 mg/l D.O.(sp)=7.0 mg/l pH=6.0-9.0 ~~F.Coli=2000/100ml~~ E.Coli=630/100ml	NH_3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.011 CN=0.005	S=0.002 NO_2=0.05	$WQS_{WC} = ((Q_{WC} + Q_{WFCC}) \times WQS_{WFCC} - (Q_{WFCC} \times C_{WFCC}))/Q_{WC}$ WQS_{WC} = Water Quality Standards for Woods Creek Q_{WC} = Flow for Woods Creek Q_{WFCC} = Flow for West Fork Clear Creek WQS_{WFCC} = Water Quality Standards for West Fork Clear Creek C_{WFCC} = Ambient Concentration in West Fork Clear Creek			Standards shall be applied using the Segment 7 equation.
8.	Mainstem of Lion Creek from the source to the confluence with West Clear Creek.	UP	Aq Life Cold 2 Recreation ~~1a~~E	T=TVS(CS-I)ºC D.O. = 6.0 mg/l D.O. (sp)=7.0 mg/l pH = 3.0-9.0 ~~F.Coli=200/100ml~~ E.Coli=126/100ml						
9a.	Mainstem ~~to~~of the Fall River, including all tributaries~~, lakes, reservoirs~~ and wetlands, from the source to the confluence with Clear Creek.	9/30/00 Baseline does not apply	Aq Life Cold 1 Recreation ~~1a~~E Water Supply Agriculture	T=TVS (CS-I)ºC D.O. = 6.0 mg/l D.O. (sp)=7.0 mg/l pH = 6.5-9.0 ~~F.Coli=200/100ml~~ E.Coli=126/100ml	NH_3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.011 CN=0.005	S=0.002 B=0.75 NO_2=0.05 NO_3=10 Cl=250 SO_4=WS	As(ac)=~~50(Trec)~~ 340 As(ch)=0.02(Trec) Cd(ac)=TVS(tr) Cd(ch)=TVS CrIII(ac)=50(Trec) CrIII(ch)=TVS CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1000(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis) Hg(ch)=0.01(Tot)	Ni(ac/ch)=TVS Se(ac/ch)=TVS Ag(ac)=TVS Ag(ch)=TVS(tr) Zn(ac/ch)=TVS	Temporary modification: Cu(ch)=9.6 µg/l (dis), (type iii) Expiration date of 7/01/2014.
9b.	Mainstem of Trail Creek, including all tributaries~~,~~ ~~lakes, reservoirs,~~ and wetlands from the source to the confluence with Clear Creek.	9/30/00 Baseline does not apply	Aq Life Cold 1 Recreation ~~1a~~E Water Supply Agriculture	T=TVS (CS-I)ºC D.O.=6.0 mg/l D.O.(sp)=7.0 mg/l pH=6.5-9.0 ~~F.Coli =200/100ml~~ E.Coli=126/100ml	NH_3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.011 CN=0.005	S=0.002 B=0.75 NO_2=0.05 SO_4=WS NO_3=10 Cl=250	As(ac)=~~50(Trec)~~ 340 As(ch)=0.02(Trec) Cd(ac)=TVS(tr) Cd(ch)=TVS CrIII(ac)=50(Trec) CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1000(Trec) Pb(ac/ch)=TVS Mn(ac/ch) = TVS Mn(ch)=WS(dis) Hg(ch)=0.01(Tot)	Ni(ac/ch)=TVS Se(ac/ch)=TVS Ag(ac)=TVS Ag(ch)=TVS(tr) Zn(ac)=TVS Zn(ch)=200	
10.	Mainstem of Chicago Creek, including all tributaries~~, lakes, reservoirs~~ and wetlands, from the source to the confluence with Clear Creek, except for specific listings in Segment 19.	9/30/00 Baseline does not apply	Aq Life Cold 1 Recreation ~~1a~~E Water Supply Agriculture	T=TVS (CS-I)ºC D.O. = 6.0 mg/l D.O. (sp)=7.0 mg/l pH = 6.5-9.0 ~~F.Coli=200/100ml~~ E.Coli=126/100ml	NH_3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.011 CN=0.005	S=0.002 B=0.75 NO_2=0.05 NO_3=10 Cl=250 SO_4=WS	As(ac)=~~50(Trec)~~ 340 As(ch)=0.02(Trec) Cd(ac)=TVS(tr) Cd(ch)=TVS CrIII(ac)=50(Trec) CrIII(ch)=TVS CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1000(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis) Hg(ch)=0.01(Tot)	Ni(ac/ch)=TVS Se(ac/ch)=TVS Ag(ac)=TVS Ag(ch)=TVS(tr) Zn(ac/ch)=TVS	

~~*REFER TO STATEMENT OF BASIS AND PURPOSE~~

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS

REGION: 3 AND 4 BASIN: **CLEAR CREEK** Stream Segment Description	DESIG	CLASSIFICATIONS	NUMERIC STANDARDS PHYSICAL and BIOLOGICAL	INORGANIC mg/l		METALS µg/l			TEMPORARY MODIFICATIONS AND QUALIFIERS
11. Mainstem of Clear Creek from a point just above the Argo Tunnel discharge to the Farmers Highline Canal diversion in Golden, Colorado.	UP	Aq Life Cold 1 Recreation ~~1a~~E Water Supply Agriculture	T=TVS (CS-I)ºC D.O. = 6.0 mg/l D.O. (sp)=7.0 mg/l pH = 6.5-9.0 ~~F.Coli=200/100ml~~ E.Coli=126/100ml	NH_3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.011 CN=0.005	S=0.002 B=0.75 NO_2=0.05 NO_3=10 Cl=250 SO_4=WS	As(ac)=~~50(Trec)~~ 340 As(ch)=0.02(Trec) Cd(ac/ch)=TVS CrIII(ac)=50(Trec) CrVI(ac/ch)=TVS Cu(ch)=17	Fe(ch)=WS(dis) Fe(ch)=1000(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis) Hg(ch)=0.01(Tot) Zn(ac)= $0.978e^{(0.8537[\ln(hardness)]+1.9467)}$ Zn(ch)= $0.986e^{(0.8537[\ln(hardness)]+1.8032)}$	Ni(ac/ch)=TVS Se(ac/ch)=TVS Ag(ac)=TVS Ag(ch)=TVS(tr) ~~Zn(ch)=300~~	Temporary modification: ~~Zn(ch)=325 µg/l (dis),~~ Cd(ch)=1.42 µg/l (dis), (type iii) Expiration date of 7/01/2014.
12. All tributaries to Clear Creek, including all ~~lakes. reservoirs and~~ wetlands, from the Argo Tunnel discharge to the Farmers Highline Canal diversion in Golden, Colorado, except for specific listings in Segments 13a and 13b.	~~UP~~ 9/30/00 Baseline does not apply	Aq Life Cold 2 Recreation ~~1a~~E Water Supply Agriculture	T=TVS(CS-II) ºC D.O. = 6.0 mg/l D.O. (sp)=7.0 mg/l pH = 6.5-9.0 ~~F.Coli=200/100ml~~ E.Coli=126/100ml	NH_3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.011 CN=0.005	S=0.002 B=0.75 NO_2=0.05 NO_3=10 Cl=250 SO_4=WS	As(ac)=~~50(Trec)~~ 340 As(ch)=0.02-10(Trec) Cd(ac)=TVS(tr) Cd(ch)=TVS CrIII(ac)=50(Trec)CrVI(ac/ch)=TVSCu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1000(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis) Hg(ch)=0.01(Tot)	Ni(ac/ch)=TVS Se(ac/ch)=TVS Ag(ac)=TVS Ag(ch)=TVS(tr) Zn(ac/ch)=TVS	
13a. Mainstem of North Clear Creek, including all tributaries and wetlands, from its source to its confluence with Chase Gulch. and Four Mile Gulch~~,~~ including all tributaries~~, lakes, reservoirs~~ and wetlands~~,~~ from their sources to ~~the lowest water supply intake located in each stream and Chase Gulch including all tributaries, lakes, reservoirs and wetlands from its source to the~~ their confluence with North Clear Creek and Eureka Gulch, including all tributaries and wetlands, from its source to its confluence with Gregory Gulch.	9/30/00 Baseline does not apply	Aq Life Cold 1 Recreation ~~1a~~E Water Supply Agriculture	T=TVS (CS-I)ºC D.O. = 6.0 mg/l D.O.(sp)=7.0 mg/l pH = 6.5-9.0 ~~F.Coli=200/100ml~~ E.Coli=126/100ml	NH_3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.011 CN=0.005	S=0.002 B=0.75 NO_2=0.05 NO_3=10 Cl=250 SO_4=WS	As(ac)=~~50(Trec)~~ 340 As(ch)=0.02(Trec) Cd(ac)=TVS(tr) Cd(ch)=TVS CrIII(ac)=50(Trec) CrIII(ch)=TVS CrVI(ac/ch)=TVS	Cu(ac/ch)=TVS Fe(ch)=WS(dis) Fe(ch)=1000(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis) Hg(ch)=0.01(Tot)	Ni(ac/ch)=TVS Se(ac/ch)=TVS Ag(ac)=TVS Ag(ch)=TVS(tr) Zn(ac/ch)=TVS	
13b. Mainstem of North Clear Creek including all tributaries~~, lakes, reservoirs~~ and wetlands from ~~the source~~ a point just below the confluence with Chase Gulch to the confluence with Clear Creek, except for the specific listings in ~~s~~Segment 13a.	UP	Aq Life Cold 2 Recreation ~~1a~~E Agriculture	T=TVS (CS-I)ºC D.O. = 6.0 mg/l D.O. (sp)=7.0 mg/l pH = 6.5-9.0 ~~F.Coli=200/100ml~~ E.Coli=126/100ml	NH_3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.011 CN=0.005	S=0.002 B=0.75 NO_2=0.05	As(ac)=340 As(~~ac~~ch)=100 (Trec) Cd(ac)=TVS(tr) Cd(ch)=TVS CrIII(ac)=50(Trec) CrVI(ac/ch)=TVS	Cu(ch)=64 Fe(ch)=5400(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Hg(ch)=0.01(Tot)	Ni(ac/ch)=TVS Se(ac/ch)=TVS Ag(ac)=TVS Ag(ch)=TVS(tr) Zn(ch)=740	Temporary modifications: Cd(ch)=4.7 µg/l (dis), Mn(ch)=3841 µg/l (dis), Zn(ch)=1582 µg/l (dis), Fe(~~trec~~ch)=7941 (Trec), T=current condition (type iii) Expiration date of 7/01/2014.
14a. Mainstem of Clear Creek from the Farmers Highline Canal diversion in Golden, Colorado to the Denver Water conduit #16 crossing.	UP	Aq Life Warm 2 Recreation ~~2~~N Water Supply Agriculture	T=TVS (WS-II)ºC D.O.= 5.0 mg/l pH = 6.5-9.0 ~~F.Coli=2000/100ml~~ E.Coli=630/100ml	NH_3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.011 CN=0.005	S=0.002 B=0.75 NO_2=0.5 NO_3=10 Cl=250 SO_4=WS	As(ac)=~~50(Trec)~~ 340 As(ch)=0.02-10(Trec) Cd(ac/ch)=TVS CrIII(ac)=50(Trec) CrVI(ac/ch)=TVS Cu(ac/ch)=TVS~~X3.66*~~	Fe(ch)=WS(dis) Fe(ch)=1000(Trec) Pb(ac/ch)=TVS Mn(ac)=TVS Mn(ch)=~~500~~ 244 Hg(ch)=0.01(tot) Ni(ac/ch)=TVS	Se(ac/ch)=TVS Ag(ac/ch)=TVS Zn(ac/ch)=TVS~~X~~ x1.57*	Temporary modifications: Cu(ac/ch)=TVSx3.66*, T=current condition (type iii) Expiration date of 12/31/2014.
14b. Mainstem of Clear Creek from the Denver Water conduit #16 crossing to a point just below Youngfield Street in Wheat Ridge, Colorado.	UP	Aq Life Warm 2 Recreation ~~1a~~E Water Supply Agriculture	T=TVS (WS-II)ºC D.O.= 5.0 mg/l pH = 6.5-9.0 ~~F.Coli=200/100ml~~ E.Coli=126/100ml	NH_3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.011 CN=0.005	S=0.002 B=0.75 NO_2=0.5 NO_3=10 Cl=250 SO_4=WS	As(ac)=~~50(Trec)~~ 340 As(ch)=0.02-10(Trec) Cd(ac/ch)=TVS CrIII(ac)=50(Trec) CrVI(ac/ch)=TVS Cu(ac/ch)=TVS~~X3.66*~~	Fe(ch)=WS(dis) Fe(ch)=1000(Trec) Pb(ac/ch)=TVS Mn(ac)=TVS Mn(ch)=~~500~~244 Hg(ch)=0.01(tot) Ni(ac/ch)=TVS	Se(ac/ch)=TVS Ag(ac/ch)=TVS Zn(ac/ch)=TVS~~X~~ x1.57*	Temporary modifications: Cu(ac/ch)=TVSx3.66*, T=current condition (type iii) Expiration date of 12/31/2014.

* TVS x (times) the FWER (final water effect ratio) = site-specific standard or value of temporary modification.

COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT

Water Quality Control Commission

REGULATION NO. 31 - THE BASIC STANDARDS AND METHODOLOGIES FOR SURFACE WATER

5 CCR 1002-31

[Editor's Notes follow the text of the rules at the end of this CCR Document.]

31.1 AUTHORITY AND SCOPE

This regulation is promulgated pursuant to 25-8-101 et seq., and in particular, 25-8-203 and 25-8-204, C.R.S. It provides basic standards, an antidegradation rule and implementation process, and a system: for classifying state surface waters; for assigning water quality standards; for granting temporary modifications and for periodic review of the classifications and standards.

31.2 PURPOSE

This regulation establishing basic standards and an antidegradation rule and implementation process and establishing a system for classifying state surface waters, for assigning standards, and for granting temporary modifications (hereinafter referred to as "Regulation") is the foundation for the classification of the state surface waters of Colorado, as prescribed by the Colorado Water Quality Control Act.

It is intended to implement the state Act by maintaining and improving the quality of the state surface waters. This regulation is based on the best available knowledge to insure the suitability of Colorado's waters for beneficial uses including public water supplies, domestic, agricultural, industrial and recreational uses, and the protection and propagation of terrestrial and aquatic life.

It is further intended to be consistent with the 1983 and 1985 goals and objectives of the federal Act. This regulation shall be constructed in a manner consistent with these purposes and shall be considered part of the implementation of the 1983 and 1985 goals and objectives.

31.3 INTRODUCTION

This regulation presents a classification system which establishes beneficial use categories together with basic standards (section 31.11), an antidegradation rule (section 31.8), and numeric tables which define the conditions generally necessary to maintain and attain such beneficial uses. In addition, it establishes procedures for classifying the waters of the state, for assigning water quality standards, and for continued review of the classifications and standards.

The classifications set forth in section 31.13 will be assigned by applying the system to specific state surface waters, in accordance with proper procedures, including public hearings. The basic standards and the antidegradation rule will apply to all state surface waters at the effective date of this regulation. Whenever a specific stream segment or body of water receives a classification for one or more of the uses, additional numeric standards may be assigned. When appropriate, achieving water quality standards through innovative solutions or management approaches may be implemented through control regulations, TMDLs, Waste Load Allocations, antidegradation reviews, and permits. All classified uses will be protected. This does not mean that any entity has the right to rely on the presence of specific pollutants in the stream even though those pollutants may be utilized by the entity.

In assigning classifications and standards, the Commission shall take into consideration the water quality classifications and standards of downstream waters and shall ensure that as implemented through its policies, the water quality classifications and standards of downstream waters will be attained and maintained.

Water quality standards, temporary modifications of numeric standards, and classifications shall be reviewed at least once every three (3) years and revised where appropriate. No provisions of this regulation shall be interpreted so as to supersede, abrogate, or impair rights to divert water and apply water to beneficial uses..

31.4 DELETED

31.5 DEFINITIONS

See the Colorado Water Quality Control Act, section 25-8-101 et seq., C.R.S., and the codified water quality regulations additional definitions.

(1) "ACT" means the Colorado Water Quality Control Act, section 25-8-101 et seq., C.R.S..

(2) "ACUTE STANDARD" means the level not to be exceeded by the concentration for either a single sample or calculated as an average of all samples collected during a one-day period, except for temperature, which shall be based on the DM (see DM definition). As used in tables II and III, acute represents one-half of the LC-50 that protects 95 percent of the genera in a waterbody from lethal effects. The acute standard is implemented in combination with a selected duration and frequency of recurrence (section 31.9(1)). In determining attainment of the applicable acute standard, the representative nature of the data must be considered.

(3) "ANTIDEGRADATION RULE" means the rule established in section 31.8.

(4) "BASIC STANDARDS" means those standards as established in section 31.11.

(5) "BENEFICIAL USES" means those uses of state surface waters to be protected such as those identified in the classification system.

(6) "BMP" (Best Management Practices) means a practice or a combination of practices that is determined by a governmental agency after problem assessment, examination of alternative practices, and appropriate public participation, to be the most effective, practicable (including technological, economic, and institutional considerations) means of preventing or reducing the amount of pollution generated by nonpoint sources to a level compatible with quality goals.

(7) "CHRONIC STANDARD" means the level not to be exceeded by the concentration for either a single representative sample or calculated as an average of all samples collected during a thirty-day period, except for temperature, which shall be based on the WAT (see WAT definition). As used in tables II and III, chronic represents the level that protects 95 percent of the genera from chronic toxic effects. Chronic toxic effects include, but are not limited to, demonstrable abnormalities and adverse effects on survival, growth, or reproduction. The chronic standard is implemented in combination with a selected duration and frequency of recurrence (section 31.9(1)). In determining attainment of the applicable chronic standard, the representative nature of the data must be considered.

(8) "COLD WATER BIOTA" means aquatic life, including trout, normally found in waters where the summer weekly average temperature does not frequently exceed 20 ºC.

(9) "COMMISSION" means the Colorado Water Quality Control Commission.

(10) “COMPENSATORY WETLANDS” means wetlands developed for mitigation of adverse impacts to other wetlands (e.g. wetlands developed pursuant to section 404 of the federal Act).

(11) “CONSTRUCTED WETLANDS” means those wetlands intentionally designed, constructed and operated for the primary purpose of wastewater or stormwater treatment or environmental remediation provided under CERCLA, RCRA, or section 319 of the federal Act, if (a) such wetlands are constructed on non-wetland sites that do not contain surface waters of the state, or (b) such wetlands are constructed on previously existing wetland sites, to the extent that approval or authorization under section 404 of the federal Act has been granted for such construction or it is demonstrated that such approval or authorization is not, or was not, required. This term includes, but is not limited to, constructed swales, ditches, culverts, infiltration devices, catch basins, and sedimentation basins that are part of a wastewater or stormwater treatment system or a system for environmental remediation mandated under CERCLA or RCRA. Compensatory wetlands shall not be considered constructed wetlands. Constructed wetlands are not state waters.

(12) “CREATED WETLANDS” means those wetlands other than compensatory wetlands created in areas which would not be wetlands in the absence of human modifications to the environment. Created wetlands include, but are not limited to wetlands created inadvertently by human activities such as mining, channelization of highway runoff, irrigation, and leakage from man-made water conveyance or storage facilities. Wetlands resulting from hydrologic modifications such as on-channel reservoirs or on-channel diversion structures that expand or extend the reach of adjacent classified state waters are not considered created wetlands.

(13) “DAILY MAXIMUM TEMPERATURE (DM)” means the highest two-hour average water temperature recorded during a given 24-hour period.

(14) “DISSOLVED METALS” means that portion of a water and suspended sediment sample which passed through a 0.40 or 0.45 µm (micron) membrane filter. Determinations of “dissolved” constituents are made using the filtrate. This may include some very small (colloidal) suspended particles which passed through the membrane filter as well as the amount of substance present in true chemical solution.

(15) “DIVISION” means the Division of Administration of the Colorado Department of Public Health and Environment of which the Water Quality Control Division is a part.

(16) “*E. coli*” means *Escherichia coli*.

(17) “EFFLUENT-DEPENDENT STREAM” means a stream that would be ephemeral without the presence of wastewater effluent, but has continuous or periodic flows for all or a portion of its reach as the result of the discharge of treated wastewater.

(18) “EFFLUENT-DOMINATED STREAM” means a stream that would be intermittent or perennial without the presence of wastewater effluent whose flow for the majority of the time is primarily attributable to the discharge of treated water (i.e. greater than 50 percent of the flow consists of treated wastewater for at least 183 days annually, for eight out of the last ten years).

(19) “EPHEMERAL STREAM” means a stream channel or reach of a stream channel that carries flow during, and for a short duration as the result of, precipitation events or snowmelt. The channel bottom is always above the groundwater table.

(20) "EXISTING QUALITY" means the numeric value that represents the quality of a waterbody and is generally used for comparison with the water quality standard. Existing quality shall be calculated as:

- Total ammonia, nitrate, and the dissolved metals: 85th percentile
- Total recoverable metals: 50th percentile
- Dissolved oxygen in streams: 15^{th} percentile
- *E. coli:* geometric mean
- pH: the range between the 15th and 85th percentiles
- Temperature: For the purposes of determining standards attainment, existing quality is the seasonal maximum DM (acute) and WAT (chronic) which allows one warming event with a 3-year average exceedance frequency. For data records with less than or equal to 3 years, existing quality is equal to the maximum WAT and DM. For data records with 4-6 years, one warming event above the standard is permitted. The warming event allowance is described in Footnote 5(c)(ii) to Table I.

  For the purposes of permits implementation, for data records with less than or equal to 3 years of representative upstream data, existing quality is equal to the seasonal or monthly maximum DM (acute) and WAT (chronic). For data records with 4-6 years, for monthly limits, the second highest monthly DM or WAT may be selected for one month in either winter or summer and the remaining months shall be the max DM or WAT.

(21) "FEDERAL ACT" means the Clean Water Act, U.S.C. Section 1251 <u>et seq</u>., as amended.

(22) "FIRST (1st) ORDER STREAM" means a stream that has no tributaries, based on USGS mapping at 1:100,000 scale.

(23) "FLOODPLAIN" means any flat or nearly flat lowland that borders a stream, a lake, or an on-channel reservoir and that may be covered by its waters at flood or high stage as described by the parameter of the probable maximum flood or probable maximum high stage.

(24) "HIGHEST ATTAINABLE USE" means the modified use that is both closest to the uses specified in section 31.13 and attainable based on the evaluation of the factors in 31.6(2)(b) that preclude attainment of the use and any other information or analyses that were used to evaluate attainability.

(25) "LC-50" means the concentration of a parameter that is lethal to 50% of the test organisms within a defined time period.

(26) "MAXIMUM WEEKLY AVERAGE TEMPERATURE (MWAT)" means the largest WAT in the period of interest. For lakes and reservoirs, the summertime MWAT is assumed to be equivalent to the maximum WAT from at least three profiles distributed throughout the growing season (generally July-September).

(27) "MIXED LAYER" means that part of a lake that is well-mixed by wind action and can be expected to have relatively homogeneous physical and chemical conditions. In a thermally stratified lake, the mixed layer corresponds to the *epilimnion*; in an unstratified lake, the mixed layer extends to the bottom. The vertical extent of the mixed layer usually is determined by inspection of a vertical profile of temperature.

(28) “MIXING ZONE” means that area of a waterbody designated on a case-by-case basis by the Division which is contiguous to a point source and in which certain standards may not apply.

(29) “NUMERIC VALUE” means the measured concentration of a parameter.

(30) “PARAMETER” means the chemical constituents or other characteristics of the water such as algae, *E. coli*, total dissolved solids, dissolved oxygen, or the magnitude of radioactivity levels, temperature, pH, and turbidity, or other relevant characteristics.

(31) “PERMIT” means a National Pollutant Discharge Elimination System (NPDES) permit, a Colorado Discharge Permit System (CDPS) permit, or other state water quality permit.

(32) “POTENTIALLY DISSOLVED METALS” means that portion of a constituent measured from the filtrate of a water and suspended sediment sample that was first treated with nitric acid to a pH of less than 2.0 and let stand for 8 to 96 hours prior to sample filtration using a 0.4 or 0.45 µm (micron) membrane filter. Note the “Potentially Dissolved” method cannot be used where nitric acid will interfere with the analytical procedure used for the constituent measured.

(33) “PRIMARY CONTACT RECREATION” means recreational activities where the ingestion of small quantities of water is likely to occur. Such activities include but are not limited to swimming, rafting, kayaking, tubing, windsurfing, water skiing, and water play by children.

(34) “REGIONAL WASTEWATER MANAGEMENT PLAN” means a water quality planning document prepared pursuant to section 208 of the federal Act, sometimes referred to as “208 Plans” or “Water Quality Management Plans.”

(35) “REPRODUCTIVE SEASON” means the portion of the year when fish migration, spawning, egg incubation, fry rearing or other reproductive functions occur.

(36) “SALINITY” means total dissolved solids (TDS).

(37) “SECOND (2nd) ORDER STREAM” means a stream which begins downstream of the confluence of two first (1st) order streams and ends downstream of the confluence of two second (2nd) order streams, based on USGS mapping at 1:100,000 scale.

(38) “STANDARD” means a narrative and/or numeric restriction established by the Commission applied to state surface waters to protect one or more beneficial uses of such waters. Whenever only numeric or only narrative standards are intended, the wording shall specifically designate which is intended.

(39) “STATE WATERS” means any and all surface and subsurface waters which are contained in or flow in or through this state, but does not include waters in sewage systems, waters in treatment works of disposal systems, waters in potable water distribution systems, and all water withdrawn for use until use and treatment have been completed.

(40) “STATUS QUO”, in the context of temporary modifications, means the numeric values representative of the conditions at the time of the original temporary modification adoption for:

1. the quality of a waterbody, for which a temporary modification is applied, and

2. the quality, and as appropriate the flow and loading, of effluent discharged into a waterbody, for which a temporary modification is applied.

Status quo shall be calculated as follows using data representative of quality at the time of the original temporary modification adoption, typically using data for the 5 years leading up to the temporary modification. Where such adequate, representative data do not exist, data representative of quality as close in time as practicable to the original temporary modification adoption shall be used.

For consideration of waterbody status quo:

- Total ammonia, nitrate, and dissolved metals (chronic): 85th percentile
- Total recoverable metals (chronic): 50th percentile
- Total ammonia, nitrate, total metals, and dissolved metals (acute): 95th percentile
- Temperature: seasonal maximum DM (acute) and WAT (chronic)
- Other parameters: As appropriate based on the duration and frequency for the water quality standard from Tables I, II, or III
- Or, in limited circumstances, as otherwise determined by the Commission on a case-by-case basis

For consideration of effluent status quo:

- Total ammonia, nitrate, and dissolved and total recoverable metals (chronic): maximum 30-day average
- Total ammonia, nitrate, and dissolved and total recoverable metals (acute): maximum daily maximum
- Temperature: seasonal maximum DM (acute) and WAT (chronic)
- Other parameters: As appropriate based on permit implementation approaches of the water quality standard from Tables I, II, or III
- Representative effluent flow and loading, as appropriate
- Or, in limited circumstances, as otherwise determined by the Commission on a case-by-case basis

(41) “TABLES” means tables I, II, and III, appended to this regulation, which set forth accepted levels for various parameters which will generally protect the beneficial uses of state surface waters.

(42) “THIRD (3rd) ORDER STREAM” means a stream which begins at the confluence of two second (2nd) order streams and ends downstream of the confluence of two third (3rd) order streams, based on USGS mapping at 1:100,000 scale.

(43) “TOTAL RECOVERABLE METALS” means that portion of a water and suspended sediment sample measured by the total recoverable analytical procedure described in “Methods for Chemical Analysis of Water and Wastes,” U.S. Environmental Protection Agency, March, 1979, or its equivalent.

(44) "TRIBUTARY WETLANDS" means wetlands that are the headwaters of surface waters or wetlands within the floodplain that are hydrologically connected to surface waters via either surface or groundwater flows. The hydrologic connection may be intermittent or seasonal, but must be of sufficient extent and duration to normally reoccur annually. Tributary wetlands do not include constructed or created wetlands.

(45) "USE ATTAINABILITY ANALYSIS" means an assessment of the factors affecting the attainment of aquatic life uses or other beneficial uses, which may include physical, chemical, biological, and economic factors.

(46) "USES" see Beneficial Uses.

(47) "WARM WATER BIOTA" means aquatic life normally found in waters where the summer weekly average temperature frequently exceeds 20 °C.

(48) "WATER QUALITY-BASED DESIGNATION" means a designation adopted by the Commission for specific state surface waters pursuant to section 31.8(2), to identify which level of water quality protection such waters will receive under the Antidegradation Rule in section 31.8(1). Such designations are adopted pursuant to the Commission's authority to classify state waters, as set forth in section 25-8-203, C.R.S., and the procedural requirements for classifying state waters shall be applied in adopting such designations.

(49) "WATER EFFECT RATIO" means a ratio that is computed as a specific pollutant's acute or chronic toxicity value measured in water from the site covered by a standard, divided by the respective acute or chronic toxicity value in laboratory dilution water, as more specifically defined in 40 CFR. subsection 131.36(c) (1993).

(50) "WATER QUALITY STANDARD" see Standard.

(51) "WEEKLY AVERAGE TEMPERATURE (WAT)" means the average of daily average temperatures over a seven-day consecutive period, with a minimum of three data points spaced equally through each day. For lakes and reservoirs, the WAT is assumed to be equivalent to the average temperature of the mixed layer. The average temperature of the mixed layer is determined from a vertical profile of equally-spaced temperature measurements, separated by not more than one meter.

(52) "WETLANDS" means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

31.6 PROCESS FOR ASSIGNING CLASSIFICATIONS

The Commission is responsible for classifying state waters as set forth in sections 25-8-202(1)(a), and 25-8-203, C.R.S. All state surface waters may be classified in one or more of the use classifications as set forth in section 31.13.

Waters shall be classified for the present beneficial uses of the water, or the beneficial uses that may be reasonably expected in the future for which the water is suitable in its present condition or the beneficial uses for which it is to become suitable as a goal. The assignment of one or more classifications to a portion of the state surface waters is based upon its current suitability for the designated uses or goals for future uses. Where the use classification is based upon a future use for which the waters are to become suitable, the numeric standards assigned to such waters to protect the use classification may require a temporary modification to the underlying numeric standard and an implementation plan for eliminating the temporary modification.

When assigning classifications to waters of a given area, the Commission will consider the goals, objectives, and requirements of federal and state statutes and regulations, recommendations of the regional wastewater management plans (208 plans); 208 plans of adjoining regions; testimony, comments, and documents presented at public hearings on the issue; and other relevant information.

(1) Considerations in Assigning Classifications

The following will serve to guide the Commission in assigning classifications:

(a) Classifications should be directed towards the realization of the water quality goals as set forth in the federal and state Acts.

(b) It is state law and policy to prevent any water quality degradation that can interfere with present uses.

(c) Upstream classifications must not jeopardize downstream classifications or actual uses.

(d) Classification must protect all current classified and actual uses, unless it is determined after a public hearing that downgrading is justifiable. (See section 31.6(2)(b)).

(e) Classifications should be for the highest water quality attainable. Attainability is to be judged by whether or not the use classification can be attained in approximately twenty (20) years by any recognized control techniques that are environmentally, economically, and socially acceptable as determined by the Commission after public hearings. At a minimum, uses are deemed attainable if they can be achieved by the imposition of effluent limits required under the federal Act for point sources and cost-effective and reasonable best management practices for nonpoint source control, in accordance with duly adopted regulations.

(f) Relevant physical, chemical and biological characteristics are valid water quality concerns that may be taken into account in the classification process.

(2) Upgrading and Downgrading

(a) <u>Upgrading</u>

The state shall maintain those water use classifications which are currently being attained. Where existing classifications specify fewer designated water uses than those which are presently being attained, the Commission shall upgrade the designated classification to reflect the uses actually being attained.

(b) <u>Downgrading</u>

At a minimum, the state shall maintain those water use classifications currently designated, unless it can be demonstrated that the existing classification is not presently being attained and cannot be attained within a twenty (20) year time period. Nonattainability must be due to at least one or more of the following conditions:

(i) Naturally occurring pollutant concentrations prevent the attainment of the use within a twenty (20) year period; or

(ii) Natural, ephemeral, intermittent or low flow conditions or water levels prevent the attainment of the use, unless these conditions may be compensated for by the discharge of sufficient volume of effluent discharges without violating state water conservation requirements to enable uses to be met; or

(iii) Human caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied within a twenty (20) year period or would cause more environmental damage to correct than to leave in place; or

(iv) Dams, diversions or other types of hydrologic modifications preclude the attainment of the use, and it is not feasible to restore the waterbody to its original condition or to operate such modification in a way that would result in the attainment of the use; or

(v) Physical conditions related to the natural features of the waterbody, such as the lack of a proper substrate, cover, flow, depth, pools, riffles, and the like, unrelated to water quality, preclude attainment of aquatic life protection uses; or

(vi) Controls more stringent than those required by section 301(b) and 306 of the federal Act would result in substantial and widespread economic and social impact; or

(vii) Agricultural practices which are considered satisfactory for the locality. It must be demonstrated that these agricultural practices preclude the present classifications. Satisfactory practices will be approved by the Commission based on evidence from areawide 208 agencies, soil conservation districts, agricultural extension services and other public input.

An additional reason for revising classifications will be where previous classifications had no basis in fact and did not reflect actual beneficial uses. Such corrections to classifications shall not be considered downgrading. See e.g., section 31.6(3)(b) regarding hearings pursuant to section 25-8-207, C.R.S.

(3) Procedures for Assigning or Changing Classifications

(a) General

(i) Assigning or changing a classification shall be accomplished by rule after a rulemaking hearing. Rulemaking hearings to consider a classification will be conducted according to the Procedural Regulations of the Commission. At a minimum, the Commission shall review classifications once every three years. Any interested person have shall have the right to petition the Commission to assign or change a stream classification. Such petition shall be open to the public inspection. Except as provided below, pursuant to section 24-4-103(7), C.R.S., action on such petition shall be within the discretion of the Commission. The Commission may also decide to consider a classification on its own motion.

(ii) In making a decision regarding a proposed classification, the Commission will consider the principles set forth in this regulation. The decision will be made by the Commission applying its expertise after analyzing the evidence presented at public hearing and considering the requirements of law, its own policies, and all other matters deemed pertinent in the discretion of the Commission.

(iii) Where the classifications of a waterbody segment do not include an aquatic life classification or recreation class E, P, or U, as a part of the triennial review of the segment the Division shall review any prior use attainability analyses or other basis for omission of one or more of the above classified uses. If the justification for the omission is determined not to be consistent with accepted use attainability procedures, the Division or other party, if any, advocating the omission shall perform a supplemental analysis to provide a basis for a Commission determination whether such uses are attainable. When the Commission wishes to remove an aquatic life class 1 or 2 or recreation class E, P, or U classification, the Division shall conduct or the Commission shall require the petitioner to conduct, in consultation with the Division, a use attainability analysis to justify the proposed change.

(b) Section 25-8-207

(i) Procedural requirements relating to reviews pursuant to section 25-8-207, C.R.S., are set forth in the Procedural Regulations, Regulation No. 21, 5 CCR 1002-21.

(ii) The Commission shall, upon petition, or upon its own motion, review existing stream standards, classifications or water quality designations in subsection (iii) below. The Commission may revise stream standards, classifications and designations pursuant to the criteria listed in subsection (iv) below.

(iii) The Commission shall make a finding of inconsistency, taking into account sections 25-8-102 and 25-8-104, C.R.S., if a water quality designation does not conform with the provisions of section 25-8-209 or if the existing use classification(s) or water quality standards:

(A) are more stringent than is necessary to protect fish life, shellfish life, and wildlife in waterbody segments which are reasonably capable of sustaining such fish life, shellfish life, and wildlife from the standpoint of physical, streambed, flow, habitat, climatic and other pertinent characteristics. Where such characteristics are adequate to support the use, use classifications shall be adopted or retained to protect aquatic life which constitutes a significant source of food supply for the fish, shellfish, or wildlife that is the basis for the classified use; or

(B) were adopted based upon material assumptions that were in error or no longer apply.

(iv) As a result of any hearing held pursuant to this section, the Commission may revise or change use classifications, water quality standard(s) or water quality designations in accordance with the criteria contained in the Act or whenever necessary to insure compliance with the other provisions of this regulation.

(v) Where the Commission determines that an inconsistency exists, it shall declare the inconsistent classification, standards or designations void ab initio and shall simultaneously establish appropriate classifications, standards or designations.

(4) Segmentation

(a) For purposes of adopting site-specific classifications and water quality standards, the streams and other surface water bodies shall be identified according to river basin and/or subbasin and specific water segments.

(b) Segments may constitute a specified stretch of a river mainstem, a specific tributary, a specific lake or reservoir, or a generally defined grouping of waters within the basin (e.g., a specific mainstem segment and all tributaries flowing into that mainstem segment).

(c) Segments shall generally be delineated according to the points at which the use, physical characteristics or water quality characteristics of a watercourse are determined to change significantly enough to require a change in use classifications and/or water quality standards. In many cases, such transition points can be specifically identified from available water quality data. In other cases, however, the delineation of segments shall be based upon best judgments of where instream changes in uses, physical characteristics or water quality occur, based upon upstream and downstream data.

(d) Segment descriptions, unless specified by the Commission, are to mean that any boundary reference other than those that begin at the "source" means to be "immediately above" that reference.

31.7 PROCESS FOR ASSIGNING STANDARDS AND GRANTING, EXTENDING, OR REMOVING TEMPORARY MODIFICATIONS AND VARIANCES

Overview: Assigning or changing a standard or granting, removing before its expiration, or extending a temporary modification or variance shall be accomplished by a rule after a rulemaking hearing. The procedures for taking such action shall be the same as the procedures for assigning or changing classifications. See section 31.6(3)(a)(i).

(1) Assigning Standards

The Commission is responsible for promulgating water quality standards as set forth in section 25-8-204, C.R.S. Standards may be narrative and/or numeric and include the following:

(a) Basic Standards

The basic standards in section 31.11 shall apply to all state surface waters at the effective date of the regulation.

(b) Numeric Standards

A numeric standard may be assigned by the Commission either to apply on a statewide basis or to specific state surface waters. A numeric standard will be assigned by the Commission when it is presented with evidence that a particular numeric level for a parameter is the suitable limit for protecting the classified use. A numeric standard consists of a numeric level and may include a description as to how that numeric level is to be measured. Numeric standards will include appropriate averaging periods and appropriate frequencies of allowed excursions. A numeric standard may be exceeded due to temporary natural conditions such as unusual precipitation patterns, spring runoff or drought. Such uncontrollable conditions are not cause for changing the numeric standard.

A temporary modification of a numeric standard may be granted by the Commission if the numeric standard is not being met at the present time, but such numeric standard is necessary to allow the full attainment of the classified use.

Numeric standards will be assigned based on the evidence presented at the classification and numeric-standard-setting hearings. Numeric standards may not necessarily be assigned for all constituents listed in the tables. In making this determination, the Commission will consider the likelihood of such constituents being present in the waters in question naturally or due to point or nonpoint sources, and shall consider the significance of the constituents with respect to protection of the classified uses. Entities having specific water quality data for the waters being classified, such as 208 agencies, local municipalities and industries, and citizens' groups, the Water Quality Control Division, state and federal agencies, environmental organizations, and other interested persons are encouraged to present such information.

The Commission may use any of the following approaches to establish site-specific numeric standards, as it determines appropriate with respect to specific state surface waters. Existing site-specific standards shall remain in effect until superseded by revised standards promulgated pursuant to this section:

(i) Table Value Standards

The Commission may apply the numeric levels set forth in tables I, II, and III as site-specific standards when those levels are determined to be appropriate to protect the applicable classified uses, and the available site-specific information does not indicate that one of the following alternative approaches to numeric standards would be more appropriate. Acute and chronic standards may be adopted. Numeric standards may not necessarily be assigned for all constituents listed in the tables. Standards for metals may be established by site-specific adoption of the hardness-dependent equations in table III, instead of single-value numeric standards. The numeric levels for various parameters in tables I, II, and III, are levels determined by the Commission after careful analysis of all available information and are generally considered to protect the beneficial use classifications. They are intended to guide the Commission and others at the use classification and numeric-standard-setting hearings.

(ii) Ambient Quality-Based Standards

(A) Where ambient water quality levels are worse than specific numeric levels contained in tables I, II, and III, but are determined adequate to protect the highest attainable uses, the Commission may adopt one of the two following types of site-specific ambient quality-based standards:

(I) Feasibility-based Ambient Standard: Where water quality can be improved, but not to the level required by the current numeric standard, a feasibility-based numeric ambient standard may be adopted based on available representative data.

(II) Natural or Irreversible Ambient Standard: Where no improvement is feasible, or sources and causes are natural, a site-specific numeric standard may be adopted at existing quality based on available representative data. Site-specific acute standards for parameters in Table III shall be based on the 95th percentile value of the available representative data.

(B) Ambient quality-based standards are authorized only where a comprehensive analysis and review is conducted:

(I) Which identifies the sources and causes of the elevated levels and characterizes existing conditions, including spatial and temporal variation;

(II) Where sources and causes are not natural, a comprehensive alternatives analysis identifies the improved water quality conditions (if any) that could result from feasible pollution control alternatives;

(III) Which includes a rationale for either retaining or revising the current use classification(s); and

(IV) Which characterizes the highest attainable use.

(iii) Site-Specific Criteria-Based Standards

For state surface waters where an indicator species procedure (water effects ratio), recalculation procedure, use attainability analysis or other site-specific analysis has been completed in accordance with section 31.16(2)(b), or in accordance with comparable procedures deemed acceptable by the Commission, the Commission may adopt site-specific standards as determined to be appropriate by the site-specific study results. For segments assigned aquatic life classifications, where factors other than water quality substantially limit the diversity and abundance of species present, the Commission may adopt site-specific acute or chronic standards as determined to be appropriate based upon available information regarding the waters and the habitat. Recurrence intervals for site-specific-criteria-based standards may be determined on a site-specific basis.

Site-specific criteria-based standards and ambient quality-based standards for metals shall be based on dissolved metals whenever the Commission determines that the evidence presented is adequate to justify such standards. Site-specific standards for metals in effect prior to July 31, 1988 were generally based on total recoverable metals. Those standards shall remain in effect until superseded by revised standards promulgated pursuant to this section.

(iv) Standards For Surface Waters In Wetlands

(A) Tributary wetlands to which the interim classifications referenced in section 31.13(1)(e)(iv) apply, shall be subject to the following interim standard:

(1) Until such time as the Commission adopts site-specific standards for the tributary wetland, water quality in the wetland shall be maintained for each parameter at whichever of the following levels is less restrictive:

(a) ambient quality, or

(b) that quality which meets the numeric standards (except for numeric standards for pH, dissolved oxygen, and any standard established for the protection of a domestic water supply use) of the tributaries of the surface water segment to which the wetland is most directly hydrologically connected. Where the applicable numeric standard is based on section 31.16, table III, of this regulation, the numeric standard applicable to the wetland may be implemented taking into account the water effect ratio of the pollutant.

(2) Ambient quality shall be determined in accordance with section 31.7(1)(b)(ii) and shall take into account the location, sampling date, and quality of all available data. Ambient quality shall be determined as of the time the first regulatory action is undertaken which requires the identification of water quality standards for wetlands. If available information is not adequate to otherwise determine or estimate ambient quality, the interim standard set forth in section 31.7(1) (b) (iv) (A) (1) (b) shall apply.

(B) Wetlands for which the Commission has adopted a site-specific “wetlands” classification described in section 31.13(1)(e)(v), shall be subject to numeric standards and designations adopted by the Commission. The Commission shall adopt any numeric standards and designations determined to be appropriate in view of the functions and values to be protected for the wetlands in question.

(C) Created wetlands shall be subject only to the narrative standards set forth in section 31.11, unless the Commission has adopted the wetlands classification and appropriate numeric standards. All created wetlands will have a use protected designation unless determined otherwise as a result of a site-specific hearing.

(D) Compensatory wetlands shall be subject to the standards of the segment in which they are located, unless the Commission adopts a wetlands classification and appropriate numeric standards.

(E) All other wetlands which are state waters shall be subject only to the narrative standards set forth in section 31.11, unless the Commission has adopted the wetlands classification and appropriate numeric standards.

(F) The issuance and use of site-specific or individual permits under section 404 of the Clean Water Act, is not precluded by the provisions of sections 31.7, 31.11 or 31.13, except as provided in the 401 certification process under section 25-8-302, C.R.S.

(G) Wetlands water quality standards and classifications shall not be interpreted or applied in a manner that is inconsistent with sections 25-8-102(5) and 25-8-104, C.R.S.

(c) Site-Specific Narrative Standards

(i) Narrative standards may be assigned by the Commission to apply on a specific state surface water where numeric criteria are not required under federal law. Narrative standards will be assigned based on the evidence presented at the classification and numeric-standards-setting hearings, and must protect the classified uses.

(ii) The Commission may adopt a site-specific narrative standard where water quality currently is degraded as a result of historical mining activities and improvement is likely within 20 years, if it determines that such a standard is the most appropriate option to protect existing uses and to promote water quality improvement efforts for the segment(s) in question due to uncertainty regarding what water quality is attainable. Unless the Commission determines that a different approach is appropriate on a site-specific basis, it shall use a statement that the standard(s) for the pollutant(s) in question shall be the chemical concentrations, biological conditions, and/or physical conditions identified by a structured scientific use attainability analysis, or table value standards, if the use attainability analysis is not completed and submitted by a specified date and approved by the Commission. Generally, a numerical temporary modification based on existing ambient quality will also be adopted for the segment(s) and pollutant(s) in question.

(2) Considerations in Assigning Standards

In promulgating water quality standards, the Commission shall consider:

(a) The need for standards which regulate specified pollutants;

(b) Such information as may be available to the Commission as to the degree to which any particular type of pollutant is subject to treatment; the availability, practicality, and technical and economic feasibility of treatment techniques; the impact of treatment requirements upon water quantity; and the extent to which the discharge to be controlled is significant;

(c) The continuous, intermittent, or seasonal nature of the pollutant to be controlled;

(d) The existing extent of pollution or the maximum extent of pollution to be tolerated as a goal;

(e) Whether the pollutant arises from natural sources;

(f) Beneficial uses of water; and

(g) Such information as may be available to the Commission regarding the risk associated with the pollutants including its persistence, degradability, the usual or potential presence of the affected organism in any waters, the importance of the affected organisms, and the nature and extent of the effect of the pollutant on such organisms.

(3) Granting, Extending, and Removing Temporary Modifications to Numeric Standards

Where non-attainment of underlying standards has been demonstrated or predicted, the Commission may grant a temporary modification to a numeric standard upon a showing that the conditions in subsection (a), below, exist, provided that adequate supporting information described in subsection (b), below, are submitted. The presence of a temporary modification will be indicated in the appropriate water quality standards basin regulation by listing the parameter, the operative value, and the expiration date. A temporary modification may be granted to an entire stream or waterbody or to any portion thereof. It may be granted at the time a numeric standard is assigned or at any later time. When the temporary modification expires or is removed by the Commission, the underlying numeric standard will be in full effect. In every case, the modification to the numeric standard shall be temporary. All temporary modifications must be reevaluated not less than once every three (3) years.

In general, requests for a temporary modification are preferred over a more permanent downgrading of a present classification where it appears that the conditions causing the lower water quality might be temporary within a twenty (20) year time frame. The adoption of a temporary modification recognizes current conditions while providing an opportunity to resolve the uncertainty.

For the term of a temporary modification, regional wastewater management plans (208 plans) and plan updates, wasteload allocations, and planning, design, and construction of new, enlarged, or improved facilities and management practices shall be geared toward fully attaining the classified use and underlying numeric standard and assist in eliminating the need for the temporary modification. Discharge permits shall be implemented such that, at a minimum, status quo is maintained, and effluent quality is maintained at the best level reasonably achievable in a manner consistent with the provisions of subsection 31.9(4).

The subsections below provide requirements for the adoption, extension, review, and implementation of temporary modifications.

(a) <u>Conditions Justifying a Temporary Modification</u>

The Commission may grant a temporary modification of a numeric water quality standard for a waterbody where all of the following apply:

(i) Non-attainment of underlying standards has been demonstrated or predicted

(ii) Such non-attainment co-occurs spatially and temporally with an existing permitted discharge that has a demonstrated or predicted problem complying with a water quality-based effluent limit with which:

(A) the discharge must currently comply, or

(B) the discharge must comply within the next five years, or

(C) the discharge must comply in more than five years, and evidence shows significant investment in facility infrastructure would be required before the uncertainty is resolved.

(iii) At least one of the following is shown to exist:

(A) there is significant uncertainty regarding the water quality standard necessary to protect current and/or future uses.

(B) there is significant uncertainty regarding the extent to which existing quality is the result of natural or irreversible human-induced conditions.

(b) Adequate Supporting Information for Original Adoption of a Temporary Modification

Adequate supporting information must be submitted including all of the following:

(i) Characterization of the waterbody and effluent including:

(A) raw data describing the waterbody and effluent and characterization of the status quo, or, absent adequate data, a plan to collect data representative of quality as close in time as practicable to the temporary modification adoption, and

(B) documentation of waterbody non-attainment and an effluent compliance problem, as required in section 31.7(3)(a).

(ii) Documentation of uncertainty pertaining to the underlying water quality standard for the waterbody and/or the extent to which existing quality is the result of natural or irreversible human-induced conditions.

(iii) A plan for resolving the uncertainty and eliminating the need for the temporary modification that includes, for each type of uncertainty, a detailed, site-specific approach expected to result in sufficient information to resolve the uncertainty within the term of the temporary modification. The plan shall also include a schedule of timelines for key deliverables, including, but not limited to, annual reporting on progress to the Division. Additionally, the plan shall include activities to ensure that, at a minimum, status quo is maintained, and effluent quality is maintained at the best level reasonably achievable, in a manner consistent with the provisions of subsection 31.9(4). Implementation of nonpoint source strategies for improving waterbody quality can also be considered, as appropriate.

(iv) A justification for the narrative or numeric operative value, as defined in section 31.7(3)(d).

(v) A justification for the proposed expiration date, consistent with section 31.7(3)(e).

(c) Adequate Supporting Information for Extension of a Temporary Modification

In addition to the information required for adoption of an original temporary modification, a proposed extension of a temporary modification shall be supported by:

(i) Justification for why the time allotted under the previous temporary modification term was not sufficient to resolve the uncertainty and eliminate the need for the temporary modification, and

(ii) Demonstration that status quo has been maintained. If waterbody quality status quo is shown to have been degraded, justification that the degradation was not due to the effluent in question shall also be provided.

(d) Operative Value during the Term of a Temporary Modification

In order to ensure that, at a minimum, status quo is maintained, the operative value during the term of the temporary modification will be set to represent the current condition of the waterbody and effluent by either:

(i) Numeric values representing the status quo, or

(ii) A narrative "current condition" that represents the status quo; the numeric values representing status quo shall be documented in the Statement of Basis and Purpose.

(e) Term and Review of a Temporary Modification

(i) When a temporary modification is granted, the length of term of the temporary modification will be set by the Commission. The term granted shall be the shortest possible to resolve the uncertainty. The term of a temporary modification shall be determined on a case-by-case basis, based upon all relevant factors, including, but not limited to:

(A) the degree of uncertainty pertaining to the justification regarding the need for and length of the original temporary modification or extension, and

(B) how soon resolving the issues that necessitated adoption of the temporary modification is deemed feasible.

(ii) In making a decision as to whether a temporary modification should be removed or extended, the Commission will consider all relevant factors, including, but not limited to, whether:

(A) the temporary modification still qualifies under 31.7(3)(a),

(B) there is an adequate plan to resolve uncertainty for eliminating the need for the temporary modification and substantial progress has been made under the plan,

(C) status quo has been maintained, or if status quo in the waterbody, alone, has not been maintained, whether degradation of the waterbody quality status quo is due to factors other than the effluent in question, and

(D) there has been no, or minimal, impact from the temporary modification on the uses of the stream in the area of the temporary modification and upstream and downstream of that area.

A temporary modification shall not be extended if the proponent did not substantially comply with all conditions of the temporary modification, including, but not limited to, submission of annual progress updates and supporting documentation.

(f) Frequency of Commission Review

(i) The Commission will hold, at a minimum, a biennial (i.e., every other year) public rulemaking hearing to review all temporary modifications. As a result of the hearing, the Commission may:

(A) Delete the temporary modification and allow the existing underlying standards to go into effect;

(B) Delete the temporary modification and adopt a revised underlying standard;

(C) Extend the expiration date of the current temporary modification, with or without a revised underlying standard; or

(D) Adopt a revised temporary modification with an appropriate expiration date.

(ii) Annual progress updates must be submitted to the Division. As a result of the review of the annual progress updates submitted during years with no scheduled formal public rulemaking hearing, the Division may propose that the Commission schedule a rulemaking hearing prior to the regularly scheduled biennial hearing to review and consider revisions, deletions, or extensions of temporary modifications.

(4) Granting, Extending and Removing Variances to Standards

A variance to a water quality standard may be granted by the Commission to establish a temporary water quality standard that represents the highest feasible degree of protection of a classified use when the criteria in this subsection are met. Variances approved by the Commission shall be incorporated into the relevant standard tables, and the presence of the variance will be indicated in the appropriate water quality standards basin regulation. When the variance expires or is removed by the Commission, the underlying standard will be in full effect. In every case, the variance to the standard shall be temporary and must be reevaluated during each basin triennial review for the segment, unless the Commission requires a more frequent review when adopting the variance.

(a) <u>Criteria for Granting a Discharger-Specific Variance</u>

Variances to standards are authorized only where a comprehensive alternatives analysis demonstrates that there are no feasible alternatives that would allow for the regulated activity to proceed without a discharge that exceeds water quality-based effluent limits. In addition, an applicant for a variance must satisfy both of the following criteria.

(i) Tests to Determine the Need for a Variance

(A) Limits of Technology: Demonstration that attaining the water quality standard is not feasible because, as applied to the point source discharge, pollutant removal techniques are not available or it is technologically infeasible to meet the standard;

(B) Economics: Demonstration that attaining the water quality standard is not feasible because meeting the standard, as applied to the point source discharge, will cause substantial and widespread adverse social and economic impacts in the area where the discharge is located. Considerations include such factors as the cost and affordability of pollutant removal techniques; or

(C) Other Consequences: Human caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place.

(ii) Evaluation of the use of other regulatory tools, including compliance schedules, use attainability analyses to determine whether a change in uses or standards could fully protect actual and potential classified uses on the segment, and temporary modifications, and an explanation for how these other tools are not appropriate or would not result in water quality-based effluent limits that are feasible for the discharger to achieve within the required timeframe.

(b) Selection of Alternative Effluent Limits for Discharger-Specific Variances

The Commission's decision on whether to adopt a variance shall be based upon an evaluation of a comprehensive alternatives analysis and consideration of the impact of the variance on the uses of the waterbody at the discharge location and downstream of the discharge.

(i) Variances adopted by the Commission for a specific discharger shall include alternative effluent limits (AELs) that:

(A) represent the highest attainable condition by requiring the highest degree of protection of the classified use that is feasible for the specific discharger named in the variance, and

(B) reflects the greatest pollutant reduction achievable throughout the term of the variance while taking into consideration the factors in subsection 31.7(4)(a), as appropriate, and

(C) do not result in any lowering of the currently attained ambient water quality, unless temporarily necessary for restoration activities.

(ii) To ensure all feasible water quality improvements are implemented throughout the term of the variance, the Commission shall adopt one of the following:

(A) An effluent-based AEL, expressed as an effluent concentration, load, pollutant percent removal, or other quantifiable expression of effluent quality and quantity. At its discretion, the Commission may additionally require the adoption and implementation of a Pollutant Minimization Program.

(B) An action-based AEL with a quantifiable expression of the specific pollution control requirements to be completed by the discharger and the adoption and implementation of a Pollutant Minimization Program. An action-based AEL may only be justified when no additional feasible pollution control technology can be identified which could achieve a predictable, quantitative improvement in effluent quality.

(iii) The Commission will adopt a minimum of two AELs:

(A) an initial AEL that applies from the onset of the variance to ensure the discharge does not contribute to any lowering of currently attained ambient water quality, and

(B) a final AEL which represents the highest attainable condition that is feasible to achieve during the term of the variance.

(iv) The underlying standard is the applicable standard for assessing attainment for a waterbody and the development of effluent limitations for all other dischargers to the waterbody segment not named in the variance.

(c) Conditions on Discharger-Specific Variances

A discharger-specific variance applies only to the point source discharge and pollutant(s) specified in the variance. In all permit actions issued to implement a discharger-specific variance:

(i) At the time the variance is implemented in the permit, compliance with the initial AEL will be required. Where necessary and appropriate, the permit may include a compliance schedule for the achievement of any interim and final AELs adopted by the Commission, which may include interim milestones towards achieving the applicable AEL.

(ii) Ongoing investigation of treatment technologies, process changes, wastewater reuse, or other controls that may result in improvement in effluent quality, and reports regarding such investigations should be submitted with adequate time to allow for consideration of the information during the scheduled review of the variance by the Commission.

(iii) Any limitations and requirements necessary to implement the variance shall be included as enforceable permit conditions, including but not limited to additional monitoring requirements.

(iv) The discharge permit effluent limitations shall be established using the least stringent of the water quality-based effluent limits based upon the underlying standard or the AEL(s).

(d) Term and Review of a Discharger-Specific Variance

The Commission will set the term of a variance, on a case-by-case basis, to be only as long as necessary to achieve the highest attainable condition, including the time needed to plan, implement, or evaluate the outcome of the activities. In every case, the variance to the standard shall be temporary and must be reevaluated at a minimum during each basin triennial review for the segment. The specific timing of reviews shall be specified in the variance and comply with all requirements in this section. If the term of the variance is greater than five years, the variance must be reviewed at least every five years after EPA’s approval.

The Commission will conduct a reevaluation and submit the results of its reevaluation to EPA within 30 days of the completion of the reevaluation process. If the Commission does not fulfill this requirement, the DSV will no longer be the applicable water quality standard for purposes of the Clean Water Act.

If, as a result of the reevaluation process, the Commission determines that it is possible to achieve a more stringent AEL or highest attainable condition than was originally required by the variance, then the Commission will revise the variance to incorporate the more stringent AEL in that hearing and submit the reevaluation results to EPA. Similarly, if the Commission determines a less stringent AEL is necessary, a revised variance must be submitted to EPA.

When the variance expires, a subsequent variance shall only be adopted if the permittee completed the ongoing investigation of pollution control alternatives and substantially complied with all other conditions of the variance.

31.8 ANTIDEGRADATION

(1) Antidegradation Rule

(a) The highest level of water quality protection applies to certain waters that constitute an outstanding state or national resource. These waters, which are those designated outstanding waters pursuant to section 31.8(2)(a), shall be maintained and protected at their existing quality. Short-term degradation of existing quality is allowed for activities that result in long-term ecological or water quality benefit or clear public interest.

(b) An intermediate level of water quality protection applies to waters that have not been designated outstanding waters or use protected waters. These waters shall be maintained and protected at their existing quality unless it is determined that allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located. For these waters, no degradation is allowed unless deemed appropriate following an antidegradation review in accordance with section 31.8(3), except as specified in (i) and (ii) below. Further, all applicable statutory and regulatory requirements for point sources and, if applicable control regulations have been adopted, all cost-effective and reasonable best management practices for nonpoint sources shall be met.

(i) For dissolved iron, dissolved manganese, and sulfate, concentrations may reach the applicable water supply standard without an antidegradation review provided degradation for Aquatic Life based standards is not significant.

(ii) For all other pollutants, no degradation is allowed, unless deemed appropriate following an antidegradation review in accordance with section 31.8(3).

(c) At a minimum, for all state surface waters existing classified uses and the level of water quality necessary to protect such uses shall be maintained and protected. No further water quality degradation is allowable which would interfere with or become injurious to these uses. The classified uses shall be deemed protected if the narrative and numerical standards are not exceeded.

The antidegradation review requirements in section 31.8(3) are not applicable to waters designated use protected pursuant to section 31.8(2)(b). For these waters, only the protection specified in this subparagraph applies.

(d) Water quality designations and reviewable water provisions shall not be utilized in a manner that is contrary to the provisions of sections 25-8-102 and 25-8-104, C.R.S.

(2) Water Quality-Based Designations

Waters which satisfy the criteria in subparagraph (a) below may be designated by the Commission as “outstanding waters”. Waters which satisfy the criteria in subparagraph (b) below may be designated “use protected.” Waters not satisfying either set of criteria will remain undesignated, and will be subject to the antidegradation review provisions set forth in section 31.8(3), below.

(a) Outstanding Waters Designation

Waters may be designated outstanding waters where the Commission makes all of the following three determinations:

(i) The existing quality for each of the following parameters is equal to or better than that specified in tables I, II, and III for the protection of aquatic life class 1, recreation class P and (for nitrate) domestic water supply uses:

Table I: dissolved oxygen, pH, *E. coli*

Table II: chronic ammonia, nitrate

Table III: chronic cadmium, chronic copper, chronic lead, chronic manganese, chronic selenium, chronic silver, and chronic zinc

The determination of existing quality shall be based on adequate representative data, from samples taken within the segment in question. Data must be available for each of the 12 parameters listed; provided, that if *E. coli* samples from within the segment are infeasible due to its location, and a sanitary survey demonstrates that there are no human sources present that are likely to impact quality in the segment in question, *E. coli* data will not be required. “Existing quality” shall be the 85th percentile of the data for ammonia, nitrate, and dissolved metals, the 50th percentile for total recoverable metals, the 15th percentile for dissolved oxygen, the geometric mean for *E. coli*, and the range between the 15th and 85th percentiles for pH.

In addition, the foregoing notwithstanding, this test shall not be considered to be met if the Commission determines that, due to the presence of substantial natural or irreversible human-induced pollution for parameters other than those listed above, the quality of the waters in question should not be considered better than necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water.

(ii) The waters constitute an outstanding natural resource, based on the following:

(A) The waters are a significant attribute of a State Gold Medal Trout Fishery, a National Park, National Monument, National Wildlife Refuge, or a designated Wilderness Area, or are part of a designated wild river under the Federal Wild and Scenic Rivers Act; or

(B) The Commission determines that the waters have exceptional recreational or ecological significance, and have not been modified by human activities in a manner that substantially detracts from their value as a natural resource.

(iii) The water requires protection in addition to that provided by the combination of water quality classifications and standards and the protection afforded reviewable water under section 31.8(3).

(b) <u>Use Protected Designation</u>

These are waters that the Commission has determined do not warrant the special protection provided by the outstanding waters designation or the antidegradation review process.

(i) Waters shall be designated by the Commission use protected if any of the criteria below are met, except that the Commission may determine that those waters with exceptional recreational or ecological significance should be undesignated, and deserving of the protection afforded by the antidegradation review provisions of section 31.8(3):

(A) The use classifications of the waters include aquatic life warm water class 2, except as provided in subsection (iii) below;

(B) The existing quality for at least three of the following parameters is worse than that specified in tables I, II and III for the protection of aquatic life class 1, recreation class P and (for nitrate) domestic water supply uses:

Table I: dissolved oxygen, pH, *E. coli*

Table II: chronic ammonia, nitrate

Table III: chronic cadmium, chronic copper, chronic lead, chronic manganese, chronic selenium, chronic silver, and chronic zinc

The determination of existing quality shall be based on adequate representative data, from samples taken within the segment in question. Data must be available for each of the 12 parameters listed; provided, that if *E. coli* samples from within the segment are infeasible due to its location, and a sanitary survey demonstrates that there are no human sources present that are likely to impact quality in the segment in question, *E. coli* data will not be required. “Existing quality” shall be as defined in 31.5.

(ii) In addition, waters may be designated use protected even though none of the preceding criteria apply if the Commission determines that due to the presence of substantial natural or irreversible human induced pollution for parameters other than those listed in section 31.8(2)(b)(i)(B) the quality of the waters in question should not be considered better than necessary to support aquatic life class 1 and recreation class P uses. In making such a determination about a use protected designation, the Commission may take into account evidence of exceedances of one or more of the parameters listed in section 31.8(2)(b)(i)(B). (This provision shall be repealed effective 12/31/2031)

(iii) Waters classified as aquatic life warm water class 2 shall not be designated use protected solely on the basis of such classification if:

(A) There is adequate representative data available from samples taken within the segment in question for each of the 12 parameters listed in subsection 31.8(2)(b)(i)(B), above, and that data shows that the existing quality for at least 10 of the 12 parameters is equal to or better than that specified in tables I, II and III for the protection of aquatic life class 1, recreation class P and (for nitrate) domestic water supply uses; and

(B) The segment in question is not listed, and does not qualify for listing, for two or more pollutants on Colorado’s Section 303(d) List of Water-Quality-Limited Segments Requiring Total Maximum Daily Loads, for an exceedance of chronic or “30-day” numeric standards.

(3) Antidegradation Review Process

(a) Applicability

These antidegradation review procedures shall apply to the review of regulated activities with new or increased water quality impacts that may degrade the quality of state surface waters that have not been designated as outstanding waters or use protected waters, including waters previously designated as high quality class 2. These waters are referred to below as “reviewable waters.” “Regulated activities” means any activities which require a discharge permit or water quality certification under federal or state law, or which are subject to state control regulations unless the Commission has specified in the control regulation that the antidegradation review process is not applicable. Where possible, the antidegradation review should be coordinated or consolidated with the review processes of other agencies concerning a proposed activity in an effort to minimize costs and delays for such activities.

(b) Division and Commission Roles

For regulated activities, the significance determination set forth in section 31.8(3)(c) and the determination whether degradation is necessary to accommodate important economic or social development in the area in which the waters are located, pursuant to section 31.8(3)(d), shall be made by the Division, subject to a de novo review by the Commission in an adjudicatory hearing, on the Commission's own motion, pursuant to a petition by any interested person who has submitted written comments during the Division review process, or on the Commission's determination pursuant to section 24-4-105(2), C.R.S.

(c) Significance Determination

The initial step in an antidegradation review shall be a determination whether the regulated activity in question is likely to result in significant degradation of reviewable waters, with respect to adopted narrative or numeric standards. The significance determination will be based on the chronic numeric standard and flow for the pollutant of concern except for those pollutants which have only acute numeric standards in which case the acute standard and flow will be used. This significance determination shall be made with respect to the net effect of the new or increased water quality impacts of the proposed regulated activity, taking into account any environmental benefits resulting from the regulated activity and any water quality enhancement or mitigation measures impacting the segment or segments under review, if such measures are incorporated with the proposed regulated activity. The regulated activity shall be considered not to result in significant degradation, as measured in the reviewable waters segment, if:

(i) For bioaccumulative toxic pollutants, (i.e., those chemicals for which the bioaccumulation factor (BAF) is equal to or greater than 1000) the new or increased loading from the source under review is less than 10 percent of the existing total load to that portion of the segment impacted by the discharge for critical constituents; provided, that the cumulative impact of increased loadings from all sources shall not exceed 10 percent of the baseline total load established for the portion of the segment impacted by the discharge (the baseline total load shall be determined at the time of the first proposed new or increased water quality impacts to the reviewable waters.); and

(ii) For all pollutants:

(A) The flow rate or volume of a new or increased discharge under review is small enough that it will be diluted by 100 to 1 or more at low flow, as defined in section 31.9, by water in the stream; or

(B) The new activity or increased discharge from the source under review will consume, after mixing, less than 15 percent of the baseline available increment, provided that the cumulative increase in concentration from all sources shall not exceed 15 percent of the baseline available increment. The baseline available increment is the increment between low-flow pollutant concentrations and the relevant standards for critical constituents for that portion of the segment impacted by the discharge. Except as identified in (C) below, the baseline low-flow pollutant concentration shall represent the water quality as of September 30, 2000 (or the effective date when the use protected designation is removed), and shall be determined at the time of the first proposed new or increased water quality impacts to the reviewable waters after that date.

(C) If water quality subsequently improves as the result of the remediation of impacts from past unpermitted releases of contaminants that affected the water quality as of September 30, 2000 (or the effective date when the use protected designation is removed), the resulting improved water quality at the time of the proposed new water quality impacts shall be used as the baseline. However, if such improvement results from non-legally-mandated remediation, upon petition the Commission may determine an alternative baseline to be used for antidegradation review purposes, taking into account the site-specific circumstances, including the benefits of protecting improved water quality and the goal of not discouraging voluntary clean-up efforts, including water pollutant trading. Any individual or entity, including those involved in the remediation efforts, may petition the Commission, at any time, to establish an alternative baseline, including prior to proceeding with a remediation project.

(D) The regulated activity will result in only temporary or short term changes in water quality. This exception shall not apply where long-term operation of the regulated activity will result in an adverse change in water quality.

For the purposes of this subsection, the phrase “portion of the segment impacted by the discharge” means the portion of the stream from the discharge point to the first major tributary inflow, or as determined by the Division based on site-specific information at the time of the analysis.

(d) Necessity of Degradation Determination

If a determination has been made in accordance with section 31.8(3)(c) that a proposed regulated activity is likely to result in significant degradation of reviewable waters, a determination shall be made pursuant to this section whether the degradation is necessary to accommodate important economic or social development in the area in which the waters are located. The following provisions shall apply to this determination:

(i) The “area in which the waters are located” shall be determined from the facts on a case-by-case basis. The area shall include all areas directly impacted by the proposed regulated activity.

(ii) A determination shall be made from the facts on a case-by-case basis whether the proposed regulated activity is important economic or social development. If the activity proponent submits evidence that the regulated activity is important development, it shall be presumed important unless information to the contrary is submitted in the public review process. The determination shall take into account information received during the public comment period and shall give substantial weight to any applicable determinations by local governments or land use planning authorities.

(iii) If the proposed regulated activity is determined to be important economic or social development, a determination shall be made whether the degradation that would result from such regulated activity is necessary to accommodate that development. The degradation shall be considered necessary if there are no water quality control alternatives available that (A) would result in no degradation or less degradation of the state waters and (B) are determined to be economically, environmentally, and technologically reasonable. In situations where water quality control alternatives are identified that satisfy the tests in (A) and (B), the Division shall consider the proposed degradation to be unnecessary, and require implementation of a non-degrading or less degrading alternative as a condition of authorizing the proposed activity.

This determination shall be based on an assessment of whether such alternatives are available, based upon a reasonable level of analysis by the project proponent, consistent with accepted engineering practice, and any information submitted by the public or which is otherwise available. The assessment shall address practical water quality control technologies, the feasibility and availability of which has been demonstrated under field conditions similar to those of the activity under review. The scope of alternatives considered shall be limited to those that would accomplish the proposed regulated activity's purpose. Any alternatives that would be inconsistent with section 25-8-104 of the Water Quality Control Act shall not be considered available alternatives.

In determining the economic reasonableness of any less-degrading water quality control alternatives, the Division may take into consideration any relevant factors, including but not limited to the following, if applicable:

(A) Whether the costs of the alternative significantly exceed the costs of the proposal;

(B) For publicly owned treatment works (POTWs) or public water supply projects, whether user charges resulting from the alternative would significantly exceed user charges for similarly situated POTWs or public water supply projects;

(C) For private industry, whether the alternative would have a significant adverse effect upon the project's profitability or competitive position (if the project proponent chooses to provide such information);

(D) For any dischargers, whether treatment costs resulting from the alternative would significantly exceed treatment costs for any similar existing dischargers on the segment in question.

(E) The relative, long-term, energy costs and commitments and availability of energy conservation alternatives.

(e) <u>Public Participation and Intergovernmental Coordination</u>

Procedural provisions relating to public participation and intergovernmental coordination and antidegradation reviews are set forth in the Procedural Rules, Regulation No. 21, section 21.16 (5 CCR 1002-21).

(f) <u>Public Nomination-Water Quality Based Designations</u>

Any person may nominate any state water for designation as outstanding waters or use protected during triennial review or at any time. Such nomination shall include written documentation of the qualifications for such designation based upon the criteria in section 31.8(2)(a) or (b).

(g) <u>Protection of Existing Uses</u>

If, during an antidegradation review, it is determined that an existing use of the affected waterbody has not been classified, prior to completing the antidegradation review for an applicable regulated activity, an expeditious rulemaking hearing shall be held (on an emergency basis if necessary) to consider adoption of the additional classification.

31.9 IMPLEMENTATION OF STANDARDS

(1) Low Flow Exceptions

(a) Water quality standards shall apply at all times; provided, that in developing effluent limitations or other requirements for discharge permits, the Division shall normally define critical flow conditions using the following low-flow values:

(i) Generally: the empirically based 30-day average low flow with an average 1-in-3 year recurrence interval (30E3) for chronic standards and the empirically based 1-day low flow with an average 1-in-3 year recurrence interval (1E3) for acute standards, or the equivalent statistically-based flow.

(ii) Temperature limitations: the empirically based 7-day average low flow with an average 1-in-3 year recurrence interval (7E3), and the empirically based 1-day low flow with an average 1-in-3 year recurrence interval (1E3) for acute standards, or the equivalent statistically-based flow.

(iii) Total phosphorus and total nitrogen limitations: the annual median of the daily average flows with a 1-in-5 year recurrence interval.

(b) Data Requirements

The period of record for determining low flows shall be based on a minimum of ten years of flow data, except that, when ten years of data is not available, low flows may be determined, on a case-by-case basis, using a period of record of less than ten years. If more than ten years of flow data is available, it may be more appropriate to establish low flow conditions based on a longer period of record to more accurately reflect site-specific conditions.

(c) Streams With Rapid Flow Changes

For streams with seasonal rapidly rising or falling hydrographs, the Division shall use, if so requested by a discharger, the procedure set forth in subparagraphs (i) through (v) below for calculating 30E3 values for those transitional flow periods of the year. For certain substances such as ammonia, the low flow exceptions may be based on periodic or seasonal flows as determined on a case-by-case basis by the Division.

(i) Averaging Procedure – Calculation of 30-day Forward Moving Harmonic Means - Moving harmonic means shall first be calculated for each consecutive thirty-day period in the period of record being considered.

(ii) Calculate Annual 30E3 Value - Determine the annual 30E3 value using the procedure set forth in Appendix A using

(A) 30-day forward moving harmonic means, and

(B) the excursion procedure for a 1-in-3 year recurrence interval.

(iii) Assigning Harmonic Means - Each 30-day harmonic mean shall then be assigned to a month. A harmonic mean shall be assigned to a specific month only if the harmonic mean is calculated using data for 15 or more days from that month.

(iv) Ranking of Harmonic Means - Harmonic means shall be ranked from the lowest to highest for each month of the year. The lowest harmonic mean for a month shall be used to establish the low flow value for that month using the procedure set forth in subparagraph (v) below.

(v) Establishing Monthly 30E3 Low Flows – The low flow for a month shall be either the lowest harmonic mean assigned to that month (as determined in subparagraphs (iii) and (iv), above), or the annual low flow value (as determined in subparagraph (ii), above), whichever is greater.

(d) Waters Not Yet Classified

Discharges to waters not presently classified must meet established effluent limitation regulations, the basic standards, antidegradation rule and control regulations. Effluent flows which reach a classified body of water, even though the discharge point is to a water not yet classified, must be of a quality which will not cause the standards of the classified body of water to be violated.

(2) Compliance Schedules

Where the Commission has adopted new standards, temporary modifications or revised standards that have become more stringent, or where the Division has developed new interpretations of existing standards, including, but not limited to, implementation requirements through approved TMDLs and Wasteload Allocations, interim and final AELs for variances and antidegradation reviews; the Division may include schedules of compliance in Colorado Discharge Permit System (CDPS) permits when it determines such schedules to be necessary and appropriate.

(3) Temperature Limits

The Division will determine whether temperature limits are to be included in permits utilizing the following approach.

(a) No temperature effluent limit will be applied if a discharge is to an effluent-dependent stream and there is no evidence that the aquatic life use may be negatively affected by the thermal component of the discharge. In implementing this provision, the Division will consider all readily available and pertinent evidence regarding the potential for the thermal properties of a discharge to affect aquatic life.

(b) No temperature effluent limit will be applied to a discharge of water from a natural hot springs, so long as that water enters the receiving water in the vicinity of its natural outflow.

(c) Where neither (a) nor (b) above apply to a discharge, the Division will determine whether a limitation for temperature is to be included in a permit consistent with procedures developed in accordance with Section 61.8(2)(b)(i) of the CDPS Regulations. Where there are not adequate data to determine reasonable potential, the Division may require the permittee to collect and submit temperature data.

(d) At the time of permit renewal, where a site-specific recalculation procedure demonstrates that alternative numerical criteria are more appropriate for protection of aquatic life, these alternative criteria will be used for development of permit limits.

(e) Consistent with section 316(a) of the federal Clean Water Act, and federal implementing regulations, the Division may impose alternate effluent limitations with respect to the thermal component of such discharge.

(4) Temporary Modifications

Where a temporary modification is adopted, permits for discharges to the segment in question:

(a) For existing discharges:

(i) Will not include a compliance schedule to meet limits based on the underlying standard during the period that the temporary modification is in effect.

(ii) Will, regardless of whether the operative value of the temporary modification is numeric or narrative, include permit effluent limits, where appropriate, that ensure that, at a minimum, status quo is maintained during the temporary modification.

(iii) May include limitations or other conditions (e.g., source identification, pretreatment, and evaluation of other source control and treatment options) for the parameter(s) in question based on an assessment of the level of effluent quality reasonably achievable without requiring significant investment in facility infrastructure (e.g., based on past facility performance). Such limits (numeric or otherwise) may be at or below the level derived from the temporary modification, where such a requirement would not cause an undue economic burden, but not more restrictive than necessary to achieve the underlying standard.

(b) For expanding discharges: Will include effluent limits that, at a minimum, do not pose an unreasonable risk to downstream uses and ensure status quo is maintained.

(c) For new discharges: Will include effluent limits based on the underlying standard, rather than the temporary modification, unless the Commission has established a specific limit or value for new dischargers.

(d) May include a permit condition requiring actions intended to eliminate the uncertainty regarding the appropriate underlying standard.

31.10 MIXING ZONES

(1) Definitions

(a) Physical Mixing Zone

That portion of a waterbody, surrounding or downstream from a point source of discharge, wherein constituents of the discharge are not uniformly dispersed into the receiving waters. The physical mixing zone also can be referred to simply as the “mixing zone,” except where there is possible confusion with the regulatory mixing zone, as it is defined below, which differs from the physical mixing zone

(b) Exceedance Zone

That portion of a physical mixing zone within which a numeric water quality standard for a given water quality parameter is not met during critical conditions. The size of an exceedance zone may differ from one numeric standard to another at a given location.

(c) Regulatory Mixing Zone

The maximum size allowable for an exceedance zone at a given location. An acute regulatory mixing zone limits the size of exceedance zones for acute standards, and a chronic regulatory mixing zone limits the size of exceedance zones for chronic standards. The sizes of the acute and chronic regulatory mixing zones are related to the size of the receiving water, as explained in 31.10 (3).

(d) Stream Channel Width at Bankfull Stage

The width of a stream under flow conditions when the stream just begins to enter the lowest level of the floodplain.

(e) Average Waterbody Surface Area

The average surface area for a lake shall be determined from historic data (five years or more if possible), and must be computed monthly or seasonally, as appropriate, to reflect significant monthly or seasonal changes in area.

(f) Stream, Lake, Wetland

For purposes of this regulation, streams will include Waters of the State that flow, regardless of size, and lakes will include Waters of the State that are not flowing, including reservoirs. Wetlands will be treated in the same manner as lakes.

(2) Exemptions from Restriction of Permit Limits by Mixing Zone Regulations

In the following instances, water quality-based effluent limits (permit limits) for discharges to streams will be calculated using the full chronic (30E3) and acute (1E3) low flow of the stream for dilution except where a more stringent approach is determined by the Division to be necessary to protect designated uses in the waterbody as a whole based on the factors identified in subsection 31.10(5). These exemptions do not apply to lakes.

(a) Exemption tables, other procedures developed or approved by the Division, or site-specific data indicate that the chronic regulatory mixing zone is larger than the physical mixing zone;

(b) The effluent flow at maximum permitted discharge is greater than twice the chronic low flow (30E3); or

(c) The ratio of the chronic low flow (30E3) to the maximum permitted or other appropriate effluent flow is greater than or equal to 20:1 and the operation is designated by the Division as a “minor.”

(3) Regulatory Mixing Zone Sizes

(a) Streams

The Division shall consider the following factors in determining the sizes of the regulatory mixing zones for streams:

(i) The size of the chronic regulatory mixing zone for any point source of discharge to a stream shall not be greater than a plan view area equal to six times the square of the stream channel width at bankfull stage.

(ii) Where the size of the physical mixing zone exceeds the size of the chronic regulatory mixing zone, the area of the acute regulatory mixing zone for a water quality parameter shall be established between 10 % and 25 % of the area of the chronic regulatory mixing zone for the same water quality parameter. The size of the acute regulatory mixing zone will be determined within this range based on a presumption that:

(A) For waters determined under subsection 31.8 to be “reviewable,” the default acute regulatory mixing zone will be 10% as large as the chronic regulatory mixing zone.

(B) For waters determined under subsection 31.8 to be “use protected,” the default acute regulatory mixing zone will be 25% as large as the chronic regulatory mixing zone.

An acute mixing zone may also be further reduced below default limits for reasons given in subsection 31.10(5). The permittee may request that the size of the acute regulatory mixing zone be higher than recommended by the Division, but no higher than 25% of the chronic regulatory mixing zone, on the basis of arguments related to cost/benefit analysis, economic reasonableness, ecological risks, use classification, or designation. The burden is on the permittee to bring appropriate information to the Division.

(iii) The sum total of the plan view areas of all chronic regulatory mixing zones for point sources of discharge into any reach of stream for a specified water quality parameter shall not occupy more than ten percent 10% of the total plan view area of such reach of river or stream, as measured at bankfull stage. The length (approximately 10 miles) and boundaries of the stream or river reach for these purposes shall be determined by the Division. Constraints on chronic regulatory mixing zones used to determine permit limits in discharge permits resulting from the cumulative impacts of multiple point sources of discharge into a stream reach shall be shared equitably among permittees and any other sources of discharge. The distribution of the allowable loads for the pollutant of concern shall be consistent with regulations applicable to total maximum daily loads and/or upon mutual agreement amongst the permittees.

(b) <u>Lakes</u>

The Division shall consider the following factors in determining the size of the regulatory mixing zones for lakes:

(i) For each point source of discharge, the size of the chronic regulatory mixing zone shall not be greater than 3% of the average inter-annual seasonal or monthly surface area. The Division may apply this limit to an entire lake or to a smaller, geographically distinguishable (bay, arm, etc.), portion of a lake.

(ii) Where the physical mixing zone exceeds the chronic regulatory mixing zone, the area of the acute regulatory mixing zone for lakes, for any water quality parameter, shall be established between 10% and 25% of the area of the chronic regulatory mixing zone for the same water quality parameter. The size of the acute mixing zone will be determined within this range based on a presumption that:

(A) For waters determined under subsection 31.8 to be “reviewable” the default acute regulatory mixing zone will be 10% as large as the chronic regulatory mixing zone.

(B) For waters determined under subsection 31.8 to be “use protected” the default acute regulatory mixing zone will be 25% as large as the chronic regulatory mixing zone.

An acute mixing zone may also be further reduced below default limits for reasons given in subsection 31.10 (5). The permittee may request that the size of the acute regulatory mixing zone be higher than recommended by the Division, but no higher than 25% of the chronic regulatory mixing zone, on the basis of arguments related to cost/benefit analysis, economic reasonableness, ecological risks, use classification, or designation. The burden is on the permittee to bring appropriate information to the Division.

(iii) The sum total of the plan view areas of all chronic regulatory mixing zones for point sources of discharge into lakes for a specified water quality parameter shall not occupy more than ten percent 10% of the total plan view area of such lake, or a geographically distinguishable portion thereof, at any seasonally average area. Constraints on chronic regulatory mixing zones used to determine limits in discharge permits resulting from the cumulative impacts of multiple point sources of discharge into lakes shall be shared equitably among permittees and any other sources of discharge. The distribution of the allowable loads for the pollutant of concern shall be consistent with regulations applicable to total maximum daily loads and/or upon mutual agreement amongst the permittees.

(iv) For artificial lakes supplied principally with potable water, mixing zones larger than those allowed above may be designated for purposes of CDPS permits. Appropriate mixing zone size limits shall be determined by the Division on a case-by-case basis, consistent with the constraints described in subsection 31.10(5). Such mixing zones shall be kept as small as practicable, on a parameter-by-parameter basis, and shall provide for protection of existing and designated uses in the waterbody as a whole.

(4) Use of Mixing Zone Regulations in Setting Permit Limits

(a) <u>Streams</u>

Computation of chronic or acute permit limits for point source discharges to streams shall be as follows:

(i) For discharges not exempted as explained in subsection 31.10(2), the permit limit for any parameter for which there is a water quality standard shall be that resulting in acute and chronic exceedance zones equal to or smaller than the respective acute and chronic regulatory mixing zones.

(ii) Where the annual acute low flow (1E3) of the receiving stream is zero, no dilution will be provided in calculating acute permit limits. Where the chronic low flow (30E3) of the receiving stream is equal to zero, no dilution will be provided in calculating chronic permit limits.

(b) <u>Lakes</u>

Computation of chronic or acute permit limits for point source discharges to lakes shall be as follows:

(i) The permit limit for any parameter for which there is a water quality standard shall be that resulting in acute and chronic exceedance zones equal to or smaller than the respective acute and chronic regulatory mixing zones as shown by site-specific analysis for each regulated substance.

(5) Additional Constraints on Mixing Zones

(a) Exceedance zones from multiple point sources of discharge shall not overlap to such an extent as to harm beneficial uses.

(b) Regulatory mixing zones shall comply with the narrative basic standards included in subsection 31.11(1), except that these requirements do not apply to the protection of any sessile organisms residing within acute and chronic regulatory mixing zones.

(c) Where sampling shows that the conditions described in subsection 31.10(3) are not attained, the mixing zone analysis will be revised as necessary to achieve compliance with subsection 31.10(3).

(d) The Division may limit or deny regulatory mixing zones on a site-specific basis for specific regulated substances. In doing so, the Division shall consider the following:

(i) The need to provide a zone of passage for aquatic life;

(ii) The likelihood of bioaccumulation of toxins in fish or wildlife;

(iii) The special importance of certain habitat such as fish spawning or nursery areas or habitat that supports threatened or endangered species;

(iv) Potential for human exposure to pollutants through drinking water or recreation;

(v) The possibility that aquatic life will be attracted to the effluent plume;

(vi) The potential for adverse effects on groundwater; or

(vii) The toxicity or persistence of the substance discharged.

(6) Mixing Zones for Whole Effluent Toxicity-based Permit Requirements

The provisions of this section 31.10 do not apply to the determination of whole effluent toxicity-based permit requirements.

31.11 BASIC STANDARDS APPLICABLE TO SURFACE WATERS OF THE STATE

All surface waters of the state are subject to the following basic standards; however, discharge of substances regulated by permits which are within those permit limitations shall not be a basis for enforcement proceedings under these basic standards:

(1) Except where authorized by permits, BMPs, 401 certifications, or plans of operation approved by the Division or other applicable agencies, state surface waters shall be free from substances attributable to human-caused point source or nonpoint source discharge in amounts, concentrations or combinations which:

(a) for all surface waters except wetlands;

(i) can settle to form bottom deposits detrimental to the beneficial uses. Depositions are stream bottom buildup of materials which include but are not limited to anaerobic sludges, mine slurry or tailings, silt, or mud; or

(ii) form floating debris, scum, or other surface materials sufficient to harm existing beneficial uses; or

(iii) produce color, odor, or other conditions in such a degree as to create a nuisance or harm existing beneficial uses or impart any undesirable taste to significant edible aquatic species or to the water; or

(iv) are harmful to the beneficial uses or toxic to humans, animals, plants, or aquatic life; or

(v) produce a predominance of undesirable aquatic life; or

(vi) cause a film on the surface or produce a deposit on shorelines; and

(b) for surface waters in wetlands;

(i) produce color, odor, changes in pH, or other conditions in such a degree as to create a nuisance or harm water quality dependent functions or impart any undesirable taste to significant edible aquatic species of the wetland; or

(ii) are toxic to humans, animals, plants, or aquatic life of the wetland.

(2) The radioactive materials in surface waters shall be maintained at the lowest practical level. In no case shall radioactive materials in surface waters be increased by any cause attributable to municipal, industrial, or agricultural practices or discharges to as to exceed the levels in 31.11 Table A below, unless alternative site-specific standards have been adopted pursuant to subsection (4) below:

31.11 TABLE A - RADIONUCLIDE STANDARDS

TABLE A RADIONUCLIDE STANDARDS**	
Parameter	Picocuries per Liter
Americium 241*	0.15
Cesium 134	80
Plutonium 239, and 240*	0.15
Radium 226 and 228*	5
Strontium 90*	8
Thorium 230 and 232*	60
Tritium	20,000

*Radionuclide samples for these materials should be analyzed using unfiltered (total) samples.

**These Human Health based standards are 30-day average values.

(3) The interim organic pollutant standards contained in 31.11 Table B Basic Standards for Organic Chemicals Table below are applicable to all surface waters of the state for which the corresponding use classifications have been adopted, unless alternative site-specific standards have been adopted pursuant to sub-section (4) below.

Note that all standards in the 31.11 Table B Basic Standards for Organic Chemicals Table are being adopted as “interim standards.” These interim standards will remain in effect until alternative permanent standards are adopted by the Commission in revisions to this regulation or site-specific standards determinations. Although fully effective with respect to current regulatory applications, these interim standards shall not be considered final or permanent standards subject to antibacksliding or downgrading restrictions.

31.11 TABLE B - BASIC STANDARDS FOR ORGANIC CHEMICALS

TABLE B BASIC STANDARDS FOR ORGANIC CHEMICALS (concentration in µg/L)						
Parameter		Human Health Based[1]			Aquatic Life Based[4]	
	CAS No.	Water Supply[2]	Water + Fish[3]	Fish Ingestion[8]	Acute	Chronic
Acenaphthene	83-32-9	420	420	---[10]	1,700	520
Acetochlor	34256-82-1	140	---	---	---	---
Acetone	67-64-1	6300	---	---	---	---
Acrolein	107-02-8	3.5	3.5	9.3	3	3
Acrylamide[C, 13]	79-06-1	0.022	---	---	---	---
Acrylonitrile[C]	107-13-1	0.065	0.051	0.25	7,500	2,600
Alachlor	15972-60-8	2[M]	2	140	---	---
Aldicarb	116-06-3	7[M]	---	---	---	---
Aldicarb Sulfone	1646-88-4	7[M]	---	---	---	---
Aldicarb Sulfoxide	1646-87-3	7[M]	---	---	---	---
Aldrin[C]	309-00-2	0.0021	$4.9X10^{-5}$	$5.0X10^{-5}$	1.5	---
Aniline[C]	62-53-3	6.1	---	---	---	---
Anthracene (PAH)	120-12-7	2,100	2,100	40,000	---	---
Aramite[C]	140-57-8	1.4	---	---	---	---
Atrazine	1912-24-9	3[M]	---	---	---	---
Azobenzene[C]	103-33-3	0.32	---	---	---	---
Benzene[C, 12]	71-43-2	2.3 to 5[M]	2.2	51	5,300	---
Benzidine[C]	92-87-5	0.00015	$8.6X10^{-5}$	0.00020	2,500	---
Benzo(a)anthracene (PAH)[C, 13]	56-55-3	0.16	0.0051	0.0053	---	---
Benzo(a)pyrene (PAH)[C, 12, 13]	50-32-8	0.016	0.00051	0.00053	---	---
Benzo(b)fluoranthene (PAH)[C, 13]	205-99-2	0.16	0.0051	0.0053	---	---
Benzo(k)fluoranthene (PAH)[C, 13]	207-08-9	1.6	0.051	0.053	---	---
Benzo(g,h,i)perylene (PAH)	191-24-2	---	0.0038	0.018	---	---
Benzotrichloride[C]	98-07-7	0.0027	---	---	---	---
Benzyl chloride[C]	100-44-7	0.21	---	---	---	---
Biphenyl[C]	92-52-4	4.4	---	---	---	---
Bis(chloromethyl)ether (BCME)[C]	542-88-1	0.00016	0.0001	0.0003	---	---
Bromate[C]	15541-45-4	0.050	---	---	---	---
Bromobenzene	108-86-1	56	---	---	---	---

TABLE B BASIC STANDARDS FOR ORGANIC CHEMICALS (concentration in µg/L)						
Parameter		Human Health Based[1]			Aquatic Life Based[4]	
	CAS No.	Water Supply[2]	Water + Fish[3]	Fish Ingestion[8]	Acute	Chronic
Bromodichloromethane (HM)[C]	75-27-4	---	0.55	17	11,000	---
Bromoform (HM)[C]	75-25-2	---	4.3	140	---	---
Butyl benzyl phthalate	85-68-7	1,400	1,400	1,900	---	---
Carbaryl	63-25-2	---	---	---	2.1	2.1
Carbofuran[12]	1563-66-2	35 to 40[M]	---	---	---	---
Carbon tetrachloride[C, 12]	56-23-5	0.5 to 5[M]	0.43	3.0	35,200	---
Chlordane[C, 12]	57-74-9	0.10 to 2[M]	0.00080	0.00081	1.2	0.0043
Chlordecone[C]	143-50-0	0.0035	---	---	---	---
Chlorethyl ether (BIS-2)[C]	111-44-4	0.032	0.030	0.53	---	---
Chlorobenzene[11]	108-90-7	100[M]	100	1,600	---	---
Chlorodibromomethane (dibromochloromethane) (HM)[11]	124-48-1	---	54.0	1,700	---	---
Chloroform (HM)[C]	67-66-3	---	3.4	110	28,900	1,240
Chloroisopropyl ether(BIS-2)	108-60-1	280	280	65,000	---	---
4-Chloro-3-methylphenol	59-50-7	210	---	---	30	---
Chloronaphthalene	91-58-7	560	560	---[10]	2,300	620
Chlorophenol,2-	95-57-8	35	35	150	4,380	2,000
Chlorpyrifos	2921-88-2	21	---	---	0.083	0.041
Chrysene (PAH)[C, 13]	218-01-9	16	0.51	0.53	---	---
Dalapon	75-99-0	200[M]	---	---	---	---
DDD[C]	72-54-8	0.15	0.00031	0.00031	0.6	---
DDE[C]	72-55-9	0.1	0.00022	0.00022	1,050	---
DDT[C]	50-29-3	0.1	0.00022	0.00022	0.55	0.001
Demeton	8065-48-3	---	---	---	---	0.1
Di(2-ethylhexyl)adipate	103-23-1	400[M]	---	---	---	---
Diazinon	333-41-5	---	---	---	0.17	0.17
Dibenzo(a,h)anthracene (PAH)[C, 13]	53-70-3	0.016	0.00051	0.00053	---	---
1,2 Dibromo-3-Chloropropane (DBCP)	96-12-8	0.2[M]	---	---	---	---
Dibromoethane 1,2[C]	106-93-4	0.018	---	---	---	---
Dicamba	1918-00-9	210	170	860	---	---
Dichloroacetic acid[C]	79-43-6	0.7	---	---	---	---

TABLE B BASIC STANDARDS FOR ORGANIC CHEMICALS (concentration in µg/L)						
Parameter		Human Health Based[1]			Aquatic Life Based[4]	
	CAS No.	Water Supply[2]	Water + Fish[3]	Fish Ingestion[8]	Acute	Chronic
Dichlorobenzene 1,2[11]	95-50-1	600[M]	420	1,300	---	---
Dichlorobenzene 1,3	541-73-1	94	94	960	---	---
Dichlorobenzene 1,4[11]	106-46-7	75[M]	63	190	---	---
Dichlorobenzidine[C]	91-94-1	0.078	0.021	0.028	---	---
Dichloroethane 1,2[C, 12]	107-06-2	0.38 to 5[M]	0.38	37	118,000	20,000
Dichloroethylene 1,1	75-35-4	7[M]	7	3,600	---	---
Dichloroethylene 1,2-cis[12]	156-59-2	14 to 70[M]	---	---	---	---
Dichloroethylene 1,2-trans[11]	156-60-5	100[M]	100	10,000	---	---
Dichloromethane (methylene chloride)[C, 13]	75-09-2	5[M]	4.6	590	---	---
Dichlorophenol 2,4	120-83-2	21	21	290	2,020	365
Dichlorophenoxyacetic acid (2,4-D)	94-75-7	70[M]	---	---	---	---
Dichloropropane 1,2[C, 12]	78-87-5	0.52 to 5[M]	0.50	14	23,000	5,700
Dichloropropylene 1,3[C]	542-75-6	0.35	0.34	21	6,060	244
Dichlorvos[C]	62-73-7	0.12	---	---	---	---
Dieldrin[C]	60-57-1	0.002	$5.2X10^{-5}$	$5.4X10^{-5}$	0.24	0.056
Diethyl phthalate	84-66-2	5,600	5,600	44,000	---	---
Diisopropylmethylphosphonate (DIMP)	1445-75-6	8	---	---	---	---
Dimethylphenol 2,4	105-67-9	140	140	850	2,120	---
Dimethyl phthalate	131-11-3	70,000	70,000	1,100,000	---	---
Di-n-butyl phthalate	84-74-2	700	700	4,500	---	---
Dinitro-o-cresol 4,6	534-52-1	0.27	1.3	28	---	---
Dinitrophenol 2,4	51-28-5	14	14	5,300	---	---
Dinitrotoluene 2,4[C]	121-14-2	0.11	0.11	3.4	---	---
Dinitrotoluene 2,6[C]	606-20-2	---	---	---	330	230
Dinoseb	88-85-7	7[M]	---	---	---	---
Dioxane 1,4-[C]	123-91-1	0.35	---	---	---	---
Dioxin (2,3,7,8 TCDD)[C, 12]	1746-01-6	$2.2x10^{-7}$ to $3.0x10^{-5}$,[M]	$5.0X10^{-9}$	$5.1X10^{-9}$	0.01	0.00001
Diphenylhydrazine 1,2[C]	122-66-7	0.044	0.036	0.20	270	---
Diquat[12]	85-00-7	15 to 20[M]	---	---	---	---
Endosulfan	115-29-7	42	---[10]	---	0.11	0.056

TABLE B BASIC STANDARDS FOR ORGANIC CHEMICALS (concentration in µg/L)						
Parameter		Human Health Based[1]			Aquatic Life Based[4]	
	CAS No.	Water Supply[2]	Water + Fish[3]	Fish Ingestion[8]	Acute	Chronic
Endosulfan, alpha	959-98-8	42	---[10]	---	0.11	0.056
Endosulfan, beta	33213-65-9	42	---[10]	---	0.11	0.056
Endosulfan sulfate	1031-07-8	42	---[10]	---	0.11	0.056
Endothall	145-73-3	100[M]	---	---	---	---
Endrin	72-20-8	2[M]	----[10]	---	0.086	0.036
Endrin aldehyde	7421-93-4	2.1	0.29	0.30	---	---
Epichlorohydrin[C]	106-89-8	3.5	---	---	---	---
Ethylbenzene[11]	100-41-4	700[M]	530	2,100	32,000	---
Ethylene dibromide[C, 12] (1,2 – dibromoethane)	106-93-4	0.02 to 0.05[M]	---	---	---	---
Ethylene glycol monobutyl ether (EGBE) (2-Butoxyethanol)	111-76-2	700	---	---	---	---
Ethylhexyl phthalate (BIS-2)[C, 12] (DEHP)	117-81-7	2.5 to 6[M]	1.2	2.2	---	---
Fluoranthene (PAH)	206-44-0	280	130	140	3,980	---
Fluorene (PAH)	86-73-7	280	280	5,300	---	---
Folpet[C]	133-07-3	10	---	---	---	---
Furmecyclox[C]	60568-05-0	1.2	---	---	---	---
Glyphosate	1071-83-6	700[M]	---	---	---	---
Guthion	86-50-0	---	---	---	---	0.01
Heptachlor[C, 12]	76-44-8	0.008 to 0.4[M]	$7.8X10^{-5}$	$7.9X10^{-5}$	0.52	0.0038
Heptachlor epoxide[C, 12]	1024-57-3	0.004 to 0.2[M]	$3.9X10^{-5}$	$3.9X10^{-5}$	0.52	0.0038
Hexachlorobenzene[C, 12]	118-74-1	0.022 to 1.0[M]	0.00028	0.00029	---	---
Hexachlorobutadiene	87-68-3	0.45	0.44	---[10]	90	9.3
Hexachlorocyclohexane, Alpha[C]	319-84-6	0.0056	0.0026	0.0049	---	---
Hexachlorocyclohexane, Beta	319-85-7	0.019	0.0091	0.017	---	---
Hexachlorocyclohexane, Gamma (Lindane)	58-89-9	0.2[M]	0.2	---[10]	0.95	0.08
Hexachlorocyclohexane, Technical[C]	608-73-1	---	0.012	0.041	100	---
Hexachlorocyclopentadiene[11, 12] (HCCPD)	77-47-4	42 to 50[M]	40	---[10]	7	5

TABLE B BASIC STANDARDS FOR ORGANIC CHEMICALS (concentration in µg/L)						
Parameter		Human Health Based[1]			Aquatic Life Based[4]	
	CAS No.	Water Supply[2]	Water + Fish[3]	Fish Ingestion[8]	Acute	Chronic
Hexachlorodibenzo-p-dioxin (1,2,3,7,8,9-hcdd)[C]	19408-74-3	5.60E-06	---	---	---	---
Hexachloroethane[C]	67-72-1	0.88	0.5	1.2	980	540
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	121-82-4	0.42	---	---	---	---
Hexanone 2-	591-78-6	35	---	---	---	---
Hydrazine/Hydrazine sulfate[C]	302-01-2	0.012	---	---	---	---
Indeno(1,2,3-cd)pyrene (PAH)[C, 13]	193-39-5	0.16	0.0051	0.0053	---	---
Isophorone[11]	78-59-1	140	130	3,600	---	---
Malathion	121-75-5	140	---	---	---	0.1
Methanol	67-56-1	14,000	---	---	---	---
Methoxychlor12	72-43-5	35 to 40M	---10	---	---	0.03
Methyl bromide (HM)	74-83-9	---	9.8	1,500	---	---
Methyl chloride (HM)[C]	74-87-3	---	5.6	180	---	---
Methylene bis(N,N'-dimethyl)aniline 4,4[C]	101-61-1	0.76	---	---	---	---
Metribuzin	21087-64-9	180	160	1,700	---	---
Mirex	2385-85-5	1.4	---	---	---	0.001
Naphthalene (PAH)	91-20-3	140	140	---[10]	2,300	620
Nitrobenzene	98-95-3	14	14	2,800	27,000	---
Nitrophenol 4	100-02-7	56	56	9,700	---	---
Nitrosodibutylamine N[C]	924-16-3	0.0065	0.0043	0.012	---	---
Nitrosodiethylamine N[C]	55-18-5	0.00023	0.00023	0.0083	---	---
Nitrosodimethylamine N[C] (NDMA)	62-75-9	0.00069	0.00069	3.0	---	---
N-Nitrosodiethanolamine[C]	1116-54-7	0.013	---	---	---	---
Nitrosodiphenylamine N[C]	86-30-6	7.1	3.3	6.0	---	---
N-Nitroso-N-methylethylamine[C]	10595-95-6	0.0016	---	---	---	---
N-Nitrosodi-n-propylamine[C]	621-64-7	0.005	0.005	0.50	---	---
Nitrosopyrrolidine N[C]	930-55-2	0.017	0.016	36	---	---
Nonylphenol	84852-15-3 and 25154-52-3	---	---	---	28	6.6
Oxamyl (vydate)[12]	23135-22-0	175 to 200[M]	---	---	---	---
PCBs[C, 9, 12]	1336-36-3	0.0175 to 0.5[M]	$6.4X10^{-5}$	$6.4X10^{-5}$	2.0	0.014

TABLE B BASIC STANDARDS FOR ORGANIC CHEMICALS (concentration in µg/L)						
Parameter		Human Health Based[1]			Aquatic Life Based[4]	
	CAS No.	Water Supply[2]	Water + Fish[3]	Fish Ingestion[8]	Acute	Chronic
Parathion	56-38-2	---	---	---	0.065	0.013
Pentachlorobenzene	608-93-5	5.6	1.4	1.5	---	---
Pentachlorophenol[C, 12]	87-86-5	0.088 to 1.0[M]	0.080	0.91	19[6]	15[6]
Perchlorate	7790-98-9	4.9	---	---	---	---
Phenol	108-95-2	2,100	2,100	---[10]	10,200	2,560
Picloram	1918-02-1	490	---	---	---	---
Prometon	1610-18-0	100	---	---	---	---
Propylene oxide[C]	75-56-9	0.15	---	---	---	---
Pyrene (PAH)	129-00-0	210	210	4,000	---	---
Quinoline[C]	91-22-5	0.012	---	---	---	---
Simazine	122-34-9	4[M]	---	---	---	---
Styrene	100-42-5	100[M]	---	---	---	---
Tetrachlorobenzene 1,2,4,5	95-94-3	2.1	0.97	1.07	---	---
Tetrachloroethane 1,1,2,2[C]	79-34-5	0.18	0.17	4	---	2,400
Tetrachloroethylene (PCE)[C]	127-18-4	5[M]	5	62	5,280	840
Tetrahydrofuran	109-99-9	6,300	---	---	---	---
Toluene[11, 12]	108-88-3	560 to1,000[M]	510	5,900	17,500	---
Toxaphene[C, 12]	8001-35-2	0.032 to 3[M]	0.00028	---[10]	0.73	0.0002
Tributyltin (TBT)	56573-85-4	---	---	---	0.46	0.072
Trichloroacetic acid	76-03-9	0.52	---	---	---	---
Trichlorobenzene 1,2,4[11]	120-82-1	70[M]	35	---[10]	250	50
Trichloroethane 1,1,1 (1,1,1-TCA)	71-55-6	200[M]	---	---	---	---
Trichloroethane 1,1,2 (1,1,2-TCA)[11, 12]	79-00-5	2.8 to 5[M]	2.7	71	9,400	---
Trichloroethylene (TCE) [C]	79-01-6	5[M]	2.5	30	45,000	21,900
Trichloropropane 1,2,3 [C, 13]	96-18-4	3.7E-4	---	---	---	---
Trichlorophenol 2,4,5	95-95-4	700	700	3,600	---	---
Trichlorophenol 2,4,6[C]	88-06-2	3.2	1.4	2.4	---	970
Trichlorophenoxypropionic acid (2,4,5-tp) (Silvex)	93-72-1	50[M]	---	---	---	---

TABLE B BASIC STANDARDS FOR ORGANIC CHEMICALS (concentration in µg/L)						
Parameter		Human Health Based[1]			Aquatic Life Based[4]	
	CAS No.	Water Supply[2]	Water + Fish[3]	Fish Ingestion[8]	Acute	Chronic
Total Trihalomethanes (HMs)	(total)[7]	80	80	---	---	---
Trimethylbenzene 1,2,3	526-73-8	67	---	---	---	---
Trimethylbenzene 1,2,4	95-63-6	67	---	---	---	---
Trimethylbenzene 1,3,5	108-67-8	67	---	---	---	---
Vinyl Chloride[C, 12]	75-01-4	0.023 to 2[M]	0.023	2.3	---	---
Xylenes (total)[12]	1330-20-7	1,400 to 10,000[M]	---	---	---	---

Table B – Footnotes

(1) All standards are chronic or 30-day standards. They are based on information contained in EPA's Integrated Risk Information System (IRIS) and/or EPA lifetime health advisories for drinking water using a 10^{-6} incremental risk factor unless otherwise noted.

(2) Only applicable to segments classified for water supply.

(3) Applicable to all Class 1 aquatic life segments which also have a water supply classification or Class 2 aquatic life segments which also have a water supply classification designated by the Commission after rulemaking hearing. These class 2 segments will generally be those where fish of a catchable size and which are normally consumed are present, and where there is evidence that fishing takes place on a recurring basis. The Commission may also consider additional evidence that may be relevant to a determination whether the conditions applicable to a particular segment are similar enough to the assumptions underlying the Water + Fish ingestion criteria to warrant the adoption of Water + Fish ingestion standards for the segment in question.

(4) Applicable to all aquatic life segments.

(5) Deleted.

(6) Standards are pH-dependent. Those listed are calculated for pH = 7.8.

Acute = $e^{[1.005(pH)-4.869]}$; Chronic = $e^{[1.005(pH)-5.134]}$.

(7) Total trihalomethanes are considered the sum of the concentrations of bromodichloromethane (CAS No. 75-27-4), dibromochloromethane (Chlorodibromomethane(HM), CAS No. 124-48-1), tribromomethane (bromoform, CAS No. 75-25-2) and trichloromethane (chloroform, CAS No. 67-66-3).

(8) Applicable to the following segments which do not have a water supply classification: all Class 1 aquatic life segments or Class 2 aquatic life segments designated by the Commission after rulemaking hearing. These class 2 segments will generally be those where fish of a catchable size and which are normally consumed are present, and where there is evidence that fishing takes place on a recurring basis. The Commission may also consider additional evidence that may be relevant to a determination whether the conditions applicable to a particular segment are similar enough to the assumptions underlying the fish ingestion criteria to warrant the adoption of fish ingestion standards for the segment in question.

(9) PCBs are a class of chemicals which include aroclors, 1242, 1254, 1221, 1232, 1248,1260 and 1016, CAS numbers 53469-21-9, 11097-69-1, 11104-28-2, 11141-16-5, 12672-29-6, 11096-82-5, and 12674-11-2 respectively. The aquatic life criteria apply to this set of PCBs. The human health criteria apply to total PCBs, i.e. the sum of all congenor or all isomer analyses.

(10) The chronic aquatic life standard is more stringent than the associated Water + Fish or Fish Ingestion standard, and therefore no Water + Fish or Fish Ingestion standard has been adopted.

(11) The Water + Fish and Fish Ingestions standards for these compounds have been calculated using a relative source contribution (RSC).

(12) Whenever a range of standards is listed and referenced to this footnote, the first number in the range is a strictly health-based value, based on the Commission's established methodology for human health-based standards. The second number in the range is a maximum contaminant level, established under the federal Safe Drinking Water Act that has been determined to be an acceptable level of this chemical in public water supplies, taking treatability and laboratory detection limits into account. Control requirements, such as discharge permit effluent limitations, shall be established using the first number in the range as the ambient water quality target, provided that no effluent limitation shall require an "end-of-pipe" discharge level more restrictive than the second number in the range. Water bodies will be considered in attainment of this standard, and not included on the Section 303(d) List, so long as the existing ambient quality does not exceed the second number in the range.

(13) Mutagenic compound, age dependent factors were used in calculating standard.

(C) Carcinogens classified by the EPA as A, B1, or B2.

(M) Drinking water MCL.

CAS No. – Chemical Abstracts Service Registry Number.

(HM) – Halomethanes

(PAH) – Polynuclear Aromatic Hydrocarbons.

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(4) Site-Specific Radioactive Materials and Organic Pollutants Standards.

(a) In determining whether to adopt site-specific standards to apply in lieu of the statewide standards established in sections (2) and (3) above, the Commission shall first determine the appropriate use classifications, in accordance with section 31.13. If such a determination would result in removing an existing classification, the downgrading factors in section 31.6 (2)(B) shall apply.

(b) The Commission shall then determine whether numerical standards other than some or all of the statewide standards established in sections (2) and (3) above would be more appropriate for protection of the classified uses, taking into account the factors prescribed in section 25-8-204(4), C.R.S. and in section 31.7. The downgrading factors described in section 31.6(2)(B) shall not apply to the establishment of site-specific standards under this section.

(c) Site-specific standards to apply in lieu of statewide standards may be based upon consideration of the appropriateness of the assumptions used in the risk assessment based potency factors and reference dose values, including, but not limited to, consideration of the uncertainty factor, exposure assessment, bioaccumulation factor, exposed population factor, assumed consumption factor, risk comparisons, uncertainty analysis, and the availability of the toxics in the water column, considering persistence, hardness, pH, temperature or valence form in the water column.

(5) Nothing in this regulation shall be interpreted to preclude:

(a) An agency responsible for implementation of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 42 U.S.C. 9601 et seq., as amended, from selecting a remedial action that is more or less stringent than would be achieved by compliance with the statewide numerical standards established in this section, or alternative site-specific standards adopted by the Commission, where a determination is made that such a variation is authorized pursuant to the applicable provisions of CERCLA.

(6) Except where the Commission adopts or has adopted a different standard on a site-specific basis, the less restrictive of the following two options shall apply as numerical standards for all surface waters with a “water supply” classification, if water supply is an actual use of the waters in question or of hydrologically connected groundwater:

i. existing quality as of January 1, 2000; or

ii. the following table value criteria set forth in Tables II and III:

Iron	300 µg/L (dissolved)
Manganese	50 µg/L (dissolved)
Sulfate	250 mg/L (dissolved)

Provided, that if the existing quality of these constituents in such surface waters as of January 1, 2000, is affected by an unauthorized discharge with respect to which the Division has undertaken an enforcement action, the numerical standards shall be the ambient conditions existing prior to the unauthorized discharge or the above table value criteria, whichever is less restrictive.

Data generated subsequent to January 1, 2000 shall be presumed to be representative of existing quality as of January 1, 2000, if the available information indicates that there have been no new or increased sources of these pollutants impacting the segment(s) in question subsequent to that date.

For all surface waters with a “water supply” classification that are not in actual use as a water supply, the water supply table value criteria for sulfate, iron and manganese set forth in Tables II and III may be applied as numerical standards only if the Commission determines as the result of a site-specific rulemaking hearing that such standards are necessary and appropriate in accordance with section 31.7.

(7) Methylmercury Fish Tissue: Fish tissue concentrations shall not exceed 0.3 milligrams methylmercury per kilogram (0.3 mg/kg) of wet-weight fish tissue. Attainment of the standard will be assessed by comparing the average fish tissue methylmercury concentration for each species and size class to the 0.3 mg/kg standard.

31.12 SALINITY AND SUSPENDED SOLIDS

The Commission recognizes that excessive salinity and suspended solids levels can be detrimental to the water use classifications. The Commission has established salinity standards for the Colorado River Basin (“Water Quality Standards for Salinity including Numeric Criteria and Plan of Implementation of Salinity Control”, Commission Regulation No. 39) but has not established or assigned other standards for salinity or suspended solids control practices to be developed through 208 plans, coordination with agricultural agencies, and further studies of existing water quality.

31.13 STATE USE CLASSIFICATIONS

Waters are classified according to the uses for which they are presently suitable or intended to become suitable. In addition to the classifications, one or more of the qualifying designations described in section 31.13(2), may be appended. Classifications may be established for any state surface waters, except that water in ditches and other manmade conveyance structures shall not be classified.

(1) Classifications

(a) Recreation

(i) Class E Existing Primary Contact Use

These surface waters are used for primary contact recreation or have been used for such activities since November 28, 1975.

(ii) Class P - Potential Primary Contact Use

These surface waters have the potential to be used for primary contact recreation. This classification shall be assigned to water segments for which no use attainability analysis has been performed demonstrating that a recreation class N classification is appropriate, if a reasonable level of inquiry has failed to identify any existing primary contact uses of the water segment, or where the conclusion of a UAA is that primary contact uses may potentially occur in the segment, but there are no existing primary contact uses.

(iii) Class N - Not Primary Contact Use

These surface waters are not suitable or intended to become suitable for primary contact recreation uses. This classification shall be applied only where a use attainability analysis demonstrates that there is not a reasonable likelihood that primary contact uses will occur in the water segment(s) in question within the next 20-year period.

(v) Class U - Undetermined Use

These are surface waters whose quality is to be protected at the same level as existing primary contact use waters, but for which there has not been a reasonable level of inquiry about existing recreational uses and no recreation use attainability analysis has been completed. This shall be the default classification until inquiry or analysis demonstrates that another classification is appropriate.

(b) Agriculture

These surface waters are suitable or intended to become suitable for irrigation of crops usually grown in Colorado and which are not hazardous as drinking water for livestock.

(c) Aquatic Life

These surface waters presently support aquatic life uses as described below, or such uses may reasonably be expected in the future due to the suitability of present conditions, or the waters are intended to become suitable for such uses as a goal:

(i) Class 1 - Cold Water Aquatic Life

These are waters that (1) currently are capable of sustaining a wide variety of cold water biota, including sensitive species, or (2) could sustain such biota but for correctable water quality conditions. Waters shall be considered capable of sustaining such biota where physical habitat, water flows or levels, and water quality conditions result in no substantial impairment of the abundance and diversity of species.

(ii) Class 1 - Warm Water Aquatic Life

These are waters that (1) currently are capable of sustaining a wide variety of warm water biota, including sensitive species, or (2) could sustain such biota but for correctable water quality conditions. Waters shall be considered capable of sustaining such biota where physical habitat, water flows or levels, and water quality conditions result in no substantial impairment of the abundance and diversity of species.

(iii) Class 2 - Cold and Warm Water Aquatic Life

These are waters that are not capable of sustaining a wide variety of cold or warm water biota, including sensitive species, due to physical habitat, water flows or levels, or uncorrectable water quality conditions that result in substantial impairment of the abundance and diversity of species.

(d) Domestic Water Supply

These surface waters are suitable or intended to become suitable for potable water supplies. After receiving standard treatment (defined as coagulation, flocculation, sedimentation, filtration, and disinfection with chlorine or its equivalent) these waters will meet Colorado drinking water regulations and any revisions, amendments, or supplements thereto.

(i) Direct Use Water Supply Lakes and Reservoirs Sub-classification

(A) For the purpose of this section, “plant intake” means the works or structures at the head of a conduit through which surface water is diverted from a source (e.g., lake) into the treatment plant.

(B) Direct Use Water Supply Lakes and Reservoirs (DUWS) are those water supply lakes and reservoirs where:

(I) There is a plant intake located in the lake or reservoir or a man-made conveyance from the lake or reservoir that is used regularly to provide raw water directly to a water treatment plant that treats and disinfects raw water, or

(II) The Commission, based on evidence in the record, determines that the reservoir will meet the criteria in 31.13(1)(d)(i)(B)(I) in the future.

(e) Wetlands

(i) The provisions of this section do not apply to constructed wetlands.

(ii) Compensatory wetlands shall have, as a minimum, the classifications of the segment in which they are located.

(iii) Created wetlands shall be considered to be initially unclassified, and shall be subject only to the narrative standards set forth in section 31.11, unless and until the Commission adopts the “wetlands” classification described below and appropriate numeric standards for such wetlands.

(iv) Tributary wetlands shall be considered tributaries of the surface water segment to which they are most directly connected and shall be subject to interim classifications as follows: such wetlands shall be considered to have the same classifications, except for drinking water supply classifications, as the segment of which they are a part, unless the “wetlands” classification and appropriate site-specific standards have been adopted to protect the water quality dependent functions of the wetlands. Interim numeric standards for these wetlands are described in section 31.7(1)(b)(iv).

(v) The Commission may adopt a “wetlands” classification based on the functions of the wetlands in question. Wetland functions that may warrant site-specific protection include groundwater recharge or discharge, flood flow alteration, sediment stabilization, sediment or other pollutant retention, nutrient removal or transformation, biological diversity or uniqueness, wildlife diversity or abundance, aquatic life diversity or abundance, and recreation. Because some wetland functions may be mutually exclusive (e.g., wildlife abundance, recreation), the functions to be protected or restored will be determined on a wetland-by-wetland basis, considering natural wetland characteristics and overall benefits to the watershed. The initial adoption of a site-specific wetlands classification and related standards to replace the interim classifications and standards described above shall not be considered a downgrading.

(2) Qualifiers

The following qualifiers may be appended to any classification to indicate special considerations. Where a qualifier applies, it will be appended to the use classification; for example, “Class 1, Warm Water Aquatic Life (Goal)”.

(a) Goal

A qualifier which indicates that the waters are presently not fully suitable but are intended to become fully suitable for the classified use. “Goal” will be used to indicate that a temporary modification for one or more of the underlying numeric standards has been granted.

(b) Seasonal

A qualifier which indicates that the water may only be suitable for a classified use during certain periods of the year. During those periods when water is in the stream, the standards as defined in sections 31.7(1)(b) and 31.9(1) shall apply.

(c) Interrupted Flow

A qualifier which indicates that due to natural or human induced conditions the continuity of flow is broken not necessarily according to a seasonal schedule. This qualifier appended to a classification indicates that the flow conditions still permit the classified use during period of flow. The presence of water diversions in a stream does not change the classifications and standards, and the standards do not require that flow be maintained in the stream.

(3) Areas Requiring Special Protection

In special cases where protection of beneficial uses requires standards not provided by the classification above, special standards may be assigned after full public notice and hearings. Cases where special protection may be needed include but are not limited to wildlife preserves and waterbodies endangered by eutrophication. In addition, the Commission may adopt site-specific criteria-based standards based on site-specific analyses to protect agriculture, water supply or recreational uses.

31.14 RESERVED

31.15 SEVERABILITY

The provisions of this regulation are severable, and if any provisions or the application of the provisions to any circumstances is held invalid, the application of such provision to other circumstances and the remainder of this regulation shall not be affected thereby.

31.16 TABLES

(1) INTRODUCTION

The numeric levels for parameters listed in Tables I, II, III shall be considered and applied as appropriate by the Commission in establishing site-specific numeric standards, in accordance with section 31.7.

For the purposes of integrating these parameters into NPDES discharge permits, the duration of the averaging period for the numeric level is designated in the tables. Chronic levels and 30-day levels are to be averaged as defined in section 31.5(7). Acute levels and 1-day levels are to be averaged as defined in section 31.5(2).

Certain toxic metals for Aquatic Life have different numeric levels for different levels of water hardness. Water hardness is being used here as an indication of differences in the complexing capacity of natural waters and the corresponding variation of metal toxicity. Other factors such as organic and inorganic ligands, pH, and other factors affecting the complexing capacity of the waters may be considered in setting site-specific numeric standards in accordance with section 31.7. Metals listed in Table III for aquatic life uses are stated in the dissolved form unless otherwise indicated.

(2) TESTING PROCEDURES

Various testing procedures to determine that numeric values for water quality parameters may be appropriate to present to the Water Quality Control Commission at stream classification hearings. (See section 31.6(3)). These include:

(a) Standard Test Procedures

- (i) Code of Federal Regulations, Title 40, Part 136;
- (ii) The latest approved EPA <u>Methods for Chemical Analysis of Water and Wastes;</u>
- (iii) <u>Standard Methods for the Examination of Water and Wastewater</u> (current edition), American Public Health Association;
- (iv) <u>ASTM Standards,</u> Part 31, <u>Water</u>;
- (v) EPA Biological Field and Laboratory Methods.

(b) Toxicity testing and Criteria Development Procedures:

(i) The latest EPA Methods for Chemical Analysis of Water and Wastewater; ASTM, Standard Methods for Examination of Water, Wastewater;

(ii) Interim Guidance on Determination and Use of Water-Effect Ratio for Metals, EPA-823-B-94-001, U.S. Environmental Protection Agency, February, 1994.

(iii) Other approved EPA methods.

(c) Other Procedures:

Other procedures may be deemed appropriate by either the Water Quality Control Commission and/or the Water Quality Control Division.

(3) REFERENCES

Capital letters following levels in the tables indicate the sources of the level; they are referenced below.

(A) EPA Quality Criteria for Water, July 1976, U.S. Environmental Protection Agency, U.S. Government Printing Office: 1977 0-222-904, Washington, D.C. 256 p.

(B) EPA Water Quality Criteria 1972, Ecological Research Series, National Academy of Sciences, National Academy of Engineering, EPA-R3-73-033, March 1973, Washington, D.C. 594 p.

(C) Davies, P.H. and Goettl, J.P., Jr., July 1976, Aquatic Life - Water Quality Recommendations for Heavy Metal and Other Inorganics.

(D) Parametrix Inc., Attachment II, Parametrix Reports - Toxicology Assessments of As, Cu, Fe, Mn, Se, and Zn, May 1976, Bellevue, Washington, 98005. submitted to Water Quality Control Commission by Gulf Oil Corp., Inc., 161 p.

(E) EPA National Interim Primary Drinking Water Regulations, 40 Code of Federal Regulations, Part 141.

(F) EPA, March 1977, Proposed National Secondary Drinking Water Regulation, Federal Register, Vol. 42 No. 62, pp 17143-17147.

(G) Recommendations based on review of all available information by the Committee on Water Quality Standards and Stream Classification.

(H) American Fishery Society, June 1978, A Review of the EPA Red Book Quality Criteria for Water, (Preliminary Edition).

(I) Section 307 of the Clean Water Act, regulations promulgated pursuant to Section 307.

(J) Final Report of the Water Quality Standards and Methodologies Committee to the Colorado Water Quality Control Commission, June 1986.

(K) Proposed Nitrogenous Water Quality Standards for the State of Colorado, by the Nitrogen Cycle Committee of the Basic Standards Review Task Force, March 12, 1986 (Final Draft).

(L) Quality Criteria for Water, 1986, and Updates Through 1989, U.S. Environmental Protection Agency, U.S. Government Printing Office, EPA 440/5-86-001, Washington, D.C. 20460.

(M) Level modified by Commission

(N) 1999 Update of Ambient Water Quality Criteria for Ammonia (1999 Ammonia Update), U.S. Environmental Protection Agency, Office of Water, EPA-823-F-99-024, Washington, D.C. 20460.

(O) Raisbeck, M.F., S. L. Riker, C. M. Tate, R. Jackson, M. A. Smith, K. J. Reddy and J. R. Zygmunt. 2008. Water quality for Wyoming livestock and wildlife. University of Wyoming AES Bulletin B-1183.

TABLE I - PHYSICAL AND BIOLOGICAL PARAMETERS

TABLE I PHYSICAL AND BIOLOGICAL PARAMETERS									
Parameter	Recreation			Aquatic Life			Agriculture	Domestic Water Supply
	CLASS E (Existing Primary Contact) and CLASS U (Undetermined Use)	CLASS P (Potential Primary Contact Use)	CLASS N (Not Primary Contact Use)	CLASS 1 COLD WATER BIOTA	CLASS 1 WARM WATER BIOTA	CLASS 2		
PHYSICAL								
D.O. (mg/L)[(1)(9)]	3.0[(A)]	3.0[(A)]	3.0[(A)]	6.0[(2)(G)] 7.0 (spawning)	5.0[(2)(G)]	5.0(A)	3.0[(A)]	3.0[(A)]
pH (Std. Units)[(3)]	6.5–9.0[(B,M)]	6.5–9.0[(B,M)]	6.5–9.0[(B,M)]	6.5–9.0[(A)]	6.5–9.0[(A)]	6.5–9.0[(A)]		5.0–9.0[(A)]
Suspended Solids[(4)]								
Temperature (°C)[(5)]				**Rivers & Streams:** **Tier I[a,g]:** June-Sept = 17.0 (ch), 21.7 (ac) Oct –May = 9.0 (ch), 13.0 (ac) **Tier II[b,g]:** Apr-Oct = 18.3 (ch), 24.3 (ac) Nov-Mar = 9.0 (ch), 13.0 (ac) **Lakes & Res[h]:** Apr-Dec = 17.0 (ch), 21.2 (ac) Jan-Mar = 9.0 (ch), 13.0 (ac) **Large Lakes & Res[c,h]:** Apr-Dec = 18.3 (ch), 24.2 (ac) Jan-Mar = 9.0 (ch), 13.0 (ac)	**Rivers & Streams:** **Tier I[d]:** Mar-Nov = 24.2 (ch), 29.0 (ac) Dec-Feb = 12.1 (ch), 24.6 (ac) **Tier II[e]:** Mar-Nov = 27.5 (ch), 28.6 (ac) Dec-Feb = 13.8 (ch), 25.2 (ac) **Tier III[f]:** Mar-Nov = 28.7 (ch), 31.8 (ac) Dec-Feb = 14.3 (ch), 24.9 (ac) **Lakes & Res:** Apr-Dec = 26.2 (ch), 29.3 (ac) Jan-Mar = 13.1 (ch), 24.1 (ac)	Same as Class 1		
BIOLOGICAL:								
E. coli per 100 ml	126[(7)]	205[(7)]	630[(7)]					630

Note: Capital letters In parentheses refer to references listed in section 31.16(3); numbers in parentheses refer to Table I footnotes.

Temperature Definitions

[a] Cold Stream Tier I temperature criteria apply where cutthroat trout and brook trout are expected to occur.
[b] Cold Stream Tier II temperature criteria apply where cold-water aquatic species, excluding cutthroat trout or brook trout, are expected to occur.
[c] Large Cold Lakes temperature criteria apply to lakes and reservoirs with a surface area equal to or greater than 100 acres surface area.
[d] Warm Stream Tier I temperature criteria apply where common shiner, johnny darter, or orangethroat darter, or stonecat are expected to occur.
[e] Warm Stream Tier II temperature criteria apply where brook stickleback, central stoneroller, creek chub, finescale dace, longnose dace, mountain sucker, northern redbelly dace, razorback sucker, or white sucker are expected occur, and none of the more thermally sensitive species in Tier I are expected to occur.
[f] Warm Stream Tier III temperature criteria apply where warm-water aquatic species are expected to occur, and none of the more thermally sensitive species in Tiers I and II are expected to occur.
[g] Mountain whitefish-based summer temperature criteria [16.9 (ch), 21.2 (ac)] apply when and where spawning and sensitive early life stages of this species are known to occur.
[h] Lake trout-based summer temperature criteria [16.6 (ch), 22.4 (ac)] apply where appropriate and necessary to protect lake trout from thermal impacts.

Table I – Footnotes

(1) Standards for dissolved oxygen are minima, unless specified otherwise. For the purposes of permitting, dissolved oxygen may be modeled for average conditions of temperature and flow for the worst case time period. Where dissolved oxygen levels less than these levels occur naturally, a discharge shall not cause a further reduction in dissolved oxygen in receiving water. (For lakes, also see footnote 9.)

(2) A 7.0 mg/liter standard (minimum), during periods of spawning of cold water fish, shall be set on a case by case basis as defined in the NPDES or CDPS permit for those dischargers whose effluent would affect fish spawning.

(3) The pH standards of 6.5 (or 5.0) and 9.0 are an instantaneous minimum and maximum, respectively to be applied as effluent limits. In determining instream attainment of water quality standards for pH, appropriate averaging periods may be applied, provided that beneficial uses will be fully protected.

(4) Suspended solid levels will be controlled by Effluent Limitation Regulations, Basic Standards, and Best Management Practices (BMPs).

(5) Temperature shall maintain a normal pattern of diel and seasonal fluctuations and spatial diversity with no abrupt changes and shall have no increase in temperature of a magnitude, rate, and duration deleterious to the resident aquatic life. These criteria shall not be interpreted or applied in a manner inconsistent with section 25-8-104, C.R.S.

a. The MWAT of a waterbody shall not exceed the chronic temperature criterion more frequently than one event in three years on average.

b. The DM of a waterbody shall not exceed the acute temperature criterion more frequently than one event in three years on average.

c. The following shall not be considered an exceedance of the criteria:

i. Lakes and reservoirs: When a lake or reservoir is stratified, the mixed layer may exceed the applicable temperature criteria in Table I provided that an adequate refuge exists in water below the mixed layer. Adequate refuge means that there is concurrent attainment of the applicable Table I temperature and dissolved oxygen criteria. If the refuge is not adequate because of dissolved oxygen levels, the lake or reservoir may be included on the 303(d) List as “impaired” for dissolved oxygen, rather than for temperature.

ii. A “warming event” is the maximum allowable extent of exceedances above the standard, in units of degree-days (°C-days). This concept integrates both the magnitude of temperature (°C) above the standard as well as the duration (in days) and represents the cumulative temperatures above which growth or lethal impacts to fisheries are expected. For all Cold Stream tiers the allowable degree-days are 2.4 (acute) and 13.5 (chronic). For all Warm Stream tiers the allowable degree-days are 3.8 (acute) and 35.5 (chronic).

(6) Deleted

(7) *E. coli* criteria and resulting standards for individual water segments are established as indicators of the potential presence of pathogenic organisms. Standards for *E. coli* are expressed as a two-month geometric mean. Site-specific or seasonal standards are also two-month geometric means unless otherwise specified.

(8) Deleted

(9) The dissolved oxygen standard applies to lakes and reservoirs as follows.

a. Recreation: In the upper portion of a lake or reservoir, dissolved oxygen shall not be less than the criteria in Table I or the applicable site-specific standard. In the lower portion of a lake or reservoir, dissolved oxygen may be less than the applicable standard except where a site-specific standard has been adopted. A site-specific dissolved oxygen standard will be established for the lower portion of a lake or reservoir where there is evidence that primary contact occurs within the lower portion.

b. Agriculture: In the upper portion of a lake or reservoir, dissolved oxygen shall not be less than the criteria in Table I or the applicable site-specific standard. In the lower portion of a lake or reservoir, dissolved oxygen may be less than the applicable standard except where a site-specific standard has been adopted. A site-specific dissolved oxygen standard will be established for the lower portion of a lake or reservoir where there is evidence that livestock watering or irrigation water is pumped from the lower portion.

c. Aquatic Life: In the upper portion of a lake or reservoir, dissolved oxygen shall not be less than the criteria in Table I or the applicable site-specific standard. In the lower portion of a lake or reservoir, dissolved oxygen may be less than the applicable standard as long as there is adequate refuge. Adequate refuge means that there is concurrent attainment of the applicable Table I temperature and dissolved oxygen criteria. A site-specific dissolved oxygen standard will be established for the lower portion of a lake or reservoir where the expected aquatic community has habitat requirements within the lower portion.

i. Fall turnover exclusion: Dissolved oxygen may drop 1 mg/L below the criteria in Table I in the upper portion of a lake or reservoir for up to seven consecutive days during fall turnover provided that profile measurements are taken at a consistent location within the lake or reservoir 7-days before, and 7-days after the profile with low dissolved oxygen. The profile measurements taken before and after the profile with low dissolved oxygen must attain the criteria in Table I in the upper portion of the lake or reservoir. The fall turnover exclusion does not apply to lakes or reservoirs with fish species that spawn in the fall unless there are data to show that adequate dissolved oxygen is maintained in all spawning areas, for the entire duration of fall turnover.

d. Water Supply: The dissolved oxygen criteria is intended to apply to the epilmnion and metalimnion strata of lakes and reservoirs. Dissolved oxygen in the hypolimnion may, due to the natural conditions, be less than the table criteria. No reductions in dissolved oxygen levels due to controllable sources is allowed.

TABLE II - INORGANIC PARAMETERS

TABLE II INORGANIC PARAMETERS								
Parameter	Aquatic Life						Agriculture	Domestic Water Supply
	CLASS 1 COLD WATER BIOTA		CLASS 1 WARM WATER BIOTA		CLASS 2			
Ammonia (mg/L as N) Total	chronic = elsp or elsa(1) acute = sp(1)(N)		chronic = Apr 1-Aug 31 = elsp(1) Sept 1-Mar 29 = elsa(1) acute = sa(1)(N)		Class 2 Cold/Warm have the same standards as Class 1 Cold/Warm(N)			
Total residual Chlorine (mg/L)	0.019(L) (acute)	0.011(L) (chronic)	0.019(L) (acute)	0.011(L) (chronic)	0.019(L) (acute)	0.011(L) (chronic)		
Cyanide - Free (mg/L)	0.005(H) (acute)		0.005(H) (acute)		0.005(H) (acute)		0.2(G) (acute)	0.2(B,D,M) (acute)
Fluoride(6) (mg/L)								2.0 (E) (acute)
Nitrate (mg/L as N)							100(2)(B) (acute)	10(4)(K) (acute)
Nitrite (mg/L as N)	TO BE ESTABLISHED ON A CASE BY CASE BASIS(3)				A CASE BY CASE BASIS(3)		10(2)(B) (acute)	1.0(2)(4)(K) (acute)
Sulfide as H_2S (mg/L)	0.002 undissociated(A) (chronic)		0.002 undissociated(A) (chronic)		0.002 undissociated(A) (chronic)			0.05(F) (chronic)
Boron (mg/L)							0.75(A,B) (chronic)	
Chloride (mg/L)								250(F) (chronic)
Sulfate, dissolved(7) (mg/L)								250(F) (chronic)
Asbestos(6) fibers/L								7,000,000 (5) (chronic)
Note: Capital letters in parentheses refer to references listed in 31.16(3); numbers in parentheses refer to Table II footnotes.								

Table II – Footnotes

(1) Chronic:

For fish early life stage present (elsp)*:

$$chronic\,elsp = \left(\frac{0.0577}{1+10^{7.688-pH}} + \frac{2.487}{1+10^{pH-7.688}} \right) * MIN\left(2.85, 1.45 * 10^{0.028(25-T)}\right)$$

For fish early life stage absent (elsa)*:

$$chronic\,elsa = \left(\frac{0.0577}{1+10^{7.688-pH}} + \frac{2.487}{1+10^{pH-7.688}} \right) * 1.45 * 10^{0.028*(25-MAX(T,\,7))}$$

*T = Temperature

Acute:

For salmonids present (sp):

$$acute\ sp = \frac{0.275}{1+10^{7.204-pH}} + \frac{39.0}{1+10^{pH-7.204}}$$

For salmonids absent (sa):

$$acute\ sa = \frac{0.411}{1+10^{7.204-pH}} + \frac{58.4}{1+10^{pH-7.204}}$$

(2) In order to provide a reasonable margin of safety to allow for unusual situations such as extremely high water ingestion or nitrite formation in slurries, the NO3-N plus NO2-N content in drinking waters for livestock and poultry should be limited to 100ppm or less, and the NO2-N content alone be limited to 10ppm or less.

(3) Salmonids and other sensitive fish species* present:

Acute= 0.10 (0.59 * [Cl-]+3.90) mg/L NO2-N

Chronic= 0.10 (0.29 * [Cl-]+0.53) mg/L NO2-N

[Cl-] = Chloride ion concentration; upper limit for Cl- = 40 mg/L

Salmonids and other sensitive fish species* absent:

Acute= 0.20 (2.00 * [Cl-]+0.73) mg/L NO2-N

Chronic=0.10 (2.00 *[Cl-]+0.73) mg/L NO2-N

[Cl-] = Chloride ion concentration; upper limit for Cl- = 22 mg/L

*Sensitive fish species include salmonids, channel catfish, logperch and brook stickleback. Either total or dissolved chloride data may be used in these equations.

(4) The combined total of nitrate plus nitrite will not exceed 10 mg/L.

a. The nitrate limit shall be calculated to meet the relevant standard in accordance with the provisions of Section 31.10 of this regulation, unless the permittee provides documentation that a reasonable level of inquiry demonstrates that there is no actual domestic water supply use of the waters in question or of hydrologically connected groundwater. The combined total of nitrate plus nitrite at the point of intake to the domestic water supply will not exceed 10 mg/L as demonstrated through modeling or other scientifically supportable analysis. (This Footnote 4a is repealed effective 12/31/2022).

(5) Asbestos standard applies to fibers 10 micrometers or longer.

(6) Consistent with 31.7(1)(b) and 31.7(2), these table values will be applied on a site-specific basis.

(7) The dissolved sulfate standard may be assessed and implemented from either unfiltered or filtered samples.

TABLE III - METAL PARAMETERS

TABLE III METAL PARAMETERS (concentration in µg/L)						
Metal(1)	Aquatic Life(1)(3)(4)(J)		Agriculture(2)	Domestic Water Supply(2)	Water + Fish(7)	Fish Ingestion(10)
	ACUTE	CHRONIC	CHRONIC		CHRONIC	CHRONIC
Aluminum	$e^{(1.3695*\ln(hardness)+1.8308)}$ (total recoverable)	87 or $e^{(1.3695*\ln(hardness)-0.1158)}$ (total recoverable)(11)			---	---
Antimony(18)				6.0 (chronic)	5.6	640
Arsenic	340	150	100(A)	0.02 – 10(13) (chronic)	0.02	7.6
Barium(18)				1,000(E) (acute) 490 (chronic)	---	---
Beryllium(18)			100(A,B)	4.0 (chronic)	---	---
Cadmium	Warm(17) = (1.136672-(ln(hardness)* 0.041838))*$e^{(0.9789*\ln(hardness)-3.443)}$ Cold(17) = (1.136672-(ln(hardness)* 0.041838))*$e^{(0.9789*\ln(hardness)-3.866)}$	(1.101672-(ln(hardness)*0.041838))* $e^{(0.7977*\ln(hardness)-3.909)}$	10(B)	5.0(E) (acute)	---	---
Chromium III(5)	$e^{(0.819*\ln(hardness)+2.5736)}$	$e^{(0.819*\ln(hardness)+0.5340)}$	100(B)	50(E) (acute)	---	---
Chromium VI(5)	16	11	100(B)	50(E) (acute)	100	---
Copper	$e^{(0.9422*\ln(hardness)-1.7408)}$	$e^{(0.8545*\ln(hardness)-1.7428)}$	200(B)	1,000(F) (chronic)	1,300	---
Iron		1,000 (total recoverable)(A,C)		300 (dissolved)(F) (chronic)	---	---
Lead	(1.46203-(ln(hardness)* 0.145712))*$e^{(1.273*\ln(hardness)-1.46)}$	(1.46203-(ln(hardness)* 0.145712))*$e^{(1.273*\ln(hardness)-4.705)}$	100(B)	50(E) (acute)	—	---
Manganese	$e^{(0.3331*\ln(hardness)+6.4676)}$	$e^{(0.3331*\ln(hardness)+5.8743)}$	200(B)(12)	50 (dissolved)(F) (chronic)	—	---

TABLE III METAL PARAMETERS (concentration in µg/L)						
Metal[1]	Aquatic Life[1][3][4][J]		Agriculture[2]	Domestic Water Supply[2]	Water + Fish[7]	Fish Ingestion[10]
	ACUTE	CHRONIC	CHRONIC		CHRONIC	CHRONIC
Mercury		FRV(fish)[6] = 0.01 (total recoverable)		2.0[E] (acute)	—	---
Molybdenum			300[O][15]	210 (chronic)		
Nickel	$e^{(0.846*\ln(hardness)+2.253)}$	$e^{(0.846*\ln(hardness)+0.0554)}$	200[B]	100[E] (chronic)	610	4,600
Selenium[9]	18.4	4.6	20[B,D]	50[E] (chronic)	170	4,200
Silver	$0.5*e^{(1.72*\ln(hardness)-6.52)}$	$e^{(1.72*\ln(hardness)-9.06)}$ Trout[19] = $e^{(1.72*\ln(hardness)-10.51)}$		100[F] (acute)	—	---
Thallium[18]		15[C]		0.5 (chronic)	0.24	0.47
Uranium[16]	$e^{(1.1021*\ln(hardness)+2.7088)}$	$e^{(1.1021*\ln(hardness)+2.2382)}$		16.8 – 30[13] (chronic)	---	---
Zinc	$0.978*e^{(0.9094*\ln(hardness)+0.9095)}$	$0.986*e^{(0.9094*\ln(hardness)+0.6235)}$ Sculpin[14] = $e^{(2.140*\ln(hardness)-5.084)}$	2000[B]	5,000[F] (chronic)	7,400	26,000

Note: Capital letters in parentheses refer to references listed in section 31.16(3); numbers in parentheses refer to Table III footnotes.

Table III – Footnotes

(1) Metals for aquatic life use are stated as dissolved unless otherwise specified.

Where the hardness-based equations in Table III are applied as table value water quality standards for individual water segments, those equations define the applicable numerical standards. As an aid to persons using this regulation, Table IV provides illustrative examples of approximate metals values associated with a range of hardness levels. This table is provided for informational purposes only.

(2) Metals for agricultural and domestic uses are stated as total recoverable unless otherwise specified.

(3) Hardness values to be used in equations are in mg/L as calcium carbonate and shall be no greater than 400 mg/L. The exception is for aluminum, where the upper cap on calculations is a hardness of 220 mg/L. For permit effluent limit calculations, the hardness values used in calculating the appropriate metal standard should be based on the lower 95 percent confidence limit of the mean hardness value at the periodic low flow criteria as determined from a regression analysis of site specific data. Where insufficient site-specific data exists to define the mean hardness value at the periodic low flow criteria, representative regional data shall be used to perform the regression analysis. Where a regression analysis is not possible, a site-specific method should be used, e.g., where hardness data exists without paired flow data, the mean of the hardness during the low flow season established in the permit shall be used. In calculating a hardness value, regression analyses should not be extrapolated past the point that data exist. For determination of standards attainment, where paired metal/hardness data is available, attainment will be determined for individual sampling events. Where paired data is not available, the mean hardness will be used.

(4) Both acute and chronic numbers adopted as stream standards are levels not to be exceeded more than once every three years on the average.

(5) Unless the stable forms of chromium in a water body have been characterized and shown not to be predominantly chromium VI, data reported as the measurement of all valence states of chromium combined should be treated as chromium VI. In addition, in no case can the sum of the concentrations of chromium III and chromium VI or data reported as the measurement of all valence states of chromium combined exceed the water supply standards of 50 µg/L chromium in those waters classified for domestic water use.

(6) FRV means Final Residue Value and should be expressed as “total recoverable” mercury. The term “total recoverable” refers to the mineral acid digestion of an unfiltered sample to account for all forms of mercury present in water. Mercury data analyzed and reported as “total” or “total recoverable” mercury by using EPA approved total mercury analysis methods listed in 40 CFR 136.3 are considered equivalent.

Many forms of mercury are readily converted to toxic forms under natural conditions. The FRV of 0.01 µg/liter is the maximum allowed concentration of total mercury in the water. This value is estimated to prevent bioaccumulation of methylmercury in edible fish or shellfish tissue above the fish tissue standard for methylmercury of 0.3 mg/kg.

In waters supporting populations of fish or shellfish with a potential for human consumption, the Commission can adopt the FRV as the stream standard to be applied as a 30-day average. Alternatively, the Commission can adopt site-specific ambient-based standards for mercury in accordance with section 31.7(1)(b)(ii) and (iii). Site-specific water-column standards shall be calculated from the site-specific bioaccumulation factor, using measured water column concentrations of total mercury and measured fish tissue concentrations of methylmercury. Fish tissue data shall be collected from species of the highest trophic level present in the waterbody. Fish tissue samples should include older, larger individuals present in the waterbody. A bioaccumulation factor should be calculated separately for each species sampled, and the highest bioaccumulation factor should be used to calculate the site-specific water column standard in order to prevent the average fish tissue concentrations from exceeding 0.3 mg/kg for all species.

(7) Applicable to all Class 1 aquatic life segments which also have a water supply classification or Class 2 aquatic life segments which also have a water supply classification designated by the Commission after rulemaking hearing. These Class 2 segments will generally be those where fish of a catchable size and which are normally consumed are present, and where there is evidence that fishing takes place on a recurring basis. The Commission may also consider additional evidence that may be relevant to a determination whether the conditions applicable to a particular segment are similar enough to the assumptions underlying the Water + Fish ingestion criteria to warrant the adoption of Water + Fish ingestion standards for the segment in question.

(8) The use of 0.1 micron pore size filtration for determining dissolved iron is allowed as an option in assessing compliance with the drinking water standard.

(9) Selenium is a bioaccumulative metal and subject to a range of toxicity values depending upon numerous site-specific variables.

(10) Applicable to the following segments which do not have a water supply classification: all Class 1 aquatic life segments or Class 2 aquatic life segments designated by the Commission after rulemaking hearing. These class 2 segments will generally be those where fish of a catchable size and which are normally consumed are present, and where there is evidence that fishing takes place on a recurring basis. The Commission may also consider additional evidence that may be relevant to a determination whether the conditions applicable to a particular segment are similar enough to the assumptions underlying the fish ingestion criteria to warrant the adoption of fish ingestion standards for the segment in question.

(11) Where the pH is equal to or greater than 7.0 in the receiving water after mixing, the chronic hardness-dependent equation will apply. Where pH is less than 7.0 in the receiving water after mixing, either the 87 µg/L chronic total recoverable aluminum criterion or the criterion resulting from the chronic hardness-dependent equation will apply, whichever is more stringent.

(12) This standard is only appropriate where irrigation water is applied to soils with pH values lower than 6.0.

(13) Whenever a range of standards is listed and referenced to this footnote, the first number in the range is a strictly health-based value, based on the Commission’s established methodology for human health-based standards. The second number in the range is a maximum contaminant level, established under the federal Safe Drinking Water Act that has been determined to be an acceptable level of this chemical in public water supplies, taking treatability and laboratory detection limits into account. Control requirements, such as discharge permit effluent limitations, shall be established using the first number in the range as the ambient water quality target, provided that no effluent limitation shall require an “end-of-pipe” discharge level more restrictive than the second number in the range. Water bodies will be considered in attainment of this standard, and not included on the Section 303(d) List, so long as the existing ambient quality does not exceed the second number in the range.

(14) The chronic zinc equation for sculpin applies in areas where mottled sculpin are expected to occur and hardness is less than 102 ppm CaCO3. The regular chronic zinc equation applies in areas where mottled sculpin are expected to occur, but the hardness is greater than 102 ppm CaCO3.

(15) In determining whether adoption of a molybdenum standard is appropriate for a segment, the Commission will consider whether livestock or irrigated forage is present or expected to be present. The table value assumes that copper and molybdenum concentrations in forage are 7 mg/kg and 0.5 mg/kg respectively, forage intake is 6.8 kg/day, copper concentration in water is 0.008 mg/L, water intake is 54.6 L/day, copper supplementation is 48 mg/day, and that a Cu:Mo ratio of 4:1 is appropriate with a 0.075 mg/L molybdenum margin of safety. Numeric standards different than the table-value may be adopted on a site-specific basis where appropriate justification is presented to the Commission. In evaluating site-specific standards, the relevant factors that should be considered include the presence of livestock or irrigated forage, and the total intake of copper, molybdenum, and sulfur from all sources (i.e., food, water, and dietary supplements). In general, site-specific standards should be based on achieving a safe copper:molybdenum total exposure ratio, with due consideration given to the sulfur exposure. A higher Cu:Mo ratio may be necessary where livestock exposure to sulfur is also high. Species specific information shall be considered where cattle are not the most sensitive species.

(16) When applying the table value standards for uranium to individual segments, the Commission shall consider the need to maintain radioactive materials at the lowest practical level as required by Section 31.11(2) of the Basic Standards regulation.

(17) The acute(warm) cadmium equation applies to segments classified as Aquatic Life Warm Class 1 or 2. The acute(cold) cadmium equation applies to segments classified as Aquatic Life Cold Class 1 or 2.

(18) Consistent with 31.7(1)(b) and 31.7(2), these table values will be applied on a site-specific basis.

(19) The chronic silver equation for trout applies in areas where trout are expected to occur. The regular chronic silver equation applies in areas where trout are not expected to occur.

TABLE IV – AQUATIC LIFE TABLE VALUE STANDARDS FOR SELECTED HARDNESS CONCENTRATIONS

TABLE IV AQUATIC LIFE TABLE VALUE STANDARDS FOR SELECTED HARDNESS CONCENTRATIONS (µg/L)											
Mean Hardness in mg/L Calcium Carbonate											
		25	50	75	100	150	200	250	300	350	400
Aluminum	Acute	512	1324	2307	3421	5960	8838	10071	10071	10071	10071
	Chronic	73	189	329	488	851	1262	1438	1438	1438	1438
Cadmium	Acute(cold)	0.49	0.94	1.4	1.8	2.6	3.4	4.2	5.0	5.8	6.5
	Acute(warm)	0.75	1.4	2.1	2.7	4.0	5.2	6.4	7.6	8.8	10
	Chronic	0.25	0.43	0.58	0.72	0.97	1.2	1.4	1.6	1.8	2.0
Chromium III	Acute	183	323	450	570	794	1005	1207	1401	1590	1773
	Chronic	24	42	59	74	103	131	157	182	207	231
Copper	Acute	3.6	7.0	10	13	20	26	32	38	44	50
	Chronic	2.7	5.0	7.0	9.0	13	16	20	23	26	29
Lead	Acute	14	30	47	65	100	136	172	209	245	281
	Chronic	0.5	1.2	1.8	2.5	3.9	5.3	6.7	8.1	9.5	11
Manganese	Acute	1881	2370	2713	2986	3417	3761	4051	4305	4532	4738
	Chronic	1040	1310	1499	1650	1888	2078	2238	2379	2504	2618
Nickel	Acute	145	260	367	468	660	842	1017	1186	1351	1513
	Chronic	16	29	41	52	72	94	113	132	150	168
Silver	Acute	0.19	0.62	1.2	2.0	4.1	6.7	9.8	13	18	22
	Chronic(trout)	0.01	0.02	0.05	0.08	0.15	0.25	0.36	0.50	0.65	0.81
	Chronic	0.03	0.10	0.20	0.32	0.64	1.0	1.6	2.1	2.8	3.5
Uranium	Acute	521	1119	1750	2402	3756	5157	6595	8062	9555	11070
	Chronic	326	699	1093	1501	2346	3221	4119	5036	5968	6915
Zinc	Acute	45	85	123	160	231	301	368	435	500	565
	Chronic(sculpin)	6.1	27	64	118	N/A	N/A	N/A	N/A	N/A	N/A
	Chronic	34	65	93	121	175	228	279	329	379	428
Shading indicates the aquatic life standards exceed drinking water supply standards.											

APPENDIX A. Calculation of a Biologically-Based Low Flow

The biologically-based flow calculation method is an iterative convergence procedure consisting of five parts. In Part I, Z (the allowed number of excursions) is calculated. In Part II, the set of X-day running averages is calculated from the daily flows for the period of record being considered. Because the ambient (instream) concentration of a pollutant can be considered to be inversely proportional to stream flow, the appropriate "running averages" of stream flow are actually "running harmonic means." (The harmonic mean of a set of numbers is the reciprocal of the arithmetic mean of the reciprocals of the numbers.) Thus, "X-day running averages" should be calculated as , not as , where F is the flow for an individual day. Throughout this Appendix A, the term "running average" will mean "running harmonic mean."

Part III describes the calculation of N (the total number of excursions of a specified flow for the period of record being considered). The calculations described in Part III will be performed for a number of different flows that are specified in Parts IV and V. In Part IV, initial lower and upper limits on the flow are calculated, the number of excursions at each limit are calculated using Part III, and an initial trial flow is calculated by interpolation between the lower and upper limits. In Part V, successive iterations are performed to calculate the flow as the highest flow that results in no more than the number of allowed excursions calculated in Part I.

Part I. Calculation of allowed number of excursions.

I-1. Calculate Z = D/[(Y)(365.25 days/year])

where D = the number of days in the flow record;

Y = the average number of years specified in

the frequency; and

Z = the allowed number of excursions based on a 1-in-3-year recurrence interval.

Part II. Calculation of X-day running averages, i.e., X-day running harmonic means.

II-1. Where X = the specified duration (in days) of the averaging period, calculate the set of X-day running averages for the entire period of record being considered, i.e., calculate an X-day average starting with day 1, day 2, day 3, etc. Each average will have X-1 days in common with the next average, and the number of X-day averages calculated from the period of record being considered will be (D+1-X).

Part III. Determination of the number of excursions of a specified flow in a set of running averages, i.e., running harmonic means.

III-1. Select a specified trial low flow by method outlined in Part IV or an equivalent method.

III-2. In the set of X-day running averages for the period of record being considered, record the date for which the first average is below the specified trial low flow and record the number of consecutive days that are part of at least one or more of the X-day averages that are below the specified flow. (Note that whether a day is counted as an excursion day does not depend exclusively on whether the X-day average for that day is below the specified trial low flow. Instead, it depends entirely on whether that day is part of any X-day average that is below the specified trial low flow. Table A-1 provides examples of the counting of excursion days. For ease in discussion, it is based on a 4-day flow period, rather than a 30-day flow period. When calculating a low flow pursuant to Section 31.9(1), a 30-day period should be used.)

Thus the starting date and the duration (in days) of the first excursion period will be recorded. By definition, the minimum duration is X days.

III-3. Determine the starting dates of, and number of days in, each succeeding excursion period in the period of record being considered.

III-4. Identify all of the excursion periods that begin within 120 days after the beginning of the first excursion period. (Although the first excursion period is often the only one in the 120-day period, two or three sometimes occur within the 120 days. Rarely do any excursion periods occur during days 121 to 240.) All of these excursion periods are considered to be in the first low flow period. Add up the total number of excursion days in the first low flow period and divide the sum by X to obtain the number of excursions in the first low flow period. If the number of excursions is calculated to be greater than 5.0, set it equal to 5.0.

III-5. Identify the first excursion period that begins after the end of the first low flow period, and start the beginning of the second 120-day low flow period on the first day of this excursion period. Determine the number of excursion days and excursions in the second low flow period.

III-6. Determine the starting dates of, and the number of excursions in, each succeeding 120-day low flow period.

III-7. Sum the number of excursions in all the low-flow periods to determine S = the total number of excursions of the specified trial low flow.

Part IV. Calculation of initial limits of the low flow and initial trial flow.

IV-1. Use L = 0 as the initial lower limit.

IV-2. Use U = the XQY low flow as the initial upper limit.

IV-3. Use N L = 0 as the number of excursions (see Part III) of the initial lower limit.

IV-4. Calculate N U = the number of excursions (see Part III) of the initial upper limit.

IV-5. Calculate T = the initial trial flow as

$$T = L + \frac{(Z - N_L)(U - L)}{(N_U - N_L)}$$

IV-6. Calculation of initial limits of the low flow and initial trial flow may be accomplished using equivalent methods.

Part V. Iterative convergence to the low flow.

V-1. Calculate N T = the number of excursions for the trial low flow.

If $-0.005 < (N_T - Z)/Z) < +0.005$

If $N_T > Z$, set $U = T$ and $N_U = N_T$.

V-2 If $N_T < Z$, set $L = T$ and $N_L = N_T$. , use T as the low flow and stop.

V-3. If ((U-L)/U) < 0.005, use L as the low flow and stop.

Otherwise, calculate a new trial flow as $T = L + \frac{(Z - N_L)(U - L)}{(N_U - N_L)}$ and repeat steps V-1, V-2, and V-3 as necessary.

APPENDIX A TABLE A-1 - COUNTING EXCURSION DAYS FOR A SPECIFIED FLOW OF 100 FT3/SEC USING 4-DAY AVERAGES.

TABLE A-1. COUNTING EXCURSION DAYS FOR A SPECIFIED FLOW OF 100 FT3/SEC USING 4-DAY AVERAGES.

Date	Daily flow	4-day avg. flow	Is the 4-day average below 100?	Is this date part of any 4-day average that is below 100?	Date of start of excursion period	Number of days in excursion period	Date of start of low flow period	Number of excursion days in low flow period	Number or excursions in low flow period
1	130	112.5	No	No					
2	120	102.5	No	No					
3	110	97.5	Yes	Yes	3	4	3	12	3
4	90	102.5	No	Yes					
5	90	117.5	No	Yes					
6	100	112.5	No	Yes					
7	130	102.5	No	No					
8	150	102.5	No	No					
9	70	87.5	Yes	Yes	9	8			
10	60	90.0	Yes	Yes					
11	130	102.5	No	Yes					
12	90	95.0	Yes	Yes					
13	80	97.5	Yes	Yes					
14	110	127.5	No	Yes					
15	100	225.0	No	Yes					
16	100	>100	No	Yes					
17	200	>100	No	No					
18	500	>100	No	No					
The daily flows and four-day average flows for days 19 to 200 are all above 100 ft^3/sec.									

31.17 NUTRIENTS

(a) Overview

This section establishes interim numeric values for phosphorus, nitrogen and chlorophyll *a* and also sets forth provisions regarding the use of these numeric values for the adoption of water quality standards.

(b) Interim Phosphorus Values

Table 1 Interim Total Phosphorus Values	
Lakes and Reservoirs, cold > 25 acres	25 µg/L[1]
Lakes and Reservoirs, warm > 25 acres	83 µg/L[1]
Lakes and Reservoirs < = 25 acres	RESERVED
Rivers and Streams - cold	110 µg/L[2]
Rivers and Streams - warm	170 µg/L[2]

[1] summer (July 1 - September 30) average total phosphorus (µg/L) in the mixed layer of lakes (median of multiple depths), allowable exceedance frequency 1-in-5 years.
[2] annual median total phosphorus (µg/L), allowable exceedance frequency 1-in-5 years.

(c) Interim Nitrogen Values (Effective December 31, 2027)

Table 2 Interim Total Nitrogen Values	
Lakes and Reservoirs, cold > 25 acres	426 µg/L[1]
Lakes and Reservoirs, warm > 25 acres	910 µg/L[1]
Lakes and Reservoirs < = 25 acres	RESERVED
Rivers and Streams - cold	1,250 µg/L[2]
Rivers and Streams - warm	2,010 µg/L[2]

[1] summer (July 1 – September 30) average total nitrogen (µg/L) in the mixed layer of lakes (median of multiple depths), allowable exceedance frequency 1-in-5 years.
[2] annual median total nitrogen (µg/L), allowable exceedance frequency 1-in-5 years.

(d) Interim Chlorophyll *a* Values

Table 3 Interim Chlorophyll *a* Values		
Waterbody type		DUWS
Lakes and Reservoirs, cold > 25 acres	8 µg/L[1]	5 µg/L[3]
Lakes and Reservoirs, warm > 25 acres	20 µg/L[1]	5 µg/L[3]
Lakes and Reservoirs < = 25 acres	RESERVED	5 µg/L[3]
Rivers and Streams - cold	150 mg/m2[2]	
Rivers and Streams - warm	150 mg/m2[2]	

[1] summer (July 1 - September 30) average chlorophyll a (µg/L) in the mixed layer of lakes (median of multiple depths), allowable exceedance frequency 1-in-5 years.
[2] summer (July 1 - September 30) maximum attached algae, not to exceed.
[3] March 1 - November 30 average chlorophyll a (µg/L) in the mixed layer of lakes (median of multiple depths), allowable exceedance frequency 1-in-5 years.

(e) Use of Interim Phosphorus Values for Standards Adoption

Prior to December 31, 2027 the values set forth in subsection (b) above will be considered for the adoption of water quality standards for specific water bodies in Colorado in the following circumstances.

(i) Waters located upstream of

(A) all permitted domestic wastewater treatment facilities discharging prior to May 31, 2012 or with preliminary effluent limits requested prior to May 31, 2012,

(B) cooling tower discharges, and

(C) any non-domestic facility subject to Regulation #85 effluent limits and discharging prior to May 31, 2012.

(ii) Circumstances where the Commission has determined that adoption of numerical standards is necessary to address existing or potential nutrient pollution because the provisions of Regulation #85 will not result in adequate control of such pollution.

(f) Chlorophyll *a* Values for Standards Adoption

Prior to December 31, 2022, the values set forth in subsection (d) above will be considered for the adoption of water quality standards for specific water bodies in Colorado in the following circumstances.

(i) Waters located upstream of

(A) all permitted domestic wastewater treatment facilities discharging prior to May 31, 2012, or with preliminary effluent limits requested prior to May 31, 2012,

(B) cooling tower discharges, and

(C) any non-domestic facility subject to Regulation #85 effluent limits and discharging prior to May 31, 2012.

(ii) Discretionary Application of the Values for Direct Use Water Supply (DUWS) Lakes and Reservoirs. The Commission may determine that a numerical chlorophyll standard is appropriate for specific water bodies with this sub-classification after consideration of the following factors:

(A) Whether the public water system using the lake or reservoir as a raw water supply experiences impacts attributed to algae on an intermittent or continual basis;

(B) Whether there are lake or reservoir use restrictions in place that recognize the importance of the reservoir as a water supply;

(C) Whether application of this value appropriately balances protection of all classified uses of the lake or reservoir;

(D) Other site specific considerations which affect the need for a more protective value.

(iii) Circumstances where the Commission has determined that adoption of numerical standards is necessary to address existing or potential nutrient pollution because the provisions of Regulation #85 will not result in adequate control of such pollution.

(g) Use of Interim Nitrogen Values for Standards Adoption

After December 31, 2027, the values set forth in subsection (c) above will be considered for the adoption of water quality standards for specific water bodies in Colorado in the circumstances identified in subsection (e)(i) and (ii) above.

(h) Phase 2 Application of Numeric Standards

After December 31, 2022, the values set forth in subsection (d) will be considered by the Commission when applying numeric standards to individual segments. After December 31, 2022, the values set forth in subsections (b) and (c) for lakes and reservoirs will be considered by the Commission when applying numeric standards to Direct Use Water Supply (DUWS) reservoirs and lakes or lakes and reservoirs with public swim beaches that meet the definition of natural swimming areas in C.R.S. § 25-5-801. After December 31, 2027, the values set forth in subsection (b) and (c) will be considered by the Commission when applying numeric standards to individual segments where total phosphorus and total nitrogen standards have not yet been adopted.

For each individual segment where numeric standards for total phosphorus, total nitrogen, and chlorophyll *a* have not yet been adopted, numeric standards will be adopted by the Commission where necessary to:

(i) protect the assigned use classifications, and

(ii) comply with the Colorado Water Quality Control Act and the Federal Act.

(i) Site-Specific Flexibility to Consider Alternatives to the Interim Values

In accordance with the preceding subsection, both before and after December 31, 2027, in considering adoption of numeric standards for specific water bodies in Colorado, the Commission may review relevant site-specific factors and conditions in determining what numeric standards are most appropriate, and may adopt standards, either more or less stringent than the 31.17(b)(c) and (d) interim values.

(i) Where evidence demonstrates that an alternative numeric standard would be more appropriate for the protection of use classifications, the Commission may consider assigning ambient quality-based standards or site-specific criteria based standards as outlined in 31.7(1)(b)(ii-iii).

(ii) Where it has been demonstrated that interim values are not feasible to achieve, the Commission may consider modifying the use classification as outlined in Section 31.6(2).

(iii) Where the conditions established in Section 31.7(3)(a) are met, the Commission may consider granting a temporary modification.

31.18 RESERVED.

31.19 RESERVED.

31.20 STATEMENT OF BASIS AND PURPOSE (1979 ADOPTION)

These Regulations establish Basic Standards and an Antidegradation Standard (Section 3.1.11 and Section 3.1.8). They also establish a system for classifying State waters, for assigning standards and for granting temporary modifications. These Regulations do not classify State waters, nor do they assign any numeric standards except those radiological standards listed under Basic Standards. In addition, one of these Regulations is a control regulation. Section 3.1.4 makes it a violation to release pollutants into State waters without the treatment or other corrective action necessary to protect the beneficial uses of the waters, or to conduct, operate, or maintain facilities, processes, activities, or waste piles in such a way as to have any adverse effect on the beneficial or classified uses. This section gives the Colorado Water Quality Control Division greater flexibility to protect and maintain the quality of State waters. It is based on C.R.S. 1973, 25-8-102, 25-8-202(1), and 25-8-207(c).

The Colorado Water Quality Control Act requires the Commission to classify waters of the State. These regulations are intended to comply with the legislative intent as stated in C.R.S. 1973, 25-8-102(2):

> "It is further declared to be the public policy of this state to conserve state waters and to protect, maintain, and improve the quality thereof for public water supplies, for protection and propagation of wildlife and aquatic life, and for domestic, agricultural, industrial, recreational, and other beneficial uses; to provide that no pollutant be released into any state waters without first receiving the treatment or other corrective action necessary to protect the legitimate and beneficial uses of such waters; to provide for the prevention, abatement, and control of new or existing water pollution; and to cooperate with other states and the federal government in carrying out these objectives."

In addition, the subject Regulations are consistent with the Federal Clean Water Act which states, in part: (Section 101(a))

> "The objective of this Act is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters…
>
> (1) it is the national goal that discharge of pollutants into the navigable waters be eliminated by 1985;
>
> (2) it is the national goal that wherever attainable, an interim goal of water quality which provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water be achieved by July 1, 1983;"

C.R.S. 1973, 25-8-203(2) provides that the types of water classes shall be based on or intended to indicate relevant characteristics such as:

(c) Present uses of the water, the uses for which the water is suitable in its present conditions, or the uses for which it is to become suitable as a goal" and

(e) The need to protect the quality of the water for human purposes and also for the protection and propagation of wildlife and aquatic life;"

Such regulations are known as Classifications. C.R.S. 1973, 25-8-204 also requires that the Commission shall promulgate regulations which describe water characteristics or the levels of protection necessary to protect the beneficial uses. Such regulations are referred to as Standards.

In formulating the Regulations governing stream classifications, the Commission relied upon portions of the January 1974 Water Quality Standards and Stream Classifications, on the work of a broadly-based scientific committee which met publicly for several years, on testimony given at two oversight hearings and two series of public hearings, on workshops involving the public, and on documentary evidence including, but not limited to, the following:

1. EPA - Quality Criteria for Water, July 1976, U.S. Environmental Protection Agency, U.S. Government Printing Office: 1977 0-222-904, Washington, D.C. 256-p.

2. EPA - Water Quality Criteria 1972, Ecological Research Series, National Academy of Sciences, National Academy of Engineering, EPA-R3-73-033, March 1973, Washington, D.C. 594p.

3. Davies, P.H. and Goettl, J.P., Jr., July 1976, Aquatic Life - Water Quality Recommendations for Heavy Metal and Other Inorganic Toxicants in Fresh Water , submitted to Water Quality Standards Revision Committee and Colorado Water Quality Control Commission, 29 p.

4. Parametrix Inc., Attachment II - Parametrix Reports - Toxicology Assessments of As, Cu, Fe, Mn, Se and Zn, May 1976, Bellevue, Washington, 98005, submitted to Water Quality Control Commission by Gulf Oil, Inc. 161 p.

5. EPA - National Interim Primary Drinking Water Regulations, 40 CFR, Part 141 (Code of Federal Regulations) Washington, D.C.

6. EPA - Proposed National Secondary Drinking Water Regulations, Federal Register, Vol. 42, No. 62, March 1977, pages 17148–17149.

7. Material generated by the Committee on Colorado Water Quality Standards and Stream Classification, such as Summary of Concentration Limits for the Radionuclides Under Consideration by Numbers Subcommittee, July 1976, Milton W. Lammering, Ph.D., Chief Technical Investigations Branch, Surveillance and Analysis Division, EPA, Washington, D.C. 4 p.

More than thirty meetings, on notice to the public, were held during the formulation of these Regulations.

Section 303 of the Federal Act requires that water quality standards be established for every state. EPA will only promulgate such standards if the state does not promulgate acceptable water quality standards itself. Both the Federal and the State Acts require review of the water quality standards and stream classifications every three years. This review of the standards and classification system is pursuant to that required review.

With the exception of 3.1.4, these Regulations supersede those adopted in May, 1978. They May 1978 regulations superseded or were to phase out the January 1974 Water Quality Standards and Stream Classifications and the Temporary Stream Classification Exception Designated as Class C, effective October, 1976. As the Commission reclassifies State waters, previous classifications will be phased out. Those which have never been classified will be controlled by the Basic and Antidegradation Standards of these Regulations, by effluent limitations, and by classified uses in adjacent waters. Until such time as they are reclassified, streams which were classified under the previous system will be controlled by the limitations accompanying the previous system and all the factors mentioned above.

These Regulations establish basic water quality standards (called Basic Standards) which differ very little from the Basic Standards adopted in January, 1974. Previous Basic Standards stated that “the radioactivity of surface waters shall be maintained at the lowest practicable level and shall, in no case, except when due to natural causes, exceed the latest federal drinking water standard …” . To further clarify the previous Basic Standards, the present Regulations set numeric standards for six radioactive substances. Four of the levels - Cesium 134, Radium 226, and 228, Strontium 90, and Tritium - are identical to those in the federal drinking water standards.

With Plutonium 238, 239, and 240, and Thorium 230 and 232, the numeric standards are consistent with a goal of keeping exposures below 4 millirems per year (the level suggested for other human-made radionuclides in the National Interim Primary Drinking Water Regulations. Because of the difficulty of removing these radionuclides by conventional treatment procedures, it is necessary and important to restrict treatment procedures, it is necessary and important to restrict their levels in the waters. Their potential adverse effect on human health suggests that extreme caution be exercised in their release to State waters. In addition to addressing radioactivity, Basic Standards set forth certain other minimum standards applying to all waters regardless of beneficial use(s). These Basic Standards (Section 3.1.11) are essential to a program designed to protect the waters of the State because they describe the fundamental condition that all waters must meet. All of the previously-cited evidence and testimony form the basis for the Basic Standards.

An Antidegradation Standard, required by state and federal law is included. It requires that the quality of the waters cannot be degraded so as to interfere with their present uses. Furthermore, certain high quality waters may be identified. Because of the special values of these waters, no parameters may be degraded (High Quality Water - Class 1), or may be degraded only when the Commission allows lower water quality as a result of necessary economic or social development (High Quality Water - Class 2).

Under the previous system (January 1974), waters were classified as A_1, A_2, B_1, or B_2. Waters designated A_1 or A_2 were defined as waters suitable or to become suitable for all purposes for which raw water is customarily used, including primary contact recreation. Waters classified B_1 of B_2 were defined similarly except they were not protected for primary contact recreation. A_1 and B_1 applied to cold waters and A_2 and B_2 to warm waters. The temperature classifications were consistent with characteristics for cold and warm water aquatic life. Because that classification system was not comprehensive, dissatisfaction was expressed by many including those being regulated and those doing the regulating. Therefore, a new system was devised where uses to be protected could be identified indivdually and levels for various parameters could be identified which would protect the specified use. Subsequently, a stream could be classified for as many of those uses for which it is presently suitable and those for which it is to become suitable within the next twenty years.

The Classification Subcommittee of the Water Quality Standards and Stream Classification Committee recommended the following classifications: Recreation (primary contact and secondary contact), Agriculture, Aquatic Life (Cold Water and Warm Water), Domestic Water Supply (two classes). The Subcommittee also recommended a Wildlife Classification for protection of critical wildlife areas. This classification has been dropped, however, in favor of a section entitled “Areas Requiring Special Protection” in which various special situations can be addressed on a case-by-case basis.

An Industrial classification and a Stock Watering Classification were considered and rejected by both the Subcommitte and the Commission. Regarding an Industrial classification, it was decided that water supply requirements for different industries vary so greatly that it would be virtually impossible to decide what parameters and what levels would be appropriate for such a classification. At the request of the cattle and dairy interests, the Agriculture classification was defined so that in addition to being suitable for irrigation, it would also be suitable for stock watering. The rationale was that it would be difficult to segregate the two uses. If, in specific areas, the waters are in fact segregated and numeric standards for those parameters to protect stock watering are not necessary, the Commission can respond by not assigning those standards to those waters.

The Aquatic Life classification went through a number of changes during the public hearing process and was eventually defined in terms of habitat. The temperature differentiation was retained resulting in cold and warm water categories under Class 1. The major change was a differentiation made between waters where the potential life forms are presently limited primarily to flow and stream bed characteristics rather than water quality characteristics. An additional classification was added primarily in response to federal requirements that high quality waters be identified in each state. This classification is appropriately entitled High Quality Waters (FORMERLY in two classes).

Stream classifications may either be upgraded or downgraded upon reclassification. Upgrading means that additional uses are identified and will be protected. Downgrading will eliminate one or more of the presently classified uses. A finding must be made by the Commission that the stream is not attaining that use and that such use is unattainable in a twenty-year period because of at least one of the conditions set forth. The first three conditions are essentially the same as the conditions for the Class C Exception under the previous system. The Class C was a temporary classification for the purpose of granting a temporary exception for one or more parameter levels otherwise in effect on a stream. The criteria, however, were of a very permanent nature and are now much more appropriately applied to the more permanent downgrading situation. To accommodate the agricultural industry, an additional criterion was established recognizing agricultural practices considered a satisfactory for the locality. The twenty-year time period for attainability was used because the areawide wastewater management plans (208 plans) are based on twenty years. The regulations also allow the Commission to find that the former classifications had no factual basis and therefore did not reflect actual beneficial uses and that this would be an additional reason for downgrading.

The concept of the previous Class C Exception is now incorporated into a section entitled Temporary Modifications. When a use classification is assigned to a stream, numeric standards may also be assigned to protect that use. When a numeric standard is not being met at the present time, a temporary modification to this numeric standard may be granted. All planning, discharge permits, new wastewater facilities and other water quality control actions are to be geared towards eliminating the need for the temporary modification. Such temporary modifications must be reviewed at least every three years and may be extended or removed. In general, requests for temporary modifications are preferred over the more permanent downgrading. They serve as reminders that conditions are correctable and may increase the priority for funding to attain the classified use and the underlying numeric standard.

In addition, there are Qualifiers which may be appended to a use classification to indicate special considerations. The “Goal” qualifier indicates that the waters are presently not fully suitable for such use. The “Seasonal” qualifiers indicates that the water may only be suitable for the classified use during certain periods of the year. The “Interrupted Flow” qualifier indicates that while flow may be interrupted, the flow conditions still permit the classified use during periods of flow. The expanded use classification, the upgrading and downgrading provisions, the temporary modifications and the qualifiers make this system far more flexible than the previous system.

All waters of the State will be classified under this regulatory system through a process which provides for public notice and a public hearing before any classification of numeric standard is assigned. Whenever possible, the Commission will hold the public hearing in the general locality of the waters being classified. All classifications, standards, and temporary modifications will be assigned by the Commission by rule after consideration of all available data and evidence presented at the hearings, and can be changed only by a new rulemaking decision. Numeric standards will be assigned when there is documentation showing that a particular numeric level is appropriate for protecting the classified use. Standards may be set for an entire stream or for one or more segments thereof. Standards may be assigned at the time classifications are assigned or at any time thereafter, this is intended to be a dynamic process so that new standards may be adopted on a regular basis as the supporting information becomes available. The scientific and technological rationale for the standards will be developed from information obtained at the classification hearings.

Public participation in the process is always encouraged. A change in a classification, standards, or temporary modification may be sought at any time; however, it is within the discretion of the Commission to decide whether or not to consider the proposed change. In any case, all classifications, standards, and temporary modifications must be reviewed every three years.

The establishment of classifications and standards is based on the long-established fact that natural waters have a limited ability to assimilate wastes without rendering the water unfit for various beneficial uses. The quantity of pollutants that can be assimilated by a stream or water body is directly related to the quantity of water available for dilution and assimilation. Stream flows and levels change during the year and from year to year. Extremely low flows or water levels may not provide enough dilution water to assimilate the pollutants which, under normal or high flows, would not impair the assigned uses; therefore, it is reasonable to establish a flow below which the water quality standards assigned to State waters are not in force. This low flow or water level is commonly accepted as the “minimum annual average seven-consecutive-day flow expected to occur once in ten years” - 7-day 10 year low flow. The 7-day 10-year low flow may be determined by various statistical analyses of stream flow records covering at least ten years.

The Regulations also permit a seasonal average low flow rather than an Annual average low flow. A seasonal average low flow, for instance, may result in a less restrictive discharge permit requirement for ammonia in the winter because of the toxicity relationship to temperature and pH.

Another concept which uses the dilution and assimilative capacity of a stream and may result in a less restrictive discharge permit requirement is the “mixing zone”. A mixing zone is intended to serve as a zone of initial dilution in the immediate area of a discharge. The water quality standards assigned to the receiving waters are not in effect in the mixing zone. The Division designates the mixing zone on a case-by-case basis in accordance with the criteria established in the Regulations, Section 3.1.9(3). The mixing zone is well explained in that section and further information can be found in the Federal Water Pollution Agency's Water Quality Criteria 1968, p. 31.

Attached to the Regulations are three tables showing numeric levels for various parameters. The Tables are not adopted as regulations. The numeric levels set forth in the Tables are levels established by the commission after careful analysis of all available information and are generally considered to protect the beneficial use classifications of the waters of the state. They are intended to guide the commission and others at the use classification and numeric-standard-setting hearings. They carry no presumptive validity or applicability. Numeric standards may not be assigned for all the parameters listed in the Tables, and conversely, standards may be assigned for parameters which are not listed in the Tables.

31.21 STATEMENT OF BASIS AND PURPOSE (1984 REVISIONS):

In accordance with the requirements of 24-4-103(4), C.R.S. 1973, the Commission makes these findings and adopts this Statement of Basis and Purpose. The Commission, at a public rulemaking hearing November 14, 1983, and December 12, 1983, adopted minor and editorial corrections to clarify the Commission's current regulations numbered respectively 3.1.0, 3.4.0, 3.5.0, 3.6.0, and 3.8.0. These regulations are contained in Article 3, Water Quality Standards and Classifications, of the Policies, Regulations, and Guidelines of the Water Quality Control Commission. (5CCR 1002-8)

In adopting these corrections and clarifications, the Commission considered the economic reasonableness of its action. The scientific or technological rationale of the Commission in justifying the changes to its rules was that it made the classifications and standards which it had previously assigned more technically correct and accurate. The consolidated changes adopted by the Commission are provided with this Basis and Purpose. The Secretary of State is being provided corrected pages for each of the regulations as replacements for pages previously published in those regulations.

An issue raised during the hearing, was whether or not the table of organic parameters should be moved from the Appendix to the text. The Commission included standards for organic parameters in the regulations it adopted for each of the River Basins of the State. Thus, standards for organic parameters were applicable Statewide, prior to the hearing to consider the changes to which this Statement of Basis and Purpose is applicable. This has had the same effect as would have a basic standard applicable to all waters of the State.

The Commission finds that it would be easier to make changes to one document, the Basic Standards and Methodologies, as future scientific information necessitates, than to make such changes in each basin. Thus it is more economically reasonable to deal with the organic substances in one regulatory document, rather than many. There was testimony that it was confusing to have the table of organic parameters as criteria guidance subject to change on a stream by stream basis when the parameters had been assigned and were not merely to provide guidance. It was testified that it would be less confusing to have the table in the text of the regulation to provide basic standards.

The City of Loveland testified that if the table in question were moved to the regulatory text there was the possibility of a basin standard differing from the general standard. The Commission found that its regulations enabled it to set site specific standards to stream segments as an exception to the basic standard, and that for the parameters in this table it was unlikely to have different basin standards.

The organic parameters in the table are not substances that form a naturally occuring background. T hey are toxic controlled at the point of sale or use. They are not ambient and subject to the same treatment as are other naturally occurring parameters. The Commission found it inappropriate to regulate these organic constituents in the same manner as are those that can be ambient or uncontrollable background parameters. Therefore, the Commission changed the guideline table to a basic standard in the body of the regulation.

FISCAL IMPACT STATEMENT

Regarding the Adoption of Minor Corrections and Clarifications for the Basic Regulations and Corrections to the Numeric Standards for the San Juan and Dolores, Gunnison and Lower Dolores, Rio Grande, and the South Platte River Basins.

In accordance with section 24-4-103(8) (d) the Commission finds that the corrections and clarifications to its current regulations numbered respectively, 3.1.0, 3.4.0, 3.5.0, 3.6.0, and 3.8.0, have no quantifiable fiscal impact, although it is expected that these regulations will be more readily usable by the regulated industries and the general public.

PARTIES TO PROCEEDINGS

1. Climax Molybdenum Corporation
2. Trout Unlimited
3. Colorado Municipal League
4. City of Loveland
5. Eastman Kodak Company

31.22 STATEMENT OF BASIS AND PURPOSE (1987 REVISIONS)

A. BACKGROUND

These amendments to the Basic Standards and Methodologies were made as a result of a February, 1983 triennial review hearing which revealed dissatisfaction with several elements of the regulation. The Commission organized a task force of three committees of selected scientific experts representing several points of view in early 1985:

(1) The Water Quality Standards and Methodologies Committee, to address issues relating to metal toxicity and issues regarding the methodologies used to set water quality standards;

(2) The Nitrogen Cycle Committee, to address issues relating to determining appropriate water quality standards for nitrogenous compounds; and,

(3) The Aquatic Life Committee, to evaluate the system for adopting aquatic life classifications.

Reports from the three committees were completed in early 1986. The recommendations of the Water Quality Standards and Methodologies Committee and the Nitrogen Cycle Committee formed the basis for the proposed revisions that were considered at this hearing. The Commission decided to take no action with respect to the recommendations of the Aquatic Life Committee in this hearing, because it felt that the recommendations advanced did not warrant proposing changes to the classification system at this time. Revisions of the aquatic life classification system may be considered at a later date.

At least one party recommended that a separate peer review process regarding the committee reports be held prior to taking action on revisions to the Basic Standards and Methodologies. The Commission believes that this hearing process provided an adequate opportunity to review those aspects of the reports relied on in the proposed revisions.

B. OVERVIEW OF REVISIONS

The revisions adopted by the Commission make a variety of changes in the system for establishing and implementing site-specific water quality standards in Colorado. The following are the major areas in which the Commission made or considered changes:

(1) New or revised site-specific standards for metals shall be based on dissolved metals whenever adequate evidence to justify such standards is presented in a hearing. The existing total recoverable metals standards shall remain in effect until superceded by standards promulgated under the new system. For discharge permits, effluent monitoring to determine compliance with metals limitations based on dissolved metals standards shall use the potentially dissolved method, unless it is demonstrated that dissolved analysis is statistically comparable for the discharge in question.

(2) A methodology has been adopted for setting site-specific ambient quality-based standards that is similar to the methodology previously used in practice, with certain important differences. Where ambient quality exceeds table values, but is determined adequate to protect uses, chronic standards may be set equal to the 85th percentile of the available representative data. For metals, determination of new ambient quality-based standards will be based on the dissolved method. The Commission intends that the determination of what data are representative shall be made consistent with the Division's established procedure for exclusion of outliers.

The Commission also has added to the regulation a statement of a second alternative approach to setting site-specific standards, referred to as site-specific-criteria-based standards.

(3) Revised aquatic life table values have been adopted for metals. Both chronic and acute values are established in Table III. Site-specific metals standards also may be established in accordance with the provisions for ambient quality-based standards and site-specific-criteria-based standards.

(4) New aquatic life table values have been adopted for unionized ammonia. Both chronic and acute values are established in Table III. Site-specific unionized ammonia standards also may be established in accordance with the provisions for site-specific-criteria-based standards.

(5) Revised aquatic life table values have been adopted for nitrite. The Commission considered, but rejected, proposed revisions to the agriculture table values for nitrite and nitrate.

(6) The Commission considered, but rejected, a proposal to establish a new domestic water supply classification.

(7) The Commission considered proposals to modify the current low flow criteria in the regulation. The Commission decided to make no major changes at this time, pending analysis of a low flow study undertaken by Colorado State University.

(8) The Commission ratified its previous action deleting section 3.1.4, so that deletion will be reflected in the published regulations.

The basis and purpose for each of these actions is discussed in the following sections of this statement of Basis and Purpose.

The July 31, 1988 effective date has been selected for several reasons. First, the Commission felt that it could reach a consensus on the revisions adopted herein. To delay final adoption of these revisions to a later date along with the other issues described below would have unnecessarily complicated new hearings with old issues and would have possibly required a total rehearing due to the turnover of membership on the Commission.

Second, certain technical issues (particularly relating to low flows) that the Commission had hoped to address in this rulemaking proceeding were not addressed as fully as the Commission had hoped during the hearing. The Commission hopes to address those issues in a new rulemaking hearing prior to the effective date of these revisions, so that any additional technical changes can become effective as part of one overall package, reducing the confusion and disruption that could result from two successive major sets of revisions of the regulation.

Third, EPA has raised several issues regarding the adequacy of the Basic Standards and Methodologies. The Commission intends to hold a rulemaking hearing regarding those issues sometime between December, 1987 and March, 1988. Therefore, the Commission again hopes that any changes to the regulations that may be determined necessary relating to the issues raised by EPA can become effective as part of one overall package, to avoid multiple revisions going into effect at different times.

Fourth, the Commission recognizes that a number of the revisions now being adopted are major. Because the range of options considered in this hearing was wide, it may be that there are aspects of the specific changes adopted which could usefully be further clarified. Therefore, between now and the effective date of these revisions the Commission may consider the adoption of further refinements of these changes if that appears appropriate.

The Commission gave extensive consideration to the public and private costs potentially associated with implementing a major overhaul of the State's water quality standards system. In several instances the Commission has attempted to minimize these impacts by minimizing the magnitude of the change. (E.g. the 85th percentile ambient quality-based standards methodology adopted is very similar to the previously-used mean plus standard deviation ($\bar{x}$ + s) methodology, especially compared to the more stringent 50th percentile hearing proposal; the new table values for unionized ammonia are similar to existing values and the previous approach to setting site-specific ammonia standards has been ratified; proposed changes to domestic use classifications and agriculture table values were rejected.) In addition, the Commission hopes to minimize the dislocation caused by these changes by ratifying all existing site-specific standards and implementing the revised system on a basin-by-basin, segment-by-segment basis as adequate data becomes available. Adoption of these revisions to the Basic Standards and Methodologies in no way undermines the legitimacy or effectiveness of existing site-specific standards adopted under the previous system.

Generally, the Commission Contemplates that standards will be revised in conjunction with the triennial review of each basin's standards. The new provisions are being adopted because they represent an improvement and refinement of the existing system based on more recent information, not because the existing system is based on material assumptions that were in error or no longer apply. Therefore, this revision of the Basic Standards and Methodologies does not by itself create grounds for site-specific hearings pursuant to 25-8-207, C.R.S. However, the Commission may in its discretion hold hearings to revise site-specific standards in accordance with the new system prior to the next triennial review for a basin where exigent circumstances warrant.

The Commission intends that when considering revision of site-specific standards based on the new system, either all or none of the standards on a particular segment will be revised to conform with the new system, unless there is a compelling justification to vary from this procedure. This should mean that during the transition period of implementation of the new system, dischargers on any given segment are dealing with either the old system or the new system, not a mixture of both. In some instances, during the transition period it may be desirable to collect and analyze data for both total recoverable metals and dissolved metals. At least one party recommended that the Commission adopt a revised system as an alternative to the existing methodologies, without doing away with the existing system. The Commission rejected this approach because it believes it is important to move, over time, to a single, consistent standard-setting system. However, retaining existing site-specific standards and implementing the new system on a site-specific basis only when adequate data is available will ease the transition to the new system.

Although it is not feasible to predict the impact of implementing this new water quality standards system for each stream segment in the State, from the evidence submitted it is clear that certain site-specific standards may become more stringent while others may become more lenient. For example, the revised table values will result in some more stringent standards and some less stringent standards for various metals, depending on water hardness. The new table value acute standards generally will result in less stringent daily maximum effluent limitations in discharge permits. Basing standards on dissolved metals will result in lower in-stream metals standards in certain instances, but this is partly compensated for by corresponding changes in the methodology for analysis of discharge effluents.

The Commission finds that the revisions as a whole are economically reasonable because the new water quality standards system is more scientifically justifiable. Any practical water quality standards system must rely on simplifications and generalizations of the large variety of conditions that exist in nature. In general, the Commission finds that the revisions being adopted as scientific improvements in the system will minimize the potential for over-protection (saving the resources of dischargers) and minimize the potential for under-protection (reducing unwarranted impacts on the State's water quality resources). Therefore the revisions are justified by the need to base standards on the best scientific information available, to the maximum extent feasible.

C. ANALYTICAL TECHNIQUES FOR METALS (Sections 3.1.7, 3.1.14, Table III)

The shift to basing water quality standards on dissolved metals has been undertaken because the evidence indicates that it is the dissolved fraction that is principally responsible for impacts to aquatic life. EPA proposed reliance on an “acid soluble” method for establishing ambient criteria, but the Commission believes the evidence adequately supports reliance on the dissolved method. Generally, the dissolved method more accurately measures (compared to total or total recoverable analyses) the ionic form of metals that is toxic to aquatic life, while excluding less toxic complexed forms. The acid soluble method may overstate the metals that are biologically available to aquatic life.

In addition, dissolved ambient water quality data tends to be more “normally” distributed than total or total recoverable data. Therefore, dissolved data is better suited to the methodology adopted for setting ambient quality-based standards, including the use of Chauvenet's Criteria to screen potential outliers.

Adoption of the potentially dissolved method for effluent monitoring may overstate the availability of ionic metals in an effluent. However, the dissolved method would potentially understate the availability of ionic metals once an effluent has mixed with receiving waters. For example, this would occur where stream pH is lower than effluent pH, so that more metals would be released into solution after mixing with the lower pH receiving waters. To better ensure protection of aquatic life, the Commission has decided as a matter of policy to require the more conservative approach. Also, it is noted that a discharger has the option of using the dissolved method to monitor its effluent if it can demonstrate that the dissolved and potentially dissolved fractions in its effluent are not significantly different.

Because extensive in-stream metals data has not previously been generated, this shift in methodologies will result in additional monitoring costs for the State and the regulated community. However, in certain instances it may be possible to set new dissolved standards without extensive new in-stream data; for example, where table value standards are determined to be appropriate or where appropriate assumptions can be made to set dissolved standards based on existing total recoverable data.

As discussed in the “Overview of Revisions” section of this Statement of Basis and Purpose, current site-specific water quality standards (including metals standards not based on the dissolved method) remain in effect in spite of the adoption of these revisions to the Basic Standards and Methodologies until new site-specific standards are adopted. The Commission intends to move as quickly as feasible (generally through the triennial review process) to the adoption of site-specific dissolved metals standards throughout the State. All interested parties are encouraged to begin collecting and analyzing in-stream metals data using the dissolved method.

Finally, the Commission notes that using dissolved metals values for aquatic life in Table III while using total recoverable values for agriculture and domestic water supply could result in requirements for multiple analyses of water quality samples in some circumstances. It is the Commission's intention that the Division avoid or minimize this result in establishing discharge permit monitoring requirements to the extent feasible, by making appropriate assumptions regarding the relative levels of dissolved and total recoverable metals present.

D. AMBIENT QUALITY-BASED STANDARDS (Section 3.1.7)

For normally distributed data, the new 85th percentile methodology for setting chronic ambient quality-based standards is comparable to the mean plus standard deviation ($\bar{x}$ + s) approach previously used. For data sets with a large standard deviation, the 85th percentile methodology will result in a more protective standard. (As discussed above, the shift to dissolved metals analysis will generally result in lower numeric ambient quality-based standards.)

In determining what is “representative data” for setting ambient quality-based standards, the Commission intends that the Division's established procedure for excluding outliers be applied. In order to retain appropriate site-specific flexibility in the process, the Commission decided as a matter of policy not to specify specific techniques for screening outliers in the regulation.

In adopting 85th percentile methodology, the Commission rejected a proposal to set chronic ambient quality-based standards equal to the 50th percentile of representative data and acute ambient quality-based standards equal to the 90th percentile. A shift to the 50th percentile for chronic standards would result in uniformly more stringent water quality standards and effluent limitations compared to the current system. The Commission does not believe that the evidence justifies this change or demonstrates that the 85th percentile methodology (which is generally comparable to the current $\bar{x}$ + s methodology) is insufficiently protective of state waters. Adoption of the 85th percentile methodology means that it is expected that 15 percent of the data for a given segment is expected to exceed standards set equal to the 85th percentile. Such exceedances do not constitute a violation of ambient quality-based standards.

There was evidence submitted that setting an ambient quality-based standard above the 50th percentile can result over time in a “creeping mean.” In other words, since dischargers can discharge up to the standard, over time the mean water quality value may increase, justifying an upward revision of the standard, based on a new 85th percentile value. Other testimony indicated that this risk is largely theoretical, since dischargers must plan to routinely discharge at levels below established effluent limitations in order to assure that they remain in compliance. In addition, because permit limitations are based on low flows, during most of the year discharge levels should not result in a significant increase in ambient levels. Moreover, standards based on ambient quality generally are set factoring out the contribution of point source discharges. The Commission determined that the theoretical creeping mean is not likely to occur.

The revised regulation also explicitly provides for an additional alternative basis for establishing site-specific standards. Site-specific-criteria-based standards may be established when justified by the results of a bioassay or comparable scientific study. This provision essentially codifies previous practice and preserves flexibility in the standard-setting process. It provides a mechanism for taking the wide variation of conditions that exist in Colorado into account when adopting site-specific standards. For example, site-specific standards may be determined from a recalculation based on the species present at a particular location.

The Commission finds that in certain circumstances even substantial improvements in water quality will not result in any furtherance of the “fishable-swimmable” goal, as where factors other than water quality limit the diversity and abundance of aquatic life. Under such circumstances it would be unsound policy to require standards reflecting a need for substantial improvements in water quality.

E. REVISED TABLE VALUES FOR METALS (Table III)

The adoption of new tiered, acute and chronic table values for metals should result in more accurate protection of water bodies from short and long-term impacts. The values have been adopted using the current EPA water quality criteria, modified to apply to Colorado. Some parties testified that the new table values are inappropriately based on excessive, multiple safety factors. However, EPA testified that in certain respects the approach adopted by the Commission is not conservative enough. The Commission has decided as a matter of policy that the safety factors provided are not excessive. This conclusion is reinforced in part by the fact that the new chronic table values are partly more stringent and partly less stringent than the existing table values.

Moreover, the Commission feels that the safety factors reflected in the table values are appropriate and necessary because those values are intended to protect aquatic life over a wide range of conditions throughout the State. The conservative nature of the table values is tempered by the availability of alternative approaches to setting site-specific standards when justified by available site-specific information. Both ambient quality-based standards and site-specific-criteria-based standards are available alternatives in such circumstances.

For simplicity, the Colorado Final Chronic value (FCV) as described in the Water Quality Standards and Methodologies Committee report is referred to in the regulation as the “chronic” value. The Colorado Criterion Maximum Concentration (CMC) is referred to as the “acute” value. The Committee report also discussed a Colorado Final Acute Value (FAV), to be applied when more extensive monitoring is undertaken. The Commission considered but rejected the option of establishing alternative acute table values equal to the FAV.

Some parties testified that an acute (i.e. 24-hour average) standard based on the CMC is excessively stringent, since the CMC is equal to one-half of the FAV, which in turn represents the 96-hour LC-50 that should protect 95 percent of the genera from acute toxic effects. The Commission decided as a matter of policy that the more conservative CMC-based acute standards are appropriate. The Commission felt that an alternative acute standard equal to the FAV walks too close to the edge of potential impacts. In fact, it is a concentration expected to adversely impact 50 percent of the fifth percentile of the genera tested. Moreover, there was testimony that the costs of the increased monitoring that would be required to allow reliance on a more lenient alternative acute standard would be excessive so that dischargers would be unlikely to choose that option.

The majority of the new Table III metals values are based on equations that rely on ambient measurements of water hardness. The equations reflect the reduced toxicity of metals in higher hardness waters. The proposed revisions also provided that alkalinity values may be substituted for hardness in the equations. This would have been generally consistent with the Commission's previous practice of using the more stringent of available hardness or alkalinity data in determining the applicable “range” of metals values in Table III and setting site-specific standards based on that determination. The Commission felt that there was insufficient evidence justifying a direct substitution of alkalinity into equations developed based on hardness. The new table value equations are based on a data base that uses hardness data. For these reasons, the Commission deleted the alternative of substituting alkalinity into the Table III equations. Where appropriate site-specific evidence has been developed, alkalinity may be a factor in establishing site-specific-criteria-based standards.

Several parties testified that the proposed table values in certain instances unacceptably result in standards below detection limits associated with standard analytical techniques. However, the evidence generally was lacking in specific information to demonstrate that detection limits present a practical problem in implementing stream standards, although similar concerns had been raised in earlier hearings. One witness did propose adoption of a new set of definitions to address the concerns raised. Because this issue was not addressed in the notice for this hearing, and because the Commission feels that insufficient information was presented at the hearing to warrant new provisions regarding detection limits at this time, the Commission has not included any such provisions in the revisions being adopted. This issue may be addressed in a future rulemaking hearing if specific information and/or proposals submitted to the Commission warrant.

Footnote 5 to Table III states that standards based on these table values are not to be exceeded more than once every three years on the average. This provision is adopted based on evidence that aquatic life can recover from impacts if not exposed to exceedances more frequently than once every three years.

Finally, the Commission notes that the new acute metals table values adopted, once translated into site-specific acute standards, may in many instances result in less stringent short-term effluent limitations in discharge permits, as compared to the current system. Currently, daily maximum effluent limitations generally are established equal to twice the 30-day average effluent limitation. Because the new acute table values often are more than twice the corresponding chronic value, standards based on these numbers would result in less stringent daily maximum effluent limitations.

F. REVISED UNIONIZED AMMONIA TABLE VALUES (TABLE II)

The adoption of new tiered, acute and chronic table values for unionized ammonia should result in more accurate protection of water bodies from short and long-term impacts. The new acute table values for class 1 warm and cold water aquatic life are based on equations that take pH and temperature into account. The primary controversies regarding these equations centered on the extent of safety factors included and the appropriate universe of aquatic life on which to base the equations.

With respect to acute values, the Commission adopted an approach consistent with its adoption of new acute table values for metals. That is, the acute unionized ammonia values are based on one-half of the 96-hour LC-50 level that protects 95 percent of the genera. In general, the Commission believes that the safety factors present are not excessive.

With respect to species considered in developing the equations, the Commission decided as a matter of policy that the golden shiner and orangethroat darter should be included. Even though these species are present only in limited areas, they should be included in a statewide value intended to protect waters throughout the state. Under the alternatives provided in the revised regulation, site-specific-criteria-based standards (which may not be protective of these specific species) can be established in lieu of table value standards where warranted by available information.

Consistent with the methodology underlying the equations for new metals table values, the Commission determined that invertebrates should be included in developing the ammonia equations. Healthy invertebrate populations are essential to viable aquatic ecosystems. However, including some invertebrates in the calculations did not change the final table values.

The Nitrogen Cycle Committee proposed varying ammonia standards based on whether salmonids are present or absent, rather than on whether waters are cold or warm. Because this change would not result in a major difference in the standards applied to most state waters, the Commission chose to stay with the current system of basing distinctions on cold versus warm water. This will help minimize disruption of the current system.

The Class 1 cold and warm water, acute and chronic table values adopted conform with the recommendations of the Nitrogen Cycle Committee, based on EPA documentation (translating salmonid/non-salmonid values into cold/warm water values, respectively), with minor modifications. The acute values are based on EPA's criteria calculation procedures. The cold water acute value results specifically from data on the adult male rainbow trout. The warm water acute value results from using in the EPA equations available data for warmwater species found in Colorado.

The Class 1 cold and warm water chronic values are the same as those contained in the existing regulation. The Nitrogen Cycle Committee recommended values of 0.02 mg/l and 0.05 mg/l for cold and warm water segments, respectively. These values were calculated to correspond to the 95 percent protection level when the number of taxa in the calculation is 19. However, for several reasons the Commission decided not to lower the chronic value to 0.05 mg/l as proposed. There was evidence submitted that it is difficult to distinguish between aquatic life impacts resulting from 0.06 mg/l versus 0.05 mg/l unionized ammonia. Adoption of the 0.06 mg/l value has the benefit of minimizing disruption to the current standards-setting system. This is particularly appropriate when the lower 0.05 mg/l value could result in substantial additional costs for some dischargers, without necessarily resulting in identifiable environmental benefits.

The Class 2 cold and warm water acute and chronic table values are essentially the same as Class 1, except that a range of 0.06 to 0.10 mg/l is provided for chronic values, depending upon the aquatic life present or intended to be protected on a site-specific basis, and whether the waters have been adversely impacted by factors other than ammonia. The evidence demonstrated that values near the higher end of this range may not be protective of certain species, such as the Johnny darter. Therefore, the absence of such sensitive species should be demonstrated to justify a site-specific standard in the upper end of the range.

The adoption of the 0.06 to 0.10 mg/l range is based on a policy judgement regarding the appropriate degree of flexibility to vary precise protection levels and take into account site-specific circumstances when adopting site-specific standards. A level of 0.08 mg/l unionized ammonia represents the 90 percent protection level. Moreover, the Nitrogen Cycle Committee found that it is difficult to toxicologically differentiate between the 0.08 and 0.10 mg/l levels. Thus, the upper end of the range accepts some sublethal effects. One study of the South Platte River (entitled “Physical, Chemical, and Biological Characteristics of the South Platte River, Segment 15, in Relation to Classified Uses” , by William M. Lewis, Jr. and James F. Saunders III, dated November 13, 1985) found no identifiable differences in diversity or abundance of aquatic life for unionized ammonia levels in the range of 0.05 to 0.10 mg/l.

Finally, although the Committee report recommended that a chronic standard greater than 0.10 mg/l not be allowed, under the approach adopted by the Commission a higher site-specific standard could adopted for severely impacted segments where justified by an appropriate site-specific study in accordance with Section 3.1.7(1) (c) (iii) of the regulation. Such a study may consider whether factors other than ammonia reduce the diversity and abundance of species present.

G. REVISED NITRITE STANDARD FORMULA (Table II)

The revised aquatic life table values for nitrite are based on equations that take into account the buffering effects of chloride ions on nitrite toxicity. The City of Longmont testified that this approach included too many safety factors, while Denver Metro supported the proposal. The Commission has decided as a matter of policy that the safety factors included are appropriate. The Commission intends that existing nitrite standards will remain in effect until adequate chloride data is developed on a site-specific basis to allow application of the new formula.

The Nitrogen Cycle Committee also proposed revisions of the nitrite and nitrate table values for the agricultural use classification. No public comment was received regarding this proposal and the Commission has decided to make no change in the existing table values at this time.

H. DOMESTIC WATER SUPPLY CLASSIFICATIONS (Section 3.1.13(1) (d))

The Nitrogen Cycle Committee proposed subdividing the current domestic water supply classification for surface waters into two classifications, depending on the levels of total ammonia present and the need for standard or special treatment of waters prior to use. The hearing proposal for a new classification was similar, but not tied specifically to ammonia levels. Limited comment was received regarding this proposal. Because questions regarding the application and impact of this proposed new classification have not yet been fully examined, the Commission has decided to make no changes in the existing domestic water supply classifications at this time. In particular, the Commission was concerned that the proposal would have resulted in a new “priority to pollute” concept being added to Colorado water quality regulation, accepting the presence of pollution if an upstream discharge is established prior to a downstream water supply use.

I. LOW FLOW CRITERIA (Section 3.1.9(1))

As noted above, the Commission decided to make no change in the current low flow criteria at this time, pending analysis of additional information, including the results of a low flow study undertaken by Colorado State University. The Commission contemplates that this issue will be addressed in an additional rulemaking hearing prior to the effective date of these revisions.

J. DELETION OF SECTION 3.1.4

Section 3.1.4 of the Basic Standards and Methodologies, entitled “Implementation” , was repealed effective June 9, 1980, after a public hearing on March 3, 1980, but was not deleted from the Colorado Code of Regulations by the Secretary of State's Office. The Commission's action here merely ratifies that earlier action, so that the deletion will appear in the official published regulation.

FISCAL IMPACT STATEMENT

The most significant change embodied in these amendments is the use of dissolved metals standards dependent upon hardness levels instream, and the corresponding requirement of the potentially dissolved metals analytical test by dischargers. Since a relatively small ambient data base for dissolved metals exists compared to the total recoverable data base, it is unknown at this time whether this change in metal form will require additional treatment costs for dischargers of metals to state waters. However, it is likely that some relief in the form of relaxed discharge limits may be realized by adopting this new system since most metals in effluents are likely to be in the bound or total form.

Some site-specific standards may become more stringent as a result of these revisions and some less stringent (once the revisions are translated into new site-specific standards). Therefore, for some dischargers costs may increase while for others they decrease. More specifically, limitations may become more stringent for some that discharge to low hardness waters and less stringent for those that discharge to high hardness waters.

The use of acute and chronic standards with the corresponding two-tiered discharge permit limits will allow more flexibility to the discharger by not penalizing him for short-term excursions above a chronic limit. In many instances short-term effluent limitations under the new system will be less stringent than short-term effluent limitations under the previous system. This should result in less economic burden to dischargers of both metals and nitrogen compounds.

Since the ammonia table values are essentially identical to previous standards, no major additional economic consequences are anticipated from these revised provisions. In isolated circumstances, the new table values for Class 2 aquatic life classifications could result in more stringent ammonia standards on a site-specific basis. In such instances, the economic impact of such standards will be addressed in the site-specific hearings. The other changes to nitrogen parameters should have no substantial economic ramifications.

The recognition of tolerable excursion of these standards no more than once every three years should also provide some economic relief to dischargers since previously the level of tolerance was once every ten years.

These changes are all made in recognition of maintaining the beneficial uses of the state's waters. Preservation of the uses to the level maintained in the recent past represents an economic benefit to the citizens of the state. In general, the Commission finds that the revisions being adopted as scientific improvements in the system will minimize the potential for over-protection (saving the resources of dischargers) and minimize the potential for under-protection (reducing unwarranted impacts on the State's water quality resources).

PARTIES TO PROCEEDINGS

1. Adolph Coors Company
2. Castle Pines; Silverthorne/Dillon; and Purgatory
3. Larimer-Weld Regional Council of Governments
4. Cotter Corporation
5. The Colorado Association of Commerce and Industry (CACI)
6. The City of Boulder
7. The City of Loveland
8. The City of Longmont
9. AMAX Inc.
10. The Colorado Water Congress (CWC)
11. Eastman Kodak Company
12. Trout Unlimited
13. Colorado Mining Association (CMA)
14. Gulf & Western
15. Metro Denver Sewage Disposal District No. 1

31.23 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE (1988 REVISIONS-ANTIDEGRADATION)

The provisions of 25-8-202(1)(a),(b) and (2); 25-8-203; and 25-8-204; C.R.S., provide the specific statutory authority for adoption of the attached regulatory amendments. The Commission also adopted, in compliance with 24-4-103(4) and 24-4-103(8)(d) C.R.S., the following statements of basis and purpose and fiscal impact.

BASIS AND PURPOSE:

A. ANTIDEGRADATION

1. Basis for Antidegradation Provisions

Section 25-8-102(2), C.R.S., declares a public policy “to conserve state waters and to protect, maintain, and improve, where necessary and reasonable, the quality thereof for public water supplies, for protection and propagation of wildlife and aquatic life, for domestic, agricultural, industrial, and recreational uses, and for other beneficial uses.” To implement this policy, the Commission is required to “develop and maintain a comprehensive and effective program for prevention, control, and abatement of water pollution and for water quality protection throughout the entire state.” Section 25-8-202(1), C.R.S. As part of the water quality protection program developed to implement these statutory directives, the antidegradation provisions that are now being revised have been in place since 1979. The current Commission reaffirms its belief that an appropriate antidegradation rule is an important and integral part of a comprehensive and effective water quality protection program designed to serve the statutory purposes.

The Commission believes that Colorado's highest quality waters are a unique natural resource that warrants special protection. Moreover, the Commission believes that the revised antidegradation rule and review process set forth in the accompanying revisions are economically reasonable. Therefore, the amendments also are consistent with that portion of the legislative declaration set forth in section 25-8-102(5), C.R.S. Assuring protection of Colorado's unique, high quality natural environment is an important component of maintaining the attractiveness of our State for future economic development. At the same time, the revisions now being adopted are designed to assure that important economic or social development will be allowed to proceed even where such development requires limited degradation of high quality waters, so long as there has been an adequate investigation of potentially non-degrading alternatives. In this regard, it is important to recognize that the use classifications and narrative and numeric water quality standards already in place will prevent any major degradation of high quality waters. In no case may degradation exceed water quality standards or interfere with or injure existing classified uses. Irrespective of the antidegradation policy, in many instances no further degradation for particular parameters on Colorado streams will be allowed because numeric standards have been set equal to the existing ambient water quality.

The Commission believes that the antidegradation rule as revised is one useful tool to assure the protection of beneficial uses of State waters for current and future generations. Although the water quality standards system has become substantially more sophisticated over the last decade, there are still significant uncertainties regarding the levels of specific pollutants that are consistent with the protection of various uses, and there are many specific pollutants for which no water quality standards have been set. In the face of this uncertainty, the antidegradation rule provides an extra layer of protection for the beneficial uses of the State's highest quality waters.

Finally, the revisions adopted should help eliminate any controversy regarding whether Colorado's antidegradation standard satisfies the requirements of the federal Clean Water Act. Although the Commission believes that its previous antidegradation provisions were legally valid and had effectively been approved by EPA, these revisions should largely eliminate that issue. Therefore, while the Commission has proceeded by attempting to determine what antidegradation policy is in the best interests of the State of Colorado, an additional benefit of these revisions is that they should more clearly comply with requirements established by EPA under the federal Clean Water Act.

2. Hybrid Antidegradation Review Approach

The previous version of this regulation relied on a classification-based approach to antidegradation – i.e., only waters classified “High Quality” were subject to antidegradation review requirements. EPA initially advocated a purely non-classification-based approach to antidegradation – i.e., all waters would potentially be subject to antidegradation review requirements, depending on a site-specific assessment of quality at the time that an individual activity undergoes review. The revisions adopted create a hybrid approach to antidegradation. The regulation now establishes three categories of waters for antidegradation purposes: (1) waters designated High Quality 1 or 2, (2) waters designated “Use-Protected” , and (3) waters classified cold water aquatic life class 1, or warm water aquatic life class 1 and recreation class 1, with no affirmative or negative quality-based designation. This hybrid system combines many of the benefits of the previous classification-based approach with benefits of the non-classification-based alternative advocated by some parties.

When sufficient evidence is available, the system adopted preserves the option for the Commission to make the policy decision as to which waters do or do not warrant the extra protection afforded by an antidegradation review. Such action by the Commission occurs in a rulemaking forum, which is more conducive to broad public review and comment than decisions made solely in connection with the processing of individual permits. At the same time, the hybrid approach retains flexibility to handle on a case-by-case basis a category of waters which - due to lack of information or ambiguous factual characteristics - do not warrant a formal, affirmative or negative quality-based designation. This flexibility is similar to that available under the non-classification-based alternative.

The hybrid approach preserves the additional benefit of being a proactive, planning-based approach instead of a purely reactive system. Under the purely non-classification-based alternative, a determination of which waters are “High Quality” can be made only at the time there is a specific proposal to degrade those waters (e.g., a new point source discharge). Once a specific development is at issue, it may be more difficult to make an objective determination whether the waters in question warrant special protection. With the hybrid approach, a decision may be made as to which waters warrant special protection prior to a confrontation with specific proposed developments. Once the initial water quality-based designation decisions are made, the public is on notice in advance that waters designated “High Quality” will receive the special protection provided by the antidegradation review. Furthermore, the addition of the “Use-Protected” designation option allows the public to be put on notice that the antidegradation review will not be required for specified streams, where site-specific facts warrant that designation.

3. Revised Antidegradation Rule (section 3.1.8(1))

The title of this section has been changed from “Antidegradation Standard” to “Antidegradation Rule.” This new title more accurately describes the nature of the revised regulation. The antidegradation provisions are not themselves a water quality standard, but rather a set of criteria and requirements that determine whether specific waters are to be maintained and protected at existing quality or rather protected solely by applicable narrative and numerical water quality standards. The Commission rejected the title “Antidegradation Policy” because “policy” might imply non-mandatory provisions. Consistent with this change in terminology, section 3.1.7(1)(a), which listed “antidegradation standard” among those standards that may be applied to State waters, has been deleted.

Although many of the concepts in the previous antidegradation provisions have been retained in the new section 3.1.8(1), this material has been completely reorganized and rewritten consistent with the new hybrid approach. Section 3.1.8(1)(a) describes the three levels of water quality protection that may apply to Colorado surface waters, and essentially replaces the provisions of the previous section 3.1.8.

Subsection 3.1.8(1)(a)(i) regarding High Quality 1 waters has been revised to delete the previous “no degradation” language. The revised language is consistent with that in EPA's antidegradation policy. This change is intended to recognize, as EPA has, that activities which result in only temporary or short term changes in water quality may be allowed for these waters.

Subsection 3.1.8(1)(a)(ii) regarding waters subject to an antidegradation review has been revised to pattern the language in EPA's antidegradation policy more closely. As elaborated in the discussion of the antidegradation review process below, the Commission believes that this language forms the basis for a reasonable and appropriate Colorado regulation.

In subsection 3.1.8(1)(a)(iii), the regulation now specifies that it is existing classified uses that are to be protected. This should not represent a significant change in practice since, pursuant to section 3.1.13, all existing uses should be classified uses. The language also now clarifies how protection of classified uses may be measured – i.e. by compliance with narrative and numerical standards.

Subsection 3.1.8(1)(b) summarizes which waters are and are not subject to the antidegradation review requirement, which provides the intermediate level of water quality protection described in subsection 3.1.8(1)(a)(ii). This subsection establishes the hybrid approach: Based on the High Quality 2 and Use-Protected designations certain waters will always or never require antidegradation reviews, while a middle category is reserved for which an antidegradation review is potentially required, based on a case-specific assessment. This case-specific quality assessment provides flexibility by focusing specifically on parameters likely to be adversely impacted by a particular proposed activity.

The language in the regulation clarifies that an activity-specific determination under this subsection does not create a water quality-based designation for the waters in question. Of course, based on information generated in connection with such an activity-specific assessment, the division or any other person could request that the Commission consider adopting a High Quality 1 or 2 or a Use-Protected designation for the waters.

4. Water Quality-Based Designation Criteria (section 3.1.8(2))

a. Overview

The criteria for designating waters “High Quality” have been moved from section 3.1.13 to section 3.1.8. In addition, the terminology has been changed to refer to “water quality-based designations” rather than “classifications”. A definition of this term has been added to section 3.1.5. These changes are intended to avoid confusion and help clarify that “High Quality” designations are not “use classifications”. These designations do not describe a separate “use” of a water body, but rather establish an extra layer of protection for those uses that are present. Therefore, provisions applicable solely to use classifications, such as the downgrading provisions in section 3.1.6 and such as hearings pursuant to section 25-8-207, C.R.S., do not apply to water quality-based designations.

The language of the subsection describing the High Quality 1 designation (now subsection 3.1.8(2)(a)) has been substantially revised and shortened. This change is intended to be consistent with the new criteria for applying a High Quality 2 designation, allowing High Quality 1 to be applied whenever High Quality 2 requirements are met as a minimum and the Commission determines that the extra protection is warranted.

The Commission has established new criteria in section 3.1.8(2)(b) to help clarify which State surface waters should be designated “High Quality 2.” The goal of these criteria is to assure that all waters whose quality exceeds levels necessary to support fishable/swimmable uses are designated High Quality 2, unless the Commission has determined that the “Use-Protected” designation is appropriate, as described in section 3.1.8(2)(c), and below.

The question when “the quality of waters exceeds levels necessary to support” specified uses is subject to considerable interpretation. The quality of any specific water body can vary substantially throughout the year, and, at any given time, can vary substantially among the wide range of pollutants of potential concern. The criteria adopted reflect the Commission's judgment as to how the “High Quality” concept should be applied in view of the wide range of factual circumstances that exist in nature.

Specific criteria also have been established to specify when waters should be designated "Use-Protected," in accordance with the new hybrid approach.

b. High Quality 2 designation criteria

The previous classification provisions contained only a very general statement as to when a High Quality 2 designation is appropriate. The new criteria are intended to provide more specificity and predictability to this determination, while retaining important flexibility to take unique, site-specific circumstances into account. Three automatic grounds are provided for applying the High Quality 2 designation. The first two grounds represent circumstances in which the Commission has determined that the extra layer of protection provided by an antidegradation review is always appropriate. The third automatic ground is a strictly water quality-based test of whether the waters in question are "high quality." This test is somewhat conservative in terms of applying the High Quality 2 designation in that it requires existing quality to be better than "table values" for each of 12 key parameters. These specific parameters have been selected from Tables I, II and III as those which have a significant likelihood of being present in some Colorado waters at background levels (not influenced by point source discharges) above the table values. The Commission intends that the division should exercise its best professional judgment to determine what is representative data on a case-by-case basis. While any specific test is necessarily somewhat arbitrary in terms of the wide variety of conditions that exist in nature, the Commission believes that a predictable test is a helpful and necessary administrative tool.

In addition to the three automatic grounds, the Commission has established a discretionary basis for applying the High Quality 2 designation whenever special reasons are present to provide the extra protection of the antidegradation review for specific waters. For example, after considering all of the relevant facts in a particular case, the Commission could decide that a specific gold medal trout fishery or waters containing state or federal threatened or endangered species warrant this extra protection.

c. "Use-Protected" designation criteria

These criteria have been added to provide a predictable basis on which the Commission can determine when certain waters should be designated in advance as waters to which the antidegradation review will not apply. Three automatic grounds are provided for this designation. The first ground is definitional. Under the revised descriptions of the aquatic life classifications that are being adopted concurrent with these changes, waters classified aquatic life class 2, or recreation class 2 and warm water aquatic life class 1, do not have quality "higher than necessary to support primary contact recreation and propagation of fish, shellfish, and wildlife." (Note that waters classified cold water aquatic life class 1 and recreation class 2 do not automatically qualify for the use-protected designation. This is because the Commission recognizes that in many instances where this combination of classifications is present, the recreation class 2 classification is based on physical limitations to primary contact recreation, rather than on poor water quality.)

The second ground for this designation is a strictly water-quality based test. In order to avoid too liberally excluding high quality water resources from the antidegradation review without case-specific information, the test requires that three or more of the listed 12 parameters must have quality worse than table values to apply the "Use-Protected" designation on this basis. Note, however, that for waters left in the middle category (no High Quality or Use-Protected designation), the presumption that an antidegradation review is required is overcome at the time of the case-specific review if only one parameter likely to be adversely impacted by a particular activity has worse quality than required by table values.

The third automatic ground for this designation is where the current quality is maintained better than standards only because of dischargers' treatment efforts. The Commission believes that this provision is appropriate, because in the absence of such a provision some dischargers may have a disincentive to treat to the highest levels possible, for fear that their success could result in a High Quality designation and, in turn, more stringent discharge permit requirements.

Finally, the Commission also has established two separate discretionary grounds for applying the "Use-Protected" designation. First, the designation may be applied where the Commission determines that due to the likelihood that substantial, new or expanded development will occur, it is unlikely that economically, environmentally and technologically reasonable water quality controls will be able to maintain the quality of particular waters above standards. The Commission intends that this basis for designation would be applied cautiously, only when pending development proposals are substantial enough, along with the existing development, if any, to provide a firm basis for determining that degradation of the waters in question is necessary. However, the Commission believes that when such circumstances are present, for administrative efficiency it is appropriate to apply this designation in advance rather than require each activity to undergo a separate antidegradation review.

The second discretionary basis for applying this designation is where the quality of the waters in question is limited by substantial pollution from substances other than the 12 parameters listed for the quantitative water quality test discussed above. The Commission anticipates that the application of this basis for designation is likely to be limited, but believes that this option should be provided to assure adequate flexibility.

5. Antidegradation Review (section 3.1.8(3))

a. Applicability provisions

The Commission has determined that the antidegradation review should apply to all regulated activities with new or increased water quality impacts that may degrade the quality of reviewable waters (as defined by the antidegradation rule, applying the hybrid system). The Commission has clarified that "regulated activities" currently includes those requiring NPDES permits or section 401 certifications. The Commission has retained the flexibility for the regulation to apply to other types of activities, e.g. nonpoint sources, if such activities are addressed by control regulations in which the Commission has determined that application of the antidegradation review requirements is appropriate. This approach recognizes the status of current regulatory efforts, but provides the flexibility for those to be expanded as necessary in the future.

The regulation also clarifies that the antidegradation review is conducted with respect to activities with "new or increased" water quality impacts. The review is intended to limit future degradation and is not intended to be applied as a means to require remediation of prior impacts. For example, only increased point source loadings above those levels already permitted shall be subject to an antidegradation review.

The Commission also had added language to section 3.1.8(3)(a) stating its intent that the antidegradation review be coordinated or consolidated with other regulatory reviews whenever possible. The Commission recognizes that many new projects already face substantial regulatory hurdles. Any procedural steps that can be taken to minimize the regulatory burden, while still providing the necessary substantive environmental protection, should be encouraged.

b. Division and Commission roles

The Commission has decided that antidegradation review responsibilities should be shared between the Commission and the Division. It is appropriate for the Division to make the initial determination whether a particular activity involves “significant degradation” , since this is largely a technical analysis. In addition, although it involves more than a mechanical, technical analysis, the Commission has decided that on balance it is preferable for the Division to have the initial responsibility for the determination whether the degradation is necessary to accommodate important economic or social development in the area in which the waters are located. Several parties recommended that this latter determination be made in the first instance by the Commission. The Commission believes, however, that requiring it to hold a hearing with respect to every such determination may be an unnecessary additional burden in the permitting or approval processes to which regulated activities are subject. Especially considering that the Commission's agenda typically is filled up several months in advance, significant delays could result from this approach. In many instances where an antidegradation review determination is not subject to substantial controversy, considerable time may be saved by delegating authority for this initial determination to the Division.

At the same time, the Commission has provided for de novo review of the Division's determinations by the Commission. When significant controversy exists, this provides for essentially the same level of Commission input into the antidegradation determination as if the Commission were responsible for the determination in the first instance. The Commission believes that on balance the adopted approach is likely to save regulatory resources for both activity proponents and the Commission, while not significantly changing the level of effort required from the Division, since it would be involved in advising the Commission even if it did not have decision-making authority.

The Commission discussed whether its involvement in the antidegradation review process, with respect to activities requiring a discharge permit, might run afoul of the “conflict of interest” provision in section 304(i) of the federal Clean Water Act. The Commission believes that it does not. The result of the Commission's involvement in the antidegradation review process is a determination of which water quality standards (i.e. existing quality v. specific numeric standards) will apply in a particular fact situation. The resulting standards are then used in drafting a discharge permit, but the Commission itself is not “approve(ing) permit applications or portions thereof.” The impact of the Commission's antidegradation review decisions on an individual discharger is no more direct than when the Commission adopts ambient water quality standards on any single-discharger water segment in the State.

c. Significance criteria

Although virtually any impact on a water body could theoretically degrade the water, the Commission believes that any practical antidegradation policy must focus on the presence of “significant” degradation. If degradation is insignificant, it would not be reasonable to devote substantial administrative and private resources to prevent the degradation. This approach of screening insignificant degradation out of the antidegradation review process is supported by EPA in guidance documents that it has provided to the Commission. Therefore, the criteria set forth in the regulation are designed to screen out insignificant impacts. These criteria have been structured in an effort to take cumulative impacts into account.

Establishment of a specific dividing line between “significant” and “insignificant” degradation is necessarily somewhat arbitrary. However, establishing some dividing line is necessary for purposes of predictability and administrability. From the evidence submitted the Commission believes that the specific criteria adopted are appropriate from a technical standpoint to assure that any substantial new degradation will be subject to the full antidegradation review process.

In addition to the specific significance tests set forth in section 3.1.8(3)(c)(i)–(iv), the regulation provides an additional significance screen for waters designated High Quality 2 due to the presence of exceptional reasons for extra protection. For these waters, degradation will be considered insignificant if there is no adverse impact with respect to the specific reasons for the high quality designation. For example, for a proposed project on a segment designated high quality due to threatened or endangered species, in appropriate circumstances the U.S. Fish and Wildlife Service may issue a “no jeopardy” biological opinion or a biological opinion that identifies potential jeopardy based solely on non-water-quality impacts, as a result of section 7 consultation under the federal Endangered Species Act. The Division should determine that such an opinion demonstrates no adverse impact with respect to the threatened or endangered species. Therefore, such a project would be considered not to result in significant degradation and no further antidegradation review would be required. Where the U.S. Fish and Wildlife Service has specifically addressed threatened and endangered species protection with respect to a proposed project, there is no need for the antidegradation review process to require an additional analysis of this issue, for streams subject to antidegradation review solely to protect such species.

The “mitigation” concept that is incorporated into the determination of “significant degradation” is intended to encourage a practical approach to water quality protection. If anticipated impacts are offset by substantial water quality-enhancing mitigation measures, the Commission could find that the net effect of a proposed activity would be insignificant degradation. For example, in some circumstances an activity could result in lowering the water quality for two or three parameters by an amount that would not be deemed insignificant pursuant to the criteria set forth in the regulation; however, in such circumstances any impact on classified uses of the segment may be largely hypothetical and relatively minor. If an applicant incorporates into a project water quality-enhancing mitigation measures for the same water segment, such as substantial habitat improvement measures, it may be reasonable to conclude that the net effect of the activity is no significant degradation.

Note that the determination of whether an activity will result in significant degradation takes into consideration all new or increased water quality impacts from the activity. Some parties proposed that only the impacts of pollutant discharges be considered. The language adopted allows the impacts of hydrologic modifications also to be considered. The Commission has addressed the issue of potential interference with the exercise of water rights by providing in section 3.1.8(3)(d)(iii) that no project alternatives that would be inconsistent with section 25-8-104 of the Water Quality Control Act would be deemed “available.” Therefore, no project proponent would be required to implement alternatives that would be inconsistent with the protection provided by that statutory provision.

In addition, note that the potential impact on small water development projects is limited in part by the fact that only projects requiring an individual section 404 permit need a section 401 certification. Projects that qualify for a section 404 exemption or nationwide permit do not require a section 401 certification, and therefore are not subject to the antidegradation review requirements.

d. “Area in which the waters are located”

A wide range of proposals for interpreting this language was submitted to the Commission. The Commission believes that it is appropriate to include all areas directly impacted by a proposed activity in the review. For projects that affect multiple basins, this should assure that input is received from each affected area. The Commission decided that defining “area” to always include the entire State would be too broad. For example, some relatively small new developments may not be “important” from a statewide perspective, but may be very important to a local region.

The provision as adopted also will help accommodate the language of EPA's water quality regulations with the established Colorado water rights system, which authorizes transbasin water transfer. For water diversion projects, the “area” would include both the basin from which the diversion occurs and the area in which the water use will occur. A narrower definition of “area in which the waters are located” could essentially prohibit transbasin water transfers from affected streams, whenever significant degradation would result from such activities. Moreover, these activities would be restricted even though other activities with identical water quality impacts (but with economic benefits centered in a different location) would be allowed to proceed. There does not appear to be any basis in the federal Clean Water Act for such a non-water-quality-based, land use policy distinction. In fact, such an interpretation would appear to run directly counter to the section 101(b) recognition of states' “primary responsibilities and rights ... to plan the development and use ... of land and water resources” while protecting water quality.

e. “Important economic or social development”

Implementation of the antidegradation rule requires some determination of whether a particular proposed activity is important economic or social development. The Commission intends that the case-by-case determinations regarding this issue will take into account all available information and will recognize that the primary responsibilities and expertise of the Commission and the Division are not in making land use decisions that assess the importance of specific development. While local land use decisions would not be binding on the antidegradation determination, the Commission believes that such decisions should be given substantial weight.

The Commission also intends that the determination of importance will be based on the net impacts of a project, after considering both positive and negative impacts. The Commission anticipates that in many instances if there is no information presented to the contrary, the Division will appropriately assume that the proposed development in question is “important.” In specific instances, public comment could lead to a contrary conclusion. For example, the people in the area of a proposed development could feel that the jobs and other benefits associated with the development are not important to them compared to the importance of protecting the quality of a local water resource.

While acknowledging the primary local role in land use planning, the Commission notes that in some circumstances there may be a dispute regarding which local governmental entity's land use determinations should take precedence. That issue is beyond the scope of these regulations and no attempt is made to resolve it here. Rather, based on all the evidence submitted the Division and, if necessary, the Commission will simply have to decide on a case-by-case basis which local land use determinations are “applicable”.

f. Necessity of degradation

The determination whether degradation is necessary is to be made by examining whether any less-degrading alternatives are available. The Commission has attempted to circumscribe the range of alternatives considered in several respects. First, alternatives must be economically, environmentally and technologically reasonable. The Commission does not intend by this regulation to force the application of untested new technologies. Second, available alternatives are limited to those that would accomplish the proposed activity's purpose. So long as a project has passed the “important development” test and reached this stage of the review, the “no-action” alternative (i.e. not proceeding with the project) will not be considered an available alternative. Third, in order to avoid undue impact on water rights, the Commission has provided that any alternative that would be inconsistent with the provisions of section 25-8-104 will not be considered “available”.

Finally, the Commission has chosen to focus on available “water quality control alternatives.” While this term is not specifically defined in the regulation the intent is to focus on alternatives directly related to protecting water quality—e.g. different treatment techniques, different discharge locations, applications of additional best management practices, or process changes that improve discharge quality. It is not the Commission's intention that activity proponents would have to examine completely different types of projects than those originally proposed.

Substantial concern was expressed in comments submitted regarding the additional burden placed on project proponents by establishing an alternatives analysis requirement. The Commission does not intend that this requirement would constitute a major additional burden in most instances. Alternatives analysis is standard engineering practice when planning a new project. New domestic dischargers already are required to undertake an alternatives analysis in the site application process. Projects that require a section 404 permit are already subject to Corps of Engineers and EPA requirements to consider alternatives (see, e.g., 33 CFR section 320.4(a)(2)(ii) and 40 CFR section 230.10(a)). Projects subject to federal NEPA requirements already are faced with an alternatives analysis requirement that goes substantially beyond that required here. The Commission intends that the alternatives analysis for antidegradation review purposes should be coordinated with any such other reviews to the extent possible to avoid unnecessary duplication. So long as a reasonable effort has been made to assess less-degrading alternatives, in many circumstances these other reviews may be sufficient to satisfy the antidegradation review requirements.

The Commission also has included in this section a general list of factors that the Division is directed to consider in making case-by-case determinations whether potential alternatives are economically reasonable. The proposal for this hearing included a more specific test of economic reasonableness. Based on the comments submitted, it appears that it is not possible at this time to formulate one simple test that will yield an appropriate determination in all circumstances. Therefore, the Commission has decided to retain flexibility, while providing some guidance as to the criteria it will apply. If experience demonstrates that more specific criteria are workable and helpful, the regulation can be revised at a later date. Although the Division does not maintain an economist on its staff, the Commission notes that the Division has prior experience with implementing an economic reasonableness concept, especially in the context of certain discharge permit variances, which are no longer available following the adoption of Senate Bill 83 in 1985.

6. Review of Individual Basins

The Commission intends that these revised antidegradation provisions will generally be applied to individual basins by assessing the appropriateness of water quality-based designations during the next round of triennial reviews. However, the Commission intends that the Division should recommend the establishment of water quality-based designations for a particular water segment prior to the next triennial review whenever (1) the Division believes the water body should be designated High Quality under the revised criteria and (2) the Division is aware of proposed development activities that could significantly degrade the water body in question prior to the next triennial review. Such circumstances warranting an “expedited” review also could be brought to the Commission's attention by the public. Of course, under the hybrid approach, the antidegradation review requirement will apply in some situations without reclassification.

In conducting reviews and applying this revised system in classification hearings, the Commission intends that a determination will first be made as to what use classifications and numeric standards will apply to a water body under the Basic Standards and Methodologies provisions in effect as of July 31, 1988. The determination whether any water quality-based designations are appropriate would then be made with respect to these new standards.

7. Intergovernmental Coordination and Public Participation

At least two parties to the hearing proposed that local water quality planning agencies should have a formal role in the antidegradation review process. In addition, EPA's antidegradation policy requires that such reviews satisfy intergovernmental coordination and public participation requirements. The Commission has determined that there is no need to adopt special provisions in the antidegradation section of the regulation addressing such input.

The Commission intends in a separate proceeding to revise its Procedural Regulations to establish specific provisions regarding intergovernmental coordination and public participation with respect to the antidegradation review process. Prior to such additional rulemaking, the Commission requests the Division to notify the Commission of the procedures that it will apply to antidegradation reviews on an interim basis, to assure that adequate intergovernmental coordination and public participation occurs.

FISCAL IMPACT STATEMENT

The revised antidegradation provisions will require an increased expenditure of public and private resources during the next round of triennial reviews of surface water quality classifications and standards, to assess whether adoption of water quality-based designations is warranted pursuant to the new “High Quality” and “Use-Protected” criteria. However, the magnitude of this impact may not be substantial. The information requirements for determination of water quality-based designations should not differ substantially from those required for determining appropriate use classifications. The cost associated with collection of data to determine, for example, the appropriateness of an aquatic life classification and associated standards should not differ from that of determining the suitability of a stream for a high quality designation.

To the extent that additional streams are subject to antidegradation reviews as a result of these changes, an additional expenditure of public and private resources will be required. The review process will require additional Division staff time. The magnitude of these impacts can not be quantified at this time, since the exact number of activities that will be subject to antidegradation reviews also can not be specifically quantified. However, the Commission has attempted to assure that such reviews will not constitute a major additional burden in most instances, by establishing the “significant degradation” screening criteria and by attempting to establish reasonable parameters on the alternatives analysis requirement.

No major adverse fiscal impact is anticipated as a result of the substantive application of the antidegradation review requirements. The Commission has attempted to develop an antidegradation implementation process that assures a demonstration that degradation is necessary before it is allowed for high quality streams, while not precluding additional important development where such degradation is necessary. There could be a fiscal impact to a specific project if the Commission finds that it does not constitute “important development.” With the Commission's recognition of the primary local government land use planning role, it is unlikely that a project would be excluded on this basis except in rare instances. Absent such a finding, a project could be denied under the revised regulation only if there is a finding that there are economically, environmentally and technologically reasonable alternatives available but the project proponent refuses to implement such alternatives.

The new antidegradation provisions will result in new, unquantifiable benefits to the general public from increased protection of Colorado's high quality water resources. While these benefits are unquantifiable, the Commission believes that they may be substantial in preserving the current quality of life in Colorado and preserving Colorado's national image as a state with high quality natural resources.

PARTIES TO MARCH, 1988 HEARING

1 AMAX Inc.
2. Colorado Water Congress
3. Metropolitan Denver Sewage Disposal District No. 1
4. Eastman Kodak Company
5. Colorado Mining Association
6. City of Colorado Springs
7. North Front Range Water Quality Planning Association
8. Metropolitan Water Providers
9. Rocky Mountain Oil and Gas Association (RMOGA)
10. Amoco Production Company
11. Environmental Defense Fund
12. Northwest Colorado Council of Governments (NWCCOG)
13. City & County of Denver Board of Water Commissioners

14. Adolph Coors Company (Coors)
15. Northern Colorado Water Conservancy District and Municipal Subdistrict
16. Sierra Club and The Wilderness Society
17. Southeastern Colorado Water Conservancy District (Southeastern District)
18. CF&I Steel Corporation (CF&I)
19. Umetco Minerals Corp. (Umetco)
20. Martin Marietta Corp.
21. Shell Oil Company
22. Cotter Corporation
23. Division of Wildlife
24. Union Oil of California
25. City of Broomfield
26. Trout Unlimited

31.24 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE (1988 REVISIONS-MISCELLANEOUS ISSUES)

The provisions of sections 25-8-202(1)(a),(b) and (2); 25-8-203; 25-8-204 and 25-8-207; C.R.S., provide the specific statutory authority for adoption of the attached regulatory amendments. The Commission also adopted, in compliance with sections 24-4-103(4) and 24-4-103(8)(d) C.R.S., the following statements of basis and purpose and fiscal impact.

BASIS AND PURPOSE:

A. TEMPORARY MODIFICATIONS

Several changes have been adopted to the temporary modification provisions in section 3.1.7. Several of these changes were recommended by EPA, to ensure compliance with EPA's water quality standards regulations. The Commission agreed to delete certain language relating directly to taking the availability of public and private funds into account in granting or determining the duration of a temporary modification. However, the Commission has added new language providing that the need for time to take the necessary actions to come into compliance with an underlying standard will be taken into account in deciding whether to grant temporary modifications. This provision is meant to take into account the practical realities of implementing new treatment or other control measures, while at the same time assuring reasonable progress toward the improvement of water quality where existing conditions are correctable.

In addition, the Commission has added new language providing that temporary modifications will have a definite expiration date, while retaining flexibility as to the duration of specific temporary modifications. The purpose of this change is to avoid the possibility of a temporary modification simply remaining in place indefinitely without close reexamination, while retaining the flexibility to respond to individual circumstances. For example, the time that it will take to implement corrective measures, as well as the timing of discharge permit expiration and renewal, may be taken into account in determining the appropriate duration of a specific temporary modification.

B. USE ATTAINABILITY ANALYSIS

EPA recommended that new language be added to the regulation stating a requirement that a “use attainability analysis” be conducted in certain instances to assess the attainability of “fishable/swimmable” uses. The Commission has added language to section 3.1.6(3)(a) requiring that a use attainability analysis be conducted in appropriate instances, and has added a definition of this term to the regulation (section 3.1.5(25)). The Commission declined to make several changes relating to this issue recommended by EPA. For example, EPA recommended that the definition of “beneficial uses” be expanded to differentiate among existing uses, designated uses, and attainable uses. The Commission decided that these changes were unnecessary because there has not been a problem with the current definition, and EPA's changes may generate confusion.

The Commission is aware that certain guidance documents and technical support manuals are available from EPA that may assist in performing use attainability analyses. However, to preserve flexibility, the Commission declined to reference any such specific documents in the regulation. A full biological, chemical, and physical assessment is not a necessary minimum requirement for each and every use attainability analysis. Only those evaluations necessary to determine the attainability of a use for a particular water body need be performed.

In addition, the Commission rejected EPA's recommended change to the definition of “water quality standard.” EPA recommended that “standard” be defined to refer both to a designated use and related water quality criteria. In Colorado, the established practice is that classifications specify the designated use and “standard” refers to what EPA calls “criteria.” There is no need for the change recommended by EPA, and it would result in considerable confusion.

The EPA recommended that two additional items be added to the list in section 3.1.6(1) of considerations in assigning classifications. There is no need to adopt the language relating to “waste transport or waste assimilation” because the Commission has never considered adopting such a classification for any Colorado streams. In addition, the requirement that flows resulting solely or principally from effluent discharge be taken into account in classifying ephemeral or intermittent streams would be inconsistent with Colorado's water rights system. Because water rights changes may result in changes in discharge points, it would be inappropriate to rely on effluent flows in classifying streams.

C. TOXICS CONTROL AND WATER QUALITY STANDARDS

The adoption of new statewide basic standards for organic pollutants was proposed in the notice for this hearing. That proposal is being addressed at a separate hearing scheduled for December, 1988, and action on that proposal will be taken separately at a later date. The Commission revised the introduction language in section 3.1.11(1) to help clarify the application of the narrative basic standards. The Commission rejected a recommendation by EPA that this Regulation reference a separate policy for implementation of the narrative “free from toxics” standards. The Commission has scheduled a separate hearing to consider the adoption of biomonitoring regulations relating to the “free from toxics” standards.

D. GROUND WATER REFERENCES

Because the Commission has adopted separate Basic Standards for Ground Water (3.11.0), the Commission has generally deleted references to ground water in this Regulation. In addition, the name of the Regulation has been changed to “The Basic Standards and Methodologies for Surface Water.” A few references to ground water were retained, where ground water quality is a relevant factor in determining appropriate surface water classifications and standards. In addition, as provided in sections 3.1.1 and 3.1.11, until issues relating to proposed new statewide ground water standards for organic pollutants and radioactive materials are resolved following a December, 1988 hearing, certain basic standards set forth in section 3.1.11 will continue to apply to State ground waters.

E. LOW FLOW CRITERIA

Section 3.1.9(1) has been revised to change the low flow criteria used for permitting and other purposes. The revised criteria are based on the “biological” approach of establishing a 3-year recurrence interval for water quality standards exceedences, to allow adequate time for aquatic life to recover. This biologically based method is an empirical approach recommended by EPA based upon the available historical data. One example of how to calculate an empirically based flow is contained in “Technical Guidance on Stream Design Flow for Steady-State Modeling,” USEPA (1986). This approach is preferable to the prior “7Q10” low flow criterion, which has no biological basis. The revised criteria preserve flexibility to determine on a case-by-case basis the best way to calculate low flows meeting these requirements, depending on the data available in a specific case.

The revised low flow criteria will be applied in conjunction with the new frequency and duration provisions added to the regulation. (See the discussion in the following subsection of this Statement of Basis and Purpose.) This overall approach will provide flexibility for the Division and permittees in the permitting process to assure that water quality standards are met during all appropriate periods, whether resulting from, e.g., flow, pH, or temperature conditions. The second sentence of section 3.1.9(1) also provides flexibility for the use of periodic low flows whenever warranted due to seasonal variations in critical parameters, such as pH or temperature.

The Commission deferred for later discussion the proposal by the Denver Board of Water Commissioners that certain future water uses be taken into account in calculating a low flow, since the future actual use of conditional water rights often is unpredictable. The Commission believes that this type of proposal warrants further consideration in the future, when it can be more fully and directly analyzed. A Colorado Springs proposal to add language stating that there is no guarantee of low flows used in permits was rejected because it presents a legal issue beyond the scope of this Regulation. The Commission notes that section 25-8-104 precludes the Commission and Division from requiring minimum stream flows.

The Commission has also added a new section 3.1.14(8) to clarify that these revised low flow criteria are to be used in the discharge permitting process.

F. FREQUENCY AND DURATION PROVISIONS

Language has been added to section 3.1.7(1)(b) to state that numeric water quality standards will include appropriate averaging periods and frequencies of allowed excursions. Averaging periods are specified in the definitions of “acute standard” and “chronic standard” (sections 3.1.5(2) and (7)), in section 3.1.16(1) and in Tables I, II and III.

The Commission declined to add language to section 3.1.16(1) stating that discharge permit limits are to be based on the more stringent of an acute or chronic standard. Generally, effluent limitations based on chronic standards will be more stringent than those based on acute standards. For now, any exceptions to this rule are to be dealt with by the Water Quality Control Division on a case-by-case basis, using best professional judgment. It is anticipated that this issue will be addressed further in a wasteload allocation/total maximum daily load guidance document being developed by the Division.

Frequency of allowed excursions is addressed in section 3.1.7(1)(b). The new low flow criteria in section 3.1.9(1) also are consistent with these averaging period and frequency of excursion provisions. New section 3.1.14(8) assures that these provisions will be implemented in translating water quality standards into discharge permit effluent limitations. The Commission believes that these provisions will help clarify the proper interpretation and application of water quality standards.

G. USE CLASSIFICATIONS

The introductory language of section 3.1.13 has been revised to clarify the applicability of the use classifications described in that section. The reference to ground water has been deleted. Consistent with the Water Quality Control Act, the language now specifies that these classifications may be applied to any State surface waters except those in ditches and other manmade conveyance structures. The Commission does not intend any change in its prior practice of applying use classifications to rivers, streams, lakes and reservoirs.

The aquatic life use classification descriptions have been substantially revised. Definitions of “cold water biota” and “warm water biota” have been added to section 3.1.5 to help implement these revised classification descriptions. The changes are intended to more clearly and accurately describe the distinctions that are intended by the Commission among the various aquatic life classifications.

The Commission intends the reference to “diversity” of species to be general, with the appropriate means of assessing diversity to be determined on a case-by-case basis. This reference is not intended to rely on any specific aquatic diversity index. The Commission also notes that a proposal by the Colorado Mining Association to adopt a “stocked segment” qualifier was rejected as unnecessary and potentially confusing. The Commission already has flexibility under section 3.1.7(1)(b)(iii) to take site-specific circumstances into account in determining appropriate numeric standards.

Although existing classifications will be reviewed for consistency with the new aquatic life classification provisions during the next round of triennial reviews, the Commission does not anticipate that wholesale revision of existing aquatic life classifications throughout the State will be necessary.

The previous domestic water supply class relating to ground water has been deleted, since ground water classification is now addressed by The Basic Standards for Ground Water. Also, the previous high quality water classification provisions have been deleted here, since they have been moved—in a revised form—into section 3.1.8.

H. SECTION 25-8-207 IMPLEMENTATION

Both procedural and substantive provisions regarding hearings pursuant to section 25-8-207, C.R.S., have previously been located in the Commission's Procedural Regulations. In response to a recommendation made at the July, 1987 triennial review hearing, the Commission has added the substantive provisions relating to “section 207 hearings” to this Regulation (section 3.1.6(3)(b)), and has simultaneously deleted the corresponding provisions from the Procedural Regulations. The Commission also has added several clarifying revisions to these provisions, in part to make the language more consistent with that in the statute. In addition, the Commission has added language to section 3.1.6(2)(b) to clarify that in appropriate circumstances revisions to classifications pursuant to a “section 207 hearing” should not be considered downgrading.

I. INNOVATIVE SOLUTIONS OR MANAGEMENT APPROACHES

The Commission seeks to encourage innovative solutions and management approaches to achieve compliance with water quality standards. A new subsection 3.1.14(5) has been added to clarify that such techniques may be incorporated into discharge permits to achieve compliance with standards. In addition, new language in section 3.1.3 notes that, where appropriate, control regulations can be adopted to require such techniques.

J. MISCELLANEOUS WATER QUALITY STANDARDS REVISIONS

1. Table III, Footnote (3)

The new table values for metals contained in Table III are based on equations that are dependent on hardness. Footnote (3) specifies how to select hardness values for use in the equations. Footnote (3) as previously adopted (relating to use of the lower 25th percentile of hardness values) has resulted in some confusion regarding its application. The revised footnote is intended to clarify selection of an appropriate hardness value, and to specify that a regression analysis may be used to select hardness values in appropriate circumstances.

The phrase “representative regional data” will need to be interpreted on a case-by-case basis. It is intended to provide flexibility to use data from adjacent streams or geographically and hydrologically similar streams in appropriate circumstances.

The restrictions on use of regression analysis—use of the lower 95 per cent confidence limit and prohibiting extrapolation beyond the data base—are intended to help minimize the risk of developing a regression-based hardness value that may be unrepresentative of actual conditions. The adopted language also is intended to preserve flexibility for the Division to determine where regression analysis may be inappropriate, requiring use of an alternative site-specific method. As one example, regression analysis may be inappropriate where there is a poor statistical fit.

2. Change in Bacteria Standard

The Commission considered at the hearing whether the fecal coliform standard currently contained in Table I should be changed to a standard based on a different type of bacteria. Recently available EPA criteria documents suggest that standards based on E. coli or enterococci may be appropriate. The Commission declined to make any change in the standard at this time. The major concerns expressed regarding the proposed change were the increased cost of analysis and the lack of a standard analytical methodology for E. coli. The Commission intends to give further consideration to a possible change in the indicator bacteria as more information becomes available to address these concerns. The Commission has requested the Division to provide a status report regarding these issues to the Commission in approximately one year.

3. "Aerobic" Standard Clarification

Table I has previously specified that dissolved oxygen conditions be maintained as "aerobic" for several classifications. This standard was imprecise and led to some confusion. Therefore, a specific numeric value for dissolved oxygen has been added to replace the previous "aerobic" standard. The intent of the 3.0 mg/l criterion is to reduce the potential for anaerobic conditions downstream from discharges to segments not classified for aquatic life.

4. Fluoride Table Value

The table value for fluoride for domestic water supply in Table II has been revised to be consistent with EPA's revised drinking water standards. Consistent with past practice, EPA's "secondary drinking water standard" has been adopted as the table value.

5. Averaging Period Clarification

Notations have been added where appropriate to the text and footnotes of Tables I, II, and III to clarify which standards are intended as thirty-day, chronic standards and which are intended as one-day, acute standards. In addition, footnotes 1, 2 and 3 to Table I now specify that certain criteria are intended as one-day or instantaneous maxima or minima.

6. Table III, Former Footnote (1)

The Commission has deleted the previous footnote (1) from Table III. This footnote, relating to alkalinity, has not been applied in practice and has created confusion as to its intent and applicability.

7. Ammonia Values Clarification

As previously drafted, the new ammonia equations in Table II could under some circumstances result in an acute value that is less (i.e. more stringent) than the chronic value. A clarification has been added to provide that in such circumstances the chronic value would be used as the acute standard.

8. Table II, Footnote (5)

Clarifications have been added to the equations contained in Table II, footnote (5) to specify the upper limits for chloride ion concentration for application of the respective equations.

K. OTHER REVISIONS

1. Segmentation Criteria

A new subsection has been added to section 3.1.6 to specify the criteria used by the Commission in determining the appropriate segmentation of streams and other water bodies for classification and standard-setting purposes. These criteria are the same as have been used by the Commission for the last several years, and they are simply being added to the text of the Regulation to assure that the public is aware of the Commission's policy in this regard.

2. Section 3.1.7 Clarifications

A new subsection has been added to section 3.1.7, to reference the statutorily required considerations in assigning water quality standards. This change was recommended at the July, 1987 triennial review hearing, so that the public will be more clearly on notice of the factors relevant to setting water quality standards.

3. EPA Guidance Documents

Several references in the regulation to specific EPA guidance documents have been deleted. While these guidance documents, along with other relevant guidance materials, may be used by the Commission and the Division when applicable, the Commission decided that references to the guidance documents in the regulation are inappropriate, because such reference could be interpreted to suggest that the provisions of the guidance documents are intended to have binding regulatory effect. However, the list of references in section 3.1.16(3) has not been revised, since this list is intended as background information to identify the source of numeric values in Tables I, II and III.

4. Mixing Zones

EPA recommended a change to the mixing zone provisions in section 3.1.9(3), to require no acute lethality in the mixing zone. The Commission has adopted changes providing that there shall be no acute lethality in the mixing zone except where there is significant dilution and mixing is rapid. The Commission believes that this change should protect aquatic life while avoiding the need for increased treatment where that is unnecessary to protect the classified uses.

5. Editorial Changes

In addition to the substantive changes described above, numerous editorial changes have been made in the Regulation in an attempt to make the Regulation as a whole more readable. Several minor changes were made to conform the overall Regulation with the recent changes to the antidegradation provisions. In several instances terminology has been revised to be more consistent with that in EPA regulations—e.g. changing “areawide” to “widespread” —where the Commission felt that this would minimize unproductive semantic disputes with EPA, while not changing the substantive intent of the State regulation. In addition, several typographical errors in Table III and elsewhere in the Regulation have been corrected.

FISCAL IMPACT STATEMENT

The changes taken as a whole are not expected to have major new fiscal impacts over the long run. These changes are in the nature of clarifications and refinements of a system that has already been adopted. It is expected that there will be significant “start-up costs” for both public and private entities, including the Water Quality Control Division, to become familiar with the revised classification and standards system resulting from the combination of these changes and those adopted on June 2, 1987. These costs, which cannot be quantified at this time, would result from any substantial revisions to this system.

It is possible that specific changes may result in marginally less stringent or more stringent standards applying to specific entities, with associated differences in cost of compliance. At this time it is not possible to predict whether the net cost impact on regulated entities will be positive or negative; nor can such impacts be quantified at this time. Overall, the Commission finds that the revisions adopted constitute improvements in the current classification and standard-setting system which will minimize the potential for over-protection (saving the resources of dischargers) and minimize the potential for under-protection (reducing unwarranted impacts on the State's water quality resources).

PARTIES TO MARCH, 1988 HEARING

1. AMAX Inc.
2. Colorado Water Congress
3. Metropolitan Denver Sewage Disposal District No. 1
4. Eastman Kodak Company
5. Colorado Mining Association
6. City of Colorado Springs
7. North Front Range Water Quality Planning Association
8. Metropolitan Water Providers
9. Rocky Mountain Oil and Gas Association (RMOGA)
10. Amoco Production Company
11. Environmental Defense Fund
12. Northwest Colorado Council of Governments (NWCCOG)
13. City & County of Denver Board of Water Commissioners
14. Adolph Coors Company (Coors)
15. Northern Colorado Water Conservancy District and Municipal Subdistrict
16. Sierra Club and The Wilderness Society
17. Southeastern Colorado Water Conservancy District (Southeastern District)
18. CF&I Steel Corporation (CF&I)
19. Umetco Minerals Corp. (Umetco)
20. Martin Marietta Corp.
21. Shell Oil Company
22. Cotter Corporation
23. Division of Wildlife
24. Union Oil of California
25. City of Broomfield
26. Trout Unlimited

31.25 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY, AND PURPOSE (1989 REVISIONS)

The provisions of sections 25-8-202(1)(b), (2) and (7); and 25-8-204; C.R.S., provide the specific statutory authority for adoption of the attached regulatory amendments. The Commission also adopted, in compliance with section 24-4-103(4) C.R.S., the following statement of basis and purpose.

A. OVERVIEW

The Commission has adopted substantial revisions to the statewide standards for organic pollutants contained in section 3.1.11. The additional standards for organic pollutants, now contained in Tables A, B and C, are based on EPA water quality criteria documents, maximum contaminant levels (MCLs), EPA drinking water health advisories, and EPA Integrated Risk Information System (IRIS) data, which have become available subsequent to the adoption of the original table in 1979. These standards are being adopted in part in response to new requirements in the 1987 amendments to the federal Clean Water Act (CWA) to adopt water quality standards for toxic pollutants, "the discharge or presence of which in the affected waters could reasonably be expected to interfere with" classified beneficial uses. CWA, section 303(c)(2)(B). Although toxic organic pollutants generally are not a major problem in Colorado surface waters at present, the Commission believes that the best policy option is to adopt numerical standards now, to help assure that these pollutants do not become a problem.

The organic chemicals for which standards are being adopted generally are not naturally occurring water quality constituents. Therefore, the Commission has determined that a statewide approach to adoption of water quality standards for these substances is the most efficient and appropriate means of assuring human health and environmental protection in a timely manner. Where there may be naturally occurring levels of some specific pollutants for which standards are adopted, or where other site-specific factors warrant, the Commission has preserved the flexibility to adopt alternative, site-specific standards, as discussed further below. Considering the federal requirements and the potentially serious adverse impacts from these toxic pollutants, the Commission has determined that the record in this proceeding demonstrates the need for the adoption of these standards.

Recently adopted legislation—Senate Bill 181 in the 1989 session—includes new provisions that apply when the Commission adopts “rules more stringent than corresponding enforceable federal requirements.” Section 25-8-202(8)(a), C.R.S. The Commission interprets these provisions to be inapplicable to this rulemaking, since there are no “corresponding enforceable federal requirements” that establish ambient surface water quality standards in Colorado. Section 303 (c)(2)(B) of the 1987 amendments to the federal Clean Water Act includes a directive that, whenever states revise surface water quality standards, they adopt standards for certain toxic pollutants. However, no federal standards—no enforceable federal requirements—are established for these pollutants. EPA develops water quality criteria, but these are not enforceable standards. Enforceable requirements exist only after states have adopted standards. EPA can adopt standards for a state that fails to act, but this has never occurred in Colorado.

Moreover, even if this section did apply, the Commission finds that the standards adopted are based on sound scientific and technical evidence in the record. This basis is demonstrated in part by the testimony submitted by witnesses for the Division and for EDF, including the underlying analyses and studies referenced therein. The Commission's evaluation of the available information, and its assessment of how this information should be reflected in the standards, is also addressed in the discussion of “Basis for Specific Standards” set forth below. Finally, these standards are necessary to protect the public health, beneficial uses of water, and the environment of the State—in part due to the fact that there are no corresponding enforceable federal requirements. As mentioned above, the Commission believes that the best policy to assure protection of these uses is to adopt uniform, preventive standards. Without such standards in place, waters that have not yet been affected by the discharge or presence of such toxic pollutants may be adversely affected in the future, and protection of their present and future uses would then not be assured. The approach adopted by the Commission attempts to assure protection of uses by initially applying the standards broadly, but at the same time assures economic reasonableness by providing flexibility to revise the standards on a site-specific basis and to take site-specific circumstances into account in determining the need to apply the standards in regulating individual entities. See, e.g., the discussion below regarding “Integration into Discharge Permits”.

Section 3.1.11 also has been revised by deleting several previous references to ground water. Concurrently with these amendments to this regulation, the Commission is adopting similar new provisions in the Basic Standards for Ground Water, 3.11.0 (5 CCR 1002-8). No changes are being made at this time to the radioactive materials standards contained in section 3.1.11, although new language is being added clarifying that alternative site-specific standards may be adopted by the Commission.

Finally, certain corresponding and clarifying changes have been adopted in section 3.1.14, regarding integration into discharge permits.

B. RELATION OF STANDARDS TO CLASSIFICATIONS

The previous basic standards for organic pollutants in section 3.1.11 applied to all state surface waters, irrespective of site-specific use classifications. The original proposal for this hearing set forth a similar approach for the new standards. After considering the various alternative proposals, the Commission has decided to tie applicability of the new organics standards to established classifications for aquatic life and water supply. Because comprehensive classification of the surface waters of the state has already occurred, this approach should assure protection of appropriate uses.

C. BASIS FOR SPECIFIC STANDARDS

1. Overview:

A wide range of approaches to setting standards for the organic pollutants were considered during the course of this proceeding. These ranged from setting “zero” standards for some pollutants (carcinogens), to setting standards only for chemicals for which MCLs have been adopted, to setting standards based on practical quantitation limits (PQLs).

The standards adopted have been established as interim rather than permanent standards for two general reasons. First, it is clear to the Commission that the development of appropriate numerical criteria to protect various beneficial uses from organic pollutant impacts is a rapidly evolving area that is still very much in flux. For example, there are currently significant differences among the various criteria, advisories, and maximum contaminant levels available for a number of specific pollutants. As new information becomes available and potential conflicts among the various numerical levels are resolved, it may be appropriate in specific instances in the future to adopt permanent standards either more or less stringent than the interim standards being established at this time. However, given the importance of controlling toxic pollutants in the environment, the Commission believes that it is necessary to move forward with the adoption of interim statewide standards at this time, and that the interim standards adopted are reasonable based on the best currently available information.

Second, there is currently substantial uncertainty and concern regarding whether or how a federal antibacksliding policy may apply to any standards adopted at this time. The Commission believes that it is not appropriate for antibacksliding or downgrading restrictions to apply to any subsequent, more lenient, revisions of these standards based on improved general or site-specific information. The fact that these restrictions would not apply to such subsequent revisions is a material assumption upon which the Commission is relying in adopting these statewide standards.

2. Aquatic Life Standards:

In addition to these two general motivations for adopting interim standards, the Commission wishes to even more strongly highlight the “interim” nature of the standards being adopted for aquatic life classifications. For standards applied to waters with aquatic life classifications (Table C), the Commission has adopted water quality standards based on toxicity to aquatic life from EPA's “Gold Book.” The principal alternative, which the Commission has chosen not to adopt at this time, would be standards based on “fish ingestion” criteria, which are intended to protect the public from potential adverse health impacts of eating contaminated fish. As a matter of public policy, it is extremely important that fish caught in Colorado streams be safe for the public to eat. However, pending further review of this issue, the Commission believes that adoption of statewide numerical standards based on fish ingestion criteria would be premature at this time.

Therefore, pending further investigation as described below, it cannot be stated that the pollutants in question would “reasonably be expected to interfere with” fish ingestion “uses” on a statewide basis. Rather, the need for such standards can and will be addressed on a site-specific basis where appropriate. Given the established system of site-specific surface water classifications and standards, this can be accomplished practically in the triennial review process for individual river basins. Should a specific situation arise where there was immediate concern regarding such pollutants and fish ingestion, the Health Department would issue appropriate health advisories and work with the Division of Wildlife to insure the area was properly posted. In addition, the desirability of statewide standards can be reassessed over time.

It is the Commission's understanding that the health based 304(a) criteria adopted by EPA are based on regular ingestion of fish by humans over a 70 year lifetime. It is unlikely that these circumstances exist on a statewide basis in Colorado and hence the Commission determined that application of the 304(a) fish ingestion criteria are not appropriate at this time.

The Commission is requesting that the Division staff further analyze this issue for subsequent reassessment on a statewide or site-specific basis. For example, further analysis should be given to the applicability of the assumptions underlying EPA's fish ingestion criteria to the circumstances in Colorado. Are general or site-specific levels of fish consumption in Colorado consistent with EPA assumptions? Should statewide or site-specific standards that apply modified assumptions be considered? To what extent do heavily-fished streams overlap with those already classified for water supply, resulting in the presence of more restrictive, health-protective standards even without application of the fish ingestion criteria? Do bioconcentration factors require more stringent standards than those to protect water supply? Are certain organic chemicals more of a concern than others with respect to potential impacts in Colorado?

Along with these types of Health Department efforts to examine circumstances unique to Colorado, the Commission anticipates that additional national information regarding fish ingestion criteria for organic pollutants will be developed over the next several years. Taking all such information into account, the Commission intends that the Division staff should raise any possible need for revising the current interim aquatic life standards in subsequent triennial reviews of this regulation, or of site-specific classifications and standards, as it determines appropriate.

In addition to pure public health concerns, Colorado has a strong economic motivation to assure public confidence in the safety of consuming fish from Colorado streams, to protect the recreational fishing industry. If at any point it becomes clear that a real risk to public health could develop, or that the remaining uncertainties make preventive standards the preferable public health policy option, more stringent statewide or site-specific standards may be adopted in the future.

On Table C, several chemical compound families are identified. The Division and Commission considered several options regarding whether or how to set standards for these families, in part because a detection method has not been established for families per se. The detection method for families is essentially the detection of individual compounds within the family. The sum of the concentrations of the individual compounds establishes the family's concentration level. This method is quite cumbersome in many cases. For instance, Polynuclear Aromatic Hydrocarbons are comprised of hundreds of different compounds. At this time, the Commission believes it is more appropriate to not set a standard for an entire family, but rather to set standards for individual compounds within certain families as listed in the EPA Gold Book. The Commission realizes that there are many toxic compounds which are addressed in the Gold Book only as families. However, due to the complexity of the problem, the Commission will defer these to possible additions in updates of this regulation during the triennial review process, as more specific criteria are developed or other options are identified to address this issue.

3. Water Supply Standards:

The organic pollutant standards for waters classified for water supply protection have been divided into two categories—Table A for carcinogens and Table B for non-carcinogens. For non-carcinogens, the interim standards are based on MCLs, or lifetime exposure levels derived from the “reference dose” for constituents for which no MCLs have been adopted. Non-MCL standards generally are based on EPA drinking water health advisories or IRIS data. The Commission has determined that this is the best information currently available to derive appropriate criteria for protection of human health from non-carcinogens.

For the Table A carcinogens, the interim standards are again based on MCLs for constituents for which these limits have been developed. For non-MCLs, standards based on the 1x10^-6 cancer risk level have been adopted. Recognizing that there is no scientifically “correct” risk level, the Commission has selected this level as a matter of policy, because it believes this is an appropriately conservative and protective level for human health risks.

To determine which specific pollutants to list on Table A, any particular compound was considered to be carcinogenic if it has been classified by EPA as either a Group A (known human carcinogen) or Group B (probable human carcinogen) compound. Compounds classified as Group C (possible human carcinogen), Group D (information inadequate to assess), or Group E (not anticipated to be a carcinogen), were treated as non-carcinogenic and listed on Table B. A few specific compounds classified by EPA as Group B/C were considered carcinogens and included in Table A.

D. SITE-SPECIFIC STANDARDS

Section 3.1.11(4) clarifies the Commission's ability to adopt site-specific standards to apply in lieu of the statewide standards where appropriate. One such example where this might be appropriate was mentioned above—i.e., where a more restrictive aquatic life standard may be appropriate because adverse human health impacts from fish consumption are demonstrated to be a potential problem on a site-specific basis. Rather than attempt to anticipate all potential factual justifications for different site-specific standards, the Commission has determined that it is most appropriate simply to refer to the standard statutory and regulatory criteria for such determinations.

The Commission believes that because these standards are being adopted without taking site-specific factual circumstances into account, any revised site-specific standards based on such a site-specific analysis should not be considered a downgrading. Rather, this would simply be a determination that different numerical standards are adequate to protect the uses in question. The fact that downgrading criteria would not apply to such circumstances is another material assumption upon which the Commission relies in adopting these statewide standards. Of course, any proposal to remove an existing use classification in a site-specific hearing would be subject to the downgrading criteria.

E. INTEGRATION INTO DISCHARGE PERMITS

The Commission also has added four new subsections to section 3.1.14. New subsection (9) explains how detection levels are to be used in implementing the new standards, in view of the fact that in many instances the standards are lower (more stringent) than common detection levels. Although the new standards will be used in appropriate circumstances to calculate effluent limitations for discharge permits, the Commission believes that it is appropriate to recognize the limits of current detection technology by clarifying that specified detection levels will be used for purposes of determining permit compliance.

The specific detection levels to be used for these statewide standards are being specified in the regulation. Although this is not the Commission's normal practice, it has determined that this step is appropriate in this instance because the need to comply with very stringent standards for organic pollutants will be new to many regulated entities.

The Commission has decided to rely for now on detection levels based on practical quantitation limits (PQLs) associated with GC-MS laboratory analysis techniques, except where only a GC-based PQL exists. For those compounds which have an MCL as the standard, the corresponding detection method was adopted. The Commission has decided not to require detection to the generally more stringent GC-PQLs in all circumstances, in order to temper the economic impact of this new set of standards. Of course, as scientific knowledge and technology advance, this decision may be reconsidered in subsequent rulemaking hearings. In a few specific instances where national guidance is not available, PQLs have been established based on the Health Department Laboratory's best professional judgment.

One major concern raised by several parties to the hearing concerns the potential application of antibacksliding restrictions to discharge permit requirements resulting from these new statewide standards, should more lenient statewide or site-specific standards be adopted in the future. One of the material assumptions relied on by the Commission in proceeding with the adoption of these standards at this time is that antibacksliding should logically apply to discharge levels actually attained, rather than to more stringent underlying standards or effluent limitations. In other words, the fact that a discharger is achieving a PQL-based compliance threshold for an effluent limitation based on one of the statewide organic standards does not necessarily mean that the more stringent effluent limitation level itself is being attained.

The remaining new subsections of section 3.1.14 provide guidance as to when a specific discharge permit may need effluent limitations or monitoring requirements based on one or more of the organic pollutant standards. The Commission obviously does not intend that all discharge permits will contain effluent limits for all of these constituents. Subsections 3.1.14(10) and (11) establish general criteria to be followed by the Division in determining when such limits are necessary. These criteria are intended to assure that effluent limits are imposed only for those pollutants that can reasonably be expected to occur in a discharge at levels such that the applicable standards would be threatened or exceeded. The Division's determination could be based, for example, on effluent monitoring results from a particular discharger, or on knowledge that a particular chemical is used in a specific industry's process and may be present in its wastewater at levels which, following discharge, could be inconsistent with water quality standards. Correspondingly, the language in the regulation clarifies that if monitoring data for all probable sources identified demonstrates that a particular chemical is not present at levels of concern, no effluent limitation should be established. The Commission cannot realistically anticipate all factual circumstances that could arise, but rather recognizes that the Division will need to exercise its professional judgment, based on the best information available to it, in making such determinations.

Concern was expressed during the rulemaking process that situations could arise where municipal dischargers violate effluent limitations based on the new organics standards, but where the source of such pollution is difficult or impossible to control through traditional pretreatment programs. For example, it was suggested that if the source of a problem turns out to be widespread use of certain household products, the only practical solution may be a product ban, which cannot feasibly be accomplished by the municipality. Given the uncertainty at present regarding the nature and extent of any such problems that could be identified, it would be premature for the Commission to attempt to specify a particular remedy for such situations in advance. However, the Commission is committed, should such circumstances develop, to taking any actions within its authority to assure that responsibility for and resolution of such problems is addressed in a practical manner. For example, it has been suggested that the Commission could hold a hearing to investigate the source of the problem, and then report its conclusions and recommendations to the Governor and the General Assembly. Finally, the Commission notes that the Division has authority to exercise its enforcement discretion in individual situations in a manner that it determines to be appropriate based on the facts at hand.

New subsection 3.1.14(12) addresses monitoring requirements for pollutants covered by the new organic chemical standards. This subsection is intended to help assure that monitoring requirements for discharges of such pollutants are reasonably related to the potential for the presence of such pollutants in the discharge at levels inconsistent with water quality standards, and that such requirements are imposed to the maximum extent practical on those responsible for the presence of the pollutants. For example, if a specific industrial facility is the only source of a particular pollutant, monitoring of that facility's discharge into a domestic facility's collection system could be substituted for monitoring of the domestic discharger's effluent.

Finally, a general goal of new subsections 3.1.14(10), (11) and (12) is to help assure that the new standards are implemented in a manner that is consistent with the state's pretreatment program. The Commission's intent is to avoid unnecessary, duplicative requirements to the maximum extent practical.

One concept which was raised during the rulemaking process that has been rejected by the Commission was the possibility of adding new "point of compliance" language into this portion of the regulation regarding integration into discharge permits. The Commission believes that this is not necessary at this time and would add potential confusion since "mixing zone" provisions—a related concept—are already addressed elsewhere in this regulation. The Commission's simultaneous adoption of new organics and radioactive materials standards for ground waters in the Basic Standards for Ground Water, 3.11.0, may add a new factual determination that will need to be made in drafting some surface water discharge permits—i.e. What effluent limitations are needed, if any, to assure compliance with ground water standards at their applicable point of compliance, if recharge from the surface water in question is likely? However, this determination does not require additional regulatory provisions in this document.

F. RELATIONSHIP TO OTHER PROGRAMS

Concerns were raised during the hearing process regarding the relationship of these new statewide organic pollutant standards to environmental standards that might be established under federally-dictated environmental programs. The Commission does not intend to attempt to preempt such programs by the adoption of these standards. To address the one specific program where there appeared to be a potential for conflict in the surface water context, the Commission has added new subsection 3.1.11(5), relating to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA).

The Commission also notes that, in accordance with Senate Bill 181, for certain categories of activities these standards will be implemented initially by other state "implementing agencies," except for use in discharge permits. Section 25-8-202(7), C.R.S. The Commission believes that this system should be efficient and effective. Moreover, if at any time it appears that the other agencies are not taking adequate steps to assure compliance with the standards, the Commission is authorized by SB181 to step back in and take appropriate action.

G. ECONOMIC REASONABLENESS

The new statewide standards for organic pollutants could have an adverse fiscal impact on any persons discharging such pollutants to state waters. It is impossible to quantify that impact at this time. Such impacts will depend to a large degree on the nature and extent of any of the listed contaminants in dischargers' waste streams. The marginal impact of these amendments also is difficult to quantify since the existing narrative "free from toxics" standards has already been used to establish effluent limitations for organics for some dischargers. In addition, the recently adopted biomonitoring requirements will already require efforts to remove toxics from effluent. Any fiscal impact on nonpoint sources would depend on the nature of any control regulations that the Commission may adopt in the future. However, the Commission believes that in general the cost associated with compliance with the standards will be counter-balanced by the environmental benefits associated with protecting beneficial uses, although these benefits are also impossible to quantify at this time.

The Commission has incorporated several elements into these amendments in an effort to make them as economically reasonable as possible, consistent with providing adequate protection of human health and the environment. Examples of these elements include:

1. Use of MCLs, which are set at levels that take technological feasibility into account, as interim standards for any pollutants for which these levels have been established;

2. Reliance on accepted detection levels as compliance thresholds where the actual standards are more stringent;

3. Adoption of aquatic life interim standards based solely on toxicity to aquatic life, rather than on "fish ingestion" criteria, pending further analysis of that issue;

4. Provisions for adoption of site-specific standards to apply in lieu of the statewide provisions where appropriate;

5. Explicit deference to the federal CERCLA program, which may apply different standards; and

6. Provisions attempting to assure that the new standards do not result in unnecessary discharge permit limitations or excessive monitoring requirements.

Each of these elements is discussed in more detail above, in earlier sections of this statement.

PARTIES TO THE PROCEEDINGS OF THE PUBLIC RULEMAKING HEARING FOR THE BASIC STANDARDS FOR SURFACE WATER

1. Holme, Roberts & Owen
2. Vranesh & Raisch
3. Colorado Mining Association
4. City of Colorado Springs
5. North Front Range Regional Planning Agency
6. Homestake Mining Company
7. Rocky Mountain Oil and Gas Association
8. Amoco Production Company
9. Saunders, Snyder, Ross & Dickson
10. Welborn, Dufford, Brown & Tooley
11. Environmental Defense Fund

31.26 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY, AND PURPOSE (1991 REVISIONS)

The provisions of section 25-8-202(1)(a),(b),(d) and (2); 25-8-203; 25-8-204; and 25-8-501 to 25-8-504 C.R.S., provide the specific statutory authority for adoption of the attached regulatory amendments. The Commission also adopted, in compliance with section 24-4-103(4) C.R.S., the following statement of basis and purpose.

A. ANTIDEGRADATION

The Commission adopted major revisions to the antidegradation provisions in 1988. The experience gained by the Commission and Division in implementing those provisions since that time indicates that this new structure is generally workable, but that a few refinements would be helpful.

1. Presumptive Review Provisions.

Section 3.1.8(1)(b)(iii) provides that antidegradation review requirements are presumptively applicable to certain waters for which no water quality-based designation has been established. The previous version of this section allowed this presumption to be overcome if existing water quality for one or more parameters is worse than the “table values” set forth in Tables I, II and III. This provision has now been revised to provide that existing quality must be worse than table values for at least three of these parameters in order for the presumptive antidegradation review requirement to be overcome.

This change is being made in part to be consistent with parallel changes that are being adopted in section 3.1.8(2)(b)(i)(C). The previous regulatory provisions resulted in a regulatory “no man's land” for segments where one or two parameters exceed table values. Such segments did not qualify for designation either as “high quality” or as “use-protected” segments. They were presumptively subject to antidegradation review if the appropriate classifications were applicable, although this presumption could be overcome by data showing that as few as one parameter in fact exceeded table values. The Commission now believes that a simpler, more consistent cut-off between two and three parameters of “poor” quality is preferable. The Division has indicated that the previous test excluded from antidegradation review a number of water bodies that generally would be considered to have very good quality water. This was particularly true for a number of streams that were excluded from review on the basis of elevated levels of iron. The impacts of iron on aquatic life uses are uncertain, and the benefit of iron as a water quality standard is more as an indicator of sediment loading.

The Commission recognizes that this revision will marginally expand the number of streams subject to antidegradation reviews. The Commission believes that this expansion is appropriate as a matter of policy, to further the goal of protecting Colorado's existing high quality water resources. Moreover, the Commission notes and is influenced by the fact that the experience gained since 1988 indicates that fears that the new antidegradation review provisions would be used as a tool to stop development in Colorado were unfounded.

The Commission also has deleted the reference in this segment to recreation classifications, so that presumptive review would now be based solely on the presence of an aquatic life class 1 classification. In recent basin-specific hearings, and in other revisions being made in this hearing, the Commission has based the distinction between recreation class 1 and class 2 classifications on the presence or absence of specific uses, rather than on the presence or absence of water quality consistent with a class 1 classification. Therefore, it now appears that whether a segment is classified recreation class 1 or class 2 is not a good general indicator of the quality of the water in a particular segment. Accordingly, here and in section 3.1.8(2)(c), the references to recreation classifications as a determinant of whether an antidegradation review is required have been eliminated.

2. Key Parameter Test.

Section 3.1.8(2)(b)(i)(C) has been revised to provide that waters are to be designated high quality 2 if less than three of the listed parameters exceed table values. The previous version of this regulation required that existing quality for all of the listed parameters be better than table values in order for the high quality 2 designation to routinely apply. The reasons for this change are the same as those described above, with respect to the revisions of section 3.1.8(1)(b)(iii).

3. Use-Protected Designations.

The reference to recreation classifications in section 3.1.8(2)(c)(i)(A) has been deleted. See the discussion regarding Presumptive Review Provisions, above.

4. Public Participation and Intergovernmental Coordination.

Subsequent to the revision of this regulation in 1988, the Commission revised its Procedural Rules, 2.1.0 (5 CCR 1002-1), to establish procedural provisions regarding public participation and intergovernmental coordination relating to antidegradation review. A new subsection 3.1.8(3)(e) has been added to this regulation to cross-reference those procedural provisions.

5. Other Proposals

The Commission considered but rejected proposals to delete subsections 3.1.8(2)(b)(i)(A), (B), and (ii). The result of these deletions would have been to base high quality designations solely on the 12-parameter test in subsection 3.1.8(2)(b)(i)(C). The Commission continues to believe that it is appropriate as a matter of policy to provide the extra layer of protection afforded by antidegration reviews to waters in National Parks, National Monuments, National Wildlife Refuges, and Wilderness Areas, and to designated Wild Rivers. The Commission also believes that the “exceptional reasons” provision in subsection 3.1.8(2)(b)(ii) has proven workable to date. The Commission considered and rejected a proposal to put more specific guidance regarding the application of this latter subsection in the regulation. In determining whether to designate a segment high quality 2 based on “exceptional reasons” , the Commission has in the past considered factors such as:

1. The water supply for the segment is high quality water;
2. Sensitive aquatic life inhabit the segment;
3. The segment is an economically important resource used by a significant number of people for fishing or other recreational purposes;
4. The segment is unique, either by fact of designation by a government body other than the Commission, or by proximity to government preservation areas such as national parks, national monuments, or state parks; and
5. Potential effects of the designation on other uses of the segment.

Factors such as these, or other factors, may be determined to be relevant to high quality designation decisions in the future. However, until more experience with application of this subsection is acquired, the Commission believes it would be premature include such specific criteria in the regulation.

The Commission also considered but rejected proposals to make several other changes to the antidegradation provisions. The Commission does not believe that it is necessary or appropriate to further define “available representative data” at this time. Exercise of case-by-case best professional judgment will continue to be necessary in applying this concept. The Commission does agree that the Division should be encouraged to explain the basis for its application of this concept in specific situations (e.g. is an extrapolation from data in other adjacent or similar segments being relied upon?) as early as possible in individual rulemaking hearing proceedings.

The Commission also declined to make changes in the significance determination, economic reasonableness and public participation provisions, or in the provisions defining the applicability of antidegradation provisions to regulated activities. The substance of the public participation provisions is set forth in the Commission's Procedural Rules and was not at issue in this hearing. With respect to other provisions, the Commission does not believe that there is sufficient evidence available at this time that there is a need to revise the provisions adopted in 1988.

B. STATEWIDE NUMERICAL STANDARDS

1. Organic Chemicals.

In 1989, the Commission adopted certain interim organic pollutant standards, applicable to water segments statewide based on the presence of domestic water supply or aquatic life classifications. Several revisions and additions to those interim standards are now being adopted. In general, the primary purpose of these changes is to provide a more thorough system to assure protection of Colorado's water resources with respect to potential adverse impacts from organic chemicals. In addition, these revisions should address remaining questions regarding Colorado's compliance with the requirements of section 303(c)(2)(B) of the federal Clean Water Act.

One change adopted is to combine previous Tables A, B, and C into a new, consolidated Basic Standards for Organic Chemicals Table. The Commission believes that this format will be easier to read, and helps to assure elimination of potential inconsistencies between the separate tables.

a. Fish and Water Ingestion Standards.

The Commission has added to the new consolidated Basic Standards for Organic Chemicals Table additional organic chemical standards for class 1 aquatic life water segments. These standards have been added to help ensure protection of human health, taking into consideration the fish ingestion or consumption pathway. In 1989, the Commission declined to adopt such standards for all state waters classified for aquatic life (class 1 or class 2). The Commission still believes that that blanket application is unnecessary. However, the Commission does believe that presence of a class 1 aquatic life classification is in general a good indicator of streams where significant fishing may occur.

In 1989, the Commission also questioned whether the assumptions underlying EPA's criteria regarding fish ingestion were appropriate for use in Colorado. EPA's criteria assume an average consumption of 6.5 grams of fish per person per day. The evidence indicates that where other states that have adopted similar standards have used a different average consumption rate, they have generally assumed a consumption rate three times that used by EPA. In the absence of resources to do a more exhaustive analysis of Colorado fish consumption habits, the Commission believes that use of the EPA assumption is a reasonable policy choice.

The Commission does not believe that the evidence indicates that the pollutants contained in the Basic Standards for Organic Chemicals Table are currently present at levels of concern for most Colorado waters. By adopting these standards at this time, the Commission intends to help implement a preventive system to assure that problems do not develop in the future. The experience of other states indicates that issuance of health advisories regarding consumption of locally caught fish can have a significant negative impact on the recreational fishing industry. It is the Commission's goal to prevent such circumstances from developing in Colorado to the maximum degree possible.

In taking this step, the Commission also is influenced by the experience to date in implementing the organics standards adopted in 1989. During the proceeding that led up to the 1989 action, substantial concern was expressed that adoption of standards for a long list of organic chemicals would result in substantial and unnecessary monitoring expenses for the regulated community. The Commission attempted to address this concern by the adoption of section 3.1.14(10), which instructs the Division to require monitoring only where toxic conditions are present or the individual constituent is likely to be present in the effluent of a particular discharger on a continuous or recurring basis in quantities which could cause the water quality standards to be violated. The Commission believes that this approach is workable, and that the adoption of the additional standards should not significantly increase monitoring costs, except where there is reason to believe that these pollutants may be present. In such circumstances, additional monitoring—and, and if necessary, effluent limitations—is appropriate.

Some comment was submitted recommending that the Commission should apply the new standards only to streams classified for aquatic life and water supply, since the underlying criteria are based on a combination of water and fish ingestion. The Commission has rejected this alternative. Persons eating fish from Colorado streams can still be expected to drink water from some source, even if not the same segment. Both ingestion pathways should be protected, even if they do not occur at the same location. Therefore, the assumption that a portion of the potential total exposure is through drinking water is still valid.

Finally, the Commission intends to consider the application of the fish and water ingestion standards to class 2 aquatic life segments on a case-by-case basis, where there is evidence that fishing is a significant activity for the waters in question. The Division staff has begun to request information regarding fishing for particular streams, as the basin-by-basin triennial review hearings occur. The Commission specifically requests that in future basin-specific hearings the Division solicit information, at a minimum, from the Colorado Division of Wildlife and any applicable section 208 agency to determine those class 2 aquatic life segments on which significant fishing occurs.

b. Risk-based Water Supply Standards.

When the Commission adopted interim organic chemical standards in 1989, the Commission adopted standards based on maximum contaminant levels (MCLs) for all pollutants for which MCLs had been established under the Safe Drinking Water Act. The Commission has now reevaluated this policy and adopted health-based standards for these constituents instead of standards equal to the MCLs, whenever health-based criteria are available. Several considerations have led to this new approach.

The vast majority of the standards adopted in 1989 were already set equal to health-based criteria. MCLs generally are more lenient than health-based criteria, and have been developed taking into account laboratory detection limits and the economic ability of water suppliers to treat for removal of these constituents. For most dischargers, the availability of low flow dilution credits in calculating effluent limitations has resulted in a second level of relaxation—i.e. movement away from underlying health-based-levels—when applying non-health-based MCL standards. The Commission already has attempted to temper the application of stringent health-based standards for non-MCL organic pollutants by providing for the application of the practical quantitation limit (PQL) concept in determining compliance with the standards. Use of low flow dilution credits in calculating effluent limitations provides for a further tempering of these very stringent standards in application. Therefore, the Commission has determined that it is a more appropriate policy to base these water quality standards on health-based criteria, rather than MCLs. Revisions have been made to the standards as now contained in the consolidated Basic Standards for Organic Chemicals Table.

c. Other Issues

Standards for a number of additional organic chemicals have been added to the Basic Standards for Organic Chemicals Table to help complete Colorado's compliance with section 303(c)(2)(B) of the federal Clean Water Act. The chemicals added are ones listed as priority toxic pollutants, and for which EPA has developed human health or aquatic life criteria under the Clean Water Act.

The Commission decided not to include in the consolidated Table standards for total trihalomethanes or for polynuclear aromatic hydrocarbons (PAHs) as a class. The Commission believes that it is more practical to regulate individual chemicals in these groups. Some evidence was submitted indicating that not all PAHs should have the same standard. For now the Commission has adopted these standards based on the available EPA criteria, although if more specific evidence on this issue is brought to the Commission in the future, revisions can be considered.

Several minor clarifications have been adopted in the Basic Standards for Organic Chemicals Table. A footnote has been added for the human health-based standards to indicate that these are chronic water quality standards. The “detection levels” column has been relabeled “PQLs” , to clarify that the values indicated are practical quantitation limits. In addition, the PQLs for a few parameters were revised to be consistent with the current information from the Colorado Department of Health laboratory. Inconsistencies in PQLs for individual chemicals have been avoided by adopting a consolidated table. The Commission declined to adopt a definition of “PQL” based on a fixed multiple of the method detection limit (MDL), since that would not accurately reflect current scientific practice.

The Commission chose not to list EPA laboratory analytical methods in the Basic Standards for Organic Chemicals Table. Dictating a specific analytical method in the regulation would unnecessarily constrain flexibility. Currently, the Division has discretion to approve the use of alternative methods. However, the Commission encourages the Division to make information regarding the standard analytical techniques available in a guidance document, so that this information will be easily accessible to the regulated community and the general public.

One party suggested that the Commission should specify that dischargers would not be subject to effluent limitations based on the aquatic or fish and water ingestion standards if they had passed whole effluent toxicity (WET) tests. WET tests only address potential toxicity to aquatic life and are therefore not an appropriate substitute for limits based on fish and water ingestion standards. Moreover, the Division already has discretion to determine the appropriate combination of chemical-specific effluent limitations and WET testing requirements to assure that potential toxicity to aquatic life is controlled. Therefore, the suggested change was not made.

The Commission has adopted a new subsection 3.1.11(4)(c), to enumerate factors that may be addressed in considering the adoption of site-specific standards to override statewide numerical standards. These provisions are intended to broaden the scientific base of information considered, not to limit protection. For example, these provisions do not mean that an area with a few people should receive a lower level of protection than a heavily populated area. Rather, certain sensitive populations may need to be considered in site-specific situations, e.g. children. The burden of demonstrating the relevance of these factors in a site-specific application would be that of the proponent of site-specific standards.

The Commission declined to make revisions that would broaden the applicability of section 3.1.11(5), since these provisions were adopted solely to clarify the interrelation of the statewide standards with the unique provisions of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA).

C. WATER QUALITY IMPROVEMENT

The Commission has been concerned that the current regulation does not contain as much flexibility as the Commission believes appropriate to address currently contaminated water segments where the Commission believes that some improvement in water quality is desirable and feasible. The Commission has expressed a general discomfort with the extreme options of choosing either ambient quality-based standards or table value standards in segments where some improvement is expected but the degree of improvement is difficult to predict. The Commission often is left with the dilemma of either sending a message that it finds the status quo of existing contamination acceptable by setting ambient quality-based standards, or that it expects the water segment to reach table value standards within twenty years, when the actual degree of cleanup may be difficult to identify with certainty.

An additional concern of the Commission's has been that the water quality standards system has generally been reactive, rather that proactive. The Commission believes that the standards system should, where feasible, help facilitate the statutory goal “to protect, maintain, and improve “ Colorado's water resources. In this regard, a more proactive, goal-based approach would also help establish priorities for determining upon which water segments nonpoint source cleanup efforts might best be focused.

To address these concerns, the Commission considered the adoption of a new section 3.1.4, entitled "Water Quality Improvement Targets." The provisions of this section would have been intended to operate in a manner independent from, but complementary to, the water quality classification and standards system. The key aspect of this section would have been the adoption of "numerical protection targets" , which would be used to help guide efforts at point and nonpoint source pollution control. In addition, in keeping with the statutory focus on beneficial use protection, this section would have provided for the adoption of "use attainment targets" , which would then be used as the basis for determining appropriate numerical protection targets.

Numerous concerns were expressed in the rulemaking process regarding this proposed new section, particularly with respect to uncertainties regarding the relationship of targets to the water quality standards system, and the practical effects of implementing targets in discharge permits. Upon consideration of all the evidence submitted, the Commission has decided not to adopt the proposed targets provisions at this time. However, the Commission continues to believe that pursuing opportunities for water quality improvement is an important priority that needs to be addressed further in the future. The Commission will continue to explore opportunities in this regard, and encourages any interested persons to advance to the Commission any recommendations that they may have.

D. RECREATION CLASSIFICATIONS

The Commission has revised the description of the class 1 recreation classification. Although the previous definition was broad enough to encompass uses other than swimming, recent basin-specific hearings have resulted in controversy regarding how broadly that definition can or should be applied. The Commission believes that the operative factor for classifying waters recreation class 1 should be whether there are any activities that are likely to involve ingestion of water. This may include certain recreational activities that generally occur on the water, such as rafting, kayaking and water-skiing. This list of activities potentially involving ingestion is not intended to be exclusive. Other activities may warrant a class 1 classification in specific situations.

By clarifying the class 1 recreation definition in this manner, the Commission is not condoning or encouraging the ingestion of any untreated water. Rather, the Commission is recognizing the reality that ingestion occurs from these activities. In fact, experience indicates that these activities may involve a higher likelihood of ingestion of water than does swimming. Therefore, the definition in section 3.1.13(1)(a)(i) has been revised to further clarify the Commission's intent.

E. INTEGRATION INTO DISCHARGE PERMITS

1. Implementing Narrative Standards.

Language has been added to section 3.1.14(4) to clarify that the Water Quality Control Division has authority to establish numerical effluent limitations for parameters for which no statewide or site-specific numerical standards have been adopted, when necessary to comply with the narrative standards in section 3.1.11(1). Such action by the Division does not constitute standard-setting. The effluent limitations developed are applicable only to an individual discharger. Moreover, this appears to be the only meaningful way to implement the narrative standards in practice. Application of such effluent limitations when necessary reflects the past and current practice of the Division. This language has been added to this regulation merely to recognize the appropriateness of this practice.

2. Compliance Schedules.

Language also has been added to section 3.1.14(4) to clarify that it is the Commission's intent that the Water Quality Control Division is authorized to utilize compliance schedules when appropriate in implementing water quality standards into discharge permits. Again, this revision merely confirms existing Division practice. This provision is being added to this regulation because of recent indications from EPA that states that may need to authorize the use of compliance schedules in their water quality standards regulations in order for such schedules to be included in discharge permits. Other compliance schedule issues raised by EPA in this proceeding are more appropriately addressed in the Discharge Permit Regulations.

3. Metals Methods.

Section 3.1.14(7) has been revised to clarify the appropriate analytical methodologies for metals monitoring. This revision is necessary since there are water segments which have both total recoverable and dissolved metals standards.

4. Monitoring Requirements.

The provisions of section 3.1.14(10) previously referred merely to the imposition of monitoring requirements with respect to organic chemicals standards. The language in this section has now been revised to apply to monitoring related to water quality standards in general. This change has been adopted because the Commission believes that, although this section was originally drafted with organic chemical standards in mind, the provisions contained therein are appropriate with respect to water quality standards generally.

5. Effluent Limitations Requirements.

As described with respect to the preceding revision, the Commission has revised section 3.1.14(11) to broaden its applicability to water quality standards in general, rather than merely organic chemicals standards.

6. Acute v. Chronic Limitations.

A new subsection 3.1.14(13) has been added, to clarify the relationship between chronic and acute effluent limitations, when implementing water quality standards.

F. TABLE I, II, AND III REVISIONS

1. Table I Revisions.

The Commission considered revisions to the dissolved oxygen values for aquatic life. The Division withdrew this proposal at this time, since it appears that EPA's position on this issue is still evolving. The Commission did adopt a new footnote to Table I, to help clarify the application of dissolved oxygen standards to lakes.

In 1988, the Commission considered and rejected a proposal to change the indicator parameter used for bacteriological standards. Although the issue was raised again in this hearing, the Commission does not believe that any new information has become available since 1988 to warrant a different conclusion.

2. Table II Revisions.

The total residual chlorine values for aquatic life have been revised, to be consistent with the 1986 EPA criteria. The Commission also has adopted a new table value for asbestos, to assure that criteria for all appropriate priority toxic pollutants are available for adoption on a site-specific basis if necessary.

3. Table III Revisions.

The Table III table values for aluminum, mercury, and zinc have been revised to reflect more current information that was unavailable when the Commission revised this regulation in 1988. With respect to zinc, limited information was submitted in the hearing questioning the appropriateness of the new criteria at low hardness levels. This issue can be considered further in the future, if more specific evidence is submitted to the Commission. With respect to mercury, the Commission has revised footnote 6 to Table III.

For the vast majority of stream segments in the state, the Commission has adopted the FRV (final residue value) of 0.01 ug/liter mercury as the numeric stream standard. The Commission has clarified that this standard applies to the “total” form. For a few segments, the Commission has adopted ambient-based standards or temporary modifications where site-specific studies have shown methylmercury concentrations in fish to be less than the FDA action level. New information contained in the 1990 Colorado Department of Health's Advisory for Consumption of Fish Contaminated with Methylmercury, indicates that methylmercury concentrations in sport-caught fish as much as one-fifth lower (0.2 ppm) than the FDA action level may pose a health risk to sensitive subpopulations such as the fetus, infants and children.

In consideration of this health risk assessment it becomes apparent that the FDA action level is not the only basis for evaluating concentrations of mercury in sport-caught fish. It may be possible to recalculate the FRV based on the health risk information, but the Commission decided not to, because the current FRV and any subsequent adjustments would place the resulting stream standard below the CDH detection limit for mercury in water of 0.25 ug/liter. From a practical standpoint, achievement of FRV or any adjusted FRV would still be based on instream values being below the detection limit.

It is the Commission's intent that due to the persistence of mercury in the environment and the new health risk information, mercury in effluent discharges be kept to the lowest levels possible, preferably below detectable concentrations. However, for those segments supporting fish or shell fish populations where there is the potential for human consumption and where an ambient-based approach is sought by a proponent, the Commission believes that a substantial case must be clearly demonstrated for adopting an ambient standard. Accordingly, footnote (6) of Table III for metals in Section 3.1.16 has been changed to reflect new information requirements based on the health risk assessment.

The Commission considered but declined to make revisions in the table value for selenium, based on a new EPA criteria document. Substantial questions were raised regarding the basis for the new EPA criteria, and the Commission believes that this issue should be examined more closely before the existing table values are changed.

The Commission has adopted new drinking water supply table values for antimony, beryllium, and thallium, to assure that criteria for all appropriate priority toxic pollutants are available for adoption on a site-specific basis if necessary. These table values will be applied on a site-specific basis only where there is reason to believe that there is potential concern regarding the pollutant in question. Such circumstances are not expected to arise frequently.

The Commission declined to adopt a proposal to change the table values for agricultural and domestic uses to the dissolved form rather than total recoverable, because no scientific basis for the change was provided.

The Commission declined to adopt a proposal to adopt PQLs for all parameters in Table III. This issue of standards below routine detection levels appears to be an issue for metals only with respect to mercury and silver. Therefore, only in these instances would the adoption of PQLs be significant. No proposals for specific PQLs were advanced by the parties to the hearing. If specific proposals are put forth in the future, the Commission can consider them in a subsequent rulemaking proceeding.

The Commission also declined to adopt regulatory provisions proposed by the Division of Wildlife to address certain sampling and analytical method issues. The Commission does not believe that these issues are appropriately addressed in this regulation, but encourages the Division to consider these recommendations.

G. OTHER REVISIONS

1. Downgrading.

Section 3.1.6(2)(b) has been revised to delete a reference to the effective date of this regulation. First, this reference is somewhat confusing since there have been several revisions in this regulation. More significantly, the Commission believes that as a matter of policy and to be consistent with federal law, the downgrading restrictions should apply to use classifications whenever adopted, not merely to classifications that were in effect at some earlier date. In addition, in response to a recommendation by the Colorado Water Congress, the provisions of this section have been substantially revised to more closely parallel the federal downgrading provisions.

2. Use Attainability Analyses.

Section 3.1.6(3)(a)(iii) has been revised to clarify the circumstances in which it may be necessary for the Division or other advocate of omitting an aquatic life or recreation classification to perform a new use attainability analysis.

3. Segmentation.

The Commission rejected a proposal to add a new subsection (d) to section 3.1.6(4), to clarify the Commission's policy to minimize the number of segments established in its basin-specific classifications and standards whenever possible. Although it was intended to restate existing policy and not to indicate that segments should be combined where there is a reason for distinguishing between them, based on substantial concerns raised regarding the proposal, the Commission has decided that it is unnecessary at this time.

4. Table Value Standards Application.

Language has been added to section 3.1.7(1)(b) to clarify the criteria used by the Commission in determining whether to apply standards based on Tables I, II and III on a site-specific basis. This provision merely confirms existing practice. It is adopted in large part to clarify for EPA the fact that the Commission does apply such criteria in deciding when standards for priority toxic pollutants need to be adopted on a site-specific basis.

5. Acute v. Chronic Ambient Standards.

Section 3.1.7(1)(b)(ii) has been revised to clarify that when the Commission establishes chronic standards based on existing ambient quality, such standards must be at least as stringent as an acute toxicity standard based on table values. The purpose of this revision is to assure that the adoption of ambient quality-based standards does not result in any acute toxicity in-stream. This revision is not intended to change the current methodology for determining compliance with ambient standards.

6. Low Flow Exceptions.

Section 3.1.9(1) has been revised to clarify the Commission's intention with respect to the application of standards during low flow conditions. In particular, the language has been revised to indicate that the 30E3 and 1E3 flow values are to be utilized as minimum dilution assumptions for developing discharge permit effluent limitations. This is consistent with existing practice. However, the language has been revised to clarify that water quality standards apply to streams at all times. In other words, merely because a stream happens to be currently at a flow below its established low flow values, does not mean that someone would be allowed to dump pollutants into the stream in violation of the standards. Again, this is not intended to change the existing practice with respect to the development of discharge permit effluent limitations.

7. Editorial Revisions.

Minor editorial revisions have been made to sections 3.1.1, 3.1.6(3)(b)(iii)(2), 3.1.16(1), 3.1.16(3)(L), footnote 4 to Table II and the Table II entry regarding ammonia. These revisions delete certain language that is no longer necessary or applicable, and make minor clarifications in the existing provisions.

H. OTHER REJECTED PROPOSALS

A number of additional proposals for revisions to this regulation were raised during this rulemaking proceeding. Although no attempt is made to comprehensively list every such proposal, several of the more significant ones considered and rejected by the Commission are noted below.

Several proposals were advanced to add new definitions to section 3.1.5. The Commission does not believe that the additional definitions proposed are necessary at this time. The Commission rejected a proposal to add additional provisions to section 3.1.6(2)(a) regarding “upgrading” because it does not believe these revisions are necessary at this time. A proposal for revised mixing zone provisions was not addressed, since it was not within the scope of the issues noticed for this hearing. A proposal to revise section 3.1.10 regarding Otherwise Dry Streambeds was rejected because the Commission believes that the concerns raised are more appropriately addressed in the pending revisions to the State's biomonitoring regulations. Finally, several proposals to revise the narrative standards in section 3.1.11(1) were rejected because the Commission believes that the current standards are workable, and it has not been demonstrated that there is a need for revisions at this time.

PARTIES TO THE RULEMAKING HEARING FOR BASIC STANDARDS & METHODOLOGIES FOR SURFACE WATER AND GROUND WATER

1. Adams Rib Recreational Area
2. EG&G Rocky Flats
3. Northwest Colorado Council of Governments
4. The Grand County Water & Sanitation District #1, Fraser Sanitation District and Winter Park Water and Sanitation District
5. The Metro Wastewater Reclamation District
6. Amax, Inc.
7. Kodak Colorado Division
8. Paramount Communications Inc.
9. Schlage Lock Company
10. The Colorado Water Congress
11. Chevron Shale Oil Company
12. Adolph Coors Company
13. Remedial Programs Section, Hazardous Materials & Waste Management Division, Colorado Department of Health
14. Umetco Minerals Corporation
15. Martin Marietta Corporation
16. Shell Oil Company
17. Cotter Corporation

18. Union Oil Company of California
19. Supervisory Committee of the Littleton-Englewood Bi-City Wastewater Treatment Plant
20. Arapahoe County Water and Wastewater Authority
21. City of Colorado Springs Wastewater Department
22. Colorado Wastewater Utility Council
23. Colorado Mining Association
24. Getty Oil Exploration Company and Texaco
25. Colorado River Water Conservation District
26. Exxon Company, USA
27. St. Vrain and Left Hand Conservancy District
28. Division of Wildlife
29. North Front Range Water Quality Planning Association
30. City of Westminster
31. City of Colorado Springs Water Department
32. Res-Asarco
33. Three Lakes Water & Sanitation District
34. City of Arvada
35. Northern Colorado Water Conservancy District and the Municipal Subdistrict, Northern Colorado Water Conservancy District
37. Environmental Defense Fund
38. Cherokee Water and Sanitation District, Security Sanitation District, and the Fountain Sanitation District

31.27 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY, AND PURPOSE; MARCH, 1993 HEARING ON WETLANDS CLASSIFICATIONS AND STANDARDS:

The provisions of 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; and 25-8-402 C.R.S. provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted, in compliance with 24-4-103(4), C.R.S., the following statement of basis and purpose.

Basis and Purpose:

A. WETLANDS

1. Definitions

The Commission considers the existing definition of “state waters” broad enough to include wetlands. Therefore, the definition has not been modified.

To add further clarity in this regard, a definition of “wetlands” has been added to the regulation. This definition is the same as that used by both EPA and the U.S. Army Corps of Engineers, except that the list of examples included in the federal definition has been omitted. These examples do not appear to be generally relevant to the types of wetlands most likely to be found in Colorado. The Commission believes that use of this definition is appropriate for consistency with Clean Water Act programs. The Commission recognizes that the site-specific application of this definition has led to considerable controversy, for example with respect to the Federal Interagency Delineation Manual. That controversy addresses a level of detail that is beyond the scope of this hearing. The Commission generally anticipates that implementation of this definition in Colorado will be consistent with the federal delineation manual once it is finalized, taking any relevant regional differences into account. However, the Commission will await resolution of the issues pertaining to the federal delineation manual and, depending on how such issues are resolved, may elect to provide further clarification or refinement regarding the appropriate delineation of wetlands in Colorado.

A definition of “constructed wetlands” has also been added to the regulation. This definition is intended to provide further clarification as to which wetlands will be subject to water quality classifications and standards. Consistent with the definition of “state waters” , those wetlands that are designed, constructed and operated for the purpose of treatment of wastewater or storm water, including wetlands designed, constructed, and operated as a system or part of a system for control, storage, or retention of wastewater or storm water, are excluded from coverage. Wetlands constructed as a part of environmental remediation provided under CERCLA or RCRA and section 319 of the Clean Water Act are also excluded since they also serve primarily a treatment function. The Commission has used the term “primary purpose” rather than “sole purpose” because it recognizes that some wetlands created for the purpose of treatment may, as a secondary matter, provide other beneficial functions. These secondary benefits should not be discouraged by an overly restrictive definition of constructed wetlands.

There was considerable debate in the hearing regarding whether wetlands constructed for treatment on previously existing wetlands sites should qualify as constructed wetlands, and thereby be excluded from state waters. The Commission believes that such wetlands should be considered constructed wetlands where approval or authorization has been obtained under section 404 of the Federal Act for filling in the previous wetlands. In other words, if a judgment is made in the 404 program that previously existing wetlands may appropriately be eliminated by or transformed into new constructed wetlands for treatment purposes, the water quality standards system should be applied in a manner that is consistent with that determination. Moreover, the existence of the water quality standards adopted by the Commission for wetlands is not intended to affect section 404 permit determinations regarding the permanent filling of areas of state waters. Rather, the standards are intended to govern activities potentially impacting wetlands that will continue to exist as (other than constructed) wetlands after any fill occurs. The Commission recognizes that some flood control, urban drainage improvement and stormwater management activities may have been conducted without prior 404 approval, but such activities may have resulted in the creation of wetlands which could be useful for purposes of complying with the new stormwater discharge requirements. If 404 requirements are demonstrated to be no longer applicable or enforceable, or after-the-fact authorization can be obtained from the Corps of Engineers, such created wetlands shall be considered constructed wetlands. Constructed wetlands are required to be permitted under the CDPS system if they are designed to provide treatment for wastewater or stormwater point sources and discharge to state waters. However, there is nothing in the regulation that interferes with the Corps of Engineers' responsibility to negotiate mitigation for wetlands lost in a project for which a section 404 permit is required.

Next, a definition of “compensatory wetlands” has been added which includes wetlands created to mitigate for adverse impacts to other wetlands. The definition of constructed wetlands includes a provision clarifying that wetlands created to provide mitigation for adverse impacts to other wetlands will not qualify as “constructed wetlands”. If new wetlands are created essentially to replace other wetlands which were state waters, such new wetlands should also be protected as state waters.

Next, a definition of “created wetlands” has been added. Many wetlands today are not natural, but rather created as a result of human actions. In many instances, such wetlands are the unintentional result of topographic or hydrologic modifications undertaken for other purposes. Examples would include wetlands resulting from highway construction or from irrigation tailwaters. These wetlands satisfy the statutory definition of “state waters”. However, they have been separately defined because the Commission believes that their varied nature warrants separate treatment under the water quality classification and standards system, as discussed further below.

The final revision to the Definitions section is the addition of a definition of “tributary wetlands” . The Commission has added this term to the definitions because it is used in section 3.1.13(1)(e) to identify certain wetlands that are subject to existing surface water classifications, and some of the associated standards, on an interim basis. Tributary wetlands either serve as the headwaters of surface waters or are wetlands within the floodplain. Tributary wetlands have been defined in this manner because there is a strong hydrologic connection characterized by rapid permeabilities between surface and ground water in the floodplain. This is because at some point during the past a river has occupied each and every position within its floodplain resulting in deposition of porous cobble material and sand and gravel throughout the floodplain. Waters and tributary wetlands may directly influence water quality in downgradient stream segments and, waters in streams may directly affect water quality in hydrologically downgradient wetlands.

To summarize, the result of this set of definitions, as further elaborated below, is as follows: (1) all wetlands that are not constructed wetlands are state waters, and are subject to the narrative standards; (2) all tributary wetlands are initially subject to interim classifications and numeric standards; (3) created wetlands are initially subject only to the narrative standards; (4) compensatory wetlands are subject to the classification and standards of the segment in which they are located; and (5) wetlands that are not tributary wetlands or created wetlands (sometimes referred to generally as isolated wetlands) are also initially subject to the narrative standards.

2. Classifications

The Commission has decided as a matter of policy that the approach to water quality classifications and standards for wetlands in Colorado that will result in the most appropriate protection of the resource with the least disruption to the current system is a two-step process. The initial step is a clarification that for wetlands that are tributary to other surface waters (except for created wetlands), the classifications adopted for the segment into which the wetlands fall will apply on an interim basis. This is consistent with the Commission's approach to classifying all tributaries of a segment. This approach will also ensure that the use of the streams to which the wetland is tributary is not impacted. The Commission recognizes, however, that the use of wetlands as drinking water supply sources is highly unlikely. For that reason, the Commission's rule exempts tributary wetlands from the drinking water supply classification, even if the segment to which they are hydrologically connected is subject to such classification. This does not mean that drinking water supply cannot be considered a water quality dependant function of wetlands, but only that such a determination must be made on a case-by-case basis. The Commission intends that in the next round of basin-specific rulemaking hearings appropriate language will be added for each basin to further clarify the application of existing classifications as interim classifications for wetlands that are tributary to other surface waters in the basin.

The Commission has provided that existing surface water classifications will not be considered to apply to created wetlands, which have been defined as described above. Rather, these wetlands will initially be subject only to the narrative standards set forth in new subsection 3.1.11(1)(b). The Commission has determined this distinction to be appropriate because of the varied nature of these wetlands. Because these wetlands are not natural, their functions may in many instances be more limited than those of other wetlands. Moreover, a blanket application of classifications and standards to these wetlands may create a counter-productive incentive for the elimination (e.g. through draining) or prevention of such wetlands in the future. Given the already apparent disagreements regarding the proper implementation of the wetland narrative standards and the inherent difficulties in distinguishing between tributary and created wetlands, the adopted approach to regulation of created wetlands (i.e., initially applying narrative standards only) is likely to be more resource intensive and more difficult to implement than the approach to regulation of tributary wetlands. Some parties at the hearing expressed concern with the potential abuse of this approach and the burdens faced by the Division if required to make a demonstration that a wetland is not created. In the created versus tributary wetlands determination, the Commission expects that wetlands that otherwise meet the definition of tributary wetlands, will be presumed to be tributary until shown to be created by human activity as specified in the created wetlands definition. Finally, it should be noted that if it is determined that specific wetlands of this type warrant additional or more precisely defined protection, the wetlands classification described below, along with associated site-specific standards, can be adopted.

The second step in the process established by the Commission is the application of the new wetlands classification established in section 3.1.13(1)(e)(v), which can be applied on a site-specific basis. The protection resulting from such a site-specific classification could be more or less stringent than that provided by the interim classifications. Some wetlands may have unique functions that are not adequately protected by the interim classifications and standards. In other instances, the interim classifications and standards may protect uses, e.g. sensitive aquatic species, that are not present in particular wetlands and therefore do not require site-specific protection. Because the initial adoption of the wetlands classification, and associated site-specific standards, to replace the interim classifications would provide the first opportunity for review of the site-specific factual circumstances of the wetlands in question, the Commission has provided that such a revision would not be considered a downgrading. This provision is intended to apply only the first time a wetland-specific classification and associated standards are adopted to replace the interim standards established by this rulemaking action.

The new wetlands classification also can be applied to any wetlands that are not tributary to other surface waters. These wetlands, sometimes referred to as isolated wetlands, would initially be protected by the statewide narrative standards in new subsection (1)(b) (discussed below), which apply to all state surface waters. In addition, since these wetlands would generally be associated with the ground water table, they would receive some protection from the statewide, regional, and site-specific ground water quality standards that the Commission has adopted.

Where the Commission applies the new wetlands classification on a site-specific basis, the intent of establishing the classification will be to maintain or restore appropriate wetland characteristics and functions, within the range of natural variation of the affected wetland. Thus, where the site-specific wetlands classification includes the “sediment or other pollutant retention” function, the intent of including this function within the classification is to promote the maintenance or restoration of the natural wetlands characteristics. The classification should not be viewed as authorizing or promoting the use of the wetlands for treatment or retention of sediments or other pollutants from human sources. Rather, the Commission intends that this classification be interpreted and applied in a manner consistent with section 131.10(a) of the federal water quality standards regulation, which prohibits adoption of waste transport or waste assimilation as a designated use for any waters of the United States. The wetlands functions to be protected should be related to water quality and determined on a site-specific basis.

3. Standards

All wetlands that are state waters (i.e. not constructed wetlands) are subject to the statewide basic standards for all state waters contained in section 3.1.11. Concerns were raised in the hearing regarding the appropriateness of the previous narrative standards (section 3.1.11(1)(a)–(f)) for waters in wetlands. The Commission believes that not all of these standards are appropriate for wetlands.

Accordingly, section 3.1.11(1) has been amended and new subsections (a) and (b) have been created. Subsection (a) continues to apply all narratives to all surface waters, except wetlands. Subsection (b) specifies the narrative standards which are specifically applicable to wetlands.

A number of parties expressed concern regarding the potential use of the regulation and, in particular, the narrative standards, to create or expand other agencies' jurisdiction over wetlands. The Commission does not have the authority to create or expand the authority of other agencies and, therefore, this regulation cannot have such an effect. Neither the narrative standards nor the numeric standards proposed in this rule are self-implementing. Rather, implementation occurs only through discharge permits or other independent regulatory programs specifically designed to include water quality standards implementation as one of their purposes. It is the intent of the Commission that, to the extent these regulations are utilized by other agencies under independent statutory authority, the Division's interpretation thereof, as reflected in Division implementation guidance or otherwise, must be followed by such agencies. For example, the Commission intends that compliance with the water quality standards developed in this proceeding be determined using the techniques, methodologies and policies used by the Division for determining compliance with the adopted standards.

Subsection (1)(b)(i) incorporates a new narrative standard which addresses discharges that would be harmful to water quality dependent functions of wetlands. Each wetland function outlined in section 3.1.13(1)(e)(v) may be considered to be a water quality function of the wetland, depending on the facts of each case. The Commission intends that implementation of this narrative standard only address activities with adverse water quality impacts. This provision is not intended for example, to be applied as a biological criterion for wetlands that would more broadly mandate preservation of wetlands functions. Any such regulatory provisions should be addressed as part of the broader biological criteria issue, on which the Commission has chosen to defer the adoption of binding standards at this time. The new narrative standard in subsection (1)(b)(i) also addresses the potential impact of discharges which affect the pH of the wetland in such a manner as to harm the water quality dependent functions of the wetland. Considerable testimony about the need to protect wetlands from discharges of substances that could cause significant changes in pH was provided by EDF. Based on this testimony, the Commission has elected to adopt a specific prohibition against the discharge of pollutants in amounts that produce changes in pH to such degree as to harm the water quality dependent function of the wetland.

In addition, all wetlands would receive the protection offered by the applicable portions of the antidegradation rule contained in section 3.1.8. A provision has been included in section 3.1.7(1)(b)(iv) to provide that all created wetlands will initially be considered to have a “use-protected” designation. For the same reasons that the Commission has decided to initially apply only narrative standards to these wetlands, the Commission believes that a blanket subjection of such wetlands to antidegradation review requirements is not appropriate at this time. To the extent that specific wetlands do warrant such review, that can be addressed in the site-specific classification and standard-setting process.

The need to apply the narrative standards to created wetlands is not expected to arise very frequently. If this need does arise, e.g. due to a proposed point source discharge into such a wetland, the Commission intends that the water quality dependent functions of the particular wetland would be considered by the Division in applying the standards. In many circumstances, those functions may already be limited by the quality of the inflow that has led to the, sometimes unintentional, creation of the wetland in the first place. In such instances, the discharge of additional flows of similar quality may not interfere with those functions. The Commission recognizes that created wetlands can provide beneficial storm retention and cleansing functions, and intends with these provisions to allow enough flexibility so that such functions can be protected without imposing a degree of regulation likely to result in unreasonable treatment costs or a disincentive to the preservation or future creation of such wetlands.

Consistent with the Commission's two-step approach discussed above, wetlands subject to the interim classifications described in section 3.1.13(1)(e)(iv) (i.e., tributary wetlands) shall be initially subject to the numeric standards adopted for the applicable segment, unless it is demonstrated that said standards are not being met in the wetland in question. To the extent that such a standard is not met for any given parameter, the applicable interim standard shall be the ambient levels for that parameter. The determination of ambient quality shall be made by, or in consultation with the Division, on a case-by-case basis based on available data and information. The Commission expects that ambient conditions, for purposes of subsection 3.1.7(1)(b(iv)(A), will be determined in accordance with the past Division practice in recommending ambient water quality standards for adoption by the Commission.

These interim standards will apply until the Commission adopts site-specific standards for the tributary wetlands in question. The Commission expects to review any interim ambient standard established pursuant to subsection iv(A), during the Commission's triennial review of the basin in which the wetlands subject to such interim standards are located. Upon triennial review, where ambient based interim standards have been developed by the Division, the Commission will establish site-specific standards such as: permanent ambient quality based standards, table value standards, temporary modifications or alternative numeric standards when the “wetlands” classification is adopted. The Commission may determine, however, that insufficient data exists to adopt the interim ambient based standard(s) developed by the Division on a permanent basis. Such standards will be based on very limited data in many cases. A trial and error period and an iterative approach will typically be needed to address stormwater discharges and nonpoint sources impacting wetlands water quality. While the Commission recognizes that the issue of an appropriate numeric standard, which is demonstrated to protect the use(s) of state waters, needs to be resolved through rulemaking as quickly as possible, it may be necessary to allow time to gain implementation experience, acquire field data and to evaluate the effectiveness of various BMPs. When additional data is necessary to establish appropriate numeric standards or additional time is needed to achieve the numeric standards for which adequate supporting data has been collected, the Commission may adopt the interim values as temporary modifications. A temporary modification is generally appropriate in such cases because it will allow time to evaluate options for establishing or achieving the underlying standards or for development and adoption of more appropriate site-specific standards be they basin standards or ambient based standards.

In many cases, the stream standards on which the tributary wetland's standards are based are expressed as a function of the total hardness of the stream in question (i.e., table-value standards for protection of aquatic life for certain metals found in Table III, Section 3.1.16). The Commission expects the interim numeric standards for protection of aquatic life in tributary wetlands to be expressed as a function of total hardness as well. In addition, the Commission finds that the concept of water effect ratio, as developed by EPA in its recently adopted toxics criteria for aquatic life (57 Fed. Reg. 60,848 (12-22-92)), is appropriate in the development of numeric criteria for protection of aquatic life in wetlands. Accordingly, the Commission has adopted language that allows the Division or agencies implementing these standards and classifications for wetlands to express the appropriate numeric standard as a function of both hardness and water effect ratio of the pollutant in question. The Commission expects such adjustments to be made at the time of permitting, certification, or other action by the Division or other agency implementing these standards and classifications for wetlands, in a manner consistent with EPA's criteria. The water effect ratio of a pollutant shall be assigned a value of 1.0, except where the implementing authority assigns a different value that protects the designated uses of the water body.

Altemative numeric standards, to apply when the "wetlands" classification is adopted to replace the interim classifications, or for specific created wetlands, will need to be developed on a case-by-case basis, taking into account the functions of the wetlands in question. In making this determination, the Commission will take into account all relevant and available information. This information may include, e.g., whether the wetlands are natural or created, or, in the case of the latter, the reason for their creation. Given the diversity of functions of individual wetlands, the Commission does not believe that an effort to develop general "table values" for this new classification would be feasible or constructive at this time.

The Commission has decided not to adopt biological criteria as water quality standards for wetlands at this time. Very little is known at present about the structure and function of aquatic communities within wetlands. Concerns that have been raised regarding the lack of standardized, field-tested biological evaluation techniques are much more significant with respect to wetlands than for other surface waters.

Considerable concern was expressed in the hearing regarding the potential impact of wetlands water quality standards on activities involving the exercise of water rights. As in all other areas of Colorado's water quality program, the potential for application of these standards in a manner detrimental to water rights is constrained by the provisions of section 25-8-104, C.R.S. However, in an effort to more directly alleviate concerns in this regard, the Commission has adopted new subsection 3.1.7(1)(b)(iv)(G), to clarify that wetlands water quality standards shall not be interpreted or applied in a manner that restricts the lawful exercise of water rights.

The Commission expects that in permitting the discharge of pollutants into the state's streams, the Division will ensure the protection of the downstream wetland uses. However, where the downstream, tributary wetland is upgradient of the stream, there may be no pathway from the stream to the wetland. In such circumstances, the discharge to the stream need not be regulated for the protection of the wetland use.

PARTIES TO THE RULEMAKING HEARING MARCH 2, 1993

1. Res-ASARCO
2. The Lake Catamount Joint Venture
3. Vail Valley Consolidated
4. The City of Thornton
5. The Cache La Poudre Water Users Association
6. The Water Supply and Storage Company
7. The Thompson Water Users Association
8. The Cache La Poudre Reservoir Company & the New Cache La Poudre Irrigating Company
9. The North Poudre Irrigation Company
10. The Larimer-Weld Irrigation Company, The Larimer-Weld Reservoir Company & The Windsor Reservoir Canal Company
11. The Littleton/Englewood Wastewater Treatment Plant
12. NaTec Minerals, Inc.
13. Fort Morgan Reservoir and Irrigation Company
14. The City of Colorado Springs
15. Metro Wastewater Reclamation District
16. Northwest Colorado Council of Governments
17. Colorado Mining Association
18. Northern Colorado Water Conservancy District & Municipal Subdistrict
19. Martin Marietta Corp.
20. Shell Oil Company
21. Cotter Corporation
22. Vail Associations
23. Environmental Defense Fund
24. Battle Mountain Resources
25. Denver Water Board
26. The Home Builders Association of Metropolitan Denver
27. The City and County of Denver

28. Colorado Ski Country USA
29. Cherry Creek Basin Water Quality Authority
30. North Front Range Water Quality Planning Association
31. Division of Wildlife

31.28 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY, AND PURPOSE; JANUARY, 1993 HEARING ON WATER QUALITY DESIGNATION PROVISIONS:

The provisions of 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; 25-8-209 and 25-8-402 C.R.S. provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted, in compliance with 24-4-103(4), C.R.S., the following statement of basis and purpose.

Basis and Purpose:

A. Overview

House Bill 92-1200 was adopted by the 1992 Colorado Legislature. This act establishes a new section 25-8-209 in the Colorado Water Quality Control Act, concerning water quality designations. The purpose of this rulemaking hearing is to conform the Commission's regulatory provisions regarding water quality designations with these new statutory provisions.

The Basic Standards regulation previously provided for three water quality designations that could be applied to state surface waters in appropriate circumstances: high quality 1, high quality 2, and use-protected. H.B. 92-1200 does not require that any changes be made to the existing use-protected criteria. Consequently, only a few minor changes necessary to conform the use-protected provisions with other portions of the regulation were made.

B. Deletion of High Quality 2 Designation

In accordance with new section 25-8-209 of the Act, section 3.1.8 of the Basic Standards regulation has been revised to delete the high quality 2 waters designation. This revision does not change which waters will be subject to antidegradation review. Barring new information indicating that a use-protected or outstanding waters designation is appropriate, all waters previously designated high quality 2 will be undesignated but still subject to antidegradation review once these revisions are fully implemented in the basin-specific hearings. Until specifically revised in the triennial review process or in hearings held pursuant to section 25-8-207 of the act, all existing high quality class 2 designated segments are to be considered reviewable water subject to the antidegradation review provisions of 3.1.8(3).

The Commission is hopeful that the deletion of the high quality 2 designation will eliminate the risk that other agencies might misunderstand and misapply the high quality 2 designation. This designation was intended to denote waters for which an antidegradation review is required prior to approval of activities with new or increased water quality impacts. Concern was expressed by a number of entities that this label was likely to be used by other agencies for purposes broader than requiring antidegradation reviews, and in a manner that may unduly restrict beneficial economic activities. The Commission believes that the revisions being adopted to conform with the provisions of H.B. 92-1200 will still result in protection of the quality of Colorado's water resources in a manner fully consistent with the state and federal acts, while eliminating this risk of misuse of the high quality 2 designation. To further safeguard against misuse, the Commission included the statutory language prohibiting misinterpretation in 3.1.8(1)(D).

C. Outstanding Water Criteria

Section 25-8-209 essentially changes the label for those waters for which no degradation is allowed from “high quality 1” waters to “outstanding waters” . To date, the Commission has designated only seven specific surface water segments high quality 1. Each of these segments automatically become outstanding waters, pursuant to section 25-8-209(3)(b).

The Commission is also directed to promulgate criteria governing these designations. In addition, this section now sets forth certain determinations that must be made by the Commission before an outstanding waters designation is applied to specific waters. The provisions adopted by the Commission with respect to each of these determinations are addressed below.

In addition to the criteria for the three determinations, the Commission has adopted a proviso that no outstanding waters designation shall be adopted for specific waters if the Commission determines that such designation would be inconsistent with the provisions of section 25-8-102 or 25-8-104, C.R.S. This proviso is consistent with the requirements of new section 25-8-209(2). The application of an outstanding waters designation is a powerful tool. It can help assure protection of some of our state's outstanding natural resources, the preservation of which will be beneficial to Colorado's future environmental and economic health. At the same time, the restrictions associated with this designation are extreme, and it is essential that it be applied with discretion so as to not unduly restrict future development in Colorado. Application of this proviso will require case-by-case judgment, balancing considerations such as those listed above. The Commission does not believe that it is possible to enumerate in advance all of the circumstances where this language may be applicable.

1. Quality Test

The new statutory language provides that the Commission must determine that the quality of any waters designated “outstanding waters” is better than “fishable, swimmable” , based upon indicator parameters identified by the Commission. The Commission has selected 12 indicator parameters for this test. This list of parameters is the same as used in the previous high quality 2 water quality test, except that iron and mercury have been deleted and un-ionized ammonia and nitrate have been added.

Based on the professional judgment of the Water Quality Control Division staff, iron has not been as good an indicator of water quality as other metals, due to questions regarding its toxicity to aquatic life. Mercury has been deleted because questions regarding appropriate detection limits have unduly complicated its use as an indicator parameter. Moreover, it is the judgment of the Division and the Commission that the remaining metals parameters provide an adequate indication of water quality with respect to this category of inorganics. Un-ionized ammonia and nitrate have been added based upon recommendations that the types of indicator parameters used be broadened, particularly to include nutrients, and in the case of nitrate to indicate the suitability of the water for domestic water use.

The Commission has again considered the issue of whether minimum data requirements for this test ought to be included in the regulation. The Commission has chosen as a matter of policy to require that water quality determinations be based on “adequate representative data” , without attempting to quantify that requirement. The Commission continues to believe that case-by-case judgment considering all of the available information regarding a particular segment (e.g. upstream and downstream quality, surrounding land use, presence or absence of point sources) must be considered to determine what is adequate data in a particular circumstance. However, the Commission has added a new requirement that there be at least some data for each of the 12 indicator parameters from samples taken within the segment in question. This does not mean, e.g. that data is required from all tributaries within a segment, but some data from within the segment must be available for all 12 parameters. The one exception provided is where the remote location of a segment makes it impractical to collect and analyze fecal coliform data within the required holding time.

The City of Colorado Springs, a party to the hearing, requested that all data used to determine designations be “scientifically reliable.” The Commission rejected that request citing concern over likely confusion in interpreting such a requirement and noting that it always has and will continue to expect all data used to support standards or designation proposals to be scientifically reliable.

2. Outstanding Natural Resource

The second determination to be made by the Commission is that the waters in question constitute an outstanding natural resource. The Commission has established two bases for making this determination. First, this test will be considered to be met whenever waters are a significant attribute of certain categories of outstanding state fishing waters (Gold Medal Waters) or federal lands that have been given one of the types of protected status listed. The Commission believes that the presence of these federal designations is evidence that the waters are part of an outstanding natural resource. The inclusion in the regulation of the list of these federally designated lands is not intended to indicate that waters in other areas, such as lands with special state designations, do not warrant the outstanding waters designation. The application of the designation to other areas is addressed in subsection 3.1.8(2)(a)(ii)(B) of the regulation, and discussed in the following paragraph.

The second basis established for this determination is where the Commission finds that the waters in question have exceptional recreational or ecological significance, and that they have not been modified by human activities in a manner that substantially detracts from their value as a natural resource. The Commission believes that there are outstanding natural resources in Colorado that have not received one of the federal land use designations referenced above. Application of this provision will require case-by-case judgment, based upon all of the available facts. From a review of the available information, including the approaches taken in other states, the Commission has been unable to come up with a more concrete or specific formulation of this concept. However, the Commission intends that for this test to apply the waters in question should have the same type and degree of attributes that in other circumstances have led to adoption of one of the federal land use categories listed.

The language in the last half of the first sentence of subparagraph (B) is intended to assure that the outstanding waters designation is not applied to waters in an area whose natural resources values have already been significantly degraded by human impacts. The Commission believes as a matter of policy that this designation should be reserved for substantially unimpacted areas.

A number of parties requested that the Commission insert language in subsection B to help assure that outstanding waters designations are not applied in a manner inconsistent with Section 25-8-104. Particular language proposed would have required approval from the owner and operator before waters in a reservoir could be designated “outstanding.” Disapproval could only be based upon evidence that the additional water quality protection provided by the outstanding waters designation would have caused or resulted in material injury to an existing water right. The Commission declined to add the proposed language because it believes it is inappropriate and potentially confusing to single out one particular type of water right for what may appear to be special protection. The Commission understands the mandate of Section 25-8-104 to apply to all water rights. It also believes the protection afforded by Section 25-8-104 does not need to be placed in regulation to be applicable. Whenever any state water is proposed to be designated outstanding, persons with water rights associated with such water may bring evidence to the Commission of how the proposed designation will affect their water rights. Any information the commission receives will be considered in determining the appropriate designation, consistent with the requirements of Section 25-8-104.

3. Additional Protection

The third determination required by section 25-8-209 for the application of an outstanding waters designation is that protection over and above (1) classifications and standards and (2) antidegradation review is required. The Commission believes that this determination essentially requires a policy judgment that protection of the waters in question is important enough to prohibit any degradation. The Commission recognizes that this determination can have major consequences for potential future development in the area in question, due to the “no degradation” restriction associated with the outstanding waters designation. Therefore, this determination should be made only after full consideration of the appropriateness of this result in the area in question.

Some have suggested that this provision means that the outstanding waters designation can not be applied to waters that already have some other form of protection, such as wilderness designation—i.e., that in such circumstances the Commission designation is not “required” to assure protection of the water quality. The Commission disagrees with this interpretation of the statutory language. Such an interpretation would prevent application of the outstanding waters designation to waters that may be among those most deserving of protection, as already indicated by other formal designations. The Commission understands the statutory language to mean that the Commission must determine that the “no degradation” result is required to achieve appropriate protection of the water resources in question. The Commission does not understand this language to require a judgment on its part regarding the adequacy of controls resulting from, e.g., federal land use designations to achieve this goal. Moreover, the Commission believes that the contrary interpretation described above would be directly inconsistent with the fact that the Legislature “grandfathered” all existing high quality 1 designations—each of which are for waters located in wilderness areas or Rocky Mountain National Park—as outstanding waters designations.

Other Issues:

The Commission considered whether to include in the regulation further provisions addressing the appropriate implementation of the “no degradation” restriction associated with the outstanding waters designation. The Commission has decided not to do so, in large part because there appears to be no practical need to do so at this time. To date, the high quality 1/outstanding waters designation has been applied only in areas where there are no activities likely to result in measurable impacts to the waters in question. The Commission does not believe that this situation is likely to change substantially in the near future.

At the same time, the Commission notes that even EPA has recognized some flexibility in the application of this highest category of protection. For example, EPA's Water Quality Standards Handbook provides that “States may allow some limited activities which result in temporary and short-term changes in the water quality of ONRW [EPA's parallel to “outstanding water “]”. EPA Handbook at 2-14. The Commission believes that similar flexibility is appropriate in Colorado should future implementation issues arise.

Two parties to the hearing asked that other portions of the regulation not specifically provided for in statute be eliminated or significantly revised in this rulemaking. The Commission declined to make such changes to the antidegradation portion of the regulation primarily because this proposal was a direct result of HB 92-1200 which was limited in scope, and the hearing record to support modifications to rule beyond those necessitated by the statute was not extensive.

Finally, the Commission decided not to repeat the statutory limitations on Section 401 certifications of 404 permits (25-8-302) in the section of this regulation addressing applicability (3.1.8(3)(a)) because such repetition is unnecessary and can cause confusion.

PARTIES TO THE RULEMAKING HEARING

1. Climax Molybdenum Co.
2. Environmental Defense Fund
3. Colorado Mining Association

4. City of Golden
5. Cherry Creek Basin Water Quality Authority
6. City of Colorado Springs
7. City of Westminster
8. The Board of Water Works of Pueblo
9. Plum Creek Wastewater Authority
10. City of Arvada
11. Littleton-Englewood Bi-City Wastewater Treatment Plant
12. Colorado Division of Wildlife
13. City & County of Denver Board of Water Commissioners
14. Northwest Colorado Council Governments
15. Northern Colorado Water Conservancy District & the Municipal Subdistrict of Northern Colorado Water Conservancy District
16. North Front Range Water Quality Planning Assc.

31.29 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; OCTOBER 4, 1993, HEARING:

The provisions of C.R.S. 25-8-202(1)(a), (b); provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted in compliance with 24-4-103(4) C.R.S. the following statement of basis and purpose.

BASIS AND PURPOSE

The Commission held this rulemaking to allow for the insertion of several pages that were inadvertently left out of the regulation in previous publications. These pages were promulgated by the commission with the regulation at the time of adoption.

31.30 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY, AND PURPOSE (1993 REVISIONS—DIMP STANDARD)

The provisions of Colorado Revised Statutes (C.R.S.) Sections 25-8-202(1)(b), (2), and 25-8-204 provide the specific statutory authority for adoption of the attached regulatory amendment regarding a statewide surface water standard for diisopropylmethylphosphonate. In support of the regulatory amendment and in accordance with 24-4-103(4) C.R.S., the following statement of basis and purpose is provided.

I. Overview

a. Diisopropylmethylphosphonate (DIMP)

The purpose of this hearing was to consider the adoption of statewide water quality standards for diisopropylmethylphosphonate (DIMP). DIMP is a liquid chemical, a by-product from the manufacture and detoxification of a nerve agent, Sarin or GB (isopropylmethanefluorophosphonate), produced by the U.S. Army (Army) at the Rocky Mountain Arsenal in the 1950s. This is an area on the Front Range of the Rocky Mountains, just north of Denver. The Army disposed of DIMP, along with other chemicals, primarily in surface impoundments at the Rocky Mountain Arsenal where it leached into the underlying soils and ground water. The Water Quality Control Commission has heard testimony indicating that DIMP contamination has been detected in the surface and ground water within and outside the boundaries of the Rocky Mountain Arsenal, although ground water contamination exists in the greatest concentrations and is the most prevalent.

The Commission has heard evidence demonstrating that a significant quantity of ground water in the vicinity of the Rocky Mountain Arsenal is contaminated with DIMP. DIMP has been detected in certain drinking water wells located up to 5 miles downgradient of the Rocky Mountain Arsenal. In addition, the evidence indicates that DIMP-contaminated ground water near the Rocky Mountain Arsenal discharges to certain irrigation ditches and affects First Creek, a tributary to the South Platte River. For approximately the last three years, the State has been providing bottled water for consumption and cooking to residents and businesses whose wells were found to contain DIMP, although it is uncertain how long funds will be available to continue this program.

b. Scope of Evidence and Information

The Commission was presented with, and considered, a voluminous amount of evidence in this rulemaking. The majority of the evidence addressed the risk associated with exposure to DIMP and the toxicity of the chemical. The Commission heard approximately twenty-five hours of oral testimony from more than twenty witnesses for the Colorado Department of Health, the Army, the Shell Oil Company (Shell), the Arsenal Action Alliance, and the Environmental Protection Agency (EPA), as well as comments by members of the public and commentary by an expert advisory panel of toxicologists. The Commission received and considered literally thousands of pages of written testimony and exhibits from parties and the expert advisory panel. A Regulatory Analysis was prepared by Water Quality Control Division staff in response to a request by one of the parties. The Commission devoted a significantly greater amount of time in hearing testimony and considering written submissions, compared to the majority of water quality standard-setting proceedings it undertakes. Moreover, this hearing addressed the adoption of a water quality standard for a single contaminant, whereas most hearings address multiple pollutants and multiple segments.

Because of the importance of this proceeding, prior to the hearing the Commission took the unprecedented step of requesting that the parties and the Department of Health fund an independent expert advisory panel to provide testimony to the Commission on toxicology issues relating to DIMP. The expert advisory panel, which consisted of three toxicologists who were qualified to discuss risk assessment, assisted the Commission in objectively understanding the large volume of evidence regarding the toxicity of DIMP. The expert advisory panel provided a background educational briefing to the Commission, reviewed the written record, prepared a report for the Commission generally discussing the toxicity information and the different positions of the parties, attended the hearing and asked questions of witnesses, made an oral presentation to the Commission, and responded to questions from the Commission. The Commission found the explanation and clarification of the large amount of evidence by the expert advisory panel very helpful. In accordance with an agreement between the Department of Health, Shell and the Army, and upon advice by the Attorney General's Office, the panel did not advocate or offer a recommendation as to whether a water quality standard for DIMP should be adopted, or, if so, at what level.

Prior to these proceedings, there were no enforceable federal or state standards for DIMP. In 1989, the EPA's Office of Drinking Water issued a lifetime Health Advisory, which is not an enforceable standard, of 600 ug/l (micrograms per liter, also expressed as parts per billion) for DIMP. The EPA Health Advisory is based on a 1980 study of beagle dogs exposed to DIMP over a period of ninety days.[1]

The Department of Health initiated these water quality proceedings by requesting that the Commission adopt a statewide standard for DIMP of 8 ug/l, based on its evaluation of the relevant toxicology studies and selection of the 1979 Aulerich mink study[2] as the critical study upon which to base the water quality standard. In the Aulerich study, a significant number of female mink died over the course of their one year exposure to DIMP. Based on this and a more recent study with mink[3] , the Department of Health is concerned about the public health threat associated with DIMP exposure, particularly long-term or lifetime exposure, and derived its proposed standard to protect against these possible effects. In deriving its proposed standard of 8 ug/l for DIMP, the Department of Health followed EPA risk assessment methodology published in EPA's Integrated Risk Information System (IRIS) guidance. The Department of Health presented witnesses and exhibits supporting its recommended standard for DIMP of 8 ug/l. The State's consultant, Dr. Edward Calabrese, recommended a more stringent standard of 0.36 ug/l based on the Aulerich study, but employed certain factors in deriving that recommendation which the Department of Health, based on its professional judgment and the IRIS guidance, chose not to incorporate in its derivation of the recommended standard.

The EPA provided a witness who explained the toxicological basis for that agency's DIMP Health Advisory, and also discussed other issues related to the toxicity of DIMP. The Army and Shell offered witnesses and exhibits supporting the EPA Health Advisory of 600 ug/l on a site-specific basis, although one witness for Shell supported a standard of 500 ug/l later in the proceedings.

The Arsenal Action Alliance provided testimony and exhibits supporting its recommendation that a DIMP standard of 0 ug/l be adopted by the Commission. This position was based largely on that entity's general policy concerns regarding toxins and pollutants in the environment, although it referenced as support Dr. Calabrese's 1990 report regarding DIMP toxicity. The Commission also heard considerable testimony from the public regarding the significant health concerns raised by the presence of DIMP in domestic water supplies.

Accordingly, the toxicological testimony supporting the various recommended standards primarily involved three studies, the 1980 Hart dog study lasting ninety days, the 1992 Bucci study with mink lasting ninety days, and the 1979 Aulerich mink study lasting one year. As the expert advisory panel acknowledged, interpreting the toxicological data from these and the other relevant DIMP studies in the risk assessment context involves professional judgment, and there were differing opinions among the various experts on behalf of the parties regarding the results of these studies.

One question that arose near the conclusion of this process was whether a transcript of the Commission's deliberations regarding the issues raised in this rulemaking proceeding should be made a part of the hearing record. The Commission has decided not to include the deliberations transcript in the record, because it believes that to do so may result in confusion regarding the basis for the Commission's ultimate determination. During deliberations it is typical for many perspectives to be offered and many options advanced and “tested” by individual Commission members. However, it is ultimately only this Statement of Basis, Specific Statutory Authority, and Purpose that accurately reflects the final views of the full Commission. It is this document that sets forth the basis for the Commission's decision, not some or all of the individual comments made during the deliberative process.

c. Summary of Basis for Decision

Following consideration of the extensive information briefly summarized above, the Commission has decided to establish a statewide interim surface water quality standard for DIMP at 8.0 ug/l, with an accompanying practical quantitation limit (PQL) of 1.0 ug/l. The ultimate basis for this decision is a policy judgment regarding what level of DIMP is protective of public health and the beneficial uses of water, in the face of credible but differing scientific interpretation of the information regarding the toxicity of DIMP.

The Commission has experienced considerable frustration in coming to the realization that the extensive information and data presented in the record does not lead to the identification of one scientifically “correct” value for the toxicity of DIMP upon which all experts can agree. EPA, which issued a lifetime Health Advisory for DIMP, has indicated that it has “low confidence” in the standard it recommends. Based upon the information provided by the parties, the public, and the Department of Health staff, and the explanations and clarifications of this scientific evidence provided by the expert advisory panel, it is the Commission's judgment that it is ultimately faced with a range of scientifically supportable interpretations of the evidence regarding the toxicity of DIMP. The Commission acknowledges that each of these interpretations carries with it a degree of uncertainty. In the face of this uncertainty, the Commission must exercise its policy judgment. Even a decision to adopt no standard for DIMP would entail substantial uncertainty — uncertainty as to whether public health and the beneficial uses of water would be adequately protected until better information might become available in the future.

Fully cognizant of the existing scientific uncertainty, the Commission has determined that there is a need for the adoption of a statewide surface water quality standard for DIMP at the level of 8 ug/l, in view of the evidence submitted regarding the presence of DIMP in some waters of the State as described above and the evidence regarding the toxicological risk posed by DIMP (as discussed briefly above, and further discussed in section II of this Statement of Basis and Purpose). This standard is derived from the results of the 1979 Aulerich study. The Commission is concerned by the death of female mink observed at each dose level in that study, and cannot ignore these results. The Commission believes that the statewide standard of 8 ug/l is necessary to protect public health and the beneficial uses of waters of the State at this time, and that the standard is based on sound scientific and technical evidence in the record.

The Army and Shell have stated their belief that the Commission's selection of an 8 ug/l standard is based upon a public policy choice that “was not supported by the weight of the scientific evidence.” This assertion is a misleading characterization of the basis for the Commission's action. The Commission finds that there is substantial and sufficient scientific and technical evidence in the record to support this standard. The fact that other standards could also be defended from a scientific and technical standpoint based upon the information submitted does not mean that there is no such basis for the standard selected.

This Statement of Basis, Specific Statutory Authority, and Purpose does set forth “an evaluation of the scientific or technological rationale justifying the rule,” as required by the State Administrative Procedure Act. §24-4-103(4)(c). Indeed, in view of the importance of and controversy surrounding this determination, the Commission has taken pains to assure that this evaluation is substantially more extensive than that typically provided for the adoption of water quality standards. However, the Commission rejects the interpretation of the Administrative Procedure Act and Water Quality Control Act requirements implicit in the position advocated by the Army and Shell, which would appear to lead to the conclusion that whenever there is scientific disagreement or any remaining level of uncertainty regarding the appropriate standard to be adopted, the Commission is required to adopt the least stringent scientifically defensible standard. The Commission does not believe that this interpretation is mandated by law, and in fact believes that it would be contrary to the Commission's mission as set forth in the Water Quality Control Act.

The Commission previously considered the adoption of water quality standards for DIMP in January, 1991. The Commission eventually decided not to adopt any standards for DIMP as a result of that proceeding, in part based upon the representations of the Army that new DIMP toxicity studies then being conducted and scheduled for completion in 1992 would provide additional information that might address some of the uncertainty surrounding the interpretations of the studies completed prior to that time. It had been the Commission's hope that a new mink study of at least one year's duration, including at least one reproductive cycle for female mink, would be completed to essentially reassess the results of the 1979 Aulerich mink study, which was the focus of substantial debate in 1991 and again in this 1993 rulemaking hearing. Unfortunately, the additional studies conducted were not of a design or duration to provide this reassessment. Moreover, based upon the information presented in these proceedings it now appears unlikely that a new study of this scope, design and duration is likely to be completed in the foreseeable future. Therefore, the Commission believes that further delay or inaction on its part would be inappropriate. Accordingly, the Commission believes it must exercise its judgment based upon the information available now as presented in the 1993 rulemaking hearing, and adopt a standard to protect against the potential adverse health effects associated with DIMP exposure and to help ensure that DIMP does not become a more widespread threat to human health and the waters of the State.

This decision does not mean that the Commission is not open to reconsidering appropriate water quality standards for DIMP should additional relevant information become available in the future. Consistent with the Commission's practice for statewide standards for other organic chemicals, the DIMP standard is being adopted as an interim statewide standard. This standard is fully effective and enforceable once promulgated. However, the “interim” label recognizes the potential for future modifications should additional relevant information become available. In this regard, the Commission's statement concerning the adoption of interim statewide organic pollutant standards in 1989 applies here:

As new information becomes available and potential conflicts among the various numerical levels are resolved, it may be appropriate in specific instances in the future to adopt permanent standards either more or less stringent than the interim standards being established at this time. However, given the importance of controlling toxic pollutants in the environment, the Commission believes that it is necessary to move forward with the adoption of interim statewide standards at this time, and that the interim standards adopted are reasonable based on the best currently available information.

II. Selection of Numerical Level for Standard

a. Toxicological Basis

As briefly described above, the Water Quality Control Commission has heard and considered substantial testimony and scientific evidence regarding the toxicity of DIMP and the risk associated with DIMP exposure. The Commission believes that a statewide interim standard for DIMP of 8 ug/l is necessary and appropriate to protect the citizens of Colorado and the waters of the State, and is based on sound scientific evidence as presented by the Department of Health and the parties to the hearing. The Commission's determination follows EPA risk assessment methodology, as applied to the available information regarding DIMP toxicity. In summary form, the Commission's substantive basis for adopting the 8 ug/l statewide standard for DIMP in surface water is described below.

There are no studies of human exposure to DIMP that can be used in deriving a health-based drinking water standard. Of the most relevant animal studies regarding DIMP toxicity, the Commission has identified the 12 month mink study undertaken by Aulerich, as the critical animal study from which to derive a water quality standard. The Commission believes this is the critical study because none of the other species of animal used in other DIMP studies are proven to be of superior extrapolative relevance to humans; the 12 month mink study had the longest duration of all the animal studies; the 12 month study used a relatively large number of animals; and, the mink in the 12 month study proved to be the most sensitive of all the animals exposed to DIMP (exhibiting an increasing linear mortality relationship to their exposure to DIMP). This selection of the critical study comports with accepted risk assessment principles, including EPA's IRIS guidance.

The Commission recognizes the disagreement among scientific experts regarding the cause of death of mink in the 1979 Aulerich study and the issues surrounding background mortality for mink. However, the Commission agrees with the expert advisory panel's conclusion that the possibility that the mink deaths resulted from administration of DIMP could not be ruled out. The Aulerich 12 month mink study is the only study lasting one full year. Although experts debate over the significance of the results of the Aulerich study, the Commission recognizes that a dose-response relationship was exhibited during the study. This fact is troubling and cannot be ignored from a public health perspective, particularly because the end-point was mortality. No other studies to date have addressed female mink exposed before, during and through the reproductive cycle. The Commission also recognizes that adverse blood effects, among others, were observed in mink in the 90 day Bucci study, and that these effects were still increasing in severity when the study was completed at 90 days.

Given the Aulerich study's statistically significant mortality rate at the highest dose level, the statistically significant linear dose-response relationship across all doses, and the highly biologically significant end-point, the Commission believes it is an appropriate scientific and policy decision to base the DIMP standard of 8 ug/l on the information available currently to the Commission regarding mortality in female mink. The Commission recognizes that there was a difference of opinion among experts in the hearing regarding the relevance of the linear regression (trend) analysis of mortality across the different dose levels to select a Lowest Observed Adverse Effect Level. One member of the expert advisory panel commented that such trend analysis could result in more false positive conclusions compared to other relevant statistical tests. Recognizing this concern as well as the advantages of trend analysis, the difference of opinion among experts, and that the end-point was mortality in female mink, the Commission has chosen to use this potentially more conservative approach as part of its analysis.

The Commission recognizes there was considerable debate in the testimony regarding whether to incorporate in the statistical analysis of the 1979 Aulerich DIMP study the female mink deaths observed in the control group of a parallel 1979 study with dicyclopentadiene (DCPD). The expert advisory panel discussed the results of the DCPD study and noted that, because of atypical circumstances, they “should be factored in the overall analysis” of the results of the Aulerich DIMP study. The Commission has considered this information, as well as countervailing evidence presented that it is unorthodox to use data from a different study to statistically evaluate the results of the primary study that is being considered, and that statistical comparison using the concurrent control group from the primary study is the norm. There was evidence both supporting and challenging the notion that the two studies were sufficiently similar to allow their respective results to be commingled. There is considerable professional judgment involved in evaluating the available data in risk assessment, and the Commission is concerned by the direct linear increase in female mink mortality observed between the control group and the successive treatment groups in the 1979 Aulerich DIMP study. Considering the above, the Commission has decided to follow scientific convention and use only the data from the 1979 Aulerich DIMP study to evaluate the death of female mink in that study.

With the selection of the Aulerich study as the critical study, following accepted risk assessment guidance, the Commission derives the recommended standard as follows:

(1) The Lowest Observable Adverse Effect Level (LOAEL) [4] in the 12 month mink study was at the 11 mg/kg/day dose level (the lowest dose) because at this dose level the end-point of concern (female mink mortality) was both statistically and biologically significant. [5]

(2) In accordance with EPA methodology for risk assessment, the relevant Uncertainty Factors to be applied to the LOAEL of 11 mg/kg/day in the Aulerich study are: (i) interspecies variation, (10), (ii) intra-species variation (10), (iii) less than lifetime exposure (10), and (iv) conversion from LOAEL to NOAEL (10), for a total Uncertainty Factor of 10,000.

(3) The Commission recognizes that the LOAEL identified in the critical study was for death in female mink. This critical effect level, therefore, is actually a Frank Effect level [6]. Given that the endpoint was a Frank Effect Level and not a subtle, reversible toxic effect, and that the critical study has not been replicated to verify the results or better characterize the biological response in that study, it is appropriate to consider the application of a Modifying Factor [7]. The Commission chooses to follow the professional judgment of the Department of Health that in this instance the appropriate Modifying Factor is 1 because of the overall protection provided by the four Uncertainty Factors adopted by the Commission, although it appears that the evidence could also support a larger Modifying Factor. Therefore, the total Uncertainty Factor of 10,000 will not change based on the Modifying Factor.

(4) Deriving a safe human dose, commonly referred to as the Reference Dose (or RfD), the LOAEL is divided by the final total Uncertainty Factor of 10,000.

$$\frac{11 \text{ mg/kg/day}}{10{,}000} = 0.0011 \text{ mg/kg/day}$$

(5) The water quality standard is derived using standard EPA methodology - multiplying the Reference Dose by (i) the average adult body weight of 70 kg and (ii) the relative source contribution from water of 20% (0.2), and then dividing this figure by (iii) the average drinking water consumption of 2 liters/day.

$$\frac{0.0011 \text{ mg/kg/day} \times 70 \text{ kg} \times 0.2}{2 \text{ l/day}} = 0.0077 \text{ mg/l.}$$

0.0077 mg/l = 7.7 ug/l, which is rounded to 8 ug/l.

Based on the information available and evidence presented during these rulemaking proceedings, the Commission believes the statewide surface water standard for DIMP of 8 ug/l is necessary, scientifically justified and supported by the record. Also, as described above, the Commission has fully considered the relevant evidence regarding the risk associated with the pollutant, and the extent of such pollution to be tolerated as a goal, in deciding to adopt the standard for DIMP of 8 ug/l.

b. Technological Basis

Based on evidence presented to the Commission in these proceedings, the Commission believes it is technically and economically feasible and practical to treat water contaminated with DIMP with granular activated carbon to achieve a DIMP effluent concentration in water of 8 ug/l or less. There is evidence in the record that other treatment technologies might also be practical and technically and economically feasible to achieve the adopted standard.

The Commission recognizes that the Army and Shell are currently undertaking ground water remediation at and near the Rocky Mountain Arsenal employing granular activated carbon; that their existing ground water treatment systems are treating ground water for DIMP prior to discharge and are capable of achieving the adopted DIMP standard of 8 ug/l; that the existing ground water treatment systems may have to be reconfigured or costs associated with those systems may be increased; and that, if adopted as an applicable or relevant and appropriate requirement under the federal Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) remediation process or applied as a standard pursuant to any other law, new or additional ground water treatment systems may be required of the Army and Shell in order to meet the adopted statewide surface water standard for DIMP, due to the hydrological connection between ground and surface water. The Commission recognizes that costs may be associated with meeting the adopted standard if DIMP is discovered in surface water elsewhere in the State. [8] It is the hope of the Commission that public health and the waters of the State can be protected in a cost-effective manner when the standards it adopts are applied in any regulatory or remedial context. However, the Commission finds that in general the costs associated with compliance with the adopted DIMP standard, wherever compliance may be required, will be counter-balanced by the public health and water quality benefits achieved.

c. Consideration of Statutory Requirements

As described in part above, in promulgating the statewide ground and surface water quality standards for DIMP, the Commission has considered the factors enumerated in Section 25-8-204(4), C.R.S. The Commission has considered evidence regarding the extent of DIMP contamination and the risk associated with DIMP exposure. The Commission is aware that DIMP is a non-naturally occurring pollutant and it is also a “continuous” pollutant in the ground water (versus “intermittent” or “seasonal”) in the currently known affected area, which has resulted in detection of some impact on surface waters in the area. The Commission has also considered the technical evidence regarding treatment, and has concluded that treatment techniques to achieve the statewide standard of 8 ug/l are available, practical, and technically and economically feasible. As discussed above, the Commission recognizes the potential economic impacts associated with the adopted standard for DIMP, but believes these potential impacts will be counter-balanced by the public health and water quality benefits achieved. No evidence was submitted indicating that treatment for DIMP would have a significant impact on water quantity. Based on all the evidence presented, as summarized above, the Commission believes that there is a strong need for a statewide standard for DIMP of 8 ug/l at this time to support the beneficial uses of State waters, including drinking water, and that the standard adopted is appropriate and scientifically supported by the record.

d. Senate Bill 181 Requirements

Colorado Senate Bill 181, adopted in the 1989 legislative session and codified in part in Section 25-8-202(8)(a), C.R.S., includes provisions that apply when the Commission adopts “rules more stringent than corresponding enforceable federal requirements.” In the 1989 revision to the Basic Standards and Methodologies for Surface Water 3.1.0 (5 CCR 1002-8), the Commission interpreted these provisions to be inapplicable to the rulemaking since there were no “corresponding enforceable federal requirements” that establish ambient surface water quality standards. Likewise, the provisions of C.R.S. Section 25-8-202(8)(a) are inapplicable to the proposed rulemaking on DIMP because, as stated above, there are no enforceable federal requirements for DIMP. Even if Section 25-8-202(8)(a) were applicable, the Commission finds that the standard adopted is based on sound scientific and technical evidence in the record.

III. Decision to Adopt a Statewide Standard

In establishing a statewide standard for DIMP the Commission has determined that DIMP should be controlled on a statewide basis, wherever it is found in the waters of the State, within or outside the Rocky Mountain Arsenal. While the present known contaminated area is limited, the Commission recognizes that the ultimate clean-up and remediation actions for the Rocky Mountain Arsenal may not be finally determined, or may not be put in place, for many years. In establishing a statewide standard, the Commission also intends to ensure that future disposal and handling practices associated with the clean-up and remediation do not adversely affect surface or ground water resources anywhere in the State, and that new contamination problems associated with DIMP do not arise elsewhere in the future.

Much of the rationale for the Commission's 1989 adoption of statewide standards for organic chemicals applies with respect to DIMP (see, Section 3.1.22; revised in 1991, Section 3.1.23). The Commission believes that as a matter of policy all potential beneficial uses of water should be protected on a statewide basis from potential contamination from non-naturally occurring organic chemicals. This policy was reflected in the Commission's 1989 adoption of statewide standards for surface and ground water for approximately 55 organic chemicals. The current adoption of the DIMP standard is a consistent extension of this policy. As with the other organic chemicals, DIMP is a non-naturally occurring pollutant for which a statewide standard is appropriate. Unlike certain other potential pollutants, there is no need to take natural background levels for DIMP into account on a site-specific basis in adopting standards. DIMP is a “continuous” pollutant in the ground water at and near the Rocky Mountain Arsenal, with an estimated half-life of over 500 years, and this ground water is hydrologically connected to area surface water so the adoption of a statewide standard that applies at all times, and that protects future water supplies, is appropriate. As Water Quality Control Division staff testified, there are other statewide standards for chemicals that exist in limited areas of the State, such as chlorobenzene, for example.

The Commission also intends to set a statewide standard in order to protect any state waters that are not yet known to have DIMP contamination, if any are found to exist. The Commission intends that the standard should be applied uniformly wherever DIMP may be a concern in the State, currently or in the future, and that the standard is generally applicable and legally enforceable throughout the State pursuant to statute and associated regulations.

The parties to the hearing have expressed differing opinions regarding the Commission's intent on how its statewide water quality standards will be used as cleanup standards in other statutory programs. In a letter to the Commission, Shell appears to interpret Sections 3.11.5(C)(5)(a) (regarding statewide ground water standards) and 3.1.11(5) (regarding statewide surface water standards), 5 C.C.R. 1002-8, of the Commission's regulations to mean that the Commission “did not intend” for its standards to be applicable or relevant and appropriate requirements (ARARs) under CERCLA (i.e., cleanup standards) or to be enforced as cleanup standards under other statutes. Shell interprets those sections to mean that the Commission believes “it is in the discretion of other agencies” to apply or ignore the statewide standards as cleanup standards, and that the Commission intended to “specifically defer to the discretion of other agencies in setting cleanup levels at Superfund sites.” This is an inaccurate expression of the Commission's intent. Instead, the Commission intends for its standards to be used as cleanup requirements, including at CERCLA sites, except in the limited circumstances where “ <u>a determination</u> is made that such a variation <u>is authorized</u> pursuant to the applicable provisions” of those federal statutes [§ 3.11.5(C)(5)(a); § 3.1.11(5)].

These cited sections were added to the Commission's regulations in 1989 as simple clarifying statements to address potential conflicts between the Commission's statewide standards and other remediation requirements under the federal programs. The Commission is simply stating that it does not attempt to preempt a federal law, such as CERCLA, by mandating the use of its specific water quality standards as cleanup standards in instances where the federal program is authorized to use a different standard, more or less stringent, and where such programs dictate that the different standard be applied. See e.g., § 3.1.22 (F). The Commission's regulations do not provide that any agency has open-ended discretion to choose to apply or disregard the Commission's standards as cleanup requirements. The Commission intends for its standards to be used as cleanup standards; the Commission understands that in certain federal programs, such as CERCLA, the federal agency can waive a state standard, but only if certain specific statutory requirements have been met. From the Commission's perspective, the standards cannot be waived based on the federal agency's mere discretion whether to use them or not.

IV. Selection of a Practical Quantitation Limit

The Commission has heard testimony from the Department of Health's Laboratory on its routine analytical capability and procedure for DIMP analysis, and has determined that the Practical Quantitation Limit (PQL) for DIMP should be set at 1.0 ug/l. The Commission credited the testimony that the Department of Health Laboratory has devised a reliable and effective methodology for analyzing DIMP. The Commission also considered the evidence that the Army has been reporting levels of DIMP above .392 ug/l since 1988, demonstrating that the Department of Health Laboratory's PQL could be reproduced by other laboratories. The basis for this PQL is consistent with that underlying PQLs for other statewide organic chemical standards. Because the adopted standard is higher than the PQL of 1.0 ug/l, this value should have little practical significance.

PARTIES TO THE RULEMAKING HEARING

1. Colorado Department of Health
2. United States Department of the Army
3. South Adams County Water and Sanitation District
4. Shell Oil Company
5. Arsenal Action Alliance

31.31 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY, AND PURPOSE: JULY 11, 1994 HEARING

The provisions of C.R.S. 25-8-202(1)(1), (b); provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted in compliance with 24-4-103(4) C.R.S. the following statement of basis and purpose.

BASIS AND PURPOSE

3.1.8 Antidegradation Rule

Changes were made to several portion of the rule to clarify that the basis for designating waters and making determinations whether significant degradation will occur were the chronic criteria or standards except in those instances where the parameter of concern had only an acute criteria or standard.

One party requested an amendment to §3.1.8(2)(b)(i), asserting that the current language did not comport with C.R.S. §25-8-209(4). However, given the fact that this particular provision was recently adopted in response to a 1992 legislative change, and in view of the fact that the Basic Standard changes under review at this time focus upon numeric criteria, it was decided to defer this particular issue. It may be considered at the next Basic Standards triennial review, or prior to that time if a separate rulemaking addressing antidegradation is noticed by the Commission.

3.1.11 Basic Standards applicable to Surface Waters of the State

The Commission updated the organic chemical table to reflect new chemicals and revised numeric standards and criteria contained in revisions to the Federal Drinking Water Standards and/or updates to the 304(a) criteria for pollutants that have occurred since the 1991 Basic Standards rulemaking.

During the hearing, a number of parties raised concerns about the basic standards applicable to the water supply and water plus fish classifications for chloroform, bromoform, bromodichloromethane and dibromochloromethane. These substances are collectively known as total trihalomethanes (THMs) and are found in most treated drinking water supplies. The substances are contained in drinking water as a result of chlorination of raw water supplies in water treatment facilities. As a result of the discharge of treated drinking water, after use, into wastewater treatment systems, untreated and treated wastewater may contain the substances, particularly chloroform, in excess of the established basic standards levels.

The rationale for limiting trihalomethanes in waters of the State is to protect human health from adverse effects when water is ingested. The existing standards for the four substances were based on calculations from the EPA's Integrated Risk Information System (“IRIS”). The Safe Drinking Water Act and the implementing regulations set a maximum contaminant level (MCL) in finished potable water for total THMs at 100 ug/l, which is significantly higher than the current basic standard of 6 ug/l for chloroform. No maximum contaminant levels have been established for the four individual substances. The Commission recognizes that continued chlorination of drinking water supplies is necessary to control water-borne bacteria and to provide a safe drinking water supply. The Commission also recognizes that to meet the established standards for the four chemicals wastewater treatment works could be required to treat their wastewater at very significant costs to levels below that allowed in drinking water. In general, the Commission's policy has been to limit the occurrence of pollutants in state waters to the lowest feasible levels, consistent with the latest available information regarding full protection of public health. In this instance, in view of the fact that these pollutants may be present due to necessary water supply chlorination, and in view of the potential treatment costs and the existence of the total THM drinking water standard, the Commission has decided to replace the water supply and water plus fish standards for chloroform, bromoform, bromodichloromethane and dibromochloromethane with a total trihalomethane standard of 100 ug/l. This change is being made due to the unique circumstances pertaining to these chemicals, and should not be interpreted as a precedent for other instances where health-protective standards are more stringent than adopted MCLs. The Commission also anticipates that the standard now being adopted may be tightened in the future if, as currently expected, EPA revises the current total THM MCL to make it more stringent. The aquatic life standards for bromodichloromethane and chloroform have not been changed.

A determination was made that the practical quantitation limits (PQL's) were more appropriately addressed in the Regulations for the State Discharge Permit System in order to allow more flexibility in their application in permits and the PQL column and all footnotes referencing them were removed from the table.

Other changes to the table were to expand upon the footnote concerning the application of the water and fish ingestion standards to class 2 aquatic life segments and to correct typographical errors in the spelling of several chemicals.

3.1.16 Tables

Changes to this section included revising and updating the references, and adjusting the water supply criterion for asbestos in Table II and cadmium, nickel, selenium, and thallium in Table III to reflect updated standards in the National Primary Drinking Water Regulations. No revisions to the aquatic life table values for selenium were made as a result of this hearing. A separate rulemaking hearing to consider these issues has been scheduled for October, 1994.

A new class of criteria for metals which address water + fish ingestion was also added to Table III. Water + fish criteria were adopted for antimony and thallium that were equivalent to their respective drinking water supply criteria since their human health based water + fish values were slightly higher. The specific drinking water criteria used are the current “maximum contaminant level goals” for these two metals. As a result of issues raised during this hearing, the Commission intends to review the policy issues related to selecting the basis for human health-based table values and water quality standards. Should the Commission adopt an approach to such table values and standards in the future that differs from that applied in this hearing, the Commission may adjust these antimony and thallium table values at a future hearing. Footnotes concerning application of these criteria as standards to segments were adopted verbatim from the organic chemical table in 3.1.11.

The Commission considered the proposal of various parties to delete the chronic and chronic (trout) table values for silver. The evidence demonstrated that ionic silver causes chronic toxicity to fish at levels below that established by the acute table values. It was undisputed that silver is present in Colorado streams and in the effluent of municipal and industrial dischargers in Colorado. The evidence also demonstrated that the removal of silver from wastewater can be costly. However, there was strongly conflicting scientific evidence regarding the degree to which silver does, or could in the absence of chronic standards, result in actual toxicity to aquatic life in Colorado surface waters. In particular, there was conflicting evidence regarding the degree to which the toxic effects of free silver are mitigated by reaction with soluble ligands to form less toxic compounds and by adsorption to particulates and sediments.

The Commission believes strongly that there is a need for additional analysis of the potential chronic toxicity of silver in streams in Colorado. The Commission encourages the participants in this hearing, and any other interested parties, to work together to develop additional information that will help resolve the differences in scientific opinions that were presented in this hearing. The Commission believes that it should be possible to develop such information within the next three years.

In the meantime, the Commission has decided as a matter of policy to take two actions. First, the chronic and chronic (trout) table values for silver are repealed for the next three years. The Commission intends to implement this action by also repealing for the next three years, in a separate rulemaking hearing to be held later this year, all current chronic table value standards for silver previously established on surface waters in Colorado. Any acute silver standards and any site-specific silver standards not based on the chronic table values would remain in effect. The Commission intends that any discharge permits issued or renewed during this period will not include effluent limitations based on chronic table value standards, since such standards would not currently be in effect. In addition, at the request of any discharger, any such effluent limitations currently in permits should be deleted.

The second action being taken by the Commission is the readoption of the chronic and chronic (trout) table values for silver, with a delayed effective date of three years from the effective date of this final action. The Commission also intends to implement this action by readopting chronic silver standards with a corresponding delayed effective date at the same time that such standards are deleted from the individual basins as described above. The Commission has determined that this is an appropriate policy choice to encourage efforts to reduce or eliminate the current scientific uncertainty regarding in-stream silver toxicity, and to assure that Colorado aquatic life are protected from chronic silver toxicity if additional scientific information is not developed. If the current scientific uncertainty persists after three years, the Commission believes that it should be resolved by assuring protection of aquatic life.

In summary, in balancing the policy considerations resulting from the facts presented in this hearing, the Commission has chosen to provide relief for dischargers from the potential cost of treatment to meet chronic silver standards during the next three years, while also providing that such standards will again become effective after three years if additional scientific information does not shed further light on the need, or lack of need, for such standards.

The Commission also has revised the drinking water supply table value for silver, to reflect the current secondary drinking water standard, since EPA has deleted the previous maximum contaminant level for silver.

At the hearing, Coors requested that the Commission consider adopting language stating that the Division should not use secondary drinking water standards as the basis for discharge permit limits if the background levels exceed those standards and if there are no site-specific numeric standards based upon ambient data adopted for the constituents in questions. Coors and the Division have discussed the issue and have resolved it for the time being without the need for Commission action on the request at this time. Coors agreed not to pursue this issue in the current rulemaking, but anticipates that its concerns will be addressed in a subsequent hearing that will consider the adoption of site-specific standards on Clear Creek.

Other

Changes were made to section 3.1.7(b)(ii) which specify procedures appropriate in the development of site-specific standards and to section 3.1.14(7) to allow the adjustment of effluent limits for metals if a site-specific relationship can be shown for instream dissolved and total recoverable metals. Both these changes are being made in response to recent EPA policy concerning the development and application and of metals standards.

The definition of created wetlands was changed to clarify that compensatory wetlands were not included in this class of wetlands.

PARTIES TO THE JULY 11, 1994 HEARING

1. Sierra Club and Colorado Environmental Coalition
2. City of Colorado Springs
3. Conoco, Inc.
4. Shell Oil Co.
5. Metro Wastewater Reclamation District, the City of Fort Collins, the Silver Coalition, and the Cyprus Climax Metals Company
6. Coors Brewing Company
7. City of Pueblo
8. ASARCO, Inc.

31.32 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE: OCTOBER, 1995 HEARING

The provisions of C.R.S. 25-8-202(1)(b) and (2); 25-8-204; and 25-8-402; provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted in compliance with 24-4-103(4) C.R.S. the following statement of basis and purpose.

BASIS AND PURPOSE

A. Aquatic Life Table Values for Selenium

The aquatic life table value criteria for selenium are being changed from 135 ug/l acute and 17 ug/l chronic to 20 ug/l acute and 5 ug/l chronic respectively. These values, which are measurements of waterborne selenium, will serve as interim guidance for the Commission in establishing numeric standards for specific basins and individual stream segments. The new interim numeric criteria are based upon EPA's 1987 Selenium Criteria Document. The EPA selenium criteria values of 5 ug/l chronic and 20 ug/l acute are not expected to be the appropriate standards for each and every waterbody within Colorado. Appropriate site-specific standards may be different than these table value numbers. These numbers may no longer represent the latest scientific evidence for all cases. Bioaccumulation may occur at higher or lower water column concentrations of selenium depending upon a variety of factors. Nutrient enrichment, productivity of primary producers, selenium speciation, pond residence time and other factors influence bioaccumulation. Several parties argued that the EPA criteria are unnecessarily stringent to protect aquatic life in many Colorado streams, while the U.S. Fish and Wildlife Service urged the adoption of a chronic table value of 2 ug/l to assure adequate protection.

Information was presented at the rulemaking hearing that the field studies which support the EPA criteria may not be directly transferrable to Colorado streams and reservoirs. Certain Colorado segments currently have elevated selenium levels, yet there is no apparent evidence of adverse impacts upon aquatic life or wildlife. Selenium in the aquatic environment exhibits a strong association with particulate organic matter and, as a result, measurements of waterborne concentration can be an unreliable predictor of bioaccumulation and the subsequent potential for adverse biological effects. Some research indicates that particulate selenium (i.e. selenium associated with detritus sediment or suspended particulate matter) is a more reliable predictor of these effects. Pending further study, the table values are used as an interim guideline.

In accordance with Section 3.1.7 of the Basic Standards and Methodologies for Surface Waters, the selenium table values are intended to guide the Commission and others at site-specific standard-setting hearings. These values are generally considered to protect the beneficial use classifications, but are not presumptively applicable to site-specific stream segments prior to or during the course of subsequent triennial review or segment specific rulemakings. The site-specific standard-setting process is a more appropriate vehicle for identifying and weighing the many variables influencing selenium toxicity.

Given the potential for significant site-specific differences in bioavailability and subsequent effects, the naturally high concentrations of selenium in some Colorado water bodies, the lack of evidence of adverse impacts to Colorado ecosystems despite such elevated levels, and the difficulty in remediating selenium contributions from natural and nonpoint sources, the Commission has added a footnote to the TVS which explicitly states: “Selenium is a bioaccumulative metal and subject to a range of toxicity values depending upon numerous site-specific variables.” This footnote recognizes the opportunity to develop ambient or site-specific water quality standards on a basin-by-basin or specific segment basis. This can be accomplished in a number of ways, including the adoption of ambient or site-specific standards under Section 3.1.7(1)(b), or pursuant to other scientifically defensible methods. No single appropriate site-specific method has been identified to date.

The Commission will reconsider this interim standard and the availability of site-specific standard setting methods in subsequent reviews of this regulation. In the meantime, the Commission strongly encourages statewide cooperative efforts to (i) define potential biological thresholds, (ii) consolidate fish population data bases, and (iii) provide specific Colorado guidance for the development of methodologies for derivation of site-specific standards. The Commission urges all participants in this hearing, including the U.S. Fish and Wildlife Service, to assist in this effort. It is apparent that the determination of appropriate water quality standards for selenium is an extremely complex technical issue that warrants a broad-based effort if an appropriate long-term resolution is to be achieved. The absence of guidance and/or methods for the development of site-specific standards shall be considered by the Commission during subsequent reviews in determining whether to retain this interim standard. The next triennial review informational hearing for this regulation is currently scheduled for July, 1996, with any subsequent rulemaking hearing likely to be scheduled 6 to 12 months later.

Site-specific standards may be based upon considerations of site-specific factors including, but not limited to, ambient selenium concentrations, selenium speciation, sulfate antagonism, sediment and water column interaction, food web structure, stream gradient and temperature, seasonal stream flows, geohydrology, hydrologic residence time and evaporation rates, selenium sensitivity of the aquatic life present or to be protected, the diversity and density of the aquatic life present, conditions conducive or not to bioaccumulation, presence of toxic effects, risk of sublethal effects taking into consideration habitat limitations or other water quality factors, and the availability, practicality, technical and economic feasibility of point and nonpoint source treatment techniques, as well as other factors enumerated in C.R.S. 25-8-204(4).

During the hearing, one party urged the Commission not to apply the new selenium table values to cold water aquatic life streams above 7,000 feet in Colorado but rather to retain the existing table value criteria for these waters. The Commission has decided as a matter of policy that these issues are better addressed in site-specific standard-setting hearings, rather than addressing them in a hearing on table value criteria. As indicated in the preceding paragraph, site-specific factors such as geology, stream gradient and temperature, ambient selenium levels and other conditions conducive to bioaccumulation can be considered in standard-setting hearings.

Extensive testimony was received concerning the natural, as well as nonpoint source nature of selenium loading of streams. These sources will necessitate long-term water quality planning processes. Testimony was presented on the need for Total Maximum Daily Load determinations and allocation of mass loading among point and nonpoint sources. This implementation process is separate from the setting of the standard and may require additional planning processes and efforts by the Commission and Division once standards are set.

Finally, the Commission notes that a selenium standard need not be adopted during the course of triennial review or segment specific rulemakings unless it is determined that the discharge or presence of selenium in the affected waters reasonably could be expected to interfere with the classified uses adopted for the affected waters. Where it is determined that the presence of selenium reasonably could be expected to interfere with classified uses, appropriate action shall be taken in conjunction with a site-specific or a basin-wide rulemaking hearing.

B. Agriculture Table Value for Selenium

The notice for this rulemaking also proposed that the current agriculture table value for selenium be changed from 20 ug/l to 50 ug/l based on levels needed for protection of livestock. However, in this hearing the Commission was not presented with substantial scientific information demonstrating that 50 ug/l of selenium would be protective of agriculture uses. Therefore, the Commission has declined to modify the current agriculture table value at this time.

PARTIES TO THE OCTOBER 11, 1995 HEARING

1. Northern Colorado Water Conservancy District and Municipal Subdistrict
2. Metro Wastewater Reclamation District

3. Climax Metals Company
4. Conoco, Inc.
5. City of Colorado Springs
6. City of Pueblo
7. The Board of Water Works of Pueblo
8. Total Petroleum, Inc.
9. United States Department of the Interior, Fish and Wildlife Service
10. Colorado Division of Wildlife
11. The Southern Ute Indian Tribe
12. The Southwestern Water Conservation District
13. Southeastern Colorado Water Conservancy District
14. High Country Citizens' Alliance
15. Tri-Lakes Wastewater Treatment Facility Joint Use Committee
16. Northwest Colorado Council of Governments
17. U.S. Environmental Protection Agency's Region VIII
18. Colorado River Water Conservation District
19. Western Slope Environmental Resource Council

31.33 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE: DECEMBER, 1996 HEARING

The provisions of C.R.S. 25-8-202(1)(b) and (2); 25-8-204; and 25-8-402; provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted in compliance with 24-4-103(4) C.R.S. the following statement of basis and purpose.

BASIS AND PURPOSE

1. Summary

In this rulemaking proceeding, the Commission adopted a revised basic standard for surface water for plutonium (Pu) and established an additional basic standard for surface water for americium (Am).

2. **Background**

The Commission previously adopted a basic standard for plutonium of 15 pCi/L and had no basic standard for americium. A basic standard was considered in this hearing for americium because it is closely associated with plutonium and these two radionuclides generally occur together. The current basic standard of 15 pCi/L plutonium was calculated using methodologies in the 1976 National Interim Primary Drinking Water Regulations and was consistent with a goal of keeping exposures below 4 millirems per year. The Basis and Purpose indicated that it was necessary and important to restrict levels because of the difficulty of removing this radionuclide by conventional treatment procedures and because the potential adverse effect on human health suggests that extreme caution be exercised in its release to State waters. Since plutonium is predominantly an alpha emitter, the basic standard was made consistent with the 15 pCi/L alpha standard. (A site-specific standard, based on ambient conditions, was set in 1990. Note that this hearing also addressed site-specific standards, which are further discussed in section 3.8.48 of this Statement of Basis and Purpose.)

3. Basis for **Commission** Decision

Since the previous basic standard was set, several changes have occurred: 1) a new methodology for assessing carcinogens has become the standard practice, 2) new data have resulted in periodic updates to the slope factors used in this methodology, and 3) a more refined Commission policy on appropriate levels of protection for carcinogens has been developed. This latter risk-based policy also parallels a national trend towards risk-based approach to environmental cleanup standards.

The 15 pCi/L dose-based approach was calculated using a “reference-man” and considered exposure during his working life. It was an approach designed to address questions related to occupational exposure. It did not consider sex, age and organ-specific factors over a lifetime. In contrast, the new slope factor methodology, used in EPA's 1989 Risk Assessment Guidance for Superfund Sites, is more complete, more applicable to a general population and has become the standard practice for calculating risk.

The Commission adopted a basic standard of 0.15 pCi/L for plutonium and americium, calculated using a 1x10^-6 risk level, based on residential use. This risk level is consistent with the Commission's policy for human health protection.

PARTIES TO THE RULEMAKING

1. State of Colorado Division of Wildlife
2. U.S. Department of Energy
3. Kaiser-Hill Company, LLC
4. City of Broomfield
5. City of Westminster
6. U.S. EPA Region VIII
7. City of Thornton
8. City of Arvada
9. City of Northglenn

31.34 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; JULY, 1997 RULEMAKING

The provisions of sections 25-8-202 and 25-8-401, C.R.S., provide the specific statutory authority for adoption of the attached regulatory amendments. The Commission also adopted, in compliance with section 24-4-103(4) C.R.S., the following statement of basis and purpose.

BASIS AND PURPOSE

The Commission has adopted a revised numbering system for this regulation, as a part of an overall renumbering of all Water Quality Control Commission rules and regulations. The goals of the renumbering are: (1) to achieve a more logical organization and numbering of the regulations, with a system that provides flexibility for future modifications, and (2) to make the Commission's internal numbering system and that of the Colorado Code of Regulations (CCR) consistent. The CCR references for the regulations will also be revised as a result of this hearing.

31.35 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; NOVEMBER, 1997 RULEMAKING

The provisions of sections 25-8-202(1)(b). 25-8-204; 25-8-402, C.R.S., provide the specific statutory authority for adoption of the attached regulatory amendments. The Commission also adopted, in compliance with section 24-4-103(4) C.R.S., the following statement of basis and purpose.

BASIS AND PURPOSE

1. Manganese Table Vales

The current Colorado aquatic life table value for manganese of 1,000 µg/l is based on limited laboratory toxicity test data generated by the Colorado Division of Wildlife (CDOW) in the 1970's (Davies and Goettl 1976). The revised table values adopted in this hearing are based on more recent data obtained from several sources (i.e., CDOW, ENSR, et al.) providing greater insight into the toxicological properties of manganese to aquatic organisms. The database, upon which the new table values are based, contains more than 25 acute and chronic toxicity data points representing approximately eight freshwater quality species. The USEPA has not developed national ambient water quality criteria for manganese. The new state table value criteria are based on the USEPA's guidance for deriving ambient water quality criteria, i.e., Guidelines for Developing Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses (USEPA 1985).

Laboratory test results indicate that manganese toxicity is affected by water hardness — an observation consistent with many metals included on Table III of the Basic Standards. The proposed acute and chronic revisions to the table values are water hardness-based equations rather than the current single value, reflecting the mitigating effect of water hardness on manganese toxicity and the differences in toxic effects resulting from acute (short-term) and chronic (long-term) exposures.

2. Correction of Typographical Errors

The listings of standards for the following organical chemicals were revised in this hearing, to correct previous typographical errors: Chlorethyl ether (BIS-2) [c] ; Chloroisopropyl ether (BIS-2); 4-Chloro-3-methylphenol; Chlorophenol 2; Di-n-butyl phthalate; Dinitrotoluene 2,6; Nitrosodiphenylamine N [2] ; and Trichlorobenzene 1,2,4.

3. Silver Table Values

As the result of a 1994 rulemaking hearing, the Commission repealed the aquatic life chronic and chronic (trout) table values for silver that had been contained in Table III of this regulation, but also readopted these same table values, with a delayed effective date of March 2, 1998. The Statement of Basis and Purpose for that rulemaking action stated in part: “The Commission has determined that this is an appropriate policy choice to encourage efforts to reduce or eliminate the current scientific uncertainty regarding in-stream silver toxicity, and to assure that Colorado aquatic life are protected from chronic silver toxicity if additional scientific information is not developed.”

In the present rulemaking proceeding, the Silver Council, the City of Colorado Springs, the City of Fort Collins, Climax Molybdenum Company, and Kodak Colorado Division proposed that the Commission should delete the chronic and chronic (trout) silver table values from Table III, arguing (among other things) that there is no need for these table values. As an alternative proposal in this rulemaking, the Division of Wildlife proposed that the Commission should replace the existing chronic and chronic (trout) table values for silver with a single new chronic table value (in the form of a new hardness-based equation) that in general would be more restrictive than the previous table values. The Water Quality Control Division proposed that the Commission should take no further action regarding aquatic life chronic table values for silver at this time, thereby allowing the previous table values to go back into effect.

After consideration of the extensive information presented in this hearing on this issue, the Commission has decided to take no action regarding aquatic life chronic table values for silver at this time, with the result that the previously adopted chronic and chronic (trout) table values will go back into effect on March 2, 1998. The Commission finds that the record of this rulemaking proceeding, taken as a whole, demonstrates the need for chronic silver table values (and, correspondingly, chronic water quality standards) to protect aquatic life. The evidence submitted does not demonstrate that Colorado aquatic life would be protected from silver toxicity in the absence of chronic standards, or that the adoption of more restrictive standards is appropriate at this time.

The Commission rejects the Silver Council's argument that the presence of low levels of silver in ambient waters in Colorado is grounds for the deletion of the chronic and chronic (trout) table values. Table values (and corresponding segment-specific standards) are established to protect beneficial uses from the adverse effects of pollutants that are currently or may in the future be discharged to Colorado streams. It is undisputed that silver is present in current point source discharges to Colorado waters. Therefore, it is appropriate to establish table values that will assure that such discharges do not in the future cause elevated levels of in-stream silver that would cause toxicity to aquatic life, even if in most instances current ambient concentrations are not at a level anticipated to cause impacts. The evidence in this hearing does not demonstrate that silver is removed or bound by either inorganic or organic complexing material (ligands) and/or sediments to the extent necessary to eliminate chronic toxicity to aquatic life.

The Commission has considered the factors enumerated in section 25-8-204(4), C.R.S., and believes that they support the decision not to delete chronic table values for silver.

The evidence demonstrated that cities such as Golden, Colorado Springs and Fort Collins have successfully established pretreatment programs that achieve compliance with silver effluent limits in their discharge permits. Moreover, if ambient standards resulting from these table values would result in a substantial economic impact to a particular discharger on a site-specific basis, a number of options may be available in establishing appropriate site-specific standards, as provided in section 31.7(1)(b)(iii) of this regulation. As a policy matter, the Commission believes that it is appropriate to consider any such site-specific economic impacts in a site-specific hearing, rather than by deleting a table value that has been shown to be necessary to avoid chronic toxicity. Based on these considerations, the Commission believes that the decision not to delete the previously adopted chronic table values for silver also meets the “economic reasonableness” goal set forth in section 25-8-102(5), C.R.S.

Contrary to the assertion of the Silver Council, and in accordance with its established interpretation of this legislative provision, the Commission does not believe that the provisions of section 25-8-202(8)(a), C.R.S. are applicable to the issue of whether to retain previously adopted table values for silver. This provision applies only in the situation where there are “corresponding enforceable federal requirements” in place. There are no federal requirements establishing enforceable silver standards in Colorado. Moreover, even if section 25-8-202(8)(a) were applicable to this proceeding, the Commission finds that the evidence in the record of this hearing includes sound scientific and technical evidence that chronic table values for silver are necessary to protect beneficial aquatic life uses of Colorado waters.

Although the Division of Wildlife presented evidence in this hearing which suggests that more stringent chronic table values than those previously adopted for silver may be necessary to protect aquatic life, the Commission believes that it would be premature to adopt more stringent table values at this time. Testimony presented indicated that there are issues regarding the derivation of the specific equation recommended by DOW that warrant further review before revising the table values. The Commission encourages the parties to this hearing to work with the Water Quality Control Division and any other interested persons in a collaborative effort to determine whether the existing chronic table values for silver should be modified to more accurately reflect potential toxicity effects. The Commission also encourages future collaborative efforts to further assess the potential economic and environmental costs and benefits of chronic silver table values, including consideration of how such table values may influence effluent limits in discharge permits.

PARTIES TO THE RULEMAKING HEARING

1. Climax Molybdenum Company
2. Silver Council, City of Colorado Springs, City of Fort Collins, & Kodak Colorado Division
3. Colorado Division of Wildlife
4. Chatfield Watershed Authority
5. Lockheed Martin Astronautics
6. Coors Brewing Company
7. US EPA Region VIII
8. Northwest Colorado Council Of Governments
9. City of Westminster

31.36 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; JANUARY, 1999 RULEMAKING

The provisions of sections 25-8-202; 25-8-204; 25-8-402, C.R.S., provide the specific statutory authority for adoption. The Commission also adopted, in compliance with section 24-4-103(4) C.R.S., the following statement of basis and purpose.

BASIS AND PURPOSE

This revisions is to reconfirm the previous action taken by the Commission to include correct publication in the Colorado Code of Regulations Statement of Basis, Specific Statutory Authority. and Purpose for the December, 1996 rulemaking hearing.

31.37 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; JULY, 2000 RULEMAKING HEARING

The provisions of 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; 25-8-209 and 25-8-402 C.R.S. provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted, in compliance with 24-4-103(4), C.R.S., the following statement of basis and purpose.

Basis and Purpose:

I. Climax Molybdenum Company Proposal

The current Colorado manganese table value was adopted in 1997. It was based on data available at that time that demonstrated the mitigating effect of water hardness on manganese toxicity to a variety of aquatic species, including brook and brown trout. Subsequent to the adoption of the hardness-based table value by the Commission, additional acute and chronic toxicity tests were conducted by the Division of Wildlife (DOW) on rainbow trout. Inclusion of the rainbow trout data results in a more accurate aquatic life manganese table value for Colorado.

The Climax Molybdenum Company (CMC) proposal was developed using EPA's *Guidelines for the Derivation of Ambient Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses.* EPA recommends the use of regression analysis in evaluating concentration-effect relationships for toxicity data to be used in criteria derivation. In EPA's most recent ambient water quality criteria (1999 revision for ammonia) it recommends the use of a 20 percent effect concentration (EC 20) as the appropriate endpoint for evaluating chronic toxicity. This was the approach originally proposed by CMC. The DOW expressed concern that the result of this methodology would not be protective enough for Colorado. The DOW recommended that a more restrictive 10 percent effect concentration be used. CMC agreed to revise its proposal to accommodate this concern but noted that this may require the consideration of site-specific manganese standards in one case. The Commission adopted the modified proposal.

II. Farmers Reservoir and Irrigation Company Proposal

The Farmers Reservoir and Irrigation Company (FRICO) advanced two alternative proposals for consideration in this rulemaking hearing. The first alternative would have added a footnote to section 31.16(1), addressing the relationship of table value criteria to site-specific standards. The second alternative would have added new table value criteria for the agriculture classification for fecal coliform, nitrate and phosphorus. In its prehearing statement, FRICO withdrew the proposal for the adoption of nitrogen and phosphorus standards to protect agricultural canals and reservoirs from eutrophication, in view of EPA's current effort to develop nutrient criteria.

Based upon the evidence submitted in this rulemaking, the Commission has decided not to adopt either proposal advanced by FRICO.

With respect to the proposed footnote for section 31.16(1), the proposed first sentence appears to be a restatement of language in section 31.7 of the regulation, while the second sentence appears to be inconsistent with language in section 31.7. The Commission has determined that the proposed footnote is not necessary or appropriate at this time.

The Commission also has determined that the addition of table values for the agriculture use is not necessary or appropriate at this time, particularly where the function of such table values would be only to protect a limited subclass of that use. The Commission does not believe that the evidence regarding potential impacts on crops from nitrate levels above 5.0 mg/l is strong enough to warrant inclusion of a new table value. Moreover, the existing provisions of the Basic Standards, including section 31.13(3) and section 31.7, provide authority for the Commission to adopt site-specific standards to protect sensitive crops should that be determined necessary and appropriate in particular circumstances.

The Commission also considered the potential risk to agricultural workers of fecal coliform in irrigation water. The Commission has concluded that the evidence available at this time does not indicate that agricultural workers are faced with a risk greater than that associated with a recreation class 2 classification. Since all surface waters are classified either class 1 or class 2 recreation, the Commission has determined that the effect of such classifications serves to protect agricultural workers and that consequently there is no need for a separate fecal coliform table value for the agriculture.

The Commission received conflicting evidence in this rulemaking regarding the potential economic costs and benefits of compliance with water quality standards that might result from the implementation of the proposed new Basic Standards provisions. In view of the lack of an adequate demonstration that the proposed changes are necessary or appropriate to protect agricultural uses, as described above, the Commission has concluded that the benefits of adopting such changes would not bear a reasonable relationship to the potential costs of compliance with resulting requirements.

III. City of Thornton Proposal

The City of Thornton proposed that the Commission adopt a new “wastewater treatment plant effluent-dominated” sub-classification under the water supply classification. Thornton also proposed that the Commission adopt numerical table values for fecal coliform, nitrate, phosphorus and total organic carbon (TOC) that would apply to this new sub-classification. Thornton's prehearing statement dropped the proposal for a fecal coliform table value.

Based upon the evidence submitted in this rulemaking, the Commission has decided not to adopt the Thornton proposal.

The Commission does not believe that the evidence submitted demonstrated the need for a separate water supply sub-classification at this time. From the available information, it does not appear that the conditions proposed by Thornton in which the new sub-classification would apply occur frequently enough to warrant the creation of an entire sub-classification and associated table values. Moreover, the existing provisions of the Basic Standards, including section 31.13(3) and section 31.7, provide authority for the Commission to adopt site-specific standards to provide additional protection for specific water supplies, should that be determined necessary and appropriate in particular circumstances.

The Commission also does not believe that the evidence submitted supports the adoption of the table values proposed by Thornton. With respect to nitrate, Thornton provided no convincing evidence that water with nitrate levels between 5 mg/l (Thornton's proposed table value) and 10 mg/l (the existing water supply table value) poses a significant public health risk. Moreover, there was no evidence provided that a population being served by a water source that is “wastewater treatment plant effluent-dominated” is more susceptible to nitrate than the general public. With respect to phosphorus, the table value proposed by Thornton is based on limited site-specific experience and does not warrant the adoption of a statewide table value.

The Commission believes that the potential public health issues associated with TOC should be investigated further. However, the evidence submitted in this hearing does not warrant the adoption of the proposed TOC table value at this time. The evidence does not demonstrate that TOC present in effluent poses a greater risk than TOC from other sources. Moreover, Thornton has not demonstrated that its proposed TOC limit of 2 mg/l above background is necessary to avoid interference with its treatment processes. The potential usefulness of TOC as an indicator for the presence of organic pollutants is worthy of further examination; however, the Commission has concluded that the existing science does not support Thornton's position on this issue.

The Commission received conflicting evidence in this rulemaking regarding the potential economic costs and benefits of compliance with water quality standards that might result from the implementation of the proposed new Basic Standards provisions. In view of the lack of an adequate demonstration that the proposed changes are necessary or appropriate to protect water supply uses, as described above, the Commission has concluded that the benefits of adopting such changes would not bear a reasonable relationship to the potential costs of compliance with resulting requirements.

IV. Water Quality Control Division Proposals

A. Overview

This rulemaking hearing addressed a number of potential revisions to this regulation that were identified in a January, 2000 triennial review informational hearing. Many of the revisions proposed for this rulemaking and ultimately adopted by the Commission grew out of the efforts of the Colorado Water Quality Forum's Basic Standards Work Group, which provided important input to the Water Quality Control Division as it developed its proposals for this rulemaking. Each of the major revisions adopted by the Commission is addressed below.

B. Site-specific Narrative Standard Option (section 31.7(1))

Over the last several years, the Commission has had several discussions regarding how best to use the water quality standards system to encourage improvement - or not discourage such improvement - for waters impacted by historical mining activities. The Commission has felt that neither of the primary options set forth in the Basic Standards - table value standards or ambient quality-based standards - are the best possible fit for many of these situations. To provide additional options, the Commission adopted language in a new subsection (c)(ii) of section 31.7(1). This new subsection explicitly provides that a site-specific narrative standard may be adopted on a site-specific basis to address waters impacted by historical mining activities where improvement is believed to be attainable. The new provision would include numerical temporary modifications based on existing ambient quality.

This approach could be applied where a use attainability analysis has not yet been conducted, but the Division or other interested parties intend to conduct such an analysis. It would provide that the underlying standards for a segment would be either the results of such an analysis if completed and approved by the Commission, or - if a use attainability analysis is not completed by a specified date - table value standards. This option would provide an incentive for timely completion of a use attainability analysis, while assuring that protective standards will be in place if such an analysis is not completed. An appropriate date will be identified when a narrative standard is adopted for a particular segment, based upon the amount of time needed to complete a site-specific use attainability analysis.

The Commission is aware of the fact that situations may exist where a use attainability analysis for such impacted waters has been completed, and though feasible improvement measures have been identified, uncertainty remains regarding the chemical, biological, and/or physical conditions that will be achieved once those measures have been implemented. Though the Commission considered the adoption of a narrative standard option which would have equated the standard with that concentration or condition realized after the improvement measures were complete, it decided that this concept was adequately addressed within the state's temporary modification provisions, with specific reference to the newly adopted language found in section 31.7(3)(a)(iii). That section addresses situations where significant uncertainty exists. In other words, a temporary modification could be utilized until such time as the results achieved from the implementation of the improvement measures provide a clear indication of the appropriate long-term standard.

The Commission believes that this site-specific narrative standard option should make the water quality standards system more consistent with efforts to remediate state waters degraded by historical mining activities. The new language is specific to waters impacted by historical mining activities because this is the type of situation that has presented a concern regarding the restrictions of the previous options for water quality standards. Other instances where current impaired water quality exists, such as the segments listed on the section 303(d) list, may bring into play a variety of considerations that differ from the unique circumstances associated with waters impacted by historical mining activities that the Commission has determined warrant the new site-specific narrative standard option. If it is determined that other categories of circumstances warrant a similar site-specific narrative standard option, revised or additional provisions can be considered in future reviews of this regulation.

In addition to the language in new subsection 31.7(c)(ii) regarding historical mining sites, the Commission has added language in a new subsection 31.7(c)(i), clarifying the Commission's more general authority to adopt site-specific narrative standards in appropriate circumstances. A variety of site-specific narrative standards have previously been adopted by the Commission where warranted by specific circumstances. It is appropriate for the Basic Standards to recognize this option.

C. Temporary Modifications (section 31.7(3))

The traditional situation for adopting a temporary modification has been where an underlying numerical water quality standard currently is not being met, but it is believed that the conditions causing the exceedance can be corrected within a 20-year period so that the underlying standard that is protective of the use will be attained. However, over time the Commission has used temporary modifications as a helpful regulatory tool in circumstances that go somewhat beyond this original specific situation. In particular, temporary modifications have been adopted in certain circumstances where there is uncertainty as to whether existing water quality is caused by natural or irreversible conditions, or where there is uncertainty about the level of water quality needed to protect the classified uses of a water segment. In this rulemaking, the Commission adopted revisions to section 31.7(3) to explicitly provide that “significant uncertainty regarding the appropriate long-term underlying standard” is a basis for establishing a temporary modification.

Previous language in section 31.7(3)(b) and section 31.14(3) provided that, whenever a temporary modification has been adopted, discharge permits and other applicable control requirements should include provisions aimed at eliminating the need for the temporary modification. In this rulemaking, the Commission adopted revisions to these provisions to recognize that in instances where a temporary modification is adopted based on uncertainty as to the appropriate underlying standard, it may not be appropriate to expect control actions aimed at achieving the underlying standard until the uncertainty is resolved.

D. Antidegradation Provisions (section 31.8(3))

In this rulemaking, the Commission adopted a number of revisions to the Antidegradation Review Process provisions of section 31.8(3). Several changes have been adopted in the “Significance Determination” provisions in subsection 31.8(3)(c). This subsection has provided that an activity will not be considered to result in “significant degradation” if any of four tests are met. If it is determined that an activity would not result in significant degradation, then no further antidegradation review is required. The Commission restructured these significance tests. The test based on 10 percent of the existing load has been revised to apply specifically to bioaccumulative toxic pollutants, since this is the major category of pollutants for which “load”, rather than merely “concentration” , plays a key role. The Commission has selected a bioaccumulation factor (BAF) of 1000 as the threshold above which this test would apply. By placing an “and” at the end of this revised subsection, this loading test is required to be met whenever bioaccumulative toxic pollutants are present in order to determine that a new or increased loading is not significant.

The remaining significance tests would now apply in the case of new or increased loadings of all pollutants. In order to assure that successive new loadings to a segment do not result in an impact that is cumulatively significant without an antidegradation review occurring, the concentration-based “15 percent of the available increment” test has been modified. The revised language provides that where the cumulative impact of discharges would increase the low flow pollutant concentration by more than 15 percent, any new or increased loading would not be considered insignificant based on this test.

The Commission has added language to the regulation specifying that the load and concentration-based significance tests apply to “the portion of the segment impacted by the discharge”. The Commission recognizes a need to further define this term as utilized in the new regulatory language. It has been included, in part, to address concerns over future loading to those segments which currently include in their description “all tributaries thereto”. The Commission directs the Division to work with the regulated community in an effort to further define this concept as a part of the work group process established to develop a new antidegradation guidance document.

The Commission believes that these significance tests warrant additional consideration in the future. In particular, a question has been raised whether the presence of “100 to 1” dilution alone should result in a conclusion that a new or increased loading is not significant, if the concentration-based increment is exceeded. Secondly, additional consideration should be given to whether there are pollutants other than bioaccumulative toxics for which cumulative loads are an important consideration, even when concentration thresholds are not exceeded. The Commission requests that the Division and other interested persons explore these issues further prior to the next triennial review and bring a recommendation back to the Commission at that time as to what, if any, additional revisions to the regulation should be considered to address these concerns.

The Commission also adopted additional language with respect to the “temporary or short term changes” significance test, to assure that this “off-ramp” is not applied where the long-term operation of a regulated activity will result in an adverse change in water quality. Any such impacts should not be considered temporary or short term.

The Commission added a new subsection 31.8(3)(g), entitled “Protection of Existing Uses” . This new subsection merely places in the regulation a provision previously contained in Commission Policy 88-1, providing that a rulemaking hearing will be held to consider adoption of an additional water quality classification for a water segment if it is determined during an antidegradation review that an existing use of the segment has not been classified. This policy was originally adopted in response to a concern raised by EPA regarding the antidegradation provisions adopted by the Commission in 1988. The Commission determined that it would reduce the confusion that has existed regarding the scope of this policy to incorporate this provision into the regulation, eliminating the need for a separate policy. Therefore, by this action the Commission also is repealing Policy 88-1 as a separate policy document.

The Commission revised the references to “activity” throughout this section to refer to “regulated activity” , for consistency with the terminology used in subsection 31.8(3)(a). In addition, a reference in this subsection to “control regulations existing as of April 30, 1993” was deleted since it appears that this language is no longer necessary.

E. Statewide Organic Chemical Standards (section 31.11(3) Table)

An extensive list of statewide numerical standards are established in the table entitled “Basic Standards for Organic Chemicals”, which is contained in section 31.11(3) of the regulation. Two specific issues regarding these standards were addressed in this rulemaking. First, many of the standards are based upon EPA-established drinking water standards, under the federal Safe Drinking Water Act, or water quality criteria developed pursuant to section 304(a) of the federal Clean Water Act. Since these standards and criteria are modified from time to time, it is necessary to review the existing Colorado standards in comparison to the latest available information. As a result of this review, the Commission adopted several revisions to the standards to conform with the latest available information as to protective levels for the various chemicals.

Second, the Commission modified the human health-based criteria set forth in this table to refine how these criteria apply to individual water segments. Specifically, the Commission has established three human health-based standards columns (water supply only, fish consumption only, and water + fish consumption) in the table. The standards in these three columns will apply to individual water segments based on whether (a) a water supply classification, (b) a class 1 aquatic life or class 2 with recurring fishing, or (c) both of these classifications/circumstances is present, respectively. A similar change has been made to Table III. The Commission believes that these revisions result in a system that provides more appropriate human health-based water quality standards for individual circumstances, minimizing the potential for under-protection or over-protection.

In comments submitted for this rulemaking, EPA expressed concern that Colorado's proposed standards for certain “Group C Chemicals” are not adequately protective since they are not based on the potential carcinogenicity of these chemicals. The chemicals in Group C have been identified by EPA as “possible human carcinogens” due to the limited nature of the data regarding carcinogenicity. The Commission's Policy 96-2, regarding Human Health-based Water Quality Criteria and Standards, sets forth a policy approach not to base standards for Group C chemicals on carcinogenicity. The Commission has chosen to continue to apply its established policy approach in this hearing. EPA has recognized that it is the prerogative of states to choose an appropriate level of risk in setting water quality standards. This action by the Commission is a determination that the risks of carcinogenicity of Group C chemicals do not warrant standards based on carcinogenicity at this time. If EPA decides that the evidence of carcinogenicity for the chemicals in question warrants re-classifying them as Group B “probable human carcinogens” , then Colorado's standards will be revised accordingly. Until then, or until the Commission should decide to modify its current standard-setting policy for this category of chemicals, the action taken here is an appropriate state consideration of risk levels in adopting water quality standards.

F. Recreation Classifications and Standards (section 31.13(1)(a) and Table I)

In this rulemaking the Commission adopted revisions to the provisions in subsection 31.13(1)(a) regarding recreation use classifications and to the Table I water quality criteria for recreation uses. Several revisions were adopted to the provisions regarding recreation classifications. First, the Commission subdivided the class 1 classification into “class 1a” for waters with existing primary contact uses and “class 1b” for potential primary contact uses. As reflected in the associated numerical criteria in Table I, the Commission believes that it is appropriate to provide a higher level of protection for those water segments where primary contact uses are actually occurring.

Reflecting the federal requirement that water quality be protected at a level adequate for “recreation in and on the waters” unless it is demonstrated that such uses are not attainable, the revised regulation provides that the Commission shall assign a class 1a or class 1b classification to all surface waters unless a use attainability analysis demonstrates that there is not a reasonable potential for primary contact uses to occur in the waters in question within the next 20-year period. The Commission is requesting that the Division develop a Recreation Use Attainability Analysis Guidance Document that could be used by any person wishing to conduct such a use attainability analysis. This guidance document should be developed with public input, including a public briefing to the Commission that provides an opportunity for public comment to the Division.

The revised regulation also provides that where no use attainability analysis supporting a class 2 classification has been completed, the new class 1a will be the default classification, unless a reasonable level of inquiry has failed to identify any existing class 1 uses of the water segment. Where such an inquiry fails to identify existing recreation uses, a class 1b classification will be appropriate. This approach should help assure that primary contact uses are protected. The Commission intends that what constitutes a “reasonable level of inquiry” will be a case-specific determination, which will depend on factors such as the size and location of the segment in question and what is known about the presence or absence of primary contact uses for other, similar water segments. It generally will be appropriate to direct inquiries to a variety of persons in the area with potential knowledge regarding uses of the water segment, such as to land owners, land management agencies, local governments, recreational user groups, and/or Riverwatch coordinators or other school contacts.

The Commission intends that any revisions of existing recreation classifications and standards to apply the new classifications described above would occur through the normal rulemaking process, which would provide an opportunity for public review of and comment on information supporting any new site-specific classifications and standards. Proposed changes generally are identified in attachments to the rulemaking hearing notice, with any alternative proposals to be considered identified in parties' prehearing statements.

The discussions that led up to this rulemaking hearing included consideration of options that would have included additional subcategories of the recreation use classifications. Although additional subcategories are not being adopted at this time, such options may be considered further in subsequent triennial reviews. The Commission requests that the Division and other interested persons develop additional information regarding the usefulness or appropriateness of such subcategories for consideration in subsequent reviews.

The primary change adopted with respect to the Table I water quality criteria for recreation uses is the addition of Escherichia coli (E. coli) as a pathogen indicator. Available studies indicate that E. coli, which is a subset of fecal coliform, is a better predictor of potential human health impacts from waterborne pathogens. For now, the Commission also has retained fecal coliform table values. The Commission intends that during the next triennium alternative fecal coliform and E. coli numerical standards will be adopted for water segments in the individual basins. The Commission wants the public to be aware that it currently anticipates moving to E. coli as the sole pathogen indicator in the next triennial review of this regulation. Dual standards are being established in the interim as a transitional step. One reason for adopting this transitional approach is that at present there is uncertainty regarding the acceptability and comparability of several alternative E. coli monitoring methods. The Commission is hopeful that much of this uncertainty may be resolved prior to the next triennial review.

As stated in the revised footnote 6 to Table I, so long as dual standards are in place for a water segment, the Commission intends that dischargers will have the option of either parameter being used in establishing effluent limitations in discharge permits. This footnote further clarifies that for the evaluation of ambient water quality data, such as in making section 303(d) listing decisions, in the event of a conflict between fecal coliform and E. coli data, the E. coli data will govern. The Commission believes that these provisions will help ease the transition from fecal coliform to E. coli standards.

The E. coli criterion adopted for new recreation class 1a is 126 per 100 milliliters. This level is based on EPA criteria recommendations, which are derived from an anticipated risk level of 8 swimmer illnesses per 1000 swimmers. The class 1b criterion of 205 per 100 ml is based on a policy decision to accept a higher risk level - 10 illnesses per 1000 swimmers - for this classification, based on the assumption that primary contact uses are not currently likely to be occurring for these water segments, although such uses may be a potential in the future. The E. coli criterion for class 2 waters is set at 630 per 100 ml, based on an EPA policy recommendation that the criteria for secondary recreation uses not be set higher than five times the primary use standard.

During this transition period, the previous class 2 fecal coliform criterion of 2000 per 100 ml is retained. The previous class 1 fecal coliform criterion of 200 per 100 ml is adopted as the value for the new class 1a. Finally, a fecal coliform level of 325 per 100 ml has been established for the new class 1b, based upon interpolation between the 200 and 2000 values, to be consistent with the new E. coli value for class 1b.

The revised footnote 6 to Table I clarifies that compliance with fecal coliform and/or E. coli standards is to be based upon the geometric mean of representative samples. EPA has recommended that states consider the adoption of single sample maxima for bacteriological indicators, in addition to standards based on geometric means, to provide additional protection of recreation uses. The Commission has declined to adopt such criteria at this time, due in part to uncertainty regarding the significance of and the appropriate response to elevated single sample test results. An important aspect of this concern is the substantial variability that can be common in individual bacteriological samples, because bacteria are not uniformly distributed in water samples, since they behave more like suspended particles, rather than dissolved constituents. Repeat testing on such samples can yield results which vary substantially.

However, the Commission may consider the adoption of single sample maxima or other short-term indicators in the next triennial review. Another approach to short-term indicators that has been suggested would be to provide that no more than “x” percent of samples could exceed a specified level. The Commission requests that the Division and other interested persons develop additional information regarding the usefulness or appropriateness of such short-term bacteriological criteria prior to the next triennial review, including identifying potential criteria values.

The issue of whether and how to account for animal waste in setting recreation standards is a challenging one. Relatively little information is available at present regarding the risks posed by animal sources. Moreover, the range of natural sources - such as waterfowl and terrestrial wildlife - and anthropogenic sources - both urban (pets) and rural (livestock) - present a variety of management challenges with respect to potential options for controlling or mitigating water quality impacts. Therefore, the Commission anticipates that this issue will need to be closely monitored and revisited over the next several years. As a matter of policy, the Commission chose at this time not to include any language in the standard itself - or the accompanying footnote - regarding non-human sources of coliform bacteria.

With respect to non-human sources, the Commission intends that the fecal coliform and E. coli standards will be applied in a manner consistent with EPA's current official guidance, which is contained in the Water Quality Standards Handbook, Second Edition, August, 1994, page 2–3.

In adopting these provisions, the Commission recognizes that the state of knowledge regarding the potential risks posed by non-human sources of coliform bacteria is evolving. The EPA criteria generally were developed based upon evidence of risks posed by human sources. However, there have been recent examples of human health impacts resulting from water contamination by at least some non-human sources, and EPA currently is considering substantial changes to its guidance regarding the use of bacterial water quality criteria for the protection of recreational uses. The Commission believes that the approach adopted here is a reasonable policy choice based on current information. However, the issue of non-human sources will need to be reevaluated in subsequent triennial reviews as additional information becomes available.

Finally, the Commission wishes to emphasize that ingesting water from streams and other surface waterbodies has inherent risks and is not encouraged, but rather should be avoided to the extent possible during all forms of recreation. While the Commission believes that the criteria adopted here provide a reasonable and appropriate level of protection of human health, avoidance of ingestion is always preferable.

G. Ammonia Table Values (Table II)

In December of last year, EPA published its 1999 Update of Ambient Water Quality Criteria for Ammonia. This update is a modification of the 1998 Update of Ambient Water Quality Criteria for Ammonia. Colorado's current table value criteria for ammonia in the Basic Standards were adopted in the late 1980's, following an extensive review of EPA's then-current criteria by a Colorado panel of scientific experts. The recommendations of this panel were set forth in a draft final report entitled Proposed Nitrogenous Water Quality Standards for the State of Colorado, dated March 12, 1986, prepared for the Water Quality Control Commission by the Nitrogen Cycle Committee of the Basic Standards Review Task Force.

In view of the complex set of issues relating to ammonia criteria and standards, and the need to assess the appropriateness of EPA's revised criteria for conditions in Colorado, the Commission decided not to consider changes to the current Colorado ammonia criteria in this rulemaking hearing. Rather, the Commission believes that it will be important for the Division to work with the regulated community and other interested persons to examine the new EPA criteria and develop recommendations for any revisions to the current Colorado criteria and standards that may be appropriate. In order to provide a meaningful opportunity for such an informal process to occur, the Commission anticipates revisiting the ammonia criteria issue in the next triennial review of the Basic Standards and Methodologies for Surface Water.

H. Standards Based on Secondary Drinking Water Standards (Tables II and III)

Tables II and III of this regulation include table value criteria for a “water supply” use for four parameters (chloride, sulfate, iron and manganese) that are based on “secondary” drinking water standards developed pursuant to the federal Safe Drinking Water Act. These secondary standards are not health-based, but rather are based upon “welfare” impacts such as taste, odor and discoloration of laundry or fixtures. They are established by EPA as goals for public water supplies and are not required to be enforced by states.

Prior to this rulemaking, the Commission generally applied these four table values as numerical standards for all water segments classified for water supply use, except where site-specific information justified a different standard, e.g. based upon higher naturally occurring levels of the parameter in question. For some time, dischargers have expressed concern about the cost of meeting effluent limitations resulting from the sulfate, iron and manganese secondary drinking water standard-based stream standards, since the secondary standards are not enforceable against water suppliers and are not health-based, and since treatment of wastewater to remove these constituents is generally expensive and difficult. (Similar practical concerns do not seem to have arisen with respect to chloride standards.) On the other hand, although the secondary standards are not enforceable against water suppliers and are not health-based, water suppliers have indicated that due to the needs of their customers it is important to them to minimize these constituents in their source water, and there is a cost to the water suppliers if they need to treat to remove these constituents. Several water suppliers have experienced problems with ambient manganese levels in the past, and have had to add additional treatment steps to remove manganese.

In an effort to balance these considerations, as a result of this rulemaking the Commission is adopting a change to its approach to establishing numerical standards for sulfate, iron and manganese. (No change is being adopted with respect to chloride standards, since it does not appear that there are practical concerns with the current approach to chloride standards.) There are several components to this action:

- Existing numerical standards for all surface water segments that are based on the water supply table values for sulfate, iron and manganese will be deleted in a rulemaking hearing addressing water quality standards for all river basins;

- Existing segment-specific numerical standards for sulfate, iron and manganese that are based on previous site-specific analysis (e.g., identifying higher naturally occurring levels of a constituent) will be retained;

- For segments with a water supply classification that have an actual water supply use (as opposed to a potential use), the Commission is adopting numerical standards based on the less restrictive of (a) existing quality as of January 1, 2000, or (b) the water supply table value criteria for iron, manganese, and sulfate;

- For segments with a water supply classification that do not have an actual water supply use, no numerical standards for sulfate, iron and manganese will be established unless determined to be necessary and appropriate in accordance with section 31.7 as the result of a future site-specific rulemaking;

- For purposes of implementing water supply-based numerical standards for iron, manganese and sulfate into discharge permits, a new provision is added to section 31.14 to direct the Division to give credit in establishing effluent limitations for potentially elevated levels of these constituents in the water entering the wastewater treatment plant or other discharging facility, where the source is ambient surface or ground water tributary to the receiving waters that is no worse than existing quality as of January 1, 2000.

The Commission believes that this set of actions provides the most efficient and reasonable starting point for water supply-based sulfate, iron and manganese standards to provide appropriate protection of actual water supplies against the introduction of new or increased sources of these constituents while also minimizing the risk of costly, unnecessary treatment by point source dischargers. The Commission has essentially “grandfathered” existing levels of these constituents (where they exceed table values) as the numerical standards for segments with an actual water supply use. A proviso has been included to assure that existing contamination levels are not grandfathered if they result from an unauthorized discharge with respect to which the Division has undertaken an enforcement action or if they conflict with remedial action requirements for these constituents established pursuant to any response action under the Comprehensive Environmental Response Compensation and Liability Act. Of course, the numerical standards being established by these revisions to the Basic Standards could be revised to be more or less stringent in a subsequent site-specific standard-setting hearing if determined appropriate based on the site-specific evidence. In some cases, where iron and manganese levels are elevated due to historic mining activities, use of the new site-specific narrative standard option discussed above may be appropriate.

The Commission intends that, consistent with established practice, the “existing quality” of particular segments for the parameters in question will be determined based upon the 85th percentile of available representative data.

At the same time, the Commission has determined that there is no need for statewide water supply-based sulfate, iron and manganese standards for segments with a water supply classification but no actual water supply use - i.e., those segments classified as water supply based on a potential future use. Where there is no actual use in place that could be impacted by a discharge, the Commission does not believe that dischargers should need to treat for these secondary drinking water standard-based stream standards. If an actual use for a water supply-classified segment begins in the future, then the numerical standards being adopted as a result of this rulemaking would apply - i.e., existing quality as of January 1, 2000, or table values, whichever is less restrictive. In such circumstances, the Commission expects that the Division would allow a reasonable compliance schedule in issuing or renewing discharge permits.

The Commission has provided that an “actual use” will be determined based on use of the surface waters from the segment in question or use of hydrologically connected ground water. The Commission intends that an actual use of ground water would receive protection where its quality could be impacted by the quality of the surface water in question. Any situation for which it is determined that there is no reasonable potential for the surface water quality to affect the quality of ground water used as water supply should not be considered to involve “hydrologically connected ground water” .

The Commission recognizes that today's action could result in numerical standards for sulfate, iron and manganese applying in a segment with a water supply use classification that has an actual water supply use, but where the only water supply intake(s) are located upstream from any point source discharge(s) to that segment. In these circumstances, if it appears that there are no downstream actual water supply uses potentially impacted by the discharge(s), it would be appropriate for the Commission to re-segment the stream in question so that the numerical standards now being established through the Basic Standards apply only upstream of the water supply intake.

The Commission recognizes that it is not possible to anticipate and account for all potential site-specific factual situations in a statewide rulemaking action such as this. Therefore, the Commission has retained the option of adopting site-specific water supply-based numerical standards for sulfate, iron and manganese that may be more or less stringent than those being adopted here wherever determined appropriate in a site-specific rulemaking proceeding. Moreover, the Commission intends to revisit this action in subsequent triennial reviews of the Basic Standards, to determine whether it is working effectively as intended or may need future refinement. If it is determined that this action results in significantly increased costs for water suppliers, especially in light of significant new Safe Drinking Water Act requirements for additional treatment of public water supplies, the Commission believes that more protective standards should be re-established.

I. Metals Table Values and Standards Issues (Table III)

Two sets of changes are adopted with respect to the metals table values set forth in Table III. First, the Commission has adopted language to clarify use of the hardness-based equations in calculating standards, to provide consistency between current practice, this regulation and EPA guidance. The Commission added language to footnote 3 to Table III to explicitly state the limitations on using the hardness-based metals equations in that table. These equations are to be used with hardness values no greater than 400 mg/l, as calcium carbonate, even if the ambient conditions are greater than this range. The data that were used to derive these equations were generally based on toxicity tests in waters with hardness ranging from 50 mg/l to 200 mg/l. The cap at 400 mg/l hardness limits the extent that the equations are extrapolated beyond the original data where the slope of the LC50's flattens out. The previous practice of using a lower limit of 25 mg/l is inappropriate, since there is no evidence that the toxicity does not continue to increase as hardness decreases below 25 mg/l (i.e., the slope remains constant at low hardness).

Adding this clarification in the Basic Standards does not preclude the use of site-specific studies, such as developing a “water effects ratio” to demonstrate that lower toxicity occurs at higher hardness levels in specific circumstances. The Commission is concerned with the current uncertainty regarding toxicity at higher hardness levels that results from available EPA criteria. The Commission encourages EPA to undertake additional studies of the metals in question at higher hardness levels, to reduce this uncertainty and improve the accuracy of the criteria in the future.

Second, the Commission modified the hardness-based table value criteria for several metals to incorporate appropriate “conversion factors” . The need for these conversion factors results from the fact that the table value criteria originally were developed based on “total recoverable” metals levels, but are now applied as “dissolved” metals standards. Because the dissolved fraction of a metals sample is a subset of total recoverable metals, application of the conversion factors is necessary to assure that metals standards are not under-protective. The revised criteria should more accurately reflect potential toxicity to aquatic life.

Concern was expressed in the hearing regarding application of the revised selenium table values that result from application of the conversion factors. Where selenium data is available only reported to the nearest whole number, the Commission intends that this be taken into account in assessing compliance with the revised table values.

The Commission also added a new Table IV to the regulation, identifying metals levels associated with a range of hardness values, for those metals with table value criteria in the form of hardness-based equations. The Commission has included language in the introductory portion of section 31.16 to clarify that where the hardness-based equations in Table III are applied as “table value” water quality standards for individual water segments, those equations - rather than the values set forth in Table IV - define the applicable numerical standards. The illustrative examples of approximate metals values associated with a range of hardness levels in Table IV are intended solely as an aid to persons using this regulation, for informational purposes only.

J. Housekeeping Issues

The Commission corrected a number of clerical errors that had been identified in this regulation.
PARTIES STATUS/MAILING LIST STATUS TO THE RULEMAKING HEARING

1. Climax Molybdenum Company
2. The City of Broomfield
3. Centennial Water and Sanitation District
4. Kodak Colorado Division
5. Metro Wastewater Reclamation District
6. The City of Fort Collins
7. The Farmers Reservoir and Irrigation Company
8. The City of Thornton

9. The City of Westminster
10. The Board of Water Works of Pueblo, CO
11. The Chatfield Watershed Authority
12. Plum Creek Wastewater Authority
13. The City of Pueblo
14. Colorado Division of Wildlife
15. The City and County of Denver, Board of Water Commissioners
16. Colorado River Water Conservation District
17. North Front Range Water Quality Planning Association
18. The Colorado Wastewater Utilities Council
19. South Adams County Water & Sanitation District
20. The Cottonwood Water & Sanitation District
21. The Inverness Water & Sanitation District
22. The City of Arvada
23. Northwest Colorado Council of Governments
24. The Supervisory Committee of the Littleton/Englewood Wastewater Treatment Plant
25. The City of Aurora
26. The Town of Olathe
27. The Town of Hotchkiss
28. The Town of Ridgway
29. The North Fork Conservancy District
30. Leroux Creek Water Users Association
31. The Upper Clear Creek Watershed Association
32. Grand County Water & Sanitation Districts
33. The City of Golden
34. New Consolidated Lower Boulder Reservoir & Ditch Company and New Coal Ridge Ditch Company
35. The Pittsburg & Midway Coal Mining Co.
36. The Coors Brewing Company
37. The Colorado Association of Commerce and Industry
38. Sunnyside Gold Corporation
39. The City of Black Hawk
40. Boxelder Sanitation District
41. Todd Creek Metropolitan District No. 1
42. The City of Colorado Springs including Colorado Springs Utilities
43. The Northern Colorado Water Conservancy District and the Municipal Subdistrict
44. The Denver Southeast Suburban Water & Sanitation District d.b.a. Pinery Water & Wastewater District
45. The Town of Silverton
42\. Colorado Petroleum Association
43\. Lockheed Martin Astronautics
44\. Viacom International Inc.
45\. Homestake Mining Company
46\. The Cherry Creek Basin Water Quality Authority
47\. The United States Department of Energy, Rocky Flats Field Office
48\. The City of Lakewood
49\. The Town of Lochbuie
50\. Denver Regional Council of Governments
51\. The City & County of Denver
55\. The City of Glendale
56\. The City of Boulder
57\. Trout Unlimited
58\. Bromley Park Metropolitan District 1
59\. U.S. Environmental Protection Agency, Region VIII
60\. The Board of County Commissioners of the County of Gunnison, CO
61\. Arapahoe County Water & Wastewater Authority

62. U.S. Fish & Wildlife Service, Colorado Field Office
63. Battle Mountain Resources, Inc.
64. Colorado Livestock Association

31.38 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE: OCTOBER, 2000 CONTINUATION OF JULY, 2000 RULEMAKING

The provisions of 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; 25-8-209 and 25-8-402 C.R.S. provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted, in compliance with 24-4-103(4), C.R.S., the following statement of basis and purpose.

Basis and Purpose:

This statement of basis and purpose addresses the revised mixing zone provisions in section 31.10, adopted by the Commission as the result of the October, 2000 continuation of the July, 2000 Basic Standards rulemaking.

Permit limits for point sources of discharge have been determined in Colorado based on the assumption that mixture of the discharge with the receiving water is instantaneous. While this assumption simplifies the preparation of permits, studies conducted by the Division and others have shown that the mixture of a point source discharge with a receiving water occurs over a period of time and therefore occupies a space within which full mixing has not occurred. This space, which is called the “physical mixing zone,” may show concentrations of regulated substances that exceed the acute or chronic water quality standards applicable to the receiving water. The area within a physical mixing zone where a water quality standard for a given constituent is exceeded is referred to in the regulation as the “exceedence zone” for that constituent. To be fully protective of the designated uses of Waters of the State, the permit limits for point sources of discharge need to take into account not only the numeric standards that apply to the fully mixed condition, but also the appropriate maximum size for exceedence zones.

The Commission recognizes the need to limit the size of exceedence zones associated with point sources of discharge. The allowable size of the exceedence zone for a chronic water quality standard in the vicinity of a particular discharge is referred to as the “chronic regulatory mixing zone” for that particular parameter. The allowable size of the exceedence zone for an acute water quality standard for the same point source of discharge is the “acute regulatory mixing zone.”

The Commission has chosen to treat mixing zones in streams differently from such zones in lakes - the rationale being that mixing in lakes is significantly more complex than mixing in streams- by limiting the use of exclusions to discharges to streams. However, a common approach, allowing the exceedence zone to occupy a limited plan view area of the water body, will be used in both cases.

The sizes of both chronic and acute regulatory mixing zones for streams in Colorado are based on an area that is a function of the “bankfull” stream width, rather than a distance from the discharge. In this way, zones of exceedence for acute and chronic standards in streams are limited to a proportionally small area of the aquatic environment in the vicinity of a discharge. The size of the mixing zone for lakes has been limited to three percent of the surface area of the lake, or a geographically identifiable aspect of the lake, so that, as with streams, the exceedence of water quality standards is limited to a relatively small area of the aquatic environment. Furthermore, the mixing zone regulation limits the cumulative area of exceedence zones resulting from multiple discharges along a reach of stream or in a lake. Finally, the regulation allows for further limitation or denial of a regulatory mixing zone where the use of such a zone, even though small, could create an unacceptable risk of impairment to beneficial uses or damage aquatic habitat of special value.

The Commission has determined antidegradation analyses conducted pursuant to subsection 31.8 are not to be conducted within mixing zones established in a CDPS permit. In addition, for purposes of determining impairment of a waterbody, the Commission will not consider ambient lake or stream data that has been collected within a mixing zone where such mixing zone has been established in a permit using site-specific in-stream measurements. Finally, the Commission has decided not to apply these mixing zone regulations to the determination of whole effluent toxicity (WET) requirements in permits as this issue is appropriately addressed in the Division's WET guidance. The Commission expects the Division to consider the application of mixing zone requirements to the determination of WET permit limits in revisions to the WET guidance that will be made as soon a practicable in conjunction with other necessary revisions to the WET guidance.

The Commission recognizes that adoption of this mixing zone regulation will add complexity to the preparation of permits and to the evaluation of future treatment requirements by dischargers. As a means of minimizing costs and delays associated with this additional complexity, the Commission has included a number of exclusions in the mixing zone regulation that it deems to be consistent with the protection of beneficial uses. As previously mentioned, the exclusions do not apply to discharges to lakes, as the simplifying assumptions that can be applied to mixing of discharges to streams are not relevant to discharges to lakes. Consequently, a mixing zone in the vicinity of a discharge to a lake must be established based on a site-specific mixing zone analysis. Exclusions will be determined based on combinations of physical characteristics of streams (discharge flow rate, stream slope, channel width, etc.) under which the rate of mixing of discharge and receiving stream is so rapid that the application of the mixing zone regulation would be highly unlikely to result in any significant modification of permit limits. For minor discharges, exclusions from the regulatory requirements for mixing zones and avoidance of costs associated with such requirements are allowed where the ratio of effluent discharged to the flow of the receiving water is low as the likelihood of a relatively large exceedence zone is small.

During the rulemaking proceeding, the Commission received testimony upon how the mixing zone provisions could prove problematic for a limited category of man-made water storage facilities utilized as urban recreation and aesthetic amenities and filled primarily with chlorinated potable water. Subsection 31.10(3)(b)(iv) has been added to the rule in order to address this situation and accommodate the needs of the entities that manage these water bodies, on a case-by-case basis, such that they can continue to be filled with potable water and used as they have been historically.

The Commission expects the Division, in cooperation with a stakeholder group, to prepare guidance for the implementation of this regulation. The guidance should include detailed descriptions of procedures that are to be used to collect measurements (e.g. bankfull width) that can be used to determine the applicability of mixing zone requirements to the discharge. The guidance will be noticed for an informational hearing before the Commission. The Commission recognizes that the procedures developed to determine the applicability of exclusions may be somewhat conservative initially. As the Division and dischargers collect more data on mixing zones and the understanding of mixing in streams improves, the Commission expects the guidance to be adjusted where methodologies for determining the applicability of exclusions can be refined.

The Commission also has incorporated directly into the regulation certain assumptions and simplifications, to the extent that these are consistent with protection of beneficial uses. Most importantly, the regulation allows a single value for the size of the physical mixing zone to be used for all low-flow conditions, and directs the Division to include procedures by which this value can be estimated in the aforementioned guidance. Once the size of the physical mixing zone has been determined, it will be used, in the first instance, to determine if the size of the exceedence zone for the relevant chronic standard must be reduced. Where the size of the physical mixing zone is smaller than the chronic regulatory mixing zone, then mixing is implied to be fairly rapid, further analysis of both the chronic and acute mixing zone parameters will not be required, and the full low flow of the receiving stream will be used to calculate water quality standards based permit limits.

While use of exclusions and assumptions reduce the total burden of the mixing zone regulation on the Division and on permittees, some permits will require a full, site-specific, evaluation. A site-specific evaluation may show that a permit will not be affected by the mixing zone regulation, or may show that certain permit limits will be reduced through application of the regulation. The regulation emphasizes the importance of field data for site-specific evaluations. The guidance will allow for the direct use of field data, without the necessity for complex water quality modeling, in site-specific evaluations. Dischargers wishing to use modeling may do so, but models should be calibrated for site-specific conditions from field data. Modelling without calibration with field data will not be considered a sufficient basis for a site-specific evaluation.

The requirements prepared by the Division for site-specific evaluations will be as simple as possible and will not require a high degree of precision, but must constitute a valid estimate of true conditions upon which the adjustment of permits can be based. Although the technical and financial burden of carrying out site-specific evaluations will fall on dischargers, site-specific studies need not be repeated at every permit cycle unless there is a significant change in volume of discharge, a physical change in the receiving water, or evidence of error in the original analysis.

The mixing zone regulation for Colorado acknowledges the existence of incomplete mixing near point sources of discharge and properly limits the extent of any exceedence of standards that might occur within the mixing zone. The regulation is a means by which protection of beneficial uses of water and aquatic habitat in close proximity to point sources of discharge can be achieved without unnecessarily restricting permit limits to maintain standards in a relatively small area of the receiving water in the vicinity of the discharge.

PARTIES STATUS/MAILING LIST STATUS TO THE RULEMAKING HEARING

1. Climax Molybdenum Company
2. The City of Broomfield
3. Centennial Water and Sanitation District
4. Kodak Colorado Division
5. Metro Wastewater Reclamation District
6. The City of Fort Collins
7. The Farmers Reservoir and Irrigation Company
8. The City of Thornton
9. The City of Westminster
10. The Board of Water Works of Pueblo, CO
11. The Chatfield Watershed Authority
12. Plum Creek Wastewater Authority
13. The City of Pueblo
14. Colorado Division of Wildlife
15. The City and County of Denver, Board of Water Commissioners
16. Colorado River Water Conservation District
17. North Front Range Water Quality Planning Association
18. The Colorado Wastewater Utilities Council
19. South Adams County Water & Sanitation District
20. The Cottonwood Water & Sanitation District
21. The Inverness Water & Sanitation District
22. The City of Arvada
23. Northwest Colorado Council of Governments
24. The Supervisory Committee of the Littleton/Englewood Wastewater Treatment Plant
25. The City of Aurora
26. The Town of Olathe
27. The Town of Hotchkiss
28. The Town of Ridgway
29. The North Fork Conservancy District
30. Leroux Creek Water Users Association
31. The Upper Clear Creek Watershed Association

32. Grand County Water & Sanitation Districts
33. The City of Golden
34. New Consolidated Lower Boulder Reservoir & Ditch Company and New Coal Ridge Ditch Company
35. The Pittsburg & Midway Coal Mining Co.
36. The Coors Brewing Company
37. The Colorado Association of Commerce and Industry
38. Sunnyside Gold Corporation
39. The City of Black Hawk
40. Boxelder Sanitation District
41. Todd Creek Metropolitan District No. 1
45. The City of Colorado Springs including Colorado Springs Utilities
46. The Northern Colorado Water Conservancy District and the Municipal Subdistrict
47. The Denver Southeast Suburban Water & Sanitation District d.b.a. Pinery Water & Wastewater District
45. The Town of Silverton
52. Colorado Petroleum Association
53. Lockheed Martin Astronautics
54. Viacom International Inc.
55. Homestake Mining Company
56. The Cherry Creek Basin Water Quality Authority
57. The United States Department of Energy, Rocky Flats Field Office
58. The City of Lakewood
59. The Town of Lochbuie
60. Denver Regional Council of Governments
61. The City & County of Denver
55. The City of Glendale
56. The City of Boulder
62. Trout Unlimited
63. Bromley Park Metropolitan District 1
64. U.S. Environmental Protection Agency, Region VIII
65. The Board of County Commissioners of the County of Gunnison, CO
66. Arapahoe County Water & Wastewater Authority
62. U.S. Fish & Wildlife Service, Colorado Field Office
64. Battle Mountain Resources, Inc.
65. Colorado Livestock Association

31.39 FINDINGS IN SUPPORT OFADOPTION OF EMERGENCY REVISIONS TO REGULATION NO. 31, THE BASIC STANDARDS AND METHODOLOGIES FOR SURFACE WATER (5 CCR 1002-31) AND REGULATION NO. 21, PROCEDURAL RULES (5 CCR 1002-21)

The Commission adopted revisions to Regulation No. 31, *The Basic Standards and Methodologies for Surface Water* , on August 15, 2000.

The Commission submitted the entire regulation to the Secretary of State for republication and to the Office of Legislative Legal Services for review in accordance with section 24-4-103(8)(d), C.R.S. The Legislative Legal Services staff raised a concern that section 31.6(3)(b) of the Basic Standards, concerning “Section 25-8-207 Reviews,” did not incorporate all provisions of section 25-8-207, C.R.S. That statutory section includes water quality designations among the matters subject to review, while the regulation did not. The Commission agrees that Regulation 31 should include appropriate references to water quality designations. In addition, the Commission concludes that conforming changes to the Procedural Rules will be necessary.

If the Commission does not adopt revisions to Regulation 31 and the Procedural Rules on an emergency basis, the General Assembly Committee on Legal Services will need to address this issue. In view of the Commission's conclusion that its regulations should be modified to address this provision of section 25-8-207, C.R.S., the public interest will be best served by a prompt resolution with minimum expenditure of resources. Compliance with the procedures and notice requirements in section 24-4-103, C.R.S., would engender unnecessary delay in achieving conformance of the Commission regulations to Colorado statute. The Commission finds that immediate adoption of these revisions to Regulation 31 and the Procedural Rules is imperatively necessary to comply with state law and that compliance with the requirements of section 24-4-103, C.R.S., would be contrary to the public interest.

31.40 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; FEBRUARY, 2001 RULEMAKING

The provisions of 25-8-202, 25-8-203, 25-8-204 and 25-8-402 C.R.S. provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted, in compliance with 24-4-103(4), C.R.S., the following statement of basis and purpose:

Basis and Purpose:

In October, 2000, the Office of Legislative Legal Services identified a deficiency in section 31.6(3)(b) of the Basic Standards and Methodologies for Surface Water, Regulation #31, which addresses “Section 25-8-207 Reviews” . The language in section 31.6(3)(b) at that time did not fully track the provisions of section 25-8-207 of the Colorado Water Quality Control Act. The Commission corrected this deficiency in an emergency rulemaking hearing on November 7, 2000, by adding language including “water quality designations” among the matters subject to review under section 25-8-207, C.R.S. At the same time, the Commission adopted on an emergency basis corresponding revisions to the corresponding provisions of the Procedural Rules, Regulation #21, regarding section 25-8-207 hearings. The action taken in this rulemaking adopts these same revisions to both sets of regulations on a permanent, non-emergency basis.

31.41 FINDINGS IN SUPPORT OF ADOPTION OF EMERGENCY REVISIONS TO REGULATION NO. 31, THE BASIC STANDARDS AND METHODOLOGIES FOR SURFACE WATER [5 CCR 1002-31]

The Commission adopted revisions to Regulation No. 31, *The Basic Standards and Methodologies for Surface Water*, on August 15, 2000.

The published version of Regulation No. 31 contains a number of typographical errors. The Water Quality Control Division uses the water quality standards in this regulation to calculate Colorado Discharge Permit System permit effluent limits. Where the Division must use the standards containing typographical errors, the permit limitations would be calculated incorrectly. Depending on the individual circumstances, this could lead to discharge of pollutants that might adversely impact public health. In other circumstances, a discharger might be forced to expend additional funds to meet an effluent limitation based on a published standard that contains typographical errors.

If the Commission does not adopt revisions to Regulation 31 on an emergency basis, discharge permits may be issued incorrectly; that would result in an unnecessary adverse impact on the public. The Commission finds that immediate adoption of these revisions to Regulation 31 is imperatively necessary to preserve public health and welfare and that compliance with the requirements of section 24-4-103, C.R.S., would be contrary to the public interest.

31.42 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; SEPTEMBER, 2001 RULEMAKING

The provisions of 25-8-202, 25-8-203, 25-8-204 and 25-8-402 C.R.S. provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted, in compliance with 24-4-103(4), C.R.S., the following statement of basis and purpose:

Basis and Purpose:

As the result of a July, 2000 rulemaking hearing, the Commission adopted numerous changes to this regulation. Subsequent to final adoption and publication of those changes, several errors in the revised regulation were identified. These errors, including errors in the equations in Table III, certain calculated standards in Table IV, and several of the entries in the Organic Chemical standards table, were originally corrected in an emergency rulemaking hearing on May 14, 2001. In this rulemaking the Commission has re-adopted these corrections to make the emergency rule changes permanent.

31.43 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; SEPTEMBER 2004 RULEMAKING HEARING

The provisions of sections 25-8-202; 25-8-204; 25-8-402, C.R.S., provide the specific statutory authority for adoption. The Commission also adopted, in compliance with section 24-4-103(4) C.R.S., the following statement of basis and purpose.

BASIS AND PURPOSE:

This hearing was held to consider changes to the Basic Standards for Organic Chemicals found at section 31.11(3). In an effort to keep ground water and surface water standards consistent, the changes to this regulation were considered at the same time as changes to the statewide Ground Water Organic Chemical Standards in Regulation No. 41 (Basic Standards for Ground Water). The Commission continued to follow past policy decisions and precedence as recorded in Commission policy 96-2, except as regards Group C carcinogens and standards for parameters with MCLs as described below.

A. Group C Carcinogens

In November 2000, EPA disapproved the standards for several Group C organic chemicals because the proposed standards were not based on carcinogenic risk. Group C carcinogens are typically classified, based on limited evidence, as possible human carcinogens. Historically, due to the lack of substantive carcinogenic evidence, the Commission has not established carcinogenic-based standards for Group C chemicals, but rather adopted standards based on toxicity.

Based on published human-health risk data there are three classes of Group C compounds, which include:

1) Those compounds with published toxicity (RfD) values,
2) Those compounds with published cancer slope factors (q1*), and
3) Those compounds with published RfD and q1* values.

Previously, the Commission has promulgated standards for the Group C compounds in the first and third class based on toxicity and for the second class based on carcinogenicity. However, this treatment of the class 3 Group C chemicals resulted in EPA disapproving the standards.

As an alternative, the Commission adopted a standard for these Group C chemicals based on toxicity, but with an additional margin of safety to account for any unknown carcinogenic effects. Using this method the standards for Group C compounds, with both RfD and q1* values, are based on toxicological data, and then adjusted downward using an uncertainty factor of 10. The Commission believes that this methodology is consistent with SDWA practices and will be protective of human health.

B. Update Calculations to Incorporate New Fish Consumption Data

New information has been published, and adopted by US EPA, that characterizes the per capita fish consumption in the United States. This information relies upon the US Dept of Agriculture's 1994 to 1996 Continuing Survey of Food Intakes by Individuals. The new fish intake rate is 17.5 grams/day. "Fish ingestion" and "water+fish" ingestion standards have been revised to incorporate this new assumption.

C. Other Updates to Existing Standards

The existing standards for several organic chemicals were changed. These standards were changed based on either updated human health risk information, or were a Group C compound that the methodology for deriving the standard incorporated the above described uncertainty factor.

D. Addition or Removal of Compounds

Five compounds were removed from the table because EPA has removed them from the 304(a) criteria list and there was no independent risk information available. The Commission also added numeric standards for twenty-one additional organic chemicals that are classified as either Group A, known human carcinogens, or Group B, probable human carcinogens where published risk information is available.

One of the new standards that was the subject of extensive written and oral testimony in this hearing is a standard for 1,4-dioxane. Based upon the current status of the scientific evidence as disclosed at the hearing, with specific reference to the number for 1,4-dioxane found in EPA's IRIS database, the Commission adopted a standard of 6.1 ug/l to apply for a period of five years, with a standard of 3.2 µg/l becoming effective at the end of the five-year period. The Commission is aware of the fact that EPA is re-examining its criteria for 1,4-dioxane. However, that effort likely will take a number of years and the result is uncertain, and there is a current need to address this chemical in the water quality standards context. Because 6.1 ug/l is the value typically used to date for 1,4-dioxane remedial activities in Colorado, the adoption of this value as a water quality standard will provide a basic level of protection of human health while essentially preserving the status quo regarding clean-up requirements for the next five years. This standard provides protection within the same order of magnitude as the 3.2 ug/l standard that results from application of the Commission's generally accepted methodology for establishing health-based standards. The Commission sees no reason in this matter to deviate from its policy regarding the order of magnitude of risk used for the protection of human health.

If no further action is taken by the Commission, the 3.2 ug/l standard will go into effect after five years. If EPA's pending review of 1,4-dioxane results in a revision of the current IRIS value, the Commission can consider a corresponding revision of its water quality standards at that time.

The Commission notes that the adopted standards are consistent with the Department of Public Health and Environment's policy on the use of IRIS in setting standards. The Commission understands that remediation action levels applied by implementing agencies at currently contaminated sites may be set at a different, higher number based on a site-specific risk analysis as referenced in the CDPHE policy. The Commission also notes that it may adopt site-specific standards for 1,4-dioxane if warranted by a site-specific risk assessment. The Commission has adopted numerous site-specific standards for other chemicals where it was determined that such standards appropriately account for site-specific circumstances.

Further, to clarify the use of this standard in a regulatory context, the Commission requests that the Division promptly develop a practical quantitation limit (PQL) for 1,4-dioxane. Consistent with other provisions of this regulation, the PQL will be used as the compliance threshold for implementation of these standards. The Commission notes that it may be appropriate to establish a site-specific PQL for individual discharges, if warranted by the unique characteristics of a particular discharge.

In adopting standards for 1,4-dioxane, the Commission has considered the factors listed in section 25-8-204, C.R.S., as follows:

(a) The need for standards which regulate specified pollutants

1,4-dioxane is a Group B2, probable human carcinogen and has been found as a ground water contaminant in the State of Colorado. In addition, following treatment ground water contaminated with 1,4-dioxane is discharged to Colorado surface waters.

(b) Such information as may be available to the commission as to the degree to which any particular type of pollutant is subject to treatment; the availability, practicality, and technical and economic feasibility of treatment techniques; the impact of treatment requirements upon water quantity; and the extent to which the discharge to be controlled is significant

1,4-dioxane is most commonly treated with a combination of advanced oxidation processes (AOP) in combination with ultraviolet light (UV). This remediation technology, though relatively new, is rapidly becoming a more common technique. The AOP/UV treatment techniques will have minimal impact on water quantity. Evidence was submitted indicating that 1,4-dioxane treatment costs could be substantial in some circumstances, although there was conflicting evidence regarding treatment costs. Because the standard that will be in effect for the next five years is set at the level already most commonly used as a 1,4-dioxane remediation goal, the adopted standard will not have a major impact on treatment costs during this period. The Commission intends that discharge permits issued while the 6.1 ug/l standard is in effect will include effluent limits based on that standard until the expiration of the existing permit. Renewal permits will be subject to the standard in effect at the time of renewal. Moreover, to the extent that the adopted standards do result in increased treatment costs, the Commission believes that such costs must be weighed against the benefits of the protection of public health, including the preventative benefits of reducing the likelihood of future exposure to 1,4-dioxane.

As to the extent to which this pollutant is significant, since 1,4-dioxane is primarily used as a solvent stabilizer, it will most likely be found in areas with known chlorinate solvent contamination. Chlorinated solvents have been in use since the 1960s, with more widespread use occurring in the late 1970s and early 1980s due to the increasing production of electronic circuits.

(c) The continuous, intermittent, or seasonal nature of the pollutant to be controlled

1,4-dioxane is characterized by a high solubility (infinitely soluble/miscible), moderate vapor pressure, and low Henry’s Law Constant, all of which indicate that this chemical will be persistent within the aquatic environment. Additionally, the available data indicate that 1,4-dioxane will not readily degrade in the environment.

(d) The existing extent of pollution or the maximum extent of pollution to be tolerated as a goal

The Hazardous Materials and Waste Management Division reports that 1,4-dioxane has been found at 9 sites and is suspected at 19 others. The standards adopted by the Commission establish the maximum extent of 1,4-dioxane to be tolerated as a human health goal, for the reasons set forth in this Statement of Basis and Purpose.

(e) Whether the pollutant arises from natural sources

1,4-dioxane contamination does not arise from natural sources.

(f) Beneficial uses of water

The 1,4-dioxane standards are adopted to protect domestic water supply uses.

(g) Such information as may be available to the Commission regarding the risk associated with the pollutants including its persistence, degradability, the usual or potential presence of the affected organisms in any waters, the importance of the affected organisms, and the nature and extent of the effect of the pollutant on such organisms

1,4-dioxane is a highly persistent contaminant. Very little degradation is observed in the ambient environment. The standards are being adopted to protect human health, so humans are the affected “organisms”. 1,4-Dioxane is classified by EPA as a probable human carcinogen (Group B2). Conflicting evidence was submitted regarding the level at which 1,4 dioxane poses a human health risk. Some parties argued that a different toxicity model than that used to develop the current IRIS value for 1,4-dioxane should be used to characterize its toxicity. Some parties also argued that a 1,4-dioxane standard should be established based on a PQL for this chemical, but the Commission believes that the standard should be health-based. The Commission acknowledges that there are conflicting scientific interpretations of the available information and that further review and analysis of the toxicity of 1,4-dioxane is warranted. However, the outcome of that further review is uncertain and the Commission does not believe that there is sufficient evidence to invalidate the current EPA IRIS value at this time. The Commission believes that the record supports the scientific and technical validity of the standards that it is adopting. Moreover, in the face of conflicting scientific information, as a matter of policy the Commission has decided to err in the direction of protection of public health in approving the 6.1 ug/l and 3.2 ug/l standards for 1,4 dioxane.

E. Hybrid MCLG/MCL Standards

Since the 1989 hearing, there has been debate about whether standards for parameters with MCLs should be based on the MCLs or purely health-based numbers. The arguments for MCLs focused on whether it is reasonable to require in-stream standards (and potentially wastewater treatment) to a level cleaner than allowed for drinking water. The arguments for health-based standards focused on maximizing human health protection, putting the clean-up burden on pollution sources, and the fact that wherever dilution is available end-of-pipe effluent limits would be less restrictive than the standard.

In this hearing, the Commission adopted a hybrid MCLG/MCL proposal that provides much of the benefits advocated for each of the above options. The adoption of this proposal assures that the in-stream water quality goal will be as close to purely health-based numbers as feasible, while assuring that no discharger will be required to meet effluent limits for these parameters that are more stringent than MCLs. Additionally, the hybrid MCLG/MCL proposal was concurrently considered for Regulation 41, The Basic Standards for Ground Water, and the adoption of this rule for ground water provides a consistent approach to addressing water quality for all waters of the State.

PARTIES TO THE RULEMAKING HEARING

1. Schlage Lock Company
2. Teck Cominco Limited
3. Raytheon Aircraft Company
4. City and County of Denver
5. Waste Management of Colorado
6. Lockheed Martin Space Systems Company
7. Barrick Gold Corporation
8. Shell Oil Company
9. Colorado Wastewater Utility Council

10. The City of Boulder
11. Emerson Electric Company
12. Colorado Association of Commerce and Industry
13. Metro Wastewater Reclamation District
14. Dover Industries, Inc.
15. Colorado Mining Association
16. The Board of County Commissioners of El Paso County
17. The JRW Family Limited Partnership
18. The South Adams County Water and Sanitation District
19. Colorado Department of Transportation
20. U.S. Environmental Protection Agency
21. Stephen A. Bain
22. U.S. Department of Energy, Rocky Flats Project Office
23. John D. Fognani & Suzanna K. Moran
24. Alliant Techsystems Inc.

31.44 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; June 2005 Rulemaking Hearing; Final Action August 8, 2005; Revisions Effective December 31, 2005 and December 31, 2007

The provisions of sections 25-8-202; 25-8-203; 23-8-204; 25-8-402, C.R.S., provide the specific statutory authority for adoption. The Commission also adopted, in compliance with section 24-4-103(4) C.R.S., the following statement of basis and purpose.

BASIS AND PURPOSE:

I. Water Quality Control Division Proposals

A. Overview

This rulemaking hearing addressed a number of potential revisions to this regulation that were identified in the November 2004 issues formulation hearing. Many of the revisions proposed for this rulemaking and ultimately adopted by the Commission grew out of the efforts of the Colorado Water Quality Forum's Basic Standards Work Group, which provided important input to the Water Quality Control Division as it developed its proposals for this rulemaking. Each of the major revisions adopted by the Commission is addressed below.

B. Definitions (section 31.5)

The Commission added definitions for *E.coli*, effluent-dependent stream, effluent-dominated stream, ephemeral stream, existing quality and primary contact recreation. These definitions are discussed more below.

The Commission has revised section 31.5 by adding a subsection (18), which defines “ephemeral streams.” Ephemeral streams are characterized by surface water and groundwater hydrology. To determine whether a stream is ephemeral, visual observation or a rain gage should be used to determine whether water is present for only a short duration following precipitation or snowmelt. If water is present for more than just a short duration, then the depth of the groundwater should be monitored. If the groundwater and flow are not connected, then the system is ephemeral.

C. Ambient Quality Based Standards (section 31.7(1)(b))

There has been confusion regarding how acute standards are to be set where natural or man-induced conditions justify ambient standards. This section was clarified to state that acute site-specific ambient quality-based standards should be set at a level equal to the 95th percentile of the available representative data. This approach avoids debate over "outliers" yet characterizes the high levels that have been recorded.

D. Temporary Modifications (sections 31.7(3), 31.7(4) and 31.14))

The Commission revised sections 31.7(3) and (4) that address the conditions for granting a temporary modification, the duration of temporary modifications and the procedures for granting, removing or extending temporary modifications. The Commission also revised section 31.14 that addresses implementation of temporary modifications in discharge permits.

1. <u>Remove the distinction between types of temporary modifications</u> : The Commission deleted the second half of subsection 31.7(3)(b) so that, regardless of the conditions upon which the temporary modification is based, the impact of the temporary modification upon regulated entities is the same. The Commission felt that all three conditions in subsection 31.7(3)(a) should warrant the same focused attention. In cases where the sources of pollution are correctable, it is important to determine the level of water quality that can be achieved so that appropriate control actions can be undertaken, whether for point or non-point sources.

It is anticipated that this approach to temporary modifications will ensure that a more thorough consideration is given to the causes and sources of non-attainment before temporary modifications are proposed. In many cases, the appropriate way to address non-attainment of underlying standards will be through the TMDL program, not through adoption of temporary modifications. This may be particularly true where there are no point-source discharges.

Where the Commission determines that the TMDL program is the vehicle to address "the need for additional information regarding the extent to which existing quality is the result of natural or irreversible human-induced conditions or regarding the level of water quality necessary to protect current and/or future uses", no temporary modification shall be assigned. Non-attainment of underlying standards shall be addressed through Listing and prioritization of TMDLs.

In cases where there are point source discharges on such segments, decisions on temporary modifications will be made on a case-by-case basis and may include consideration of the parameter of concern, whether that parameter is present in the discharge, what are the other sources of the parameter, and what are the plans to either return the water to full attainment or determine what are the appropriate underlying standards.

2. Clarifying the duration of temporary modifications: The Commission modified subsection 31.7(3)(c) and removed the explicit statement that permitting status was to be taken into account when determining the duration of the temporary modification. Current language makes it clear that the intent is to attain the underlying standard as soon as possible. The duration of temporary modifications would also be decided based upon the complexity of the issues to be resolved, the data that needs to be collected, and other site-specific considerations. The duration of temporary modifications should be limited to the amount of time reasonably necessary to resolve the uncertainty as to what action is necessary to achieve attainment (if the basis is (i)) or what the appropriate underlying standard should be (if the basis is (iii)). Compliance time would generally not be considered in establishing the duration of temporary modifications because compliance schedules would be prepared upon the resolution of the underlying standard and re-opening of the permits to reflect the resolution. An exception could be made based on a situation where, due to the requirement that compliance schedules may not extend past the duration of the permit. In these cases, the permittee would not have a reasonable amount of time in the period between the expiration of the temporary modification and the projected expiration date of the next issued permit to meet new limits based on the underlying standard.

3. Instituting annual review of temporary modifications (section 31.7(4)) : The Commission restructured section 31.7(4) and has established an annual rulemaking hearing to review temporary modifications (regardless of the basis) that are due to expire in the two years following the rulemaking hearing. The Commission will consider evidence as discussed in subsections 31.7(3) (b) and (c) to determine whether the temporary modification should be modified, eliminated or extended.

4. Implementation of Temporary Modifications in Discharge Permits (subsection 31.14) : The Commission revised subsection 31.14(3) and added subsections 31.14(15) and (16) to more clearly define the relationship between temporary modifications and CDPS permit limits. The second sentence of subsection 31.14(3) was struck and the detail provided in subsections (15) and (16).

The Commission has clarified its intent for the use of temporary modifications, including their duration. In establishing the duration of a temporary modification, the Commission will be focusing on the length of time required to determine the appropriate underlying standard.

Given this priority, the Commission adopted new subsection 31.14(15)(a). The Commission has provided latitude in this section for the Division to consider circumstances under which the permittee may not be able to comply with limits based on the underlying standard during the term of the permit (e.g. where a renewal permit would expire shortly after the underlying standard takes effect).

The Commission adopted subsection 31.14(15)(b) to allow permittees, discharging to segments where temporary modifications have been adopted pursuant to subsection 31.7(3)(a)(iii), to focus their available resources on addressing uncertainty with respect to appropriate water quality standards. The Commission finds this to be appropriate and has determined that schedules of compliance directing permittees to identify and implement facility improvements are not required until the appropriate underlying standard is adopted. That way, permittees will be able to develop proposals for meeting underlying standards knowing the underlying standard that will have to be attained. In order to ensure that the underlying standard is attained in a timely manner, the Commission is requiring that the Division reopen permits within a reasonable period after its adoption. In this regard, permits should normally be reopened within six to nine months of the adoption of the underlying standard. However, the Commission intends that the Division have flexibility in its interpretation of this provision so that situations, such as where a permit will expire in twelve months, can be taken into account.

Also, consistent with the Commissions expectation that progress be made to develop information to resolve temporary modifications, it added subsection 31.14(15)(b)(ii). This subsection provides explicit authority for the Division to require permit compliance schedules that include milestones and dates to ensure that information necessary to determine appropriate underlying standards is developed.

The Commission adopted subsection 31.14(16) in order to provide direction that, while temporary modifications are in place, water quality should be maintained at the best level that is practicably achievable. This provision allows the Division to exercise its discretion in determining the level of treatment that a facility can provide without significantly increasing costs such that water quality would be maintained or even improved. An example would be where the existing quality of the facility discharge is better than the level of the temporary modification or where relatively minor actions, such as adopting local pretreatment limits or low cost facility improvements, could be taken to improve the quality of the discharge.

Concern was expressed in the hearing that this provision could have a ratcheting down effect on permit effluent limits. In other words, there was concern that a reissued permit could be based on the actual performance of a discharger that has achieved effluent quality better than required by its permit limits. If effluent limits were tightened to reflect this better effluent quality, the discharger could then be required to improve its discharge quality even further in order to consistently stay in compliance with the new limitations. This is not the Commission’s intent. Rather, the Commission intends that best professional judgment-based effluent limits would be set at a level intended to maintain existing effluent quality, not at a level to further improve effluent quality.

For new or expanding facilities, the Commission is requiring the Division to establish limits that will be protective of downstream uses. The Commission does not expect the Division or other party to conduct a use attainability-like analysis in these situations. However, a sensitivity analysis or other appropriate approach should be used to establish the magnitude of downstream pollutant concentrations to evaluate potential impacts to uses. The Commission recognizes that, in some situations, allowing an increase in loading to the stream may be appropriate or even beneficial.

The Commission recognizes that portions of the temporary modification provisions adopted in this rulemaking may be inconsistent with current provisions in Regulation No. 93. The Commission intends that the provisions adopted in this rulemaking will govern and that appropriate revisions will be adopted in Regulation No. 93 in the next rulemaking hearing reviewing that regulation.

E. Antidegradation Provisions (section 31.8)

1. Use Protected Designation (section 31.8(2)(b)) . The purpose of these provisions is to identify waters whose quality is not better than the federal “fishable, swimmable” goal, and which therefore are appropriately not subject to the antidegradation review process. The regulatory provisions in effect since 1988 establish several alternative criteria for applying a use-protected designation to specific water segments. Based on experience since that time, the Commission determined that revisions to some of these criteria are appropriate.

One previously automatic basis for a use-protected designation was the existence of a class 2 aquatic life classification for the water segment. The record demonstrates that in fact there are segments with a class 2 aquatic life classification that have water quality better than the aquatic life and recreation use table value criteria. The revisions adopted eliminate the presence of a cold-water aquatic life classification as a basis for a use-protected designation. The Commission determined that there is no substantial evidence of a correlation between cold water class 2 aquatic life classifications and poor water quality.

For warm water class 2 streams, the Commission modified the provision regarding application of a use-protected designation. The presence of a warm water class 2 classification will still be a presumptive basis for applying a use-protected designation; however, that presumption can be overcome based on the provisions of new subsection 31.8(2)(b)(iii) if the water quality test in that subsection is met. That is, if there is data showing better-than-table-value water quality for at least 10 of 12 indicator water quality parameters and the segment is not listed, and does not qualify for listing, for two or more pollutants for exceedance of chronic or 30-day standards, the aquatic life class 2 classification will not be a basis for a use-protected designation.

The Commission also revised the provisions of subsection 31.8(2)(b)(i)(C). This subsection provided that a segment would not be designated use-protected if its quality was maintained better than standards solely because a point source discharger was achieving treatment levels better than required by law. This provision was never utilized to apply a use-protected designation and discussions with interested parties indicated confusion regarding how the previous language was intended to be interpreted. The Commission revised this subsection to provide that “effluent-dependent” and “effluent-dominated” water segments generally will be designated use-protected. Because such waters are, by definition, those where the majority of the flow consists of treated wastewater for the majority of the time, the Commission has determined as a matter of policy that it is reasonable to assume that in most instances such waters will not maintain water quality significantly better than table value standards for the majority of pollutants. Of course, the quality of these waters will continue to be protected for their designated uses. The Commission added definitions of the flow regimes “effluent dependent stream” , “effluent dominated stream”, and “ephemeral stream” in section 31.5.

The Commission anticipates that the revised 31.8(2)(b)(i)(C) generally will result in use protected designations for most effluent dominated and effluent dependent water bodies. Parties advocating that a segment should be use-protected because it is effluent dependent or effluent dominated will need to provide flow data that documents that one of these definitions is met. However, the Commission cannot conclude, based on the limited evidence presented in this rulemaking, that use protected designations are necessarily appropriate for all effluent-dependent and effluent-dominated waters. Instead, the Commission has determined that it is appropriate to allow flexibility to make decisions for effluent dependent and effluent dominated waters based on the water body's public resource value and ecological significance. The Commission expects to apply this provision considering factors such as representative existing water quality data, information regarding the effects of nonpoint sources on water quality, the extent to which existing point source loads are less than allowed under current discharge permits, existing uses of the water by the public, the location of the water body, and ecological attributes. The purpose of allowing this flexibility is to recognize that: (1) numeric standards have been established for a large number of parameters, (2) in all effluent dependent and effluent dominated waters, assimilative capacity exists for some of those parameters, and (3) maintenance and protection of that assimilative capacity may be appropriate and desirable.

Finally, the Commission revised subsection 31.8(2)(b)(ii). This subsection was created to provide for the possibility of a use-protected designation where a segment may have poor water quality for parameters other than those considered in the 12-parameter test in subsection 31.8(2)(b)(i)(B). The Commission has revised this provision to clarify that if there is poor water quality for one or more of those 12 parameters in addition to poor water quality for other parameters, the cumulative water quality conditions can be considered in determining whether to apply a use-protected designation. The Commission also notes that a portion of the existing language in subsection 31.8(2)(b)(ii), which is not being changed in this rulemaking, provides that “substantial natural or irreversible human-induced pollution” may be a basis for a Commission determination that a use-protected designation is appropriate. The term “pollution” is defined in the Colorado Water Quality Control Act more broadly than the term “pollutant” and can include any “alteration of the physical, chemical, biological, and radiological integrity of water” . Therefore, the Commission intends this provision to allow non-chemical water quality conditions to be taken into account in a site-specific determination that the quality of particular waters does not “exceed levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water” and therefore does not warrant the extra protection provided by the antidegradation review process.

The Commission considered alternative proposals for revisions to the use-protected provisions submitted by the Littleton-Englewood Wastewater Treatment Plant. In view of uncertainties regarding application of the revisions proposed by Littleton-Englewood, and because the Commission believes that the provisions adopted provide appropriate flexibility in applying use-protected designations, the Commission declined to adopt the Littleton-Englewood proposals.

2. Regarding Adjusting the Baseline Where Water Quality is Improving (section 31.8(3)(ii)(B)) : The September 30, 2000 date for determining baseline water quality was established as the result of a July 2000 rulemaking hearing. In that hearing, the primary assumption was that increasing human development over time would result in increasing water quality impacts and that the September 30, 2000 date would establish the minimum water quality used as a baseline against which to gauge future impacts. In establishing that date for determining baseline water quality, the Commission did not consider the possibility that water quality might improve after September 30, 2000.

There is currently substantial interest in remediation efforts to reduce the water quality impacts from past contaminant releases in Colorado, e.g. from past mining operations. Where remediation is legally mandated and such efforts are successful, the Commission believes that it is appropriate to help assure continuing benefits from the completed remediation by using the resulting improved water quality as the baseline for future antidegradation reviews. Otherwise, the opportunity for any new discharger to fully consume any increased assimilative capacity resulting from remediation activities could effectively undermine the benefits of clean-up efforts. Note that by referring to “unpermitted” past contaminant releases the Commission intends that the term “remediation” in this provision not apply to improved treatment of ongoing, permitted releases, e.g. from a municipal wastewater treatment plant.

The Commission also recognizes that some remediation, including that associated with pollutant trading, is not legally mandated. This brings additional considerations into play. In such circumstances, the Commission intends that in determining whether to establish an alternative baseline to be used for antidegradation purposes, it will consider the site-specific circumstances, including but not limited to (1) the benefit of protecting improved water quality that results from remediation and (2) the benefit of encouraging voluntary clean-up efforts. In no event would the alternative baseline be water quality worse than that as of September 30, 2000. The Commission recognizes that in some circumstances it may be appropriate to use the water quality resulting from voluntary remediation as the new baseline, to help assure that the actions of one entity do not undo, without adequate review, the benefits of remediation performed by another entity. However, in other circumstances, entities could be discouraged from conducting voluntary remediation if the improved water quality could result in stricter requirements on future modifications to their own discharge. Any individual or entity, including those involved in the remediation efforts, may petition the Commission, at any time, to establish an alternative baseline, including prior to proceeding with a remediation project. Nothing in this rule revision is intended to in any manner interfere with or adversely affect either existing or future water pollutant trades that are consummated in a manner consistent with state policies or regulations regarding trades, including the use of pollutant credits or offsets generated.

When the Division becomes aware of waterbodies where remediation of impacts from past unpermitted releases has or will result in improved water quality after the September 30, 2000 baseline date, the Division will provide documentation of this in the Basin Rationale at the time of the next basinwide or site-specific rulemaking hearing encompassing the segment. In such circumstances, the Commission will also include a note in the Designation column in the basin tables to indicate that the September 30, 2000 default baseline date does not apply to the specific segment. For such waterbodies, the appropriate baseline date will be determined at the time that a new activity triggers an antidegradation review. It is anticipated that in most cases this will be the date upon which the antidegradation review commences. However, where the remediation is not yet complete or the water quality benefits of remediation have not yet been fully realized in-stream, verifiable evidence of future pollutant loading reductions may be utilized to establish a baseline date that extends into the future.

F. Statewide Standards (section 31.11):

A footnote was added to the statewide radionuclide Standards that clarifies which parameters should be analyzed in the unfiltered fraction.

Aquatic-life based criteria for Tributyltin (TBT) were added to the Basic Standards for Organic Chemicals Table based on information from EPA's National Recommended Water Quality Criteria: 2002 (EPA-822-R-02-047).

G. Recreation Classification (section 31.13) and Table Values (section 31.16 Table I)

In this rulemaking the Commission adopted revisions to the provisions in subsection 31.13(1)(a) regarding recreation use classifications, and to section 31.16 Table I water quality criteria for recreation uses.

The revised regulation moves the definition of primary contact recreation to the definition section at 31.5 and establishes two subsets of primary contact recreation and one undetermined recreational use category and a "Not Primary Contact" use category.

Existing Primary Contact Use: The Commission intends that this classification receive the highest level of protection (with an anticipated risk level of 8 swimmer illnesses per 1000 swimmers). It is to be adopted where evidence has been presented that these waters are used for primary contact recreation or have been used for such activities since November 28, 1975 (per the Federal Regulatory definition of "existing uses"). This use category applies to a subset of waters previously classified recreation 1a.

Potential Primary Contact Use: The Commission intends that this classification be used where a reasonable level of inquiry has failed to identify any existing primary contact use, but a full scale Use Attainability Analysis has not been conducted, or such analysis shows that primary contact uses may potentially occur in the future. This classification will receive a slightly elevated numeric value (with an anticipated risk level of 10 swimmer illnesses per 1000 swimmers). This use category replaces the previous recreation class 1b.

Undetermined Use: The Commission intends that this classification be used where little or no effort has been undertaken to determine the level of recreational use of a waterbody. This classification will receive the highest level of protection (with an anticipated risk level of 8 swimmer illnesses per 1000 swimmers) and will be the default classification until the Commission has determined that another classification is appropriate.

Not Primary Contact Use: The Commission intends that this classification be used only where a Use Attainability Analysis has been conducted that demonstrates that there is not a reasonable likelihood that primary contact uses will occur in the waterbody within the next 20 years. This classification will receive the lowest level of protection (five times the existing primary contact use standard). This use category replaces the previous recreation class 2.

This revised classification system for recreation uses was established to address issues of documentation and inquiry, or lack thereof. A key aspect of this revised classification system is to distinguish different reasons for applying the highest level of bacteriological standards protection to water bodies. The previous "class 1a" designation was applied either because an existing primary contact use had been documented for a segment or as a protective default classification where no significant site-specific investigation of recreation uses had occurred. These different situations are clearly distinguished by the new set of classifications. In addition, the "undetermined use" category provides a useful option in those circumstances where there is good water quality and no objection to applying the more stringent standards, but there is concern about labeling state waters on private lands as "primary contact" recreation waters when landowners intend not to provide public assess to those waters.

These new recreation sub classes necessitated revisions throughout Regulation No. 31 to ensure that references to recreation classifications conformed to the new nomenclature.

The Commission revised the first sentence of subsection 31.7(1)(b)(iii) to delete the words "acute or chronic" . The reason for this change is to assure that site-specific standards can be adopted for classified uses other than aquatic life. For example, site-specific standards may be appropriate for a segment with a Class E recreation classification where it is demonstrated that *E.coli* levels in excess of table values are present as the result of natural or irreversible human-induced sources.

The Commission intends that any revisions of existing recreation classifications and standards to apply the new classifications described above would occur through the normal rulemaking process. This would provide an opportunity for public review and comment on information supporting any new site-specific classifications and standards.

Although Colorado has historically used a fecal coliform standard, *E. coli* levels have been shown to be a better indicator organism of the risk of human illness. *E. Coli* standards were added to the Basic Standards in 2000 and the Commission proposes to complete the transition to *E. coli* by removing the fecal coliform table values. The Commission intends to implement this change by deleting fecal coliform standards from individual segment standards in the next round of basin reviews.

The Commission also added the definition of "*E.coli*" to section 31.5.

H. Temperature Table Values (section 31.16 Table I)

Having considered the evidence submitted in this rulemaking the Commission believes that it is appropriate to move forward toward revised temperature table values. However, since this is a very complex issue and there is still much controversy, the Commission adopted revised temperature criteria with an effective date of December 31, 2007. The intention of the Commission is to retain the current standards until that date. During the interim, the Commission encourages establishment of an expert panel to review the available data and provide input on technical and policy issues regarding appropriate temperature standards for Colorado. The Commission anticipates that a further rulemaking hearing will be held prior to December 31, 2007, to consider further revisions to the temperature table values.

The Commission recognizes that many participants in this rulemaking hearing are likely to disagree with various specific aspects of the temperature criteria now being adopted with a delayed effective date. The Commission acknowledges this disagreement and intends that the overall package of criteria now adopted help create an incentive for further analysis of appropriate temperature criteria.

The Commission also recognizes that, because proposals evolved throughout this rulemaking process, for several specific aspects of the criteria now being adopted there is limited information in the hearing record beyond the statements contained in the original proposed statement of basis and purpose. In particular, because the Division's proposal evolved, several aspects of the original proposal did not receive a full dialogue from all interested parties. Nonetheless, the Commission concluded that the reasoning expressed in the original proposed statement of basis and purpose provides the best explanation regarding the rationale for the specific criteria adopted in this rulemaking.

The Commission adopted revised temperature standards, as proposed by the Division in February 2005, in Table 1 and Section 31.14(14). This proposal was developed based on a literature review of temperature effect data for fish species present in Colorado. The temperature standards adopted provide protection for the aquatic community from lethal and sublethal effects, and provide protection against abrupt changes in water temperatures that may lead to thermal shock.

The original Colorado temperature standards were first adopted by the Commission in 1978. Over the years, the basis for the original standards has become unclear, the standards have been inconsistently applied in permits, and there have been disagreements about how the attainment of these standards should be assessed.

In this rulemaking, the Commission adopted new temperature standards based on warm and cold-water use classifications and adopted two new qualifiers of cold water use classifications, “cutthroat trout” and “cool water”. These new qualifiers were developed in recognition that the cold water classification covers a wide range of temperature regimes and aquatic life communities.

The cutthroat trout (“ct”) qualifier was developed to provide protection for cutthroat trout, a Colorado threatened species. Cutthroat trout require somewhat lower temperatures than other trout species. The Commission intends that the “ct” qualifier will be adopted on a site-specific basis where evidence has been presented that cutthroat trout are present or are expected to be present in a water body.

The cool water (“cw”) qualifier was developed to acknowledge that temperature regimes are a continuum and the transition between cold and warm is not abrupt. The Commission intends that the “cw” qualifier will be adopted on a site-specific basis where the downstream end of the segment adjoins a warm water segment and where there is either free passage for cold water fish to move upstream or adequate refugia within the segment. These decisions will be made on a case-by case basis and are not intended to prejudge or predetermine the work of the Aquatic Life work group that is working on refined aquatic life classifications.

Two types of criteria were adopted: Maximum Weekly Average Temperature (“MWAT”) and Daily Maximum (“DM”). The MWAT provides protection against sublethal effects on metabolism, growth, and reproduction. The MWAT is defined as the mean of multiple, equally spaced, daily temperatures over a 7-day consecutive period. The DM provides protection against lethal effects that elevated temperature can cause. The DM the maximum temperature attained in any one day. The MWAT is calculated from the optimum and upper temperatures tolerated by a species:

$$MWAT = \begin{pmatrix} upper\ optimum \\ temperature \end{pmatrix} + 1/3 \left(\begin{bmatrix} ultimate\ upper\ incipient \\ lethal\ temperature \end{bmatrix} - \begin{bmatrix} upper\ optimum \\ temperature \end{bmatrix} \right)$$

The rationale for using the MWAT as a temperature standard is based on studies that show moderate temperature fluctuations can be tolerated as long as the upper incipient lethal temperature is not exceeded for extended periods of time. The basic assumption of this method is that optimum temperatures are not necessary or realistically attainable at all times to maintain healthy fish populations.

The temperature criteria (both MWAT and DM) were developed for warm, cold and cool temperature regimes based on review of the temperature toxicity data in the literature. Where multiple studies were conducted for each species, the average for each value above was calculated before entering them into the MWAT equation (e.g., an average upper optimum temperature was calculated from multiple studies). Species MWATs were ranked and the value was selected that protects 95 percent of the species. The DM was developed by calculating an average ultimate incipient lethal temperature for each species, ranking the species and selecting the value that protected 95 percent of the species.

The Commission determined that special consideration should be provided for cold water fish during spawning seasons when they are more sensitive to increased temperature. The temperatures during these periods must be protective of the offspring (eggs, and early life stages). The spawning criteria are to be applied on a seasonal basis in segments where habitat is suitable and spawning is expected to occur. This standard is to be implemented as the MWAT in CDPS permits just as the DO spawning is applied.

Due to the complexity of a temperature standard and the potential for natural systems to have temperatures exceeding the numeric standards, the Commission adopted a series of excursions. The following excursions will not be considered an exceedance of the temperature standards:

Air temperature excursion : ambient water temperature may exceed the criteria in Table 1 or the applicable site-specific standard when the daily maximum air temperature exceeds the 90th percentile value of the annual maximum air temperatures calculated using at least 10 years of air temperature data.

Low-flow excursion : ambient water temperature may exceed the criteria in Table 1 or the applicable site-specific standard when the daily stream flow falls below the acute critical low flow or monthly average stream flow falls below the chronic critical low flow, calculated pursuant to Regulation 31.9(1)

Lakes and reservoirs : When a lake or reservoir is stratified, the surface layer may exceed the Table 1 value as long as the lower levels meet the temperature and dissolved oxygen standards.

Natural hot springs: ambient water temperature in a water body may exceed the criteria in Table 1 or the applicable site-specific standard, when the temperature in that water body is influenced by a natural hot springs.

The Commission acknowledges that there may be a need to adopt site-specific temperature standards that differ from current temperature standards to provide adequate protection for specific segments during the interim period prior to the delayed effective date of the revisions approved today.

Thermal Shock: Thermal shock has lethal and sublethal effects that result from an abrupt change in stream temperatures. The Commission adopted the provision in 31.14 (14) that effluent shall not cause an abrupt change in temperature of a magnitude, rate and duration deemed deleterious to the resident aquatic life This is quantified as no more than a 1°C change over one hour not to exceed 12°C in 24 hours. Because the effects of thermal shock are dependent on many factors (acclimation and thermal history, fish body size, other stressors) a single thermal shock criteria is a simplification. However, the Commission believes that it is important to protect fish from anthropogenic thermal shock.

The rate of change of 1°C per hour was selected since experimental evidence suggests that most fish can tolerate temperature shifts of 15 to 18°C if exposure falls within the tolerance range of individual species. Further, daily temperature fluctuations (within 10 to 12 hours) in this range have been measured in small streams of low volume without apparent high mortality. This equates to 1.25 to 1.8°C per hour.

Other parties have suggested a rate of change based on the research approach called Critical Thermal Method (CTM) wherein fish are warmed at a constant rate to either a lethal temperature or a loss of equilibrium. The key in this approach is to select a rate of change that is rapid enough that fish do not acclimate while they are being tested but slow enough that the internal temperature does not lag significantly behind the water temperature. Many rates have been recommended for CTM experiments ranging from 18°C per hour (in studies by Beitinger and by Becker and Galaway) to 1.2°C per hour (in studies by Elliot and Elliot). The Commission decided that the upper range was inappropriate since at 15°C, heat shock proteins have been shown to form in the tissues of rainbow trout. A rate rounded to 1°C per hour was selected.

Natural Conditions: In adopting new numeric temperature criteria so as to ensure the continued protection of classified uses, the Commission became aware of the fact that there may be a significant number of segments where the numeric temperature criteria are being consistently exceeded, at least on a seasonal basis, in the absence of impacts from point source discharges or controllable nonpoint sources, yet the aquatic life use continues to be attained. In these cases of natural or irreversible human-induced exceedances of the numeric criteria, the Commission desired to identify an option to retain and protect the existing uses, but avoid the need for inappropriate section 303(d) listings. Thus, it adopted a footnote providing that a narrative table value criterion for temperature that can be applied in such situations to site-specific waters, where there is a demonstration that exceedance of numerical criteria results from natural or irreversible human-induced impacts. Implementation of this provision will be further addressed in the temperature standards guidance to be developed by the Division.

Implementation in Discharge Permits

Modifications were made to section 31.14 to record the Commission's intentions regarding how the Colorado temperature standards will be implemented in discharge permits.

The DM standard is to be applied so that there is attainment of the DM at the edge of acute regulatory mixing zone. The MWAT is to be applied so that there is attainment of the MWAT at the edge of the chronic regulatory mixing zone.

Spawning criteria are to be applied on a seasonal basis where the Division determines that the habitat that will be affected by the physical mixing zone is suitable for spawning by fish species that are expected to be present.

The Commission also determined that temperature effluent limits would not be required for discharges to dry streams that only have flowing water in response to precipitation (effluent dependent streams). This provision is only valid if there is no evidence that the aquatic life use may be negatively affected by the discharge. A definition of effluent dependent streams was added to section 31.5.

Determination of Attainment

The Commission intends that the temperature standard be evaluated against representative instream data. Temperature varies within a reach both spatially and temporally. Data should be taken from a location in the stream that is representative of the reach, not in locations that may be substantially warmer or cooler than the rest of the segment – e.g. backwater habitats, eddies, deep pools, or refugia. Temperature also varies throughout the day. Attainment of the DM standard is based on temperature readings taken from the warmest part of the day – typically in the afternoon. Attainment of the MWAT standard is based on equally spaced data throughout the day including the warmest part of the day.

I. Ammonia Table Values (section 31.16 Table II)

The Commission adopted revised ammonia aquatic life criteria, based on EPA's 1999 Update of Ambient Water Quality Criteria for Ammonia. Colorado's previous table value criteria for ammonia were adopted in the late 1980's and have not been revised since. The new criteria are in the form of total ammonia rather than unionized ammonia and generally represent a less stringent criterion in cold-water segments but a more stringent criterion in warm-water segments.

After lengthy discussions between the Division and Colorado Water Quality Forum's Basic Standards Work Group of EPA's 1999 criteria and alternative approaches, the Division determined that the 1999 criteria would be appropriate for Colorado. Based on the evidence submitted in this hearing, the Commission agreed.

Acute Criteria - Salmonids Present (sp) or Absent (sa): The Commission intends that, generally, the acute criteria be applied along cold or warm water classification lines. On a case-by-case basis, where evidence has been presented, the Commission may decide that salmonids (trout) are present in warm water segments or absent in cold water segments.

Chronic Criteria – Early Life Stage Present (Elsp) or Absent (Elsa): The early life stages include the pre-hatch embryonic period, the post hatch free embryo or yolk-sac fry, and the larval period, during which the organism feeds. Juvenile fish, which are anatomically rather similar to adults, are not considered early life stages. Since ammonia is less toxic to juvenile and adult fish than at earlier life stages, a somewhat relaxed criterion is available for use when early life stages are expected to be absent from the aquatic ecosystem.

The Commission found that for cold water streams, early life stages could reasonably be expected in any month, therefore the default assumption will be that the chronic Elsp criterion will apply to cold water streams all year. This assumption can be modified on a site-specific basis where appropriate evidence is submitted.

For warm water streams, early life stages could reasonably be expected in March through August. The default assumption will be that the chronic Elsp criterion will apply from March 1 through August 31, and the Elsa criterion will apply from September 1 through February 29. This assumption can be modified on a site-specific basis where appropriate evidence is submitted.

The Commission acknowledges that there will be a substantial cost of compliance with the new criteria for some entities, once the criteria are adopted as standards in individual basins and implemented in discharge permits. Economic impacts on a per capita basis may be most significant for small communities located on warm water streams and currently using lagoon treatment systems.

Anticipating a potentially significant cost of meeting the EPA criteria, the Division and others have explored whether other scientifically valid approaches to ammonia criteria are available. However, all parties involved have been unable to identify any alternative for statewide criteria that would be less costly and meet the requirements of the federal and state law by assuring protection of aquatic life uses.

The Commission believes that it will be important for all involved to explore options to mitigate the economic burden of meeting the new ammonia criteria. In some instances, consideration of site-specific criteria may be appropriate, so long as any such criteria are consistent with federal and state requirements to protect existing aquatic life uses. It also will be appropriate when applying the new criteria as standards in the individual basins to consider the adoption of temporary modifications that provide a reasonable and adequate amount of time for affected municipalities to address the planning, financing and construction that may be needed for upgrading treatment facilities. We encourage the state legislature to explore the possibility of state grant funds to provide financial assistance, particularly to small communities faced with significant costs to meet the new ammonia criteria.

J. Metals Table Values and Implementation Issues (section 31.16, Table III)

Several changes are adopted with respect to the metals table values set forth in Table III. The metals parameters that changed include aluminum, antimony, arsenic, cadmium, uranium and zinc.

Aluminum : A footnote was added to the chronic aluminum value to explain the application of the standard. Application of the 87 µg/l total recoverable aluminum chronic table value is based on toxicity studies with brook trout and striped bass. The studies underlying the 87 µg/l chronic value, however, were conducted at low pH (6.5-6.6) and low hardness (<10 ppm $CaCO_3$), conditions uncommon in Colorado surface waters. A water effect ratio toxicity study in West Virginia indicated that aluminum is substantially less toxic at higher pH and hardness (although the relationship is not well quantified at this time). Further, field data indicate that many high quality waters in the U.S. contain more than 87 µg/l aluminum when either the total recoverable or dissolved aluminum is measured. Based on this information and considering the available toxicological information in EPA's Aluminum Criteria Document (EPA 440/5-86-008), the 87 µg/l chronic table value standard for aluminum will be implemented as follows: where pH is equal to or greater than 7.0 and hardness is equal to or greater than 50 ppm as $CaCO_3$ in the receiving water after mixing, the 87 µg/l standard will not apply, and aluminum will be regulated based on compliance with the 750 µg/l acute standard. In situations where the 87 µg/l chronic standard applies, a discharger may propose a site- specific chronic standard based on a water effect ratio.

Arsenic: Arsenic table values for drinking water supply, W+F and FI were updated to reflect the classification of arsenic as a Class A carcinogen by EPA, in accordance with Policy 96-2. The Commission during the recent adoption of Basic Standards for Organic Chemicals for Regulations 31 and 41 has allowed for two drinking water supply standards. The same approach is being applied in this hearing to metals table standards. The first number in the range is a strictly health-based value, based on the Commission's established methodology for human health-based standards. The second number in the range is a maximum contaminant level (MCL), established under the federal Safe Drinking Water Act that has been determined to be an acceptable level of this chemical in public water supplies, taking treatability and laboratory detection limits into account. Control requirements, such as discharge permit effluent limitations, shall be established using the first number in the range as the ambient water quality target, provided that no effluent limitation shall require an "end-of-pipe" discharge level more restrictive than the second number in the range. Water bodies will be considered in attainment of this standard, and not included on the Section 303(d) List, so long as the existing ambient quality does not exceed the second number in the range. The Drinking Water Supply table values are applicable at the point of intake to a domestic water supply.

Water + Fish (W+F) and Fish Ingestion(FI) Table Values :

Table values for antimony are updated to reflect a revised relative source contribution for both W+F and FI. The antimony W+F standard was updated to reflect the change in increasing the fish consumption rate numbers adopted by the Commission on 9/14/2004 at the hearing regarding organics for Regulation 31.

Table values for copper, nickel, selenium, thallium, and zinc were updated to reflect water quality criteria developed under the CWA section 304(a) and published in EPA National Water Quality Criteria: 2002.

Cadmium: The Commission considered alternative revised acute and chronic aquatic life table values. Using the results from the most recent literature review, it adopted new hardness based equations for cadmium. This review resulted in two separate acute equations: one for waters that have trout and one for waters that do not have trout. The Commission also adopted a revised hardness based chronic equation that resulted from the most recent literature review. Although the revised acute and chronic equations differ slightly from EPA's national criteria, they more accurately reflect the current science and are protective for Colorado's waters.

Uranium: A drinking water supply table value for uranium was added, in accordance with Policy 96-2. Since there is no bio-concentration factor (BCF) available, no W+F or FI criteria are proposed. A conversion of pCi/L to mg/L was developed. The conversion factor of 670 pCi/mg natural uranium, which assumes secular equilibrium of U-234 and U-238, will be used to provide for consistent interpretation of data. When uranium activity units are used (e.g. pCi/L), they will be converted to milligrams by dividing by 670. The current uranium standard of 40 pCi/L or 59.7 µg/l (when divided by 670 pCi/mg) is greater than the new MCL (drinking water supply standard). As each individual basin regulation is reviewed, the uranium standard will be changed from 40 pCi/L to 30 µg/L in the basinwide standards at the beginning of each regulation.

Zinc : The Commission adopted alternative revised zinc aquatic life table value hardness-based equations. These differ slightly from EPA's national criteria. However, they more accurately reflect the current science by inclusion of acute and chronic data for sculpin and are protective for Colorado's waters. The Commission notes that more protective standards may be adopted on a site-specific basis when appropriate to protect sculpin.

Hardness footnote (footnote 3): The Commission clarified how hardness is to be determined for permit effluent limitations and for determining standards attainment.

K. House Keeping Issues

1. Clarifications : The Commission added clarification to a number of items:

Segment descriptions, unless specified by the Commission, are to mean that any boundary location means “immediately above” that reference, except when the boundary location is referred to as “source” .

The Commission clarified the methodology to be utilized in assigning ambient quality based standards.

The Commission added a definition of “existing quality” to section 31.5. This is the same definition that can be found at 31.8(2)(a)(i). It was added to the definitions because it has broader applicability than merely the antidegradation provisions.

The Commission added a footnote to the pH standard, which addresses judging when attainment is achieved, and when the appropriate averaging period can be applied.

The provision at 31.14(9) that addresses PQLs was revised in light of the removal of PQLs from the Regulation for the State Discharge Permit System (Regulation No. 61). Generally applicable PQLs now reside in a Division policy document. In addition, site-specific PQLs can be developed in accordance with Division policy.

2. The Commission corrected minor typographical errors in the regulation.

II. Paonia Colbran Proposal

The Commission has modified Section 31.9 to address an issue regarding the methodology used to calculate monthly low flows for streams experiencing large seasonal variability in in-stream flows. That section now provides that, when requested by the discharger, a specific method for calculating low flows during such periods is to be used.

Currently, the Division uses a modified version of a low flow model, commonly referred to as the “DFLOW model,” which was developed by the U.S. Environmental Protection Agency. The DFLOW model was developed by EPA to establish an empirical “biologically based” annual low flow. The model calculates a harmonic mean for each consecutive, forward rolling, 30-day period for the period of record being considered. An excursion procedure is applied to establish an annual low flow which is expected to occur at a frequency of no greater than once every three years (see EPA, 1986. Technical Guidance Manual for Performing Waste Load Allocations, Book VI, Design Conditions: Chapter 1 - Stream Design Flow for Steady-State Modeling, Appendix C - Office of Water Regulations and Standards).

The Division modified the EPA DFLOW model to calculate monthly low flows for use in determining monthly effluent limitations. In calculating monthly low flows, the Division assigns to a month of interest all harmonic means that include one or more days in that month. This procedure can result in the calculated low flow for the month in interest being unduly influenced by the flow data from the preceding or succeeding month.

In order to reduce the influence of flows outside the month of interest during seasons of highly variable flow, the Commission adopted a revised procedure. That procedure uses only those consecutive 30-day harmonic means which contain at least 15 days from the month of interest to determine the low flow for that month. The Commission also determined the 1986 EPA Technical Guidance Manual sets forth the most appropriate excursion procedure and that such procedure should be used by the Division, when requested by the discharger, in calculating the annual 30E3 low flow. Appendix A to Section 31.9 sets forth the excursion procedure and is derived from the 1986 EPA Technical Guidance Manual. The low flow for a month of interest is then set at either the lowest harmonic mean assigned to that month, or the annual low flow value (using the procedure set forth in Appendix A), which ever is greater.

The Commission concluded that the revised methodology will more accurately reflect average in-stream low flow conditions during transitional flow months.

The Division's current practice is to use the most recent ten years of flow data in establishing low flow conditions. The Commission recognized that, in most instances, the period of record (POR) of available data might be different than ten years. The Commission also recognized that the determination of low flows based on the most recent ten years of flow data could be biased by the predominance of wet or dry cycles within the ten year period, and that such bias could be reduced by the use of a longer period of record. Where the period of available flow data exceeds ten years, the Commission would expect the Division to consider using such POR. In such instances, the Commission would expect the Division to evaluate whether changes (for example, anthropogenic changes such as dams or diversion structures) have occurred in the stream system that would make it inappropriate to use such longer POR. The Commission also determined that, where ten years of data does not exist, the use of a period of record of less than ten years may be appropriate to establish low flow conditions, particularly where less accurate methodologies such as "similar basin" approaches would otherwise be used. Determination of the appropriate period of record for calculating low flow conditions outside the Division's normal practice will likely be based on a case-by-case request by the discharger. In these situations, the Commission would expect the Division to work with the discharger to determine the most appropriate period of record for calculating low flow conditions.

III. Colorado Water Congress Proposal Regarding Mixing Zones

Section 31.10, "Mixing Zones" in the Basic Standards Regulation (Regulation 31) provides the regulatory basis for defining and implementing mixing zones in discharge permits ("mixing zone rule"), Section 31.10 (5) of the mixing zone rule entitled "Additional Constraints on Mixing Zones" includes the following provision:

(d) The Division may limit or deny regulatory mixing zones on a site-specific basis for specific regulated substances. In doing so, the Division shall consider the following:

(iii) The special importance of certain habitats such as fish spawning or nursery areas or habitat that supports threatened or endangered species;

In February 2002, the Water Quality Control Division issued the "Colorado Mixing Zone Implementation Guidance" (Water Quality Control Division, February 2002). Appendix IV, entitled "Mixing Zone Guidance for Water for Threatened and Endangered Species," describes the manner in which the Division will work with the EPA and the Service to provide compliance with the Endangered Species Act for permits to discharge to waters that include threatened or endangered species.

EPA's approval of the mixing zone rule (May 16, 2002) was subject to compliance with the Endangered Species Act, given that EPA determined that the rule may adversely affect Colorado pikeminnow, humpback chub, bonytail, razorback sucker, and greenback cutthroat trout, and may affect critical habitat of these species. By letter dated September 16, 2002, EPA requested a formal consultation with the U.S. Fish and Wildlife Service regarding approval of the mixing zone rule.

On August 11, 2003, the U.S. Fish and Wildlife Service issued a biological opinion based on its review of EPA's approval of Colorado's amended mixing zone rule (Exhibit 2). Seven conservation measures are identified in the August 11, 2003 biological opinion.

Conservation measure No. 2 acknowledges that there may be situations where there are no feasible alternatives that would entirely avoid adverse impacts to listed aquatic species. In these cases, the project applicant will be asked to implement a conservation plan to minimize anticipated impacts. In such cases, the Service provides that it will issue a supplemental biological opinion, acknowledging the unavoidable nature of the issue, acknowledging the implementation of the conservation plan, and authorizing take for that permit. Federal regulations also allow the Service to specify reasonable and prudent measures in a biological opinion to minimize incidental take (50 CFR 402.14).

Conservation measure No. 2 was not included as an option in the revised Mixing Zone Guidance developed by the Division, as the Guidance preceded the biological opinion. In addition, neither the guidance nor the biological opinion recognized other regulatory options that may be available under the federal Endangered Species Act, such as issuing a biological opinion with reasonable and prudent alternatives, or issuing a programmatic biological opinion dealing with more than one permit.

Conservation measure No. 7 also states that site-specific modifications to eliminate or minimize adverse effects can include:

- effluent diffusers,
- application of numeric standards at end of pipe, or
- relocation of the discharge and associated mixing zone.

Conservation measure No. 7 is recognized in the Mixing Zone Guidance document.

The Commission received requests from parties to the hearing to modify the mixing zone rule to address the terms of the biological opinion and other available regulatory options. Prior to the hearing, those parties and the Division agreed that the proposed modifications would be withdrawn and that it is appropriate to modify the Mixing Zone Guidance to incorporate provisions from the biological opinion, and provide for use of other federal regulatory options that may be available under the Endangered Species Act. The Commission supports this approach and recognizes that the Division will need to present it to the US Fish and Wildlife Service and EPA for their comment and make any appropriate changes prior to bringing a revised version of the Mixing Zone Guidance before the Commission for public comment.

PARTIES TO THE RULEMAKING HEARING

1. Town of Paonia
2. Town of Collbran
3. Colorado Water Congress Special Project on Basic Water Quality Standards
4. The Supervisory Committee of the Littleton/Englewood Wastewater
5. The City of Colorado Springs and Colorado Springs Utilities
6. Trout Unlimited
7. The City of Pueblo
8. Chatfield Watershed Authority
9. Bear Creek Watershed Association
10. City of Boulder
11. Town of Hotchkiss
12. Town of Olathe
13. Colorado Wastewater Utility Council
14. Upper Gunnison River Water Conservancy District
15. Colorado River Water Conservation District
16. Atlantic Richfield Company
17. The City of Westminster
18. The Board of Water Works of Pueblo, Colorado
20. Western Slope Water Network
21. High Country Citizens’ Alliance
22. The City of Grand Junction
23. City of Black Hawk
24. Colorado Rock Products Association
25. Parker Water and Sanitation
26. Sky Ranch Metropolitan District No. 2
27. Eastern Adams County Metropolitan District
28. City of Loveland
29. The Board of County Commissioners of the County of Gunnison, Colorado

30. City and County of Denver acting by and through its Board of Water Commissioners
31. Gunnison County Stockgrowers Association, Inc.
32. Colorado Division of Wildlife
33. Pioneer Natural Resources USA Inc.
34. The Northern Colorado Water Conservancy District
35. Metro Wastewater Reclamation District
36. Tri-State Generation and Transmission
38. City and County of Denver
39. The Southwestern Water Conservation District
40. The South Adams County Water and Sanitation District
41. North Front Range Water Quality Planning Association
42. Shell Frontier Oil & Gas Inc
44. The Farmer's Reservoir and Irrigation Company
45. Hot Springs Lodge and Pool
46. U.S. Environmental Protection Agency Region VIII
47. The Denver Regional Council of Governments
48. The Northwest Colorado Council of Governments

31.45 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE: January 2007 Rulemaking Hearing; Final Action February 12, 2007; Revisions effective July 1, 2007

The provisions of sections 25-8-202(1)(b), 25-8-204; and 25-8-402, C.R.S., provide the specific statutory authority for adoption. The Commission also adopted, in compliance with section 24-4-103(4) C.R.S., the following statement of basis and purpose.

BASIS AND PURPOSE:

In this rulemaking, the Commission adopted new temperature criteria for Colorado's surface waters. The revisions to the regulation and definitions, revised table values and qualifiers, and revised implementation provisions. In this rulemaking, the Commission also adopted revisions to the basinwide temperature standards in Regulation Numbers 32 – 38.

Overview: As the Commission indicated in the 2005 Statement of Basis and Purpose, the basis of the original temperature standards had become unclear, the standards had been inconsistently applied in permits and there had been disagreements about how the attainment of these standards should be assessed. In adopting these revisions, the Commission has established criteria that are clear and can be consistently and fairly implemented by the Division. Section 31.14(14) was amended to establish general criteria to be followed by the Division in determining when effluent limits related to temperature are necessary in discharge permits. These criteria are intended to assure that effluent limits are imposed only when thermal discharges can reasonably be expected at a level such that the applicable standards would be threatened or exceeded.

Temperature standards will also be implemented in the context of determining attainment of standards in individual water bodies, for instance in the context of the biennial compilation of the "List of Impaired Water Still Requiring TMDLs" (the Section 303(d) List). Methods and process for determining of attainment of the temperature standards will be consistent with the Section 303(d) Listing Methodology as adopted by the Commission for that particular listing cycle.

Water Rights: Concerns have been raised regarding the potential impact of the proposed temperature criteria and standards on the exercise of water rights. The Commission included a reference to section 25-8-104, C.R.S. in the revised table value criteria. Section 25-8-104 states in part that "Nothing in this article [the Colorado Water Quality Control Act] shall be construed, enforced or applied so as to cause or result in material injury to water rights."

In cases where it is determined that the classified aquatic life use is adversely impacted by any pollutant, the Commission believes that it is appropriate to place the impacted segment on the Section 303(d) List. When a segment is placed on the 303(d) List for any reason, the Division (along with any interested parties) then investigates the source of the impairment. If the cause of non-attainment is deemed to be natural or irreversible man-induced, then a site-specific standard is appropriate. See Regulation 31.7(1)(b)(ii), 5 CCR 100-31, section 31.7(1)(b)(ii). In cases where a temperature standard exceedance is determined to be caused by the valid exercise of those water rights and the exceedance cannot be eliminated in a manner consistent with CRS 25-8-104, the Commission would consider that to be an irreversible man-induced condition, and thus would support adoption of a site-specific standard as provided in section 31.7(1)(b)(ii).

Similarly, Colorado's 401 certification regulation (Regulation No. 82.5(6)) provides that 401 Certification shall not be denied where the imposition of conditions or denial would result in material injury to water rights as prohibited under section 25-8-104, C.R.S. In such case, the Division, the project proponents, and any commenters are to examine and implement, where appropriate, any means to prevent, reduce, or mitigate water quality impacts identified during the permitting process and associated with the exercise of valid water rights. Where such means are found they may be included in the Division's certification determination. This process would apply to temperature standards in the same manner as other water quality standards.

Definitions: Definitions were added to section 31.5 for terms used in the context of revised temperature standards. Pre-existing definitions were renumbered.

Low-Flow Exemptions: Language was added to section 31.9(1) to clarify that for calculation of chronic temperature effluent limits for permits, a 7-day average low flow with an average once in three-year recurrence interval (7E3) will be used. This statistic is appropriate since the chronic temperature criteria (the MWAT) has a seven day averaging period and a once in three-year exceedance frequency.

New Temperature Table Values: One result of the 2005 Basic Standards hearing was a focused effort on developing a sound methodology, re-reviewing the laboratory-based temperature effect literature, and developing a new, more robust temperature database. The methodology for developing temperature criteria was the subject of an Administrative Action Hearing in April, 2006, that resulted in adoption of WQCC Policy 2006-1: Temperature Criteria Methodology. The Policy is intended as a general informational guide of the Commission's approach to the adoption of these criteria and standards. As stated in the Policy, it is not intended and should not be interpreted to limit any options that may be considered or adopted by the Commission in future rulemaking proceedings.

The new table values, adopted in this hearing, were developed using the laboratory-based studies of individual fish species' tolerance to elevated water temperatures. For each aquatic community, the tolerances were ranked and the 5th percentile was selected as the operative criterion, except in the case of coldwater aquatic life.

Cold Water Numeric Criteria: The cold water criteria were generated using laboratory generated thermal tolerance information for the following cold water species: Arctic grayling, brook trout, brown trout, cutthroat trout, mottled sculpin, longnose sucker, rainbow trout, and sockeye salmon. The lake trout and mountain whitefish are also present in Colorado, but insufficient thermal data were available to consider them in numeric criteria development. The fish species were grouped into two communities "Rivers and Streams" (all the species except lake trout and sockeye salmon) and "Lakes and Reservoirs" (see below). Other groupings, including east and west slope were investigated, however provided no significant difference in criteria. For "Rivers and Streams" the Policy 2006-1 methods, 5th percentile did not fully protect cutthroat trout (the most sensitive species). Since cutthroat trout are an ecologically important species in cold-water communities, and are the only native trout species in Colorado, the cold criteria were lowered to ensure full protection of that species. The Commission anticipates that as the Division and interested parties continue to collect thermal tolerance studies, the database will become more robust and these decisions will be revisited.

A specific large lake and reservoir category was created for lakes and reservoirs equal to or larger than 100 acres in size, which is consistent with CDOW's management regime where lakes and reservoirs are grouped into one of three size classes: < 100 acres, 100-500 acres, or > 500 acres. Lakes and reservoirs larger than 100 acres typically do not contain brook or cutthroat trout. The summertime criteria for this category are based on protection of rainbow trout. Site-specific standards can be applied to the few large lakes and reservoirs that do contain thermally sensitive fish, such as cutthroat trout, brook trout, sockeye or arctic grayling. The Commission believes that having two separate cold-water lakes and reservoirs standards will protect thermally-sensitive fish in their natural habitat and in small lakes and reservoirs where they may be stocked by CDOW while exempting larger lakes and reservoirs from overly restrictive temperature standards.

Warm water numeric criteria: The warm water numeric criteria were developed using laboratory-based temperature studies of fish species. As with development of the cold criteria, several community groupings were evaluated. With the current data, it was determined that criteria for four river and stream sub-classes and one lake class would be promulgated. The default "Rivers and Streams" criteria are based on information about the Arkansas darter, bigmouth shiner, black bullhead, bluegill, boneytail, brown bullhead, channel catfish, fathead minnow, golden shiner, green sunfish, hornyhead chub, longnose dace, orangespotted sunfish, plains killifish, plains minnow, plains topminnow, pumpkinseed, red shiner, roundtail chub, sand shiner, smallmouth bass, southern redbelly dace, speckled dace, spottail shiner, western mosquitofish, and yellow bullhead. The following species are also present in Colorado, but insufficient thermal data were available to consider them in numeric criteria development for rivers and streams: bluehead sucker, brassy minnow, Colorado pikeminnow, common carp, flannelmouth sucker, flathead catfish, flathead chub, freshwater drum, Iowa darter, quillback, Rio Grande chub, Rio Grande sucker, river carpsucker, smallmouth buffalo, and stonecat.

Three additional sub-classes (a, b, and c) of sensitive warm water species were created to protect thermally sensitive warm water species with similar thermal requirements or geographic distribution. Existing data for these species indicate that they are sensitive to chronic high temperatures, relative to other warm water fish. If these species were included with the other warm-water river and stream species, following Policy 2006-1, the resulting criteria are over protective for waters without these thermally sensitive species. Since the range of these species are known, the Commission decided that it was more appropriate and will provide flexibility to create a separate subclass rather than have interested parties outside the range of thermally sensitive species to have to go through the recalculation procedure. The Commission directs the Division to rely upon information from the Colorado Division of Wildlife for determining where thermally sensitive species are expected to occur at the site.

Where thermally sensitive species occur, or are expected to occur, the most protective applicable criteria will be used. Warm-water sensitive group a is the most thermally sensitive and includes the common shiner, Johnny darter, and orangethroat darter. The common shiner and Johnny darter specifically occupy the eastern slope transition zone. The orangethroat darter occurs only in the Republican River Basin. Warm-water sensitive group b includes only the razorback sucker that occurs on the west slope. Warm-water sensitive group c includes the brook stickleback, central stoneroller, creek chub, longnose dace, Northern redbelly dace, finescale dace and white sucker. The default warm-water table value will apply in segments that do not have, and are not expected to have, any of these thermally sensitive species.

The "Lakes and Reservoir" criteria are based on information about the bluegill, largemouth bass, northern pike, pumpkinseed, smallmouth bass, spottail shiner, striped bass, tiger muskellunge, walleye, white bass, and yellow perch. The following species are also present in Colorado lakes and reservoirs, but insufficient thermal data were available to consider them in numeric criteria development for lakes: black crappie, common carp, gizzard shad, sauger, wiper, and white crappie.

The Commission acknowledges that all of these fish species do not occur in all warm water locations. For instance, the white bass only occurs in east slope reservoirs, and channel catfish generally occur in warm water lakes, reservoirs, ponds, and moderate to large rivers. Neither of these may be appropriate in some locations on the western slope. However, rather than include all the combinations in Table 1, the Commission adopted table values for five subclasses. The revised regulation allows for refinement of criteria on a site-specific basis using the recalculation procedures in Policy 2006-1 without the burden of a Commission hearing. This provides the Division and interested parties the flexibility to develop site-specific solutions based on the species that are expected to occur at the site.

Occur at the Site: The Commission intends that the phrases “occur at the site” and “expected to occur at the site” have the same meaning as in WQCC Policy 2006-1 (see Section XII, Recalculation Procedures), and shall be determined on a site-by-site basis. The Commission requests that the Division consider further appropriate refinement of this concept in the development of implementation guidance, including but not limited to appropriate consideration of fish only temporarily present in transition segments.

Spawning/Reproductive Seasons: The Commission revised the provisions to protect spawning in order to broaden the consideration to all the reproductive functions. The consideration of reproductive season is to ensure that the thermal requirements for successful migration, spawning, egg incubation, fry rearing and other reproductive functions are met These particular life stages and behaviors warrant more protective criteria than those required for the young adult and adult life stages; however, there are many site-specific considerations. The Commission decided to provide protection for these life stages in combination with protection of seasonal patterns as discussed below.

Winter Criteria to Protect Reproductive Functions and Normal Pattern of Seasonal Fluctuation: The original language of the temperature standard contained the requirement that “temperature shall maintain a normal pattern of seasonal fluctuation.” This component is intended to preserve thermal cues necessary for protection of aquatic life cycles. After consideration of alternative means to protect seasonal patterns, the Commission chose an approach that links protection of the seasonal pattern with protection of reproductive functions. To this end the Commission added winter season table value criteria in Table 1. The default winter season for cold water river and streams was established from October to May, November to March for “not sensitive” cold water rivers and streams, and for warm water rivers and streams from December to February. The winter season for lakes and reservoirs for both cold and warm water was established from January to March.

Normal Pattern of Summertime Diel Fluctuation: The narrative provision contains the requirement that temperature shall maintain a normal pattern of summertime diel fluctuation. The addition of “summertime” represents a modification of the longstanding language in the Basic Standards. While it is clear that aquatic life need nighttime cooling during the summers, to allow recovery from daily afternoon high temperatures, it is not clear that this recovery period is necessary during the rest of the year. A single value to protect summertime diel fluctuation would not address the myriad site-specific conditions, and so the Commission is relying upon the narrative statement. The Division is directed to impose permit conditions where best professional judgment indicates such protection is necessary to protect the use.

Normal Pattern of Spatial Diversity: The narrative standard also contains the requirement that temperature shall maintain a normal pattern of spatial diversity. Spatial diversity is a concept that incorporates the importance of a distribution of conditions along the stream reach. Natural aquatic ecosystems have a range of temperatures available to organisms in microhabitats. This array of microhabitats makes it possible for a broader range of organisms and life-cycles to flourish in the aquatic system. Although spatial diversity is critical to a fully functioning aquatic community, the Commission does not see a way to quantify or define the lower threshold in regulation at this time. The Commission’s intent is that the Division use its discretion to implement the narrative requirement for spatial diversity in situations where there is evidence that an activity does or will create spatial uniformity that will threaten or impair the aquatic life use.

Abrupt Changes / Thermal Shock: The thermal shock provisions were reviewed and revised. Even though there is a need to provide clear direction for implementation of the narrative prohibition of abrupt changes, the complexity of the phenomenon and the confusion over implementation indicate that Colorado is not yet ready for a numeric thermal shock criterion at this time. The Commission directs the Division to continue to explore means to protect aquatic life from anthropogenic thermal shock, with particular emphasis on an implementation strategy that is straightforward. The Commission expects to see a revised thermal shock proposal in the 2010 Basic Standards rulemaking proceedings. In the meantime, the Division is directed to impose permit conditions where best professional judgment indicates protection is necessary to protect the use from abrupt thermal changes.

Transition Zones: In 2005, the Commission adopted the cool water ("cw") qualifier to acknowledge that temperature regimes are a continuum and the transition between cold and warm is not abrupt. The Commission endorses recognition of the transition zone, but decided that rather than having separate criteria for the transition zone, it is more appropriate to wait for the results of the Aquatic Life Work Group's effort to propose refined aquatic life uses. To help assure a reasonable approach in the interim, the Commission believes that the flexibility provided by resegmentation, recalculation of standards at the time of permit renewal, and the tools available at 31.7(1) are adequate. On a case-by-case basis, appropriate standards can be established at the upper end of warm water segments and the lower end of cold water segments.

Implementation Overview: The Commission has identified an approach to the implementation of the temperature standards that attempts to strike a balance between: (1) the goal of having temperature standards in place in Colorado that will protect beneficial uses of our surface waters, particularly for aquatic life; and (2) the goal of minimizing the demands on internal and external resources in implementing temperature standards, in an effort to focus on instances where it is more likely that temperature may present a concern.

The Commission intends that implementation guidance will be developed by the Division to facilitate implementation of the narrative standard. However, the Commission does not intend that implementation of the new standard will be delayed pending finalization of such guidance.

Role of Numerical Temperature Criteria and Site-Specific Numerical Standards: The Commission has adopted numerical temperature criteria that have been included in Table I of these Basic Standards. These Table I criteria are established at levels that the record indicates will be generally protective of the beneficial use classifications. The Commission intends that the numerical table values will be used as the starting point for establishing segment-specific numerical standards for individual segments, while providing an opportunity for a demonstration that alternative site-specific standards are appropriate. Unlike pollutants that may occur at significant levels only rarely, such as beryllium or thallium, temperature is a parameter that can impact aquatic life in any waterbody. Therefore, the Commission anticipates that in the next round of triennial reviews, numerical temperature standards generally will be adopted for segments throughout the state.

Although the table value criteria adopted here will be used as the starting point for considering such standards, alternative site-specific standards may be appropriate. As outlined in the Basic Standards at section 31.7(1)(b), Ambient Quality-Based or Site-Specific Criteria-Based Standards may be adopted by the Commission. These situations include:

1. Ambient Quality-Based Standards may be established where evidence has been presented in accordance with subsection 31.7(1)(b)(ii): For state surface waters where evidence has been presented that the natural or irreversible man-induced ambient water quality levels are higher than specific numeric levels contained in tables I, II, and III, but are determined adequate to protect classified uses, the Commission may adopt site-specific chronic standards equal to the 85th percentile of the available representative data. Site-specific acute standards shall be based on the 95th percentile value of the available representative data. For temperature, chronic (MWAT) and acute (DM) standards will be set at a level that would be exceeded once in a three-year frequency.

2. The Recalculation Procedure: One option for determining appropriate site-specific standards is the use of a recalculation procedure, based on changes to the database used to calculate standards, where there is a determination that certain aquatic species do not occur and are not expected to occur at a particular location. The Division has developed an acceptable recalculation procedure, modeled after EPA's recalculation procedures. That procedure is set forth in the Temperature Criteria Methodology, Policy 2006-1.

3. Site-specific Narrative Standards: As provided in section 31.7(1)(c), narrative standards may be adopted on a site-specific basis. The Commission believes that numeric temperature criteria are not required under federal law and that this section provides authority to promulgate narrative temperature standards on a site-specific basis where convincing evidence is presented that the narrative statement will protect the uses. Although numerical standards generally provide more certainty to assure protection of the resource, a narrative standard may be appropriate where robust temperature and aquatic life data exist. Such a narrative standard proposal must include an implementation strategy.

The Commission notes that the adoption of site-specific standard may require resegmentation in some instances, e.g. to appropriately match numerical standards with changes in species compositions. The Commission also notes that in the initial round of basin hearings considering site specific temperature standards, in circumstances where there is concern about whether table value criteria are attainable, but there is inadequate information available – e.g. regarding ambient temperature levels or expected species composition – the adoption of temporary modifications pursuant to section 31.7(3)(a)(iii) may be appropriate.

Attainment in Lakes and Reservoirs: The Commission determined that when a lake or reservoir is stratified, the average temperature in the mixed layer may exceed the temperature criteria provided that an adequate refuge exists in a lower level. Adequate refuge exists when the lower levels meet both the temperature and applicable dissolved oxygen standards.

If the temperature criteria is not met in the mixed layer, and there is no adequate refuge, the lake or reservoir may be included on the 303(d) list as impaired for dissolved oxygen rather than temperature. The Commission recognizes that dissolved oxygen standards are intended to apply to the epilimnion and metalimnion, while dissolved oxygen in the hypolimnion may be less than the criteria due to natural conditions, although no reductions in dissolved oxygen levels are allowed due to controllable sources. Reg. #31, § 31.16, Table 1, Footnote 9.

Implementation in Discharge Permits: The provisions in section 31.14(14) have been revised to provide clarification regarding how temperature standards are to be implemented in discharge permits. The Commission added language to this section to emphasize that the Division will impose temperature effluent limits in permits only when the thermal energy in the discharge presents a significant threat to the standards.

Two general provisions were added to section 31.14(14) that provide exclusions from the circumstances where the Division will establish effluent limitations for temperature. First, no temperature effluent limitation will be applied if a discharge is to an effluent-dependent stream and there is no evidence that the aquatic life use may be negatively affected by the discharge. The Commission has determined that this provision is appropriate since ephemeral streams have no continuous flow and limited associated aquatic life, such that no adverse impact to aquatic life is anticipated.

Second, no temperature effluent limitation will be applied to a discharge of water from a natural hot spring, provided that the discharge is in the vicinity of the hot spring's natural outflow. The Commission determined that discharges of natural hot springs water do not have reasonable potential to cause significant adverse temperature impacts because the hot springs would flow directly into rivers and streams as natural heat sources if they were not diverted and used. A discharge will be considered to be "in the vicinity" of the natural outflow if it is to the same stream that would have received the hot springs flow under natural conditions and in the same general area that would have been affected by the natural flow of the hot springs.

For discharges that are not excluded by these two general provisions, the Division will conduct a reasonable potential analysis, to identify discharges with a potential to cause significant adverse temperature impacts. If this analysis shows that there is no reasonable potential for such impacts, no temperature effluent limitations will be established.

During the rulemaking hearing, there was consideration of an exclusion from temperature effluent limitations where it is determined that a discharger:

(a) has been in existence for at least 10 years, without a substantial increase in the quantity of its discharge;

(b) would not experience a substantial increase in the temperature of its discharge if a treatment process failure occurred;

(c) discharges effluent that only rarely exceeds the appropriate chronic temperature criterion in Table 1; and

(d) discharges to a receiving water that is not listed on the Section 303(d) List as impaired for aquatic life.

The Commission agrees that it is generally appropriate to exclude this class of dischargers, including, e.g., many municipal wastewater treatment plant discharges, from temperature effluent limitations based on the Commission's conclusion that this group poses a relatively low risk of causing adverse temperature impacts to aquatic life uses. Such an exclusion would not apply to discharges that have not been in place long enough to provide a substantial "track record" , discharges (such as power plants) that cool heated water prior to discharge, discharges that frequently exceed the default values in Table 1, and discharges on segments that have been identified as impaired for aquatic life. Rather than include this exclusion in the Basic Standards Regulation, the Commission has directed that the Division include an exclusion such as this as part of its reasonable potential guidance. In such guidance, the Division would retain the authority to determine, pursuant to a reasonable potential analysis, that individual discharges that meet the criteria of this provision nevertheless pose a risk of thermal impact to aquatic life that warrants the inclusion of effluent limits in a permit.

The Commission decided not to adopt an exemption from temperature limits for discharges covered by general permits as requested by the Colorado Rock Products Association. The Commission found that there was not adequate information to provide a blanket exemption for the several classes of discharges covered by general permits and that the need for temperature limits for these operations is appropriately determined during the permitting process. However, the Commission assumes that there may be several categories of discharges covered under current general permits that pose no threat to temperature standards, particularly those discharges for which there is a fair amount of dilution in the receiving water. Therefore, the Commission expects the Division to identify those classes of activities covered by general permits for which temperature is not a pollutant of concern and/or conduct a "class-wide" reasonable potential analysis to confirm whether temperature limits may be required.

Where a reasonable potential analysis determines that there is a potential to cause significant adverse temperature impacts, several results are possible. Barring information suggesting that an alternative result is appropriate, the Division will establish permit effluent limitations for temperature using the applicable temperature standards (either the basin-wide temperature standards that are listed at the beginning of each basin regulation or site-specific temperature standards that have been adopted). If the Division or a discharger believes that the effluent limitations resulting from such standards do not provide the appropriate level of temperature protection in a particular instance, three options are available.

First, the Division or a discharger may bring forth the results of a site-specific recalculation procedure analysis that supports variation from the applicable standards. As noted above, the recalculation procedure would need to be completed in a manner acceptable to the Division. An acceptable procedure is set forth in the Temperature Criteria Methodology, Policy 2006-1. This demonstration can be made at the time of permit application or for a standards hearing. When conducted as part of the permit renewal, the resulting recalculated standard should then be considered for formal adoption in the next regularly-scheduled basin-wide water quality standards rulemaking hearing or in a separate site-specific rulemaking, as determined appropriate by the Commission.

Second, a discharger could request a “section 316(a) waiver” , in accordance with the provisions added to section 31.14(14). This procedure has been established consistent with the provisions of the federal Clean Water Act and EPA’s implementing regulations, to allow a discharge-specific waiver based on a showing that alternative effluent limitations will be protective of the classified aquatic life use. This provision applies to both domestic and industrial dischargers. The Commission anticipates that in the future, Regulation No. 61 may be revised to provide added detail regarding the requirements of this provision.

Third, the Division or a discharger may request that the Commission adopt a site-specific numerical or narrative standard that differs from the applicable temperature standard where it can be demonstrated that the alternative standard provides an appropriate level of protection of the classified aquatic life use. The showing required for this option would be similar to that for a section 316(a) waiver, except that the result would be a water quality standard that applies to a water segment as a whole, rather than a discharger-specific effluent limitation waiver. Such a standard could be considered in a regularly-scheduled basin-wide water quality standards rulemaking hearing or in a separate site-specific rulemaking, as determined appropriate by the Commission.

For discharges to lakes and reservoirs, since the location of the refuge cannot be predicted, the Division should develop permit limits assuming the appropriate temperature standard is in effect for the entire mixed layer. The daily maximum was retained to facilitate permitting thermal discharges to lakes and reservoirs.

Implementation in the Section 303(d) Listing Process: With respect to implementation in the section 303(d) listing process, the Commission will hold an Administrative Action Hearing in May 2007 to consider approval of the Listing Methodology for the development of a 2008 Section 303(d) List. The Commission’s intent is that this Listing Methodology will provide that a segment’s thermal condition will be evaluated based on the basin-wide temperature standards that are listed at the beginning of each basin regulation until such time as segment-specific standards are adopted in the course of the regularly scheduled triennial reviews or in a separate site-specific hearing.

Ongoing review and refinement: The Commission acknowledges that this temperature criteria and standards rulemaking has not answered all the questions regarding appropriate temperature standards for Colorado’s waters and their applicability and implementation. More work needs to be done and as the Division and other interested parties gain experience with these provisions, the Commission anticipates that refinements to the system will be necessary. In particular, the Commission expects to see the results of the following in the course of the 2010 Basic Standards Rulemaking.

- Review and revision of Table Value criteria in recognition of newly available data.
- Consideration of numeric thermal shock provisions.

- Refined thinking regarding application of temperature standards to ephemeral and intermittent streams as they dry up.
- Reconsideration of how temperature standards are applied to transition zones.
- Review and reconsideration of the averaging period for the daily maximum.

PARTIES TO THE RULEMAKING HEARING

1. The Temperature Group (City of Aurora, City of Boulder, Colorado Springs Utilities, Littleton/Englewood Wastewater Treatment, The Metro Wastewater Reclamation District, Colorado Mining Association, Colorado Rock Products Association, Tri-State Generation & Transmission Assn., Xcel Energy, Denver Water, Northern Colorado Water Conservancy District, Southeastern Colorado Water Conservancy District)
2. City of Grand Junction
3. City of Loveland
4. City of Pueblo
5. Metro Wastewater Reclamation District
6. City of Aurora
7. City of Boulder
8. Colorado River Water Conservation District
9. Colorado Wastewater Utility Council
10. Bear Creek Watershed Association
11. Chatfield Watershed Authority
12. Mountain Coal Company, L.L.C.
13. Northern Colorado Water Conservancy District
14. Colorado Rock Products Association
15. Littleton/Englewood Wastewater Treatment Plant
16. Northwest Colorado Council of Governments
17. Southeastern Colorado Water Conservancy District
18. Colorado Mining Association
19. Colorado Division of Wildlife
20. South Platte Coalition for Urban River Evaluation
21. City and County of Denver
22. City of Colorado Springs and Colorado Springs Utilities
23. City of Westminster
24. Board of Water Works of Pueblo
25. Coors Brewing Company
26. City and County of Broomfield
27. Centennial Water and Sanitation District
28. Plum Creek Wastewater Authority
29. Climax Molybdenum Company
30. Cripple Creek & Victor Gold Mining Company
31. Tri-State Generation and Transmission Association
32. Xcel Energy
33. Sky Ranch Metro-politan District No. 2
34. Parker Water and Sanitation District
35. CAM-Colorado and CAM Mining LLC
36. Aggregate Industries – WCR, Inc.
37. Grand County Water and Sanitation District #1, Winter Park Water and Sanitation District, Winter Park West Water and Sanitation District and Fraser Sanitation District
38. Trout Unlimited and Colorado Trout Unlimited
39. Colorado Contractors Association
40. United States Environmental Protection Agency, Region 8
41. Hot Springs Lodge and Pool
42. Denver Regional Council of Governments

31.46 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; DECEMBER 10, 2007 RULEMAKING; EFFECTIVE MAY 31, 2008

The provisions of sections 25-8-202(1)(b), 25-8-204; and 25-8-402, C.R.S., provide the specific statutory authority for adoption. The Commission also adopted, in compliance with section 24-4-103(4) C.R.S., the following statement of basis and purpose.

BASIS AND PURPOSE:

In this rulemaking, the Commission adopted revised and new organic chemical standards in section 31.11(3). In an effort to keep ground water and surface water organic chemical standards consistent, the changes to 31.11(3) were considered during the same hearing that addressed changes to the statewide Ground Water Organic Chemical Standards in Regulation No. 41 (Basic Standards for Ground Water).

In adopting these new and revised organic chemical standards, the Commission continued to rely on its past policy decisions and precedence documented in Commission Policy 96-2. Additionally, as per Departmental policy the Commission has relied on the United States Environmental Protection Agency's (EPA) Integrated Risk Information System (IRIS) as its first tier source of toxicological data. Review of the IRIS data that had been updated since the last revisions to section 31.11(3) indicated that the water quality standards for two organic chemicals, toluene and 1,2-dibromoethane, needed to be revised.

At the last hearing addressing section 31.11(3), in September 2004, during which the Commission adopted water quality standards for several carcinogenic compounds, EPA had requested that a future rulemaking consider water quality standards for non-carcinogenic compounds. For this hearing the Commission reviewed several non-carcinogenic compounds that lacked water quality standards. This review identified four pesticides for which the Commission elected to adopt water quality standards: acetochlor, dicamba, metribuzin, and prometon. Aquatic life-based standards for diazinon were also adopted, based on EPA guidance.

Nonylphenol: The Commission considered evidence presented in regards to the proposal to adopt aquatic life-based standards for nonylphenol. The Commission decided to adopt acute and chronic standards with a delayed effect date of 7/1/2010 as agreed to by the parties and the Division. This delay is intended to allow time for EPA, the Division and the parties to resolve uncertainty regarding the analytical methods for testing influent waste streams. Prior to the effective date, the Metro Wastewater Reclamation District, the City of Boulder, Littleton/Englewood and Colorado Springs Utilities have committed to working on source control of nonlyphenol with the commercial laundry sector through their Pretreatment Programs. For purposes of discharge permits, the Commission expects that, because of limitations in the available data, the Division will include effluent monitoring requirements in major permits issued prior to the delayed effective date. The monitoring requirement would become effective the same date that the standards became effective.

The Commission also corrected several typographical errors and added common synonyms for some of the organic chemicals.

PARTIES TO THE RULEMAKING

1. Centennial Water and Sanitation District, Town of Castle Rock, Castle Pines Metropolitan District, Consolidated Mutual Water Company, Rangeview Metropolitan District
2. Metro Wastewater Reclamation District
3. Colorado Wastewater Utility Council
4. City of Boulder
5. City of Colorado Springs and Colorado Springs Utilities
6. City and County of Denver Department of Environmental Health
7. Climax Molybdenum Company
8. Information Network for Responsible Mining (INFORM), High Country Citizens' Alliance (HCCA), and Coloradoans Against Resource Destruction (CARD)
9. United States Environmental Protection Agency, Region 8

10. U.S. Department of Energy (DOE) Office of Legacy Management
11. Upper Black Squirrel Creek Ground Water Management District

31.47 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE: OCTOBER 13, 2009 RULEMAKING, EFFECTIVE DATE OF NOVEMBER 30, 2009

The provisions of sections 25-8-202(1)(b); 25-8-204; and 25-8-402, C.R.S., provide the specific statutory authority for the amendments to this regulation adopted by the Water Quality Control Commission (Commission). The Commission has also adopted, in compliance with section 24-4-103(4) C.R.S., the following statement of basis and purpose.

BASIS AND PURPOSE

In 2007, the Commission adopted aquatic life-based standards for nonylphenol with a delayed effective date of 7/1/2010. The purpose of the delayed effective date was to address uncertainties associated with analytical methods and possible source control options. The effective date for nonylphenol standards was identified as an issue for the June 2010 Basic Standards Rulemaking Hearing. In this written comment rulemaking, the Commission postponed the effective date for nonylphenol standards until January 1, 2011 to avoid implementation of these standards prior to their being addressed at the June 2010 hearing.

During its September 2004 rulemaking, the Commission adopted two standards for 1,4 dioxane -- 6.1 ug/L to be effective through March 21, 2010; and 3.2 ug/L to become effective on March 22, 2010. The dual standard was adopted, in part, due to the uncertainty about the risks posed by 1,4 dioxane and the fact that EPA was in the process of updating the Integrated Risk Information System (“IRIS”) database for that compound. At that time, the Commission adopted the 6.1 µg/L value (which had been typically used for remedial activities in Colorado) as a temporary standard in order to maintain the status quo for a period of five years to give EPA time to complete its IRIS update. The Commission determined that if EPA’s pending review resulted in a change in the IRIS value, the Commission could consider a corresponding revision of its standards. As of this date, EPA has not completed the IRIS review.

In May 2009, EPA released an updated draft toxicological review on 1,4 dioxane for external peer review. According to the current schedule, final completion of the IRIS update should occur before the end of 2011.

In order to continue the status quo until EPA completes the IRIS update, the Commission is postponing the effective date for the more restrictive 1,4 dioxane standard of 3.2 ug/L from March 22, 2010 to March 22, 2012 to give EPA time to finish the IRIS update.

31.48 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; JUNE 7-8, 2010 RULEMAKING; FINAL ACTION AUGUST 9, 2010; EFFECTIVE DATE JANUARY 1, 2011

The provisions of sections 25-8-202(1)(b), 25-8-204; and 25-8-402, C.R.S., provide the specific statutory authority for adoption. The Commission also adopted, in compliance with section 24-4-103(4) C.R.S., the following statement of basis and purpose.

BASIS AND PURPOSE:

I. WATER QUALITY CONTROL DIVISION PROPOSALS

A. Temporary Modifications

Background: In 2000, the Commission added “type iii” temporary modifications to section 31.7(3) to recognize that uncertainty regarding the underlying standard was an appropriate use of temporary modifications (see Statement of Basis, Regulation #31, at section 31.37, IV C,). In 2005, the Commission further revised section 31.7 to remove the distinction between the types of temporary modifications, clarify the durations of temporary modifications, and institute an annual review of temporary modifications. One of the primary purposes of these revisions was to focus attention on ending the need for the temporary modification as soon as possible (see Statement of Basis, Regulation #31, 31.44, I. D). These revisions resulted in a significant change in the Division’s approach to temporary modifications, primarily in limiting the use of temporary modifications to situations where there are point source discharges that face unreasonable outcomes.

During the time that Colorado’s temporary modifications regulatory provisions have been changing, EPA has also revised its policy regarding permit compliance schedules. Previously, it was thought that compliance schedules could be no longer than the term of the permit. This meant that attainment of underlying water quality standards had to occur by the end of the five-year permit term. EPA has recently revisited the issue and now says that compliance schedules can extend past the end of the permit term.

In the last few years, the Division has implemented the revised provisions both in the regularly scheduled basin hearings and in the new annual temporary modification review hearings. Various parties have expressed concern about the new practices. The current changes are the result of Standards Framework Work Group dialogue.

Organizational Revision of Section 31.7: The current 31.7(4) was deleted and the contents moved to other sections in 31.7. Overview language that was previously at subsection 31.7(4)(a) was moved to the beginning of 31.7 as an introductory paragraph, because it speaks to the process for all of the following subsections. 31.7(4) (b) was moved to the end of subsection (3) which addresses temporary modifications.

Commission Intent: The Commission continues to believe that temporary modifications are an important and useful water quality standards tool. The benefits of recognizing a short-term need for flexibility in the standards system is evident specifically where there are permitted dischargers on the segment.

The practical result of a temporary modification is to provide relief for permitted discharges until the time the uncertainty is resolved. The Commission continues to believe that it is more appropriate to focus resources on resolving the uncertainty rather than to focus on compliance with underlying standards that may not be appropriate.

Since temporary modifications have no impact on other aspects of Colorado’s water quality management program such as the 303(d) list, the Non-point Source Program or the Total Maximum Daily Load (TMDL) Program, it is fitting that temporary modifications only be used where there are permitted discharges that would face unreasonable consequences in the absence of a temporary modification (e.g., a permit compliance schedule to meet a standard that is significantly uncertain).

Changes to the Regulation: The Commission revised the conditions for granting a temporary modification to specifically address the types of situations that warrant adoption of a temporary modification. Temporary modifications now explicitly provide time to resolve three types of uncertainty: 1) to determine what criteria is necessary to protect the use; 2) to determine whether the sources causing the impairment are correctable; and 3) determine how additional treatment will be provided.

The third condition, significant uncertainty regarding the timing of implementing attainable source controls or treatment, will be repealed on 1/1/2013. The Commission believes that that this type of uncertainty is better addressed through the discharger-specific variance provisions which will become effective on that date.

In addition to requiring one of the three types of significant uncertainty, the Commission revised section 31.7(3)(a) to establish that temporary modifications are authorized only if there is a demonstrated or predicted water quality-based effluent limit noncompliance problem. This requirement is intended to limit adoption of temporary modifications to situations where there is evidence that a discharger would face unreasonable consequences in the absence of a temporary modification.

The Commission also added section 31.7(3)(b) to provide additional detail on the factual information that must be submitted in support of temporary modification proposals. The Commission notes that Division has developed an initial checklist and expects that while it may be refined over time as necessary, the Division will begin to use it to document the information that justifies temporary modifications. It will help clarify the expectations for meeting the requirement that we are adding to the regulation. While it will help assure that there is a consistent approach to documenting the need for temporary modifications, the Commission recognizes that the level of effort will vary considerably with the site-specific situation.

The Commission modified section 31.7(3)(d) to clarify that the duration of a temporary modification is to be based on relevant factors including how soon resolving the issues that necessitated adoption of the temporary modification is deemed feasible. The Commission’s intent is that it is important to consider site-specific information, e.g., the plan for resolving the uncertainty, in identifying an appropriate expiration date.

B. Discharger Specific Variance Provisions

In this rulemaking, the Commission adopted a new subsection in section 31.7 with a delayed effective date of January 1, 2013, establishing an option for the adoption of a discharger-specific variance in certain circumstances. Subsection (4) was added to section 31.7 to describe the process and criteria for granting, extending or removing variances. Subsection (17) was added to section 31.14 to explain how discharger-specific variances are to be integrated into discharge permits.

<u>Overview:</u> A discharger-specific variance establishes an alternative water-quality based effluent limit value that takes the place of a standards-based effluent limit for a specific point source discharge. Since technology-based effluent limits apply independently of water quality-based requirements, discharger-specific variances do not apply to technology-based effluent limits. Technology-based effluent limits must still be met, even where a discharger-specific variance has been established.

During the term of the variance, all other water quality standards not specifically modified remain applicable. Variances ensure that the highest attainable level of water quality is achieved. At the time of the periodic basin review, the basis for the discharger-specific variance must be reviewed to determine if there has been any change in the factors upon which the variance was granted.

Variances may be granted only where there are no feasible alternatives (e.g. pollutant reduction or elimination, seasonal retention, or land application) that would allow the regulated activity to proceed without a discharge that exceeds water quality-based effluent limits (WQBELs), In addition, the Commission intends that the effluent limits included with the variance require the highest degree of protection for the use classification that is feasible to achieve.

In most instances, variances are not appropriate for new discharges. This is because a broader range of alternatives are typically feasible for a new discharge than for an existing discharge. However, the Commission believes that there are a limited number of situations where variances for new discharges should be considered.

It is the Commission's intent that discharger-specific variances are to be used after other avenues (such as temporary modifications) have been shown to be inappropriate. As specified in subsection (4)(b)(ii), temporary modifications of standards must be considered before moving forward with a request for a discharger specific variance. Temporary modifications have been an effective tool in a variety of circumstances where standards are not net. The Commission is adding the discharger-specific variance option at this time because there is a limited set of circumstances where temporary modifications are not available or may not be the most effective water quality management tool.

Delayed Effective Date: The discharger-specific variance provisions will become effective on January 1, 2013. In the intervening time, it is anticipated that the Division, with input from interested stakeholders, will develop guidance to provide additional detail regarding the implementation of the discharger-specific variance provisions adopted by the Commission. The intent of the guidance is to make the discharger-specific variance adoption and implementation process more transparent and understandable to all interested parties, while providing appropriate flexibility.

Periodic Review Requirement: A discharger-specific variance acts as a revised water quality standard for a particular discharge and will be considered by the Commission in the context of water quality standards rulemaking proceedings. The variance will be reviewed in conjunction with the water quality standards review cycle that fulfills the triennial review requirements. If, at the Issues Scoping Hearing or Issues Formulation Hearing, it is determined that action is appropriate before the next scheduled basin-wide standards rulemaking hearing, a special hearing will be held.

Expiration Dates: Discharger-specific variances are temporary and will include an expiration date. In determining the appropriate duration for a variance, the Commission's primary consideration will be the site-specific basis for the variance and the potential for achieving more protective effluent concentration or load. Additional considerations will be the timing of the discharge permit renewal and basin review cycle.

Criteria for Granting a Variance: The Commission established three independent tests for determining whether a variance is warranted. One addresses situations where achieving a specific water quality-based effluent limit is not feasible because such treatment is beyond the limits of current technology. In these cases, the technology does not exist, or if it does exist, cannot treat to the levels that are required to meet water quality standards.

The second test relates to situations where achieving water quality-based effluent limits is not feasible because the costs of required treatment would cause substantial and widespread adverse economic and social impact. Facility-specific cost, affordability, and treatment information is necessary to support a decision that a discharger-specific variance is appropriate under this test.

The third test relates to the non-economic consequences of increased treatment, including the effects on other media such as air or land. The language of this test is the same as the 40 CFR 131.10(g)(3) downgrading factor. The Commission understands this test as weighing and balancing the tradeoffs between the environmental damage caused by (in this case) exceedance of effluent limits with the environmental damage caused by meeting those effluent limits. For consideration of this factor, the Commission expects to see discussion of considerations such as the fate and transport of the pollutant if the treatment works were not present, including the effect of the point source on the timing, concentrations and location of the pollutant's delivery to the receiving water.

The second element of the “other consequences” test relates to an assessment of the wider environmental impacts of increased treatment on other media as well as on water quality. For this element, there would need to be a demonstration that the increased treatment would cause more environmental damage than the benefits of meeting the standard warrant. The entity advocating this reason for a variance would need to demonstrate the basis for such a policy decision.

In addition to meeting one of these three tests to demonstrate need for the variance, the applicant for a variance must demonstrate that the conditions for granting a temporary modification are not met. Alternatively, if that demonstration cannot be made, in order to grant the variance, the Commission must make an affirmative determination that the variance is the most appropriate water quality management tool to address the site-specific circumstances. As noted above, temporary modifications have been an effective tool for many years. The Commission's intent is that, by adding the discharger-specific variance option at this time, progress can be made on the limited set of circumstances where temporary modifications are not available or may not be the most effective tool.

Selection of the Alternative Effluent Limits: A discharger-specific variance will be selected after an evaluation of the alternative pollutant removal techniques and consideration of the impact of the variance on the uses of the stream in the area of the variance and downstream of that area. Alternative techniques should include such options as pollutant reduction or elimination (for instance in industrial manufacturing processes or the pretreatment context), seasonal retention, land application and treatment process alternatives. The chosen option must provide the highest degree of protection of the classified use that is feasible in 20 years, taking into considerations the factors in subsection (4)(a)(i)(C), where appropriate.

Permits are to include "alternative effluent limitations" which represent the limits that can be achieved at full implementation of the chosen option. The alternative effluent limits may be adjusted as new information becomes available. In some cases, for instance where current pollution removal techniques represent the limits of technology, alternative effluent limits may correspond to the level currently attained.

In most cases, acute and chronic alternative effluent limits will be specified. However, on a case-by-case basis, it may be more appropriate to establish other duration-based limits.

During the term of the variance, it is the Commission's intent that the permit require progress towards meeting the alternative limit as quickly as feasible. Steps necessary to document that progress will depend on the facts of a specific situation and the basis for the variance. In some cases, investigation of treatment technologies should continue; in others, it may require long-range planning for wastewater reuse where allowed, or process modification.

Relationship with other regulatory provisions

Antidegradation: In situations where a discharger-specific variance would authorize water quality degradation and trigger the requirement for an antidegradation review, the alternatives analysis upon which the selection of the interim limit was based can also be used for the antidegradation review. Since a demonstration that a current water quality standard is not attainable (required when a variance is considered) is a higher bar than demonstrating that protection of assimilative capacity beyond the standard is not required, it is likely that no additional analysis will be required.

Impaired Waters: As stated above, adoption of a discharger-specific variance constitutes a policy decision that, according to the terms of the variance, during the life of the variance the underlying standard does not need to be met. When a discharger-specific variance is adopted for an impaired water segment that is impaired by multiple sources, development of a TMDL would be required. The Commission intends that alternative effluent limits would establish the extent of regulatory requirements for the discharger in question, in accordance with the terms of the discharger-specific variance. Any impairments that are solely attributable to a duly authorized variance, are not to be included on the section 303(d) List. The section 303(d) List is the list of waters that still require a TMDL. In the case of impairments solely attributable to (and authorized by) a variance, a TMDL is not required since it is apparent why the water quality is impaired, and thus a TMDL is not necessary to identify the remedy for these waters. Cases where multiple sources contribute to an impairment would need to be examined on a case-by-case basis, and section 303(d) Listing may be appropriate.

Regulation #61: The Discharge Permit Regulations (at section 61.12(a)) specify the conditions under which the Division can grant variances. In the context of permitting, the Division may grant variances to non-federal standards (i.e. ground water quality standards). The next time that Regulation #61 is revised, the Commission intends that the word “ground water” will be inserted before the word “standard” in the first line of 61.12(a).

C. Antidegradation

The Commission refined one aspect of the Use Protected designation provisions of section 31.8. The period 2000-2009 was inserted in the considerations for designating a water as Use Protected (see 31.8(2)(b)(i)(C)); i.e., a waterbody would need to have been effluent dependent or effluent dominated during the period 2000 - 2009. The purpose of this change is to avoid a situation where, over time, more and more waters become effluent dominated and therefore use-protected without the protection of antidegradation review regarding proposed new or increased water quality impacts.

The Commission declined to adopt the Division proposal to modify the definition of “Effluent Dominated”. The Commission chose to retain the “eight out of ten” years required instead of changing it to “six out of ten” years.

D. Dissolved Oxygen in Lakes

The Commission clarified the application of dissolved oxygen criteria in lakes and reservoirs in footnote 9 of Table 1 in 31.16. The Commission determined that standards for dissolved oxygen apply as minima against which an individual profile will be assessed. Therefore, dissolved oxygen data collected from multiple locations in a single lake or reservoir on the same date will be assessed independently, and not averaged together.

Recreation: For the recreation use classification, the dissolved oxygen standard should apply to the upper portion of a lake or reservoir, which is typically where primary contact occurs. The dissolved oxygen standard within a single profile will generally be assessed as the average of all measurements from 0.5 meter to 2.0 meters, or to the bottom, whichever is less. Dissolved oxygen standards may be applied to deeper portions of a lake or reservoir on a site-specific basis if there is evidence that primary contact occurs in deeper portions of a lake or reservoir.

Agriculture: For the agriculture use classification, the dissolved oxygen standard should apply to the upper portion of a lake or reservoir, which is typically where livestock drink, and/or where water is diverted for irrigation. The dissolved oxygen standard within a single profile will generally be assessed as the average of all measurements from 0.5 meter to 2.0 meters, or to the bottom, whichever is less. Dissolved oxygen standards may be applied to deeper portions of a lake or reservoir on a site-specific basis if there is evidence that water for livestock or irrigation is drawn from deeper portions of a lake or reservoir.

Aquatic Life: For the aquatic life use classification, the numeric dissolved oxygen standards should apply to the upper portion of a lake or reservoir. The dissolved oxygen in the upper portion of a lake or reservoir will generally be characterized within a single profile as follows:

1. Where a lake or reservoir is equal to or greater than 5 meters deep, the dissolved oxygen within a single profile will generally be assessed as the average of all measurements from 0.5 meters to 2.0 meters.

2. Where a lake or reservoir is less than 5 meters deep, but more than 1.25 meters deep, the dissolved oxygen within a single profile will generally be assessed as the average of all measurements from 0.5 meters to a depth equal to 40% of the total depth.

3. Where a lake or reservoir is 1.25 meters deep or less, the dissolved oxygen within a single profile will generally be assessed as the median of all measurements.

The Commission decided that dissolved oxygen may be less than the applicable standard in the lower portion of a lake or reservoir except where footnote 5(c)(iii) applies or a site-specific standard has been adopted. The Commission expects that the need for a site-specific standard will be determined at a standards hearing. Interested parties should work together to develop site-specific standard proposals that will protect species expected to occur based on sound scientific rationale and evidence.

Fall Turnover Exclusion: The Commission created additional flexibility with respect to the dissolved oxygen standard during fall turnover when oxygen-depleted bottom water may be mixed throughout a lake or reservoir. The fall turnover exclusion allows the dissolved oxygen to drop one milligram per liter below the table value standard for up to 7 days during fall turnover. However, a dissolved oxygen profile must be measured 7 days before and again 7 days after the profile with low dissolved oxygen is measured at a consistent location to ensure that the depressed oxygen condition does not persist for more than the allowed 7-day period. The Commission recognizes that fish grow more slowly when oxygen levels are slightly depressed, but also recognizes that low dissolved oxygen during fall turnover is a natural phenomenon, and that fish and other aquatic species can withstand this event without long-term negative consequences. Lakes with fish species that spawn in the fall do not qualify for the fall turnover exclusion since eggs and larvae are more sensitive to the negative effects of low dissolved oxygen. An exception to this is allowed if data show that adequate dissolved oxygen is maintained in all spawning areas for the duration of fall turnover.

Water Supply: The Commission left the existing Footnote 9 in place for the water supply use classification, but expects to consider revisions of the numeric criterion of 3.0 mg/l, and its application to lakes and reservoirs at the next basic standards rulemaking hearing in 2016.

E. Temperature Criteria

The Commission reformatted the temperature criteria in 31.16 Table 1, and updated the values based on new data included in the Colorado Temperature Database. The Commission also deleted the razorback sucker tier (warm stream tier III), and included the razorback sucker in warm stream tier II because the expected range of the razorback sucker is also habitat for the more thermally sensitive white sucker. Since the temperature tier applied to a segment is based on the most thermally sensitive species, the razorback sucker tier was never applied. However, this action does not preclude the adoption of a site-specific temperature standard based on the expected occurrence of the razorback sucker.

Several corrections were made to the temperature criteria. Both the Arctic grayling and golden shiner were moved from stream tiers to the cold and warm lake tiers respectively because both species are found only in lakes. Additionally, a typographical error in the chronic temperature criterion for cold stream tier II, and large lakes and reservoirs was corrected.

The Commission also adopted a provision in footnote 5(c)(iv) of Table 1 to exclude certain exceedances of the temperature criteria in the shoulder-seasons from being considered an impairment of the aquatic life use. The footnote excludes exceedances of the winter temperature criteria in cold streams for 30 days before the transition from winter to summer, and 30 days after the transition from summer to winter provided that the natural seasonal progression of temperature is maintained. The Commission adopted this exclusion to account for year-to-year variation in the timing of the natural seasonal fluctuation of temperature. The Commission does not intend for this footnote to change the underlying table value during the winter shoulder season. The Commission did not apply this exclusion to lakes or warm-water streams because there was no evidence that spring and fall temperature fluctuations occur naturally outside of the regulatory “summer” season in these systems. The Commission believes that this issue should be reevaluated as more data becomes available.

The Commission also changed the air temperature exclusion in footnote 5(c)(i), so that sites must exceed the monthly maximum air temperature instead of the annual maximum air temperature. This change makes it possible to exclude data from any extraordinarily warm day for any time of year, and not just in summer when the maximum annual temperature occurs.

The Commission also clarified the definition of “maximum weekly average temperature” in 31.5 by deleting the word “daily” and adding the word “summertime”.

F. *E. coli* averaging period

The Commission adopted an averaging period of two months for the existing *E. coli* standards in Footnote 7 to Table 1. Without an averaging period, assessments have masked seasonal trends in *E. coli* at impairment concentrations. An averaging period of two months was selected to closely approximate the duration of the eight-week epidemiological studies, which are the basis for the table value criteria. Site-specific or seasonal standards will be assessed with intervals as close as possible to two months.

G. Point of Water Supply Intake-Implementation

The Commission clarified how the domestic water supply standards for arsenic and nitrate would be implemented in permits by expanding on the Table II footnote 4 (nitrate) and Table III footnote 14 (arsenic). These two standards apply at the point of water supply intake. In order to provide a consistent level of protection and simplify implementation in the CDPS permitting process, the default assumption will be that the standard is applied at the end of the applicable regulatory mixing zone. This presumption can be overcome if the permittee provides information demonstrating 1) that there is no actual domestic water supply use; or 2) that the standard will not be exceeded at the point of intake

H. Metals Tables Values

Aluminum: With regard to aluminum, information was presented at the hearing indicating that the total recoverable aluminum water quality standard of 750 µg/L acute and 87 µg/L chronic, including the relevant footnote, should be revised. The technical basis for the existing aluminum standards was the 1988 United States Environmental Protection Agency (“EPA”) Aluminum Document subsequent to which additional relevant data and information has become available. The revisions to the acute and chronic aluminum standards used the EPA criteria derivation and recalculation procedures. The revisions also considered the results from more recent studies such as the Arid West Water Quality Research Project (2006), which analyzed potential updates to aluminum standards based on more complete literature reviews. The Arid West work was primarily based on an overall evaluation of the EPA recalculation procedure for Arid West effluent-dependent water users and provided information that was unavailable when the 1988 Aluminum Document was prepared. Specifically, the Arid West recalculation procedure analysis discovered an inverse aluminum toxicity and hardness relationship. A hardness-based aluminum standard is more representative of the concentration levels that harm aquatic life and so provides a better measurement of potential toxicity. The total recoverable aluminum acute criteria range from 512 µg/L to 10,071 µg/L at hardness concentrations of 25 mg/L and 220 mg/L, respectively. Following discussions with the Parties, the Commission has adopted a modified version of the original chronic criteria proposal to reflect certain species’ chronic sensitivity, specifically Daphnia magna. Using the modified criteria equation, the total recoverable aluminum chronic criteria range from 73 µg/L to 1,438 µg/L at hardness concentrations of 25 mg/L to 220 mg/L. Given the available data, it was recommended that the upper bound of hardness calculations be 220 mg/L, rather than the standard 400 mg/L for other metals equations. In addition, it was noted by the Commission that some evidence indicates that rainbow trout may exhibit increased sensitivity to aluminum within the upper range of the pH standard. The Commission intends to revisit the standard if new data and information become available indicating that the current standard is not protective of rainbow trout.

Iron: The Commission declined to adopt the proposal submitted by the Colorado Mining Association. The evidence did not support the assertion that the proposed dissolved iron criterion would be protective of aquatic life.

Mercury: The Commission deleted the acute mercury table value of 1.4, and the chronic mercury table value of 0.77. These values were based on toxicological studies that included water as the sole pathway of exposure. The remaining table value for aquatic life is based on toxicological studies that included both water and food as pathways for mercury exposure. The food pathway is particularly important for mercury since it is bioaccumulative, and biomagnifies up the food chain.

Molybdenum: The Commission adopted total recoverable molybdenum table-values for the drinking water supply and agriculture use classifications. The molybdenum criterion of 210 ug/l for water supply is based on an RfD-like value that the Institute of Medicine derived from the Fungwe et. al. (1990) study and was calculated in accordance with Policy 96-2. The Commission urges the Division to review this standard and consider EPA's expected health reference level and the work underway in Europe.

The molybdenum criterion of 300 ug/l for agriculture is intended to protect livestock from the effects of molybdenosis. The agriculture table value assumes that the safe copper:molybdenum ratio is 4:1. Total copper and molybdenum intakes are calculated from the following equations:

Cu intake mg/day = [([Cu] forage, mg/kg) x (forage intake, kg/day)] + [([Cu] water, mg/l) x (water intake, L/day)] + (Cu supplementation, mg/day)

Mo intake mg/day = [([Mo] forage, mg/kg) x (forage intake, kg/day)] + [([Mo] water, mg/l) x (water intake, L/day)] + (Mo supplementation, mg/day)

The assumed values for these equations are as follows:

[Cu] forage = 7 mg/kg, [Mo] forage = 0.5 mg/kg, forage intake = 6.8 kg/day, [Cu] water = 0.008 mg/L, [Mo] water = 0.375 mg/L, water intake = 54.6 L/day, Cu supplementation = 48 mg/day, Mo supplementation = 0 mg/day.

Food and water intake is based on a 273 kg (600 lb) feeder steer consuming 6.8 kg/day of dry matter and 20% of its body weight in water per day. Site-specific water intake rates should be based on estimates of actual water consumption rates based on maximum air temperatures rather than need since cattle typically consume more water than strictly necessary. In general, assumptions about copper, molybdenum, and sulfur exposure for the purpose of deriving site-specific molybdenum standards should reflect current or potential exposure levels that are reasonable for the area, including dietary supplements. When calculating site-specific standards, copper supplementation should be as low as possible and not higher than 400 mg/day.

Uranium: The Commission revised the table value for uranium to be a hyphenated value. The Commission retained the 30 μg/L value, the maximum contaminant level (MCL) from EPA's 2000 radionuclides rule, and added a value of 16.8 μg/L. The 16.8 μg/L value is derived from use of the reference dose and relative source contribution from the 2000 radionuclides rule in Equation 1-1 of Policy 96-2. This equation and the resulting value are based purely upon the protection of human-health and do not take treatment or economic considerations into account as does the MCL. Footnote 13 to Table III will be applied to the revised uranium table value. The human-health value of16.8 μg/L is based upon protection against the chemical toxicity effects of uranium. The Commission also added footnote 17 to reference 31.11(2) which establishes the need to maintain radioactive materials at the lowest practical level.

Zinc: Since the 2005 Regulation No. 31 Basic Standards Hearing, the zinc criteria have undergone an additional technical review and update as part of the Arid West Water Quality Research Project. These revisions involved extensive literature searches and evaluation of a considerable amount of usable data for the acute and chronic zinc toxicity databases. Using these latest updates to the acute and chronic zinc toxicity databases, the zinc criteria equations were updated.

Zinc (sculpin): The Commission added a chronic zinc equation for sculpin with modifications based upon new data and information available since adoption of the equation in 2005 (31.44). Although the equation was not captured in Table III of Regulation 31 at that time, it has been adopted and applied in some of the basin regulations, Regulations 33, 34, 35, & 37. The equation applies where mottled sculpin are expected to occur and hardness is less than 102 ppm $CaCO_3$. It does not apply where mottled sculpin are expected to occur if the hardness is greater than 102 ppm $CaCO_3$. Footnote 15 was added to Table III to clarify the Commission's intent for application.

The equation is based upon data and information characterizing the chronic toxicity of zinc to Colorado sculpin as zinc varies with hardness. Chronic data from sculpin outside of Colorado were not used because their toxicity exhibits a different relationship with hardness. The equation is a linear regression of chronic toxicity values and hardness.

I. Nonylphenol

The Commission declined to adopt the proposal submitted by the Wastewater Utility Council that the effective date of the nonylphenol standard be delayed until January 1, 2017, because the standard is not in dispute and is needed to protect aquatic life. However, the Commission recognizes the concerns about implementation of the standard expressed by several dischargers. These concerns relate to the potential difficulty of testing, measuring and controlling nonylphenol and its precursors. The Commission is retaining the effective date of January 1, 2011, based on its understanding that the normal permitting process would be followed. Effluent limits would not normally be imposed during the initial round of permit renewals, but monitoring would be required as a first step.

J. Other Changes

The Commission added clarification to a number of items and corrected minor typographical errors:

- The definition of "chronic standard" (at 31.5(7)) was revised to remove the reference to unionized ammonia.

- The definition of "existing quality" (at 31.5(20)) was revised to reference total ammonia instead of unionized ammonia and to clarify the time period used for determining existing quality for temperature.

- The subsection on ambient quality-based standards (at 31.7(1)(b)(ii)) was revised. The reference to the 85th percentile was changed to "existing quality" which is defined at 31.5(20) and includes the 85th percentile for dissolved metals, the 50th percentile for total recoverable metals and the appropriate statistics for pH, DO and temperature. The sentence regarding ambient temperature standards was deleted because it is covered in the definition of "existing quality." Acute standards for parameters in Tables I and II will be handled on a case-by-case basis.

- A solid line was added at the end of the footnotes to the Basic Standards for Organic Chemicals in subsection 31.11(3) to distinguish the end of the footnotes from the beginning of subsection 31.11(4)

- Punctuation was corrected in subsection 31.14 (16).

- A reference was added at subsection 31.16(3)(O).

- In Table I, the typographical error for the dissolved oxygen table value for warm water aquatic life was corrected to reflect the correct value of 5.0 mg/l. The coldwater values of 6.0 mg/l and 7.0 mg/l (spawning) had been incorrectly copied into the warm water column.

- For clarification, "1-day" was deleted from Footnote 1 to Table I.

- Language describing the transition from fecal coliforms to E. coli was deleted from Footnote 7 to Table I because this transition is complete.

- A reference to Footnote 9 was added to Footnote 1 to Table I.

- Footnote 8 to Table I was deleted because it is not used.

- The Table III column heading “Drinking Water Supply” was changed to “Domestic Water Supply” to match the name of the classification at subsection 31.1.3(1)(d).

- A missing parenthesis was replaced in the cadmium aquatic life chronic equation in Table III.

- Table IV was reformatted, the acute and chronic zinc values were updated to reflect changes adopted in this hearing, a row was added for chronic zinc numbers for the protection of mottled sculpin and the acute cadmium value at hardness 400 was corrected.

PARTIES TO THE RULEMAKING

1. Colorado Wastewater Utility Council
2. Colorado Mining Association
3. City of Grand Junction
4. South Platte Coalition for Urban River Evaluation
5. Colorado Division of Wildlife
6. City of Boulder
7. City of Westminster
8. City of Colorado Springs and Colorado Springs Utilities
9. Littleton/Englewood Wastewater Treatment Plant
10. Metro Wastewater Reclamation District
11. Denver Water
12. Northern Colorado Water Conservancy District
13. City of Black Hawk and Black Hawk/Central City Sanitation District
14. Suncor Energy (U.S.A.)
15. Bill Thiebaut, District Attorney for the 10th Judicial District
16. Western Colorado Water Network (San Juan Citizens’ Alliance, High Country Citizens’ Alliance, Colorado Environmental Coalition, Colorado Trout Unlimited)
17. Cherry Creek Basin Water Quality Authority
18. Colorado River Water Conservation District
19. U.S. Energy Corp. and Mount Emmons Moly Corp.
20. Climax Molybdenum Company
21. City of Pueblo
22. Tri-State Generation and Transmission Association
23. Xcel Energy
24. Paint Brush Hills Metropolitan District
25. Pueblo West Metropolitan District
26. Colorado Stone, Sand and Gravel Association
27. Northwest Colorado Council of Governments
28. Southeastern Colorado Water Conservancy District
29. U.S. Environmental Protection Agency
30. Lori Brusnwig
31. City of Aurora
32. Farmers Reservoir and Irrigation Company
33. U.S. Department of Energy, Office of Legacy Management
34. Board of Water Works of Pueblo, Colorado
35. Rocky Mountain Environmental Labor Coalition

31.49 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; JUNE 13, 2011 RULEMAKING; EFFECTIVE DATE JANUARY 1, 2012

The provisions of sections 25-8-202(1)(b), 25-8-204; and 25-8-402, C.R.S., provide the specific statutory authority for adoption. The Commission also adopted, in compliance with section 24-4-103(4) C.R.S., the following statement of basis and purpose.

BASIS AND PURPOSE:

The Commission's decision to delay consideration of nutrient criteria nine months until March 2012 resulted in revisions to the Division's and Commission's long range work schedule. Because the delay also will affect development of discharger specific variance guidance, the Commission extended the effective date of the variance provisions at 31.7(4) nine months to October 1, 2013. The Commission also extended the repeal date of subsection C of 31.7(3)(a)(ii), nine months to October 1, 2013, This subsection C describes a condition for granting a temporary modification: significant uncertainty regarding the timing of implementing attainable source controls or treatment. Because it is expected that this type of uncertainty will be addressed through the discharger-specific variance provisions, subsection C is scheduled to be repealed on the date the discharger-specific variance provisions become effective.

31.50 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; MARCH 12, 2012 RULEMAKING, FINAL ACTION JUNE 11, 2012, EFFECTIVE DATE SEPTEMBER 30, 2012

The provisions of sections 25-8-202, 25-8-401; and 25-8-402, C.R.S., provide the specific statutory authority for adoption. The Commission also adopted, in compliance with section 24-4-103(4) C.R.S., the following statement of basis and purpose.

BASIS AND PURPOSE:

I. Overview

In this rulemaking hearing, the Commission has taken two major actions as part of a coordinated strategy to address current and potential future nutrient pollution of Colorado surface waters.

First, the Commission has adopted a new section 31.17 in the Basic Standards and Methodologies for Surface Water, Regulation #31, to address nutrients. Section 31.17 establishes interim numerical values for phosphorus, nitrogen and chlorophyll *a* that are deemed to be suitable for the protection of identified categories and subcategories of classified uses of Colorado surface waters. The adoption of the interim phosphorus, nitrogen and chlorophyll *a* values in section 31.17 is the culmination of a decade-long effort, involving hundreds of hours of staff time and numerous work group meetings with dozens of stakeholders. As discussed further below, these interim numerical values identify levels that the currently available scientific information indicates would be protective of the corresponding categories of beneficial uses. However, in this proceeding the Commission is not determining for which specific waters it may be necessary and appropriate to adopt standards based on these interim numerical values.

Second, the Commission has adopted a new Nutrients Management Control Regulation, Regulation #85. This new control regulation establishes numerical effluent limitations for domestic wastewater treatment plants and other wastewater dischargers that use active treatment and are likely to have significant levels of nutrients in their discharges. It also describes steps to be taken by other point source dischargers and nonpoint sources to address nutrients.

Finally, it establishes monitoring requirements for point source dischargers and a program aimed at monitoring surface waters for nutrients and related parameters. This effort is geared towards better characterizing nutrient sources, and current nutrient conditions, to help inform future regulatory decisions regarding nutrients.

The Commission has determined that the adoption of the requirements set forth in Regulation #85 are necessary to protect the public health, beneficial uses of Colorado waters, and the environment of the state, based on sound scientific and technical evidence in the record. As part of the overall nutrients management strategy described here, the Commission has decided to depart from its usual practice of adopting numerical table values in Regulation #31 and then, in subsequent hearings to review individual basin standards, broadly applying those values as segment-specific water quality standards throughout the State. Rather, the Commission believes that nutrient control in Colorado will proceed faster and more expeditiously by focusing the primary control efforts over the next decade on the technology-based approach described below and set forth in a new Nutrients Management Control Regulation. However, section 31.17 includes provisions that identify limited circumstances where the interim numerical values being established may be applied in the adoption of segment specific water quality standards during the next ten years. No new or revised water quality standards are established by this current rulemaking action. It is the Commission’s determination that this approach will achieve the maximum practical degree of water quality in the waters of the state consistent with the welfare of the state, and that this approach maximizes the beneficial uses of water while bearing a reasonable relationship to the economic, environmental, energy, and public health costs and impacts to the public.

The Commission has decided that this two-part strategy for addressing nutrients is the best current policy option to make effective progress in addressing nutrients management in Colorado at this time. The Commission believes that to rely on the usual standards-based approach alone (table value criteria, followed by segment-specific water quality standards, along with possible temporary modifications and discharger-specific variances, and then incorporation into discharge permits with compliance schedules) would result in substantially less progress in controlling nutrients in the next several years than will the technology-based approach set forth in new Regulation #85. At the same time, the Commission has retained the ability to use the new interim nutrient values established in Regulation #31 as the basis for the adoption of segment-specific water quality standards in appropriate, but limited, circumstances. Although it will inevitably take a significant number of years for existing wastewater dischargers to accomplish the planning, financing and construction of facilities to meet the new Regulation #85 effluent limitations, that implementation of nutrient controls is likely to be considerably more expeditious than that which would result from the delays and transaction costs associated with the traditional standards-based control efforts alone. Moreover, following the initial ten years of implementation of the provisions now being established the Commission will determine whether additional, more extensive standards adoption is necessary to address nutrient control needs that are not fully addressed by the technology-based requirements now being established.

II. Direct Use Water Supply Use Sub-classification and Application of Discretionary Value

The Commission has adopted a new subsection 31.13(1)(d)(i) to create the Direct Use Water Supply Lakes and Reservoirs (DUWS) sub-classification of the domestic water supply use. This sub-classification will be applied to specific water bodies in certain narrowly-defined situations, as elaborated below. Colorado already broadly applied standards that provide significant protection for the water supply use. This new sub-classification supplements the existing protections of the water supply use by providing this Commission and future Commissions with the opportunity to adopt additional protection where it is needed in order to protect the use. For simplicity “lakes and reservoirs” hereinafter are referred to as “lakes”.

The intent of this sub-classification is to recognize special cases involving different vulnerabilities and risks that may not apply to all lakes covered under the broader water supply use classification. For the DUWS lakes, water flows (or is pumped) directly to the water treatment facility, where it is treated and then distributed to the service population for consumption; these water supplies are used directly. With the DUWS sub-classification, the Commission also preserves the ability to apply additional protection to lakes where convincing evidence has been presented that the lake will become a direct use water supply in the future.

A. <u>Adoption of the Sub-classification</u>

The use is intended for lakes that are used regularly to deliver surface water directly to a drinking water treatment plant that treats and disinfects raw water. The term “plant” is interpreted broadly to include, in addition to any treatment facilities, any associated conduit, forebay, mixing basin or storage feature for the waters that have been withdrawn for use or treatment. In special circumstances it may also be appropriate to assign the use to a lake, with or without an intake, for which a showing has been made that the lake will be a DUWS in the future.

In establishing the sub-classification for Direct Use Water Supply (DUWS) the Commission intended that this sub-classification apply to, and protect, waters in lakes and reservoirs that are regularly used sources of drinking water supply. Testimony was presented that during droughts, during construction of water storage, conveyance and treatment systems, and during emergencies, municipal water suppliers may use temporarily a water treatment plant intake within a lake or reservoir. It is not intended that such infrequent use of plant intakes should trigger a designation of such a lake or reservoir as a Direct Use Water Supply.

B. <u>Discretionary Application of DUWS Value as Segment-Specific Standard</u>

The decision about the need to apply a specific value to protect the DUWS use will be made on a site-by-site basis, based on consideration of the factors set forth in subsection 31.17(e)(ii). The Commission may rely on a number of factors to determine whether a numerical chlorophyll standard (either the value in table 31.17(d) or a scientifically appropriate alternative) is appropriate to provide additional protection for DUWS lakes. One factor to be considered is whether the public water system using the lake as a raw water supply has experienced impacts that may be attributed to algae on an intermittent or persistent basis. Such impacts could include potential problems with disinfection by-products, taste-and-odor, or algal toxins.

Another factor is whether there are existing restrictions on use of the lake that recognize its importance as a water supply. The existence of use restrictions, such as prohibitions against swimming or boating, may signify that the community already made a special commitment to the value of source water protection.

A third factor is whether application of this standard appropriately balances protection of all classified uses of the lake. The Commission recognizes that the DUWS use may not be the sole use for which the lake is classified. For example, there is potential for competition between interests, like fishing, that benefit from higher algal abundance and DUWS that benefits from lower abundance. It is important to note, however, that the Commission’s charge is to protect the individual uses, not “optimize” them. A balance must be found that prevents impairment of any of the uses with the consideration for the public policy ramifications of promoting one use over another. These balancing decisions will be made on a site-specific basis taking into account factors such as the holistic cost of preventing eutrophication versus the holistic costs of increased drinking water treatment.

And finally, in order to preserve the Commission's discretion in adopting standards, the decision may take into account any other site-specific considerations which affect the need for, or advisability of, a more protective value.

III. Nutrient Interim Values

The Commission has adopted a new section 31.17 in the Basic Standards and Methodologies for Surface Water, Regulation #31, to address nutrients. Section 31.17 establishes interim numerical values for phosphorus, nitrogen and chlorophyll *a* that are deemed to be protective of identified categories and subcategories of classified uses of Colorado surface waters. However, as noted elsewhere, the Commission is not determining in this proceeding that it is necessary or appropriate to adopt these numerical values as water quality standards for any specific water bodies. The Commission has labeled these values "interim" to emphasize its intent to undertake further review of the evolving science regarding nutrients before applying numerical nutrient standards broadly to surface waters throughout Colorado. These values will be subject to review in subsequent triennial reviews.

A. Development of Nutrient Values to Protect the Direct Use Water Supply

The Commission adopted a chlorophyll *a* value of 5.0 ug/L to protect human health in DUWS lakes. The value is an average of samples taken from March through November. The duration of March through November was selected as a surrogate for an annual average. An average would be consistent with assessment of the relevant drinking water standards, but not all months can be sampled safely in every year (ice cover and access are problematic in the winter). In the context of ongoing triennial reviews, the Commission intends to review the scientific rationale related to the selection of a numerical value for DUWS set forth in Table 3. As discussed in Section II.B, above, the Commission further reiterates its intent to rely on a number of factors to determine whether a numerical chlorophyll standard (either the value in Table 31.17(d) or a scientifically appropriate alternative) is appropriate to provide additional protection to a DUWS lake.

Improved protection of human health is achieved indirectly because, although chlorophyll itself is not toxic, algae produce the organic matter that can form disinfection by-products (DBPs). DBPs are formed when disinfectants used in water treatment plants react with natural organic matter present in the source water. Different disinfectants produce different types or amounts of DBPs.

Since 1974, when it was discovered that disinfection produces DBPs from naturally occurring organic matter, numerous toxicological studies (studies on the health effects from exposure to high dosages contaminants usually involving animals in a lab) have shown several DBPs to be carcinogenic in laboratory animals. Some DBPs have also been shown to cause adverse reproductive or developmental effects in laboratory animals. As a result of these and other findings, EPA included DBP controls in its Stage 1 Disinfectants/Disinfection Byproducts Rule (1998). The Colorado Primary Drinking Water Regulations (5CCR 1003-1, table 2-5) include the maximum contaminant levels for DBPs. In addition, section 31.11 of the Basic Standards for Surface Water contains a water supply standard for total trihalomethanes (total THMs) of 80ug/L. THMs are one of the classes of DBPs.

All lakes contain natural organic matter, which is the precursor for DBP formation. Algae contribute to this pool of natural organic matter, but are rarely the sole contribution. Natural organic matter also comes from external (i.e., watershed) sources. Nevertheless, the contribution from algae is significant in two ways – it is more difficult to treat and more easily controlled than natural organic matter from external sources.

The DUWS value was developed based on the relationship between THMs and dissolved organic carbon (DOC) produced by algae. The chemical properties of algal-derived DOC differ from the properties of DOC from the watershed. These properties are very important because they explain why algal-derived DOC is not amenable to removal with standard treatment of drinking water.

Generally, the amount of algal-derived DOC is proportional to the abundance of algae, which is measured as the chlorophyll concentration. Setting a limit on the amount of chlorophyll controls the production of algal-derived DOC and limits one source of precursors for the creation of cancer-causing compounds during water treatment.

The Commission adopted a numerical value of 5 ug/L for the average chlorophyll *a* concentration in DUWS lakes with the intent of controlling algal contributions to the formation of THMs. Evidence was presented that, based on the reactivity of algal-derived DOC (ug/THM per mg/DOC), a target threshold of 80 ug/L for the THM (i.e. the MCL) results in a threshold of 3 mg/L algal derived DOC. The threshold concentration of algal-derived DOC was linked to algal abundance using a ratio of DOC to chlorophyll from lakes in which DOC is predominantly from algae. The Commission has chosen the 10th percentile ratio of DOC to chlorophyll *a* of 0.6 mg/ug as a matter of policy because some small portion of algal DOC may be removed in standard treatment and because other factors in the drinking water facility also may influence the formation of DBPs.

B. <u>Development of Interim Nutrient Values to Protect Recreational Uses in Rivers and Streams</u>

The Commission adopted a value of 150 mg chlorophyll *a* / m^2 for the abundance of benthic periphyton (attached algae) for protection of the recreational use in rivers and streams. The benthic algae value is based on results from several published studies. Public opinion surveys conducted by Montana Department of Environmental Quality (DEQ) showed that recreation was “desirable” in streams where benthic algae levels were at or below 150 mg/m^2 . Recreation was “undesirable” where the level was at or above 200 mg/m^2 . The Montana study is consistent with other reports in the literature suggesting that 150 mg chlorophyll *a* / m^2 represents a “nuisance threshold.” The value will be implemented as a summertime maximum consistent with its foundation in a study of public responses to “snapshot” observations. The allowable exceedance frequency is set at once in five years, as a matter of policy, based on the historical use of a five year data period for evaluation in the context of the 303(d) list. The Commission recognizes that attainment of standards based on this value can be assessed only where a representative sample can be obtained with the Division’s sampling protocol, which is designed for hard substrate.

C. <u>Development of Interim Nutrient Values to Protect Aquatic Life in Rivers and Streams</u>

In section 31.17, the Commission adopted interim numerical values for total nitrogen (TN) and total phosphorus (TP) concentrations in Colorado’s rivers and streams. The interim values represent annual median concentrations with an allowable exceedance frequency of once in five years.

In this action, the Commission relied upon quantitative bioassessment of Colorado's surface waters using tools endorsed in Commission Policy 10-1 "Aquatic Life Use Attainment: Methodology to Determine Use Attainment for Rivers and Streams" (see Policy 10-1, section VIII). Colorado's Multimetric Index (MMI) was used (along with the total taxa metric) to measure the "health" of the macroinvertebrate community. The scientific literature demonstrates the mechanisms which link nutrients to the health of the macroinvertebrate community. Total phosphorus and total nitrogen concentration data from Colorado streams along with the bioassessments were used to derive the numeric thresholds in three steps – characterization of unimpacted conditions (anchor point location), definition of the stressor-response relationship, and threshold setting.

Anchor Point: Evidence was presented that characterized nutrient concentrations and the condition of the macroinvertebrate community at unimpacted warm and cold aquatic life sites in Colorado. At these sites and in the surrounding watersheds, there has been little or no human activity, and nutrient concentrations are low. The macroinvertebrate communities at these sites are in good condition and are relatively insensitive to changes in nutrient concentrations within the unimpacted range. Separately for cold and warm streams, the *anchor point condition* was chosen as the 85th percentile of the TN or TP for those sites. The median MMI (or total taxa) defines typical biological condition in unimpacted sites. The 85th percentile of the TN and TP concentration was used as the *anchor point nutrient level* since that statistic commonly has been used in Colorado to characterize the existing ambient condition.

Stressor-Response Relationship: Evidence submitted in this hearing showed that nutrients cause a decline in biological condition. The slope and confidence intervals of this response was estimated with a statistical tool called quantile regression. The slope of the 90th quantile provided the optimum characterization of the response, although slopes were similar for adjacent quantiles. The same procedure was applied separately for MMI and total taxa. For the stressor-response relationship, median nutrient concentrations were calculated for sites with at least five observations. Similar results are found in the scientific literature in evaluating the significance of the effects of total nitrogen on the macroinvertebrate community.

Threshold Setting: In deciding on the appropriate nutrient thresholds, the Commission reaffirmed the policy decision that criteria should be set at levels that allow minimal negative effect yet still protect the use. A 5% decrease in biological condition is considered a minimal negative effect; the value is taken by analogy from the precedent for toxics, where 95% of the genera are protected from toxic effects and 5% are not protected. In the context of setting nutrient criteria, the Commission decided as a matter of policy, that a 5% decline in the metrics that reflect the health of the aquatic community as a whole would be an allowable decline that would still provide protection of the aquatic life use.

The actual threshold values for TN and TP were derived separately for cold and warm streams in three steps based on evidence submitted in this hearing. First, the allowable decline in biological condition was calculated (it is a 5% decrease in MMI or total taxa from the anchor point condition median of the reference sites). Second, the allowable increase in nutrient concentration from the anchor point nutrient level was calculated by using the slope from the stressor-response relationship to solve for nutrient concentration that equates to the 5% allowable decline in the anchor point condition. Resulting threshold concentrations from the MMI analysis and the total taxa analysis were averaged to produce the interim values for TN and TP shown in the table.

In addition to the primary information used to calculate thresholds, the Commission considered supporting information that included comparison with published and calculated estimate of background concentrations, numeric thresholds in the scientific literature, biological metrics in the scientific literature, and thresholds developed by other states.

D. Development of Interim Nutrient Values for Lakes and Reservoirs

The Commission adopted interim numerical chlorophyll *a*, total nitrogen and total phosphorus values in 31.17 for Colorado's lakes. The values represent summer average concentrations (requiring at least three observations in the months July through September of the same year). The allowable exceedence frequency is once in five years. These numerical values would be applied to lakes that are greater than 25 acres in size and have a residence time of at least fourteen days. For lakes smaller than or equal to 25 acres, a narrative standard would be applied. Lakes with a residence time of less than fourteen days would be assessed against stream standards.

The interim values adopted by the Commission support target trophic conditions for cold and warm lakes that have been defined first in terms of algal abundance. Target trophic conditions represent the long term productivity goals that balance the potentially competing interests while minimizing the risks of water quality problems such as elevated pH. However, the Commission also recognizes that there is potential for competition between interests, like fishing, that might benefit from higher algal abundance and those, like swimming or aesthetic enjoyment, that might benefit from lower algal abundance.

The Commission selected the target trophic conditions as a matter of policy, relying in part on the existing regulatory definitions and expectations for cold and warm aquatic life. Cold lakes normally can support salmonids, and warm lakes normally can support warm water gamefish. Optimal trophic conditions for a trout fishery are mesotrophic, whereas optimal conditions for a warm water fishery are eutrophic. In both cases, the Commission specified an upper bound for productivity as a means of protecting healthy fisheries, but the Commission does not encourage or support nutrient enrichment for less productive lakes.

The Commission selected mesotrophic as the target trophic condition for cold lakes because it is supportive of trout fisheries without competing with recreational or aesthetic interests, and it is not expected to result in water quality problems (such as elevated pH). Based on evidence submitted in the hearing, a mesotrophic condition is not exceeded if the summertime average chlorophyll *a* concentration does not exceed 8 ug/L. Lakes that exceed 8 ug/L have become more productive than the target trophic condition. This level is consistent with criteria developed by other states for lakes expected to support trout fisheries.

The Commission selected eutrophic as the target trophic condition for warm lakes because it is supportive of a warm water fishery, and is respectful of clarity preferences for recreation and aesthetics. Information submitted in the hearing, however, indicated that when chlorophyll *a* concentrations approach the upper boundary of the eutrophic range (25 ug chlorophyll a/L), the risk of pH exceedances increases. Accordingly, in order to reduce the risk of water quality problems due to elevated pH, the numerical value for chlorophyll *a* was reduced to 20 ug/L. Warm water lakes in which the summer average chlorophyll concentration exceeds 20 ug/L have become more productive than the target trophic condition. The values for warm lakes in Colorado are similar to those proposed by other states for "cool water" fisheries.

Interim numerical values for TP and TN were also adopted by the Commission. The nutrient values serve as indicators of a potential for excessive productivity rather than a means of guaranteeing a particular chlorophyll concentration. The nutrient values were selected based on evidence from Colorado lakes that relates the nutrient concentrations to algal abundance. Empirical relationships between nutrients and chlorophyll were used to characterize typical conditions for each target trophic condition, and empirical mean-variance relationships were used to define exceedance thresholds for each constituent.

The Commission believes that the numerical values for chlorophyll *a* , phosphorus, and nitrogen provide a robust basis for determining when the target trophic condition is being exceeded. The values are not intended, however, as a means of guaranteeing that all other related water quality measures, like pH and dissolved oxygen (DO), will meet standards. These related measures are influenced by processes in addition to algal productivity, and they are assessed separately. Thus, they serve the additional purpose of indicating where the underlying problems are not related solely to nutrients.

IV. Use of Interim Nutrient Values

A. Limitation on Use

The interim nutrient values for phosphorus and chlorophyll *a* adopted in this regulation will not be used for the adoption of water quality standards for specific water bodies in Colorado prior to May 31, 2022, except as described below.

During the initial period of implementation, the interim nutrient values for phosphorus and chlorophyll *a* will be used for the adoption of water quality standards for waters located in headwaters areas above all permitted domestic wastewater facilities discharging prior to May 31, 2012, or with preliminary effluent limitations requested prior to May 31, 2012, regardless of whether they are subject to effluent limits in Regulation #85, and any non-domestic facility subject to Regulation # 85 effluent limits and discharging prior to May 31, 2012. These values may also be used to adopt standards for protected water supply lakes and reservoirs. The regulation also reserves the right for the Commission to make a policy determination to use the interim nutrient values to adopt standards in circumstances where the Commission has determined that the technology based requirements in the Control Regulation will not provide adequate protection of a classified use.

The Commission adopted 31.17(h) to clarify that both before and after May 31, 2022, the Commission may consider the adoption of site-specific standards and established the factors to take into consideration.

The interim nutrient values for nitrogen will not be used for the adoption of water quality standards for any specific water bodies in Colorado prior to May 31, 2017. From May 31, 2017 to May 31, 2022, these nitrogen values will be used for the adoption of water quality standards for specific water bodies only in the limited circumstances described below. The Commission has adopted a later effective date for the nitrogen numerical values as a policy choice, taking into account (1) concerns about the potential cost of treatment to meet stringent nitrogen values, (2) the fact that Regulation #85 will result in substantial nitrogen control, along with phosphorus control, over the next several years, and (3) the desirability of providing another triennial review cycle to assess any additional scientific developments regarding appropriate numerical criteria for nitrogen prior to using these numerical values to adopt enforceable standards.

The interim nutrient values are not intended to nor shall they be construed to affect effluent limitations resulting from existing TMDLs or Control Regulations developed for nutrient control. Where TMDLs are developed to address impairment of water quality standards for other parameters and it is determined that nutrients are a contributing factor, these values may be used in the development of the TMDL.

Following May 31, 2022, the numerical nutrient values adopted by the Commission may be used for the adoption of water quality standards for any surface waters in Colorado. At that time, the Commission will review the progress made in nutrients management under the regulatory provisions adopted in this proceeding and will assess where the adoption of additional water quality standards may be needed for the protection of the quality of Colorado waters as clarified in section 31.17(g).

The Commission expects that during the 2022-2025 basin reviews, in developing its proposal, the Division will carefully consider where adoption of additional numeric standards is necessary to protect uses. Entities interested in site-specific numeric standards are encouraged to develop their proposals in advance of the 2022-2025 basin reviews so that all appropriate information is available to help inform the decision making.

B. <u>Waters Above Dischargers</u>

Because Colorado's high quality headwaters streams are an important natural resource, the Commission has adopted provisions allowing for adoption during the next round of basin standards reviews of numerical water quality standards for phosphorus and chlorophyll *a* for waters above dischargers regardless of whether they are subject to effluent limits in Regulation #85. Adoption of standards in these areas will not impose any costs on existing dischargers, but will help assure protection of a valuable Colorado resource in the face of potential future development.

C. <u>Direct Use Water Supply Lakes and Reservoirs</u>

As elaborated above, the decision about whether a specific criterion is necessary to protect the DUWS will be made on a site-by-site basis. It is currently the Commission's intent to initially apply the chlorophyll *a* value without a translation to total nitrogen or total phosphorus criteria. It would be inappropriate to apply the general TN and TP translators since those are based on an assessment of the linkage between maintaining a specific trophic state and a summer average chlorophyll level. The DUWS value is based on avoiding exceedance of a threshold.

In the case where the water quality in a DUWS with a chlorophyll *a* standard exceeds its promulgated standard, then the Commission intends that, through the TMDL process, the translators can be developed to tie site-specific lake and water management characteristics to necessary in-lake and contributing watershed values for total nitrogen and/or total phosphorus.

D. <u>Other Circumstances</u>

The Commission and the Division are not currently aware of any circumstances where adoption of numerical nutrient standards for Colorado surface waters during the next round of basin reviews is necessary, except the two categories of circumstances described above. The Commission has adopted subsection 31.17(e)(iii) to preserve its options if circumstances should arise in which the Commission determines that such standards are necessary in view of unique site-specific conditions.

V. Antidegradation

The Commission decided that no new antidegradation provisions specific to nutrients are necessary at this time. Rather, the Commission intends that its existing general practice for addressing antidegradation will apply with respect to nutrients. As noted above, the Commission intends to consider the adoption of site-specific standards for high quality waters above existing dischargers. In addition, in the separate control regulation being approved today, the Commission is establishing more stringent effluent limitations for new dischargers, to help minimize new impacts on Colorado water quality.

VI. Assessment and Section 303(d) Implementation

The Commission does not intend that the interim numerical nutrient values set forth in sections 31.17(b), (c) and (d) will be used directly as a basis for identifying impaired waters to include on Colorado's Section 303(d) List. In the limited circumstances where these numeric values are used prior to 2022 as the basis for adopting site-specific numerical water quality standards, as described in sections 31.17(e) and (f), those adopted numerical standards would be used as the basis for listing decisions.

The Commission agrees with input suggesting that it is important to address how Colorado will implement the current narratives standards, as they may apply to nutrients, in making section 303(d) listing decisions. The Commission requests that the Division address this issue in development of the Section 303(d) Listing Methodology for the 2014 listing cycle. The Commission intends that listing decisions based on the narrative standards would be based on a "weight of the evidence" approach. In the absence of applicable numerical water quality standards, it is appropriate to look at all relevant considerations in making a determination about attainment of uses and compliance with the narrative standards.

In the event that a water body is determined to be impaired due to nutrient enrichment based on interpretation of the nutrient narrative standards prior to May 31, 2022, a related standard such as DO or pH is not attained, or an investigation of an aquatic life use impairment shows that the cause is nutrient enrichment, the Commission envisions the following process would be followed:

1) Where the impaired segment is the receiving water or downstream of permitted discharges that are subject to controls in Regulation #85, then

   a. Where a Category 4b demonstration plan documenting implementation of nutrient controls to comply with Regulation #85 is submitted and such plan is accepted by the Division and EPA in accordance with the Section 303(d) Listing Methodology, the segment will not be included on the 303(d) List;

   b. Where a Category 4b demonstration plan is not submitted or is not accepted in accordance with the Section 303(d) Listing Methodology, and the segment is included on the 303(d) List, the segment would receive a low priority for TMDL development until the Regulation #85 source controls are fully implemented, and the water body water quality reflects any resultant improvement.

2) Where the impairment is not downstream of permitted discharges that are subject to controls in Regulation #85, or if the water body remains impaired due to nutrients after implementation of Regulation #85, the Division will develop a TMDL that will determine what site-specific numeric nutrient values are appropriate to protect the applicable uses. The Division will propose to use those values as site-specific standards for the water body. The Commission intends that the TMDL process explore all available alternatives in an effort to avoid the potential imposition of requirements more stringent than the Regulation #85 controls on facilities not subject to controls in Regulation #85.

3) Where the Commission has adopted site-specific numeric standards, water-quality based effluent limits will be developed for the dischargers that have a reasonable potential to cause or contribute to an exceedance of those standards. (Compliance schedules and discharger-specific variances will be available according to the policies governing each.)

4) Where the impairment is upstream of permitted discharges that are subject to controls in Regulation #85, TMDL development will be designated a higher priority for the water body.

VII. Discharge Permits

In order to provide direction to the Division in the case that a new facility is sited in a location where the Commission has adopted numeric nutrient standards, or where a discharger seeks to demonstrate applicability of an exception to the technology-based effluent limits at 85.5(3)(b)(i), the Commission revised section 31.9 Flow Considerations to include critical low flows for nutrients. The existing text of subsection 31.9(1) was reformatted into further subsection and a new provision was added that established critical flow conditions for nutrient standards (TN and TP). Since nutrients are not toxic, it is not appropriate to use the 30E3 chronic low flow (used for toxic parameters) in calculating permit limits. Nutrient values in section 31.17 were developed from analysis of annual median concentrations because the aquatic community integrates the effects of nutrients over time. To be consistent with existing low flow criteria, the duration of the low flow exception should match the duration of the criteria, which is 365 days for nutrient criteria. Therefore, the Commission adopted provision 31.9(1)(c) that establishes the critical low flow for TN and TP effluent limits as an annual median low flow with an average 1-in-5 year recurrence interval, which can be calculated from the second driest year in a ten year period. Water quality based effluent limits derived using this critical low flow will apply year round.

The Commission does not intend that the interim numerical values adopted in section 31.17 would be used as the basis for implementing Colorado’s narrative water quality standards, set forth in section 31.11, in discharge permits. Rather, as elaborated in the statement of basis and purpose for Regulation #85 that is being adopted in this rulemaking, the Commission intends that the requirements of that regulation, including the numerical effluent limitations for process wastewater dischargers, constitute a reasonable and appropriate first step in the implementation of Colorado’s narrative standards as they relate to nutrients. Therefore, compliance with Regulation #85 will be deemed to be compliance with the narrative standards unless and until the Commission adopts subsequent revisions to Regulation #85 and/or Regulation #31.

PARTIES TO THE RULEMAKING

1. Conservation Groups
2. Colorado Nutrient Coalition
3. Colorado Water Utility Council
4. Colorado Wastewater Utility Council
5. Colorado Stormwater Council
6. Colorado Association of Home Builders
7. Associated General Contractors of Colorado
8. Colorado Association of Commerce & Industry
9 Colorado Agricultural Producers Alliance
10. Colorado Lake and Reservoir Management Association
11. Colorado Division of Parks and Wildlife
12. Eagle River Water and Sanitation District
13. Northwest Colorado Council of Governments
14. Colorado River Water Conservation District
15. 5-2-1 Drainage Authority
16. Mesa County
17. Grand Valley Drainage District
18. City of Grand Junction

19. Town of Rangely
20. Town of Nucla
21. Clifton Sanitation District
22. Southwestern Water Conservation District
23. Monument Sanitation District
24. Donala Water & Sanitation District
25. Buena Vista Sanitation District
26. Cherokee Metropolitan District
27. Fountain Sanitation District
28. Lower Fountain Metropolitan Sewage Disposal District
29. Security Sanitation District
30. Palmer Lake Sanitation District
31. Pikes Peak Area Council of Governments
32. City of Colorado Springs and Colorado Springs Utilities
33. Tri-Lakes Wastewater Treatment Facility
34. Pueblo West Metropolitan District
35. City of Westminster
36. Board of Water Works of Pueblo, Colorado
37. Centennial Water & Sanitation District
38. City of Boulder
39. City and County of Broomfield
40. City of Fort Collins
41. City of Pueblo
42. Miller Coors, LLC
43. Plum Creek Wastewater Authority
44. Tri-State Generation & Transmission Association
45. Upper Blue River Sanitation District
46. Xcel Energy
47. Upper Clear Creek Watershed Association
48. Northern Colorado Water Conservancy District
49. Metro Wastewater Reclamation District
50. South Platte Coalition for Urban River Evaluation
51. City of Black Hawk and Black Hawk/Central City Sanitation District
52. City of Arvada
53. Grand County Districts
54. North Front Range Water Quality Planning Association
55. Bear Creek Watershed Association
56. Littleton/Englewood Wastewater Treatment Plant
57. City of Lafayette
58. Niwot Sanitation District
59. Board of County Commissioners of Weld County
60. Parker Water and Sanitation District
61. Chatfield Watershed Authority
62. Dominion Water and Sanitation District
63. City and County of Denver
64. City of Thornton
65. City of Aurora
66. Farmers Reservoir and Irrigation Company
67. City of Northglenn
68. Denver Water
69. City of Brush
70. Academy Water and Sanitation District
71. Woodmoor Water & Sanitation District No. 1
72. Towns of Hotchkiss, Olathe, Ridgway and Silverton
73. Town of De Beque
74. Orchard Mesa Sanitation District

75. Colorado Association of Conservation Districts
76. Denver Metro Chamber of Commerce
77. Town of Estes Park
78. Pagosa Area Water and Sanitation District
79. City of Greeley
80. Central Colorado Water Conservancy District
81. Arapahoe County Water and Wastewater Authority
82. Colorado Department of Transportation
83. Colorado Municipal League
84. Cherry Creek Basin Water Quality Authority
85. Roaring Fork Water & Sanitation District
86. Southeastern Colorado Water Conservancy District
87. U.S. Environmental Protection Agency
88. Water Quality Specialists
89. Upper Thompson Sanitation District
90. City of Fort Lupton

31.51 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; AUGUST 13, 2012 RULEMAKING; FINAL ACTION SEPTEMBER 11, 2012; EFFECTIVE DATE JANUARY 31, 2013

The provisions of sections 25-8-202(1)(b), 25-8-204; and 25-8-402, C.R.S., provide the specific statutory authority for adoption. The Commission also adopted, in compliance with section 24-4-103(4) C.R.S., the following statement of basis and purpose.

BASIS AND PURPOSE:

A. Basic Standards for Organic Chemicals

In this rulemaking, the Commission adopted revised and new organic chemical standards in section 31.11(3). In an effort to keep ground water and surface water organic chemical standards consistent, the changes to section 41.5(C)(3) were considered during the same hearing that addressed changes to the statewide surface water organic chemical standards in Regulation No. 31 (Basic Standards and Methodologies for Surface Water).

In adopting these new and revised organic chemical standards, the Commission continued to rely on its past policy decisions and precedence documented in Commission Policy 96-2. Additionally, as per Departmental policy, the Commission has relied on the United States Environmental Protection Agency's (EPA) Integrated Risk Information System (IRIS) as its first tier source of toxicological data. Review of the IRIS data that had been updated since the last revisions to 41.5(C)(3) indicated that the water quality standards for acrylamide, carbon tetrachloride, 1,4-dioxane, hexachloroethane, nitrobenzene, pentachlorophenol, tetrachloroethylene (PCE), and 1,1,1-trichloroethane, needed to be revised. This review also identified new compounds in the IRIS data that the Commission elected to adopt as water quality standards, these were: acetone, bromobenzene, chlordecone, 1,2-dibromoethane, dichloromethane, ethylene glycol monobutyl ether (EGBE) (2-Butoxyethanol), 2-hexanone, perchlorate, 2,3,7,8-tetrachlorodibenzo-p-dioxin, trichloroacetic acid, 1,2,3-trichloropropane. The compounds acylamide, dichloromethane, and 1,2,3-trichloropropane are mutagenic compounds, and the resulting Water Supply standards were calculated following EPA guidance on calculating water supply standards for mutagenic compounds. The Commission also corrected several typographical errors and added common synonyms for some of the organic chemicals.

The Commission heard testimony from several parties asserting that the revised standard adopted for 1,4 dioxane may not be attainable with economical treatment technologies and in some instances may be difficult to measure using current laboratory analytical techniques. Such technical and economic issues are often addressed by EPA in establishing a Maximum Contaminant Level (MCL) under the Safe Drinking Water Act, and the Commission has in the past established a range for a particular chemical, with the health-based standard being the minimum and the MCL the maximum, since EPA has determined that MCLs represent an acceptable level to provide in public drinking water. However, no MCL has been developed for 1,4 dioxane. The Commission therefore did not adopt a range and instead set the statewide standard for 1,4 dioxane at a level to protect human health, based on the currently available scientific information and applying the Commission's established risk-based policy approach. The Commission believes that the concerns raised are better addressed with respect to site-specific implementation issues and notes that there may be a need for site-specific standards for 1,4-dioxane and other regulated organic chemicals to address site-specific economic and/or technical treatment capabilities. The Division concurred with the parties' testimony regarding these concerns and expressed willingness to work with parties who propose site-specific solutions to the Commission.

PARTIES TO THE RULEMAKING

1. Climax Molybdenum Company
2. Metro Wastewater Reclamation District
3. Lowry Environmental Protection/Cleanup Trust Fund
4. South Adams County Water and Sanitation District
5. Brown Group Retail, Inc.
6. International Risk Group, LLC
7. Environmental Protection Agency
8. City of Boulder

31.52 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; APRIL 11, 2016 RULEMAKING; FINAL ACTION MAY 9, 2016; EFFECTIVE DATE JUNE 30, 2016

The provisions of sections 25-8-202(1)(b), 25-8-204; and 25-8-402, C.R.S., provide the specific statutory authority for adoption. The Commission also adopted, in compliance with section 24-4-103(4) C.R.S., the following statement of basis and purpose.

BASIS AND PURPOSE:

A. Basic Standards for Organic Chemicals

In this rulemaking, the Commission adopted revised and new organic chemical standards in section 31.11(3). In an effort to keep ground water and surface water organic chemical standards consistent, the changes to section 41.5(C)(3) were considered during the same hearing that addressed changes to the statewide surface water organic chemical standards in Regulation No. 31 (Basic Standards and Methodologies for Surface Water).

In adopting these new and revised organic chemical standards, the Commission continued to rely on its past policy decisions and precedence documented in Commission Policy 96-2. Additionally, as per Departmental policy, the Commission has relied on the United States Environmental Protection Agency's (EPA) Integrated Risk Information System (IRIS) as its first tier source of toxicological data. Review of the IRIS data that had been updated since the last revisions to 41.5(C)(3) indicated that the water quality standard for tetrachloroethylene (TCE), needed to be revised. EPA expressed concerns regarding the proposed hybrid standard approach for TCE. In light of the impact that a decision on the hybrid standard for TCE may have on other hybrid standards adopted by the WQCC, and because the human health risk of maintaining the current standard of 5 mg/L is not an order of magnitude above the risk for a standard of .76 mg/L, the Commission decided to not modify the TCE standard at this hearing. The Commission expects the broader issue of hybrid standards will be discussed with EPA and the stakeholders, and that the issue may be revisited at a future hearing. The IRIS review also identified new compounds in the IRIS data that the Commission elected to adopt as water quality standards, these were: biphenyl, methanol, and tetrahydrofuran.

PARTIES TO THE RULEMAKING

1. Environmental Protection Agency

31.53 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; JUNE 13-15, 2016 RULEMAKING; FINAL ACTION AUGUST 8, 2016; EFFECTIVE DATE DECEMBER 31, 2016

The provisions of sections 25-8-202(1)(b), 25-8-204; and 25-8-402, C.R.S., provide the specific statutory authority for adoption. The Commission also adopted, in compliance with section 24-4-103(4) C.R.S., the following statement of basis and purpose.

BASIS AND PURPOSE

In this rulemaking the Commission considered revisions to criteria and revisions to implementation methodologies. The Commission adopted changes as detailed below.

I. TEMPERATURE

In 2007, the Commission adopted temperature criteria and implementation methods for Colorado's surface waters. The criteria were derived from laboratory-based studies of individual fish species' tolerance to elevated water temperatures. The implementation methods were developed based on review of other states' methods and adaptation of methods for implementation of other water quality standards. Since that time, the Division and stakeholders have gained a great deal of experience with empirical records showing spatial and temporal patterns of temperature in surface water and effluent. Experience has shown that the adopted standards often are not attainable due to natural environmental constraints that are closely tied to elevation and may be affected by other factors as well. Consequently, revisions may be needed to incorporate those natural constraints that are an appropriate incremental improvement to the current standards. The revisions discussed in this rulemaking build on a decade of practical experience gained from massive data collection efforts and they chart a path forward to improve the basis for the standards, incorporate the effects of elevation on attainability and ensure more consistent implementation.

There are four parts to the temperature standards that were discussed in this hearing. The first, Part A, is a change to the definition of existing quality to clarify the implementation of exceedance frequency. The second, Part B, revises criteria to incorporate new information about the temperature tolerances of fish. Part C provides policy direction to address consideration of temperature standards at elevations below which the physiologically-based temperature standards are not attained routinely. Part D provides policy direction to address consideration of temperature standards in the shoulder seasons.

A. Definition of Existing Quality

The Commission restructured the definition of existing quality (EQ) at 31.5(20) and modified the portion about temperature to allow one warming event above standards with a 3 year average exceedance frequency. EQ is a characteristic of the ambient condition that is used in two contexts: 1) comparing the ambient condition to water quality standards to determine whether standards are attained; and 2) characterizing the upstream water quality for calculating permit effluent limits. It has also been used when setting ambient standards. Changes were made to clarify the definition of EQ for temperature so that it can be consistently applied in each programmatic context.

The revised definition specifies that the value for EQ is the maximum DM and MWAT which allows for one warming event with a 3-year average exceedance frequency. The Commission recognizes the potential for natural systems to occasionally exceed numeric standards and that limited exceedances of the standard are expected. The Commission's intent is that thermal conditions should be sufficient for longer lived fish species to complete their lifecycles, and evidence derived from the literature suggests that 3 years is sufficient for most stream fish in Colorado. Additionally, the Commission recognizes that autocorrelation is inherent in stream temperatures, and that several days exceeding the standard may be the result of a single warming event. For standards attainment, the Commission intends that the average recurrence frequency of these warming events be limited to once every 3 years. (Table 1, footnotes 5a and 5b were edited to reflect this.) Therefore, where data records are 3 years or less, EQ will be the maximum DM or MWAT. For data records of 4 to 6 years, an allowance will be made for one warming event in either the summer or winter. For data records of 7 to 9 years two warming events are allowed. The definition of a "warming event" will be determined with statistically appropriate tests and representative data defined in the next 303(d) listing methodology process. In addition to consideration of the frequency of "warming events", the Commission would like the Division to look at the impacts of duration, multiplicity and cumulative effects.

For permitting, the Commission intends that EQ will also incorporate an allowable exceedance frequency for monthly determination. EQ will be the maximum DM or WAT with 3 or less years of representative upstream data. For data records with 4-6 years, the second highest monthly DM or WAT may be selected for one month in either winter or summer and the remaining months shall be the max DM or WAT. Allowances for each month are not appropriate because the allowable exceedance frequency (the recurrence interval) is based on the time that it takes for the aquatic community to recover from a harmful event.

The Commission retained the temperature excursions at 31.16 Table 1 – Footnote 5(c) so they could be addressed along with shoulder seasons and transition zones in a future rulemaking.

The requirement for "adequate refuge" has been awkwardly split between the temperature footnote (5(c)) and the dissolved oxygen footnote (9(c)). Footnote 5(d)(iii), the allowance for temperature exceedances in lakes where adequate dissolved oxygen is present below the mixed layer (the refuge allowance), was deleted. To maintain the requirement but simplify the regulation, in footnote 9(c), the reference to footnote 5(c)(iii) has been replaced by a clear statement that adequate refuge is required and a description of adequate refuge.

B. Temperature Criteria

<u>Temperature Database Updates:</u> As part of the Division's routine review, the Colorado Temperature Database was updated using the most recent literature regarding the thermal requirements of Colorado's fishes. This effort was an initial step to support revision of the warm water winter acute values (discussed below) and also allowed for general updates of cold and warm water acute and chronic values. New acute and/or chronic thermal tolerance information was found for several species, both cold and warm water, including brook trout, brown trout, cutthroat trout, lake trout, mountain whitefish, rainbow trout, black crappie, bonytail, channel catfish, largemouth bass, mountain sucker, and stonecat. Based on this information, the Commission adopted revisions to the existing temperature standards found in Table I.

A new critical thermal maxima value for lake trout was added to the database as part of the updates. This new acute value, combined with existing chronic data, allowed for the derivation of DM and MWAT values for lake trout. Including lake trout in the Cold Lakes & Reservoirs and Cold Large Lakes & Reservoirs DM and MWAT calculations would result in MWAT values of 16.7°C for both tiers. Lake trout are currently managed in only 30 individual lakes/reservoirs, which are in a total of 17 segments; these segments comprise less than 9% of all lakes segments. Due to the relatively small number of segments containing lake trout, the Commission decided to not include the lake trout data in the derivation of statewide lakes/reservoirs temperature standards. Instead, the Commission adopted a footnote to Table I stating that where lake trout do occur and protection from thermal impacts is necessary and appropriate, the literature-based summer MWAT and DM for lake trout of 16.6°C and 22.4°C, respectively, should be applied. The Commission intends for these lake trout populations to be covered by the “adequate refuge” provision that requires concurrent attainment of the literature-based summer MWAT and DM values and dissolved oxygen standards.

A similar approach was taken for mountain whitefish. Early life stages of this species are known to be more thermally sensitive than other CS-I and CS-II species and adult mountain whitefish are known to migrate into cold tributaries to spawn. To ensure protection of sensitive early life stages, the Commission adopted a footnote to Table I stating that where and when spawning and sensitive life stages of mountain whitefish are known to occur, the literature-based summer MWAT and DM of 16.9°C and 21.2°C, respectively, should be applied.

Warm Water Winter Acute Table Values: When seasonal temperature standards were adopted in 2007, warm water winter acute and chronic standards were simply set at half the summer season values, recognizing a pattern seen in cold waters. The acute winter table values for warm water fish were revised based on lethal temperature thresholds established in laboratory experiments for fish acclimated to “winter” temperatures. This new method protects warm water fish in winter from acute effects. The Commission adopted the resulting warm tier temperature winter standards in Table I.

C. Additional Flexibility in Transition Zones

The physiologically-based summer temperature standards are not attainable in every year in every segment where they have been adopted. The attainability problem is not tied to specific watersheds or isolated locations, but is instead a statewide phenomenon that shows a clear spatial pattern related to elevation and could be affected by other factors. The problem arises from an unavoidable conflict between the historical distributions of fish species and the expectation that protective conditions for all life history stages can be sustained in every year throughout a segment. The environment varies naturally and fish move in response to environmental stimuli.

Temperature tiers have been adopted on the basis of the best available information concerning the fish species that have been found in the segment. The assignment of temperature tiers is logical and defensible, but an implementation problem arises if the assignment is accompanied automatically by the assumption that temperature standards are always attainable throughout the segment.

Water temperature in unimpacted streams is primarily governed by physical factors (e.g., solar radiation) that affect heat gain and loss, for which elevation is a practical surrogate. Current evidence shows that because of this natural phenomenon, maximum temperatures are expected to exceed the physiologically-based standards in some years at lower elevations for some temperature tiers.

The Division proposed a statewide elevation adjustment for the summer MWAT (the MWATelev) to define a modified expectation for maximum temperatures. The elevation range where the adjustment was proposed to be applied is called the transition zone. Several parties at the hearing disputed the sufficiency of the data presented by the Division, the extent to which anthropogenic influences were assessed and the validity of the Division's regression analysis. The Commission declined to adopt this approach in favor of a basin-by-basin consideration of attainability issues. This adjustment informs, but does not change, the narrative standard which requires maintenance of a normal pattern of increase and decrease in water temperature. The basin-by-basin approach will allow consideration of ambient -quality–based site-specific standards proposals in accordance with section 31.7(1) where elevation is the natural, irreversible factor. Unlike the basis for most other ambient-standards proposal, elevation occurs everywhere and has a predictable effect on water temperature. The basin-by-basin approach will provide an opportunity to consider this elevation adjustment as one of multiple lines of evidence and more specifically the basin hearings will provide for consideration of site-specific contravening evidence. The Commission intends for the experiences of this approach to inform potential changes to the Basic Standards in the future. However, the Commission does not intend that this approach is a de facto adoption of statewide standards through segment specific changes.

At this time, the Commission has not considered the same adjustment to the Daily Maxima temperature standards. Such an adjustment could be considered on a site-specific basis and future analysis may identify the same statewide attainability issues that can be addressed in future rulemaking.

<u>Lakes</u>

Temperature standards for lakes apply to the upper, mixed layer where water temperatures are governed by physical factors (e.g., solar radiation). Elevation may prove to be a useful surrogate for the suite of physical factors driving temperature in lakes. The Division presented evidence based on 574 lake-years of data from 116 lakes sampled over a broad range of elevations during the last 20 years. To be included in this analysis, a lake had to have been sampled during a 6-week period in mid-summer (11 July to 21 August) when maximum temperatures (MWAT) are expected. Several lakes showed evidence of anthropogenic influence in the form of "tailwater" effects from upstream reservoirs (e.g., Morrow Point) or very short retention times (e.g., Estes); these were excluded.

Regression analysis was used to define the relationship between summer MWAT and elevation. Lines for individual years were compared to assess interannual variability, which was small for the slope. The exceedance frequency was addressed by developing a regression line for the 66.7th percentile MWAT at each of the 33 lakes with at least 5 years of qualifying data. Elevation explains more than 90% of the variability in MWATs for the lakes analyzed in this hearing.

$$MWATelev = -0.001651 \text{ (elevation)} + 32.43$$

At the time of the next routine review of each basin, the MWAT adjustment could be considered for lakes where the MWATelev is predicted to exceed the adopted standard. For example, the MWAT adopted for Cold Large Lakes currently is 18.3 oC, and the equation predicts that it is not routinely attainable in lakes at elevations below about 8560 ft and warm lakes below 3774 ft. This is consistent with the elevations of lakes for which site-specific temperature standards have already been adopted.

Streams

Like lakes, water temperatures in streams are governed by physical factors and elevation may be a useful surrogate for these factors. The Division presented evidence from analysis of water temperature records from 267 sites in Colorado over a broad range of elevations and throughout Colorado's varied landscape. Data from approximately 1162 site-years was used to examine the relationship between summer maximum temperatures and elevation. All sites were screened for likely anthropogenic influences from waste water treatment facilities and reservoirs (tailwaters). Of 10 different physical and geographic watershed and site attributes, site elevation most strongly predicts annual MWATs for the analyzed sites. Additionally, residuals (unexplained variance) from the relationship between each year's MWAT and elevation were analyzed to determine whether the remaining variance was related to the following attributes: slope, aspect, Strahler stream order, percent canopy cover, 30-year max air temperature, CHILI Index (an index of solar radiation, slope, latitude and aspect), watershed area, upstream active diversions count, and sum of absolute and conditional diversion rates. Regression analysis between the summer MWAT and elevation showed that over 80 percent of the variance is explained by elevation alone. Annual variability was examined by comparing the relationships for individual years; slopes were in close agreement. The exceedance frequency was addressed by developing a regression line for the 66.7th percentile MWAT at each of the 79 sites with at least 5 years of data. This value is an interpolated estimate of the once in three year exceedance value of existing quality. The resultant equation is:

MWATelev = -0.002145 (elevation) + 32.97

At the time of the next routine review of each basin, the MWAT adjustment could be considered for sites in the transition zone along with other lines of evidence. For example, for a site in a Cold Stream Tier II segment at 6800 feet elevation, the MWATelev of 18.5oC could be the operative standard instead of the 18.3oC standard for the segment.

D. Additional Flexibility in Shoulder Seasons

For each temperature tier, there are summer and winter criteria, and the shift from one season to the next occurs abruptly on a single date. The rigid, first-of the-month changeover of seasons does not reflect the natural pattern of gradual, predictable change in temperature, nor does it provide flexibility to allow for inter-annual variability in the timing and rate of temperature change. These two factors reflect the natural constraints on temporal patterns of water temperature in streams and lakes, partially as a function of elevation.

The Division proposed to revise the table values for each stream and lake temperature tier to substitute the existing narrative standard for the months on either side of the transitional date (i.e., the shoulder seasons). Support for applying the narrative standard was provided by the elevation-related trend in the duration of winter (i.e., consecutive days below the adopted winter standard) and the natural variability documented for the fall and spring transition dates at individual sites. The Commission declined to adopt this approach, in favor of a basin-by-basin consideration of these issues. The Commission intends for the experiences of this approach to inform potential changes to the Basic Standards in the future. However, the Commission does not intend that this approach is a de facto adoption of statewide standards through segment specific changes.

One approach that could be considered in hearings at the basin level is revising the segment-specific standards so the numeric criteria would apply only for the core winter and summer months. The narrative standard would continue to require a normal pattern with no abrupt changes.

Attainment of the narrative standard during the fall and spring could then be assessed for 303(d) purposes by determining the direction of the general temperature trend, using the average WAT of each month. If the surface water is cooling or warming at the appropriate season, then it would not result in an exceedance of the narrative temperature standard.

For the purposes of implementation in permits, the intent would be to ensure that the natural seasonal progression is maintained. For each of the months in the shoulder seasons, simple linear interpolation could be used to establish a value for the water quality standards that could be used in the mass balance equation for setting permit limits.

II. OTHER CRITERIA

A. Methylmercury (human health)

To protect human health, the Commission adopted a methylmercury fish tissue basic standard at new subsection 31.11(7) and revised Footnote 6 to Table III (Metal Parameters) at 31.16. This water quality criterion of 0.3 milligrams (mg) methylmercury per kilogram (kg) fish tissue wet weight describes the concentration of methylmercury that protects consumers of fish and shellfish among the general population. The criterion is consistent with EPA's section 304(a) water quality criterion for methylmercury. This new standard applies to all waters of the state because fish migrate and contribute to food webs that integrate large geographic areas; therefore, it is not sufficiently protective to apply the standard only in locations where fish are expected to be caught and consumed.

Adoption of this threshold as a standard in Regulation #31 recognizes the Commission's practice in the context of Regulation #93 (Colorado's Section 303(d) List of Impaired Waters and Monitoring and Evaluation Lists). The Commission has made listing decisions using an average fish tissue criterion of 0.3 mg/kg as a numeric threshold for determining attainment of the aquatic life use.

Adoption of the 0.3 mg/kg methylmercury criterion does not represent a policy change. The current water column standard of 0.01 µg/L total mercury remains in place and is intended to be implemented alongside the fish tissue standard. The Commission expects that in some circumstances, site-specific water column standards may be developed where data are available.

B. Arsenic (water supply)

After the 2010 rulemaking hearing, EPA disapproved a modification of Footnote 14 to Table III (Metal Parameters) which applies to arsenic. This footnote stated that the arsenic effluent limits would be calculated so that the arsenic concentration at the point of intake to the domestic water supply would not exceed the standard. EPA disapproved this concept because standards must protect the designated use, whether or not the use is an "actual" use. In today's action the Commission deleted Footnote 14 and renumbered the remaining footnotes and deleted the reference to Footnote 14 in Table III. The Commission found that in the majority of segments, the footnote has no effect. Most segments have a water+fish standard for arsenic that is more stringent than the water supply standard.

C. Nitrate (water supply)

After the 2010 rulemaking hearing, EPA disapproved a modification of Footnote 4 to Table II (Inorganic Parameters) which applies to nitrate. As in the arsenic footnote described above, this footnote stated that the combined total of nitrate plus nitrite at the point of intake to a domestic water supply would not exceed 10 mg/L. EPA disapproved this concept because standards must protect the designated use whether or not the use is an "actual" use. In today's action the Commission repealed Footnote 4 with a delayed effective date of December 31, 2022. A delayed date allows time for stakeholders to bring forward site-specific proposals for use removal and/or resegmentation in the next round of basin hearings, and also time to obtain permit modifications before the footnote repeal date.

D. Acute Chlorine for Class 2 Waters

The Commission adopted an acute chlorine standard of 0.019 mg/L for Class 2 waters to protect aquatic life. In 2005, the chronic chlorine standard of 0.011 mg/L was adopted for Class 2 waters, and it is unclear why an acute standard was not also adopted at that time. Because chlorine is a fast-acting toxicant, both acute and chronic chlorine standards are necessary to protect the aquatic life use.

III. ANTIDEGRADATION PROVISIONS

A. Baseline Date for Significance Determination

The Commission adopted revisions to 31.8(3)(c) to clarify the procedures for segments where the antidegradation designation changed from Use Protected to undesignated (i.e. Reviewable) after the previously established baseline date of September 30, 2000. The revision added the phrase "or the effective date when the Use Protected designation is removed." At the same time, subsection 31.8 (3)(c)(ii)(B) was split into two sections for ease of application.

B. Temporary Impacts in Outstanding Waters

The Commission revised the regulatory language to clarify that short-term degradation associated with certain types of activities is consistent with the Outstanding Waters designation. The Commission does not intend this to change policy or procedures regarding determining the meaning of waters being "maintained and protected at their existing quality."

Examples of activities that result in long-term ecological or water-quality benefit include, among others: use of rotenone or other pesticides to remove invasive species; construction of fish barriers to prevent the spread of non-native species; construction of bridges at stream crossing to minimize damage to the stream and improve water quality; or construction of aquatic habitat improvement.

A determination that activities will result in only "short-term" degradation will occur as part of a permitting or 401 certification action by the Division. It is difficult to give an exact definition of "short-term" because of the variety of activities that might be considered. However, in broad terms, "short-term" should be weeks and months, not years. In some cases, projects may need to extend over multiple work seasons, but in all cases the impacts of a project over time must be considered. The Commission expects that in those actions the Division will ensure that conditions are imposed as necessary and appropriate to ensure that degradation occurs for the shortest amount of time possible.

Examples of "clear public interest" activities shall only be those that address public health, welfare and safety which could include in some cases: construction of public roads for the purpose of public safety, maintenance of public roads, bridges and roadways, including shoulder weed control; control of mosquitoes or other disease vectors; enhancement of significant historical and archaeological resources; and suppression of wildfires or fire pre-suppression or restoration activities.

C. Antidegradation: Iron, Manganese, and Sulfate (water supply)

The Commission revised section 31.8(1)(b) and added two new subsections (i) and (ii) to exempt dissolved iron, dissolved manganese, and sulfate from antidegradation consideration. Federal requirements for antidegradation protection only extend to assimilative capacity for criteria that protect CWA § 101(a)(2) uses (commonly known as "fishable/swimmable"). Dissolved iron and manganese and sulfate do not fall in those categories; rather they are water supply standards which originated as secondary Safe Drinking Water Act criteria. The Colorado framework treats these secondary water supply parameters differently.

The criteria for iron, manganese and sulfate remain in place, unchanged, to protect the water supply use. These criteria do not act as surrogates for any criteria that would protect a fishable/swimmable use (e.g., chloride acts as a surrogate for an aquatic life criterion). This exemption does not negate the requirement for an antidegradation review in regards to standards that protect other classified uses.

D. Default Use Protected Designation for Effluent-dependent/Effluent-dominated Waters

After the 2010 rulemaking hearing, EPA disapproved a modification of section 31.8(2) (b)(i)(c) which allows the Commission to designate a waterbody as Use Protected if the waterbody was effluent-dominated or effluent-dependent during the period of 2000-2009. EPA disapproved this concept because federal policy is that antidegradation designations are to be made based on the quality of the water, not on the source of the water.

In today's action the Commission repealed section 31.8(2)(b)(i)(C) with a delayed effective date of December 31, 2019. In taking this action, the Commission considered that for all reviewable waters, affected entities have an opportunity to submit an alternatives analysis (i.e., to support decisions regarding whether allowing water quality is necessary to accommodate important economic or social development). But the Commission also acknowledges stakeholder concerns regarding uncertainty about the process and criteria for alternatives analyses. Therefore, the Commission is repealing the provision with a delayed effective date to allow the Division and interested stakeholders time to work together to review alternative analyses submittals and approvals that have been done to date, and discuss whether a new alternatives analysis guidance document should be developed, and if so, to develop guidance prior to the repeal date. The delayed effective date is also intended to allow the Division and interested stakeholders time to engage in further discussions regarding an appropriate water quality test for effluent-dependant and effluent-dominated waters. The Commission may consider a proposal to amend or replace section 31.8(2)(b)(i)(C) in a rulemaking before the repeal effective date.

E. Alternatives Analysis – Selection of Alternative

The Commission added a sentence to section 31.8(3)(d)(iii) to better align the Basic Standards rule with the recently-revised EPA water quality standards regulation. This modification was adopted because the Colorado antidegradation rule did not explicitly address what outcome is required in situations where, as part of a necessity of degradation determination, one or more non-degrading or less degrading alternatives are identified. It now explicitly requires selection of a non-degrading or less degrading alternative. The Commission does not intend this to change current Colorado policy or procedures.

IV. REVISION OF SECTION. 31.14 "IMPLEMENTATION IN DISCHARGE PERMITS"

Substantial changes were made to the portions of the Basic Standards that address the way the standards are implemented in discharge permits. Many provisions that were in 31.14 were deleted to reduce redundancy with other regulations (namely, Regulation #61, "Colorado Discharge Permit System Regulations") and to eliminate language that has outlived its useful life. Other provisions were moved to section 31.9, to consolidate the provisions that address implementation of standards. Section 31.10 continues to contain the provisions that address Mixing Zones.

Restructuring: The title of section 31.9 was changed from "Flow Considerations" to "Implementation of Standards." Even before today's rulemaking, the section contained provisions that went beyond flow considerations. Most of the material from section 31.14 that was deemed to be still relevant was moved to section 31.9.

Results of Review of 31.14: Section 31.14 now is blank and the section is "reserved." The history of each subsection, its origin (where known), and fate are described below:

- 31.14(1): This section pre-dates 1987 and there is no record of how or why this section was added to the Basic Standards. It appears to never have been used. The reasons behind the reference to Regulation #71 (the Dillon Control Regulation) are unclear. For these reasons, this section was deleted.

- 31.14(2): This section pre-dates 1987 and there is no record of how or why this section was added to the Basic Standards. It was deleted because it is redundant with section 61.8, and is also in the federal rules for state programs at 40 CFR § 130.3.

- 31.14(3): This section pre-dates 1987 and there is no record of how or why this section was added to the Basic Standards.It was deleted because it is redundant with section 61.8, and is in the federal rules at 40 CFR § 130.7.

- 31.14(4): This section pre-dates 1987 and there is no record of how or why this section was added to the Basic Standards.The portion that authorizes Compliance Schedules was moved to 31.9(2) and expanded to match the language in Regulation #61. The portion that states that effluent limits “may” be established was deleted because there was a conflict between the Regulation # 61 version (“must”) and this version (“may”). The portion that describes how effluent limits shall be established was moved to Regulation #61 to replace an existing cross-reference. The statement that a rulemaking hearing can subsequently be held was moved to the statement of basis and purpose provisions of Regulation #61.

- 31.14(5): This section was added in 1988 (see 31.24.I). The “innovation” language was added to 31.3 at the same time that this provision was added to 31.14. In order to capture the concept of using innovative approaches, such as trading programs, in various water quality contexts, the language “TMDLs, Waste Load Allocations antidegradation reviews, and permits” is also being added to 31.3. Section 31.14(5) is generally redundant with the concepts in 31.3 and is also captured at 61.8(3)(r) of Regulation #61. A new section was also adopted during this rulemaking proceeding at 61.8(3)(u) to capture the “innovation” concept in the context of permits, and thus this section 31.14(5) was deleted.

- 31.14(6): There is no record of when this section was added. Section 61.8(4)(a) addresses this concept, and thus this section 31.14(6) was deleted.

- 31.14(7): This section was added in 1987 (see 31.22 C). This section is now redundant with Regulation #61, 61.8(2)(B)(vii), and thus this section 31.14(7) was deleted.

- 31.14(8): This section was added in 1988 (see 31.24 E and F). This material is covered in sections 31.7, 31.9 and 31.16, and thus this section 31.14(8) was deleted.

- 31.14(9): This section was added in 1989 (see 31.25 E). This section was deleted because practical quantification limits (PQLs) are now covered in a separate policy.

- 31.14(10): This section was added in 1989 (see 31.25 E). Section 61.8(4)(a) of Regulation #61 addresses this concept, and thus this section 31.14(10) was deleted.

- 31.14(11): This section was added in 1989 (see 31.25 E) when organic standards were added to Regulation #31. This section was deleted because this authority is already provided to the Division. It serves no purpose substantive now, and thus was deleted

- 31.14(12): This section was added in 1989 (see 31.25 E). Section 61.8(4)(a) of Regulation #61 addresses this concept, and thus this section was deleted.

- 31.14(13): This section was added in 2000. The Division is not aware of any current permits that have implemented this provision. Colorado's intake credit provisions are found at section 61.8(2)(d) of Regulation #61. It is not clear how this provision is intended to be used, and thus it was deleted.

- 31.14(14): This section was moved to 31.9.

- 31.14(15) and (16): These sections were consolidated and were moved to 31.9. The Commission made revisions to these provisions to align them with the Division's practice since 2007, as expressed in various basin regulations for implementing "current condition" temporary modifications. Specifically, the Commission added references to "existing discharges" to clarify that effluent limits based upon temporary modifications only apply to existing discharges, and that effluent limits for new and expanded discharges must generally be set to the underlying standard. Additionally, the previous reference to 31.14(4) was deleted because all compliance schedules must be issued in accordance with the provisions authorizing compliance schedules.

- 31.14(17): This section was moved to 31.9. The phrase "compliance schedule" in subsection (a) was changed to "permit condition" to allow more flexibility for permitting approaches.

V. OTHER CHANGES TO METHODOLOGIES

A. Site-specific Ambient-based Standards

The Commission adopted revisions to section 31.7(1)(b)(ii) that identify two types of ambient-based standards, "feasibility-based" and "natural or irreversible quality-based" standards, to recognize that in some cases water quality can be improved, but not to the level required by the table value.

Where the only sources and causes of the pollutant(s) are natural, ambient quality-based ambient standards continue to be the Commission's preference. However, where the sources and causes are to some extent anthropogenic, more clarity is needed to assure that classifications and standards are set to protect the highest water quality attainable.

The provision (the downgrading factors) that provides the authority for ambient-based standards is based on the same provisions that authorizes discharger-specific variances (DSVs) (40 CFR § 131.10(g) and 31.6(2)(b)), except that the cause is not a permitted point source, and this action would apply to the entire segment. Since it is the same regulatory foundation, it is appropriate to use the same feasibility bar for determining what improvements are appropriate. As with DSVs, this type of change to numeric standards is authorized only where a comprehensive alternatives analysis demonstrates that there are no feasible alternatives that would provide better water quality.

The Commission continues to believe that adopting ambient standards for a constituent(s) is preferable to downgrading or removing entire uses and their associated water quality standards. Adopting an ambient standard in effect creates a sub-category of the use and is a regulatory downgrade. These ambient standards protect the highest attainable use and are consistent with 31.6(1)(e), which requires that classifications should be for the highest water quality attainable. To that end, "highest attainable use" was defined and added to section 31.5.

The revisions also provide clarity regarding the analysis and documentation that is required to make the "no feasible alternatives" demonstration. The Commission encourages proponents to complete the Division's checklist to ensure that their supporting information is adequate.

B. Temporary Modifications set to Current Condition

The Commission revised section 31.7(3) to incorporate a new subsection (d) that explicitly addresses the operative value that is in place during the term of a temporary modification. These changes recognize current policy and are not meant to change that policy, only to clarify and expressly approve its use. This change authorizes the use of the narrative statement "current condition" as the operative value to preserve the status quo for the discharger and the waterbody during the term of the temporary modification. The Commission indicated that if the standards database can be adjusted to accommodate it, that future proposals for temporary modifications should include in the table the date on which the temporary modification was adopted. Temporary modifications are only appropriate where a compliance problem exists, and the adoption of the temporary modifications are intended to temporarily relax the control requirements, including direct discharge permits, indirect discharge permits, and other control mechanisms such as local limits while the uncertainty regarding the underlying standards is addressed. The Commission recognizes that during the temporary modification permitted dischargers' effluent quality may be marginally changed and that variability in effluent quality may occur. Because the status quo is to be maintained, the Commission does not intend that temporary modifications set at "current condition" apply to new or expanded discharges. Protection of existing uses means protection of the actual uses rather than protection of the full use classification. The Commission intends that the revisions to section 31.7(3) apply prospectively only, and do not retroactively change the basis for or implementation of previously adopted or extended temporary modifications set at "current conditions."

C. DSV Alternative Effluent Limits

The Commission revised section 31.7(4)(b) to clarify that the Division, not the Commission, sets the alternate effluent limits of a discharger-specific variance, and that these limits are to be expressed as a temporary hybrid standard. The hybrid approach establishes a cap on the effluent limit, but does not actually set the level of the effluent limit. The Commission added three new subsections (i), (ii) and (iii) to describe the format of the hybrid standard and how it is used by the Division to set control requirements such as discharge permit effluent limitations.

Based upon the results of a comprehensive alternatives analysis, the Commission will determine specifically which alternative(s) provide the highest degree of protection of the classified use that is feasible. The alternative effluent limit establishes conditions to be met through implementation of the selected alternative(s). The Commission expects that in most cases, the alternative effluent limit will be a numeric limit. In cases where there is a high degree of uncertainty regarding the improvement or effluent concentrations that will be achieved, the Commission may adopt an alternative effluent limit as a narrative condition that identifies specific actions to be completed through implementation of the selected alternative(s).

D. Downstream Protection

The Commission adopted modifications at section 31.3 to more clearly identify that water quality classifications and standards must protect downstream waters. In the past, the Commission and Division have relied on section 31.6(1)(c) and Regulation #61 to provide this protection. This modification implements 40 CFR § 131.10(b) and is not intended to change Colorado's current practice that already considers and ensures the protection of downstream water quality during the development of designated uses and water quality standards.

VI. HOUSEKEEPING

The Commission added clarification to a number of items and corrected minor typographical errors:

- Definition of MWAT and WAT: The definitions of Maximum Weekly Average Temperature (MWAT at 31.5(26)) and Weekly Average Temperature (WAT at 31.5(50)) were clarified. The MWAT definition was shortened and does not repeat the details that are in the WAT definition. The word “mean” was inserted in the WAT definition to clarify that the WAT is calculated from daily average temperatures. This is consistent with the current implementation methods of the Permits and Assessment. The words “multiple” and “equally spaced” in the WAT definition were removed to reflect current assessment methodology.

- 31.6(4)(b): A missing parenthesis was added to this subsection.

- 31.6(2)(b)(iv): The phrase “result in attainment or the use” was to corrected to “result in attainment of the use.”

- 31.7(3)(a)(ii)(C): This section was deleted as it describes a condition for granting a temporary modification that is addressed through the discharger-specific variance provisions, and was repealed effective 10/01/2013.

- 31.11(3): The content of Footnote 5 to the Table of Basic Standards for Organic Chemicals was deleted as unnecessary and replaced with the word “deleted.” The Commission notes that practical quantification limits are now located in a Division policy document and not in Regulation #61.

- 31.16 Table III – Footnote 3: The word “aluminum” was added to replace the chemical abbreviation, and a space was deleted.

- 31.16 Table III – Footnote 5: The word “total” was deleted from the phrase “50 µg/L total chromium” to clarify that the sum of hexavalent and trivalent chromium is not to exceed 50 µg/L. Capitalization, spacing, and symbol use was also corrected for portions of this footnote.

PARTIES TO THE RULEMAKING

1. Metro Wastewater Reclamation District
2. Colorado Parks and Wildlife
3. Environmental Protection Agency
4. Arkansas Fountain Coalition for Urban River Evaluation
5. Colorado Monitoring Framework
6. Littleton/Englewood Wastewater Treatment Plant
7. Eagle Park Reservoir Company
8. Eagle River Water and Sanitation District
9. City of Steamboat Springs
10. Upper Eagle Regional Water Authority
11. City of Colorado Springs and Colorado Springs Utilities
12. Northern Colorado Water Conservancy District
13. Southwestern Water Conservation District
14. Dolores Water Conservancy District
15. Aurora Water Department
16. South Adams County Water and Sanitation District
17. Town of Fraser
18. Trout Unlimited
19. City of Boulder
20. City of Fort Collins
21. City of Pueblo
22. Seneca Coal Company
23. Suncor Energy (U.S.A.)
24. Colorado Wastewater Utility Council

25. Climax Molybdenum Company
26. Public Service Company
27. Tri State Generation and Transmission Association, Inc.
28. Plum Creek Reclamation Authority
29. Centennial Water and Sanitation District
30. City of Black Hawk and Black Hawk/Central City Sanitation District
31. Northwest Colorado Council of Governments (NWCCOG) and NWCCOG Water Quality/Water Quantity Committee
32. Colorado Wildlife Federation
33. Rocky Mountain Chapter of the Sierra Club
34. Pueblo County
35. Towns of Hotchkiss, Olathe and Ridgway
36. North Front Range Water Quality Planning Association
37. Colorado River Water Conservation District
38. XTO Energy, Inc.
39. Parker Water and Sanitation District
40. Dominion Water and Sanitation District

31.54 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; JANUARY 9, 2017 RULEMAKING; EFFECTIVE MARCH 1, 2017

The provisions of sections 25-8-202(1)(b), 25-8-204; and 25-8-402, C.R.S., provide the specific statutory authority for adoption. The Commission also adopted, in compliance with section 24-4-103(4) C.R.S., the following statement of basis and purpose.

BASIS AND PURPOSE:

A. Corrections to Organic Chemicals

In this written comment rulemaking, the Commission corrected errors to the organic chemical standards in the regulation that occurred subsequent to the April 11, 2016 rulemaking. The division proposed changes to fix errors to water+fish and fish ingestion standards for biphenyl, tetrahydrofuran, methanol and trichloroethylene (TCE), and a revision to the trichloroethylene (TCE) water supply standard. During the hearing process for the April 11, 2016 rulemaking, the division withdrew the afore mentioned additions and revisions to the Regulation 31 organic chemical standards due to concerns related to EPA’s 2015 update to Human Health Ambient Water Quality Criteria. The final action documents submitted to the Secretary of State inaccurately reflected the commission’s decision with respect to biphenyl, tetrahydrofuran, and methanol. At the time of notice for this hearing, there was a belief that the final action documents submitted to the Secretary of State also inaccurately reflected the commission’s decision with respect to trichloroethylene (TCE). However, the official version of the regulations accurately reflects the TCE standards. Therefore, the corrections made by the commission in this rulemaking were: deletion of the water+fish and fish ingestion standards for biphenyl, tetrahydrofuran and methanol. No changes were made to the water+fish, fish ingestion and water supply standards for trichloroethylene (TCE).

31.55 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; OCTOBER 10, 2017 RULEMAKING; EFFECTIVE DECEMBER 30, 2017

The provisions of sections 25-8-202(1)(b), 25-8-204; and 25-8-402, C.R.S., provide the specific statutory authority for adoption. The commission also adopted, in compliance with section 24-4-103(4) C.R.S., the following statement of basis and purpose.

BASIS AND PURPOSE:

Phase 2 of Colorado's Nutrients Management Program: In this rulemaking, the commission took action to put into place the second phase of Colorado's strategy to address current and potential future nutrient pollution of Colorado surface waters.

In 2012, the commission adopted interim numerical values for phosphorus, nitrogen, and chlorophyll a as one part of a two-part strategy. Since 2012, the commission has adopted phosphorus numeric values upstream of domestic discharges, cooling tower discharges, and non-domestic discharges subject to Regulation #85 effluent limitations in segments throughout the state in accordance with 31.17. The commission has also adopted the direct use water supply classification and standard in accordance with 31.17. In 2016, EPA approved the interim numeric values for chlorophyll a, approved with recommendations the numeric values for phosphorus and nitrogen for lakes and reservoirs, and took no action with respect to the interim numeric values for phosphorus and nitrogen for rivers and streams or the delayed effective dates.

In 2012, the commission envisioned that the interim numeric values in 31.17 could be used for the adoption of water quality standards for any surface waters in Colorado following May 31, 2022. However, EPA's action in 2016 has led the commission to consider modifications to its nutrients reduction strategy.

First, the commission noted that EPA had approved the interim numeric values for chlorophyll a, and the commission determined that the 2022 timeframe is appropriate for adoption of chlorophyll a standards. The adoption of chlorophyll a standards throughout the state in the 2022 timeframe is included in Colorado's nutrients management plan that was discussed during the proceedings for this hearing. Also discussed in that plan is the commission's anticipation that during Phase 2 of Colorado's nutrients management approach, the chlorophyll a standards will be implemented through the TMDL process for waters listed on the 303(d) list for impaired waters.

Second, the commission noted that EPA approved with recommendations the numeric values for phosphorus and nitrogen for lakes and reservoirs. Because of the EPA recommendations regarding the interim phosphorus and nitrogen values for lakes and reservoirs, additional analysis is needed before applying the interim values, particularly for warm-water lakes and reservoirs. The commission determined that the division should revisit the phosphorus and nitrogen values for lakes and reservoirs, and should prioritize the development of numeric phosphorus and nitrogen standards based on protection of public health. Therefore, as reflected in the nutrients management plan, the commission anticipates that in the 2022 timeframe the division will propose phosphorus and nitrogen standards for lakes and reservoirs that are direct use water supply reservoirs and where there are public swim beaches. With the exception of direct use water supply reservoirs and lakes and reservoirs with public swim beaches, the commission has decided to further delay the effective dates of the phosphorus and nitrogen numeric values below dischargers to 2027.

Third, the commission noted that EPA took no action with respect to the interim numeric values for phosphorus and nitrogen for rivers and streams. The commission determined more time is needed to revisit the numeric values for phosphorus and nitrogen for rivers and streams, and anticipates that revised standards will be developed and considered in the 2027 timeframe. The commission acknowledges that removing organic nitrogen to low levels is a current technological challenge. The commission recognizes this issue will need to be considered in future policy reviews and rulemaking hearings regarding nutrients along with future technological advances.

The commission also anticipates that a hearing will be held in 2020 to consider impacts from nonpoint sources and potential strategies for nonpoint source control. As part of implementing the provisions of Regulation 85 at subsection 85.5(5), Nonpoint Source Discharges, the commission determined that considerable progress has been made to date by the division, the Colorado Monitoring Framework Agricultural Task Force, the Lower Arkansas Valley Water Conservancy District, and other partnering entities through dissemination of nutrient control-related information and tools for voluntary use by the agricultural community. This model of collaborative outreach, education, and engagement has been made possible through division leadership and funding to support these efforts, as well as the proactive responsiveness of entities who work directly with agricultural producers. The commission encouraged these collaborative activities to continue with a goal of documenting measurable results for presentation at the next triennial review.

In addition, while the commission's traditional approach would have meant that the commission would have considered updated standards for ammonia and selenium in 2021, the current intent of the commission is to delay adoption of revised standards for selenium and ammonia until 2027 as well. The long-term strategy is that the commission will consider the adoption of revised standards for all of these constituents for all water bodies in the state in rulemaking hearings in 2027. The commission anticipates that over the course of the next 10 years, the division will work to revise the standards for ammonia, selenium, nitrogen and phosphorus for rivers and streams, while at the same time will develop feasibility information to assist dischargers with proposing discharger specific variances, which will also take into consideration the treatment challenges of treating for nutrients, selenium, and ammonia, as well as temperature. In order to implement standards as soon as practical, the commission will not rely on the basin review process for adoption of site-specific standards over the course of several years. Instead, in hearings in 2027, the commission will consider site-specific standards and discharger-specific variances for all of these parameters for all waters bodies of the state. After adoption of revised numeric nutrient standards in 2027 in rivers and streams, the commission intends that water quality based effluent limits will be implemented into permits after December 31, 2027.

While the commission has decided to delay the adoption of numeric nutrient values to 2027, it is committed to making additional progress towards nutrient reductions in Colorado during this second phase. The commission believes that the best way to make progress at this time is through an incentives program to encourage early reductions of nutrients. The incentives program will encourage facilities to make voluntary reductions of nutrients, and in exchange the facility will receive an extended compliance schedule as well as certainty about the year in which the facility will need to meet water quality based effluent limits. An extended compliance schedule means the facility will be given additional time to comply with water quality based effluent limits that would be based on the numeric values adopted in 2027. The commission believes that more progress can be made through an incentives program than through mandating reductions by medium sized facilities or facilities in a low priority watershed. For example, the commission believes that even if only the 15 largest dischargers took advantage of the incentives program, and if each of those facilities reduced its nitrogen 20% below the Regulation #85 effluent limits, the resulting load reduction in the state would be three times larger than what would be achieved if the Regulation #85 effluent limits were applied to all domestic wastewater treatment facilities with delayed implementation as identified in 85.5(1)(a)(ii). The commission believes this is the best current policy option to make effective progress in addressing nutrients management in Colorado at this time. The commission believes that reducing the phosphorus or nitrogen effluent limits in Regulation #85, or to apply those effluent limits to more facilities would result in substantially less progress in controlling nutrients in the next 10 years than will the incentive program. However, the commission does intend to evaluate the amount of improvement that occurs through the incentive program, and may revisit this approach and make additional modifications to its nutrients reduction strategy if this voluntary incentives program does not result in reductions as anticipated.

To achieve this goal of early nutrient reduction, the commission has adopted a voluntary incentive program. Participation in the program is entirely voluntary. The program does not require wastewater treatment facilities to implement a specific treatment technology, but it is anticipated that nutrient reductions will be achieved through BNR optimization, a water quality trade, a source reduction plan, watershed nutrient reductions, or capital improvements. A facility that achieves early reduction of nutrients will be offered an incentive in the form of an extended CDPS permit compliance schedule, which increases the number of years that the wastewater facility has to meet the water quality based effluent limits after 2027. The commission expects that the incentive will provide wastewater treatment facilities additional time to identify funding sources necessary to make the capital infrastructure investment in tertiary treatment after 2027.

Regulatory framework for voluntary incentive program: The voluntary incentive program is outlined in Regulation 85.5(1.5). The commission intends that implementation of this program will be accomplished in conjunction with Commission Policy 17-1 that was adopted concurrent with this hearing. Permittees who wish to participate in the incentive program are required to submit a nutrient reduction plan on or before December 31, 2019, and annual nutrient monitoring reports to the division on or before March 31st of each year beginning in 2020. In order to qualify for the incentive program, the permittee must reduce nitrogen and/or phosphorus discharges to levels below those in Regulation #85 by December 31, 2026.

The annual reporting requirement provides the division with an opportunity to review a permittee's progress in reducing nutrient levels below those in Regulation #85 and to assess how those reductions relate to the incentives offered in Commission Policy 17-1. If a permittee is able to make early reductions in its discharge of nutrients, the permittee will qualify for an incentive which gives it additional time to comply with numeric nutrient values in Regulation #31, and Regulations #32 through 38 that are anticipated to be adopted in 2027. The amount of additional time granted will depend on the amount of nutrient concentration reduction that the wastewater facility achieves between 2019 and 2026.

The commission considered whether permittees subject to TMDLs should still be able to participate in the incentive program due to the fact that there is an impaired waterbody and the incentive program will result in participants receiving an extended period of time to meet their wasteload allocations. In particular, the commission heard concerns about participation by the dischargers subject to the Barr Milton TMDL. The commission ultimately decided that dischargers subject to a TMDL should still be able to participate in the incentive program because it will help drive earlier reductions. However, in the case of the dischargers subject to the Barr Milton TMDL, the commission decided that in order to continue to incentivize early nutrient reductions by those dischargers but yet address concerns about additional delay in implementation of the phosphorus wasteload allocations, that the method for earning incentive credit for total phosphorus reduction would be focused on further phosphorus reductions in line with the Barr Milton TMDL phosphorus targets. During the first review of Policy 17-1 which would typically take place in 2020, the commission will consider whether to extend the method that applies to the dischargers with a wasteload allocation pursuant to the Barr Milton TMDL to other dischargers within the Barr Milton watershed or even potentially more broadly. Should any entity determine that consideration of this change should occur prior to the deadline for opting into the incentive program on December 31, 2019, any entity can request that the commission consider changes prior to December 31, 2019.

The division will use Commission Policy 17-1 to make a determination about the amount of time that a permittee participating in the incentive program should be granted when it renews the permittee's CDPS permit after 2027. The division will rely on the nutrient incentives program annual reports in making this determination. If a permittee achieves early reduction of nutrients, it will be granted a compliance schedule in accordance with Commission Policy 17-1. Such compliance schedule may be revised or terminated if the division determines, under section 25-8-307, C.R.S., that the discharge or continued discharge of nutrients by an incentive program participant constitutes a "clear present and immediate danger to the health or livelihood of members of the public," or, under section 61.8(8)(a)(iv) of Regulation #61, that the "permitted activity endangers human health or the classified or existing uses of state waters and can only be regulated to acceptable levels by permit modification or termination. Examples of situations that could trigger the division's exercise of this authority could include but are not limited to a toxic algae bloom in receiving waters downstream of a wastewater treatment facility or the presence of pollutants that cause or contribute to unacceptably high concentrations of disinfection byproducts in drinking water treatment facilities with intake locations downstream of a wastewater treatment facility. They could also include situations where nutrient levels in receiving/downstream waters have reached extreme highs or have increased two or threefold since 2017, where streams or reservoirs have repeated algae blooms producing toxins in multiple years, or where there is demonstrable and significant impact to aquatic life or other animals that is attributable to nutrients.

Based on the environmental benefit anticipated from the voluntary nutrient reductions under the incentive program, the commission expects these circumstances to be rare. The commission recognizes that the voluntary nutrient reductions that will result from the incentive program participants may reduce the severity of the event by reducing nutrient concentrations below those that would otherwise have been permitted. The commission anticipates that in such a circumstance the division will evaluate all of the sources and work to control all of the sources concurrently or in succession, depending on the most appropriate approach in that particular case.

A permittee or other interested parties can challenge the division's determination implementing the voluntary incentive compliance schedule as part of the CDPS permit renewal schedule. If the annual nutrient monitoring reports demonstrate that a permittee has achieved early nutrient reductions in accordance with Commission Policy 17-1, there will be a presumption that a permittee is entitled to the additional time allotted.

It is the commission's determination that this approach will achieve the maximum practical degree of water quality in state waters consistent with the welfare of the state, and that this approach maximizes the beneficial uses of state waters while bearing a reasonable relationship to the economic, environmental, energy, and public health costs and impacts to the public. The commission intends that the incentive program as adopted in 2017 will be maintained for the participants through 2027. The commission will review the incentive program as part of its triennial process in 2022. If the commission determines that additional nutrient reductions beyond those that result from the incentive program are necessary during the program period, the commission intends that these additional reductions will be accomplished first through alternative regulatory mechanisms and only as a last resort will the commission change the incentive program.

Headwaters: In 2012, the commission adopted language in section 31.17(e)(i) indicating that the interim phosphorus and chlorophyll a values would only be considered for adoption in "headwaters located upstream of" certain domestic and non-domestic wastewater treatment facilities. The use of the term "headwaters" led to discussion in the 2013 basin hearing. In 2013, the commission determined that there was no need for a demonstration that waters are "high quality" headwaters in order to adopt phosphorus standards. In 2014, the commission made a policy determination not to apply the interim values below a facility with a cooling tower operated by Tri-State Generation and Transmission. The commission made changes to section 31.17(e)(i) in order to reflect these policy decisions as well as to avoid confusion by continuing to use the term "headwaters," which carries with it meaning and connotation in other contexts.

PARTIES TO THE RULEMAKING

1. City of Boulder, Centennial Water and Sanitation District, Littleton-Englewood Wastewater Treatment Plant, Metro Wastewater Reclamation District and Colorado Wastewater Utilities Council
2. AF CURE
3. City of Black Hawk and Black Hawk/Central City Sanitation District
4. Colorado Monitoring Framework
5. Eagle River Water and Sanitation District
6. Supervisory Committee of the Littleton/Englewood Wastewater Treatment Plant
7. Colorado Springs Utilities
8. North Front Range Water Quality Planning Association
9. Farmer’s Reservoir and Irrigation Company
10. City of Fort Collins
11. Town of Fraser
12. MillerCoors, LLC
13. Plum Creek Water Reclamation Authority
14. Public Service Company of Colorado
15. City of Pueblo
16. Silverthorne/Dillon Joint Sewer Authority
17. Town of Telluride
18. Tri-Lakes Wastewater Treatment Facility
19. Tri-State Generation and Transmission Association, Inc.
20. Upper Blue Sanitation District
21. Dominion Water and Sanitation District
22. Parker Water and Sanitation District
23. City and County of Broomfield
24. Leprino Foods Company
25. Swift Beef Company

31.56 STATEMENT OF BASIS SPECIFIC STATUTORY AUTHORITY AND PURPOSE; DECEMBER 11, 2017 RULEMAKING; FINAL ACTION DECEMBER 11, 2017; EFFECTIVE DATE JANUARY 31, 2018

The provisions of C.R S. 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; and 25-8-402; provide the specific statutory authority for adoption of these regulatory amendments. The commission also adopted, in compliance with 24-4-103(4) C.R.S., the following statement of basis and purpose.

BASIS AND PURPOSE

In this hearing, the commission made a correction to Regulation No. 31. A typographical error has been identified that does not reflect the commission’s intended decisions from a recent hearing.

When the temperature standards were updated in June 2015, a typo was introduced in Table I – Physical and Biological Parameters, Footnote e. The commission corrected the spelling of northern redbelly dace in the species list included in Footnote e.

31.57 STATEMENT OF BASIS SPECIFIC STATUTORY AUTHORITY AND PURPOSE; DECEMBER 9, 2019 RULEMAKING; FINAL ACTION JANUARY 13, 2020; EFFECTIVE DATE JUNE 30, 2020

The provisions of C.R S. 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; and 25-8-402; provide the specific statutory authority for adoption of these regulatory amendments. The commission also adopted, in compliance with 24-4-103(4) C.R.S., the following statement of basis and purpose.

BASIS AND PURPOSE

Cadmium is a naturally-occurring element frequently found alongside other metals, and numerous treatment techniques are available to remove cadmium from wastewater. Cadmium has both acute and chronic effects on aquatic life, and can negatively impact survival, growth, reproduction, immune and endocrine systems, development, and behavior.

The commission revised the hardness-based cadmium table value standards to protect the Aquatic Life use. The updated standards incorporate toxicity data that have become available since the cadmium standards were last updated in the 2005 Regulation No. 31 rulemaking hearing. The updated standards are based on the United States Environmental Protection Agency's (EPA) "Aquatic Life Ambient Water Quality Criteria – 2016" and toxicity data that have become available since EPA's recommended criteria were released in 2016.

The updated standards include two acute equations (acute(cold) and acute(warm)) and one chronic equation. The acute(cold) and chronic equations are the same as the acute and chronic criteria recommended by EPA in 2016. The acute(cold) equation, which is lowered to protect trout, is protective of trout and other sensitive cold water species and applies in segments classified as Aquatic Life Cold Class 1 or 2. The acute(warm) equation, which is not lowered to protect trout, is protective of warm water species and applies in segments classified as Aquatic Life Warm Class 1 or 2. The chronic equation is protective of both cold and warm water aquatic life and applies in segments classified as either Aquatic Life Cold Class 1 or 2 or Aquatic Life Warm Class 1 or 2.

Compared to the previous cadmium table value standards, the updated standards are generally less stringent. The acute(cold) standard is less stringent than the previous acute(trout) standard when water hardness is greater than 45 mg/L $CaCO_3$. The acute(warm) equation is less stringent than the previous acute standard when water hardness is greater than 101 mg/L $CaCO_3$. The updated chronic equation is less stringent than the previous chronic standard at all water hardness values.

In the past, Colorado has had separate acute equations for waters with trout and waters without trout. The updated standards include separate acute equations for cold waters (both with and without trout) and warm waters. This change in approach is due to the addition of toxicity data showing that sculpin, which inhabit cold waters, are also sensitive to cadmium. To ensure protection of sculpin and other sensitive cold water aquatic life in waters where trout are absent, the acute(cold) equation applies to all cold waters. As a result, the acute trout (tr) qualifier for cadmium is no longer needed on select cold water segments and was deleted from all segments where it had applied.

31.58 STATEMENT OF BASIS SPECIFIC STATUTORY AUTHORITY AND PURPOSE; APRIL 13, 2020 RULEMAKING; FINAL ACTION MAY 11, 2020; EFFECTIVE DATE JUNE 30, 2020

The provisions of C.R S. 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; and 25-8-402; provide the specific statutory authority for adoption of these regulatory amendments. The commission also adopted, in compliance with 24-4-103(4) C.R.S., the following statement of basis and purpose.

BASIS AND PURPOSE

In this rulemaking the commission considered revisions to criteria and revisions to division point of compliance provisions. The commission adopted changes as detailed below.

I. Statewide Standards - Interim Organic Pollutant Standards

The commission adopted revised and new organic chemical standards in section 31.11. In an effort to keep surface water and groundwater organic chemical standards consistent, the changes to section 31.11 were also adopted for the statewide groundwater organic chemical standards in Regulation No. 41 (41.5(C)(3)).

In adopting these new and revised organic chemical standards, the commission continued to rely on its past policy decisions and precedence documented in Commission Policy 96-2, along with best science practices set forth in the CWA § 304(a) criteria development method. As per Departmental policy, the commission has relied on the United States Environmental Protection Agency's (EPA) Integrated Risk Information System (IRIS) as its first tier source of toxicological data. Review of the IRIS data that had been updated since the last revisions to 31.11 indicated adoption of standards for four new chemicals (hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX), CAS 121-82-4; 1,2,3-trimethylbenzene, CAS 526-73-8; 1,2,4-trimethylbenzene, CAS 95-63-6; and 1,3,5-trimethylbenzene, CAS 108-67-8) were necessary. Additionally, the water quality standards for benzo(a)pyrene (BaP), CAS 50-32-8 and related chemicals [benzo(a)anthracene, CAS 56-55-3; benzo(b)fluoranthene, CAS 205-99-2; benzo(k)fluoranthene, CAS 207-08-9; chrysene, CAS 218-01-9; dibenzo(a,h)anthracene, CAS 53-70-3; and indeno(1,2,3-cd)pyrene, CAS 193-39-5], needed to be revised. Water quality standards for RDX and the three trimethylbenzenes use the updated exposure factors of a mean adult (21 years and older) body weight of 80 kilograms and a drinking water ingestion rate of 2.4 liters per day. Use of these updated exposure factors relies on more recent exposure data than those used to derive the exposure factors in the commission Policy 96-2. Policy 96-2 is a retrospective policy and will be updated accordingly to reflect the updated exposure factors at the time of the next review. Though, this will create misalignment with the exposure factors used previously to derive existing organic chemical standards in Regulation No. 31, the division will work towards bringing previous standards up-to-date as well, as resources to do so become available. Additional details regarding aspects of these standards revisions are provided below.

A. Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX), CAS 121-82-4

RDX is characterized in IRIS with the cancer descriptor "Suggestive evidence of carcinogenic potential" per EPA 2005 guidelines. This designation is comparable to the cancer group designation of "C – Possible human carcinogen" from the 1986 EPA guidelines. Per Policy 96-2: "for Group C compounds that have both carcinogenic (cancer slope) and toxic (reference dose) data the Commission decided, in accordance with their past practice, to base the standards for these compounds on the reference dose approach, but to adjust the resulting standard with an uncertainty factor of 10 to account for any unknown carcinogenic effects." However, this approach is not aligned with best science practices set forth in the CWA § 304(a) criteria development method for these types of chemicals, under which both cancer-based and non-cancer-based water quality standards would be calculated and the lower of the two standards selected for use protection. Therefore, the commission adopted the proposed calculation of the RDX Water Supply standard, which uses the lower, cancer-based water quality standard of 0.42 µg/L, based on the IRIS cancer slope factor of 0.008 per mg/kg-day. This approach follows the more protective, 304(a)-compliant approach of selecting the lower of the two calculated standards (cancer-based or non-cancer-based). Derivation of previous standards for "Group C carcinogens" has not been consistent; therefore, the division will, ongoing, follow the practices set forth in the CWA § 304(a) criteria development method for these types of chemicals. The division will also work towards bringing previous standards up-to-date, as resources to do so become available.

The Water Supply standard uses most of the default exposure assumptions from Policy 96-2, along with updated exposure factors of a mean adult (21 years and older) body weight of 80 kilograms and a drinking water ingestion rate of 2.4 liters per day, as discussed above. There are no EPA human health ambient water quality criteria (HHAWQC) available for RDX, which would help inform development of Water +Fish and Fish Ingestion standards for RDX. Furthermore, based on available physical and chemical data available for RDX, this chemical is not likely to bioaccumulate. Therefore, the commission did not adopt Water+Fish or Fish Ingestion standards for RDX at this time.

B. **Trimethylbenzenes**

The commission adopted new Water Supply standards for 1,2,3-trimethylbenzene, CAS 526-73-8; 1,2,4-trimethylbenzene, CAS 95-63-6; and 1,3,5-trimethylbenzene, CAS 108-67-8, calculated using the non-cancer equations and most of the default exposure assumptions from Policy 96-2 in combination with the RfD of 0.01 mg/kg-day from IRIS. The Water Supply standards use updated exposure factors of a mean adult (21 years and older) body weight of 80 kilograms and a drinking water ingestion rate of 2.4 liters per day, as discussed above. The calculations resulted in Water Supply standards of 67 µg/L. The commission did not adopt Water+Fish or Fish Ingestion standards for these trimethylbenzenes because there are no EPA HHAWQC available for these chemicals. Furthermore, as documented in the 2016 IRIS assessment for these chemicals, the estimated bioconcentration factors (133−439) and high volatility of trimethylbenzenes suggest that bioaccumulation of these chemicals will not be significant.

C. **Benzo(a)pyrene (BaP), CAS 50-32-8 and related chemicals**

The commission adopted revised Water Supply, Water + Fish, and Fish Ingestion standards for BaP based on updates to the EPA IRIS assessment. In addition to providing an updated cancer slope factor, the IRIS assessment identified BaP as a mutagen. Therefore, the standards adopted by the commission were calculated using age dependent factors, following EPA 2005 guidance on risk assessment for mutagenic compounds and Minnesota's Human Health-based Water Quality Standards Technical Support Document, in combination with the default Incremental Lifetime Cancer Risk of 1E-06 from Policy 96-2, the oral cancer slope factor of 1 per mg/kg-day from IRIS, and a bioaccumulation factor of 3900 L/kg from EPA's human health ambient water quality criteria. Age-bracketed upper 90th percentile, per capita, combined direct and indirect, water ingestion rates for community water sources from Table 3-13 of the 2019 revision to the Exposure Factors Handbook were used to derive the Water Supply and Water + Fish standards. Age-bracketed upper 90th percentiles for consumption of finfish and shellfish, fresh and estuarine (but not marine species), raw weight, and only the edible portion from Tables 9a (adults) and 20a (youth) of the EPA's "Estimated Fish Consumption Rates for the U.S. Population and Selected Subpopulations (NHANES 2003-2010) were used to derive the Water + Fish and Fish Ingestion standards. The mutagenicity calculations required for the PAH water quality standards require fish consumption rates to be expressed on a body weight basis. Therefore, the age-bracketed body weights from Table 8-1 of the 2011 EPA Exposure Factors Handbook were used in combination with the fish consumption rate data.

Previously, water quality standards of several related polycyclic aromatic hydrocarbons (PAHs) [benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene] were set equal to those for BaP; therefore, the Water Supply, Water + Fish, and Fish Ingestion standards for these PAHs were also revised. Table 1 summarizes the revised standards for BaP and the other, related PAHs adopted by the commission. The commission adopted revised standards for these PAHs calculated by applying the estimated order of potential potency (EOPP) factor, for each chemical relative to BaP, presented in EPA's 1993 Provisional Guidance for Quantitative Risk Assessment of Polycyclic Aromatic Hydrocarbons. In this approach, the potencies of other PAHs relative to benzo(a)pyrene are determined. These EOPP factors were applied using the revised cancer slope factor for BaP from IRIS and using age dependent factors appropriate for use with mutagenic chemicals. Treatment of the related PAHs as mutagens, based on that determination for BaP, is consistent with the approach described in EPA’s 1993 guidance. Footnote 13 was added to indicate that BaP and related PAH standards were calculated as mutagens. In 2010 EPA provided a draft of updated guidance, which applied new relative potency factors (RPFs). However, since the guidance was never finalized, the new RPFs are widely not used throughout EPA risk assessment framework, and are thus not used for the derivation of the revised water quality standards.

Table 1. Summary of standards proposed for BaP and the other, related PAHs

Parameter	CAS no.	Water Supply Standard (µg/L)	Water +Fish Standard (µg/L)	Fish Ingestion Standard (µg/L)
benzo(a)anthracene	56-55-3	0.16	0.0051	0.0053
benzo(a)pyrene	50-32-8	0.016	0.00051	0.00053
benzo(b)fluoranthene	205-99-2	0.16	0.0051	0.0053
benzo(k)fluoranthene	207-08-9	1.6	0.051	0.053
chrysene	218-01-9	16	0.51	0.53
dibenzo(a,h)anthracene	53-70-3	0.016	0.00051	0.00053
indeno(1,2,3-cd)pyrene	193-39-5	0.16	0.0051	0.0053

Previous to revision, the Water Supply standard for BaP adopted by the commission was a hybrid standard that ranged from the concentration protective of human-health to the drinking water maximum contaminant level (MCL). The hybrid standard approach was adopted in the 2004 rulemaking in response to ongoing debate dating back to 1989 about whether standards for parameters with MCLs should be based on the MCLs or purely health-based numbers. The arguments for MCLs focused on whether it is reasonable to require surface water remediation to a level below that required for drinking water. The arguments for health-based standards focused on maximizing human-health protection, putting the clean-up burden on pollution sources, and protection of surface water as a resource. In response, the commission adopted a hybrid standard approach that provided much of the benefits advocated for each of the above options. This hybrid approach had the intention to allow for existing contamination to be addressed at levels that are deemed acceptable according to the Safe Drinking Water Act, but allowed for the protection of surface water as a resource by implementing a more protective human-health health based standard for future contamination.

There are more appropriate alternative regulatory pathways, such as variances, through which dischargers can seek regulatory relief. Furthermore, recent litigation in Idaho has resulted from attempts to adopt water quality standards that are not fully protective of the beneficial uses. In May 2016, EPA entered into a consent decree with Northwest Environmental Advocates to reconsider EPA's 2010 approval of Idaho's human health criteria for arsenic, which were based on the MCL in drinking water. In September 2016, EPA disapproved Idaho's MCL-based criteria, citing that the criteria "are not protective of Idaho's designated uses, including primary and secondary contact recreation and domestic water supply". EPA also noted that there are significant differences between the allowable factors for developing MCLs and water quality criteria to protect designated uses under CWA section 303(c). EPA points out that MCLs are in some cases based on feasibility considerations, including the availability of technology to achieve the regulatory level and the cost of such treatment. In other cases, MCLs are based on concentrations that can be measured reliably rather than concentrations expected to be protective of human health. In contrast, water quality standards must be based on a sound scientific rationale and protect the designated use, rather than being based on available treatment technology, costs, or other feasibility considerations. In addition, water quality standards regulations at 40 CFR 131.11 (a)(1) are explicit that states must adopt water quality criteria that protect designated uses.

For BaP, the Colorado Hazardous Materials and Waste Management Division (at the time of rulemaking) uses the risk-based water quality standard to derive the groundwater protection level for BaP. Furthermore, the MCL for BaP is 0.2 µg/L; the incremental lifetime cancer risk factor resulting from this concentration would be 1.21×10^{-5}, which is more than an order of magnitude greater than the risk factor that has been considered to be the appropriate level risk by the commission in past determinations (1×10^{-6}). Therefore, the commission adopted a risk-based Water Supply standard for BaP of 0.016 µg/L that is protective of human-health.

II. Change of Ground Water to Groundwater

The commission adopted a change from "ground water" to "groundwater" throughout the regulation. This change is consistent with common technical usage and usage in the Water Quality Control Act. This change is part of a broad initiative to change the spelling program-wide, and to increase consistency.

III. House Keeping

The commission added clarification to a number of items and corrected minor typographical errors:

- Alignment of footnote assignments for the following organic chemical standards between Regulation Nos. 31 and 41: biphenyl; carbofuran; 1,2 dibromo-3-chloropropane (DBCP); dibromoethane 1,2; dichloromethane (methylene chloride); dioxane 1,4; hexachloroethane; tetrachloroethane 1,1,2,2; tetrachloroethylene (PCE); and trihalomethanes.
- Corrected the spelling of chlorpyrifos
- Corrected the spelling of trichloroacetic acid
- Corrected the spelling of chloronaphthalene
- Changed the order of appearance for a number of organic chemicals in the organic table, to better align with Regulation 41 and display the correct alphabetical order: dalapon; di(2-ethylhexyl)adipate; dinitro-o-cresol 4,6; and N-Nitrosodi-n-propylamine

- Added a synonym reference for chlorodibromomethane and dibromochloromethane to better align in Regulations 31 and 41.

31.59 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; JUNE 14-15, 2021 RULEMAKING; FINAL ACTION AUGUST 9, 2021; EFFECTIVE DATE DECEMBER 31, 2021

The provisions of C.R.S. 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; and 25-8-402; provide the specific statutory authority for adoption of these regulatory amendments. The commission also adopted in compliance with 24-4-103(4) C.R.S. the following statement of basis and purpose.

BASIS AND PURPOSE

I. EPA DISAPPROVALS AND ACTION LETTERS

A. Use Protected Designation for Effluent Dependent/Dominated Waters

On December 8, 2011, EPA disapproved the Use Protected default for effluent-dependent or effluent-dominated waters provision at 31.8(2)(b)(i)(C) because Use Protected designations are to be based on water quality, not a default assumption regarding the impact of effluent on water quality. In the 2016 Regulation No. 31 rulemaking hearing, the commission adopted a sunset date of 12/31/2019 for this provision to resolve the disapproval. In this hearing, the commission deleted the repealed antidegradation provision at 31.8(2)(b)(i)(C).

B. Temperature Excursions

To adequately protect aquatic life in Colorado, the commission, following guidance from the Temperature Technical Advisory Committee (TAC) deleted the air temperature, low-flow, and shoulder season excursions in Regulation No. 31 at Table I Footnote 5(c). In the 2016 Regulation No. 31 rulemaking hearing, the commission adopted a warming event provision. However, there was no technical basis for the joint adoption and application of both the warming event and excursions concepts.

On August 17, 2016, EPA wrote a letter to the commission citing concerns that the materials developed by the division to support its proposal did not align with the decision made by the commission. In addition, EPA requested additional information supporting joint application of the excursions and warming event allowance, as EPA did “not currently have a basis for approval.” In its October 2, 2017 action letter regarding its review of the commission’s 2016 changes to Regulation No. 31, EPA took no action on these standards changes. While EPA did not issue a formal disapproval, EPA’s rationale for no action was that “a technical analysis has not been submitted which supports the revisions.” Subsequent analysis by the division and TAC found that application of both the warming event and excursions is not biologically protective and recommended deleting the air temperature, low-flow, and shoulder season excursions and retaining only the warming event allowance.

During the 2016 Regulation No. 31 rulemaking hearing, some stakeholders voiced concern that deletion of the excursions would result in an unacceptable increase in 303(d) temperature impairment listings. Analysis of over 500 temperature sites across the state indicate that the warming event and excursions are approximately equal in resulting in an assessment decision of impairment or attainment for a waterbody; therefore, deletion of the excursions is not likely to result in an increase in temperature 303(d) listings, given the similar practical outcomes of these provisions. Regarding impacts to permitting, the air temperature, low-flow, and shoulder season excursions in Table I Footnote 5(c) have never been incorporated into permit effluent limits, and deletion of these excursions will not affect permit effluent limit calculations.

C. Point of Application Footnote for Nitrate Water Supply Standards

On December 8, 2011, EPA disapproved the point of application footnote for nitrate in Table II Footnote 4 that allowed the nitrate standard to not be implemented in discharge permits if no actual Water Supply use was identified and only applied the nitrate standard to the point of intake. The provision was disapproved because the standards are intended to protect classified uses, regardless of whether they are set to protect actual or future uses. During the 2016 Regulation No. 31 rulemaking hearing, a sunset date of 12/31/2022 was adopted for this provision to resolve the disapproval. The commission did not take any action regarding this provision in the current rulemaking hearing. However, Table II Footnote 4 at 31.16 was revised to clarify that the commission intended to retain the condition that the sum of nitrate and nitrite will not exceed the standard of 10 mg/L. The commission restructured the footnote to separate this condition from the portion of the footnote that expires on 12/31/2022.

II. REVISIONS OF CRITERIA IN LIGHT OF NEW INFORMATION

A. Aquatic Life standards for Acrolein and Carbaryl

The commission adopted revised acute and chronic Aquatic Life water quality standards of 3 µg/L for acrolein, based on the EPA 304(a) criteria updated in 2009. The commission also adopted new acute and chronic Aquatic Life water quality standards of 2.1 µg/L for carbaryl, based on the EPA 304(a) criteria published in 2012.

B. Other Standards to Protect Aquatic Life and Recreation Uses

The commission declined to adopt EPA’s revised 304(a) Aquatic Life criteria for selenium, ammonia, and aluminum at this time; however, the division is committed to evaluating these new criteria. Studies are currently underway for each parameter to improve understanding of these criteria in the context of water quality conditions in Colorado and how these criteria may be adopted and implemented in Colorado in the future.

EPA has also released updated criteria or guidance for several other parameters, including copper (Aquatic Life), *E. coli* (Recreation), cyanotoxins (Recreation), and the human health risk exposure assumptions. However, the division does not recommend adopting EPA’s recommendations for these parameters at this time, as these items are not included on the division’s 10-Year Water Quality Roadmap.

III. ANTIDEGRADATION STATUTE ALIGNMENT

As part of the June 2020 Regulation No. 38 rulemaking hearing (final action August 10, 2020), the commission raised questions about a potential misalignment of the Use Protected regulatory provisions in Regulation 31.8(2)(b)(ii) that considered the reversibility of existing pollution, with the statutory language in the Water Quality Control Act that limits the water quality test for the Use Protected designation to existing quality.

SUNSET 31.8(2)(b)(ii) Effective December 31, 2031

Having considered the evidence and statements submitted in this rulemaking, the commission believes that it is appropriate to move forward toward revision or deletion of the discretionary water quality-based antidegradation test at 31.8(2)(b)(ii). While the late stages of this rulemaking helped to advance the discussion regarding options for Use Protected designations based on the presence of substantial pollution for parameters other than those listed in section 31.8(2)(b)(i)(B), it was not possible within the constraints of this rulemaking to subject these issues and options to the robust public process that they deserve. This included the division's compromise option presented as part of its consolidated proposal - Option B, which proposed to add clear and relevant factors for the commission to holistically consider the overall characteristics of a waterbody when determining antidegradation designations in the limited circumstances where the 12 parameters test may not be sufficient. Since the issues are complex and there remains much controversy at the time of the rulemaking hearing, the commission adopted the division's alternative compromise proposal – Option A and repealed the antidegradation provision at 31.8(2)(b)(ii) with a delayed effective date of December 31, 2031. It is the intention of the commission to retain the current provision until that date but maintain its focus on Use Protected designations based on the 12 parameters test.

This action preserves division resources already fully allocated to criteria development and implementation efforts as identified in the 10-Year Water Quality Roadmap (Roadmap) through 2027 and allows adequate time for the division to conduct a separate, comprehensive stakeholder process on antidegradation following completion of the Roadmap and prior to the expiration of 31.8(2)(b)(ii). The commission intends that the division will engage in this comprehensive stakeholder process to consider options to delete the test at 31.8(2)(b)(ii) or revise that test with criteria that holistically evaluate the overall characteristics of a waterbody in a manner consistent with state and federal requirements. The commission also intends to revisit the provisions at 31.8(2)(b)(ii) through a rulemaking action no later than 2031. Revisiting this provision in the future would have the added benefit of providing an opportunity to also consider other aspects of Colorado's antidegradation rule, such as a lack of explicit "Tier 1" antidegradation review for existing uses as noted by EPA. If this stakeholder process is delayed due to unforeseen circumstances, it is the commission's intent that a limited extension of the sunset date will be adopted to allow time for the stakeholder process and rulemaking hearing prior to deletion of 31.8(2)(b)(ii). The commission also deleted the word "/or" to align with the federal antidegradation rule at 40 CFR 131.12(a)(2) and the Colorado Water Quality Control Act at 25-8-209(4).

Prior to 2021 the commission has only considered the presence of substantial pollution for parameters other than those listed in Section 31.8(2)(b)(i)(B) in the context of antidegradation designations in rare circumstances throughout the history of the antidegradation program in Colorado. The commission selected the 12 parameters listed in 31.8(2)(b)(i)(B) because they are effective indicators of water quality for antidegradation designation purposes. Accordingly, as the commission's past practice has reflected, the water quality-based tests set out in 31.8(2)(b)(i) will ordinarily suffice to determine whether waters' existing quality warrants a Reviewable or a Use Protected designation.

If proposals based on 31.8(2)(b)(ii) are advanced prior to 2031, the commission will thoroughly and holistically consider the physical, chemical, and biological characteristics of a waterbody, social and economic impacts throughout the segment and on downstream waters and users, environmental justice and health equity principles, and ensure that the public has adequate notice and time to engage and comment on proposals.

It is also important to note that under the tests at 31.8(2)(b)(i), the commission may determine that those waters with exceptional recreational or ecological significance should be undesignated, and deserving of the protection afforded by the antidegradation review provisions of section 31.8(3).

Future Considerations

At this time, the commission believes that it would be appropriate for it to revisit the option of a discretionary test for use in the limited circumstances where the 12 parameters test may not be sufficient, so long as that test (1) includes clear factors established in the regulation for making Use Protected antidegradation determinations that are consistent with state and federal law and (2) is based on a finding of substantial pollution for parameters outside those included in the 12 parameters test. Without presuming to limit the options available to future decision makers and based on its experience in this rulemaking, the commission recommends that the following issues should be addressed in a future stakeholder and rulemaking process to revisit section 31.8(2)(b)(ii) . The issues include, but are not limited to, thorough and holistic consideration of all of the following:

A. the physical, chemical, and biological characteristics of a waterbody, including consideration of how many pollutants and/or what magnitude of pollution should be considered substantial pollution, impacting both aquatic life and recreation uses;

B. the social and economic impacts throughout the segment and on downstream waters and users;

C. environmental justice and health equity principles;

D. ensuring that mechanisms are in place to ensure that the public has adequate notice and time to engage and comment on proposals;

E. that waters with exceptional recreational or ecological significance should not be designated as Use Protected; and

F. whether and how to provide exclusions from the Use Protected designation based on short-term degradation, such as existing quality resulting from temporary events influencing the waterbody that are not representative of normal conditions (e.g., pollution from temporary land disturbance, illegal discharges, spills of toxic chemicals, and impacts from fires, floods, or other catastrophic events).

The commission further recommends that the future stakeholder and rulemaking process should address the broader aspects of the antidegradation program noted above (e.g., explicit Tier 1 antidegradation review).

IV. DISCHARGER-SPECIFIC VARIANCES

The commission revised the discharger-specific variance (DSV) provisions at 31.7(4) to improve the clarity and organization of requirements, reflect the commission’s current practices, and align with the 2015 federal rule (40 CFR 131.14). The commission’s criteria for DSVs have been utilized successfully to develop DSVs that have been approved by EPA and are resulting in water quality improvements. Overall, the commission determined that the requirements at 31.7(4) continue to be appropriate. The changes made during this hearing are not expected to substantively change the requirements for variances, but rather are intended to improve transparency and facilitate commission action and EPA approval.

Previously, the requirements for DSVs were included in three locations in the regulations, at 31.7(4) *Granting, Extending and Removing Variances to Numeric Standards*, at 31.9(5) *Conditions on Discharger-Specific Variances*, and in some of the basin regulations, which include reevaluation requirements for existing DSVs (e.g., 32.6(6)(a) and (b)). The commission centralized the DSV requirements in a single location at 31.7(4) to ensure that requirements are not overlooked.

A. Variances to Narrative Standards

The commission deleted the term “numeric” from 31.7(4) *Granting, Extending and Removing Variances to Numeric Standards* and 31.7(4)(a) to better align with the federal rule, which does not preclude the possibility of variances to narrative criteria. As with all variances, a DSV for a narrative standard would need to meet all Colorado and federal requirements and be supported by a comprehensive alternatives analysis demonstrating that there are no feasible pollution control alternatives that would allow for the regulated activity to proceed without a discharge that exceeds water quality-based effluent limits (WQBELs) for a given parameter(s) and an evaluation that there are no other regulatory options to achieve compliance. Therefore, a DSV must include identification of the pollutant(s) or water quality parameter(s) to be able to perform an alternatives analysis and a detailed demonstration of why it is not feasible to meet the narrative standard. The identification of the pollutant is a critical and crucial step of the DSV process whether the standard is narrative or numeric, because the treatment and control technologies can vary significantly based on the pollutant requiring removal. For example, feasible treatment technologies for removing organic carbon and ammonia may not be effective at removing zinc, cadmium, or sulfate.

There are several narrative standards in Regulation No. 31 with implementation tools that help determine numeric effluent limitations or quantifiable conditions in NPDES permits. For example, one of the narrative water quality standards listed in 31.11(1) specifies that waters should be free from substances that cause toxicity to humans, animals, plants, and aquatic life. The implementation tool used for aquatic life toxicity determinations is Whole Effluent Toxicity (WET) testing. WET tests directly measure the toxic effects on aquatic life due to the presence of one or more pollutants in the wastewater. Because WET testing is a control mechanism that measures, and limits, the combined toxic effect that the pollutants in the effluent have on aquatic life, it does not require the identification of each one of the pollutants in the effluent. The commission recognizes that each situation is unique, but in cases such as the one for toxicity described here, to qualify for a DSV, the discharger will need to identify the pollutant(s) or water quality parameter(s) that is/are causing non-compliance with the standard and/or failures with the implementation tool. The identification of the pollutant will serve two purposes during a DSV process: first, to determine if there are any pollution control alternatives that can feasibly achieve compliance with the narrative standard (in other words, whether or not the discharger qualifies for a variance); and second, to develop the alternatives analysis of feasible pollution control technologies that will provide incremental water quality improvements.

To align with the federal rule and ensure that a variance results in measurable progress towards attaining the underlying designated use, the commission will also adopt a quantifiable expression of the highest attainable condition for narrative standards. A quantifiable expression of the highest attainable condition can be expressed as numeric pollutant concentrations in ambient water, numeric effluent conditions, or other quantitative expressions of pollutant reduction. The preamble to the federal rule at 40 CFR 131.14 describes the quantifiable expression by providing the example of the maximum number of combined sewer overflows that is achievable after implementation of a long-term control plan. The commission believes such a quantifiable expression helps ensure measurable water quality improvements during the term of the variance, which is a key purpose of a variance.

Although this change acknowledges the possibility of DSVs adopted for narrative standards, the commission encourages potential proponents of DSVs for narrative standards to closely coordinate with the division before proposing such variances. At this time, the commission does not have a full understanding of all the circumstances under which DSVs for narrative standards may be warranted. Similarly, no guidance yet exists for developing and implementing alternative effluent limits (AEL) for narrative standards that protect the highest attainable condition.

B. Review Requirements

In 31.7(4), the commission changed the requirement to reevaluate DSVs “every three years” to “during each basin triennial review for the segment, unless the Commission requires a more frequent review when adopting the variance” to be consistent with current commission practice. Because the DSV reevaluation occurs across multiple hearings (Issues Scoping Hearing, Issues Formulation Hearing, and Rulemaking Hearing), the term “triennial review” better captures the process and timing of DSV reviews. This revision also provides flexibility to conduct more frequent reviews if it is required by the variance.

C. When a DSV is the Right Regulatory Tool

In 31.7(4)(a)(ii), the commission changed the requirement to obtain a DSV from being a preferable matter of policy when the conditions for granting a temporary modification are not met, to requiring evaluation of whether other regulatory tools are appropriate to obtain feasible WQBELs within the required timeframe. This change reflects the commission’s practice of granting a DSV only in instances where there has been an evaluation of other regulatory tools, such as compliance schedules or a Use Attainability Analysis (UAA), to determine whether these tools may result in WQBELs that are feasible for the discharger to achieve within the required timeframe.

The required timeframe to evaluate the potential use of other regulatory tools is based on site-specific conditions; however, a reasonable timeframe for such determinations usually does not exceed a few years. For example, if a discharger is expecting more stringent WQBELs in a future permit, or has a compliance schedule and is considering a variance because it will not be able to achieve its WQBELs at the end of the compliance schedule, the discharger should use this time to evaluate other regulatory tools. A UAA can be evaluated if there is a potential to change the classified uses or standards on the segment; while uses and standards are required to be reviewed at least once every three years, and future changes are possible, DSVs are definitely temporary. In the past, UAAs to support removal of the Water Supply use where there are no current or future water supplies have been effective for several dischargers. This type of analysis can generally be completed within months. It is important to evaluate the potential use of other regulatory tools first, as it is the commission’s intent that DSVs are to be used only in cases where the compliance problem cannot be solved using other regulatory tools.

D. Alternative Effluent Limits

In 31.7(4)(b), the commission adopted revisions to both the definition and selection of AELs to improve clarity and align with the federal rule. The commission clarified that the AEL selection process should be based on (1) implementation of the best feasible alternative(s) to achieve WQBELs over the longer term, (2) achieving the highest attainable condition throughout the term of the variance, and (3) protecting the existing water quality conditions at the time of the adoption of the variance unless necessary for restoration activities.

The commission renamed the two options for AELs to reflect what each option represents. The AEL must be either (i) an effluent-based (numeric) limit expressed as an effluent concentration, load, pollutant percent removal, or other quantifiable expression of effluent quality and quantity, or (ii) an action-based (narrative) limit with a quantifiable expression of the specific pollution control requirements to be completed by the discharger and the adoption and implementation of a Pollutant Minimization Program (PMP).

In addition, the commission revised its practice of only adopting AELs to be met by the end of the variance. Previously, the commission adopted only a final AEL, which established the required water quality improvement to be achieved once the selected alternatives had been fully implemented. To ensure that the DSV did not result in any lowering of the currently attained ambient water quality, the commission previously relied upon implementation requirements that directed the permit writer to develop “initial effluent limits” based upon the level of effluent quality currently achieved that applied from the beginning of the variance until the AEL was achieved. The permit writer would also develop “interim effluent limits” if the water quality improvements were planned in phases.

In order to align with federal requirements, the commission will instead adopt AELs that apply throughout the term of the variance. This will include an initial AEL that applies from the beginning of the variance and a final AEL based upon the expected water quality improvement to be achieved once the selected alternatives have been fully implemented. The purpose of the initial AEL is to ensure that the DSV does not result in any lowering of the currently attained ambient water quality. The purpose of the final AEL is to set requirements that represent the highest attainable condition that is feasible to achieve within the term of the variance. The commission may also adopt interim AELs to set requirements for variances with multiple planned phases of water quality improvement.

The commission strongly prefers adoption of effluent-based initial and final AELs, expressed as effluent concentrations, loads, or pollutant removal percentages. However, in cases where the commission determines that an action-based final AEL is appropriate, the commission may still adopt an effluent-based initial effluent limit. Action-based initial AELs with a quantifiable expression and a PMP will be considered only in extraordinary circumstances when it is not feasible for the discharger to comply with an effluent-based initial AEL. For instance, City of Pueblo’s selenium DSV is a good example of a case where the permittee did not have sufficient control over pollutant concentrations at the onset of the variance and there was a high degree of variability and unpredictability that limited numerical characterization of the pollutant reductions achievable in effluent concentrations. This DSV, adopted by the commission in the 2018 Regulation No. 32 rulemaking hearing, included an action-based AEL (formerly known as a narrative AEL) that quantified the requirements of the DSV as a specific set of source control and optimization measures with a specific timeline (implemented as a PMP).

E. Pollutant Minimization Program

To be consistent with the federal rule, the commission revised the language to allow the adoption of an effluent-based (numeric) AEL or an action-based (narrative) AEL with a quantifiable expression and a PMP to ensure all feasible water quality improvements are implemented throughout the term of the variance. The commission described the effluent-based AELs as limits that can be expressed as an effluent concentration, load, pollutant percent removal, or other quantifiable expression of effluent quality and quantity. The commission described the action-based AELs as a quantifiable expression of the specific pollution control requirements to be completed by the discharger and the adoption and implementation of a PMP. The commission specified that the action-based AEL is only justified when there is no additional feasible control technology that can achieve a predictable, quantitative improvement in effluent quality, and therefore, will also require adoption and implementation of a PMP to specify the actions that need to be taken to achieve maximum pollutant reduction with existing control technologies. For the effluent-based AEL (numeric), the commission stated that it may also adopt a PMP at its discretion. These requirements are consistent with the nine DSVs adopted by the commission to date.

A PMP is a comprehensive source control measure described in 40 CFR 131.14 that will prevent and reduce the pollutant loadings to the receiving waterbody. A PMP is particularly essential for variances where the requirements are adopted as actions to be completed by the discharger, rather than effluent quality. Based upon experience with the DSVs previously adopted by the commission, a PMP provides a clear set of expectations and timeline for implementation, which makes it straightforward for both the discharger and the commission to determine compliance with the requirements. Without a PMP, there is a risk of the discharger and the commission having different expectations about the DSV requirements and whether compliance has been achieved. A PMP may be a short document, and the development of a PMP should not be an onerous requirement. Previously, it has been an extremely useful document to the discharger (particularly to the plant operator) after the variance has been adopted.

F. Organization

The *Conditions on Discharger-Specific Variances* section was moved from 31.9(5) to 31.7(4)(c) to facilitate consolidation of DSV requirements in a single location. Section 31.9(5) was deleted. Section 31.7(4)(c)(i) was revised to avoid redundancy with Section 31.7(4)(b)(i). The commission also included language to state that the discharger should be in compliance with the initial AEL when the variance is implemented in the permit and that the permit writer determines the compliance schedule(s) of the interim (if any) and final AELs. The commission also clarified the language to allow the permit writer to set interim milestones to achieve the final AEL, if appropriate.

The commission moved Section 31.7(4)(b)(iii) to 31.7(4)(c)(iv) because it governs the division’s permitting implementation rather than a requirement for the selection of AELs. The previous regulatory language in this provision also gave direction to the permit writer regarding DSV implementation; however, the language was confusing. Therefore, the commission clarified the language in 31.7(4)(c)(iv) to state that the effluent limits for the point source discharge in the variance should be based on either WQBELs based on the underlying standard for the receiving waterbody or the AEL, whichever is less stringent. This is applicable in situations where a discharger’s WQBELs increase, for example, due to an increase in dilution in their discharging segment.

G. Other Changes

In 31.7(4)(b), the commission revised the language that described the variance as a standard “which represents the highest degree of protection of the classified use that is feasible within 20 years” to instead state that variances shall include AELs “that reflect the greatest pollutant reduction achievable throughout the term of the variance”. While it is important to consider the potential for attaining standards on a long time horizon (i.e., approximately 20 years), in practice, there is often a great deal of uncertainty regarding the timeframe over which it may be feasible for the permittee to achieve WQBELs based upon the underlying standard. Adopting a variance with a shorter timeframe and a more certain AEL would allow for water quality improvement in the short-term, while retaining the ability to reconsider long-term feasibility during the reevaluation of the variance or at the end of the term of the variance.

Section 31.9(2) was clarified to note that compliance schedules are authorized when appropriate and necessary to meet interim and final AELs for variances.

The commission made several revisions to 31.7(4)(d). First, the commission changed the requirements for the duration of a DSV and included language to account for the planning, implementation, and monitoring of the activities planned to achieve better water quality. Previously, 31.7(4)(c) stated that the duration of the DSV will be determined on a case-by-case basis, based upon all relevant factors, including the potential for achieving more protective effluent levels. This was not entirely consistent with the federal rule, which states “The term of the WQS variance must only be as long as necessary to achieve the highest attainable condition.” For each of the DSVs that the commission has adopted to date, the duration was based upon the time needed to achieve the highest attainable condition. The commission revised this section to align with the federal rule and reflect current commission practice.

Second, the same requirements included in the basin regulations (such as 32.6(6)(a) and (b)) regarding the reevaluation of DSVs were added to 31.7(4)(d). These requirements were not included in Regulation No. 31 previously. The requirements include conducting a reevaluation of the variance during the triennial basin review when the term of the variance is longer than five years, and more frequently if needed, and submitting the results of its reevaluation to EPA within 30 days of the date the commission completes its reevaluation, as is required by federal rule.

Third, to better align with the federal rule, the commission added that it would incorporate a more stringent AEL if, as part of the reevaluation process, it determines that a more stringent AEL or higher attainable condition than originally required by the variance is achievable. The commission added that if the commission determines a less stringent AEL is necessary, a revised variance must be submitted to EPA.

Lastly, the commission changed the language from “extending” to adopting “a subsequent variance” in order to better align with the federal rule, and clarified the requirements for adopting a subsequent variance.

V. LAKE TEMPERATURE AND DISSOLVED OXYGEN FOOTNOTE

The commission adopted Footnote 5(c)(i) to Table I, which states:

> Lakes and reservoirs: When a lake or reservoir is stratified, the mixed layer may exceed the applicable temperature criteria in Table I provided that an adequate refuge exists in water below the mixed layer. Adequate refuge means that there is concurrent attainment of the applicable Table I temperature and dissolved oxygen criteria. If the refuge is not adequate because of dissolved oxygen levels, the lake or reservoir may be included on the 303(d) List as “impaired” for dissolved oxygen, rather than for temperature.

This footnote previously existed in Regulation No. 31, but was deleted in the 2016 Regulation No. 31 rulemaking hearing. In 2016, the commission declined to adopt the division’s statewide temperature proposal for lakes to adjust the Table Value Standards (TVS) for temperature based on elevation. The proposal would have resulted in an increase in the allowable temperature for many lakes. A component of the proposal was also to delete Footnote 5(c)(iii) to Table I, which allowed for surface temperatures to exceed standards as long as concurrent attainment of dissolved oxygen (DO) and temperature existed in a profile of the reservoir. The commission did not adopt this proposal; however, Footnote 5(c)(iii) was still deleted, in error. The footnote deletion should not have been adopted because deletion of the footnote was directly coupled to the elevation-based temperature standards proposal.

The division provided evidence in this hearing showing that lake surface temperatures are widely subject to exceedances and correlated with elevation, and that Table I Footnote 5(c)(iii) should be reinstated. The reinstatement of Footnote 5(c)(iii), modified for clarity, will allow for lakes to have surface or mixed layer temperature exceedances (a naturally occurring condition) and assessments to consider 303(d) and M&E listings for DO where DO and temperature are not concurrently attained.

VI. LONGEVITY PLANS FOR SITE-SPECIFIC STANDARDS

The commission considered but did not adopt a proposal to revise section 31.7(1)(b)(ii) and (iii) and 31.7(1)(c) to incorporate a longevity plan requirement for all ambient quality-based, criteria-based, and narrative site-specific standards. The commission determined that, at this time, a regulatory change is not needed for longevity plans to continue to be adopted with site-specific standards.

The purpose of longevity plans is to ensure that site-specific standards can be reviewed during subsequent triennial reviews, as required by federal and state rule (Federal Clean Water Act Section 303(c)(1) and Colorado Water Quality Control Act Section 25-8-202(f)). Consistent with past practice, the commission will continue to thoughtfully consider the expected longevity of each site-specific standard and identify the types, extent, and timing of information needed to facilitate future reviews of the standards. The commission will continue to adopt longevity plans as needed to guarantee the collection and analysis of information that will be necessary to ensure that a site-specific standard is maintained over time, continues to be scientifically sound, protects the beneficial uses, and can be updated or revised as needed.

The commission intends that longevity plans will continue to be developed in collaboration with the division and other interested parties. In addition, the commission intends that longevity plans will be implemented by the parties proposing site-specific standards; in some situations, longevity plans may be implemented by multiple parties. Longevity plans should include plans for collection of evidence necessary to support review of the site-specific standards in subsequent rulemaking hearings, taking into account the expected longevity of the site-specific standards, the conditions on which the site-specific standards were based, the time horizon in which those conditions are expected to change, and the resources required to collect, analyze, and report on data and other information. The purpose of collecting such information is to ensure the commission can determine whether the basis and assumptions used to support the initial adoption of the site-specific standards are still valid or if there has been a significant change in conditions. Depending on the type of site-specific standard (ambient-based, criteria-based, or narrative), this may include collection of instream and effluent water quality data (and, as appropriate, the flow and loading of effluent) to characterize existing quality; aquatic life community information; updates to toxicity databases; analysis of data; investigation of treatment technologies, treatment alternatives, and/or other controls to determine if further improvements to water quality are feasible; land use or habitat evaluations; or collection of other relevant site-specific information.

For example, longevity plans for site-specific standards based on the copper Biotic Ligand Model have included continued collection of the water quality data required to run the model; longevity plans for site-specific standards based on the recalculation procedure have included investigations of new toxicity data, reporting on changes to instream chemical, physical, or biological conditions, and additional biological and water quality data collection; longevity plans for site-specific standards based on natural or irreversible ambient conditions have included ongoing biological and water quality data collection.

When the division has identified an existing site-specific standard as a priority for review in an upcoming rulemaking hearing, the division will conduct outreach with potentially impacted entities as early as possible to identify data and other information needs and collaborate on data and information collection as needed. The division shall notify potentially impacted entities in consideration of a timeline that allows them adequate notice of the division’s intent for review and allow participation in the routine approach to stakeholder participation in basin reviews.

The commission expects that longevity plans will result in the collection of evidence that is of the right type, quality, and quantity to be useful for future evaluations of the site-specific standard, recognizing that the type(s) of data collection is dependent on conditions unique to the site, and that a longer time horizon (beyond a single triennial review period) for the frequency of data collection may be warranted for certain sites. For some situations, it may be appropriate to require certain activities only if certain types of changes occur; for example, water quality data collection may only be necessary if changes to land use or flow are observed. Because every site-specific standards situation is unique, so too will be the components, review elements, and review timing of every longevity plan. In addition, the commission anticipates that individual longevity plans may be revised in future reviews to account for site-specific circumstances.

In addition, the commission encourages the division to begin evaluating the basis of all existing site-specific standards. Where the basis or validity of an existing site-specific standard cannot be confirmed with available data or other information, the commission encourages the original proponents of existing site-specific standards (including the division), and/or other dischargers whose permit compliance relies on the site-specific standards, to begin working with the division, EPA, CPW, and other interested parties to develop a plan to collect the necessary information and provide an update to the commission at the soonest possible triennial review for the waterbody at issue. Because most existing site-specific standards do not have a longevity plan, and in many cases, sampling is not occurring, the commission anticipates it will take time for representative data and/or information required for a comprehensive review of each site-specific standard to become available, and that progress will be incremental during routine basin review cycles. The division will compile and store information about all site-specific standards in a publicly available site-specific standards library; this library will house information about the basis and review history for each site-specific standard and will be used to prioritize site-specific standards for future review.

VII. TEMPORARY MODIFICATIONS

The commission adopted changes to the temporary modification provisions at 31.7(3) and 31.9 to reflect current commission practice and better ensure that temporary modifications are adopted only when necessary and eliminated in a timely manner. Changes were also adopted to ensure that facilities receiving regulatory relief through a temporary modification take measures to, at a minimum, maintain status quo and manage effluent quality at the best level reasonably achievable under the term of the temporary modification. These changes are described in more detail in the following sections.

Section 31.7(3) was also reorganized slightly for clarification and a definition for the term “status quo” was added to 31.5(40). The commission considers division Policy 13 *Permit Implementation Method for Narrative (Current Condition) Temporary Modifications* to be consistent with this regulatory definition.

A. Changes to 31.7(3)(a): Non-attainment Requirements and Appropriate Use of Predicted Non-compliance

The commission made several substantive and editorial revisions to 31.7(3)(a). The commission clarified that temporary modifications may be granted for numeric water quality standards. Additionally, the commission clarified at 31.7(3)(a) that non-attainment of the underlying water quality standard in the waterbody is an explicit requirement for justifying a temporary modification. This requirement for a temporary modification is set forth at 31.7(3), namely that “Where non-attainment of underlying standards has been demonstrated or predicted the Commission may grant a temporary modification…”. However, this requirement was not previously raised again explicitly at 31.7(3)(a). Furthermore, the commission added clarification that the appropriate scope of temporary modification application to a waterbody is only where demonstrated or predicted waterbody non-attainment and compliance problems co-occur (i.e., the temporal and spatial application should be appropriately narrow). For example, if a compliance problem or non-attainment is only observed in the summer, it may not be appropriate to grant a year-round temporary modification. These changes recognize current practice and are not meant to change that policy, only to clarify and expressly approve its use. The commission recognizes that evaluations of co-occurrence of non-attainment and non-compliance can vary depending on the situation and intends to consider site-specific information in determining the appropriate spatial and temporal extent of a temporary modification.

Additionally, the commission added language at 31.7(3)(a)(ii) to clarify how predicted compliance problems are justified. It was specified that temporary modifications are only justified in situations where, in addition to significant uncertainty and non-attainment, there is either a demonstrated or predicted problem complying with a water quality-based effluent limit (WQBEL) on a timescale such that, absent a temporary modification, the discharger would face unreasonable consequences. For purposes of temporary modifications, unreasonable consequences are defined as situations where it can be demonstrated that the timing of the anticipated permit limit (considering any potential compliance schedules or other permitting flexibility) would not provide sufficient time to resolve the uncertainty prior to requiring significant investment in design or construction of facility infrastructure. As such, the commission further defined predicted non-compliance as a problem complying with a WQBEL with which the discharge must comply within the next five years (i.e., within five years of the effective date of the temporary modification). Another example situation that would qualify for a temporary modification is where a discharge has a predicted problem complying with a WQBEL in more than five years, and evidence shows significant investment in facility infrastructure would be required before the uncertainty is resolved. For the purposes of temporary modifications, significant investment can be equated to any measures beyond low cost options for maintaining the best effluent quality reasonably achievable, such as example activities provided at 31.9(4).

These changes provide clarity regarding the appropriate use of prediction in determining whether compliance problems exist in the context of temporary modifications. The commission expects that, when time allows, progress to resolve the uncertainty (e.g., derivation of an appropriate site-specific standard or DSV) will occur in coordination with the division and other stakeholders outside of a temporary modification. This will allow for optimal use of resources and help to ensure that the scope of a temporary modification is appropriately narrow and the term is appropriately short.

B. Changes to 31.7(3)(b), 31.7(3)(c), and 31.7(3)(e): Status Quo Characterization and Plan to Resolve Uncertainty Requirements

The commission revised 31.7(3)(b) and 31.7(3)(c) to clarify what supporting information is required for temporary modification adoption and extension, respectively. To support an extension of a temporary modification, the commission added a requirement to provide justification as to why the time allotted under the previous temporary modification term was not sufficient to resolve the uncertainty. This information will help the commission judge whether the reasoning behind the need for extension is justified and avoid granting temporary modification extensions where the need for extension results from lack of sufficient effort to eliminate the need for the temporary modification.

The commission also added an explicit provision to 31.7(3)(b) and (c) requiring a characterization of the status quo of the waterbody and effluent, or, absent sufficient data, a plan to collect data to characterize the status quo as soon as possible. This characterization will ensure that the commission can use these data points to compare to future characterizations of ambient and effluent conditions when a temporary modification is reviewed or when it is proposed to be modified or extended, to verify that status quo has been maintained. As such, the commission also adopted revisions to 31.7(3)(e) that explicitly list consideration of the maintenance of the status quo when making a decision as to whether a temporary modification should be removed or extended. Additionally, a statement was added to the review criteria to clarify that an extension of the temporary modification shall not be granted in cases where the basic reporting requirements (i.e., providing annual updates and supporting documentation to the division) have not been met over the prior term of the temporary modification. All of these actions are aligned with the current intent of the regulatory language and reflect current commission practice. The commission recognizes that, during the temporary modification, permitted dischargers' effluent quality may be marginally changed and variability in effluent quality may occur; however, the commission also expects that dischargers take measures to ensure that effluent quality is maintained at the best level reasonably achievable, in a manner consistent with the provisions of 31.9(4), under the term of the temporary modification, as discussed below. There may also be situations where the waterbody quality status quo has not been maintained due to causes outside of the discharger's control (e.g., hydrological modifications of the waterbody upstream of the discharge point). Under these circumstances, justification that the waterbody degradation was not due to the effluent in question should also be provided and considered, as specified in 31.7(3)(c) and 31.7(3)(e).

The commission also made changes to 31.7(3)(b) to clarify the expectations for the required plan to resolve uncertainty that accompanies each temporary modification. The commission clarified that, for each type of uncertainty identified, the plan should include an adequately detailed, site-specific approach, including sampling plans where appropriate, to resolve the uncertainty. Plans should also include timelines for key deliverables and annual reporting of progress to the division. Furthermore, the commission added a requirement for plans to include activities to ensure that, at a minimum, status quo is maintained and effluent quality is maintained at the best level reasonably achievable. This is not only aligned with existing provisions at 31.9(4), but also with previous commission intent documented in the Statement of Basis and Purpose at 31.44 and existing commission practice to adopt plans that include low-cost activities that would result in water quality improvements under the term of the temporary modification. Such activities may include optimization-like activities such as pretreatment, source identification, and evaluations of source control and treatment options. Nonpoint source implementation of strategies for improving waterbody quality can also be considered, as appropriate. These activities also serve to help eliminate the uncertainty regarding the extent to which conditions are natural or irreversible. Except where justified otherwise, it is the commission's intent that efforts to resolve each type of uncertainty occur in parallel, rather than in sequence, such that the need for the temporary modification is eliminated as expeditiously as possible.

C. Changes to 31.7(3)(d): Removal of Term "Existing Uses" and Alignment of Numeric and Narrative Operative Values

The commission removed the requirement for temporary modification operative values to "protect existing uses" at 31.7(3)(d). This requirement is not consistent with the intent of temporary modifications, which focuses on maintaining status quo. Thus, the requirement to "protect existing uses" was replaced with a requirement that the temporary modification operative values, at a minimum, ensure that status quo is maintained. The commission also aligned the language at 31.7(3)(d)(i) and (ii) to clarify that characterization of status quo is the requirement for both numeric and narrative operative values.

D. Changes to 31.7(3)(e): Clarification of Considerations for Setting the Term of and Extending the Temporary Modifications

The commission added clarifying language at 31.7(3)(e) to better specify appropriate considerations when setting the term of temporary modifications. In circumstances where there is uncertainty pertaining to the justification for the temporary modification and further data are being gathered to support the justification (e.g., where there is some uncertainty whether waterbody non-attainment exists), a shorter term for the temporary modification may be warranted. The commission also clarified that the term granted shall be the shortest possible to sufficiently resolve the uncertainty. The reasoning for the length of term selected should be clearly justified in the plan to resolve uncertainty for the temporary modification. Additionally, the commission clarified that, when evaluating extension of a temporary modification, the situation must still qualify for a temporary modification under 31.7(3)(a) and substantial progress towards resolving the uncertainty must have been made under the previous term of the temporary modification. The commission will evaluate the adherence to planned activities scheduled in the plan to resolve uncertainty, as well as the justification (newly required at 31.7(3)(c)) as to why the time allotted under the previous temporary modification duration term was not sufficient to resolve the uncertainty.

E. Changes to 31.7(3)(f): Modification of Scope and Schedule for Rulemaking

The commission revised 31.7(3)(f) to expand the scope of temporary modifications included in the temporary modifications public rulemaking hearings from those expiring within the subsequent two years to all temporary modifications, so that the commission is able to better ensure that timely progress is being made on all temporary modifications, regardless of the expiration date. The commission also modified the minimum routine schedule for temporary modifications public rulemaking hearings from annually to biennially. The commission expects that proponents of temporary modifications will supply annual updates for all temporary modifications to the division, which the division will review to ensure that temporary modifications are still justified and timely progress is being made to resolve uncertainty. However, formal temporary modifications public rulemaking hearings will only occur routinely on a biennial basis. The need for a public rulemaking hearing in off years will be assessed after updates are received and hearings can be scheduled as needed.

F. Changes to 31.9(4): Clarification, Alignment with Division Practice, and Inclusion of Examples of Division Authority to include Low Cost Optimization in Permits for Temporary Modifications

Section 31.9(4) was reorganized slightly for clarification. The commission also added a new section (31.9(4)(ii)) that clarifies how numeric and narrative operative values for temporary modifications should be implemented in permits. Where a permit is issued for an existing discharge to a waterbody where a temporary modification applies, whether numeric or narrative, permit effluent limits applicable under the term of the temporary modification should be developed to ensure that, at a minimum, status quo is maintained.

Additionally, the commission removed the statement at 31.9(4) that specified that “The Division, where necessary and within a reasonable period of the expiration of a temporary modification, shall reopen any permit for a discharge to that segment and include a permit condition to attain limits based on the underlying standard”. This was removed because it does not reflect current permitting practices.

The commission also added language at 31.9(4)(iii) to reemphasize that inclusion of low cost optimization in permits, which includes activities such as pretreatment, source identification, and evaluation of source control and treatment options, is authorized and may be an effective permitting tool for ensuring that effluent quality is maintained at the best level reasonably achievable without requiring significant investment in facility infrastructure under the term of the temporary modification, as well as resolving uncertainty regarding the extent to which ambient conditions resulting from the effluent in question are reversible.

Finally, the commission revised the language in 31.9(4) that pertains to implementation of temporary modifications for expanding and new discharges. The commission added clarification that, when considering expanding discharges to a waterbody where a temporary modification applies, permits should not only protect downstream uses, but unless specifically decided otherwise by the commission, should, at a minimum, ensure that status quo is maintained. The commission revised the expectations for permits for new discharges to waterbodies where temporary modifications apply from establishing limits that protect downstream uses to establishing limits based on the underlying standard, unless the commission has established a specific limit or value for new dischargers for a particular temporary modification or set of modifications. An example of such a case is the operative value assigned to new discharges by the commission for arsenic temporary modifications, which also considers arsenic control and treatment limits. This revision for new discharges aligns with the commission’s intent at 31.53(IV), which states that “Specifically, the Commission added references to “existing discharges” to clarify that effluent limits based upon temporary modifications only apply to existing discharges, and that effluent limits for new and expanded discharges must generally be set to the underlying standard.” The commission considers division Policy 13 *Permit Implementation Method for Narrative (Current Condition) Temporary Modifications* to be consistent with this regulatory revision.

VIII. CLEANUP, CORRECTIONS, AND CLARIFICATIONS

A. Nitrite Aquatic Life Standards

The commission added additional instructions for using the chloride-based nitrite standards for aquatic life in Table II Footnote 3 at 31.16 to clarify that sensitive fish species include salmonids, channel catfish, logperch and brook stickleback. The “sensitive species” are defined in the 1986 Nitrogen Cycle Committee of the Basic Standards Review Task Force document. This footnote was also edited to clarify that either total or dissolved chloride data may be used in these equations. About half of the available chloride data in Colorado is reported as “total” and the remainder is reported as dissolved. Whether or not a sample was filtered should not impact the concentration of chloride, because chloride is completely soluble at concentrations well above 40 mg/L. As more nitrite data become available and nitrite standards are assessed and implemented more frequently, it is expected that there may be more interest in adopting the equation-based standards from Regulation No. 31 in the basin tables on a site-specific basis. The proposed clarifying edits are intended to make this option as straightforward as possible.

B. Reformat Hardness-based Equations

The following changes were made to the hardness-based table value standard equations in Table III at 31.16 to improve compatibility with Excel:

- Acute and chronic aluminum, chromium III, copper, lead, manganese, nickel, silver, uranium, and zinc: the first bracket was replaced with the symbol * and the second bracket was deleted from the equation.
- Chronic aluminum: a missing parenthesis was added to the end of the equation.
- Acute and chronic lead: brackets and an extra parenthesis were deleted from the conversion factor in the equation.
- Acute silver: ½ was replaced with 0.5* in the equation.

These changes were also made in Regulation Nos. 32-38.

C. Duration of Radionuclide Standards in Table A

The commission revised the footnote to the Radionuclide Standards table (Table A) in 31.11(2) to state that all of the radionuclide standards listed should be applied as chronic 30-day average health-based standards. Colorado's radionuclide standards (with the exception of americium 241) were adopted in 1979 using the 1976 National Interim Primary Drinking Water Regulations, which included maximum contaminant levels for radionuclides that are based on annual dose exposures and maintaining a body burden below harmful levels. In 1996, revised plutonium and new americium standards were adopted with the footnote specifying that they are 30-day averages. However, because all of the radionuclide standards in Table A are based on long-term risk exposure assumptions, the footnote was modified to specify that all should be implemented as chronic 30-day average standards.

D. Duration of Nitrate and Asbestos in Table II

31.16 Table II: (acute) was added to the agriculture nitrate standard and (chronic) was added to the asbestos standard to clarify the durations of the standards.

E. Duration of Standards in Tables II and III

31.16 Table III: The word "chronic" was added to the column headers for the Agriculture, Water + Fish, and Fish Ingestion standards, and the phrase '30-day' was removed from cells in those columns to clarify the durations of the standards.

31.16 Tables II and III: In columns that include both acute and chronic standards, the duration is noted in the cell with each standard. To clarify the duration of the standards, the phrase "1-day" was replaced with "acute" and the phrase "30-day" was replaced with "chronic".

F. Standards Not Routinely Applied

Footnote 6 was added to Table II and Footnote 18 was added to Table III at 31.16 to clarify that fluoride, asbestos, antimony, barium, beryllium, and thallium standards should be applied on a site-specific basis in accordance with 31.7(1)(b) and 31.7(2). Since their initial adoption, these standards have not been adopted broadly into the basin regulations (Regulation Nos. 32-38), and the footnote was included to encourage adoption of protective criteria, where appropriate.

G. Sulfate

The sulfate standard at 31.11(6)(ii) and in Table II at 31.16 was edited to clarify that the standard applies to dissolved sulfate concentrations. This change was also made in Regulation Nos. 32 38. As an ion, sulfate is found in water only in the dissolved state; therefore, either unfiltered or filtered samples may be used to determine sulfate concentrations. In addition to clarifying that sulfate is a dissolved parameter, Footnote 7 was added to Table II to clarify that sulfate can be assessed and implemented using data from unfiltered or filtered samples.

H. Mercury Clarification

The commission revised the term “total” in Table III and the associated Footnote 6 to the term “total recoverable” mercury to align with the basin regulations and clarify the confusion caused by the use of two different terms that refer to the same fraction of mercury. The term currently used to describe the mercury standard in Table III is “total” to denote that the standard is based on all forms of mercury, not just methylmercury. It is also meant to denote that the standard is based on the “total” (unfiltered) fraction, rather than dissolved (filtered) fraction of mercury. However, in the basin regulations (Nos. 32-38), the term “total recoverable” is used to refer to the same fraction and all forms of mercury.

The term “total recoverable” comes from the analytical protocols used to analyze heavy metals, including mercury, and requires a pre-digestion step. This pre-digestion step does not provide quantification of any additional fraction of mercury in the sample. It simply serves as a sample preparation step for high turbidity samples to facilitate determination of mercury (all forms) present in the sample. Although both “total” and “total recoverable” terms are used in the literature to define results from analytical methods that include a pre-digestion step of unfiltered samples, “total recoverable” is technically the more correct term.

The commission also revised Table III Footnote 6 to clarify that mercury data analyzed and reported as “total” or “total recoverable” using EPA approved total mercury analysis methods listed in 40 CFR 136.3 are considered equivalent.

I. Chromium Footnote

The commission revised Table III Footnote 5 to improve the clarity of the footnote, which directs the implementation of the trivalent (III) and hexavalent (VI) chromium standards when data for the individual valence states are unavailable. Chromium data are infrequently reported for chromium III and chromium VI individually. Instead, data are typically reported as the total of all valence states of chromium present in the sample. This is primarily due to the difficulty of accurately measuring chromium III concentrations and the instability of chromium when the sample is acidified for analysis of the total recoverable fraction. While chromium III and chromium VI are the valence states most often found in natural waters, chromium is unstable and can convert between forms in water and in the bodies of humans and aquatic life. However, chromium VI is more water soluble and a known carcinogen. Depending on the classified use, the chromium VI standards are the same as or more stringent than the chromium III standards (Table III). Therefore, when data for individual chromium species are unavailable, the use of the chromium VI standards to assess data reported as total chromium (i.e., the total of all valence states of chromium) will ensure protection of human health and aquatic life. In addition, Footnote 5 was modified to clarify that neither the sum of the concentrations of chromium III and chromium VI (when reported individually) nor the total chromium concentration (i.e., the total of all valence states of chromium) should exceed the Water Supply standards of 50 µg/L for chromium III and chromium VI in water bodies with a Water Supply use classification. This change was also made in Regulation Nos. 32-38.

J. Definition of Existing Quality for Temperature

The commission revised the definition of existing quality for temperature at 31.5(20) to distinguish between the calculations used to determine standards attainment and the calculations used in permits implementation. Standards attainment in the context of 303(d) assessment allows for a short duration of temperature exceedance as defined by the biological warming event in units of degree-days and was developed in the 2017 303(d) listing methodology. The warming event and degree-days concept was added to Table I Footnote 5(c)(ii). Permits implementation requires ambient upstream temperatures in seasonal or monthly maxima to calculate effluent limits and for reasonable potential analysis.

The method for calculating permits implementation was developed in the 2016 Regulation No. 31 rulemaking hearing at 31.53(A) to incorporate an allowable exceedance frequency for monthly determination of effluent limits. This method is being added to the definitions section of Regulation No. 31 and clarified by adding “seasonal or monthly maxima” to make clear that permits has the flexibility to implement seasonal or monthly based effluent limits. The commission expects the division to continue to engage with stakeholders regarding permits implementation of temperature and explore whether the warming event assessment method may be considered in the permitting context through workgroups and other appropriate means.

K. Table Numbering

'Table A' was added to the title of Radionuclide Standards at 31.11. 'Table B' was added to the title of Basic Standards for Organic Chemicals at 31.11.

L. Housekeeping

The following edits were made to improve clarity and correct typographical errors:

- The word “frequent” was removed from the definition of primary contact recreation at 31.5(33) to better reflect the commission’s past practice. This change also aligns with *E. coli*’s exposure risk assumptions and EPA’s definition of primary contact recreation in the federal Recreational Water Quality Criteria.

- Letter references to 31.16(3) in Table I and Table II were changed to superscript to improve clarity and consistency.

- In order to reflect a previous change to the Stream Classifications and Water Quality Standards Tables, the reference to the 'Temporary Modifications and Qualifiers' column at 31.7(3) was replaced with language that specifies the presence of a temporary modification will be indicated in the appropriate water quality standards basin regulation.

- All variations of *E. coli* were edited to display a consistent format throughout the regulation. This change was also made in Regulation Nos. 32-38.

- References to “tot.rec.” in Table III were replaced with “total recoverable”. References to “dis” were replaced with “dissolved”.

- Footnote 1 to Table II was modified to clarify that the “T” in the chronic ammonia equations stands for temperature. This change was also made in Regulation Nos. 32-38.

- The fluoride Water Supply standard in Table II included a reference to Footnote 3, which is the nitrite footnote. This reference was deleted to correct a previous error.

- Footnote 19 was added to Table III to provide clarity regarding the application of the chronic(trout) equation for silver.

- Tables and footnotes were formatted for consistency and clarity.

- Other minor edits were made to improve clarity and consistency.

Editor's Notes

History
Entire rule eff. 07/01/2007.
Rules 31.11, 31.46 eff. 05/31/2008.
Rules 31.11 (Table), 31.47 eff. 11/30/2009.
Rules 31.5, 31.7, 31.8, 31.11, 31.14, 31.16, 31.48 eff. 01/01/2011.
Rules 31.7, 31.49 eff. 01/01/2012.
Rules 31.9, 31.13.1(d), 31.17, 31.50 eff. 09/30/2012.
Rules 31.11(3), 31.51 eff. 01/31/2013.
Rules 31.11, 31.52 eff. 06/30/2016.
Rules 31.3, 31.5, 31.7-31.9, 31.11, 31.14, 31.16, 31.53 eff. 12/31/2016.
Rules 31.11(3), 31.54 eff. 03/02/2017.
Rules 31.17, 31.55 eff. 12/30/2017.
Rules 31.16 Table 1, 31.56 eff. 01/31/2018.
Rules 31.5, 31.11, 31.13, 31.16, 31.57, 31.58 eff. 06/30/2020.
Rules 31.5, 31.7(3),(4), 31.8(2)(b), 31.9, 31.11, 31.16, 31.17, 31.59 eff. 12/31/2021.

DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT

Water Quality Control Commission

REGULATION NO. 38 - CLASSIFICATIONS AND NUMERIC STANDARDS FOR SOUTH PLATTE RIVER BASIN, LARAMIE RIVER BASIN, REPUBLICAN RIVER BASIN, SMOKY HILL RIVER BASIN

5 CCR 1002-38

[Editor's Notes follow the text of the rules at the end of this CCR Document.]

38.1 AUTHORITY

These regulations are promulgated pursuant to section 25-8-101 et seq C.R.S., as amended, and in particular, 25-8-203 and 25-8-204.

38.2 PURPOSE

These regulations establish classification and numeric standards for the South Platte River, the Laramie River, the Republican River and the Smoky Hill River, including all tributaries and standing bodies of water as indicated in section 38.6. The classifications identify the actual beneficial uses of the water. The numeric standards are assigned to determine the allowable concentrations of various parameters. Discharge permits will be issued by the Water Quality Control Division to comply with basic, narrative, and numeric standards and control regulations so that all discharges to waters of the state protect the classified uses. It is intended that these and all other stream classifications and numeric standards be used in conjunction with and be an integral part of Regulation No. 31 Basic Standards and Methodologies for Surface Water.

38.3 INTRODUCTION

These regulations and Tables present the classifications and numeric standards assigned to stream segments listed in the attached Tables (See Appendix 38-1). As additional stream segments are classified and numeric standards for this drainage system are adopted, they will be added to or replace the numeric standards in the Tables in Appendix 38-1. Any additions or revisions of classifications or numeric standards can be accomplished only after public hearing by the Commission and proper consideration of evidence and testimony as specified by the statute and the "basic regulations".

38.4 DEFINITIONS

See the Colorado Water Quality Control Act and the codified water quality regulations for definitions.

38.5 BASIC STANDARDS

(1) <u>Temperature</u>

All waters of the South Platte, Laramie, Republican and Smoky Hill River Basins are subject to the following standard for temperature. (Discharges regulated by permits, which are within the permit limitations, shall not be subject to enforcement proceedings under this standard.) Temperature shall maintain a normal pattern of diurnal and seasonal fluctuations with no abrupt changes and shall have no increase in temperature of a magnitude, rate, and duration deemed deleterious to the resident aquatic life. This standard shall not be interpreted or applied in a manner inconsistent with section 25-8-104, C.R.S.

(2) Qualifiers

See Basic Standards and Methodologies for Surface Water for a listing of organic standards at 31.11 Table B and metal standards found at 31.16 Table III. The column in the tables headed “Water + Fish” are presumptively applied to all Aquatic Life Class 1 streams which also have a Water Supply classification, and are applied to Aquatic Life Class 2 streams which also have a Water Supply classification, on a case-by-case basis as shown in Appendix 38-1. The column in the tables at 31.11 headed “Fish Ingestion” is presumptively applied to all Aquatic Life Class 1 streams which do not have a Water Supply classification, and are applied to Aquatic Life Class 2 streams which do not have a Water Supply classification, on a case-by-case basis, as shown in Appendix 38-1.

(3) Uranium

(a) All waters of the South Platte River Basin are subject to the following basic standard for uranium, unless otherwise specified by a water quality standard applicable to a particular segment. However, discharges of uranium regulated by permits which are within these permit limitations shall not be a basis for enforcement proceedings under this basic standard.

(b) Uranium level in surface waters shall be maintained at the lowest practicable level.

(c) In no case shall uranium levels in waters assigned a Water Supply classification be increased by any cause attributable to municipal, industrial, or agricultural discharges so as to exceed 16.8-30 µg/L or naturally-occurring concentrations (as determined by the State of Colorado), whichever is greater.

(i) The first number in the 16.8-30 µg/L range is a strictly health-based value, based on the Commission’s established methodology for human health-based standards. The second number in the range is a maximum contaminant level, established under the federal Safe Drinking Water Act that has been determined to be an acceptable level of this chemical in public water supplies, taking treatability and laboratory detection limits into account. Control requirements, such as discharge permit effluent limitations, shall be established using the first number in the range as the ambient water quality target, provided that no effluent limitation shall require an “end-of-pipe” discharge level more restrictive than the second number in the range. Water bodies will be considered in attainment of this standard, and not included on the Section 303(d) List, so long as the existing ambient quality does not exceed the second number in the range.

(4) Nutrients

Prior to December 31, 2022 for chlorophyll a and prior to December 31, 2027 for total phosphorus, interim nutrient values will be considered for adoption only in the limited circumstances defined at 31.17(e), (f), and (g). These circumstances include headwaters, Direct Use Water Supply (DUWS) Lakes and Reservoirs, and other special circumstances determined by the Commission. After December 31, 2022, total nitrogen will be considered for adoption per the circumstances outlined in 31.17(g) and (h).

Prior to December 31, 2027, nutrient criteria will be adopted for headwaters on a segment by segment basis for the South Platte River Basin. Moreover, pursuant to 31.17(e), nutrient standards will only be adopted for waters upstream of all permitted domestic wastewater treatment facilities discharging prior to May 31, 2012 or with preliminary effluent limits requested prior to May 31, 2012, and any non-domestic facilities subject to Regulation 85 effluent limits and discharging prior to May 31, 2012. The following is a list of all permitted domestic wastewater treatment facilities discharging prior to May 31, 2012 or with preliminary effluent limits requested prior to May 31, 2012, and any non-domestic facilities subject to Regulation 85 effluent limits and discharging prior to May 31, 2012 in the South Platte River Basin:

Segment	Permittee	Facility name	Permit No.
COSPUS01a	Alma Town of	Alma, Town of	CO0035769
COSPUS01a	Fairplay Sanitation District	Fairplay Sanitation District WWTF	CO0040088
COSPUS01a	Boy Scouts of America Pikes Peak Council	Camp Alexander	COG588036
COSPUS02a	Florissant Water and San Dist	Florissant Water and San Dist	CO0041416
COSPUS02a	Teller County	Teller County WW Utility Board	CO0044211
COSPUS03	Woodland Park City of	Woodland Park, City of	CO0043214
COSPUS03	YMCA Camp Shady Brook	Camp Shady Brook	CO0045993
COSPUS03	Lost Valley Ranch Corporation	Lost Valley Ranch	COG588122
COSPUS04	Will-O-Wisp Metro District	Will-O-Wisp Metro District	CO0041521
COSPUS04	Bailey WSD	Bailey WSD WWTF	COG588056
COSPUS04	Platte Canyon School Dist 1	Platte Canyon School Dist 1	COG588114
COSPUS05c	Mountain Water and Sanitation District	Mountain Water&Sanitation District	CO0022730
COSPUS06a	Roxborough Water and Sanitation District	Roxborough Park Water&San WWTF	CO0041645
COSPUS10a	Plum Creek Water Reclamation Authority	Plum Creek WW Authority WWTF	CO0038547
COSPUS10a	Perry Park Water and Sanitation District	Sageport WWTF	CO0043044
COSPUS11b	Perry Park Water and Sanitation District	Waucondah WWTP	CO0022551
COSPUS14	Littleton/Englewood Cities of	Littleton/Englewood, Cities of	CO0032999
COSPUS15	Metro Waste Water Reclamation District	Metro Wastewater Reclamation District	CO0026638
COSPUS15	Brighton City of	Brighton WWTF	CO0021547
COSPUS15	South Adams County WSD	Williams Monoco WWTF	CO0026662
COSPUS15	Metro Waste Water Reclamation District	Northern Treatment Plant	CO0048959
COSPUS16c	Ascentia Real Estate Holding Company LLC	Foxridge Farms MH Community	CO0028908
COSPUS16c	SouthWest Water Company	Hi-Land Acres W&SD WWTF	COG589072
COSPUS16c	Mile High Racing and Enter dba Arapahoe Park	Arapahoe Park Racetrack	COG589073
COSPUS16c	Rangeview Metro District	Coal Creek WW Reclamation Fac	COG589108
COSPUS16g	Centennial Water and San Dist	Marcy Gulch WWTF	CO0037966
COSPUS16i	Aurora City of - Aurora Water	Sand Creek Water Reuse Facility	CO0026611
COSPCH01	Stonegate Village Metropolitan District	Stonegate Village WWTF	CO0040291
COSPCH01	Pinery Water and Wastewater District	Pinery WWTF	CO0041092
COSPCH01	Parker Water and Sanitation District	Parker North WRF	CO0046507
COSPCH04	Arapahoe County W and WW Authority	Lone Tree Creek WWTP	CO0040681
COSPBE01a	Amen Real Estate LLC	Singin' River Ranch WWTF	CO0035971

Segment	Permittee	Facility name	Permit No.
COSPBE01b	Morrison Town of	Morrison Town of	CO0041432
COSPBE01e	Kittredge Sanitation and Water District	Kittredge San & Water District	CO0023841
COSPBE01e	Bruce & Jayne Hungate DBA Bear Creek Cabins	Bear Creek Cabins	CO0030856
COSPBE01e	Evergreen Metropolitan District	Evergreen Metropolitan Dist WWTF	CO0031429
COSPBE04a	Genesee WSD	Genesee Water & San District	CO0022951
COSPBE04a	Forest Hills Metro District	Forest Hills Metropolitan Dist	CO0037044
COSPBE05	West Jefferson County MD	W. Jefferson County Metro Dist	CO0020915
COSPBE05	Historic Brook Forest Inn LLC	Brook Forest Inn	CO0030261
COSPBE06a	Tiny Town Foundation Inc	Tiny Town	CO0036129
COSPBE06a	Aspen Park Metropolitan District	Aspen Park Metropolitan District	CO0000001
COSPBE06b	Jefferson County Public Schools R-1	Conifer High School WW Rec Plt	CO0047988
COSPCL01	Colorado Dept of Transportation	Eisenhower/Johnson Memorial Tunnels	CO0026069
COSPCL01	Clear Creek Skiing Corp	Loveland Ski Area WWTF	CO0040835
COSPCL02a	Georgetown Town of	Georgetown WWTF	CO0027961
COSPCL02c	Central Clear Creek SD	Central Clear Creek SD WWTF	COG588055
COSPCL05	Empire Town of	Empire Town of	COG588065
COSPCL09a	St Marys Glacier WSD	St Mary's Glacier WSD	CO0023094
COSPCL10	Shwayder Camp Wastewater	Shwayder Camp WWTF	CO0047473
COSPCL11	Idaho Springs City of	Idaho Springs WWTF	CO0041068
COSPCL12b	Clear Creek WWTP	Clear Creek WWTP	CO0046574
COSPCL13b	Black Hawk/Central City Sanitation District	Black Hawk/Central City SD WWTF	CO0046761
COSPCL14a	MillerCoors LLC	MillerCoors Golden Facility	CO0001163
COSPBD01	Westminster City of	Big Dry Creek WWTF	CO0024171
COSPBD01	Broomfield City and County	Broomfield WWTF	CO0026409
COSPBD01	Northglenn City of	Northglenn WWTF	CO0036757
COSPBO02b	San Lazaro Park Properties LLP c/o	San Lazaro MHP WWTF	CO0020184
COSPBO02b	BaseCamp Ventures LLC	Boulder Mountain Lodge WWTF	CO0040819
COSPBO02b	Mueller Red Lion Inn	Red Lion Inn WWTF	COG588118
COSPBO03	Nederland Town of	Nederland Town of WWTF	CO0020222
COSPBO04b	Eldorado Springs Wastewater	Eldorado Springs WWTF	CO0047651
COSPBO04b	San Souci MHP	San Souci MHP	COG588101
COSPBO07b	Louisville City of	Louisville WWTF	CO0023078
COSPBO07b	Lafayette City of	Lafayette WWTF	CO0023124
COSPBO07b	Erie Town of	Erie WWTF	CO0045926
COSPBO08	Superior Metropolitan District No 1	Superior Metropolitan Dist No1	CO0043010
COSPBO09	Boulder City of	75TH ST WWTP	CO0024147
COSPBO10	Erie Town of	Erie North Water Reclamation Facility	CO0048445
COSPBO10	B & B Mobile Home and RV Park	B & B Mobile Home & RV Park	COG588107
COSPBO14	Lake Eldora WSD	Lake Eldora WSD WWTF	CO0020010
COSPSV02a	Peaceful Valley Ranch LLC	Peaceful Valley Ranch WWTF	CO0048828
COSPSV02a	Seventh-Day Adventist Assoc of Colorado	Glacier View Ranch	CO0030112
COSPSV02a	Aspen Lodge at Estes Park Corp	Aspen Lodge at Estes Park Corp	CO0042820
COSPSV02b	Lyons Town of	Lyons Town of	CO0020877
COSPSV03	Longmont City of	Longmont WWTF	CO0026671

Segment	Permittee	Facility name	Permit No.
COSPSV03	St Vrain Sanitation District	St Vrain Sanitation District	CO0041700
COSPSV06a	Fairways Metro Dist	Fairways WWTF	CO0048411
COSPSV06b	Niwot Sanitation District	Niwot Sanitation District	CO0021695
COSPSV06b	Mead Town of	Lake Thomas Subdivision WWTF	CO0046868
COSPSV06b	Mead Town of	Mead, Town of	CO0046876
COSPMS01a	Fort Lupton City of	Fort Lupton WWTF	CO0021440
COSPMS01a	Platteville Town of	Platteville WWTF	CO0040355
COSPMS01b	Evans City of	Evans City of WWTF	CO0020508
COSPMS01b	Kersey Town of	Kersey WWTF	CO0021954
COSPMS01b	Evans City of	Hill-N-Park Sanitation Dist.	CO0047287
COSPMS01b	La Salle Town of	La Salle Town of	COG588058
COSPMS01b	Gilcrest Town of	Gilcrest WWTF	COG588121
COSPMS03a	Elizabeth Town of	Gold Creek	COG589037
COSPMS03a	Galeton Water and Sanitation District	Galeton Water & San District	CO0043320
COSPMS03a	Orica USA Inc	Orica USA, Inc.	CO0046221
COSPMS03a	Spring Valley Ranch	Spring Valley Ranch WWTF	CO0046965
COSPMS03a	Front Range Airport WWTF	Front Range Airport WWTF	CO0047741
COSPMS04	Lochbuie Town of	Lochbuie Town of	CO0047198
COSPMS05a	Swift Beef Company	Swift Beef – Lone Tree	CO0027707
COSPMS05c	Hudson WWTF	Hudson Mechanical WWTF	COG589104
COSPMS06	Keenesburg Town of	Keenesburg Town of	CO0041254
COSPMS06	Bennett Town of	Bennett Town of	COG589069
COSPBT02	Estes Park Sanitation District	Estes Park Sanitation District	CO0020290
COSPBT02	Upper Thompson Sanitation District	UTSD WWTF	CO0031844
COSPBT04	Loveland City of	Loveland WWTP	CO0026701
COSPBT05	Milliken Town of	Milliken Sanitation District	CO0042528
COSPBT05	Johnstown Town of	Low Point WWTP	CO0047058
COSPBT07	Hidden View Estates HOA	Hidden View Estates HOA WWTF	CO0048861
COSPBT09	Johnstown Town of	Johnstown Central WWTF	CO0021156
COSPBT09	Riverglen Homeowners Assoc	Riverglen HOA WWTF	CO0029742
COSPBT09	Berthoud Town of	Berthoud Town of	CO0046663
COSPBT10	Berthoud Town of	Serenity Ridge WWTF	CO0047007
COSPBT10	Western Mini-Ranch/Vaquero Estates Sewer Assoc.	Western Mini-Ranch/Vaquero Est	COG589095
COSPBT10	Berthoud Estates Community Assoc	Berthoud Estates WWTF	COG589097
COSPCP08	Fox Acres Community Services Corp	Fox Acres WWTF	COG589112
COSPCP08	Girl Scouts of Colorado	Magic Sky Ranch G.S. Camp	CO0047317
COSPCP11	Fort Collins City of	Mulberry WWTP	CO0026425
COSPCP11	Fort Collins City of	Drake WWTP	CO0047627
COSPCP12a	Windsor, Town of	Windsor Town of WWTF	CO0020320
COSPCP12b	Greeley City of	Greeley City of	CO0040258
COSPCP12b	Leprino Foods Company	Leprino Greeley Facility WWTF	CO0048860
COSPCP13a	Anheuser Busch Inc	Nutri-Turf, Inc.	CO0039977
COSPCP13a	Eaton Town of	Eaton, Town of	CO0047414
COSPCP13a	Saddler Ridge Metro Dist Water Reclamation Facility	Saddler Ridge Metro Dist Water Reclamation Facility	COG589107
COSPCP13c	Boxelder Sanitation District	Boxelder Sanitation District WWTF	CO0020478

Segment	Permittee	Facility name	Permit No.
COSPCP13c	Wellington Town of	Wellington WWTF	CO0046451
COSPCP22	South Fort Collins Sanitation District	South Fort Collins San Dist	CO0020737
COSPLS01a	Western Sugar Cooperative	Fort Morgan Facility	CO0041351
COSPLS01a	Cargill Meat Solutions	Fort Morgan Beef Plant	CO0044270
COSPLS01a	Brush City of	Brush City of	CO0021245
COSPLS01a	Fort Morgan City of	Fort Morgan City of	CO0044849
COSPLS01a	Snyder Sanitation District	Snyder Sanitation District	COG588016
COSPLS01a	Morgan Heights WSD	Morgan Heights Water & Sewer Inc.	COG588040
COSPLS01b	Julesburg Town of	Julesburg Town of	CO0021113
COSPLS01b	Sterling City of	Sterling City of	CO0026247
COSPLS01b	Ovid Town of	Ovid Town of	COG588106
COSPLS02	Leprino Foods Company	Fort Morgan Cheese Facility	CO0043958
COSPLS02	Deer Trail Town of	Deer Trail WWTF	COG589002
COSPLS02	Hillrose Town of	Hillrose WWTF	COG589030
COSPLS02	Byers Water and Sanitation District	Byers Water and Sanitation District	COG589033
COSPLS02	Eastern Adams County Metro District	Eastern Adams CO Metro Dist WWTF	COG589035
COSPLS02	Kiowa Town of	Kiowa WWTF	CO0033405
COSPLS02	Elbert Water Sanitation District	Elbert Water Sanitation District WWTF	COG589065
COSPRE03	Wray City of	Wray City of	CO0023833
COSPRE06	Flagler Town of	Flagler WWTF	COG589036
COSPRE06	Arriba Town of	Arriba WWTF	COG589055
COSPRE06	Holyoke City of	Holyoke, City of	COG589059
COSPRE06	Akron Town of	Akron WWTF	COG589061
COSPRE06	Haxtun Town of	Haxtun. Town of	COG589062
COSPRE06	Stratton Town of	Stratton WWTF	COG589100
COSPRE06	Burlington City of	Burlington City of WWTF	COG589114
COSPRE06	Seibert Town of	Seibert WWTF	COG589120
COSPRE07	Cheyenne Wells Sanitation District No 1	Cheyenne Wells Sanitation District	COG589039
Unclassified	Silco Oil Co	Tomahawk Truck Stop	COG589003

Prior to December 31, 2027:

- For segments located entirely above these facilities, nutrient standards apply to the entire segment.

- For segments with portions downstream of these facilities, nutrient standards only apply above these facilities. A note was added to the total phosphorus and chlorophyll a standards in these segments. The note references the table of qualified facilities at 38.5(4).

- For segments located entirely below these facilities, nutrient standards do not apply.

A note was added to the total phosphorus and chlorophyll a standards in lakes segments as nutrients standards apply only to lakes and reservoirs larger than 25 acres surface area.

38.6 TABLES

(1) Introduction

The numeric standards for various parameters in this regulation and in the tables in Appendix 38-1 were assigned by the Commission after a careful analysis of the data presented on actual stream conditions and on actual and potential water uses. For each parameter listed in the tables in Appendix 38-1, only the most stringent standard is shown. Additional, less stringent standards may apply to protect additional uses and can be found in the tables in Regulation No. 31.

Numeric standards are not assigned for all parameters listed in the tables in Regulation No. 31. If additional numeric standards are found to be needed during future periodic reviews, they can be assigned by following the proper hearing procedures.

(2) Abbreviations

(a) The following abbreviations are used in this regulation and in the tables in Appendix 38-1:

ac	=	acute (1-day)
°C	=	degrees Celsius
ch	=	chronic (30-day)
CL	=	cold lake temperature tier
CLL	=	cold large lake temperature tier
CS-I	=	cold stream temperature tier one
CS-II	=	cold stream temperature tier two
DM	=	daily maximum temperature
D.O.	=	dissolved oxygen
DUWS	=	direct use water supply
E. coli	=	*Escherichia coli*
mg/L	=	milligrams per liter
MWAT	=	maximum weekly average temperature
OW	=	outstanding waters
sp	=	spawning
SSE	=	site-specific equation
T	=	total recoverable
t	=	total
tr	=	trout
TVS	=	table value standard
µg/L	=	micrograms per liter
UP	=	use-protected
WL	=	warm lake temperature tier
WS	=	water supply
WS-I	=	warm stream temperature tier one
WS-II	=	warm stream temperature tier two
WS-III	=	warm stream temperature tier three

(b) In addition, the following abbreviations are used:

Iron (chronic)	=	WS
Manganese (chronic)	=	WS
Sulfate (chronic)	=	WS

These abbreviations mean: For all surface waters with an actual water supply use, the less restrictive of the following two options shall apply as numerical chronic standards, as specified in the Basic Standards and Methodologies at 31.11(6);

(i) existing quality as of January 1, 2000; or

(ii)

Iron	=	300 µg/L (dissolved)
Manganese	=	50 µg/L (dissolved)
Sulfate	=	250 mg/L (dissolved)

For all surface waters with a Water Supply classification that are not in actual use as a water supply, no Water Supply standards are applied for iron, manganese or sulfate, unless the Commission determines as the result of a site-specific rulemaking hearing that such standards are appropriate.

(c) Temporary Modification for Water + Fish Chronic Arsenic Standard

(i) The temporary modification for chronic arsenic standards applied to segments with an arsenic standard of 0.02 µg/L that has been set to protect the Water + Fish qualifier is listed in the Other column in Appendix 38-1 tables as As(ch)=hybrid.

(ii) For discharges existing on or before 6/1/2013, the temporary modification is: As(ch)=current condition, expiring on 12/31/2024. Where a permit for an existing discharge is reissued or modified while the temporary modification is in effect, the division will include additional permit Terms and Conditions, which may include requirements for additional monitoring, source identification, and characterization of source control and treatment options for reducing arsenic concentrations in effluent.

(iii) For new or increased discharges commencing on or after 6/1/2013, the temporary modification is: As(ch)=0.02-3.0 µg/L (total recoverable), expiring on 12/31/2024.

(a) The first number in the range is the health-based water quality standard previously adopted by the Commission for the segment.

(b) The second number in the range is a technology-based value established by the Commission for the purpose of this temporary modification.

(c) Control requirements, such as discharge permit effluent limitations, shall be established using the first number in the range as the ambient water quality target, provided that no effluent limitation shall require an “end-of-pipe” discharge level more restrictive than the second number in the range.

(3) Table Value Standards

In certain instances in the tables in Appendix 38-1, the designation “TVS” is used to indicate that for a particular parameter a “table value standard” has been adopted. This designation refers to numerical criteria set forth in the Basic Standards and Methodologies for Surface Water. The criteria for which the TVS are applicable are on the following table.

TABLE VALUE STANDARDS
(Concentrations in µg/L unless noted)

PARAMETER[1]	TABLE VALUE STANDARDS [2][3]
Aluminum(T)	Acute = $e^{(1.3695*\ln(hardness)+1.8308)}$ pH equal to or greater than 7.0 Chronic=$e^{(1.3695*\ln(hardness)-0.1158)}$ pH less than 7.0 Chronic= $e^{(1.3695*\ln(hardness)-0.1158)}$ or 87, whichever is more stringent
Ammonia[4]	Cold Water = (mg/L as N)Total $acute = \frac{0.275}{1+10^{7.204-pH}} + \frac{39.0}{1+10^{pH-7.204}}$ $chronic = \left(\frac{0.0577}{1+10^{7.688-pH}} + \frac{2.487}{1+10^{pH-7.688}}\right) * MIN\left(2.85,\ 1.45*10^{0.028(25-T)}\right)$
	Warm Water = (mg/L as N)Total $acute = \frac{0.411}{1+10^{7.204-pH}} + \frac{58.4}{1+10^{pH-7.204}}$ $chronic\ \ (Apr1-Aug31) = \left(\frac{0.0577}{1+10^{7.688-pH}} + \frac{2.487}{1+10^{pH-7.688}}\right) * MIN\left(2.85,\ 1.45*10^{0.028(25-T)}\right)$ $chronic\ (Sep1-Mar31) = \left(\frac{0.0577}{1+10^{7.688-pH}} + \frac{2.487}{1+10^{pH-7.688}}\right) * 1.45*10^{0.028*\left(25-MAX\left(T,\ 7\right)\right)}$
Cadmium	Acute(warm)[5] = (1.136672-(ln(hardness)*0.041838))*$e^{(0.9789*\ln(hardness)-3.443)}$ Acute(cold)[5] = (1.136672-(ln(hardness)*0.041838))*$e^{(0.9789*\ln(hardness)-3.866)}$ Chronic = (1.101672-(ln(hardness)*0.041838))*$e^{(0.7977*\ln(hardness)-3.909)}$
Chromium III[6]	Acute = $e^{(0.819*\ln(hardness)+2.5736)}$ Chronic = $e^{(0.819*\ln(hardness)+0.5340)}$
Chromium VI[6]	Acute = 16 Chronic = 11
Copper	Acute = $e^{(0.9422*\ln(hardness)-1.7408)}$ Chronic = $e^{(0.8545*\ln(hardness)-1.7428)}$
Lead	Acute = (1.46203-(ln(hardness)*0.145712))*$e^{(1.273*\ln(hardness)-1.46)}$ Chronic = (1.46203-(ln(hardness)*0.145712))*$e^{(1.273*\ln(hardness)-4.705)}$
Manganese	Acute = $e^{(0.3331*\ln(hardness)+6.4676)}$ Chronic = $e^{(0.3331*\ln(hardness)+5.8743)}$
Nickel	Acute = $e^{(0.846*\ln(hardness)+2.253)}$ Chronic = $e^{(0.846*\ln(hardness)+0.0554)}$
Selenium[7]	Acute = 18.4 Chronic = 4.6
Silver	Acute = 0.5*$e^{(1.72*\ln(hardness)-6.52)}$ Chronic = $e^{(1.72*\ln(hardness)-9.06)}$ Chronic(Trout) = $e^{(1.72*\ln(hardness)-10.51)}$

PARAMETER	TEMPERATURE TIER	TIER CODE	SPECIES EXPECTED TO BE PRESENT	APPLICABLE MONTHS	TEMPERATURE STANDARD (°C)	
					(MWAT)	(DM)
Temperature	Cold Stream Tier I[8]	CS-I	brook trout, cutthroat trout	June – Sept.	17.0	21.7
				Oct. - May	9.0	13.0
	Cold Stream	CS-II	all other cold-water species	April – Oct.	18.3	24.3

PARAMETER[1]	**TABLE VALUE STANDARDS** [2][3]					
	Tier II[8]			Nov. - March	9.0	13.0
	Cold Lake[9]	CL	brook trout, brown trout, cutthroat trout, lake trout, rainbow trout, Arctic grayling, sockeye salmon	April – Dec.	17.0	21.2
				Jan. - March	9.0	13.0
	Cold Large Lake (>100 acres surface area)[9]	CLL	brown trout, lake trout, rainbow trout	April – Dec.	18.3	24.2
				Jan. - March	9.0	13.0
	Warm Stream Tier I	WS-I	common shiner, Johnny darter, orangethroat darter, stonecat	March – Nov.	24.2	29.0
				Dec. – Feb.	12.1	24.6
	Warm Stream Tier II	WS-II	brook stickleback, central stoneroller, creek chub, longnose dace, northern redbelly dace, finescale dace, razorback sucker, white sucker, mountain sucker	March – Nov.	27.5	28.6
				Dec. – Feb.	13.8	25.2
	Warm Stream Tier III	WS-III	all other warm-water species	March – Nov.	28.7	31.8
				Dec. – Feb.	14.3	24.9
	Warm Lakes	WL	yellow perch, walleye, pumpkinseed, smallmouth bass, striped bass, white bass, largemouth bass, bluegill, spottail shiner, stonecat, northern pike, tiger muskellunge, black crappie, common carp, gizzard shad, sauger, white crappie, wiper	April – Dec.	26.2	29.3
				Jan. - March	13.1	24.1
Uranium	Acute = $e^{(1.1021*\ln(hardness)+2.7088)}$ Chronic = $e^{(1.1021*\ln(hardness)+2.2382)}$					
Zinc	Acute = $0.978*e^{(0.9094*\ln(hardness)+0.9095)}$ Chronic = $0.986*e^{(0.9094*\ln(hardness)+0.6235)}$					

TABLE VALUE STANDARDS - FOOTNOTES

(1) Metals are stated as dissolved unless otherwise specified.

(2) Hardness values to be used in equations are in mg/L as calcium carbonate and shall be no greater than 400 mg/L except for aluminum for which hardness shall be no greater than 220 mg/L. The hardness values used in calculating the appropriate metal standard should be based on the lower 95 per cent confidence limit of the mean hardness value at the periodic low flow criteria as determined from a regression analysis of site-specific data. Where insufficient site-specific data exists to define the mean hardness value at the periodic low flow criteria, representative regional data shall be used to perform the regression analysis. Where a regression analysis is not appropriate, a site-specific method should be used. In calculating a hardness value, regression analyses should not be extrapolated past the point that data exist.

(3) Both acute and chronic numbers adopted as stream standards are levels not to be exceeded more than once every three years on the average.

(4) For acute conditions the default assumption is that salmonids could be present in cold water segments and should be protected, and that salmonids do not need to be protected in warm water segments. For chronic conditions, the default assumptions are that early life stages could be present all year in cold water segments and should be protected. In warm water segments the default assumption is that early life stages are present and should be protected only from April 1 through August 31. These assumptions can be modified by the Commission on a site-specific basis where appropriate evidence is submitted. The “T” in the chronic equations stands for temperature.

(5) The acute(warm) cadmium equation applies to segments classified as Aquatic Life Warm Class 1 or 2. The acute(cold) cadmium equation applies to segments classified as Aquatic Life Cold Class 1 or 2.

(6) Unless the stable forms of chromium in a waterbody have been characterized and shown not to be predominantly chromium VI, data reported as the measurement of all valence states of chromium combined should be treated as chromium VI. In addition, in no case can the sum of the concentrations of chromium III and chromium VI or data reported as the measurement of all valence states of chromium combined exceed the water supply standards of 50 µg/L chromium in those waters classified for domestic water use.

(7) Selenium is a bioaccumulative metal and subject to a range of toxicity values depending upon numerous site-specific variables.

(8) Mountain whitefish-based summer temperature criteria [16.9 (ch), 21.2 (ac)] apply when and where spawning and sensitive early life stages of this species are known to occur.

(9) Lake trout-based summer temperature criteria [16.6 (ch), 22.4 (ac)] apply where appropriate and necessary to protect lake trout from thermal impacts.

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(4) <u>Site-specific Standards, Assessment Locations, and Assessment Criteria</u>

(a) Upper South Platte Segment 6b, Chatfield Reservoir: Chlorophyll a Assessment Thresholds

chlorophyll a= 11.2 µg/L, summer average, 1 in 5 year allowable exceedance frequency
phosphorus(Tot) = 0.035 mg/L, summer average, 1 in 5 year allowable exceedance frequency.

(b) Upper South Platte Segment 16h: Selenium Standards and Assessment Locations

Selenium Standards (µg/L):

West Toll Gate Creek: Selenium(chronic)=50.6, Selenium(acute)=119.2
East Toll Gate Creek: Selenium(chronic)=14.3, Selenium(acute)=15.9
Toll Gate Creek: Selenium(chronic)=26.5, Selenium(acute)=29.5

Selenium Assessment Locations:

- Toll Gate Creek (TG6): Downstream of the confluence of East and West Toll Gate Creeks, at 6th Avenue near the gage station.

- East Toll Gate Creek (ET1): Upstream of the confluence with West Toll Gate Creek, at Chambers Road and 1st Avenue.

- West Toll Gate Creek (WT1): Upstream of the confluence with East Toll Gate Creek, at 2nd Avenue.

(c) Upper South Platte Segment 15 and Middle South Platte Segment 1a: Dissolved Oxygen and Ammonia Standards

Dissolved Oxygen Standards:

Early Life Stage Protection Period (April 1 through July 31)

1-Day[1,2,3]	3.0 mg/L (acute)
7-Day Average[1,4,5]	5.0 mg/L

Older Life Stage Protection Period (August 1 through March 31)

1-Day[1,2]	2.0 mg/L (acute)
7-Day Mean of Minimums[1,6]	2.5 mg/L
30-Day Average[1,4]	4.5 mg/L

Dissolved Oxygen Footnotes

1. For the purposes of determining attainment of the standards, dissolved oxygen measurements shall only be taken in the flowing portion of the stream and at mid-depth, at least six inches above the bottom of the channel. Dissolved oxygen measurements in man-made pools are not to be used for determination of attainment of the standards. All sampling protocols and test procedures shall be in accordance with procedures and protocols approved by the division.

2. During a 24-hour day dissolved oxygen levels are likely to be lower during the nighttime when there is no photosynthesis. The dissolved oxygen levels should not drop below the acute standard (ELS acute standard of 3.0 mg/L or the Older Life Stage (OLS) standards of 2.0 mg/L). However, if during the Early Life Stage (ELS) period multiple measurements are below 3.0 mg/L during the same nighttime period, the multiple measurements shall be considered a single exceedance of the acute standard. For measurements below 2.0 mg/L during either the ELS or the OLS periods, each hourly measurement below 2.0 mg/L shall be considered an exceedance of the acute standards.

3. In July, the dissolved oxygen level may be lower than the 3.0 mg/L acute standard for up to 14 exceedances in any one year and up to a total of 21 exceedances in three years before there is a determination that the acute dissolved oxygen standards is not being met. Exceedances shall be counted as described in Footnote 2.

4. A minimum of four independent daily means must be used to calculate the average for the 7-day average standard. A minimum of eight independent daily means must be used to calculate the average for the 30-day average standard. The four days and the eight days must be representative of the 7-day and the 30-day periods respectively. The daily means shall be the mean of the daily high and low values. In calculating the mean values, the dissolved oxygen saturation value shall be used in place of any dissolved oxygen measurements which exceed saturation.

5 For Upper South Platte Segment 15, north of the Lupton Bottoms Ditch diversion, the ELS 7-day average standards for the period July 1 – June 31 shall be 4.6 mg/L.

6. The 7-day mean minimum is the average of the daily minimums measured at the location on each day during any 7-day period.

Ammonia Standards:

Early Life Stage Protection Period (April 1 through July 31)

Ammonia Warm Water = mg/L as N (Total)

Acute = TVS
Chronic =

$$chronic \ \ (Apr1 - July\,31) = \left(\frac{0.0577}{1+10^{7.688-pH}} + \frac{2.487}{1+10^{pH-7.688}} \right) * MIN \left(2.85,\, 1.45 * 10^{0.028(25-T)} \right)$$

$$chronic \ (Aug\,1 - Mar\,31) = \left(\frac{0.0577}{1+10^{7.688-pH}} + \frac{2.487}{1+10^{pH-7.688}} \right) * 1.45 * 10^{0.028*(25-MAX(T,\ 7))}$$

(d) Big Dry Creek Segment 1: Selenium Assessment Locations

- bdc 1.5: Upstream of Broomfield Wastewater Treatment Plant
- bdc 2.0: Upstream of Westminster Big Dry Creek Wastewater Treatment Facility
- bdc 4.5: Upstream of Northglenn Wastewater Treatment Plant

(e) Big Dry Creek Segment 2 (Standley Lake): Chlorophyll *a* Assessment Thresholds

Chlorophyll *a* = 4.4 µg/L, Mar-Nov average, 1 in 5 yr allowable exceedance frequency

(f) Upper South Platte Segment 16i, Sand Creek from Toll Gate Creek to the confluence with the South Platte River: assessment locations for selenium and total mercury

Selenium Standards (µg/L):

Upper: Selenium(chronic)=38.2, Selenium(acute)=45.1
Lower: Selenium(chronic)=9.0, Selenium(acute)=TVS

Selenium Assessment Locations:

- Upper – (SWA): Downstream of the confluence of Sand Creek and Toll Gate Creek approximately 250 meters upstream of the Sand Creek Water Reuse Facility (SCWRF) discharge near the Peoria Street Bridge.
- Lower – (SW1): Above Suncor, approximately 60 meters upstream of the Union Pacific Railroad crossing and upstream of Brighton Boulevard.

Mercury Assessment Locations and Method:

- Sand Creek (SWP) – Downstream of the sheet piling drop structure located near the Brighton Blvd. Bridge.

- Sand Creek (SWP2-1) – Approximately 600 feet downstream of Suncor Outfall 003 and immediately upstream of the Burlington Ditch Siphon.

- Attainment of the standard below Brighton Blvd. shall be assessed using the weighted 85th percentile total mercury concentration from both assessment locations.

(g) Upper South Platte Segment 16g (Marcy Gulch): Selenium assessment

Determination of attainment of the chronic and acute selenium standards will be based on the 85^{th} and 95^{th} percentile, respectively, of paired samples taken the same day from from the two following locations:

- L29: Marcy Gulch upstream of Santa Fe Drive, immediately upstream of the Centennial Water & Sanitation District WWTF

- L36: Marcy Gulch upstream of the confluence with the South Platte River.

(h) Upper South Platte Segment 16j: Selenium standards (µg/L) and assessment

Lee Gulch: Selenium(chronic)=10, Selenium(acute)=TVS

Little’s Creek: Selenium(chronic)=6, Selenium(acute)= TVS

Big Dry Creek: Selenium(chronic)=23, Selenium(acute)=26

Little Dry Creek: Selenium(chronic)=11, Selenium(acute)=TVS

Determination of attainment of the chronic and acute selenium standards will be based on the 85th and 95th percentile, respectively. The selenium assessment locations are:

- Lee Gulch: Upstream of the confluence with the South Platte River

- Little’s Creek: Upstream of the confluence with the South Platte River

- Big Dry Creek: Upstream of the confluence with the South Platte River

- Little Dry Creek: Upstream of the confluence with the South Platte River

(i) Cherry Creek Segment 4b: Selenium standards (µg/L) and assessment

Upper Cottonwood Creek:
October–February Selenium(acute/chronic)=TVS/14.0
March–September Selenium(acute/chronic)=TVS/7.1

Lower Cottonwood Creek:
October–February Selenium(acute/chronic)=TVS/5.1
March–September Selenium(acute/chronic)=TVS

Break between Upper and Lower Cottonwood Creek is at the confluence with Lone Tree Creek.

Upper Lone Tree Creek:
October–February Selenium(acute/chronic)=41.0/37.2
March–September Selenium(acute/chronic)=19.3/19.0

Lower Lone Tree Creek: Selenium(acute/chronic)=TVS

Break between Upper and Lower Lone Tree Creek is at the ACCWA Lone Tree Facility Outfall.

Upper Windmill Creek: Selenium(acute/chronic)=TVS

Middle Windmill Creek:
October–February Selenium(acute/chronic)=TVS/15.1
March–September Selenium(acute/chronic)=TVS/8.4

Lower Windmill Creek: Selenium(acute/chronic)=TVS

Break between Upper, Middle and Lower Windmill Creek is at the assessment locations.

Determination of attainment of the chronic and acute selenium standards will be based on the 85th and 95th percentile, respectively.

- Upper Cottonwood Creek: From headwaters to confluence with Lone Tree Creek, to be assessed at CT-P2 — 39.605694, -104.84825. At Peoria St.

- Lower Cottonwood Creek: From confluence with Lone Tree Creek to terminus at Cherry Creek Reservoir, to be assessed at CT2-39.627861, -104.85025. West of Perimeter Road and south of bike path.

- Upper Lone Tree Creek: From headwaters to just above site LTC-3, to be assessed using data from LTC-1 and LTC-2
  LTC-1 — 39.58435, -104.838017. Approximately 0.15 miles N of S. Revere Pkwy.
  LTC-2 — 39.59685, -104.838217. Approximately 10 yards N of E. Peakview Ave.

- Lower Lone Tree Creek: From site LTC-3 to confluence with Cottonwood Creek, to be assessed using data from LTC-3 and LTC-4
  LTC-3 — 39.604817, - 104.837083. Below ACWWA Lone Tree facility outfall.
  LTC-4 — 39.614483, 104.840217. Downstream of confluence with Windmill Creek

- Upper Windmill Creek: From Headwaters to WC-1 — Site WC-1-39.574967, -104.830017. West of Potomac St and South of Broncos Pkwy.

- Middle Windmill Creek: All sites between (but not including) WC-1 and WC-2.
  WC-1—39.574967, -104.830017. West of Potomac St and South of Broncos Pkwy.
  WC-2—39.59655, -104.821767. North of Cherry Creek Trail.

- Lower Windmill Creek: From site WC-2 to confluence with Lone Tree Creek, to be assessed at WC-2-39.59655, -104.821767. North of Cherry Creek Trail.

(j) Clear Creek Segment 5: Manganese assessment

- Below Woods Creek: West Fork of Clear Creek approximately 0.3 miles downstream of Berthoud Falls (39.771829°, -105.803418°).

- Mouth of West Fork: West Fork of Clear Creek near County Road 257.

(k) Big Dry Creek Segments 2, 3, 4a, 4b, 5a, and 5b: Ambient-based Site-specific Radionuclide Standards

The radionuclides listed in the table below shall be maintained at the lowest practical level and in no case shall they be increased by any cause attributable to municipal, industrial, or agricultural practices to exceed the site-specific numeric standards.

Parameter	**Segment 2 (Standley Lake)[1]**	**Segment 3 (Great Western Reservoir)[1]**	**Segments 4a, 4b, 5a, and 5b[1]**
Ambient-based site-specific standards			
Gross Alpha	6	5	NA
Gross Beta	9	12	NA
Plutonium	0.03	0.03	0.15[2,3]
Americium	0.03	0.03	0.15 [2,3]
Tritium	500	500	500
Uranium	3	4	16.8 µg/L
Other site-specific standards			
Curium	60	60	60
Neptunium	30	30	30

Radionuclides Footnotes:

1. Statewide standards also apply for radionuclides not listed above.

2. 0.15 pCi/L Statewide Basic Standards.

3. For plutonium and americium measurements in Segment 4a in Woman Creek and Segment 5 in Walnut Creek, attainment will be assessed based on the results of a 12-month flow-weighted rolling average concentration (computed monthly).

NA = No site-specific standard applies

(l) Upper South Platte Lakes Segment 19: Temperature Standards

Platte Canyon Reservoir:

DM and MWAT = CLL from 1/1 – 2/29
DM = CLL and MWAT = 25.0 from 3/1 – 12/31

Antero Reservoir:

DM and MWAT = CLL from 1/1 – 3/31
DM = CLL and MWAT = 19.6 from 4/1 – 12/31

Elevenmile Reservoir:

DM and MWAT = CLL from 1/1 – 3/31
DM = CLL and MWAT = 19.8 from 4/1 – 12/31

Spinney Mountain Reservoir:

DM and MWAT = CLL from 1/1 – 3/31
DM = CLL and MWAT = 20.2 from 4/1 – 12/31

Cheesman Reservoir:

DM and MWAT = CLL from 1/1 – 3/31
DM = CLL and MWAT = 21.9 from 4/1 – 12/31

Strontia Springs Reservoir:

DM and MWAT = CLL from 1/1 – 3/31
DM = CLL and MWAT = 22.6 from 4/1 – 12/31

Jefferson Lake:

DM and MWAT = CLL from 1/1 – 3/31
DM = 22.4 and MWAT = 16.6 from 4/1 – 12/31

All other locations DM and MWAT = CL, CLL year-round

(m) Cache la Poudre Segment 18: Temperature Standards

All locations DM and MWAT = CL,CLL from 1/1 – 3/31

Barnes Meadow Reservoir DM = CL and MWAT = 16.6 from 4/1 – 12/31

Chambers Lake DM = 22.4 and MWAT =16.6 from 4/1 – 12/31

All other locations DM and MWAT = CL,CLL from 4/1 – 12/31

(n) Lower South Platte Segment 3: Temperature Standards

All locations DM and MWAT = WL from 1/1 – 3/31

North Sterling Reservoir DM = WL and MWAT = 26.1 from 4/1 – 12/31

Jumbo Reservoir DM = WL and MWAT = 27 from 4/1 – 12/31

Jackson Reservoir DM = WL and MWAT = 28.1 from 4/1 – 12/31

All other locations DM and MWAT = WL from 4/1 – 12/31

(5) Stream Classifications and Water Quality Standards Tables

The stream classifications and water quality standards tables in Appendix 38-1 are incorporated herein by reference.

The following is information regarding duration and measured form of standards in Appendix 38-1:

(a) *E. coli* criteria and resulting standards for individual water segments, are established as indicators of the potential presence of pathogenic organisms. Standards for *E. coli* are expressed as a two-month geometric mean. Site-specific or seasonal standards are also two-month geometric means unless otherwise specified.

(b) All phosphorus standards are based upon the concentration of total phosphorus.

(c) The pH standards of 6.5 (or 5.0) and 9.0 are an instantaneous minimum and maximum, respectively to be applied as effluent limits. In determining instream attainment of water quality standards for pH, appropriate averaging periods may be applied, provided that beneficial uses will be fully protected.

(d) All mercury standards apply to the total recoverable fraction of all forms, both organic and inorganic, of mercury in water.

(e) All ammonia, nitrate, and nitrite standards are based upon the concentration reported as nitrogen.

(6) Discharger Specific Variances

(a) Upper South Platte River Segments 15 and 16i (COSPUS15 and COSPUS16i):

Discharger-Specific Variance, Suncor Energy (U.S.A.) Inc., Commerce City Refinery (CO0001147): Adopted 10/11/2016.

Selenium (acute) = TVS: no limit; Selenium (chronic) = 9: 24 µg/L. Expiration date: 12/31/2023.

38.7 COMMISSION’S DETERMINATION REGARDING STATE WATERS

(1) Introduction

The following list describes the Commission’s determinations regarding water bodies that do not contain “State Waters.”

(2) Determinations

(a) Marston Forebay located in Upper South Platte Segment 23 within Sections 11, 12, 13 and 14 in Township 5 South, Range 69 West of the 6th P.M. in the City and County of Denver, Colorado.

38.8 – 38.9 RESERVED

38.10 STATEMENT OF BASIS AND PURPOSE

I. Introduction

Prior to the adoption of the Commission's "Basic Regulations," (5 CCR 1002-8) what is now known as Segment 14 of the South Platte River Basin was classified B1 and B2. In regulations adopted by the Commission on April 6, 1981, Segment 14 was classified as a warm water aquatic life class I stream (see 5CCR 1002-8). A water quality standard for unionized ammonia of .06 mg/l, with a temporary modification of .1mg/l, was established at that time in conjunction with the aquatic life classification.

On June 15, 1981, the Cities of Littleton and Englewood, Colorado, petitioned pursuant to 25-8-403, C.R.S. 1973 for administrative reconsideration and rehearing on the classification of segment 14 of the South Platte River Basin as class I, warm water aquatic life, and the modification of an ammonia standard in segment 14 of 0.06 mg/l.

On June 29, 1981, the request was denied. The Commission then decided, however, to conduct a new public rulemaking hearing to determine whether to maintain or amend certain use classifications and water quality standards for the segment.

Based on the record of this hearing, the Commission has determined that the existing aquatic life classification and the existing water quality standard for unionized ammonia should be retained.

II. WARM WATER AQUATIC LIFE CLASS I CLASSIFICATION

Notwithstanding some evidence that aquatic habitat limits the numbers and diversity of aquatic organisms in this stream segment, and some evidence that the presence of sensitive species is also limited, the Commission is persuaded by the weight of the evidence that this is a class I aquatic life stream. This conclusion is based on the following findings:

1. The ratio of rough to game fish is representative of east slope warm water plains streams generally, indicating a fair population of sensitive fish species.

2. Despite some siltation and some habitat impairment streambed improvements as well as natural conditions generally provide good or adequate habitat for warm water species.

3. There is evidence that fish spawning takes place in this segment.

4. The diversity of the fishery is adequate to warrant a class I aquatic life classification.

5. Limitations on the presence and condition of aquatic life are related to both water quality factors and to habitat impairment.

6. Given the historical improvements in habitat, water quality, and aquatic life since 1965, a class I classification appropriately reflects the results of significant community efforts to improve the South Platte River.

III. UNIONIZED AMMONIA WATER QUALITY STANDARD - .06 mg/l; TEMPORARY MODIFICATION .1 MG/L

The record reveals conflicting evidence regarding the unionized ammonia water quality standard necessary to protect resident aquatic life. The Commission has determined that the existing standards, i.e., .06 mg/l (Water Quality Standards) and .1 mg/l (Temporary Modification) should be retained for the following reasons:

1. There is substantial evidence of relationships among ammonia toxicity and pH, temperture, and alkalinity. However, the record does not provide the Commission with a satisfactory basis for linking these variables to a specific Water Quality Standard to protect the varieties of species present, except with application of the gill theory.

2. Significant uncertainties with respect to application of the gill theory preclude the Commission from utilizing it at this time.

3. The Commission recognizes that a site specific approach to the establishment of Water Quality Standards for ammonia is the preferred approach. However, no site specific bioassays have been performed, and the details of any other application of site specific factors is a matter currently under review at EPA and within the field of aquatic toxicology.

4. The .06 mg/l unionized ammonia standard is considered by the Water Quality Control Commission at this time to be generally necessary and sufficient to protect the sensitive warm water species found in this segment, as well as in Colorado generally. Furthermore, differences between the South Platte and the Cache la Poudre River, such as flows, temperature, water chemistry, and the presence of different species, indicate that the .1 mg/l unionized ammonia standard applicable for the Poudre and elsewhere is inappropriate here.

5. The .06 mg/l unionized ammonia standard is generally met in the stream at this time, although some excursions above this standard do occur. The .1 mg/l temporary modification is adequate to account for such excursions without penalizing dischargers for their occurrence.

6. The evidence submitted by the Division on the mixing zone study indicates that the .06 mg/l unionized ammonia standard is being met in the study area by the existing Bi-City treatment plant, and will continue to be met in the near term without additional treatment and without taking into account the dilution effect of additional flows, mixing zone considerations, or other similar factors utilized in writing permit effluent limitations.

7. The existing standard and temporary modification will have no effect on capital-intensive requirements for existing discharges at this time. Compliance schedules to reduce ammonia levels will not be required of dischargers until a wasteload allocation is established. Future effects are hypothetical and uncertain. As the Commission considers the temporary modification in the future, and in the conduct of its required trienniel review, such factors can be re-evaluated in the light of more specific facts and in conjunction with advancing scientific information on the establishment of site-specific standards.

IV. ECONOMIC REASONABLENESS

The Commission has considered the economic reasonableness of this action and concludes as follows:

1. Evidence indicates that the .06 mg/l unionized ammonia standard is met now below the discharge point of the existing Bi-City Treatment Plant. The .1 mg/l temporary modification is adequate to account for excursions above the standard without imposing additional treatment requirements on dischargers. the existing 20 mgd Bi-City Plant.

2. Specific cost figures submitted by Littleton and Englewood indicate potential total impacts, not incremental impacts.

3. Because no immediate economic impacts will occur, and because there are administrative remedies to specificaly address economic impacts if they materilize in the future, the decision to retain the existing aquatic life classification and ammonia standards is economically reasonable. Administrative remedies potentially available in the future include those specified by C.R.S. 1973, 25-8-204(3), 503(4), and 202 (1)(f).

38.11 MEASURING DISSOLVED OXYGEN IN LAKES AND RESERVOIRS

The water quality standards for dissolved oxygen are intended to apply to the epilimnion and metalimnion strata of lakes and reservoirs.

38.12 STATEMENT OF BASIS AND PURPOSE

I. Introduction

These stream classifications and water quality standards for state waters of the South Platte River Basin, including all tributaries and standing bodies of water, and the Laramie River, implement requirements of the Colorado Water Quality Control Act, C.R.S. 1973, 25-8-101 et seq. They also represent the implementation of the Commission's Regulations Establishing Basic Standards and an Anti-degradation Standard and Establishing a System for Classifying State Waters, for Assigning Standards, and for Granting Temporary Modifications (the “Basic Regulations”).

The Basic Regulations establish a system for the classification of state waters according to the beneficial uses for which they are suitable or are to become suitable, and for assigning specific numerical water quality standards according to such classifications. Because these stream classifications and standards implement the Basic Regulations, that statement of basis and purpose (Section 3.1.16) must be referred to for a complete understanding of the underlying basis and purpose of the regulations adopted herein. Therefore, that statement is incorporated by reference. This statement of basis and purpose is addressed to the scientific and technological rationale for the specific classifications and standards, developed from information in the record established in the administrative process. Public participation was a significant factor in the development of these regulations. A lengthy record has been built through public hearings, and this record establishes a substantial basis for the specific classifications and standards adopted. Public hearings were commenced on July 30, 1980. A total of 59 persons requested and were granted party status by the Commission in accordance with C.R.S. 1973, 24-4-101 et seq.

II. General Considerations

1. These regulations are not adopted as control regulations. Stream classifications and water quality standards are specifically distinguished from control regulations in the Water Quality Control Act, and it is the view of the Commission that they need not be adopted as control regulations pursuant to the statutory scheme.

2. The Commission has been requested in the public hearings to rule on the applicability of these and other regulations to the operation of water diversion facilities, dams, transport systems, and the consequent withdrawal, impoundment, non-release and release of water for the exercise of water rights. The Commission has determined that any such broad ruling is inappropriate in the context of the present regulations. While the request raises significant issues that must be addressed, the Commission is aware of the current practices of the Division and notes no significant impacts on these activities. In addition, these questions involve complex legal issues currently in litigation. The request does not raise specific questions as to proposed classifications and standards; however, the Commission has taken into account the fact that some issues are unresolved in adopting classifications and standards, as is more fully discussed below. In addition, on January 5, 1981, the Commission adopted a policy statement on quality/quantity issues that addresses a number of concerns.

III. Definition of Stream Segments

1. For purposes of adopting classifications and water quality standards, the streams and water bodies are identified according to river basin and specific water segments.

2. Within each river basin, specific water segments are defined, for which use classifications and numeric water quality standards are adopted. These segments may constitute a specified stretch of river mainstem, a specific tributary, a specific lake or reservoir, or a generally defined grouping of waters within the basin (e.g., a specific mainstem segment and all tributaries flowing into that mainstem segment).

3. Segments are generally delineated according to the points at which the use or water quality characteristics of a watercourse are determined to change significantly enough to require a change in use classification and/or water quality standards. In many cases, such transition points can be specifically identified from available water quality data. In other cases, however, the delineation of segments is based upon best judgements of where instream changes in uses or water quality occur, based upon upstream and downstream data.

IV. Use Classifications - Generally

1. The use classifications have been established in accordance with the provisions of Section 3.1.6 and 3.1.13 of the Basic Regulations. Each proposal classification is based upon actual current uses or existing water quality. In the latter case, even though the use may not be in place, the classification is attached if existing water quality would allow that use.

2. In all cases the regulation has been followed that an upstream use cannot threaten or degrade a downstream use. Accordingly, upstream segments of a stream are generally the same as, or higher in classification than, downstream segments. In a few cases, tributaries are classified at lower classifications than mainstems, where the flow from tributaries does not threaten the quality of mainstem waters and where the evidence indicates that lower classifications for the tributaries is appropriate.

3. The Commission has determined that it has the authority to assign the classification “High Quality Waters - Class 1” and High Quality Waters - Class 2” where the evidence indicates that the requirements of Sections 3.1.13(1) (e) are met. The validity of the use of this classification has been determined on a case-by-case basis.

4. The classification “High Quality Waters - Class 1” has been assigned where the following factors are present:

(a) waters are of a quality higher than necessary to protect specified uses;

(b) waters constitute an outstanding state and national resource;

(c) no known sources of pollution are present;

(d) restrictions on use due to federal status are present; and

(e) waters are of recreational and ecological significance.

5. Not all segments located within wilderness areas have been classified “High Quality - Class 1”. In addition, rivers designated under the Wild and Scenic Rivers Act and streams providing unique habitats for threatened species of fish have not been classified “High Quality - Class 1”. These segments have been classified “High Quality - Class 2” for the following reasons:

(a) waters are of a quality higher than necessary to protect specified uses;

(b) evidence in the record indicates the presence of water diversions within these areas;

(c) a question exists as to whether existing diversion structures can be maintained consistent with a “ High Quality - Class 1” designation. Because of the questions regarding authority to regulate diversion, the Class 1 designation was deemed potentially too rigid. The Commission recognizes its authority to upgrade these segments if and when it is appropriate to do so.

6. The “High Quality - Class 2” classification was considered for many segments located on National Forest Service lands and in other instances. These proposals have been rejected and the segments classified for specific uses for the following reasons:

(a) High quality classifications represent extraordinary categories and their use is optional at the discretion of the Commission;

(b) Due to the extraordinary nature of the classification, the Commission deems it appropriate to require more data on existing quality than present in the record to justify more extensive use of the classification;

(c) Further monitoring may indicate in the future that many segments in this region should be upgraded to a high quality classification;

(d) More reliable data is necessary with this classification in these cases because there are no guidelines other than instream values upon which to base water quality standards;

(e) It is important in these cases to assign specific numeric water quality standards to protect the highest specific use classifications and only specific use classifications provide the mechanism for assigning such standards.

(f) There is considerable uncertainty at this time regarding the manner in which the “High Quality - Class 2” classification will be administered, particularly with regard to procedures for activities which may involve some temporary degradation of water quality;

(g) Questions exist regarding “existing quality” in terms of historic activities that may have affected water quality;

(h) Questions exist regarding the applicability of the high quality classification to diversions;

(i) The Commission views the classification system as an ongoing process and recognizes its authority to upgrade specific stream segments. There is presently a need for the establishment of mechanisms for administering the “High Quality - Class 2” classification; and

(j) Location of a stream on National Forest Service lands provides no reason in and of itself to classify it as high quality.

7. Qualifiers - “Goal”

The “goal” qualifier (Section 3.1.13(2) (a), Basic Regulations) has been used in specific cases where waters are presently not fully suitable for the classified use, but are intended to become so. In all such cases, water quality standards have been established to protect the classified uses and temporary modifications have been granted for specified parameters.

8. Qualifiers - “Interrupted Flow”

The Commission has considered appending the “interrupted flow” qualifier to numerous stream segments in accordance with Sections 3.1.13(2) (c) of the Basic Regulations; however, numerous questions have arisen as to its meaning and applicability. The insertion of the provision is to allow the Commission to classify certain stream segments according to their water quality despite the existence of flow problems. It has not been included in order to eliminate confusion as to its applicability to diminished, as opposed to interrupted, flows. It has also been eliminated in order to eliminate any misimpression regarding benefits to dischargers: this qualifier is essentially a statement of the obvious, particulary in view of the provision regarding low flow exceptions (Section 3.1.9(1), Basic Regulations.

In addition, where flow characteristics permanently impair the suitability of the stream segment to provide a habitat for a wide variety of aquatic life, the “Class 2 - Cold Water Aquatic Life” classification has been assigned.

9. Recreation - Class 1 and 2

In addition to the significant distinction between Recreation - Class 1 and Recreation - Class 2 as defined in Section 3.1.13(1) of the Basic regulations, the difference between the two classifications in terms of water quality standards is the fecal coliform parameter. Recreation - Class 1 generally results in a standard of 200 fecal coliforms per 100 ml; Recreation - Class 2 generally results in a standard of 2000 fecal coliform per 100 ml.

The Commission has heard considerable testimony on the issue of applying these classifications and has deliberated on it at length. The Commission has decided to classify as “Recreation - Class 2” those stream segments where primary contact recreation does not exist and cannot be reasonably expected to exist in the future and where municipal discharges are present which may be unnecessarily affected by the “Recreation - Class 1” classification to their detriment and that of the aquatic life in the stream segment. The Commission has decided to classify as “Recreation - Class 1” those stream segments where primary contact recreation exists or where the fecal coliform standard of 200 per 100 ml. is being met and no point source discharges exist, despite the absence of the primary contact use. The reasons for these decisions are as follows:

(a) The mountain streams in this region are generally unsuitable for primary contact recreation because of water temperature and stream flows.

(b) Fecal coliform is an indicator organism. Its presence does not always indicate the presence of pathogens depending on the source of the fecal coliform. If the source is agricultural runoff as opposed to human sewage, there may be no health hazard and therefore no significant need to reduce the presence of fecal coliform to the 200 per 100 ml. level. Also, control of nonpoint sources is very difficult.

(c) Treating sewage to meet the 200 per 100 ml. level generally means the treatment plant must chlorinate its effluent to meet the limitation. The presence of chlorine in the effluent can be significantly detrimental to aquatic life without corresponding benefits. Post-treatment of effluent to meet the residual chlorine standard is expensive and often results in the addition of more chemicals which can be detrimental to aquatic life. Therefore, reducing the need for chlorine is of beneficial effect to aquatic life.

(d) Even where a treatment plant in this region might treat its effluent to attain the standard of 200 per 100 ml., agricultural runoff and irrigation return flows below the plant may result in the rapid increase of fecal coliform levels. Therefore, the benefits of further treatment are questionable.

(e) The fecal coliform standard of 2000 per 100 ml. has been established to protect water supplies. There is no significant difference in the two levels for water treatment plants because the average plant must provide the means for treatment at higher levels. The standard of 200 per 100 ml. is not intended to protect the water supply classification.

V. Water Quality Standards - Generally

1. The water quality standards for classified stream segments are defined as numeric values for specific water quality parameters. These numeric standards are adopted as the limits for chemical constituents and other parameters necessary to protect adequately the classified uses in all stream segments.

2. Not all of the parameters listed in the “Tables” appended to the Basic Regulations are assigned as water quality standards. This complies with Section 3.1.7(c) of the Basic Regulations. Numeric standards have not been assigned for parameters on which there is no data and no knowledge of their occurrence in the basin.

3. A numeric standard for the temperature parameter has been adopted as a basic standard applicable to all waters of the region in the same manner as the basic standards in Section 3.1.11 of the Basic Regulations.

   The standard of a 3° temperature increase above ambient water temperature as defined is generally valid based on the data regarding what is necessary to support an "Aquatic Life - Class 1" fishery. The standard takes into account daily and seasonal fluctuations; however, it is also recognized that the 3° limitation as defined is only appropriate as a guideline and cannot be rigidly applied if the intention is to protect aquatic life. In winter, for example, warm water releases from reservoirs (which might not be subject to the standard in any case) may be beneficial to aquatic life. It is the intention of the Commission in adopting the standard to prevent radical temperature changes in short periods of time which are detrimental to aquatic life.

4. Numeric standards for nineteen organic parameters have been adopted as basic standards applicable to all waters of the region in the same manner as the basic standards in Section 3.1.11 of the Basic Regulations. These standards are essential to a program designed to protect the waters of the state regardless of use classifications because they describe the fundamental conditions that all waters must meet.

   It is the decision of the Commission to adopt these standards as basic standards because their presence in not generally suspected. Also, these numbers are not detectable using routine methodology and there is some concern regarding the potential for monitoring requirements if the standards are placed on the particular stream. This concern should be alleviated by Section 3.1.14(5) of the Basic Regulations but there is uncertainty regarding the interpretation of those numbers by other entities. Regardless of these concerns, because these parameters are highly toxic, there is a need for regulating their presence in state waters. Because the Commission has determined that they have uniform applicability here, their inclusion as basic standards for the region accomplishes this purpose.

5. In many cases, the numeric water quality standards are taken from the "Tables" appended to the Basic Regulations. These table values are used where actual ambient water quality data in a segment incases that the existing quality is substantially equivalent to, or better than, the corresponding table values. This has been done because the table values are adequate to protect the classified uses.

   Consistent with the Basic Regulations, the Commission has not assumed that the table values have presumptive validity or applicability. This accounts for the extensive data in the record on ambient water quality. However, the Commission has found that the table values are generally sufficient to protect the use classifications. Therefore, they have been applied in the situations outlined in the preceding paragraph as well as in those cases where there is insufficient data in the record to justify the establishment of different standards. The documentary evidence forming the basis for the table values is included in the record.

6. In many cases, instream ambient water quality provides the basis for the water quality standards (See 7 below). In those cases where the classified uses presently exist or have a reasonable potential to exist despite the fact that instream data reflects ambient conditions of lower water quality than the table values, instream values have been used. In these cases, the evidence indicates that instream values are adequate to protect the uses. In those cases where temporary modifications are appropriate, instream values are generally reflected in the temporary modification and table values are reflected in the corresponding water quality standard. (Goals are established for the appropriate classification affected by the parameter).

Cases in which water quality standards reflect these instream values usually involve the metal parameters. On many stream segments elevated levels of metals are present due to natural or unknown causes, as well as mine seepage from inactive or abandoned mines. These sources are difficult to identify and impractical or impossible to control. The classified aquatic life uses may be impacted and/or may have adjusted to the condition. In either case, the water quality standards are deemed sufficient to protect the uses that are present.

7. In establishing standards based on instream ambient water quality, a calculation is made based upon the mean (average) plus one standard deviation ($\bar{x}$+ s) for all sampling points on a particular stream segment. Since a standard deviation is not added to the water quality standard for purposes of determining the compliance, this is a fair method as applied to discharges.

   Levels that were determined to be below the detectable limits of the sampling methodology employed were averaged in as zero rather than at the detectable limit. This moves the mean down but since zero is also used when calculating wasteload allocations, this method is not unfair to dischargers.

   A number of different statistical methods could have been used. All of them have pros and cons and the approach used is reasonable.

   Metals present in water samples may be tied up in turbidity when the water is present in the stream. In this form they are not “available” to fish and may not be detrimental to aquatic life. Because the data of record does not distinguish as to availability, some deviation from table values, as well as the use of $\bar{x}$+ s, is further justified because it is unlikely that the total value in the samples analyzed is in available form.

8. No water quality standards are set below detectable limits for any parameter, although certain parameters may not be detectable at the limit of the standards using routine methodology. However, it must be noted that stream monitoring, as opposed to effluent monitoring, is generally not the responsibility of the dischargers but of the state. Furthermore, the purpose of the standards is to protect the classified uses despite the inconvenience monitoring may impose.

   Section 3.1.15(5) of the Basic Regulations states that “dischargers will not be required to regularly monitor for any parameters that are not identified by the Division as being of concern”. Generally, there is no requirement for monitoring unless a parameter is in the effluent guidelines for the relevant industry.

9. The dissolved oxygen standard is intended to apply to the epilimnion and metalimnion strata of lakes and reservoirs. Respiration by aerobic micro-organisms as organic matter is consumed is the primary cause of a natural decrease in dissolved oxygen and anaerobic conditions in the hypolimnion. Therefore, this stratum is exempt from the dissolved oxygen standard.

10. Where numeric standards are established based on historic instream water quality data at the level of $\bar{x}$+ s, it is recognized by the Commission that measured instream parameter levels might exceed the standard approximately 15 percent of the time.

11. Dischargers are not responsible for the removal of pollutants present in their intake water, but may be held responsible for any and all additions of pollutants by such discharger, where necessary, to meet applicable water quality standards.

12. It is the Commission's intention that the Division implement and enforce these water quality standards consistent with the manner in which they have been established.

VI. Water Quality Standards for Unionized Ammonia

Ammonia standards on plains streams have been established after careful consideration of a number of competing factors. Ammonia standards less stringent than those recommended in the Tables have been adopted and/or the footnote (3.8.5(4)) attached based on the following factors:

1. Bioassays performed in the Cache la Poudre River show that a .1 mg/l standard is appropriate in that stream. The results of these bioassays may be appropriately extrapolated to similar plains streams; i.e., those streams that demonstrate similar chemical, physical, and biological characteristics.

2. limited nature of the aquatic life present;

3. limited recreational value of species present;

4. habitat limitations, primarily flow and streambed characteristics, that impose significant limitations on the nature of aquatic life, even if ammonia reductions were attained;

5. rapid dissipation of ammonia in streams, reducing the impact of such discharges downstream; and

6. Economic costs of ammonia removal, especially where such costs would fall primarily on publicly-owned treatment works, and while the availability of construction grant funds is questionable.

VII. Water Quality Standards for Uranium

Given the threat that radioactivity from uranium may pose to human health, it is advisable to limit uranium concentrations in streams to the maximum extent practicable. The Commission finds that based on the record of these hearings a uranium standard is particularly necessary to protect the water supply classification. In the face of significant controversy and conflicting testimony, the Commission has adopted a standard of 40 pCi/l or natural background where higher, for the following reasons:

1. 40 pCi/l generally reflects background concentrations of uranium that may be found in streams in Colorado and therefore this amount approximates routine human exposure.

2. The statistical risk of human health hazards is small at 40 pCi/l.

3. 40 pCi/l is an interim level, established now pending the outcome of further studies currently underway.

VIII. Classifications and Standards - Special Cases

1. <u>Page 1, segments 2a, 2b, and 2c</u> (proposed as page 1, segment 2)

   This segment has been re-segmented based on water quality data and other information submitted by the Coors Company indicating that Mosquito Creek and South Mosquito Creek deserve unique treatment. These streams have been subject to channelization, thus impacting aquatic life habitat and the presence of mine drainage results in high levels of heavy metals.

2. Page 2, segment 6 (proposed as page 1, segment 6)

   Present water quality and aquatic habitat demonstrates that the proposed classifications are in place and proposed standards currently met. There are trout found here, although there is a question as to whether of not reproduction takes place in this segment. However, given the importance of this segment as part of the Littleton Floodplain Park, efforts of the Division of Wildlife to establish an urban fishery, existing quality, and the lack of any definite impact on dischargers, the proposed classifications standards are deemed appropriate. Since the Mission Viejo Company is planning to install nitrification facilities, the standard for ammonia should be met downstream of their proposed discharge. In the event that this is not the case in fact, the Commission will be able to re-evaluate this situation in full when standards are reconsidered.

3. Page 3, segment 14 (same as proposed)

   Although there are large numbers of fish present in this segment, including some game fish, it is believed that there is no spawning in this stretch of stream due to high temperatures. Littleton - Englewood has demonstrated a willingness to increase treatment provided other dischargers do likewise in order to make their own efforts meaningful. Under such circumstances, it may be of measurable benefit to the stream to reduce ammonia levels. Therefore, a temporary modification for ammonia has been established based on existing quality, in the belief that the .06 mg/l standard can be achieved.

4. Page 4, segment 15 (proposed as page 3, segment 15)

   The .2 mg/l NH_3 standard represents instream quality. The reasons for this standard appear above at part VI, Denver Metro being the affect municipality.

   A total ammonia standard has not been adopted based on a lack of necessity for such a standard, the problems involved in defining “point of intake” and applying such standard, as well as the costs involved in meeting the standard.

5. Page 4, segment 17b (proposed as page 3, segment 17)

   A goal for Class 1 Aquatic Life has been established since there is a Clean Lakes Program Grant to improve the lake. Data from the Coors Company indicates elevated levels of cadmium, copper, iron, and lead, and therefore standards have been established on that basis for this lake.

6. Page 6, segments 1a, 1b, 1c (proposed as page 5, segment 1)

   Existing ammonia levels are sufficient to justify a .02 mg.l standard on all reaches of this segment although population growth may result in future problems. The establishment of appropriate mixing zones should solve any existing problem in attaining the standard and the “footnote” has been attached to the ammonia standard in segment 1b, so that impacts on discharges may be assessed as they develop.

7. Page 8, segment 2 (proposed as page 6 segment 2)

   The water supply classification has been removed because such use is not in place. In addition, existing quality may not support such a classification.

Numbers for various metals parameters are elevated based on water quality data submitted by the Coors Company, the City of Golden, and the Climax Molybdenum Company demonstrating higher instream values.

8. Page 8, segments 3a, 3b (proposed as page 6, segment 3)

Segment 3b has been separated out for unique treatment based on water quality data and other information submitted by Coors indicating poor streambed characteristics, limited aquatic life, and poor instream water quality. This reach has been subject to channelization and has a steep gradient. There are few species and numbers of species present. Elevated levels of heavy metals have been recorded.

9. Page 8, segment 4, page 9, segments 5 and 6 (proposed as page 6, segments 4 and 5)

The Commission adopts the rationale contained in Exhibit #1, page 16, of the hearing record on the Upper South Platte except as indicated below.

Numbers for metals parameters have been changed from those proposed based on water quality data submitted by Coors and Climax, as well as additional data developed by the Water Quality Control Division. The mainstem of West Clear Creek has been segmented to recognize the existence of different water quality above and below the confluence with Woods Creek, which has the major impact on water quality in West Clear Creek.

Temporary modifications have not been adopted here, but instead have been assigned on segment 7 where the discharges exist.

10. Page 9, segment 7 (proposed as page 6, segment 6)

The Commission adopts the rationale contained in Exhibit #1 page 17, of the hearing record on the Upper South Platte, except as indicated below.

With the existing segmentation, Upper Woods Creek, from the source to the outlet of Upper Urad Reservoir, is included in segment 6 (tributaries). Segment 7 is highly impacted by active and abandoned mine drainage. Treatment of active mine discharges is desirable primarily to improve water quality in West Clear Creek, where aquatic life habitat is good and could support a greater diversity of aquatic life with improved water quality in Woods Creek. This is attainable with treatment of existing discharges. During periods of low flow, Woods Creek makes up a majority of the flow in West Clear Creek. For these reasons, the standards adopted are the same as those for West Clear Creek. Temporary modifications have been assigned based on existing quality.

Since the City of Golden owns water rights in this segment, which may be affected by treatment requiring consumptive use, the Commission requests to be kept informed of any impacts on such water rights.

11. Page 10, segment 11, segment 14 (proposed as page 6, segment 11 and page 8, segment 14)

Numbers have been changed based on water quality data submitted by Climax and various municipalities.

A phosphorus standard has not been adopted as requested by parties. A study of the lake is needed to determine if a phosphorous problem exists.

A total ammonia standard has not been adopted because of a lack of demonstrated need for any such standard, the low levels of ammonia downstream in Standley Lake, the difficulty of measuring and defining compliance with such a standard, and the high costs associated with treatment to the levels requested.

12. Page 11, segment 15 (proposed as page 8, segment 15)

A goal for Aquatic Life - Class 1 has been established because this segment is a high priority for development by the Division of Wildlife as an urban fishery, and because flow and habitat conditions preclude full attainment of such use at present. Improvements of water quality and habitat may result in attainment of this goal.

The water supply classification and appropriate water quality standards have been adopted because this segment serves as a water supply for the City of Thornton.The .06 mg/l NH

3 standard is adopted in conjunction with the goal for aquatic life, while a temporary modification to .15 mg/l is assigned, reflecting existing quality.

13. Page 11, segment 17 (proposed as page 8, segment 17)

The segment description has been revised to include all three reservoirs located on this segment, all of which serve as municipal water supplies.

A Class 2 - Aquatic Life classification has been adopted because the aquatic life habitat is impacted by low flows and the existence of physical barriers to fish migration upstream from Ralson Reservoir.

Numbers for various metals parameters are elevated from the proposed standards based on instream water quality data.

Temporary modifications for lead, copper and uranium have been adopted to reflect existing quality. The modification is intended to allow the discharger to develop treatment capacity, but is effective only for one year due to the severe impact these parameters can have on the classified uses, namely aquatic life (copper and lead) and water supply (uranium). At the end of that period, the Commission must re-examine the need for the temporary modifications in accordance with the Basic Regulations.

The testimony and other evidence on the uranium issue were made part of the record during the testimony on this segment. Notwithstanding the potential impacts of the standard on the Cotter Corporation mine located in the segment, the rationale that appears above is applicable here. The impact of a polluting discharge should not be included in the calculation of ambient quality where a significant potential public health problems exists. In addition, the burden of pollutant removal should fall on the discharger and not on the downstream municipalities.

The sulfate standard is adopted as necessary to protect the water supply classification. Such action is not, however, deemed to be the adoption of a drinking water standard, since a drinking water standard applies only at the point of delivery to the users, and is enforceable only against supplies of the water to their customers. Compliance with this standard on this segment is to be measured in the reservoirs, not in the stream.

14. Page 12, segment 2 (proposed as page 9, segment 2)

    Standards for cadmium, copper, lead and nickel reflect instream levels based upon additional data submitted at the hearing.

    A total ammonia standard has been adopted on this segment to protect the water supply classification and to reflect existing quality.

15. Page 13, segments 4a and 4b (proposed as page 10, segment 4)

    The Denver Water Board proposed a Class 2 - Aquatic Life classification for this entire segment due to channelization and diversion activities impacting the aquatic habitat. Trout Unlimited proposed a Class 1 classification to reflect existing use and water quality, as well as ongoing efforts to develop a trout fishery in the lower reaches. It is believed that the re-segmentation with a goal for Aquatic Life - Class 1 in segment 4b accomplishes the objectives of the parties and the Commission and reflects existing conditions in the stream.

16. Page 14, segment 6 (proposed as page 10, segment 6)

    The water supply classification and appropriate water quality standards have been adopted to protect Great Western Reservoir which serves as a water supply for the City of Broomfield.

17. Page 14, segment 7a, 7b (proposed as page 11, segment 7)

    The segment has been re-segmented and a Class 2 - Aquatic Life classification assigned to segment 7b in recognition of limited aquatic life and aquatic habitat in the lower segment due to low flows and streambed characteristics.

18. Page 16, segment 3 (proposed as page 12, segment 3)

    The Aquatic Life - Class 1 classification has been retained based on the data and information submitted by the Water Quality Control Division as part of its special studies. This information indicates that the existing water quality, aquatic habitat, as well as numbers and varieties of aquatic species, support the proposal. Although there has been some historic channelization in this segment, the stream has regenerated into a good aquatic habitat.

19. Page 17, segment 2 (proposed as page 13, segment 2)

    Water quality standards adopted in this segment reflect instream values measured upstream. The reason for not combining this with segment 1 is the existence of a hardness change where the Big Thompson River enters the South Platte.

20. Page 17, segment 4 (proposed as page 13, segment 4)

    The record indicates that this reservoir is subject to great fluctuations in water levels and that it is eutrophic; therefore, a Class 2 - Aquatic Life classification has been assigned.

21. Page 18, segments 4 and 5 (proposed as page 14, segments 4 and 5)

    The record on these segments supports the Class 2 - Aquatic Life classification and the standards to protect that use, due to streambed and flow characteristics.

Water quality standards are based on instream levels, and in some cases, extrapolations from water quality information from Cache la Poudre River studies. Such extrapolations are justified due to the following similarities between the streams:

The water supply classification was deleted

(a) forms and species of aquatic life;

(b) background levels of hardness and alkalinity;

(c) plains streams passing through large communities, impacted by diversions and agricultural return flows;

(d) close geographical proximity; and

(e) similar rates of flow.

Temporary modifications for copper and silver and adopted for 3 years with bioassays to be performed in that period which may result in changes in the adopted standards.

The number adopted as a temporary modification for silver represents an extrapolation as described above, although a slightly more conservative number is used since the bioassays were not performed in the Thompson River. The same rationale applies to the temporary modifications for copper. In addition, changing hardness in segment 5 provides a basis for copper standards slightly higher that those proposed.

22. Page 22, segment 11,12 (proposed as page 18, segments 11, 12)

from segment 11 because the use is not in place or expected to be in place in the future. In addition, treatment for ammonia removal could result in increased nitrate levels, thus rendering the use unattainable.

Copper and silver standards are adopted that reflect the results of bioassays and instream surveys performed in the lower Poudre which are part of the record.

The copper standard in segment 11 is based on the recognition of this segment as a transition zone for hardness and alkalinity. The copper standard in segment 12 is based on bioassays performed in the Poudre, as well as data from the literature and on ambient quality.

The silver standard for both these segments is based upon the proposal, as well as stream monitoring by Kodak/Colorado. The toxic form of silver, the free soluble silver ion, is rarely present in the environment, readily complexes into less toxic forms, and is difficult to measure. For these reasons, levels of silver at the adopted standard can exist without negative impact on the stream or its aquatic life.

A voluminous record on this segment supports the Aquatic Life - Class 2 classification and appropriate standards to protect that use. Aquatic habitat limitations and the historic conditions and uses of the river lead to the conclusion that a wide variety of aquatic life cannot be supported regardless of water quality characteristics.

In addition, extensive biosurveys indicate that the aquatic life in these segments is currently limited, not by water quality but by habitat, and that existing discharges have no significant detrimental impact on the existing aquatic life.

Bioassays performed in the Poudre support a .1 mg/l unionized ammonia standard to protect the existing aquatic life.

FISCAL STATEMENT

Stream Classifications and Water Quality Standards for the South Platte River System Including All Standing Bodies of Water and the Laramie, Republican and Smoky Hill River Systems Including All Standing Bodies of Water in Those Systems

The Water Quality Control Commission is charged with the responsibility to conserve, protect, and improve the quality of State waters pursuant to C.R.S. 1973, 25-8-101 et seq.

The Commission is further charged to classify all waters of the State and to promulgate standards for any measurable characteristics of water (25-8-203 and 25-8-204). The above-titled document assigns use classifications and standards for the State waters in the listed areas in accordance with the "Basic Regulations adopted May 22, 1979.

The measurable fiscal impacts which may be caused by these regulations are as follows:

- Cost of construction of increased or decreased treatment levels of municipal waste treatment facilities;

- Cost of construction of increased or decreased treatment levels of industrial waste treatment facilities;

- Change In cost of Operation and Maintenance of municipal facilities;

- Change in cost of Operation and Maintenance of industrial facilities;

- Cost of in stream monitoring and lab analysis for added by the standards.

Dischargers will not be required to do the stream monitoring. Only those parameters which are limited by a discharge permit will be monitored by the permittee. The state, federal and local agencies now doing in stream monitoring will have some increased cost; however, any additional frequency should be done to improve state surveillance and would be needed regardless of standard changes. In the Basic Standards under the water quality standards system which is being replaced, there was a prohibition of the discharge of toxic materials as follows:

"(1) All State waters shall be:

(d) Free from substances attributable to municipal, industrial, or other discharges of agricultural practices in concentrations or combinations which are toxic or harmful to human, animal, plant, or aquatic life;"

Those municipalities which discharge to streams classified either A1 or B1 under the previous system or Cold Water Aquatic Life Class 1 under the new system are required to provide essentially the same degree of treatment under either system. As a result, any costs for advanced waste treatment required primarily for ammonia conversion and chlorine reduction for these streams would not be affected by the stream classifications. This includes the South Platte River through the Metropolitan Denver area where the possibility of additional treatment for ammonia was retained to protect the aquatic life that exists and to assure reasonably high quality of water compatible with the extensive park system being established along the river. It also includes Boulder creek through and downstream from Boulder to protect that stream for maximum public use as desired by the city.

For those municipalities discharging to streams which are classified A2 or B2 under the old system and are being classified as Warm Water Aquatic Life Class 2, the affects of the change is not as clear. Discharge permits for some of these municipalities, such as Loveland and Fort Collins, have been written for ammonia removal beyond secondary treatment to meet what was believed to be the intent of the prevailing stream classifications and standards. Construction schedules were also included in those permits leading to required construction of advanced waste treatment once the streams were reclassified and construction grant funds were available; however, some question exists as to whether such additional treatment would have been ultimately constructed. For the purposes of this statement, it is assumed that those facilities would not have had to go beyond secondary treatment with the old classification system. This assumption provides the most severe illustration of impact associated with the new classification system and may be overestimating the impacts for some of the entities. This is particularly true for the Metro Denver and Greeley where local government is already proceeding with plans for advanced waste treatment development and for Fort Collins which already has potential for ammonia removal capabilities in its current facilities.

The following tabulation summarizes the change in capital costs due to the change in classification. The municipalities shown are limited to only those included on Warm Water Aquatic Life Class 2 segments in that they would be the only ones affected. Municipalities which discharge to intermittent or low flow plains streams are also tabulated herein. Most of these municipalities are located on warm water segments that have been footnoted by the Commission to indicate that secondary treatment is adequate; however, if the Water Quality Control Division determines that ammonia removal facilities would be required to meet the numeric standards, the matter must be brought before the Commission for a hearing before such additional treatment is imposed. The costs shown represent the two options; namely, (1) the estimated costs should additional treatment be imposed; and (2) the additional costs should they not be imposed.

The costs shown, in 1980 dollars, reflect the estimated incremental costs or savings between what likely would have occurred under the old system and that anticipated under the new system. Because the basis for comparison is assumed as secondary treatment with the old system for these municipalities, the incremental costs of the second option is zero in all cases. Estimated changes in costs for annual operation and maintenance are not shown but their present worth over a 20-year period can be expected to be somewhat less than the change in capital costs.

Municipality/County	Design Flow mg/d	Incremental Cost for Advanced WT to Meet Ammonia Limits Capital $ Million	Increasing Cost For Treatment If Ammonia Standards Are Waived
ADAMS			
Metro Denver S.D.D.#1	180	4.5*	0
So. Adams W.&.S.D.	6.1	2.0	0
ARAPAHOE			
Glendale	2.0	0	0
BOULDER			
Lafayette	0.3	0.4	0
Longmont	8.2	3.3	0
Louisville	1.0	0.8	0
Lyons	.250	0.3	0
DOUGLAS			
Castle Rock	0.4	0.4	0
JEFFERSON			
Clear Creek S.D.	2.0	1.9	0
Evergreen Metro Dist.	1.0	0.5*	0
Golden	4.0	2.0	0
Wheatridge S.D.	2.2	0.9	0
Morrison S.D.	.07	0.1*	0
Kittredge	0.1	0.1*	0

Municipality/County	Design Flow mg/d	Incremental Cost for Advanced WT to Meet Ammonia Limits Capital $ Million	Increasing Cost For Treatment If Ammonia Standards Are Waived
LARIMER			
Berthoud	0.9	0	0
Boxelder	0.8	0	0
Fort Collins	22.5	0	0
Loveland	7.7	3.3	0
South Ft. Collins	1.5	0	0
LOGAN			
Sterling	2.5	0	0
MORGAN			
Brush	1.5	0	0
Fort Morgan	3.6	0	0
WELD			
Erie	0.4	0.5	0
Evans	1.5	0	0
Eaton	0.3	0	0
Fort Lupton	1.5	0	0
Johnstown	0.25	0	0
Greeley	12	3.7	0
Greeley Industrial	2.8	0	0
Milliken S.D.	0.100	0	0
Weld County Tri Area	0.8	0	0
Windsor	0.7	0	0

Notes: Most costs shown are developed from generalized cost information. Those costs shown with an asterisk were provided by the local municipality.

In addition to municipal treatment impacts, the following industries presented testimony that the standards would require capital costs as listed below:

Industry	Estimated Construction or Capital Cost in $ Million	Incremental Costs From Existing Standards
Amax Henderson	20	0
Cotter Corporation	0.3 to 0.45	$0.3 to 0.45*
Great Western Sugar	0	0
Hewlett-Packard	0	0

*Includes about $0.6 million in additional O & M costs per year

The stream classifications and standards adopted by the Commission will protect the water uses primarily through control of potential point source pollution. Nonpoint source pollution from precipitation runoff will be controlled primarily from management practices which are in existence or will be implemented in the future. Future management practices need careful consideration and will be the result of 208 areawide management plans developed by regional planning agencies and being updated annually. These plans involve local general purpose governments with general assistance from state government. Some of the possible nonpoint source pollution may be controlled through “Control Regulations” yet to be promulgated by the Commission. These types of controls could involve runoff from construction, mining activities, and urban areas. It is not certain what controls are needed at this time and there is no way that possible costs can presently be identified.

Persons who benefit from standards which will protect existing and future anticipated uses can be identified as all persons benefiting from recreation, municipal water supply, and agriculture. These benefits are directly economic for agriculture, industry and municipalities whose health benefit costs are reduced by having clean water, and are both economical and non-quantifiable for some uses such as fishing, recreation, and the aesthetic value of clean waters. Furthermore, benefits will result from human health protection and lack of debilitating disease.Figures have been developed for a recreation/fishing day which can be applied to that aspect of a water use; however, figures which have been developed for total recreation/fishing day uses have been developed statewide and could not be applied region-by-region or stream-by-stream.

The uses of water in this region are adequately protected by these standards. Most municipal treatment facilities and industrial facilities are currently adequate, or are already being upgraded, in order to meet previous requirements. Any additional facilities or expansions in this region will generally be caused by increased capacity required because of population growths or industrial enlargement. Industries are required by federal statute to meet effluent limitations described as “best available technology” by 1983 of 1984.

Adopted: April 12, 1982

38.13 APPENDIX BASIS AND PURPOSE FOR “REGULATIONS GRANTING AND EXTENDING TEMPORARY MODIFICATIONS FOR RALSTON CREEK

On April 12, 1982, the Commission reviewed the temporary modification of numeric standards in relation to the foregoing paragraphs of item 13 of this basis and purpose. At the same time the Commission considered for the first time a request of the Cotter Corporation for a temporary modification of the cadmium standard of .0004 mg/l assigned to this Segment. The following paragraphs applicable to this segment constitute the basis and purpose for the Commission’s rule adopted April 12, 1982.

The Commission was favorably impressed by the diligence of the Cotter Corporation in attempting to meet the underlying standards, which was testified to during the hearing. This favorable impression was enhanced by evidence of Cotter’s plans and the manner in which the firm has moved forward on controlling the uranium levels in it’s effluent. For these reasons the Commission felt justified in extending the temporary modification of the numeric standard for uranium while construction is being completed.

Evidence indicated there was a reasonable probability that the uranium removal capability of the ion exchange technology under construction by Cotter Corporation would be ready for testing approximately January 1, 1983. In determining the duration of the extension of the temporary modification, the Commission observed the schedules involving application of innovative technology and optomizing its functioning are often not met. Therefore, to lessen the probability that an additional hearing would be required, the Commission set the expiration of the temporary Modification for uranium fourteen months from the expiration of the existing modification, which is July 16, 1983.

Additionally, the Commission recognized that zoning changes required to permit the Cotter Corporation to make the required facility changes could be delayed.

The Commission provided that the extension of the Temporary Modifications for all of the metals parameters covered by the hearing and the Temporary Modification granted for cadmium expire on a date certain without provision for an automatic and possibly, unnecessary rehearing to consider termination, revision, or extension of the modification. If some parameter cannot be met, the Commission may be petitioned to hold a hearing to consider adoption of a Temporary Modification or to take other action.

In considering the impact of it's action on water quality, the Commission determined that as soon as the wastewater treatment facility, proposed by the Cotter Corporation, is placed in operation about the first of the year 1983, the effluent from their plant will be receiving treatment, which will be directed toward meeting underlying standards. Following that time, it was expected by the Commission, that operational adjustments may be performed and that data will be collected to demonstrate attainment of planned levels of performance. Thus the objectives of the Commission will have been attained with the balance of the temporary modification period available for operational performance testing, evaluation, and documentation.

The Commission established the length of the temporary modification recognizing that even if the technology is on line in January 1983, there will be a need to acquire 30 day averages of data to indicate the degree of success of such technology. At least two months of operation will be required to generate the minimum amount of data necessary for the Cotter Corporation to determine whether or not it will be able to meet the underlying standards. To these two months would be added 60 day hearing notice and time for the Commission to take further action, if necessary.

For the purpose of acquiring better data, the Commission extended until July 16, 1983, the modification of the stream standards for Segment 17 of Clear Creek for uranium, copper, and lead at the levels currently in effect and provided until July 16, 1983, a modification for cadmium at a level of .013 mg/l. These modifications are to terminate on the date specified without hearing and were granted on condition that the Cotter Corporation show continued diligence in the construction and start-up of the treatment facilities. The value of .013 mg/l for cadmium is approximately the $\bar{x} + s$ testified to by the Cotter Corporation. That level was supported by the testimony of the Water Quality Control Division. It is a value that can be met during the period of the temporary modification and it is not a matter of public health concern for that short a period.

During the period of the temporary modifications adopted in this rule there is a strong likelihood of Cotter Corporation achieving compliance with the underlying standards assigned to Segment 17 of Clear Creek for copper and lead.

The Commission found from the testimony presented to it that if the temporary modification of metals standards for uranium, copper, lead and cadmium were not granted for Segment 17 of Clear Creek that the mine operated by the Cotter Corporation adjacent to that creek might be shut down; that the Corporations mill in Canon City would be threatened with closure; and that the employment of some 350 people could be terminated. The payback period on the treatment facility was found to be 25 years and there would be a small net gain from the sale of the uranium recovered over the annual operating costs of the treatment facility. In light of the public health benefits of it's actions, the Commission found them to be economically reasonable. In further consideration of the economic reasonableness of it's action the Commission noted that the Cotter Corporation had testified that it had committed 1.8 million dollars to its treatment facility which was said to be approximately five times the original estimate and that the Cotter Corporation should be given the time to prove the technology it intends to apply.

The compliance schedule contained in the permit issued to the Cotter Corporation by the Water Quality Control Division is based on the current temporary modification which expires May 16, 1982. The Division can only enforce the compliance schedule in accordance with the terms of the temporary modification being extended by this action. The Division cannot extend the period covered by the current modification to the date the Commission's rule becomes effective 20 days after publication in the May, 1982 Colorado Register.

There is an approximately two week period in which there technically would not be a modification in effect. The Commission found this to constitute an emergency and that it was appropriate to formalize elimination of this gap by adopting this rule under emergency conditions thereby making it applicable during the period between adoption and the time the final rule becomes effective. In the absence of the Commission's adoption of this rule under emergency conditions the Cotter Corporation could be at risk from action by a third party. The Commission, in adopting this rule under emergency conditions intended to preclude the possibility of unnecessary litigation.

Adopted: April 12, 1982
Effective: May 16 thru May 30, 1982

STATEMENT OF FISCAL IMPACT FOR "REGULATIONS GRANTING AND EXTENDING TEMPORARY MODIFICATIONS FOR RALSTON CREEK

The Fiscal Impact of extending temporary modifications for Copper (Cu), Uranium (U), Lead (Pb), and granting a temporary modification for Cadmium (Cd) is a positive benefit to the Cotter Corporation. Testimony revealed that Cotter Corporation is committed to investing approximately $1,800,000.00 in capital expenditures to meet the adopted Uranium Standards for Segment 17 of Clear Creek with an annual operations and maintenance requirement of $82,000.00. From the innovative technology of the installation Cotter Corporation expects to recover approximately $100,000.00 worth of Uranium each year. The net effect would be $16,000.00 that could be applied towards recovering the initial capital expenditure.

Additionally demonstration of the feasibility of the metals removal technology to be applied would enable more rapid solution of similar situations in the future.

Due to the relatively untested nature of this unique application of technology, the Cotter Corporation indicated that a certain degree of time past the expiration of the original temporary modifications would be necessary to come into compliance. Without such an extension the mine would be forced to cease discharging to avoid enforcement proceedings. The impact would be to cause the mine to flood which would effectively terminate the operation of the mine. If in fact this became the case, the fiscal impact would be a potential dissolution of the Corporation's mine operations with a subsequent termination of the milling operations in Canon City. This would result in the potential permanent severance of approximately 350 employees located at the mine and the mill. Loss of profit and net losses in capital investments were not testified to but can be assumed to be of a quite substantial magnitude.

The fiscal impact of the Commission acting under emergency procedures is the savings of expenses of potential third party litigation, which cannot be estimated.

As no party gave substantive testimony indicating an economic impact or harm that could be expected from an extension, the Commission acted in an economically reasonable and responsible way by extending the modification. Thus the fiscal impact is the preservation of Cotter's Schwartzwalder Mine and Canon City Mill Operations with the attendant savings of whatever profits those operations generate. This extends to the preservation of approximately 350 jobs and the timely and economic retirement of capital equipment.

38.14 STATEMENT OF BASIS AND PURPOSE REGARDING THE ADOPTION OF NON SUBSTANTIVE CORRECTIONS TO THE CLASSIFICATIONS AND NUMERIC STANDARDS FOR THE ARKANSAS, SAN JUAN AND DOLORES, RIO GRANDE AND SOUTH PLATTE RIVER BASINS.

In accordance with the requirements of 24 4 103(4), C.R.S. 1973, the Commission makes these findings and adopts this Statement of Basis and Purpose.

The Commission at a public rulemaking hearing November 8,1982,adopted clerical and editorial corrections to the Commission's current regulations numbered respectively 3.2.0, 3.4.0, 3.6.0 and 3.8.0. These regulations are contained in Article 3, Water Quality Standards, of the <u>Policies, Regulations, and Guidelines of the Water Quality Control Commission</u>. (5CCR 1002 8)

In adopting these corrections the Commission considered the economic reasonableness of its action, except as specified the corrections in no way change the classifications and numeric standards originally adopted by the Commission. Other than written comment from the City of Westminster no testimony was offered at the public hearing.

The consolidated changes adopted by the Commission are included in this Basis and Purpose for information. The Secretary of State was provided corrected pages for each of the regulations as replacements for the regulations previously published.

Dated this 8th day of November, 1982 at Denver, Colorado.

FISCAL STATEMENT

Regarding The Adoption of Non Substantive Corrections To The Classifications And Numeric Standards For The Arkansas, San Juan and Dolores, Rio Grande and South Platte River Basins.

The Water Quality Control Commission found that clerical and editorial corrections to the Commission's current regulations numbered respectively 3.2.0, 3.4.0, 3.6.0 and 3.8.0 have no fiscal impact.

Dated this 8th day of November, 1982 at Denver, Colorado.

FISCAL IMPACT STATEMENT ADOPTED DECEMBER 6, 1982
SEGMENT 14 OF THE SOUTH PLATTE EFFECTIVE JANUARY 30, 1983

The principle economic cost of a .06 mg/l unionized ammonia standard with a temporary modification to .1 mg/l is the potential for requiring municipal dischargers in this segment to treat beyond the secondary level. Economic testimony was offered that identified three potential affected entities: The City of Englewood the City of Littleton and the City of Lakewood. All three municipalities discharge their processed wastewater effluent into this segment. The essential economic benefit of this ammonia standard is the potential preservation and enhancement of the fishery of segment 14, the potential preservation and enhancement of the segment as a recreational resource unique to the urban area, and the potential increase in the value of surrounding property and enhancement of development potential. The Commission received testimony that suggested potential economic benefits downstream to Segment 15 and Barr Lake.

The Commission heard considerable testimony regarding the economic ramifications that would allegedly attend either a .06 standard or other, less restrictive standards. None of the potentially impacted entities have been issued an NPDES permit mandating treatment beyond the secondary level and the nitrification cost estimates that were submitted are subject to question as to the final user impact. Thus, costs for nitrification must be considered as a potential rather than a certainty. The Commission also received testimony that illustrated the economic value of Segment 14 as a fishery, a recreational resource, and a lure for development. While it was suggested that a relaxation of the ammonia standard would jeapordize these beneficial uses, the Commission was faced with sufficient uncertainty regarding the causal linkages between the ammonia level and the uses such that economic evaluation was inconclusive.

It appears from the best evidence available to the Commission at this time that a .06 mg/l ammonia standard will pose no immediate threat of economic consequences to the municipal dischargers in this segment. The Commission notes that there are several administrative options available including wasteload allocations, to mitigate or eliminate the severity of economic impact should nitrification become increasingly probable. The Commission finds the use classification of the river to be appropriate, recognizes the unique nature of the urban South Platte as a recreational and aesthetic resource, and that although the economic value of Segment 14 is largely inestimable, it is nonetheless significant. The Commission believes that the more economically responsible stance is to maintain the highest practical level of beneficial use protection until such time as definite economic impositions upon the dischargers warrant a critical examination of the economic relationship between the beneficial uses of Segment 14 and the costs to maintain those uses.

The Commission concludes that there is doubt surrounding what costs and benefits varying levels of ammonia restrictions would generate. It is because the Commission believes that adequate protection exists to address potential costs should they develop and that the beneficial uses associated with this classification are identifiable and in place, that it would be economically reasonable to retain the classification and ammonia standard for this segment as a result of this hearing.

38.15 APPENDIX BASIS AND PURPOSE FOR “REGULATIONS FOR EXTENDING TEMPORARY MODIFICATIONS FOR RALSTON CREEK”

On May 9, 1983, the Commission reviewed the temporary modification of numeric standards for Ralston Creek, segment 17 of Clear Creek, section 3.8.6(2) of the “Classifications and Numeric Standards, South Platte River Basin, etc.,” effective May 16, 1981, and contained in Article 3 of the Commission’s rules. The following paragraphs applicable to this segment constitute the statement of basis and purpose for the Commission’s rule adopted May 9, 1983.

The Commission was favorably impressed by the diligence of the Cotter Corporation in attempting to meet the underlying standards, which was testified to during the hearing. This favorable impression was enhanced by evidence of Cotter’s plans and the manner in which the firm has moved forward on controlling the levels of pollutants in its effluent, particularly meeting the underlying standards for lead and uranium. For these reasons the Commission felt justified in extending the temporary modification of the numeric standards for copper and cadmium while operational modes are being tested.

In determining the duration of the extension of the temporary modifications, the Commission observed the schedules involving application of innovative technology and optimizing its functioning are often not met. To lessen the probability of an additional hearing, the Commission has set the expiration date of the temporary modification for one year from the expiration of the existing modification, which would be July 16, 1984.

The Commission provided that the extension of the temporary modifications for the metals parameters covered by the hearing expire on a date certain without provision for an automatic and possibly unnecessary rehearing to consider termination, revision, or extension of the modification. If some parameter cannot be met, the Commission may be petitioned to hold a hearing to consider adoption of a temporary modification or to take other action.

In considering the impact of its action on water quality, the Commission determined that as soon as the wastewater treatment facility constructed by the Cotter Corporation is fully tested, the effluent from their plant will be receiving treatment, which will be directed toward meeting underlying standards. Operational adjustments are being performed and that data is being collected to demonstrate attainment of planned levels of performance. Thus, the objectives of the Commission will have been attained with the temporary modification period available for operational performance testing, evaluation, and documentation. The Commission established the length of the temporary modification recognizing that there is a need to acquire 30-day averages of data to indicate the degree of success of such technology.

Adopted: May 9, 1983

STATEMENT OF FISCAL IMPACT FOR “REGULATIONS FOR EXTENDING TEMPORARY MODIFICATIONS FOR RALSTON CREEK”

The Fiscal Impact of extending temporary modifications for Copper (Cu) and for Cadmium (Cd) is a positive benefit to the Cotter Corporation. Testimony revealed that Cotter Corporation has committed to investing approximately $2,240,000.00 in capital expenditures to meet the adopted Uranium Standards for Segment 17 of Clear Creek with an annual operations and maintenance requirement of $500,000.00. Cotter has also constructed an emergency storage pond at a cost of $250,000 to further the effectiveness of their treatment program. From the innovatave technology of the installation, Cotter Corporation had expected to recover approximately $100,000.00 worth of Uranium each year. Cotter indicated through testimony that they have not yet been able to measure a recoverable amount of uranium through ion exchange solution recovery processes. Thus, they appear to have been unable at this time to recover any of the O & M costs through after treatment recovery.

Additionally demonstration of the feasibility of the metals removal technology to be applied would enable more rapid solution of similar situations in the future. Cotter testified that they hoped to gain technological insight from the ion exchange process that could be applied to the copper and cadmium problem. However, due to the relatively untested nature of this unique application of technology and the levels of copper and cadmium to be reached to meet water quality based limitations, Cotter Corporation indicated that a certain degree of time past the expiration of the original temporary modifications would be necessary to explore all available techniques to treat for the two metals of concern. Without such an extension, the mine would be forced to cease discharging to avoid enforcement proceedings. The impact would be to cause the mine to flood which would effectively terminate the operation of the mine. If in fact this became the case, the fiscal impact would be a potential dissolution of the Corporation's mine operations with a subsequent termination of the milling operations in Canon City. This would result in the potential permanent severance of approximately 350 employees located at the mine and the mill. Loss of profit and net losses in capital investments were not testified to but can be assumed to be of a quite substantial magnitude.

As no party gave substantive testimony indicating an economic impact or harm that could be expected from an extension, the Commission acted in an economically reasonable and responsible way by extending the modification. Thus, the fiscal impact is the preservation of Cotter's Schwartzwalder Mine and Canon City Mill Operations with the attendant savings of whatever profits those operations generate. This extends to the preservation of approximately 350 jobs and the timely and economic retirement of capital equipment.

The Commission finds from the testimony presented to it that if the temporary modifications are not granted for segment 17 of Clear Creek that the mine operated by Cotter Corporation adjacent to that creek might be shut down; that the Corporation's mill in Canon City would be threatened with closure; and that the employment of some 350 people could be terminated. In light of the public health benefits of its actions, the Commission found them to be economically reasonable. In further consideration of the economic reasonableness of its action the Commission noted that the Cotter Corporation had testified that it had committed 2.24 million dollars to its treatment facility which was said to be more than five times the original estimate and that the Cotter Corporation should be given the time to prove the technology it intends to apply.

Adopted: May 9, 1983

The Company has also incurred an expense of an additional $250,000 for emergency storage ponds. Estimated annual operating costs are upwards of $500,000. There is some concern for impact on other parties, but no evidence substantiates such concerns at this time. In fact, none of the parties objected to the granting of these temporary modifications.

The compliance schedule contained in the permit issued to the Cotter Corporation by the Water Quality Control Division is based on the current temporary modification which expires July 16, 1983. The Division can only enforce the compliance schedule in accordance with the terms of the temporary modification being extended by this action.

38.16 STATEMENT OF BASIS AND PURPOSE REGARDING THE ADOPTION OF MINOR CORRECTIONS AND CLARIFICATIONS FOR THE BASIC STANDARDS AND METHODOLOGIES AND CORRECTIONS TO THE NUMERIC STANDARDS FOR THE SAN JUAN AND DOLORES, GUNNISON, AND LOWER DOLORES, RIO GRANDE, AND THE SOUTH PLATTE RIVER BASINS.

BASIS AND PURPOSE:

In accordance with the requirements of 24 4 103(4), C.R.S. 1973, the Commission makes these findings and adopts this Statement of Basis and Purpose. The Commission, at a public rulemaking hearing November 14, 1983, and December 12, 1983, adopted minor and editorial corrections to clarify the Commission's current regulations numbered respectively 3.1.0, 3.4.0, 3.5.0, 3.6.0, and 3.8.0. These regulations are contained in Article 3, Water Quality Standards and Classifications, of the Policies, Regulations, and Guidelines of the Water Quality Control Commission. (5CCR 1002 8)

In adopting these corrections and clarifications, the Commission considered the economic reasonableness of its action. The scientific or technological rationale of the Commission in justifying the changes to its rules was that it made the classifications and standards which it had previously assigned more technically correct and accurate.

The consolidated changes adopted by the Commission are provided with this Basis and Purpose. The Secretary of State is being provided corrected pages for each of the regulations as replacements for pages previously published in those regulations.

An issue raised during the hearing, was whether or not the table of organic parameters should be moved from the Appendix to the text. The Commission included standards for organic parameters in the regulations it adopted for each of the River Basins of the State. Thus, standards for organic parameters were applicable Statewide, prior to the hearing to consider the changes to which this Statement of Basis and Purpose is applicable. This has had the same effect as would have a basic standard applicable to all waters of the State.

The Commission finds that it would be easier to make changes to one document, the Basic Standards and Methodologies, as future scientific information necessitates, than to make such changes in each basin. Thus it is more economically reasonable to deal with the organic substances in one regulatory document, rather than many. There was testimony that it was confusing to have the table of organic parameters as criteria guidance subject to change on a stream by stream basis when the parameters had been assigned and were not merely to provide guidance. It was testified that it would be less confusing to have the table in the text of the regulation to provide basic standards.

The City of Loveland testified that if the table in question were moved to the regulatory text there was the possibility of a basin standard differing from the general standard. The Commission found that its regulations enabled it to set site specific standards to stream segments as an exception to the basic standard, and that for the parameters in this table it was unlikely to have different basin standards.

The organic parameters in the table are not substances that form a naturally occurring background. They are toxics controlled at the point of sale or use. They are not ambient and subject to the same treatment as are other naturally occurring parameters. The Commission found it inappropriate to regulate these organic constitutents in the same manner as are those that can be ambient or uncontrollable background parameters. Therefore, the Commission changed the guideline table to a basic standard in the body of the regulation.

FISCAL IMPACT STATEMENT

Regarding the Adoption of Minor Corrections and Clarifications for the Basic Regulations and Corrections to the Numeric Standards for the San Juan and Dolores, Gunnison and Lower Dolores, Rio Grande, and the South Platte River Basins.

In accordance with section 24 4 103(8)(d) the Commission finds that the corrections and clarifications to its current regulations numbered respectively, 3.1.0, 3.4.0, 3.5.0, 3.6.0, and 3.8.0, have no quantifiable fiscal impact, although it is expected that these regulations will be more readily usable by the regulated industries and the general public.

PARTIES TO PROCEEDINGS

1. Climax Molybdenum Corporation
2. Trout Unlimited
3. Colorado Municipal League
4. City of Loveland
5. Eastman Kodak Company

Amended: May 15, 1984
Effective: June 30, 1984

38.17 Basis and Purpose

The purpose of this amendment is to remove apparent inconsistencies between two of the regulations recently adopted by the Commission with regard to the Act's provision in Section 204(3) for a hearing on the economic reasonableness of requiring treatment beyond secondary treatment. The amendment additionally extends the opportunity for a rulemaking hearing on stream classifications and/or numeric standards for ammonia and nitrite to all pollutants for which beyond secondary treatment may be required. The latter amendments could help resolve problems of conflicts between the Clean Water Act and state procedures alleged by EPA.

This amendment clarifies that when the Division proposes to issue a permit that would require treatment beyond secondary treatment, the permittee must exercise the statutory right to a hearing given in section 204(3) by requesting that hearing. In this way, only those permittees who believe that treatment beyond secondary treatment is economically unreasonable for their facilities will have hearings.

The amendment also clarifies that although the conditions requiring beyond secondary treatment will not go into effect during the review process, other permit conditions will go into effect as usual.

This amendment provides that, when a permittee requests a hearing under section 204(3), the Commission, may in its discretion, proceed first with a rulemaking hearing for the purpose of reclassifying, or changing the numeric standards of the stream segment into which the permitted facility discharges. In this manner, if a change in stream standards results that would in turn require a change in the permit conditions, the need for a hearing pursuant to section 204(3) could be obviated. If, after rulemaking, the permittee was still desirous of proceeding with section 204(3) adjudicatory hearing, that right would still be available.

By adopting this amendment, the Commission intends to avoid two conflicts with the Clean Water Act (“CWA”) alleged by EPA. One is the granting of variances from stream classifications or standards for individual permittees. EPA contends that the granting of such variances is impermissible under the CWA; whereas, changes in classifications and standards are acceptable with certain limitations. The second alleged conflict is the prohibition in the CWA against a board or body which approves permit applications from having as a member any person who receives a significant portion of his income from a permit holder. The same prohibition does not apply to rulemaking, which affects permits, such as stream classifications.

Finally this amendment deletes from the permit regulations the reference to the “Footnote for Unionized Ammonia and Nitrite”. In view of the other changes, this reference would be redundant.

FISCAL IMPACT STATEMENT

These amendments to clarify procedures for hearings pursuant to C.R.S. 1973, 25-8-204(3) (Beyond Secondary Treatment Requirements) have no fiscal impact which can be identified at this time. Any fiscal impacts that could be associated with this action would be more properly attributable to prior actions of the Commission. The Commission believes it has acted in an economically reasonable manner by adopting these amendments.

(NOTE: Not included in the CCR because this is an unnumbered section filed for the benefit of the Legislative Drafting Office in compliance with statute.)

ADOPTED: AUGUST 14, 1984
EFFECTIVE: SEPTEMBER 30, 1984

38.18 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY, AND PURPOSE FOR THE PHOSPHORUS STANDARD FOR CHERRY CREEK RESERVOIR AND CHATFIELD RESERVOIR

In accordance with the requirements of Section 24-4-103(4), C.R.S., the Commission adopted this statement of Basis, Specific Statutory Authority and Purpose.

The primary purpose of the Commission’s action was to set a total phosphorus (P) Standard of .027 to the inorganic standards for Chatfield Reservoir of stream segment (6) of the South Platte River and .035 mg/1P for Cherry Creek Reservoir, Segment (2), Cherry Creek, to limit chl a levels and, thereby protect the presently classified beneficial uses of those reservoirs. A P standard is important to the protection of the classified uses because the levels of chlorophyll a in both reservoirs are related to the amount of P in the reservoirs. (Generally the more P there is the more chl a there is, although the amounts of nitrogen and other factors affect the precise relationship.) Chl a which is an indicator of algae level, can affect aquatic life, fishing, swimming and other recreational uses. The purpose of adopting the .027 mg/l P standard for Chatfield Reservoir is to maintain the chl a level in Chatfield Reservoir at no higher than .017 mg/l. The purpose of adopting the .035 mg/l P standard for Cherry Creek Reservoir is to maintain the chl a level in Cherry Creek Reservoir at no higher than .015 mg/l. The P standards and chl a limits were developed from modeling based upon data generated in 1982.

Public participation was a significant factor in the development of these standards. A record of 1525 transcript pages plus hundreds of pages of exhibits was made through a public hearing taking 40 hours from April 9, 1984 through April 12, 1984. Twenty-two entities requested and were granted party status by the Commission in accordance with 24-4-101 et seq., C.R.S. (1982). The record forms the basis for the standards adopted.

The specific statutory authority for the Commission’s action is contained in Section 25-8-202(1) (b) and (2); and 25-8-204; C.R.S. (1982). The hearing was conducted under the procedures of Section 24-4-103; 25-8-401; 25-8-402, C.R.S. (1982); “The Procedural Regulations for All Proceedings Before the Water Quality Control Commission and the Water Quality Control Division” (the Procedural Regulations) (5CCR 1002-1); and the Regulation titled: “Basic Standards and Methodologies” (the Basic Standards (5CCR 1002-8)).

For the Cherry Creek Reservoir, proposals were made for a phosphorus (P) standard of .030, .035, and .044 (.075 mg/l P was submitted but was withdrawn. Those parties shifted their support to .044 mg/l). The classified uses of the Reservoir to be protected by the P standard include warm water aquatic life class 1, recreational class 1, water supply, and agricultural.

CHERRY CREEK:

Cherry Creek Reservoir is a mildly eutrophic plains reservoir which has limited releases. Its water quality is adequate for the classified uses at present. However, acceleration of eutrophication resulting from projected population growth could cause harm to recreational and aquatic life uses. Most of the phosphorus entering the reservoir come from non point sources via surface drainages.

The Commission found that the adopted standard .035 mg/l P maintains all beneficial uses.

A range of chl a levels of .010 mg/l to .020 mg/l which correspond approximately to .030 to .044 mg/l P was identified as protective of the aquatic life uses. There was some evidence that the ratio of rough fish to sportsfish might increase as the chl a levels approach .020 mg/l. A narrower range of .010 mg/l to .015 mg/l of chl a was determined to be necessary for the maintenance of swimming uses. The adopted standard of .035 mg/l P (corresponding roughly to .015 mg/l chl a) is higher than the 1982 ambient level of .030 mg/l P but will preserve the quality of the recreational and aquatic uses.

The Commission found that the proposed standard of .044 mg/1P would cause: (1) a shift in fish species composition away from desirable species; and (2) a perceptible reduction in water clarity from increased algae which could result in a significant reduction in visitors based on the Aukerman survey information, and other testimony. Such a visitor reduction was anticipated because the amount of algae might increase significantly and a shift in algae species to the more undesirable blue greens might occur.

Many species of algae cause scum and odors in the opinion of several expert witnesses and a level of .20 mg/l chl a associated with .044 mg/l P is the lower boundary where nuisance conditions and algae bloom become prevalent.

Survey data (Aukerman) indicated that some people perceiving increased pollution have withdrawn their patronage of the reservoir. Any further degradation due to increases in algae might interfere with or become injurious to existing uses and thus violate section 3.1.8(1) of the Commission's Basic Standards and Methodologies Regulation which states: “Existing uses shall be maintained as required by State and Federal law. No further water quality degradation is allowable which would interefere with or become injurious to existing uses.”

In rejecting the proposal for a standard of .030 mg/l P, the Commission found that achievement of such a standard might be beyond technological capabilities requiring unreasonable expenditures as growth occurs. Any standard assigned the Cherry Creek Reservoir cannot be achieved without areawide cooperation of local governments and entities involved in wastewater management. The Commission intends to adopt a standard which represents a reasonably attainable objective in order to have the greatest opportunity for successful control of phosphorus. A standard allowing no increase in discharge of P might inhibit long range planning. A standard of .035 mg/l P provides an opprotunity in the next few years to develop a plan and to seek improved treatment efficiencies.

The Commission believed that a standard which allowed a moderate increase in phosphorus would encourage greater cooperation from local governments which must adopt stringent non point source controls to meet the standard of .035 mg/l P. The Commission recognizes the importance of regional planning for gaining a fuller understanding of the dynamics of the reservoir and the technologies available for phosphorus control.

The data obtained through monitoring of the reservoir for 1983 shows the need for more data in order to better define the relationship between chl a and phosphorus. A much larger data base is required for a thorough understanding of the relationship of chl a to P. The Commission will be awaiting further studies and an expanded data base in order that it may periodically reexamine the standard which it adopted.

The Commission has determined that the standard is economically reasonable. Based on DRCOG population projections the standard can probably be reasonably achieved with AWT Technology achieving discharges of .2 mg/l until the year 2005, in addition to non-point source controls. An effluent limit of .1 mg/l is achievable via checmical/physical treatment or land treatment.

Evidence from Summit County concerning phosphorus control in the Dillon Reservoir watershed demonstrated a capability of such technology of discharges of P of less than .2 mg/l. Therefore, if population projections of the Denver Regional Council of Governments (DRCOG) are used and if .1 mg/l P is reasonable, the standard will be achievable for even a longer period under current, reasonably available AWT technology. The Fiscal Impact Statement is hereby incorporated by reference.

CHATFIELD RESERVOIR:

Chatfield Reservoir is a mildly eutrophic flow through reservoir, with water quality that is adequate for the classified uses.

The phosphorus standard of .027 mg/l P set by the Commission for the protection of the beneficial uses of Chatfield Reservoir was stipulated by the parties to the hearing as being appropriate. There was no serious disagreement at the public hearing to the proposed standard of .027 mg/l P. In considering the proposal, the Commission found that it would protect the uses of the Reservoir.

The adopted standard of P for the Chatfield Reservoir may permit an increase of chl a but it is within the margin of sampling error.

In addition regular flushing of the reservoir reduces the detrimental effect of a slight increase in phosphorus.

The Commission intends that the phosphorus standards for both reservoirs would receive thorough evaluation during the next triennial review of the classifications and standards assigned to the stream segments of the South Platte River Basin, or earlier as requested.

FISCAL IMPACT STATEMENT REGARDING THE ASSIGNMENT OF A PHOSPHORUS STANDARD TO CHERRY CREEK RESERVOIR

As a man made impoundment, Cherry Creek Reservoir is a large flood control reservoir that was specifically designed to maintain a minimum recreation pool. The basic use of this reservoir as a flood control impoundment will continue essentially unaffected by the phosphorus standard set by the Water Quality Control Commission. The classified uses, however, are subject to impact by the phosphorus standard and thus are the subject of this statement.

Fiscal Impact - Benefits:

Cherry Creek Reservoir is one of the most intensely used recreational sites in Colorado. Evidence submitted to the Commission tied the quality and the quantity of this use to the phosphorus standard though there is a level of uncertainty as to the degree to which the recreational uses will be affected by various phosphorus levels. Cherry Creek currently has visitation of around 1.5 million visitor days per year, and is frequently at capacity during Summer weekends. The market value of this visitation has been estimated at 1.5 million dollars annually in direct entrance fees. The evidence presented before the Commission indicated that the phosphorus standard of .035 mg/l would preserve this level of visitation. Furthermore, angler expenditures ranging from a low of 2.3 million dollars to a high of 11.3 million dollars was estimated as the potential losses as a result of a less stringent phosphorus limit.

Non market values were also estimated and submitted as testimony to the Commission. This analysis yielded an indication of the magnitude of the social value of the classified uses of the reservoir.

When summed with the direct expenditures, the annual worth of the reservoir in current (1983) dollars ranges from a low of just under five million dollars to a high of over one hundred million dollars that could be lost with a less stringent standard. The Commission takes note that several important measures of value were excluded from the analysis which suggests that these figures are conservative estimates.

The incidence of these benefits fall upon the persons who directly enjoy the beneficial uses of the reservoir, the property owners whose property value is enhanced by the presence and quality of the reservoir, and the Colorado taxpayers in general. This latter group is benefitted by the fact that Cherry Creek revenues more than pay for the administration of the resource and contribute significantly to the maintenance of other state parks. Without this source of revenue, Colorado taxes would need to be raised to support other resources or the quality of administration of those resources would necessarily decline. In addition, evidence at the standards setting hearing indicated that some users would have no substitutes therefore a further benefit is conferred upon retail merchants whose sales supported the enjoyment of the reservoir.

Fiscal Impact Costs:

The analysis of the costs to preserve the beneficial uses at Cherry Creek is subtle as it is more of a question of assimilative capacity than incremental costs. However, as there was no prior phosphorus limit established for Cherry Creek Reservoir, the analysis properly begins with estimates of the phosphorus incremental costs associated with wastewater treatment. It is important to note that there are currently no wastewater plants that would be affected by this standard and all estimates of incremental impact are assigned to future potential development in the drainage basin. The following table summarizes the incremental annual costs for both AWT and land application methods necessary to implement the adopted standard.

YEAR	AWT	LAND APPLICATION	50/50 BLEND OF METHODS
1985	$1.72M	$2.18M	$1.95M
1990	$2.12M	$3.05M	$2.59M
2000	$2.51M	$5.01M	$3.76M
2010	$2.66M	$5.96M	$4.31M

When reduced to per capita impacts, the monthly incremental costs range from $1.36 to $3.43.

The Commission recognizes that there is some uncertainty that this standard will allow full planned build out of the developments that would encounter these costs. It is appropriate to consider the final increment of development that may not be possible as a cost. However, this cost has not been estimated because the questions of probability and the likely solutions to capacity problems are substantially variable. It is possible that either increased treatment, development moratoriums, or revised standards could occur to address this potential cost in the future. As this standard will be reviewed every three years and as capacity is likely to not be reached until at least the year 2005, the Commission does not consider this potential cost to be ripe for consideration as a primary decision criterion at this time.

Conclusions:

The Commission recognizes that the economic value of Cherry Creek Reservoir is quite significant as is indicated by the best available evidence. Combining market and non market values, Cherry Creek beneficial use values are in the range of at least five million dollars and may be worth as much as nearly 100 million dollars. These are not estimates of total value, but rather the dollar values associated with potential losses attributable to less stringent standards. The Commission notes that the potential losses are substantially greater than the costs to prevent them. Although the Commission would caution against the natural temptation to directly weigh these cost and value loss measures in a cost benefit approach, both because the beneficial use values may be underestimated and because of the uncertainties surrounding future costs. These figures nonetheless demonstrate that maintaining the water quality at Cherry Creek Reservoir is quite defensible on economic grounds. For these reasons the Commission finds that it has acted in an economically responsible and reasonable manner and thus determines these regulations to conform with the requirements of the Colorado Water Quality Control Act in regard to economic reasonableness.

FISCAL IMPACT STATEMENT REGARDING THE ASSIGNMENT OF A PHOSPHORUS STANDARD TO CHATFIELD RESERVOIR

The development of a phosphorus standard for Chatfield Reservoir involved study through the cooperative efforts of both private and public interests. A recommendation was prepared and presented in a Clean Lakes Study report that would protect classified beneficial uses. As no testimony was forthcoming at the rulemaking hearing regarding the costs of these controls and the recommended standard was unchallenged, the Commission finds that this standard conforms with the requirements of consideration of economic reasonableness and that it is, in fact, reasonable from an economic perspective.

Adopted: April 1, 1985
Effective: May 30, 1985

38.19 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE - SEGMENTS 11 AND 12, CACHE LA POUDRE RIVER

The provisions of 25 8 202(1)(b) and (2); and 25 8 204 C.R.S. provide the specific statutory authority for adding the numeric standards adopted by the Commission.

The standard of 2.7 mg/liter NO2 N is based upon an equation derived from published studies and a bioassay conducted by the Division on fathead minnows, representing the predominant family in these segments. The bioassay and the studies indicate that as the concentration of chloride increases, the toxicity of nitrite decreases. As a result of the bioassay the Division calculated a 96 hour LC 50 of 40.6 mg/l, based on the annual average chloride of 20 mg/l in Segments 11 and 12. The Division then determined the nitrite standard by dividing the calculated LC 50 value by an acute chronic ratio. A literature review of nitrite toxicity to fish, submitted to the Division by the City of Fort Collins, suggests that the acute chronic ratio is between 5 and 10 for salmonids and channel catfish. Based on this information, the Division determined that an acute chronic ratio of 15 for fathead minnows could be used to calculate the stream standard and still provide an adequate margin of safety for the aquatic life in the stream.

Based on these factors the equation is:

Nitrite Standard = (1.99 x 20 mg/l (Chloride Conc.) + 0.7258) 15 (acute chronic ratio)

This standard is determined to be protective of a balanced aquatic life population found in these segments in recognition of the cold water/warm water transitional characteristics of Segment 11 and the relative paucity of toxicity data on certain species found in the segment.

FISCAL IMPACT STATEMENT SEGMENTS 11 AND 12, CACHE LA POUDRE RIVER

The primary fiscal impact of these regulations can be summarized as a potential for decreased treatment costs to the rate payers associated with the Cities of Fort Collins, Windsor, and Greeley. Additionally, the treatment costs related to the Kodak wastewater discharge may be decreased.

These potentials for decreased costs are associated with no expected decrease in the quality of aquatic life protection in these segments, as recent scientific findings have indicated that the species present will tolerate higher levels of nitrite concentrations. Thus, no impact upon beneficial uses is expected.

38.20 STATEMENT OF BASIS AND PURPOSE COAL CREEK, SEGMENT 7(b)

1. This action is consistent with the action taken by the Commission and EPA in adopting and approving use classifications and water quality standards for Ralston Creek and Big Dry Creek which Segment 7(b) of Coal Creek most closely resembles.

2. The Commission has considered only water quality standards for Coal Creek, Segment 7(b) in these proceedings. A regional water quality management plan, including wasteload allocations, for the entire area, taking into account Segments 9 and 10 of Boulder Creek as well as Coal Creek, must be completed before water quality standards requiring advanced wastewater treatment by municipal dischargers can be justified, if at all. The completion of the Lafayette plant expansion will improve the quality of water in the segment and provide a window of opportunity for such information to be produced prior to the imposition of such stringent requirements.

3. A marginal population of non game fish species and other aquatic life exists in Coal Creek. The most significant factors limiting aquatic life in this segment are physical habitat and natural conditions. Due to agricultural diversions and return flows, the stream is extremely shallow and the bed is sandy, not cobble. There are no deep pools or resting places for fish. The stream bank is eroded and lack of riparian vegetation raises both the temperature and pH, which increases the unionized portion of ammonia. Improvements in the physical habitat of both Coal Creek and Boulder Creek might eliminate the need for ammonia removal by the treatment plants, by impeding the conversion of ammonia to its unionized form. However, there is no evidence to support any projection of habitat improvements, and this cannot be required by law.

4. In its natural condition, without the contributions of effluent from Erie, Lafayette, and Louisville, lower Coal Creek was dry a significant portion of the year. Data from the only USGS gauging station on Coal Creek, the Plainview station about 3 miles above Segment 7(b), indicates no flow approximately 21 days in a normal year. Its Q7 10 is zero.

5. Because the segment has a low fish carrying capacity, requiring the three municipal dischargers on the segment to go to some form of AWT would result in only a marginal improvement in the numbers of fish in lower Coal Creek and would result in no greater diversity of species.

6. These changes in water quality standards do not represent a degradation of water quality since existing treatment levels must be maintained to meet technology based requirements. The standards amended by these rules exceed the water quality necessary to protect the existing and designated uses, and are not sufficient to cause a better use to be achieved. Nor will downstream water quality be adversely affected by these amendments. It was previously assumed by the Commission, based on inadequate information, that the standards adopted at that time could be met at existing levels of treatment.

7. Species consistent with existing and designated uses will be protected even though they are not prevalent in numbers or importance. Maintenance of existing quality will not result in increased mortality, reductions in growth, or reproductive impairment.

8. Water quality standards originally established and amended by these rules might necessitate, and result in, an improvement in water quality notwithstanding the fact that such improvement would not enhance the maintenance or attainment of existing and designated uses due to physical habitat and natural conditions.

9. The benefits achieved by the implementation of AWT that would be required to achieve the .1 mg/1 unionized ammonia water quality standard bare an unreasonable relationship to the economic costs and impacts of AWT. This conclusion is based on a consideration of costs for capital improvements and maintenance, and the impact of tap fees and sewer charges as compared to the benefits that might be achieved.

10. “Full protection” of existing species as defined in “<u>EPA Questions and Answers on Anti degradation</u>”, United States Environmental Protection Agency, August, 1985, is unwarranted because:

    (1) it would be futile in view of physical conditions;

    (2) it bares an unreasonable relationship to the economic costs and impacts;

    (3) it is not warranted by Clean Water Act or EPA Regulations, and the “Questions and Answers” do not represent binding national policy.

11. Construction of an expanded wastewater treatment plant at Lafayette, as planned, should improve water quality in Coal Creek beyond existing quality, because excess capacity will allow additional nitrification to take place before discharge to the stream.

12. Based on the costs for ammonia removal, the combined cities may well decide that the more cost effective alternative would be to limit discharges to Coal Creek and pump their effluent into lower Boulder Creek. The effect would be to substantially reduce flows in Coal Creek, placing more stress on the fish than under existing conditions, which would have a significant detrimental impact on aquatic life in Coal Creek.

13. Despite the deletion of numeric water quality standards the stream will not experience any water quality degradation and existing aquatic life will be protected. Discharges must meet secondary treatment requirements and may later be required to install AWT to meet water quality standards or wasteload allocations necessary to protect Boulder Creek. The few fish that now live in lower Coal Creek will be protected at current levels, and aquatic life will be enhanced by the achievement of secondary treatment requirements on a more consistent basis. Lafayette can now move ahead with its site applications for an expanded secondary treatment plant, recognizing that it may well have to go to AWT to protect the .06 mg/l unionized ammonia standard in Boulder Creek.

14. More information is necessary to understand the interrelationships between Segment 7(b) of Coal Creek and Segments 9 and 10 of Boulder Creek. The DRCOG, as 208 water quality management agency, has been requested to develop a plan for this sub region, including the development of wasteload allocations necessary to assure compliance with water quality standards and use classifications.

15. The Commission rejects arguments that it should delete all standards for inorganics and metals in this segment, as was done for Big Dry Creek and Lower Ralston Creek. The aquatic life in Lower Coal Creek, however limited in numbers and species, needs to be protected by these standards.

16. This action does not violate the EPA anti degradation policy (40 CFR 131.12) because existing instream uses and the water quality level necessary to protect them shall be continued to be maintained. Furthermore, this action does not constitute allowing lower water quality since the previous .1 mg/l unionized ammonia standard incorporated, and was conditioned by, “footnote” concept and was approved on that basis.

FISCAL IMPACT STATEMENT FOR COAL CREEKSEGMENT 7(b) OF BOULDER CREEK

The deletion of the unionized ammonia standard for Coal Creek will have no identifiable fiscal or economic impact.

The standard for Boulder Creek (into which Coal Creek flows) may ultimately have an economic impact (in the form of increased ammonia removal) upon the three Coal Creek dischargers, since the Boulder Creek standard must nonetheless be protected. This possible result was acknowledged by the Coal Creek discharges but is still speculation at this time.

38.21 STATEMENT OF BASIS AND PURPOSE

Authority

The provisions of section 25 8 202(1)(b) and (2) and section 25 8 204, C.R.S. (1982 Supp.) provide the specific statutory authority for these regulations.

Introduction

The United States Environmental Protection Agency, Region 8 (EPA), has withheld approval of the ammonia and chlorine water quality standards adopted by the Water Quality Control Commission for segment 15 pending reconsideration of those standards at a later date.

Reconsideration of the stream standards is necessary to complete the classifications and standards for segment 15 so that the Commission can resubmit the segment standards and classifications to EPA for approval.

Segment 15 is classified for warm water class II aquatic life, drinking water, recreation and agriculture uses. There are other high plains, front range streams also classified as warm water class II aquatic, but the Commission recognizes that each stream is unique and may vary in their degree of suitability for classified uses. Although segment 15 has habitat suitable for aquatic life (albeit less than ideal habitat), fish populations were found to be significantly less when compared with other front range streams. Dr. Lewis attributed this primarily to ammonia and to a lesser extent chlorine.

Chlorine

The residual chlorine standard of .003 mg/l was agreed to by all parties, the Water Quality Control Division, and the Division of Wildlife as being appropriate. Evidence presented at the hearing indicated that total fish populations in the segment could increase by more than 50 percent if the chlorine standard of .003 mg/l is met. When combined with the ammonia standard of 0.1 mg/l, the total potential fish population of this segment could be achieved. The chlorine standard is based upon both table values in the basic standards and regulations (designed to protect aquatic life) as well as data presented at the hearing. This standard, therefore, is technically supportable and will protect and improve aquatic life in this segment. The Commission accepts Denver Metro's evidence regarding the need for a temporary modification of .15 mg/l for residual chlorine to August 31, 1988 in order to enable Denver Metro to come into compliance with the adopted standard. The adopted standard will require a higher degree of treatment, and the availability of grant funds to Denver Metro are uncertain.

Ammonia (NH3)

Evidence presented at the hearing by Denver Metro's water quality expert, Dr. Lewis, and the Division, demonstrate that an unionized ammonia standard of 0.1 mg/l will protect and improve the classified uses of segment 15, particularly the aquatic life of the segment. The evidence also suggests that an unionized ammonia standard based upon EPA criteria is overly stringent. Testimony indicated that the total fish abundance in segment 15 is significantly suppressed by ammonia and chlorine levels in the segment. By reducing levels of ammonia in the stream, fish populations could increase to near full potential if combined with chlorine removal. The 0.1 unionized ammonia standard for the segment should achieve these results and is technically feasible based upon the data presented at the hearing.

For purposes of his study Dr. Lewis grouped the testing stations of his comparison region into three groups based upon their concentrations of chlorine, ammonia and dissolved oxygen. Ammonia concentrations for group I, which Dr. Lewis regarded almost identical to segment 15, were greater than 0.1 mg/l. Group II had ammonia concentrations of 0.05 to 0.1, and group III had concentrations of less than 0.05. Based upon evidence it is apparent that the benefit to aquatic life from improving the water quality of segment 15 (with regard to ammonia) from group I to group II would be substantial, whereas further improving the ammonia quality of segment 15 from group II to group III would have little appreciable benefit to aquatic life. The Commission therefore finds that there is considerable benefit to be gained by adopting a 0.1 mg/l standard for ammonia

Furthermore, the unionized ammonia standard of 0.1 mg/l is an extrapolation of findings in an earlier bioassay on fathead minnows in the Cache La Poudre River which resulted in a 0.1 mg/l standard being adopted for many east slope plains warm water class II aquatic life streams.

Since implementation of the ammonia standard will require a higher degree of treatment and will cost millions of dollars in capital costs (for which the availability of grant funds is uncertain), the Commission is adopting a temporary modification of .2 mg/l for the ammonia standard, which shall expire on August 31, 1988. The temporary modification is on the condition that Metropolitan Denver Sewage Disposal District No. 1 demonstrate to the Commission by August 31, 1987, substantial progress toward achieving the underlying standard by August 31, 1988. Because of inadequate evidence regarding the possibility of accelerating Denver Metro's projected completion date of the facilities necessary to comply with the ammonia standard, the Commission is adopting a temporary modification consistent with that for chlorine in an effort to accelerate Denver Metro's compliance with the ammonia standard. However, the Commission recognizes that circumstances may require an extension of the temporary modification consistent with the basic standards regulation, section 3.1.7, 5 C.C.R. 1002 8.

Dissolved Oxygen

Evidence presented during the hearing indicated that the existing dissolved oxygen standard of 5.0 mg/l is more stringent than necessary to protect aquatic life during nonspawning seasons and that a standard of 4.5 mg/l during that time of year when spawning is not occuring would be adequate to protect aquatic life. However, it was agreed that the 5.0 mg/l standard for dissolved oxygen should be retained during the spawning season. Dr. Lewis estimated that the bulk of spawning occurred from May 1 through July 15. Therefore, the Commission retains the existing 5.0 mg/l standard for dissolved oxygen in order to cover the spawning season (May 1 through July 15), and adopts a 4.5 mg/l standard during the rest of the season. The Commission finds that these standards will protect aquatic life and that they are consistent with EPA's recent dissolved oxygen criteria document.

Nitrite (NO2-N)

Relaxing the nitrite standard from .5 mg/l to 1.0 mg/l is based upon bioassay work by the Water Quality Control Division. Evidence presented at the hearing indicates that the 1.0 mg/l nitrite standard will protect aquatic life.

Concern was expressed at the hearing that ammonia removal might increase levels of nitrites and nitrates in the segment and downstream from the segment, and that excessive nitrite or nitrate levels may cause public health problems. The evidence shows, however, that nitrite and nitrate levels will not exceed drinking water standards and that the possible public health effects are as of yet inconclusive. However, in order to monitor the levels of nitrites and nitrates the Commission is requesting annual reports by the Division of nitrite and nitrate levels in Thornton's water supply.

FISCAL IMPACT STATEMENT

Inroduction

The precise assessment of economic impacts associated with these changes is difficult to determine in that some standards changes may tend to offset one another in terms of costs, and treatment for one standard may facilitate compliance with other standards.

Cost

The cost impacts of these regulations will fall upon the dischargers of waste water to the segment. Although the Division notes that there are three municipal dischargers on this segment (South Adams Water & Sanitation, Brighton, and Denver Metro), preliminary evidence indicates that there is sufficient flow such that only the Denver Metro plant is expected to experience a cost impact.

Although the bulk of the information regarding economics addressed chlorine and ammonia removal, the Division estimated that it is not likely that easing of nitrate concentrations will have any discernible effect upon the treatment cost of Denver Metro, though the potential exists for some increased efficiency. Although the Cities of Thornton and Westminister indicated that they may elect to remove nitrites from their drinking water system (if ammonia removal causes a significant increase in nitrite levels), this option was based primarily upon lack of confidence in drinking water standards and the cost therefor are as of yet unquanified.

The cost of dechlorination in order to meet the chlorine standard was considerably less expensive than the cost for ammonia removal. Annual cost to the Denver Metro service population for chlorine removal varied, but Dr. Walsh estimated that the cost would range about 45 cents per year per household. Denver Metro agreed that these costs were economically reasonable.

Because of the direct connection between dissolved oxygen levels and ammonia removal, the costs of meeting the dissolved oxygen standard are included in the cost figures for ammonia removal.

The cost impacts of ammonia removal varied considerably, and depended upon the alternative which was being discussed. However, Dr. Walsh testified that if the costs and benefits of ammonia removal under the Lewis proposal (which is the standard being adopted by the Commission) were combined with the costs and benefits of chlorine removal, the costs for ammonia removal ranged from $6 million to $80 million, with annual operating and maintenance expenses ranging from $500,000 to $750,000. Dr. Walsh estimated that the cost to the Denver Metro service population would be $6.58 per year household under the Lewis proposal. Although the costs of meeting the 0.1 mg/l ammonia standard will be considerable, they are nonetheless reasonable in view of the fact that, when combined with the costs of chlorine removal, are comparable to the benefits to be gained. However, the costs of further improving segment 15 from group II to group III are substantial, and when compared with the marginal benefits from such improvement, are not reasonable. In view of the testimony presented concerning Denver Metro's financial strength as well as Dr. Walsh's testimony that the cost of chlorine and ammonia removal under the Lewis proposal were comparable to the benefits, the Commission therefore finds these standards economically reasonable.

Benefits

The benefits to be gained by chlorine removal sufficient to meet th chlorine standard are considerable, and combined with ammonia removal to meet the unionized ammonia standard, the benefits are substantial. Dr. Lewis estimates that in terms of aquatic life, the full population potential of the segment could be realized by meeting these two standards. The Division anticipates significantly enhanced recreation and fishery uses in addition to aesthetic appeal. This in time can be linked to enhance property values in the vicinity of segment 15. These factors will contribute significantly to the multiple use viability of this segment, including the estimated $15 million Adams County anticipates spending to develop an urban park along segment 15.

Summary

The types and groups of persons that stand to bear the cost of this action are primarily the wastewater customers of Denver Metro. The beneficiaries are all persons who use of may use segment 15 of the South Platte or derive benefit in relation to its quality. Considering the relatively modest impact of these costs, the significant costs of ammonia removal, and the nature of the benefits that are likely to be accrued, these regulations appear to be economically reasonable.

Amended: May 9, 1986, Ralston Creek, Segment 17 of Clear Creek
Effective: June 30, 1986

38.22 STATEMENT OF STATUTORY AUTHORITY:

The provisions of sections 25-8-202(1)(b), (f) and (2); 25-8-204; and 25-8-207, C.R.S. (1982 & 1985 Supp.), provide the specific statutory authority for the regulatory review conducted by the Commission in this proceeding.

Section 25-8-207, C.R.S. (1985 Supp.), was added to the Colorado Water Quality Control Act, effective June 4, 1985. Under section 25-8-207, the Commission, upon its own motion or upon petition, is required to review any previously adopted classification or standard for consistency with section 25-8-207 or the policies set forth is sections 25-8-102 and 25-8-104. Further, the Commission is required to make a finding of inconsistency where the classifications or standards for aquatic life are more stringent than necessary (as more fully described in section 25-8-207 (1)(a)) or where any classifications or standards were adopted based upon material assumptions that were in error or no longer apply. When an inconsistency is found, the Commission shall declare the inconsistent classifications or standards void ab initio and simultaneously establish appropriate classifications or standards.

STATEMENT OF BASIS AND PURPOSE:

From March 1983 through September 1984, surveys of water quality, aquatic macroninvertebrates and fish were conducted on Ralston Creek, Segment 17 of the Clear Creek, South Platte River Basin. These surveys were designed by Robert G. Otto, Ph.D., and independent consultant for Cotter Corporation. They were designed specifically with regard to statutory requirements for the Commission to classify state waters and promulgate water quality standards. The studies were conducted by Dr. Otto in conjunction with the U.S. Geological Survey (with respect to the water quality survey) and with the assistance of the Colorado Division of Wildlife (with respect to the fishery survey). The results of these surveys were submitted to the Commission at its July 1, 1985 meeting.

In establishing the proposed revision to the numeric standards, various computational and statistical methodologies have been utilized to allow for the best definition of ambient quality in the stream and to provide for reliable standards of ambient quality for Ralston Creek. The use of varying computational techniques acknowledges the natural variations among the constituents in Ralston Creek and ensures that an appropriate numeric value is assigned for each constituent.

With regard to Cotter Corporation’s proposals, the Commission took the following actions for the following reasons.

Ammonia (NH3 mg/l, unionized). Prior to the commencement of the public hearing, Cotter withdrew its proposed change for unionized ammonia because of misinterpretation of the data supplied by the U.S.G.S. Therefore, the Commission did not change the existing standard for unionized ammonia.

Cyanide (free) and Chromium (tri and hex). Prior to the public hearing Cotter entered into a stipulation with the cities of Arvada and Westminster whereby Cotter withdrew its proposal to delete the standards for cyanide (free) and chromium (tri and hex). Evidence presented at the hearing also indicates that Cotter is not discharging cyanide or chromium and therefore retaining the existing standards will have no effect on Cotter. Therefore, the Commission has retained the standards for chromium and cyanide.

Temperature. The Commission declined to adopt Cotter's proposed standard for temperature and voted to retain the existing standard because the standard is not per se enforceable and because the standard recognizes that there will be exceedences of the temperature limitation as borne out by Cotter's evidence.

Dissolved oxygen. The Commission voted to retain the existing dissolved oxygen standard because the evidence indicates that spawning does in fact occur in the segment (although perhaps on a limited basis) and because the evidence suggests that retaining the dissolved oxygen standard would not pose a hardship to Cotter Corporation. Since the existing level of dissolved oxygen is necessary to protect what spawning does occur in Ralston Creek and since there has been no demonstration of a need to revise the standard, the Commission retains the existing dissolved oxygen standard.

The Commission adopts the following changes as proposed by Cotter based upon the finding that the previous standards are inconsistent with section 25-8-207 and the policies set forth in sections 25-8-102 and 25-8-104. The Commission therefore finds that the prior standards are void ab initio and that the following standards are appropriate because they more accurately reflect ambient water quality and will adequately protect existing uses:

Copper (Cu) .005 mg/l soluble

Lead (pb) .005 mg/l with a seasonal qualifier of .025 mg/l during periods when stream flow exceeds 50 cfs.

Iron (Fe, soluble) .3 mg/l with a seasonal qualifier of 0.5 mg/l in May and June.

Iron (Fe, total) 1.0 mg/l with a seasonal qualifier excluding the spring high flow period that exceeds 50 cfs.

Mercury (Hg). Due to the lack of data concerning mercury, the source of mercury in Ralston Creek, and its potential for bioaccumulation, the Commission retained the existing mercury standard of 0.7 micrograms per litre.

However, in order to allow an opportunity to collect more data, the Commission adopted a temporary modification of 0.13 micrograms per litre for mercury, which shall expire two years from the effective date of these regulations.

FISCAL IMPACT STATEMENT:

There was no evidence presented at the hearing that suggests there will be any fiscal or economic impact as a result of the standards adopted by the Commission. The costs, if any, of the standards, will be incurred by Cotter who proposed the standards adopted by the Commission and who discharges pursuant to a permit into Ralston Creek.

Although there are no monetary benefits specifically identified with the adopted standards, the standards are designed to protect existing uses of Ralston Creek which Cotter estimates to be substantial.

Amended: September 18, 1986, Swede Gulch, Segments 4a,b, & c of Bear Creek

Effective: October 30, 1986

38.23 STATEMENT OF STATUTORY AUTHORITY:

This rule is adopted pursuant to the provisions of the Colorado Water Quality Act, Colo. Rev. Stat. 25-8-203, 204, and 207, and the Commission's regulations, 5 Colo. Code Reg. 1002-8.

STATEMENT OF BASIS AND PURPOSE:

A. Revised Segment

By this Rule, the Commission creates two new segments in the Bear Creek Basin as follows:

Segment 4b: Swede Gulch, including all ponds, lakes and reservoirs, from its headwaters to its confluence with Kerr Gulch.

Segment 4c: Swede Gulch, including all ponds, lakes, and reservoirs, from its confluence with Kerr Gulch to its confluence with Bear Creek.

In addition, the definition of the current Segment 4 of Bear Creek Basin is modified to read as follows:

"4a. All tributaries to Bear Creek, including all lakes and reservoirs, from a point immediately below the confluence with Cub Creek to the confluence with the South Platte River, except for specific listing in Segments 4b, 4c, 5 and 6."

B. Classifications

The classifications applicable to Segments 4b and 4c are as follows:

a. Class 2 - Cold Water Aquatic Life
b. Recreation Class 1 - Primary Contact
c. Domestic Water Supply
d. Agriculture

C. Standards

In order to protect the aquatic life found in Swede Gulch, the Commission's numeric standards for the Aquatic Life protection, with metals values as appropriate for water with a hardness between 100 and 200 mg/l, are adopted for Segments 4b and 4c. A dissolved oxygen standard of 6.0 mg/l shall apply to Segment 4b, and a dissolved oxygen standard of 7.0 mg/l (during the spawning season) shall apply to Segment 4c.

In order to protect the drinking water supply uses of Swede Gulch waters, the combined quantity of nitrate and nitrite for both segments 4b and 4c shall not exceed 10 mg/l. Additionally, the numeric standards for chromium (trivalent), selenium, iron, and manganese, derived from the Class 1 - Domestic Water Supply classification currently applicable to Segment 4 of Bear Creek Basin, are adopted for Segments 4b and 4c.

In order to protect the primary contact recreational uses of Swede Gulch, a water quality standard of 200 fecal coliforms/100 ml is adopted for Segments 4b and 4c.

D. Background

This rulemaking proceeding under Colo. Rev. Stat. 25-8-207 was initiated by a petition under Colo. Rev. Stat. 25-8-207 submitted by a group of homeowners who reside in Swede Gulch (the “Petitioners”). These Petitioners claimed, and the Commission finds, that the existing classifications applicable to Swede Gulch were in error, due to a lack of specific information on Swede Gulch in the limited rulemaking proceedings and failed to take into account existing and potential uses of Swede Gulch waters. At the public hearing on this Petition, evidence was introduced by the Petitioners and their expert witnesses, and the Colorado Division of Wildlife, demonstrating the following facts:

1. Rainbow trout stocked in several ponds in Swede Gulch thrive and overwinter in the ponds, creating a successful fishery.

2. The lower segment of Swede Gulch provides habitat for rainbow and other species of trout, and rainbow trout are actively spawning in this segment.

3. The Petitioners and other residents of Swede Gulch swim and recreate in the ponds and stream of Swede Gulch in a manner likely to result in the ingestion of small quantities of water.

4. Petitioners and other residents of Swede Gulch take their drinking water from wells which have a close hydrological connection to the surface water flows in Swede Gulch.

5. The present water quality meets or exceeds the water quality standards applicable to the uses which are to be protected through this rulemaking.

This rule has been adopted in order to fulfill the Commission’s statutory and regulatory obligations which include (a) the mandate that present and potential beneficial uses of state waters be protected; (b) the mandate that waters should be classified for the highest uses attainable; and (c) the mandate that no further water quality degradation should be allowed which would interfere with or become injurious to existing uses.

E. Aquatic Life Classifications

The Commission finds that the waters of Swede Gulch provide habitat for cold water biota, including trout, and that the waters of Swede Gulch do not normally exceed 20°C. Although the ponds and lower portion of Swede Gulch constitute permanent water bodies, the aquatic life in portions of the Swede Gulch stream channel is limited by flow and streambed characteristics, rather than by water quality. For this reason, the Commission has designated both upper and lower segments of Swede Gulch as Class 2 - Cold Water Aquatic Life.

F. Aquatic Life Water Quality Standards

Based on the testimony of the Petitioners, the Petitioner’s expert witnesses, and the Colorado Division of Wildlife, the Commission finds that the numeric standards adopted for the protection of cold water aquatic life (5 Colo. Cod Reg. 1002-8, Tables I, II, and III) are necessary to protect the aquatic life currently found in Swede Gulch. Each of these standards (together with standards applicable to the other use classifications adopted by this rule), is listed in the attached Table.

With respect to dissolved oxygen, the Commission finds that spawning occurs in lower Swede Gulch and accordingly adopts a dissolved oxygen standard of 7.0 mg/l during the spawning season in order to protect spawning activity for segment 4c. The Commission is not convinced that spawning presently occurs in upper Swede Gulch and therefore adopts the less stringent dissolved oxygen standard of 6.0 mg/l for Segment 4b. If spawning is later demonstrated to occur in upper Swede Gulch, the Petitioners may seek amendment of this standard.

G. Recreation Classification

Based on the extensive testimony of the Petitioners and other local residents, the Commission finds that primary contact recreational activity has occured on portions of Swede Gulch from its headwaters to its confluence with Bear Creek and that a Recreation Class 1 - Primary Contact classification is appropriate for both upper and lower segments of Swede Gulch.

In order to maintain consistency with similar classifications elsewhere in the state, the Commission decided not to impose a seasonal qualification of the recreation classification.

H. Recreation Standards

The Commission finds that the numeric table value water quality standards for Primary Contact Recreation are necessary to protect the current recreational uses in Swede Gulch. The Commission finds that the current fecal coliform standard (200/100 ml) is sufficient to protect people engaging in primary contact recreation. The Commission therefore rejects the Petitioners' request for a more stringent fecal coliform standard of 2.2/100 ml.

The Commission recognizes, however, that the Petitioners have raised certain valid concerns about the appropriateness of the current Primary Contact Recreation fecal coliform standard, and the Commission hereby states its intention to consider the Petitioner's proposed fecal coliform standard on a state-wide basis during its next scheduled review of the basic water quality standards.

I. Domestic Water Supply and Agricultural Classifications and Standards

The Commission finds that the domestic water supply and agriculture classifications currently applicable to Swede Gulch are correct and should remain in place. The Petitioners' request for a total ammonia standard of 0.5 mg/l (associated with the water supply classification) is rejected. This standard is applied only to waters subject to direct intake for municipal drinking water use. There is no such direct municipal use of the surface waters in Swede Gulch; therefore, the total ammonia standard would be inappropriate. The Commission finds that a standard for nitrate of 10 mg/l will protect the waters of Swede Gulch for domestic water supply purposes, provided the combined quantity of nitrate and nitrite does not exceed 10 mg/l. Additionally, the numeric standards for chromium (trivalent), selenium, iron, and manganese, derived from the Class 1 - Domestic Water Supply classification currently applicable to Segment 4 of the Bear Creek Basin, are adopted for Segments 4b and 4c.

J. Conditions to Rulemaking

The Commission finds that the adoption of protective classifications and standards for Swede Gulch through the present rulemaking may be insufficient, in itself, to fully protect the current uses of Swede Gulch waters. The Commission will request that the Denver Regional Council of Governments study present and potential sources of non-point pollution in the Swede Gulch drainage, and make recommendations to the Commission for a strategy to mitigate such pollution. The Division or the Commission will also review, at the appropriate time, the availability of alternate points of treatment for sewage generated in Swede Gulch, including specifically the feasibility of treating such sewage at the existing Kittredge wastewater treatment plant.

FISCAL IMPACT STATEMENT

The Commission finds that these use classifications and water quality standards are economically reasonable. During the public hearing on June 2 and 3, the Commission solicited evidence of economic impacts. While the present rule might increase the cost of wastewater treatment for future dischargers in Swede Gulch, no evidence of specific economic impacts was introduced by the sole opponent to the proposed rule, El Rancho Metropolitan District. (El Rancho currently has pending before the Water Quality Control Division an application for the location of a wastewater treatment plant in the headwaters of Swede Gulch.)

On the other hand, the Petitioners and other witnesses before the Commission testified that they believe the degradation of existing water quality in Swede Gulch would have significant adverse impacts on the value of their property in Swede Gulch. Degradation of Swede Gulch waters could also mean the loss of valuable trout spawning and nursery habitat, and the loss of the established fisheries in the ponds in the Gulch.

The Commission concludes that the rule may impose additional economic burdens on dischargers in Swede Gulch, but these burdens were not made the subject of specific testimony. The Commission concludes that these burdens, if any, would be economically reasonable in light of the significant economic benefits accruing to the residents of Swede Gulch and the citizens of Colorado.

38.24 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY, AND PURPOSE, SEGMENT 15, SOUTH PLATTE RIVER

The provisions of 25-8-202(1)(b) and (2), and 25-8-204 C.R.S., provide the specific statutory authority for adoption of the attached regulatory amendments. The Commission also adopted, in compliance with 24-4-103(4), (8)(d) C.R.S., the following statements of basis and purpose of fiscal impact.

BASIS AND PURPOSE:

The U.S. Environmental Protection Agency, Region VIII, (“EPA”), declined to approve certain temporary modifications for residual chlorine and unionized ammonia adopted by the Commission on April 8, 1986. EPA also declined to approve the application of the 4.5 mg/l dissolved oxygen standard during the period July 16 through July 31. Finally, EPA approved the dissolved oxygen standards adopted by the Commission as instantaneous minima. Reconsideration of these stream standards was necessary so that the standards disapproved by EPA could be modified.

<u>Temporary Modifications</u>

On December 2, 1986, EPA issued an NPDES discharge permit to the Metropolitan Denver Sewage Disposal District No. 1 (“Metro District”). EPA contemporaneously issued a compliance order requiring the Metro District to construct dechlorination facilities and to upgrade its chlorination facilities to meet a final total residual chlorine limitation of 0.003 mg/l by October 1, 1988. In order to avoid the controversy over whether the temporary modifications for residual chlorine and unionized ammonia adopted by the Commission were in accordance with the terms of EPA’s regulations, and in view of the compliance order issued by EPA, the Metro District proposed that the temporary modifications be deleted. Although the Commission believes the temporary modifications were properly issued in this case, the Commission has deleted these temporary modifications in order to minimize controversy in this matter.

Dissolved Oxygen:

Evidence presented during the March 1986 hearing indicated that the previous dissolved oxygen standard of 5.0 mg/l was more stringent than necessary to protect aquatic life during non-spawning periods and that a standard of 4.5 mg/l would protect aquatic life. An expert witness on behalf of the Metro District testified that most of the spawning occurred from May 1 through July 15. A Division witness testified that he would prefer that the spawning period extend from May 1 through July 31. The Commission adopted a spawning period of May 1 through July 15. Thereafter, EPA disapproved and indicated that the spawning period must extend at least through July 31. Because not much is known about the spawning periods of the warm water fish in the South Platte, it is not possible to exactly define the spawning period. In order to avoid further controversy over this issue, the Metro District proposed that the spawning period be extended to July 31, and the Commission has accordingly revised the date.

The issue of whether the dissolved oxygen standards were monthly averages or instantaneous minima was not an issue at the March 1986 hearing. In general, the water quality standards adopted by the Commission are 30 day averages. However, the Commission has never specified the averaging period applicable to D.O. Subsequent to the March 1986 hearing, during the EPA review process, EPA contacted the Division concerning the averaging period applicable to dissolved oxygen. Based on this contact EPA approved the dissolved oxygen standards as instantaneous minima. The Metro District did not agree with this EPA action. It believed the D.O. standard was a 30 day average and that its testimony at the March, 1986 hearing supported its position. In an attempt to minimize this controversy, the Metro District and the Division subsequently met and agreed to propose a six number standard for dissolved oxygen. The standards proposed in the notice for this hearing incorporated the agreement by the Division and the Metro District.

On the date that this hearing commenced (May 4, 1987) EPA informed the Commission that it could not approve the proposal if it were adopted. As a result, the Metro District requested a continuance to July 7, 1987, to give it time to try and work out any differences. Subsequently, EPA expressed a preference not to change the presently applicable standard of 5.0/4.5 mg/l. In a further effort to minimize controversy, the Metro District agreed to withdraw its proposed changes to the dissolved oxygen standards. Consequently, the Commission made no changes to the D.O. standards adopted in April, 1986. The Commission, the EPA, and the Metro District all recognize that the issue of the averaging period is not resolved and may need to be reconsidered by the Commission at some time in the future.

FISCAL IMPACT:

In view of the compliance schedule adopted in the discharge permit issued by EPA to the Metro District which is substantially the same as the temporary modifications deleted herein, there should be no cost difference to the state or the affected dischargers.

It is unknown whether the lengthening of the spawning period will result in more stringent effluent limitations during this two week period. More stringent limitations may result in increased costs to dischargers to Segment 15 including the Metro District. Such costs are difficult to quantify, as are the benefits of extending the spawning period. The Commission concludes that the extension of the spawning period is economically reasonable.

Both EPA and the Division used modeling to assess compliance with the D.O. standards in the development of discharge permits for the Metro District. It is recognized that if the Division and/or EPA change their modeling approach to implementation of the D.O. standard then changes to the permit effluent limitations may result. If such changes are more stringent, then the discharger will be faced with additional costs. The Commission, EPA, and the Metro District recognize that in such event the issues associated with the D.O. standard may need to be reconsidered.

EPA's approval of the water quality standards for Segment 15 is a precondition for award of a construction grant pursuant to Title II of the Clean Water Act. The Metro District has made known its intentions to seek grant assistance to build the facilities necessary to meet the requirements of its NPDES permit. Hence, if the changes to the water quality standards were not made, the Metro District may be precluded from obtaining a significant amount of grant funds. This would result in a significant negative financial impact on the Metro District.

The types and groups of persons that stand to bear any cost of this action are primarily the wastewater customers of the Metro District. The beneficiaries are all the persons who use or may use Segment 15 or derive benefit based on its level of water quality. Considering the anticipated modest impact of any costs possibly associated with this action, and the nature of the benefits that are likely to accrue, these regulations appear to be economically reasonable.

Parties to said rulemaking hearing:

City of Thornton, represented by J.J. Petrock, Broadhurst, Petrock & Fendel.
Metro Denver Sewage Disposal District No. 1 represented by Jerry W. Raisch, Vranesh and Raisch.

38.25 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY, AND PURPOSE; BOWLES LAKE:

The provisions of 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204' and 25-8-402 C.R.S. provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted, in compliance with 24-4-103(4), and 24-4-103(8)(d), C.R.S., the following statements of basis and purpose and fiscal impact.

BASIS AND PURPOSE:

The evidence regarding present and prospective beneficial uses of Bowles Lake indicates that current use classifications and standards for Bowles Lake incorporated in Segment 16, South Platte River, South Platte River Basin, are insufficient to maintain and protect current uses and water quality in the Lake. Segment 16 of the South Platte River is classified as Class 2 recreation and Class 2 aquatic life. As established by evidence produced by the Town of Bow Mar: (1) Bowles Lake, a.k.a. Patrick Reservoir or Bow Mar Lake is continually used for primary contact activities, such as swimming, boating and other recreational activities; (2) the Lake receives an uninterrupted, year-round water flow; (3) the Lake supports a diversity of warm water biota, including a variety of fish species indicative of Class 1 status; and (4) the Lake is an integral part of a rare urban wetland and wildlife area. The Commission believes that classification of Bowles Lake as Class 2 aquatic life, and the failure to assign numeric water quality standards adequate to protect the uses of Bowles Lake, was due to an oversight and not based on any finding that this Lake is not worthy of such protection.

The Commission believes that these uses and qualities support reclassification of Bowles Lake as a Class 1 warm water aquatic life and recreational lake. Therefore, the Commission has concluded that segment descriptions, stream classifications, and water quality standards for Segment 16 of the South Platte River, South Platte River Basin, should be amended by carving from Segment 16 a separate Segment 17(c) for Bowles Lake. This Segment 17(c) should be classified as a Class 1 recreational and warm water aquatic life water body and should continue to be classified as suitable for agricultural use. To support the higher classifications given Segment 17(c), appropriate numeric water quality standards have been assigned. These standards are based on values from Tables I, II, and III of the Basic Standards and Methodologies, except for aluminum, zinc, and silver, for which the standards are based on existing ambient quality in Bowles Lake. Although aluminum standards have not been routinely applied to other segments, the Commission determined that such a standard is appropriate here due to a potential source of contamination upgradient from the lake. Existing ambient quality was evidenced by water quality samples taken for Bowles Lake by the Town of Bow Mar. These standards reflect and protect the existing uses and water quality of Bowles Lake as well as foreseeable potential uses of the Lake.

Further, the Commission finds that upgrading the water quality classifications and standards for Bowles Lake is economically reasonable.

FISCAL IMPACT STATEMENT:

The Denver Water Board testified that reclassification of Bowles Lake and adoption of proposed water quality standards may have a direct fiscal impact on a proposal by the Denver Water Board to construct sludge drying beds immediately adjacent to and upgradient of Bowles Lake. The Denver Water Board testified that if these sludge ponds are built, and, as a result of these regulatory changes, are required to be lined, the Denver Water Board could incur an additional construction cost of approximately $800,000. The Denver Water Board also stated that these regulatory changes may have additional fiscal impact on proposed plans to construct sludge ponds by increasing environmental permitting costs.

The Commission finds that the Denver Water Board=s claim of fiscal impact as a result of these regulatory changes in somewhat speculative at this time. The Water Board testified that its project may not impact Bowles Lake, and lining therefore may not be required. The Commission finds that even if such costs are incurred, upgrading of water quality classifications and standards for Bowles Lake is necessary to protect the waters of the state and justifies any indirect or direct fiscal impact resulting from this water quality reclassification.

Incorporation of numeric water quality standards for Bowles Lake into future discharge permits under the Colorado Water Quality Control Act may have a negative fiscal impact on applicants for such a discharge permit. Local residents will benefit from protection of a valuable area resource. The reclassification may also provide benefits for the State of Colorado and its citizens by protecting a valuable fishery.

Parties to Rulemaking Hearing:

Town of Bow Mar

38.26 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY, AND PURPOSE; DECEMBER, 1987 HEARING ON MULTIPLE SEGMENTS:

The provisions of 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; 25-8-207 and 25-8-402 C.R.S. provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted, in compliance with 24-4-103(4), and 24-4-103(8)(d), C.R.S., the following statements of basis and purpose and fiscal impact.

BASIS AND PURPOSE:

The changes considered and adopted are addressed below by segment.

1. <u>Page 1, Segment 1b</u>

   A new high quality class 2 segment has been created for tributaries within the Lost Creek and Mt. Evans Wilderness Areas. These wilderness areas were designated by Congress since the last triennial review. The creation of this high quality class 2 segment provides the same level of protection afforded other wilderness areas in Colorado.

2. <u>Page 1, Segment 2a</u>

   The Division recommended a possible resegmentation of lower Beaver Creek, with classifications and standards different from the rest of this segment. The Commission declined to make any changes at this time, and decided that this issue should be addressed further in a rulemaking hearing scheduled for September, 1988.

3. Page 1, Segment 2c

London Mine Venture proposed that numeric standards for several metals be revised for this segment, which is South Mosquito Creek. The Commission adopted revised numeric standards for cadmium, copper, lead and zinc, designed to provide protection for the aquatic life in Mosquito Creek. The previous temporary modification for lead was deleted. New three-year temporary modifications for zinc and mercury were adopted. The zinc temporary modification is calculated from data from a sampling point below the London Mine Venture discharge, and is based on the period likely to be necessary to achieve compliance with the underlying standard. The mercury temporary modification is based on the level necessary to protect aquatic life. The underlying standard for mercury is based on the level necessary to protect human health, assuming bioaccumulation of mercury in fish tissue. If a bioaccumulation study is completed on this segment, prior to the expiration of the temporary modification, the Commission will reconsider the appropriateness of the underlying standard.

4. Page 2, Segment 4

Three metals standards have been revised for this segment, the North Fork of the South Platte. The revised cadmium and lead standards are based on ambient quality, using the $\bar{x} + s$ methodology. These standards have been calculated from all available, representative data for times when the Roberts Tunnel is not discharging. The Commission believes that this data is most representative of naturally occurring stream conditions. The revised silver standard is based on the mean of the available data for times when the Roberts Tunnel is not discharging. Because of the extreme variability in the available data base for silver, the Commission decided that use of the $\bar{x} + s$ methodology may be underprotective in this site-specific circumstance. Since the revised standard is also the same as the current detection level for silver, this standard is now at the same level that would have been used for enforcement under the prior standard.

5. Page 2, Segment 5c

A new segment has been created to establish separate classifications and standards for Gooseberry Gulch. The evidence indicates that this dry gulch should be classified cold water aquatic life class 2, with limited numeric standards. Inadequate information regarding this specific tributary was available at the time of the original 1980 classification proceeding.

6. Page 2, Segment 6

The Denver Water Board proposed relaxing the cadmium standard for this segment, which is the South Platte mainstem from the North Fork to Bowles Avenue, from 0.0005 mg/l to 0.0009 mg/l. After reviewing the available evidence, the Commission has decided to make no change in this standard at this time. The Commission has determined that the existing standards do not warrant a finding of “inconsistency” within the meaning of section 25-8-207, C.R.S. This decision reflects calculations of ambient quality (using the $\bar{x} + s$ methodology) based on data collected by the Division, the Denver Water Department, and Riverside Technology Inc. The Commission agreed with the Division recommendation that Corps of Engineers data not be included in the calculation because it appears to have been analyzed by a different methodology. The Corps data had a much higher detection level, and statistical analysis indicates a highly significant difference between the Corps data and the combined data set from the other sources.

7. Page 3, Segment 10b

A new upstream segment has been created on West Plum Creek, with its aquatic life classification changed to cold water class 1. Available evidence indicates that this stream segment is not habitat-limited. The stream supports a reproducing brook trout fishery and several fish species that are rare in Colorado. The reclassification results in the dissolved oxygen standard being changed to 6.0 mg/l, 7.0 mg/l spawning, the unionized ammonia standard changed to 0.02 mg/l and the nitrite standard changed to 0.05 mg/l.

8. Page 3, Segment 14

This segment is the South Platte mainstem from Bowles Avenue to the Burlington Ditch diversion. The Division proposed that the temporary modification for unionized ammonia be deleted. The Littleton/Englewood Bi-City Wastewater Treatment Plant (Bi-City) proposed that the temporary modification be extended for an additional three years. The Commission has extended the temporary modification for one additional year, so that Bi-City and DRCOG can complete, with the Division's cooperation and review, a wasteload allocation for this segment during that additional year.

The temporary modification in question has been in place since 1981. The evidence indicates that since that time the underlying 0.06 mg/l unionized ammonia standard generally has been met in-stream. However, excursions have occurred, and high flows during the past few years may have contributed to lower in-stream concentrations. Bi-City has initiated efforts toward complying with the underlying standard, with a combination of in-stream ammonia level evaluations and assessment of wastewater technologies and facilities.

The Commission had previously requested that a wasteload allocation be performed for this segment. Completion of the wasteload allocation during the next year will aid Bi-City, and possibly other dischargers, in planning appropriate treatment to assure long-term compliance with the underlying ammonia standard.

9. Page 4, Segment 17b

The name of this segment has been corrected to read "Sloan Lake." In addition, the "goal" qualifier on the warm water aquatic life class 1 classification has been removed, so that the classification is now in effect. The lake presently is supporting aquatic life typical of this classification and is also the recipient of a Clean Lakes grant to improve its water quality.

10. Page 6, Segment 1a

The phrase "including all mainstem reservoirs" has been added to the description of this Bear Creek mainstem segment. This change will provide protection for Evergreen Reservoir, which is a heavily used urban fishery as well as a Denver Water Board water supply reservoir.

11. Page 6, Segments 1b, 1c, 2

The descriptions of each of these segments have been revised to reflect the change in name of Mt. Carbon Reservoir to Bear Creek Reservoir. For segment 1c, the recreation classification of Bear Creek Reservoir has been changed from class 2 to class 1, with a fecal coliform standard of 200 mpn/100ml. This change is consistent with the existing quality of the reservoir, and recognizes the potential for swimming in the reservoir.

12. Page 7, Segment 7

A new high quality class 2 segment has been created for Bear Creek tributaries within the Mt. Evans Wilderness Area. This wilderness area was designated by Congress since the last triennial review. The creation of this high quality class 2 segment provides the same level of protection afforded other wilderness areas in Colorado.

13. Page 10, Segment 14

At the outset of the hearing, the Commission granted a motion from several parties to limit its consideration of any changes to segment 14 of Clear Creek as a result of this hearing to that portion of the stream below the Croke Canal. The remainder of segment 14 will be addressed in a February, 1989 hearing.

The Commission has declined to implement a proposal by Coors and Golden that the aquatic life classification be deleted from segment 14. The Commission has determined that the existing classification does not warrant a finding of “inconsistency” within the meaning of section 25-8-207, C.R.S. The evidence submitted, including that from Coors and Golden, demonstrates that there is aquatic life present in segment 14, although it is limited by unfavorable flow and streambed characteristics.

The Commission has revised the numeric standards for zinc and copper, and has established temporary modifications for cadmium, zinc, copper and mercury. The temporary modifications for cadmium, zinc and copper are based on existing ambient quality (using the $\bar{x}$+ s methodology) and have been adopted for six years. The underlying standards for these three metals are set at levels that the information currently available indicates should be attainable within a 20-year period. Improvement in quality is expected to occur as a result of upstream mining waste cleanups pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). The temporary modifications recognize that cleanup of the past impacts and resulting water quality improvement will take time. The appropriateness of the temporary modifications, and the achievability of the underlying standards will be reviewed in the next triennial review.

The temporary modification for mercury, adopted for one year, is based on the level necessary to protect aquatic life. The underlying standard for mercury is based on the level necessary to protect human health, assuming bioaccumulation of mercury in fish tissue. If a bioaccumulation study is completed on this segment prior to the expiration of the temporary modification, the Commission will reconsider the appropriateness of the underlying standard.

The Commission has declined to grant the Coors and Golden request to revise the silver standard for segment 14. Using the $\bar{x}$ + s methodology, the existing ambient level of silver is less that the 0.0002 mg/l detection limit. Coors and Golden relied principally on an EPA water quality criterion for silver of .0041 mg/l, and on a new metals methodology that has not yet gone into effect under the State program. The .0041 mg/l level is an acute criterion, and therefore does not indicate what an appropriate standard is to protect against chronic impacts. The Commission has adopted a new metals methodology that will become effective July 31, 1988. After that time, the silver standard can be reviewed under the new methodology. Finally, the fact that the standard proposed by Coors and Golden is more stringent that drinking water standards is irrelevant, since the standard is necessary to protect aquatic life.

14. Page 11, Segment 15

Coors and Golden proposed that the aquatic life class 1 goal be eliminated for this segment, leaving a warm water aquatic life class 2 classification in place. The Division and the Division of Wildlife testified that the conditions supporting a class 1 classification have been achieved, and recommended removing the goal qualifier to leave a class 1 classification in place. Coors and Golden testified that class 1 conditions cannot be achieved in segment 15 due to substantial dewatering of this segment by diversions. The Commission decided that the evidence supporting a classification change in either direction is inconclusive at present and therefore decided to make no change in the classification at present.

The Commission's decisions with respect to metals standards for this segment parallel those for segment 14, and the preceding subsection of this Statement of Basis and Purpose explains the rationale for the action. For segment 15, the Division proposed that the current temporary modification for unionized ammonia be deleted. Wheatridge Sanitation District expressed concern regarding this proposal, especially in view of uncertainty regarding the implications of upstream discharge and water management decisions that currently are in flux. The Commission decided to extend the temporary modification for one year, to allow time for these uncertainties to be better resolved.

15. Page 11, Segments 17 and 18

The descriptions of these two Ralston Creek segments have been revised to reflect a change in name of Blunn Reservoir, now known as Arvada Reservoir. For segment 17, the Commission has deleted the temporary modification for mercury and changed the mercury standard to 0.00014 mg/l. This revised standard is based on existing ambient quality, using the $\bar{x}$+ s methodology. A site-specific evaluation of methylmercury in trout from the creek indicates an absence of methylmercury in the fish tissue. This indicates that protection of human health will be attained with respect to any fish consumed from this segment. The aquatic life also would be protected from chronic effects at this level.

16. Page 11, Segment 19

A new high quality class 2 segment has been created for Clear Creek tributaries within the Mt. Evans Wilderness Area. This wilderness area was designated by Congress since the last triennial review. The creation of this high quality class 2 segment provides the same level of protection afforded other wilderness areas in Colorado.

17. Page 12, Segment 3

Warm water aquatic life class 1 and recreation class 1 classifications have been added to Great Western Reservoir, along with appropriate corresponding table value standards for a mean alkalinity of 100 to 200 mg/l. The evidence indicates that these standards are met by existing ambient quality in the reservoir.

18. Page 13, Segment 4b

Habitat improvement on this segment of South Boulder Creek since 1980 has assured the attainment of cold water aquatic life class 1 conditions. Therefore, the goal qualifier has been deleted, leaving the underlying classification in place.

19. Page 13, Segment 5

The Commission has changed the zinc standard for this segment of South Boulder Creek from 0.05 mg/l to 0.067 mg/l, and changed the copper standard from 0.005 mg/l to 0.016 mg/l. These revised standards are based on existing ambient quality, using the $\bar{x}$+ s methodology. In performing this calculation, Public Service Company proposed that a value equal to the detection limit be used whenever an analysis is reported as “less than detection limit.” The Commission has instead adopted standards based on its consistent practice of using “zero” in calculations including values reported as “less than detection limit.” So long as a consistent approach is followed in discharge permit monitoring and enforcement, this approach is reasonable.

20. Page 17, Segment 4

The Division and the Division of Wildlife proposed changing the Barr Lake warm water aquatic life classification from class 2 to class 1. The Division proposed that the unionized ammonia standard be changed from 0.1 mg/l to 0.06 mg/l.

The Commission finds that Barr Lake is habitat limited and that its current aquatic life class 2 classification and accompanying standards are correct. This finding is based on the evidence presented at the hearing by the parties that Barr Lake is not capable of sustaining a wide variety of warm water species due to poor physical habitat, wide fluctuations in water levels, and potentially uncorrectable water quality conditions. Some of the factors considered by the Commission in making this finding include that the reservoir is dominated by carp; the poor physical habitat includes poor substrate which limits fish reproduction; the fluctuations in water levels are extreme and range between 31,500 and 300 acre feet; and potentially uncorrectable water quality conditions are caused by releases of nutrients from existing bottom sediments by reservoir drawdown and wind/wave action. Finally, the Commission finds that achieving the more restrictive unionized ammonia standard associated with class 1 aquatic life may not be technically or economically feasible.

21. Page 25, Segment 3

Empire Reservoir has been added to the description of this segment, to correct an oversight in the 1980 South Platte hearing. Empire Reservoir is extensively used for fishing and hunting and has public access.

22. Page 26, Segment 2

Stalker Lake has been added to the description of this segment. This lake, which is a prime fishery, was overlooked in the 1980 hearing. It is managed by the Division of Wildlife and has produced several state records for warm water fish.

23. Page 27, Segment 6

A reference to “segments 1 through 6” has been corrected to “segments 1 through 5.”

FISCAL IMPACT:

There should be no substantial fiscal impacts as a result of the majority of changes adopted.

For South Mosquito Creek, two metals standards have been made more stringent and two more lenient. The more stringent standards, particularly for zinc, may require additional treatment and/or site clean-up costs for London Mine. London Mine testified that treatment costs to achieve the previously applicable standards could exceed $400,000. However, any such impact will be eased by the temporary modification for zinc. The benefits of the revised standards consist principally of assuring protection of aquatic life.

The revised standards for cadmium, lead and silver for segment 4, the North Fork of the South Platte, are each less stringent than the prior standards. Therefore, the revised limits should result in a reduced fiscal impact on any activities subject to regulation under these standards.

New segment 4a (Gooseberry Gulch) has a potential beneficial impact to dischargers on that segment since their treatment facilities would be controlled by less stringent standards than are presently in effect particularly with respect to ammonia.

Limiting of the temporary modification on segment 14 of the South Platte to one additional year will require some form of ammonia removal at the Littleton-Englewood wastewater treatment plant in the future. The delineation of this cost will be dependent upon the type of treatment, technology used, and the period of time each year that it would be required. Bi-City estimated the cost of required nitrification facilities at $7,000,000. There are also considerable benefits to the uses of segment 14 as well as downstream segment 15 associated with the maintenance of a 0.06 mg/l unionized ammonia standard. However, these benefits can not be quantified at this time.

The revised fecal coliform standard for Bear Creek Reservoir could affect treatment costs for upstream dischargers in the future, as growth occurs. However, no major impact is expected in the near future, since the revised standard is met by existing reservoir quality.

For segments 14 and 15 of Clear Creek, the revised standards for zinc and copper could increase treatment costs in the future for any dischargers discharging metals to these segments. These revised standards also could increase the costs of upstream cleanups pursuant to CERCLA, in an amount that cannot be quantified at this time.The temporary modifications adopted for several metals are more lenient than the existing standards. Therefore, these changes will ease the economic impact on dischargers for the period while they are in effect.

The revised mercury standard for segment 17 of Ralston Creek will have a beneficial fiscal impact on dischargers to that segment. Cotter Corporation testified that this change will avoid increased treatment costs in excess of $500,000.

The revised zinc and copper standards for segment 5 of South Boulder Creek are more lenient than the previous standards, and therefore should reduce the potential fiscal impact on any dischargers in this segment. Public Service Company testified that the cost of treatment to meet the previous standards could exceed $50,000,000. Although the ambient quality-based standards recommended by Public Service differed somewhat from the ambient quality-based standards adopted by the Commission, no specific evidence was submitted regarding any treatment costs that could be necessary to meet the new standards. However, because the revised standards are based on ambient quality, and because there was no evidence that copper levels in the Public Service outflow are less than its inflow, treatment should not be required so long as the standards are applied in a manner consistent with the basis for their adoption.

No new fiscal impacts will result from those segments for which classifications and standards were left unchanged, such as lower Beaver Creek, segment 6 of the South Plate mainstem, and Barr Lake.

PARTIES TO SOUTH PLATE DECEMBER 1987 RULEMAKING HEARING

1. City of Westminster
2. Division of Wildlife
3. Douglas County
4. Littleton-Englewood Bi-City Wastewater Treatment Plant
5. Adolph Coors Company and City of Golden
6. City of Lakewood
7. Metropolitan Denver Sewage Disposal District #1
8. City of Arvada

9. City of Broomfield
10. London Mine Venture
11. City of Thornton
12. Public Service Company
13. City & County of Denver Board of Water Comm.
14. WheatRidge Sanitation District
15. City of Littleton
16. Cotter Corporation
17. Farmers Reservoir and Irrigation

38.27 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY, AND PURPOSE; OCTOBER, 1988 HEARING ON MULTIPLE SEGMENTS:

The provisions of 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; 25-8-207 and 25-8-402 C.R.S. provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted, in compliance with 24-4-103(4), C.R.S., the following statement of basis and purpose.

BASIS AND PURPOSE:

The changes considered and adopted are addressed below by segment.

1. Page 1, Segment 1a
   Page 1, Segment 2a
   Page 3, Segment 8
   Page 3, Segment 10a
   Page 3, Segment 10b
   Page 3, Segment 12
   Page 3, Segment 13
   Page 4, Segment 17a
   Page 5, Segment 1
   Page 5, Segment 2
   Page 6, Segment 3
   Page 7, Segment 4b
   Page 7, Segment 4c
   Page 7, Segment 6

   Numerical standards for metals for these segments have previously been based on table values contained in Table III of the Basic Standards and Methodologies for Surface Water. Table III has been substantially revised, effective September 30, 1988. From the information available, it appears that the existing quality of these segments meets or exceeds the quality specified by the revised criteria in Table III, and new table value standards based thereon have therefore been adopted.

2. <u>Page 2, Segment 5c</u>

   This new segment was established as a result of a December, 1987 hearing to remove it from the listing for tributaries with an aquatic life cold water class 1 classification and classify it aquatic life cold water class 2 with no numeric standards for aquatic life. This segment still retains the water supply designation, but numeric values to protect this use were inadvertently removed along with the aquatic life standards. Table values to protect water supply therefore have been readopted for this segment.

3. Page 2, Segment 7

The effect of this resegmentation is to add a water supply classification, and corresponding numeric standards, to Brush Creek and Filter Gulch. Although the water in these streams is not currently used for water supply, the evidence indicates that there is a potential future use for water supply in the Denver system, particularly should the Kassler Water Treatment Plant be reopened. In addition, there was evidence of a hydrologic connection to ground water that could potentially be used in the Denver system.

The Commission rejected a proposal by Martin Marietta to apply the standards only at the point of water supply intake, in part because the evidence indicated that the precise point on intake into the Denver system cannot be predicted at this time. However, the Commission did adopt a footnote specifying that the standards for Brush Creek and Filter Gulch apply only at the downstream of the Martin Marietta property line. The evidence indicates that the entire reach of both streams above the property line is located on Martin Marietta property, and that there is no foreseeable use of the water for water supply purposes before it leaves the Martin Marietta property.

4. Page 3, Segment 11

This resegmentation has been adopted to provide increased protection for fish species located in the new segment 11b which are relatively rare in Colorado. Four species of the fish community, the Johnny darter, The Iowa darter, the common shiner and the northern redbelly dace are relatively rare in Colorado. Of these four species only the Johnny darter is common in more than two or three waters in the entire state. Only in West Plum Creek and tributaries are those species relatively common.

West Plum Creek is unique in the South Plate drainage. It is the only transition zone stream that does not receive large pollutant loadings. A water is a transition stream in the region where the stream leaves the mountains and enters the plains region of Colorado. The highest diversity of fish species is normally found in this transition reach. The four species noted above all seem to require cool, clear water, slower currents with rooted aquatic vegetation.

These species have generally disappeared in other front range transition streams where nutrient loadings from domestic sewage plants are common. These waters include Boulder Creek, the Cache la Poudre and the Saint Vrain. Although one or two of these species may be found in some of these waters, only in the West Plum Creek system is the native fish assemblage still intact.

The use, a diverse native fish community, is still present in the West Plum Creek system. Protection for the use was not present without this resegmentation. Most tributaries were class 2 warm water with no standards. Because of the lack of appropriate numeric standards, discharge permits for entities discharging to most tributaries of West Plum Creek would not include restrictions for parameters such as chlorine and ammonia, which are toxic to fish. To provide needed protection for these populations the Commission has adopted numeric standards for all tributaries of West Plum Creek.

5. Page 4, Segment 15

Table III of the Basic Standards and Methodologies for Surface Water has been substantially revised, effective September 30, 1988. The Metropolitan Denver Sewage Disposal District No. 1 (Metro District) requested that the new Table III be applied to segment 15 as soon as possible because the Metro District renewal discharge permit sets forth a compliance schedule requiring compliance with a water quality-based effluent limitation for silver based on the old Table III methodology. Application of the new Table III methodology will result in calculation of a less restrictive effluent limitation for silver that can be met without additional treatment facilities. The Basic Standards and Methodologies for Surface Water also provide for the development of site specific and ambient quality-based standards in lieu of the table values. The Commission has adopted such standards for mercury and zinc.

The ambient quality-based chronic standard for dissolved mercury is 0.4 ug/l which is equal to the 85th percentile of the available data. The acute standard for mercury is the table value of 2.4 ug/l. In addition to presenting data supporting a chronic ambient quality-based standard of 0.4 ug/l for mercury, the Metro District presented evidence at the hearing that the methylmercury concentrations in fish flesh from fish is segment 15 ranged between 0.19 and 0.29 mg/kg. This is well below the FDA limit of 1 mg/kg. Thus, the Commission concludes that the ambient-based chronic limit of 0.4 ug/l dissolved mercury protects the classified uses of segment 15 and that no additional treatment is necessary to meet this standard.

The Metro District also presented evidence in the hearing that 1.0 ug/l mercury is the lowest level that can be reliably achieved with specified limits of precision and accuracy during routine laboratory operating conditions. Based on this evidence, the Metro District requested that a “practical quantification limit” (PQL) equal to 1.0 ug/l be established for mercury for this stream segment.

The Commission declined to modify the ambient quality-based standard to incorporate the 1.0 ug/l PQL at this time, principally because the PQL concept has not previously been applied to Colorado water quality standards, and the Commission is not yet persuaded that its adoption on this site-specific basis is necessary or appropriate. The Commission agreed to consider this issue further at its February, 1989 hearing on the South Plate water quality standards. In the meantime, the Division may take the appropriateness of a mercury PQL into account in considering appropriate discharge permit limits for the Metro District.

For zinc, acute and chronic equations differing from the aquatic life protection formulas in the Basic Standards were adopted. The equations are based on revised water quality criteria for zinc which were published in 1987 by the U.S. Environmental Protection Agency. This new criteria document was published after the “Metals Committee” had completed its work in preparing its recommended actions for the amendments to the Basic Standards. The Table III zinc standards for agriculture and water supply are being adopted without change.

Application of the new Table III and the site-specific standards for mercury and zinc will provide the level of protection necessary to assure the maintenance of the use classification assigned to segment 15. (warm water aquatic life class 2, agriculture, water supply and recreation class 2).

6. Page 22, Segment 12

Table III of the Basic Standards and Methodologies for Surface Water has been substantially revised, effective September 30, 1988. Kodak Colorado Division requested that the new table be applied to segment 12 as soon as possible because the Kodak renewal discharge permit sets forth a compliance schedule requiring compliance with a water quality-based effluent limitation for silver based on the old Table III methodology. This effluent limit represented a 50% reduction in the concentration of silver. This limit could not be met with existing wastewater treatment facilities. Application of the new Table III will result in calculation of a less restrictive effluent limitation for silver that can be met without the addition of additional treatment facilities. Application of the new Table III will provide the level of protection necessary to assure the maintenance of the use classifications (recreation class 2, warm water aquatic life class 2 and agriculture) assigned to Segment 12.

LIST OF PARTY PARTICIPANTS TO THE OCTOBER, 1988 SOUTH PLATE PUBLIC RULEMAKING HEARING

1. Kodak Colorado Division
2. Metropolitan Sewage Disposal District No. 1
3. Public Service of Colorado
4. City and County of Denver
5. Chatfield Basin Association
6. Martin Marietta Corp.
7. The City of Boulder
8. Landfill Inc.
9. Division of Wildlife

38.28 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY, AND PURPOSE: (1989 Big Thompson segments 4 and 5 revisions)

The provisions of 25-8-202(1) (b) and (2); 25-8-204; 25-8-207 and 25-8-402 C.R.S. provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted, in compliance with 24-4-103(4), C.R.S., the following statement of basis and purpose.

BASIS AND PURPOSE:

This action amends metals standards for segments 4 and 5 of the Big Thompson River, to apply the new “table values” for metals contained in the Basic Standards and Methodologies for Surface Water. Because the Commission has previously determined that these Table III values adequately protect the classified uses, no adverse impact from these revisions is anticipated. The adoption of these amendments will help assure economically reasonable regulation of the stream segments in question by limiting the risk of unnecessarily stringent protection.

38.29 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY, AND PURPOSE; OCTOBER, 1988 HEARING - BRUSH CREEK AND FILTER GULCH

The provisions of 25-8-202(1) (a), (b) and (2); 25-8-203; 25-8-204; 25-8-207 and 25-8-402 C.R.S. provide the specific statutory authority for adoption of these regulatory amendments. Please note that changes adopted as a result of this hearing for several other segments are addressed in 3.8.25. The Commission also adopted, in compliance with 24-4-103(4), C.R.S., the following statement of basis and purpose.

BASIS AND PURPOSE:

The previous segment 7 has been resegmented into segments 7a and 7b. Segment 7a is the same as the previous segment 7, except that “7b” is added to the list of excluded segments. Segment 7b is described as: Mainstem of Brush Creek and Filter Gulch from the source to the confluence with the South Plate River.

The effect of this resegmentation is to add a water supply classification, and corresponding numeric standards, to Brush Creek and Filter Gulch. Although the water in these streams is not currently used for water supply, the evidence indicates that there is a potential future use for water supply in the Denver system, particularly should the Kassler Water Treatment Plant be reopened. In addition, there was evidence of a hydrologic connection to ground water that could potentially be used in the Denver system.

The Commission rejected a proposal by Martin Marietta to permanently apply all of the standards only at the point of water supply intake, in part because the evidence indicated that the precise point of intake into the Denver system cannot be predicted at this time. However, the Commission did adopt a footnote specifying that-except for the dissolved oxygen, pH, and fecal coliform standards that have previously been in effect for the full stream reaches-the standards for Brush Creek and Filter Gulch apply only at and downstream of the Martin Marietta property line. The evidence indicates that the entire reach of both streams above the property line is located on Martin Marietta property, and that there is no foreseeable use of the water for water supply purposes before it leaves the Martin Marietta property.

In addition, the Commission adopted a three-year temporary modification, such that during this period the sulfate standard will apply only at the point of any present or future water supply intakes. The purpose of this temporary modification is to allow Martin Marietta adequate time to construct a pipeline to move its discharge to the mainstem of the South Plate. This approach is appropriate due to the unique facts applicable to this situation, including (1) Martin Marietta’s good faith commitment to pursue construction of a pipeline, and (2) the lack any apparent public health consequences or impacts on other classified uses, since there is no active water supply intake in this area at present and since the sulfate standard is based on a secondary (not health -related) drinking water standard. The Commission does not intend these determinations to serve as a general precedent or to change the Commission’s established policy that in the vast majority of circumstances ambient water quality standards are appropriately applied to the entire reach of identified stream segments.

LIST OF PARTY PARTICIPANTS TO OCTOBER, 1988 SOUTH PLATE RIVER BASIN

1. Kodak Colorado Division
2. Metropolitan Sewage Disposal District No. 1
3. Public Service of Colorado
4. City and County of Denver
5. Chatfield Basin Association
6. Martin Marietta Corp.
7. The City of Boulder
8. Landfill Inc.
9. Division of Wildlife

38.30 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY, AND PURPOSE; FEBRUARY, 1989 HEARING ON MULTIPLE SEGMENTS:

The provisions of 25-8-202(1) (a), (b) and (2); 25-8-203; 25-8-204; 25-8-207 and 25-8-402 C.R.S. provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted, in compliance with 24-4-103(4), C.R.S., the following statement of basis and purpose.

BASIS AND PURPOSE:

The changes considered and adopted are addressed below by segment.

1. Page 9, Clear Creek, Segment 6
Page 9. Clear Creek, Segment 9
Page 12, Big Dry Creek, Segment 3
Page 13, Boulder Creek, Segment 2
Page 13, Boulder Creek, Segment 3
Page 13, Boulder Creek, Segment 4b
Page 14, Boulder Creek, Segment 9
Page 15, Boulder Creek, Segment 12
Page 16, St. Vrain Creek, Segment 2
Page 19, Big Thompson River, Segment 7
Page 19, Big Thompson River, Segment 8
Page 19, Big Thompson River, Segment 11
Page 19, Big Thompson River, Segment 12
Page 20, Big Thompson River, Segment 14 (now deleted)
Page 21, Cache La Poudre River, Segment 2
Page 21, Cache La Poudre River, Segment 3
Page 21, Cache La Poudre River, Segment 4
Page 21, Cache La Poudre River, Segment 6
Page 22, Cache La Poudre River, Segment 9
Page 23, Cache La Poudre River, Segment 14
Page 23, Cache La Poudre River, Segment 15
Page 23, Cache La Poudre River, Segment 16
Page 24, Laramie River, Segment 2
Page 25, South Plate River, Segment 3
Page 26, Republican River, Segment 1
Page 26 Republican River, Segment 2
Page 26, Republican River, Segment 3

Numerical standards for metals for these segments have in most instances previously been based on table values contained in Table III of the Basic Standards and Methodologies for Surface Water. Table III has been substantially revised, effective September 30, 1988. From the information available, it appears that the existing quality of these segments meets or exceeds the quality specified by the revised criteria in table III, and new table value standards based thereon have therefore been adopted. There are also some of these segments whose previous standards were based in part on ambient quality, since their quality did not meet old table values based on alkalinity ranges. However, these segments generally have much higher hardness than alkalinity, and the new table values (based on hardness-dependent equations) are now appropriate as standards. In addition to these revisions, the segment desriptions have been clarified for Laramie River, Segment 2, and Cache La Poudre River, Segment 4. As a “housekeeping” clarification, the previous Big Thompson Segment 14 has been deleted, with these waters added into Big Thompson Segment 12. Finally, a High Quality 2 designation has been added to Cache La Poudre River, Segment 2, and the description of this segment has been revised to include waters within wilderness areas and those designated as “wild rivers” since the original hearings for this basin. This designation is appropriate in accordance with the recently revised antidegradation provision in the Basic Standards and Methodologies for Surface Water.

2. Page 10, Clear Creek, Segment 11

   The table value standards for metals have been adopted for this segment, except for cadmium, copper, and zinc. This is one of a few segments in South Plate Basin that has historic dissolved metals data base. USGS station 0671, Clear Creek at Golden, shows for mean hardness of 77 mg/l. Ambient standards based on the 85th percentile are appropriate for cadmium, copper and zinc. The geometric mean of fecal coliform data at the Water Quality Control Division's routine monitoring station is 66 MPN/10 ml. This is well below the 200 MPN/100 ml criteria for Recreation Class 1 and the change in classification and standards is justified on a water quality basis.

3. Page 18, Big Thompson River, Segment 1

   This segment's description has been revised to add a wilderness area that has been designated since the original hearings for this segment. In addition, in accordance with the new antidegradation provisions, appropriate use classifications and table value numeric standards have been adopted for this segment, to apply in the event that degradation is determined to be necessary following an activity-specific antidegradation review.

4. Page 19, Big Thompson River, Segment 9

   A new acute standard for ammonia has been adopted for this segment, based on the recent revisions to Table II of the Basic Standards and Methodologies for Surface Water. In addition, the chronic ammonia standard has been changed to 0.1 mg/l. The evidence indicates that this segment is correctly classified as a class 2 aquatic life segment, but that the variety of aquatic life in this segment may be adversely impacted by factors other than ammonia and does not warrant protection at the 0.06 mg/liter un-ionized ammonia level that the Division originally proposed. Standards greater that 0.06 are allowable according to footnote 1 of Table II of the Basic Standards and Methodologies for Surface Waters 3.1.0 (5 CCR 1002-8), which sets out a range of 0.06 to 0.1 mg/liter un-ionized ammonia for class 2 aquatic life, and specifies that standards greater than 0.08 mg/liter may be considered "where a higher risk of sublethal effects is justified by habitat limitations or other water quality factors". The Commission believes this to be the case for this segment and that there is uncertainty that the aquatic life would be enhanced with a standard in the 0.06 to 0.08 range, as opposed to a 0.1 mg/liter standard. The 0.1 standard is consistent with the other warm-water class 2 aquatic life streams in the vicinity.

   The Division has identified three dischargers on this segment which potentially will be affected by a change in the chronic standard. A change to 0.1 from the existing 0.13 mg/liter un-ionized ammonia standard could result in additional effluent treatment being required of the City of Berthoud, but will not likely result in additional treatment for Adolph Coors Company of Johnstown.

5. Page 12, Boulder Creek, Segment 4.b. (and new 4.c., 4.d.), Page 14, Boulder Creek, Segment 8

   Previously the tributaries to South Boulder Creek between Hwy 93 and South Boulder Road were listed under the description for both segments Segment 8 and 4.b. This overlap in segment description was brought to the Division's attention in May, 1988, by the Hazardous Materials and Waste Management Division of the Health Department, during negotiations over the Marshall Landfill CERCLA Consent Decree.

By listing these tributaries under Segment 4.b. it is the Commission's intent to establish classifications that are consistent with tributaries to South Boulder Creek upstream of Highway 93. One of the tributaries in 4.b. known as Cowdrey Drainage, would receive treated wastewater from a proposed treatment plant for the Marshall Landfill. Due to site-specific considerations on Cowdrey Drainage, Segment 4.b. was therefore resegmented into 4.b. (with exclusions) and new segments 4.c. and 4.d. Visits of the site and data collection indicate that intermittent surface flows from upper Cowdrey Drainage are intercepted by the Davidson Ditch and do not reach the lower portion of the drainage. Site-specific differences in use, upstream and downstream of the Davidson Ditch, account for the differences in numeric standards and use classifications.

A water supply classification has been included in segment 4.c. due to the presence of municipal water rights of the Cities of Louisville and Lafayette. According to the District 6 Water Commissioner of the Division of Water Resources, Louisville has not yet exercised its right to divert water for municipal use, but that Lafayette has diverted water for municipal use to Wanaka Reservoir, the City's storage reservoir. It is thus clear that there is a potential and existing use made of water from the upper segment (4.c.) of the Cowdrey Drainage.

6. Page 16, St. Vrain, Segment 3

Barbour Ponds have been added to the description of this segment. Barbour Ponds are open to public fishing and contain reproducing populations of fish. The change is appropriate in that there are no sludge beds on the bottom of the ponds and water level fluctuations are not extreme. Without the change of classification the Division's ability to regulate anyone who discharges or causes a fish kill by dumping a toxicant to the waterways feeding the waters would be limited.

7. Page 20, Big Thompson River, Segment 12 (Previously Segment 14)

Lon Hagler reservoir has been added to the description of this segment. Lon Hagler is open to public fishing and contains reproducing populations of fish. The change is appropriate in that there are no sludge beds on the bottom of the reservoir and water level fluctuations are not extreme. Without the change in classification the Division=s ability to regulate anyone who discharges or causes a fish kill by dumping a toxicant to the waterways feeding the waters would be limited.

8. Page 14, Boulder Creek, Segment 7.b.

Revised metals standards, based on the new Table III in the Basic Standards and Methodologies for Surface Water have been adopted for this segment. The City of Louisville requested that the new Table III be applied to Segment 7.b. as soon as possible because the City's renewed discharge permit sets forth a compliance schedule requiring the city to determine the facilities' ability to comply with water quality-based effluent limitations for each metal for which there is a stream standard. Application of the new table III methodology will allow the City to proceed with the compliance schedule required in its renewed discharge permit and determine the facilities' ability to comply with the potential limitations. Application of the new standards will provide the level of protection necessary to assure the maintenance of the use classifications (Recreation Class 2, warm Water Aquatic Life Class 2, and Agriculture), assigned to segment 7.b.

LIST OF PARTY PARTICIPANTS TO THE FEBRUARY, 1989 SOUTH PLATE

1. Division of Wildlife
2. Cities of Westminster & Thornton
3. Metropolitan Denver Sewage Disposal District #1
4. The City of Louisville
5. Northern Colorado Water Conservancy District and Municipal Subdistrict
6. City of Boulder

7. North Front Range Water Quality Planning Association
8. Adolph Coors Company
9. The North Poudre Irrigation Company
10. City of Northglenn
11. City of Arvada
12. City of Ft. Collins
13. Thompson Water Users Association
14. The Cache La Poudre Water Users Association
15. Campbell Development, Inc.
16. Landfill, Inc.

38.31 FINDINGS REGARDING BASIS FOR TEMPORARY RULE ADOPTED JULY 11, 1989

The Commission adopted revised classifications and water quality standards for all tributaries to Standley Lake and Great Western Reservoir, on a temporary basis. These classifications and standards are effective immediately and will remain in effect until March 30, 1990, unless permanent standards are adopted at an earlier date. The Commission is scheduling a rulemaking hearing for December, 1989 to consider permanent adoption.

This action creates a new segment for tributaries to Great Western Reservoir and Standley Lake in northern Jefferson County, which encompasses Walnut Creek and Woman Creek, the two streams which drain the Rocky Flats Plant. Heretofore, these tributaries were included in the general classification of Big Dry Creek Segment 1, which does not include the water supply classification, and which contains only dissolved oxygen, pH, and fecal coliforms as standards. Recent attention to the drainage of Walnut Creek and Woman Creek into the Great Western Reservoir and Standley Lake, both of which are actually used as public water supplies, has heightened the need to protect all waters entering the reservoirs via the adoption of the water supply classification and associated standards.

Immediate adoption of these rules on a temporary basis is imperatively necessary to preserve the public health, safety and welfare by insuring that the appropriate water quality standards are incorporated into federal permits for the Rocky Flats Plant and that water supply standards are met at the point of discharge. This in turn will provide an extra layer of protection of downstream water supplies from the two reservoirs, each of which are already classified as domestic water supplies.

The United States Environmental Protection Agency is currently in the process of renewing its NPDES discharge permit for the Rocky Flats Plant. EPA intends to issue the permit for public comment by October 1, 1989. Appropriate standards would not be effective by October 1 if the procedures set forth in section 25-8-402(1), C.R.S. were followed. These standards thus would not become a part of the federal permit. Immediate adoption of these rules pursuant to section 24-4-103(6), C.R.S. is in the public interest and will insure that the appropriate classifications and standards become a part of the federal permitting process.

The numeric standards adopted include:

(1) D.O., pH and fecal coliform standards from Table I of the Basic Standards and Methodologies for Surface Water;

(2) Standards to protect agriculture and domestic water supply uses, for physical and biological, inorganic and metals parameters from Tables I, II and III of the Basic Standards and Methodologies for Surface Water;

(3) Drinking water supply standards for carcinogenic and non-carcinogenic organic chemicals (Tables A and B);

(4) Additional standards for organic chemicals based on EPA Gold Book fish and water ingestion criteria (Table C); and

(5) Standards for several radionuclides not included in the list of statewide standards contained in section 3.1.11 of the Basic Standards and Methodologies for Surface Water (Table D).

For the organic pollutants contained in Tables A and B, the practical quantitation limits (PQLs) listed as “detection levels” are to be used as the compliance thresholds. For any organic pollutants listed in Table C that do not appear in Tables A or B, the Commission intends that these standards be applied in accordance with PQLs determined appropriate by the Colorado Department of Health laboratory.

PARTIES TO THE PROCEEDINGS

1. City of Broomfield
2. Environmental Defense Fund

38.32 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY, AND PURPOSE (GREAT WESTERN RESERVOIR, STANDLEY LAKE AND TRIBUTARIES)

The provisions of sections 25-8-202(1) (a), (b), and (2); 25-8-203; and 25-8-204; C.R.S., provide the specific statutory authority for adoption of the attached regulatory amendments. The Commission also adopted, in compliance with section 24-4-103(4) C.R.S., the following statement of basis and purpose.

(1) <u>Segmentation</u>

The Commission has revised the segmentation for certain tributaries to the Big Dry Creek drainage. Two separate segments have been established for portions of the Walnut Creek and Woman Creek basins, which flow from property occupied by the Rocky Flats Plant to Great Western Reservoir and Standley Lake, respectively.

Segment 4 encompasses all of Woman Creek and its tributaries except for pond C 2, and the lower portion of Walnut Creek and its tributaries above Great Western Reservoir. This segment has been established to facilitate the application of water quality classifications and standards that will help protect the uses of water in the downstream segments - Great Western Reservoir and Standley Lake.

Segment 5 encompasses the upper watersheds of North Walnut Creek and South Walnut Creek, as well as Pond C-2, which is located adjacent to Woman Creek. A separate segment has been established for these waters because they are currently impacted by the wastewater management system at the plant. Walnut Creek has been segmented at two points immediately downstream on ponds A-4 and B-5 - the last in a series of ponds constructed on the streams at the Rocky Flats complex. This is to recognize that the upper portions of Walnut Creek and these “instream” ponds currently contain some treated sanitary wastewater and storm water runoff from the Rocky Flats facility and cannot be expected to meet the high quality of water required by the standards as the water leaves the plant ponds. Similarly, Pond C-2 near Woman Creek collects runoff from the plant site, and so has been included in segment 5.

(2) Classifications

The Commission previously adopted new water supply classifications for Walnut Creek and Woman Creek on a temporary basis, as the result of a rulemaking hearing held in July, 1989. The continuation of extensive, protective use classifications and water quality standards for Standley Lake, Great Western Reservoir, and the major tributaries which drain into them is necessary because of the drinking water use made of the reservoirs, and the threat to human health posed by the Rocky Flats industrial complex which is immediately upstream. Except for the addition of a water supply classification for segments 4 and 5, the existing classifications for these streams and reservoirs have been left in place.

For segment 5, a “goal” qualifier has been added to the classifications, in recognition of the current impact of Rocky Flats operations on these waters, as described in (1) above. A goal of classification for all uses is appropriate since Rocky Flats has committed in the recent Agreement in Principle between the State and the Department of Energy (DOE) to pursuing elimination of discharges from the plant site. As a matter of policy, the Commission believes that these state waters should be returned as soon as possible to a condition that will support a full range of uses.

At the hearing, the DOE argued that a water supply classification should not be applied to segments 4 and 5 because water is not withdrawn directly from these segments for drinking water and because of the potential that water from these segments may be diverted around the two downstream water supply reservoirs in the future. The Commission recognizes that water is not withdrawn directly from Walnut or Woman Creek for water supply purposes. This classification has been added to these segments because of the Commissions policy determination that it is appropriate to establish an extra layer of protection for the major water supplies in Great Western Reservoir and Standley Lake, particularly considering the proximity upstream of a major industrial, complex utilizing nuclear materials.

Although it appears from the evidence that some potential exists for diverting Walnut and Woman Creek water around the two reservoirs in the future, the water supply classification for these streams is currently appropriate. As long as a significant potential exists that the water in these creeks will enter the downstream water supplies, the option for that use should be protected. This is particularly true since it was demonstrated this past summer that discharges from the Rocky Flats Plant can, with appropriate treatment if necessary, meet the standards (or associated compliance thresholds) that are now being adopted. If in the future permanent diversion structures are constructed, with an appropriate capacity to assure that Walnut and Woman Creek water will not enter the two reservoirs, the Commission can reconsider the appropriateness of the water supply classification at that time.

(3) Standards

Several sets of new water quality standards have been adopted for the waters addressed in this hearing. With respect to organic chemicals, two sets of numerical standards adopted on a temporary basis in July (Tables A and B) have in the interim been adopted statewide, and therefore were not addressed in this hearing. The “Additional Organic Chemical Standards” adopted for segments 2, 3, 4 and 5 in this hearing (Table 1) include 1) standards based on fish and water ingestion criteria from EPA’s “Gold Book”; 2) standards for two herbicides: atrazine and simazine; and 3) a “zero” standard for other manmade organics, for which no numerical limit has been established.

Assignment of the criteria as standards to protect humans from health risk posed by consuming both fish and water is appropriate on both the reservoirs as well as the tributary streams because of the large numbers of people who depend on these reservoirs as their drinking water supply. In addition, Standley Lake is a popular fishery and provides many fishermen with edible species which are likely consumed regularly along with the potable water supplied from the lake. Great Western Reservoir also contains fish, and although fishing is presently forbidden, the potential for allowing that use in the future is possible, and water quality adequate to support that use should be preserved. Assigning the organics standards to tributaries is necessary to provide an extra layer of protection to the waters entering the lakes, and to allow a means of limiting the introduction of organics into the environment at the source, due to the short distance between the sources and the reservoirs.

The inclusion of standards for atrazine and simazine is necessary because these two herbicides are potential carcinogens, and both have been detected in water samples from Rocky Flats in the on-site holding ponds. The standards are based on a proposed MCL for atrazine and a current EPA Health Advisory for simazine. Both are established at levels protective of human health.

Consistent with the approach taken by the Commission in establishing statewide organic chemical standards in section 3.1.11 of the Basic Standards and Methodologies for Surface Water, the Commission has adopted detection levels based on practical quantitation limits (PQLs) to be used as compliance thresholds for the standards in Table 1. The PQLs for these compounds were derived by the Colorado Department of Health laboratory. The PQLs are based on the gas chromatography (GC) laboratory analysis except where noted. This is consistent with analyses that have been required to date for water discharged from the Rocky Flats Plant.

A narrative standard has been adopted for other organic chemicals, interpreting the existing statewide “no toxics in toxic amount” provision (Section 3.1.11(1) (d)) as zero, with the compliance threshold for enforcement based on appropriate PQLs. The Commission has determined as a policy matter that this standard is appropriate due to the inability to predict with certainty at this time all chemicals of potential concern that could be discharged to these waters. If it is determined that this approach in unnecessarily stringent for a particular chemical that is found to be present, based on use-protective numerical criteria for such a chemical, then such criteria can be used to set a different numerical standard for that chemical in the future. In the meantime, in the absence of better information the Commission has chosen as a matter of policy to err in the direction of minimizing organic chemical pollution of state waters.

The adoption of the organic chemical standards described above should not have a major economic impact on the Rocky Flats Plant. From extensive sampling of the plant’s on-site holding ponds prior to discharges this past summer, the only organics detected at levels exceeding the standards (or applicable PQLs) now being adopted were atrazine and simazine. Counsel for the DOE conceded the appropriateness of the proposed standards for these two constituents during the Commission’s hearing. Moreover, to the extent that there is an economic impact of complying with such standards, that impact was essentially already incurred by DOE by entering into the Agreement in Principle with the State of Colorado in June, 1989.

The Commission also has adopted new radionuclide standards for segments 2, 3, 4 and 5. The adoption of these standards is appropriate due to the risk of discharge of radionuclides from the Rocky Flats Plant. For curium and neptunium, the standards are based on criteria developed by the International Commission on Radiological Protection. For gross alpha, gross beta, plutonium, americium, tritium and uranium, standards are based on existing ambient quality in the respective segments.

Adoption of these standards is not expected to have a major economic impact on the Rocky Flats Plant. In particular, the ambient quality-based standards have been established taking any existing impact from Rocky Flats into account. Moreover, the specific standards are based on the mean plus approximately two standard deviations of the available data (upper 95 percent confidence limit of the mean) which in this case is more lenient than the 85th percentile normally used by the Commission for ambient quality-based standards. Even if there were an economic impact on the Rocky Flats Plant, as a matter of policy the Commission believes it is appropriate to limit radionuclides in state waters to their lowest practical level, to minimize environmental exposure to such constituents. At the same time, these standards clearly are sufficient to protect the classified uses, since they are all below (more stringent than) current drinking water standards or other available health-based criteria for these radionuclides.

At the hearing, DOE argued that the Commission should not adopt radionuclide standards because DOE is self-regulating with respect to such pollutants. The Commission is authorized by the federal Clean Water Act and the Colorado Water Quality Control Act to adopt ambient water quality standards. The issue of regulatory authority over discharges from DOE facilities is not within the scope of this hearing and need not be addressed in adopting such standards. However, even if there are restrictions on the ability of the State or EPA to implement these standards, their adoption by the Commission is appropriate, to inform DOE and the public of the levels that this Commission believes can and should be met.

In addition to the organic chemical and radionuclide standards, the Commission has adopted the aquatic life, water supply and agricultural values for inorganics and metals from Tables II and III of the Basic Standards and Methodologies for Surface Water as standards for segments 4 and 5. These additional standards will help provide the extra layer of protection for the uses of waters in the downstream segments (2 and 3). The Commission also revised the metals standards for Standley Lake, to correspond with the new table values contained in Table III.

For segment 5, the Commission has adopted a narrative temporary modification based on existing ambient quality, to remain in effect until February, 1993. In accordance with the discussion of this segment above, temporary modifications appear necessary due to the current impacts of Rocky Flats Plant operations, until such time as those impacts can be eliminated and the underlying classifications and standards achieved. Temporary modifications at a level of ambient quality does not reduce environmental protection in the short run, since public health is protected by the more stringent requirements on the downstream segments.

The goal of the Commission is for the classifications and standards of segment 4 to be achieved in segment 5 as soon as possible. It is recognized that Rocky Flats may not be able to meet the standards immediately and that temporary modifications may be necessary. However, insufficient data presently exists upon which to develop a full set of numerical temporary modifications at this time. It is expected that sufficient data should be generated in the next 3 years to allow time to collect adequate data for DOE to decide whether to seek numeric temporary modifications for particular parameters.

(4) Designations

Based on their existing classifications and the evidence submitted at the hearing regarding their existing quality, the Commission has determined that it is appropriate to adopt a High Quality 2 designation for the waters in Great Western Reservoir and Standley Lake (segments 2 and 3). From the best information currently available, it appears that existing quality in these reservoirs for the 12 parameters listed in section 3.1.8(1) (b) (i) (C) of the Basic Standards and Methodologies for Surface Water is better than that specified in Tables I, II and III for the protection of aquatic life class 1 and recreation class 1 uses.

Parties to the December 4, 1989 Hearing

1. The City of Arvada
2. Environmental Defense Fund
3. The City of Broomfield
4. The City of Westminster
5. Department of Energy

38.33 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY, AND PURPOSE; MARCH, 1991 HEARING ON SEVERAL SEGMENTS:

The provisions of 25-8-202(1) (a), (b) and (2); 25-8-203; 25-8-204; and 25-8-402 C.R.S. provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted, in compliance with 24-4-103(4), C.R.S., the following statement of basis and purpose.

Basis and Purpose:

First, the Commission has revised the introductory language for the tables in section 3.8.6. The purpose of this language is to explain the references to “table value standards” (TVS) that are contained in the Tables. These provisions also include the adoption of new hardness equations for acute and chronic zinc standards throughout the basin. Based on information developed since the “Basic Standards” were revised, these new equations have been determined to represent more appropriate zinc criteria. New information contained in a 1987 EPA zinc criteria document indicates Colorado’s zinc criteria is overly restrictive, especially at hardness in the range of 50 to 200 mg/l. Adoption of the Colorado zinc criteria as site-specific TVS standards may potentially cause undue treatment costs to dischargers who would be regulated by those standards until they could be adjusted through a section 207 hearing or during the next round of basin hearings.

The existing criteria for zinc contained in the “Basic Standards” was developed by the Commission’s Water Quality Standards and Methodologies Committee. At the time of development, the EPA zinc criteria document was not available. Because of some limited data indicating a consistent chronic toxicity level at water hardnesses of 200 mg/l or less, the Commission adopted a chronic criteria of 45 ug/l for hardness of 0 to 200 mg/l. This is much more stringent than EPA criteria which, as an example, specifies chronic zinc levels of 59 ug/l and 190 ug/l at hardness of 50 mg/l and 200 mg/l, respectively.

The Commission also has adopted additional organic chemicals standards for certain aquatic life segments. The standards added in section 3.8.5(2) (e) are based on water and fish ingestion criteria contained in the U.S. Environmental Protection Agency’s Quality Criteria for Water, 1986 and updates to this document through 1989, which is commonly referred to as the “Gold Book”. The standards are being applied to all Class 1 aquatic life segments, and for those Class 2 segments for which there is evidence of significant fishing, which is likely to result in human consumption of the fish. The standards are based on a 10-6 risk factor.

The application of these standards to waters where actual or potential human ingestion of fish is likely is important in assuring that Colorado achieves full compliance with the toxics requirement of section 303(c)(2) (B) of the federal Clean Water Act. It is reasonable to assume that most Class 1 aquatic life segments, because of their variety of fish species and/or suitable habitat, have the potential for fishing and the resultant human consumption of the fish or other aquatic life.

One other general issue should be addressed at the outset. Several parties to this proceeding submitted documents expressing concern regarding the adoption of high quality 2 designations because of potential impact on water rights held by these entities. The Commission transmitted these documents to the State Engineer and the Colorado Water Conservation Board to solicit any comments that they might have. In its transmittal letter, the Commission stated its preliminary assessment that the proposed adoption of high quality 2 designations did not present the potential to cause material injury to water rights.

The high quality designation merely indicates that an antidegradation review will be required for certain activities. In its regulations, the Commission has specifically provided that in an antidegradation review "any alternatives that would be inconsistent with section 25-8-104 of the Water Quality Control Act shall not be considered available alternatives." If an issue should arise as to whether the antidegradation review criteria prohibiting material injury are being applied correctly to a specific proposed activity, that issue would be considered during that specific review process, including going through consultation with the State Engineer and Water Conservation Board.

The Commission received a letter back from the State Engineer, stating his agreement with the Commission's preliminary assessment. No letter was received from the Water Conservation Board, although the Board had previously indicated its agreement with a similar conclusion when this issue was raised in an earlier rulemaking hearing. Upon consideration of all of the available information, the Commission has determined that the adoption of high quality 2 designations in this proceeding does not cause material injury to water rights.

The other changes considered and adopted are addressed below by segment.

A. Overview of Segment-Specific Changes

Two issues were in controversy for several of the segments addressed in this hearing. The most controversial was whether to apply a high quality 2 designation to certain waters. In several instances, designations proposed by the Water Quality Control Division were opposed on the basis that there was inadequate information to support such a designation. The three most common challenges to the adequacy of the information were: (1) detection limits for some data were too high to determine whether ambient quality was better than "table values;" (2) for some segments there was not adequate data for some or all of the twelve parameters referenced in section 3.1.8(2) (b) (i) (C); (3) for some segments the sample location(s) of available data were too limited to generalize the results to the whole segment.

The Commission explicitly considered establishing minimum data requirements when it adopted the current antidegradation regulation, and consciously rejected that option. Rather, the Commission recognized that it would be necessary to rely on best professional judgement to determine what constitutes representative data in a specific situation. These issues are not new, or unique to high quality designations. The Commission has for years been required to make water quality classification and standards decisions in the absence of perfect information. Requiring substantial, recently acquired data for all parameters from multiple locations in each segment before establishing high quality designations would assure that very few waters in Colorado would receive this protection for many years to come. As a policy matter, the Commission has determined that high quality designations may appropriately be established based on a lower threshold of available data than that suggested by several parties to this proceeding.

The Commission acknowledges that the data base for the key parameters on a number of segments that were considered for high quality designation is less than ideal. On some segments, there is no specific data available from points within the segments for some of the key parameters. In addition, some of the data represents the results of a small number of samples, or samples taken at a small number of locations on the segments. In light of this fact, the Commission continues to encourage all interested parties to participate in efforts to improve the data base, and thereby further strengthen the decision-making process.

The Commission also notes that having adequate information upon which to base a high quality designation is not dependent solely on the availability of specific data for a particular segment. Relevant information may include data from downstream segments, comparison of available data with that for similar streams, and information regarding the presence or absence of activities likely to adversely impact the quality of the segment in question.

Where there is a substantial basis for considering a high quality 2 designation, in the face of some residual uncertainty the Commission has chosen to err in the direction of providing the protection. This policy decision is strongly influenced by the ease with which designations can be changed if better data is developed in the future. Unlike classifications, downgrading restrictions do not apply to water quality designations. If new site-specific data is developed that demonstrates that a particular high quality designation is improper, it can and should be removed by the Commission.

With respect to detection limits, the Commission has chosen to continue the same policy that it has followed for over ten years-i.e. to treat data reported as below detection limits as being equivalent to zero. While other methodologies have been proposed and may be defensible, the Commission has determined that this approach is reasonable and appropriate. Requiring routine analysis to below table value standard levels for all constituents would substantially increase monitoring costs for the state and the public. Moreover, the Commission believes that the “zero” assumption is fair, so long as it is applied consistently throughout the water quality regulatory system. Use of zeros in the water quality designation or standard-setting process may marginally err in the direction of increased protection. However, when zeros are used in applying standards to specific dischargers, those dischargers benefit by the assumption that there is more assimilative capacity available in the stream (allowing higher levels of pollutants to be discharged) since the existing pollution is considered to be zero rather than some level between zero and the detection limit.

A second recurring issue addressed for multiple segments in this hearing is the appropriate basis for recreation class 1 classifications. The Commission generally has declined to change the recreation classification from class 2 to class 1 unless there was evidence submitted that class 1 uses were present or likely for the waters in question. Unless the use is present or likely, application of use-protection-based water quality standards does not appear appropriate. At the same time, the Commission notes that this approach does not diminish application of antidegradation protection requirements for high quality waters. Where the existing quality is adequate, a high quality 2 designation has been established, requiring antidegradation requirements to be met before any degradation is allowed, even though the recreation classification is class 2.

A related issue is the determination of which uses warrant the class 1 recreation classification. The recreation classification definition in section 3.1.13 (1) (a) (i) of the Basic Standards and Methodologies for Surface Water refers to “activities when the ingestion of small quantities of water is likely to occur,” and states that “such waters include but are not limited to those used for swimming.” In the past the Commission often has applied the class 1 classification only when swimming occurs, and not where other recreational uses that may result in ingestion of small quantities of water occur. The Commission now believes it is appropriate for the class 1 classification also to be applied for uses such as rafting, kayaking, and water skiing. The Commission has continued its approach to recreation classifications applied in the last three basin-specific hearings (Gunnison, Lower Colorado, Upper Colorado), for the reasons articulated at length in those proceedings.

B. <u>Aquatic Life Class 1 with Table Values added; New High Quality 2 Designations</u>

South Platte River segments 3, 4, 5b and 6
Bear Creek segment 1a
Clear Creek segments 1, 3a and 4
Boulder Creek segment 4a

Numerical standards for metals for these segments have in most instances been based on table values contained in Table III of the previous Basic Standards and Methodologies for Surface Water. Table III has been substantially revised, effective September 30, 1988. From the information available, it appears that the existing quality of these segments meets or exceeds the quality specified by the revised criteria in Table III, and new acute and chronic table value standards based thereon have therefore been proposed. There are also some of these segments whose previous standards were based in part on ambient quality, since their quality did not meet old table values based on alkalinity ranges. However, these segments generally have much higher hardness than alkalinity, and the new table values (based on hardness-dependent equations) are now appropriate as standards. The one exception is Clear Creek segment 3a, for which an ambient quality-based lead standard has been adopted.

A High Quality 2 designation has been established for each of these segments. The best available information in each case indicates that the existing quality for dissolved oxygen, pH, fecal coliform, cadmium, copper, iron, lead, manganese, mercury, selenium, silver and zinc is better than that specified in Tables I, II, and III of the Basic Standards and Methodologies for Surface Water, for the protection of aquatic life class 1 and their existing recreation classification. The Commission notes that a stipulation has been agreed to by the Water Quality Control Division and the Chatfield Basin Association, addressing antidegradation reviews for discharges affecting phosphorus concentrations in the South Platte segment 6.

C. Aquatic Life Class 1, Retaining Tables Values; New High Quality 2 Designations

South Platte River segments 1a, 2a, 8, 10b, 12, and 13
Bear Creek segments 3 and 6
Clear Creek segment 6
Boulder Creek segment 3
Big Thompson River segments 7 and 12
Cache la Poudre River segments 3, 4, 6, and 15
Laramie River segment 2
Republican River segment 2

Table values contained in Table III of the Basic Standards and Methodologies for Surface Water, effective September 30, 1988 have already been adopted for these segments. High quality 2 designation is adopted for each of these segments based on their cold water class 1 aquatic life or warm water class 1 aquatic life and recreation class 1 classifications, and based on available water quality data.

Big Thompson segment 12 has been resegmented, to place several lakes that were in this segment into a new segment 14. The waters remaining in segment 12 have been reclassified recreation class 1, due to the presence of water skiing.

With respect to Cache La Poudre segment 6, it is the Commissions intention to endorse the position of the Division, that because the inlet to Halligan Reservoir changes, the segment boundary also changes. In the event that Halligan Reservoir is expanded, it is the Commissions intention that the expanded portion of the reservoir will assume the designations, classifications and standards of the existing reservoir, and that antidegradation review would not be required for the expansion under existing regulations.

The Commission designated Cache La Poudre segment 3 as high quality 2 because water quality samples taken from the Division station in the uppermost reaches of segment 10, just below the boundary of segment 3, indicate that the existing quality for all 12 parameters is better than the relevant table values. The Northern District opposed designating segment 3 as high quality 2, principally because of its concern that such designation may adversely affect the development and use of its water rights. The Northern District expressed particular concern that this designation could be applied in a manner that would prevent or seriously impede the development of its proposed Poudre Project. The Commission does not believe that the mere designation of a segment as high quality 2 adversely affects water rights, and it points out that section 25-8-104 of the State Water Quality Act would prohibit the application of the high quality 2 designation in a manner that would supersede, abrogate, impair, or cause material injury to the exercise of water rights, including the Northern District's development of the Poudre Project.

Two parties supported resegmenting segment 3 so that it corresponds with the boundaries of the Poudre River designated a scenic river under the federal Wild and Scenic Rivers Act. NFRWQPA supported creating a new segment out of the leftover downstream portion of segment 3, between the boundary of the Wild and Scenic Rivers designation to the Monroe Gravity Canal, and the Northern District recommended including this remaining portion of segment 3 in the upper portion of segment 10. The Commission determined that resegmenting to create a new segment was unnecessary because the standards and classifications for the newly created segment would remain the same as that for the resegmented segment 3, and the water quality data supported designating the entire existing segment 3 as high quality 2. Including the lower portion of segment 3 into segment 10 was rejected because it raised problems with downgrading, as segment 10 is classified as class 2 aquatic life, whereas segment 3 is classified as class 1 aquatic life.

D. Existing High Quality 1 or 2 Segments; New Classifications and Standards

South Platte River segments 1b and 9
Bear Creek segment 7
Clear Creek segment 19
Boulder Creek segment 1
St. Vrain Creek segment 1
Big Thompson segment 1
Cache la Poudre River segment 1
Laramie River segment 1

Except for Cache La Poudre segment 1 and Laramie River segment 1, these segments were already described as High Quality Class 2, and available information indicates that the parallel new High Quality 2 designation continues to be appropriate for each. All are within wilderness areas. In addition, the following use classifications, and associated table value standards, are proposed for these segments:

Recreation - Class 2
Cold Water Aquatic Life - Class 1
Water Supply
Agriculture

These classifications and standards are appropriate based on the best available information regarding existing quality. These provisions would apply in the event that degradation is determined to be necessary following an activity-specific antidegradation review.

Cache la Poudre segment 1 and Laramie River segment 1 were already described as High Quality Class 1, and available information indicates that the parallel new High Quality 1 designation continues to be appropriate for each.

E. New Use-Protected Designations; No Change in Numeric Standards

South Platte River segments 5c, 7a, 7b, 10a, 11a, 16, and 17a
Cherry Creek segments 1 and 4
Clear Creek segments 8, 11, 12, 16, 17, and 18b
Big Dry Creek segments 1, 4, and 5
Boulder Creek segments 4c, 4d, 5, 7b, 8, and 11
St. Vrain Creek segment 6
Middle South Platte segment 3
Big Thompson River segments 4, 5, 6, 10, and 13
Cache la Poudre River segments 8, 12, 13, and 16
Lower South Platte River segments 2 and 3
Republican River segments 1, 6, and 7

Except for Clear Creek segment 11 and Lower South Platte segment 3, these segments all qualify for a use-protected designation based on their present classifications. All except Big Thompson segment 13, which is classified only for water supply, are aquatic class 2 streams, or warm water aquatic class 1 streams with a class 2 recreation classification. Existing standards are recommended because these segments have only a minimal number of standards, with no metal or nutrient standards, table value standards have already been adopted, or there is insufficient data to recommend dissolved standards.

Clear Creek segment 11 is designated use-protected because it has three parameters that exceed table values. In addition, a typographical error has been corrected, to reflect the Commission's earlier decision for this segment to be recreation class 1. Lower South Platte segment 3 is designated use-protected because it is identified in the section 305(b) report as eutrophic.

Clear Creek segment 17 is one aquatic class 2 segment for which the Commission has adopted additional organic chemical standards based on water and fish ingestion criteria, because it supports fishing in its upper headwaters in Golden Gate State Park and in its lower reach including Arvada Reservoir. The Commission rejected a proposal to adopt these organics standards for Upper South Platte segment 16. The Commission encourages the Division to work with the Division of Wildlife and develop information prior ro the next triennial review as to which of these waters are in fact used for fishing.

The Commission has resegmented Clear Creek segment 18 and Big Dry Creek segment 1, to distinguish those waters that do and do not impact the Standley Lake water supply. New Clear Creek segment 18a and Big Dry Creek segment 6 have had a water supply classification and corresponding standards added.

No changes have been made in the standards for Big Dry Creek segments 4 and 5, located on and near the Rocky Flats Plant. Because the additional organics standards have been added to section 3.8.5(2), the formatting of the standards for these two segments has changed.

F. New Use-Protected Designations; Revised Numeric Standards

South Platte River segments 2b, 2c, 11b, and 15
Bear Creek segments 1b, 2, 4a, and 5
Cherry Creek segment 3
Clear Creek segments 5, 7, 13, 15, and 18a
Big Dry Creek segment 6
Boulder Creek segments 6, 7a, and 10
St. Vrain Creel segments 3 and 5
Middle South Platte segments 1 and 4
Big Thompson River segments 3 and 9

Cache la Poudre 7, 10, and 11
Lower South Platte River segment 1
Republican River segment 5

Except for Clear Creek segment 5, all of these segments are aquatic life class 2 streams with numeric standards to protect the existing aquatic life, or warm water aquatic class 1 streams with a class 2 recreation classification. Clear Creek segment 5 has three parameters that exceed table values. Numerical standards for metals have in most instances been based on table values contained in Table III of the previous Basic Standards and Methodologies for Surface Water. Table III has been substantially revised, effective September 30, 1988. Except as indicated below, from the information available, it appears that the existing quality of these segments meets or exceeds the quality specified by the revised criteria in Table III, and new acute and chronic table value standards based thereon have been adopted. There are also some of these segments whose previous standards were based in part on ambient quality, since their quality did not meet old table values based on alkalinity ranges. However, these segments generally have much higher hardness than alkalinity, and the new table values (based on hardness-dependent equations) are now appropriate as standards.

For Clear Creek segment 13, ambient quality-based standards have been adopted for copper, iron and zinc. For Lower South Platte segment 1, an ambient quality-based standard for iron has been adopted.

As noted above water supply classifications and corresponding standards have been adopted for new Clear Creek segment 18a and Big Dry Creek segment 6. Big Dry Creek segment 6 constitutes waters of the state, and does carry water into Standley Lake, which serves as a water supply for a large metropolitan area. Although opponents of the classification argued that Big Dry Creek segment 6 is a ditch, the Commission agreed with the proponents of the classification that it is a stream.

Middle South Platte segments 1 and 2 have been combined, since the classifications and standards are the same for both segments. Bear Creek segments 1b, 4a, and 5, Middle South Platte segment 4, Big Thompson segment 3, and Cache la Poudre segments 7 and 10, are additional aquatic life class 2 segments to which the Commission has applied the additional organics standards for water and fish ingestion, due to the presence of fishing.

<u>Clear Creek segments 5 and 7</u>

Segment 5, West Clear Creek, has 85th percentile concentrations that exceed table value standards for cadmium, manganese and zinc. Metal loads to this segment are affected by Woods Creek. Point source controls are expected to be implemented at the Urad facility by July, 1993 which discharges into Woods Creek. It is expected that these point source controls will improve water quality in both Woods Creek and the West Fork of Clear Creek below Woods Creek. Therefore temporary modifications are adopted until July 8, 1993 in order to implement the point source controls and to conduct studies for development of site specific criteria based standards which may replace some table value standards adopted at this time. It is expected that such site specific standards will protect the cold water aquatic life class 1 use classification of segment 5.

Segment 7, Woods Creek, is tributary to West Clear Creek and is a significant source of the metals load to West Clear Creek below the confluence with Woods Creek. The Division proposed numeric values based on achieving the proposed underlying standards and temporary modifications in West Clear Creek, by dividing the table value standard (at Woods Creek hardness = 120) for cadmium, manganese and zinc by a factor of 0.7 to account for the proportion of flow in West Clear Creek from Woods Creek. Likewise, proposed temporary modifications for West Clear Creek were divided by 0.7 to derive temporary modifications for Woods Creek. This is a departure from normal procedure due to difficulties in interpreting ambient data for Woods Creek in deciding appropriate underlying standards at this time. As stated above, it is expected that point source controls will be implemented at the Urad facility by July, 1993 which will improve water quality in Woods Creek. Therefore, temporary modifications and underlying standards are adopted in segment 7 until July 8, 1993 in order to implement the point source controls and to conduct studies for development of site specific criteria based standards. The objective of these site specific criteria based standards for segment 7 will be to protect the cold water aquatic life class 1 use classification of segment 5. An example of an approach that will be considered was included in the written testimony of Climax Molybdenum Company. The Commission agrees that the standards for segment 5 and 7 will be reviewed prior to the next triennial review if it is presented with a proposal to modify the standards.

Upper South Platte segment 15

Revised one-day average standards for dissolved oxygen, and revised dissolved manganese and total residual chlorine standards have been adopted for this segment. The dissolved manganese standard is based on the 85th percentile concentration of the ambient data. The total residual chlorine standards are based on EPA=s Ambient Quality Criteria for Chlorine - 1984 (EPA 440/5-84-030).

The dissolved oxygen standards are the same as those that are currently in effect for segment 15. These standards were adopted by the Commission in 1986 for segment 15 to protect its warm water aquatic life class 2 use and have not been achieved in the past. The Commission previously recognized the limitations of the segment in applying an unionized ammonia standard of 0.1 mg/L. In November 1990 the Metro District placed into operation nitrification/denitrification facilities which remove ammonia from about one-half of the Metro District’s effluent. The capital cost of these facilities was over $50 million and annual O & M costs are over $2 million. These nitrification facilities are expected to improve the water quality in-stream for both un-ionized ammonia and dissolved oxygen. There is uncertainty about whether the new facilities will result in the segment meeting the current standards or whether additional nitrification facilities are necessary. A study performed for the Metro District on nitrification of the remainder of its effluent indicated that such facilities could cost between $70 million and $112 million with annual O & M costs of $2.2 to $4.7 million.

Continuing the current dissolved oxygen standards is appropriate to allow time to determine the level of water quality improvements which will be provided by the facilities that recently were placed into operation, to determine the alternatives which would be most effective if the standards are not met with the existing treatment facilities, and to develop information to develop scientific evidence on which to base site specific standards. It is not the Commission’s intention to require the Metro District to construct additional nitrification/denitrification facilities before the above activities are accomplished.

During the period between now and the next triennial review, the Metro District has agreed to work with the Division and with EPA on: 1) the development of additional information on the location and extent of any instream dissolved oxygen problems; 2) studies to form a basis for acute and chronic site-specific standards for segment 15; and 3) determining the best methods of insuring that segment 15 supports its designated uses.

By readopting the current standards, the Commission has determined that these standards for segment 15 should be extended for three years. It is the intent of the Commission to reevaluate these standards during the next triennial review and to revise these standard if necessary. It is the Commission's intention that these standards continue to be applied as minimum 1-day means in conformance with the Division's established modeling procedures.

G. No Change in Classification; Revised Numeric Standards; No Designations

Clear Creek segments 2 and 10
St. Vrain Creek segment 4
Big Thompson segment 2

These are waterbodies whose classifications are appropriate for HQ2 designation (CW1 or WW1 and Rec 1) but had quality not suitable for a water supply classification or 85th percentile values of one or two parameters exceeding the criteria for class 1 aquatic life. Table value standards are adopted except for an ambient quality-based zinc standard for Clear Creek segment 2.

H. Changes in Classification; Revised Numeric Standards; No Designations

South Platte River segment 14 and 17b

These segments are waters used for recreational activities that include whole body contact. Therefore, the Commission has upgraded their recreation classification from class 2 to class 1. For segment 14, the class 1 classification has a seasonal qualifier so that it applies only from April through October, to reflect the period during which this use occurs.

I. Aquatic Life Class 2; New High Quality 2 Designations

Bear Creek segments 4b and 4c, Swede Gulch, are aquatic life class 2 cold water segments for which table value standards had already been adopted. After reopening the hearing on June 4, 1991 to receive additional testimony regarding these segments, the Commission decided to designate them high quality 2, since data shows that existing quality is better than table values for each of the parameters in question. In addition, the additional organics standards for fish and water ingestion were adopted due to the presence of fishing on these segments.

J. No Changes in Classifications or Standards; No Change in Designations

South Platte River segment 5a and 17c
Cherry Creek segment 2
Bear Creek segment 1c
Clear Creek segments 3b, 9, and 14
Big Dry Creek segments 2 and 3
Boulder Creek segments 2, 4b, 9 and 12
St. Vrain Creek segment 2
Big Thompson segments 8, 11, and 14
Cache la Poudre River segments 2, 9, and 14
Republican River segments 3 and 4

Bear Creek segment 1c is Bear Creek Reservoir for which a separate rule making hearing is scheduled for May, 1992. For the remainder of these segments, the Commission does not believe that the available information warrants changes in their classifications, standards, or designations at this time. The one exception to this is that for those segments that are aquatic life class 1, the Commission has adopted the additional organics standards for water and fish ingestion, as it has done throughout the basin.

The Commission notes that a stipulation has been agreed to by the Water Quality Control Division and the Cherry Creek Basin Water Quality Authority addressing antidegradation reviews for discharges affecting phosphorus concentrations in Cherry Creek segment 2, Cherry Creek Reservoir. That stipulation forms a part of the basis for leaving Cherry Creek Reservoir undesignated. The Commission also notes that a stipulation was entered into between the Division and Coors, with respect to Clear Creek segment 14.

Parties to the March, 1991 Hearing

1. City of Westminster
2. Metro Wastewater Reclamation District
3. Noth Front Range Water Quality Planning Association
4. Centennial Water & Sanitation
5. Chatfield Basin Authority
6. Jefferson Center Metropolitan District No. 1
7. City of Northglenn
8. Farmers' High Line Canal and Reservoir Company
9. Jackson Lake Reservoir and Irrigation Company
10. Northern Colorado Water Conservancy District and Municipal Subdistrict, Northern Water Conservancy District
11. Allenspark Water & Sanitation District & St. Vrain & Left Hand Water Conservancy District
12. City of Broomfield
13. Climax Mlybdenum Co.
14. City of Ft. Collins
15. Kodak Colorado Division
16. Hendricks Mining Co.
17. Division of Wildlife
18. City of Arvada
19. Agricultural Ditch and Reservoir Company
20. Adolph Coors Company
21. Farmers Reservoir & Irrigation
22. Martin Marietta Corporation
23. Littleton/Englewood Bi-City
24. City of Longmont
25. Cherry Creek Basin Water

38.34 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY, AND PURPOSE; JANUARY, 1992 HEARING ON SEVERAL SEGMENTS:

The provisions of 25-8-202(1) (a), (b) and (2); 25-8-203; 25-8-204; and 25-8-402 C.R.S. provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted, in compliance with 24-4-103(4), C.R.S., the following statement of basis and purpose.

Basis and Purpose:

1. <u>Acute Ammonia Standards</u>

The adoption of the acute un-ionized ammonia equations as standards for cold water and warm water aquatic life segments which have existing chronic un-ionized standards should provide a more accurate method for protecting these segments from short term water quality impacts due to ammonia. The Commission also believes this is consistent with its approach in other basins of adopting both acute and chronic standards for parameters (e.g. metals) for which acute and chronic criteria have been established in the Basic Standards. It will also bring a consistency to the application of un-ionized ammonia standards in the South Platte Basin itself, where in earlier hearings the Commission established both acute and chronic standards for un-ionized ammonia on six segments.

2. Mercury Standards

The designation of the total form of mercury as appropriate for the final residual value (FRV) mercury standards is consistent with a recent change to the Basic Standards. The Commission has determined that total mercury is the appropriate form to be regulated in water bodies where bioaccumulation of methyl-mercury in edible fish tissue could pose a risk to human health. The acute and chronic aquatic life mercury standards will continue to be applied as dissolved mercury on those segments for which site-specific justification was made for their use in lieu of the FRV standard.

3. Chronic Un-ionized Ammonia Standards

The Commission agreed to change the table listing for all coldwater aquatic life segments for the chronic un-ionized ammonia standards listed as NH3 (ch)=TVS to read NH3 (ch)=0.02, for clarification and consistency with the way that the warmwater segments list the un-ionized ammonia standard. There is no change to the numeric standard for any segment with this action.

4. Segment 7b Temporary Modification

The Commission has agreed to extend the existing temporary modification for segment 7b of the Upper South Platte Basin, with a new expiration date of April 30, 1994. Martin Marietta Astronautics Group has been approached by the Colorado Department of Parks with a proposal to direct its treated wastewater effluent to a new wetlands to be constructed on Chatfield State Recreation Area property. Martin Marietta Astronautics Group, the Colorado Department of Parks, the Colorado Department of Health and several other organizations and agencies have met regularly over the past year in an effort to determine the feasibility of the project. There are several remaining issues to be addressed and resolved prior to construction. The currently proposed construction schedule for the wetlands does not support the April, 1992 deadline currently dictated by the regulations. The extension of the deadline is required in order to allow the wetlands project to proceed.

New regulations dealing with water quality standards in wetlands are being proposed. These new regulations may have an impact on the participation of Martin Marietta in the wetlands project. Martin Marietta needs additional time to evaluate the proposed new standards for impact to the wetland project.

Martin Marietta has been closely monitoring the sulfate levels in its treated effluent and the levels in the ground water withdrawal point (the five-sided well).Over the course of the monitoring period, sulfate levels in the ground water have remained unchanged, while sulfate levels in the effluent have shown a decrease of approximately 100 mg/l. The continued discharge of sulfate at the current levels is not expected to impact the ground water quality as existing trends have shown.

PARTIES TO THE PROCEEDINGS OF THE PUBLIC RULEMAKING HEARING JANUARY 6, 1992

1. Martin Marietta Astronautics Group
2. Division of Wildlife
3. North Front Range Water Quality Planning Association
4. The City of Fort Collins
5. Kodak Colorado Division

38.35 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY, AND PURPOSE; MAY 5, 1992 HEARING ON SEGMENTS 4c AND 4d OF BOULDER CREEK (COWDREY DRAINAGE) SOUTH PLATTE RIVER BASIN, 3.8.0 (5 CCR 1002-8)

The provisions of 25-8-202(1) (a), (b) and (2); 25-8-203; 25-8-204; and 25-8-402 C.R.S. provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted, in compliance with 24-4-103(4), C.R.S., the following statement of basis and purpose.

Basis and Purpose:

The City of Boulder (the “City”) the Landfill, Inc. (“LI”), entered into a Consent Decree with the United States Environmental Protection Agency (“EPA”) to implement the final remedy at the Comprehensive Environmental Response Compensation and Liability Act (“CERCLA” or “Superfund”) site known as the Marshall/Boulder Landfill (the “Landfill”). The final remedy was selected by EPA in the 1986 Record of Decision (“ROD”) and includes the construction of a ground water collection system and treatment plant which will collect and treat contaminated ground water at the Landfill and discharge the treated ground water to Cowdrey drainage.

The chemicals of concern identified in the ROD include volatile and non-volatile organic chemicals which are being treated using carbon absorption treatment technologies. The final remedy also requires the reduction of metals in the influent to the treatment plant through the use of chemical precipitation processes. Neither of these treatment processes are designed for, or capable of, removing chloride from the influent.

Based on the 250 mg/l chloride water quality standard previously established by the Commission on Segments 4c and 4d of Cowdrey drainage, the EPA determined that the effluent limitation for the treatment plant for chloride would also be 250 mg/l. EPA determined that the 250 mg/l effluent limitation would be identical to the water quality standard since there are times of the year during which the discharge from the treatment plant to Cowdrey drainage would constitute the only flow in the intermittent stream. However, the upper bound estimate of the concentration of chloride in the effluent from the currently planned treatment is approximately 320 mg/l. Reopening the ROD and redesigning the treatment facility to remove chloride to concentrations below 250 mg/l would significantly increase the current capital and operational maintenance costs of the final remedy and would substantially delay implementation of the final remedy without a clear corresponding benefit to human health or the environment.

The 250 mg/l water quality standard for chloride was established on Cowdrey drainage based on the federal secondary drinking water standard for chloride. The secondary standard is a guideline which is recommended to public water system suppliers by the State and federal governments and is not enforceable against water suppliers under either federal or state law. The secondary standard is a recommended guideline because of taste or other aesthetic considerations but there is no evidence of human health effects at 250 mg/l.

These temporary modifications meet the criteria in Section 3.1.7(3)(a) of the Commission regulations. Human induced conditions exist which are correctable within a twenty year period, but a period of years will be required to implement the measures necessary to achieve compliance with the underlying standard. The elevated nitrate and nitrite levels are due to past human activities which a combination of human efforts in source control and natural processes will reduce or remove. If ground water contamination plume controls necessary to meet the underlying nitrate/nitrite standards are operated during the period of Site cleanup, resources may have to be diverted from the highest risk problems now facing the Site to fund that operation. Moreover, the most cost-effective use of resources to address the nitrate/nitrite contamination would be containment and closure of the source, as described further below.

Rocky Flats is implementing cleanup activities that will ultimately reduce nitrate and nitrite levels in ground water and loadings to surface water. The solar evaporation ponds were identified as the source area In the City and LI's request to revise the water quality standard for chloride to 320 mg/l, the City and LI demonstrated that the 320 mg/l standard is protective of all existing uses on Segments 4c and 4d.Based on the information provided to the Commission, the 320 mg/l standard was determined to be protective of the water supply use classification in that the federal secondary chloride standard will be met at the current points of use. Furthermore, the Commission determined that the 320 mg/l water quality standard is protective of aquatic life since EPA's Water Quality Criteria Document for Chloride (1988) indicates there are no adverse effects from chloride to the most sensitive aquatic life species identified in the aquatic life survey of Cowdrey drainage.

The Commission expressly determined that this modification of the water quality standard for chloride is appropriate considering: 1) that there are no current drinking water or aquatic life effects associated with the standard adopted for these segments; 2) the substantial costs and delays associated with modifying the treatment facility at the Marshall/Boulder Landfill to treat for chloride; and 3) that this is a CERCLA remedy being implemented at the Landfill designed to remediate the potential human health and environmental impacts in the area and therefore, there is a net beneficial effect to the environment in general and water quality in Cowdrey drainage as a result of implementation of this remedy.

The Commission also has taken this action based on its understanding that the City and LI have agreed with EPA to conduct monitoring to confirm that chloride levels do not exceed 250 mg/l at the point of any current or potential water supply intakes or cause an exceedance of the 250 mg/l chloride standard in any waters receiving discharge from Cowdrey drainage. The Commission can reassess the water quality standards for segments 4c and 4d, including the 320 mg/l standard at a subsequent triennial review at which time the Commission may consider whether the water quality standards continue to be protective of the classified uses on these segments.

The Commission has retained the water supply classifications for these segments to help assure protection of possible future uses, as well as current downstream uses. The Commission=s actions should not be interpreted as indicating that a number different than 250 mg/l is appropriate for the protection of actual water supply uses, or that transferring a treatment burden to water suppliers would be acceptable. Such tradeoffs may need to be considered with respect to Superfund cleanups in the future, but the issue is not presented by the facts of this situation.

PARTIES TO THE RULEMAKING HEARING MAY 5, 1992

1. Landfill, Inc. and the City of Boulder
2. Division of Wildlife

38.36 STATEMENT OF BASIS , SPECIFIC STATUTORY AUTHORITY, AND PURPOSE; MAY 4, 1992 HEARING ON SEGMENT 1c OF BEAR CREEK:

Basis and Purpose: Classifications, Standards, and Water Quality-based Designation:

In deciding the appropriate use classifications and standards the Commission relied on data presented in the Bear Creek Reservoir Clean Lakes Study, conducted by the Denver Regional Council of Governments (DRCOG) in 1990, on data collected by the Jefferson County Mountain Water Quality Association and the city of Lakewood on Water Quality Studies conducted by the Division in 1987, and on water quality data collected by the U.S. Army Corps of Engineers from 1979 through 1991.

Bear Creek Reservoir currently supports recreational uses such as small boating and fishing. Although swimming is not now allowed by the City of Lakewood, this use has occurred in the past and has the potential for occurring as part of future recreational activities at the Bear Creek Park. According to data collected by the Division, DRCOG, the Jefferson County Mountain Water Quality Association and City of Lakewood, the fecal coliform standard of 200 per 100/ml was consistently met in the reservoir. The Commission determined that based on these factors, the Recreation Class 1 is the appropriate classification for segment 1c and that the Goal Qualifier be deleted.

Information collected by the Division, DRCOG, Jefferson County Mountain Water Quality Association and city of Lakewood shows that the Aquatic Life Class 1 Cold Water use is substantially impaired during summer months because of low dissolved oxygen concentrations. This condition is correctable, and otherwise, the reservoir's physical habitat and water levels are currently capable of sustaining class 1 aquatic life. The Commission has thus retained the existing classification.

The Commission decided to retain the existing undesignated status of the water quality-based designations. In deciding this, the Commission considered the twelve key parameter test and other criteria.

For the key parameter test, ambient water quality data collected by the various agencies previously mentioned was compared to table values for all 12 of the key parameters for water quality-based designations. Due to the very limited amount of dissolved metals data, total metals data was used in the comparison for those metals specified as dissolved in the Basic Standards. It was assumed for these metals that if ambient total metals did not exceed the table values, then the dissolved fraction would therefore also not exceed the table values. The 50th percentile of the U.S. Army Corps of Engineers data was compared to the table values at an average reservoir hardness of 75 mg/liter.

Dissolved oxygen and possibly lead were the two parameters whose quality was worse than table value criteria. Dissolved oxygen concentrations frequently were less than the 6 mg/liter standard in the upper mixed layers (epilimnion and metalimnion) during periods of summer stratification in July, August, and September. The Division believes that if total recoverable or dissolved data were available, that lead would meet table values. Support for this claim comes from Division data collected on seven dates in 1987 which indicate that the 50th percentile would be less than the 5 ug/liter detection limit. By comparison the lowest Army Corps of Engineers lead data for the three collections in 1987 was 135 ug/liter. Thus based on the key parameter test, the reservoir could be designated HQ2. However, the Commission decided that due to the advanced degree of eutrophication the reservoir does not warrant a HQ2 designation at this time, but rather is best left undesignated.

Basis and Purpose: Narrative Phosphorus Standard:

The purpose of the narrative water quality standard for phosphorus is to restore and protect the classified beneficial uses of Bear Creek Reservoir, through improvement in trophic state by limiting concentrations of total phosphorus to the extent necessary to prevent excessive algal growth. This standard is intended to operate in conjunction with the Bear Creek Basin Control Regulation, which is being adopted concurrently, and will provide for significant reduction in phosphorus loads to the reservoir.

Data collected by the Division in 1987, by DRCOG during the Phase I Clean Lakes Diagnostic/Feasibility study in 1988 and 1989 and data collected during subsequent reservoir and inflow monitoring in 1990 and 1991, documented the water quality in the reservoir was noticeably degraded due to excessive algal production and resultant low dissolved oxygen conditions. Very high levels of nutrients including total phosphorus were measured. The reservoir trophic state was classified as hypertrophic to eutrophic. Blooms of undesirable blue-green algae were frequent, and were often dominated by species such as Aphanizomenon. Average growing season chlorophyll-a was 19 ug/liter with maximum values exceeding 90 ug/liter. Average secchi depth transparency was 1.7 meters. During summer stratification, the concentrations of dissolved oxygen were near zero throughout the entire hypolimnion layer (bottom unmixed layer of water ranging from 6 to 14 meters deep) and was frequently less than 6 mg/liter in the metalimnion. This eliminated most of the cold water habitat for trout in the reservoir during the months of July, August, and September.

The Commission determined that in order to improve the poor water quality and the resultant impacts on the beneficial uses and aesthetics, that the current trophic condition of hypertrophic to eutrophic will need to be improved. The Commission established that a reasonable goal for improvement is to shift the trophic condition to a range of mesotrophic to eutrophic. This desired condition would place Bear Creek Reservoir in a trophic state similar to those found in other important recreational reservoirs in the Denver-Metro region, such as Chatfield Reservoir which is classified as mildly eutrophic to mesotrophic (Figure 17, Pg. 117 in Bear Creek Reservoir Clean Lakes Study).

Because the focus of this narrative standard is improvement in trophic condition, it is important to establish the basis for trophic classification. Trophic state is a classification based on nutrient status and level of biological productivity. Lakes with few available nutrients and a low level of biological productivity are termed oligotrophic; those with high nutrient levels and a high level of productivity are termed eurotrophic. Those lakes between oligotrophic and eutrophoic are termed mesotrophic. Lakes in advanced eutrophy are termed hypertrophic. These terms are descriptive and are not exact. The system used in the Bear Creek Reservoir Clean Lakes Study (Figures 9 and 10, Pg. 88 and 89) provides for open boundaries between categories, thus allowing for overlap in classification based on a probability of being classified into a particular category by a large number of limnologists.

Common indicators of nutrient status and productivity include water transparency, as measured by secchi depth; the amount of algae as measured by average and peak chlorophyll-a concentrations; and nutrient status as measured by average lake phosphorus concentration. Traditionally the average concentration of chlorophyll-a has been selected by the Commission as the indicator of lake condition. For Bear Creek Reservoir, however, peak algal biomass (chlorophyll-a) was selected as the most important of these indicators upon which to assess trophic response, because algae blooms are most often associated with impaired uses. To achieve the goal of change in trophic status, a 16 percent reduction in the frequency of nuisance algal blooms during the growing season would need to be achieved, as well as a reduction in frequency and magnitude of the peak chlorophyll-a concentrations.

Available scientific evidence indicates that, in general, the amount of algae is directly related to the concentration of nutrients, in particular total phosphorus. Experience in lake and reservoir restoration around the country during the past two decades has shown that control and limitation of phosphorus supply remains one of the most effective means of controlling eutrophication. In order to achieve a change in trophic status through reduction in algae growth there will, therefore, have to be a substantial reduction in total phosphorus concentration in the reservoir. The phase I study indicates that phosphorus concentrations in the reservoir averaged 111 ug/liter during the growing season. Water quality models predict a 16 percent reduction in frequency of blooms will require a 70% reduction in external phosphorus loading to the reservoir. There would also need to be concomitant in-lake treatment to reduce internal loading and to improve hypolimnion dissolved oxygen concentrations.

Because of the advanced state of eutrophication in Bear Creek Reservoir and the goal to improve degraded conditions, the normal approach of setting a fixed numeric in-lake phosphorus standard was not followed. In other Colorado reservoirs, ambient based phosphorus standards were adopted by the Commission to maintain the existing ambient chlorophyll-a levels and thereby maintain the existing trophic conditions. The narrative standard approach is used here as an alternative that provides flexibility in establishing phosphorus controls in the watershed. This flexibility is needed due to the uncertainty in predicting the specific in-lake phosphorus concentrations required to achieve the clean-up goal and in predicting the reservoir response to algae growth from nutrient reductions. The Commission believes that because of this more flexible approach that substantial monitoring of lake inflow and lake conditions will be required to track the success of reducing phosphorus loading to the reservoir, to make adjustments in point and non-point control strategies, and to document shifts in reservoir trophic state. The Commission intends that the standard be periodically evaluated at triennial reviews.

PARTIES TO THE RULEMAKING HEARING MAY 4, 1992

1. Jefferson County Mountain Water Quality Association
2. Jefferson County
3. Denver Regional Council of Governments
4. Nicole & Charles Moody and Family
5. The City of Lakewood

38.37 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY, AND PURPOSE; NOVEMBER 2, 1992:

The provisions of 25-8-202, 25-8-204, 25-8-207 and 25-8-402 C.R.S., provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted, in compliance with 25-4-103 (4) C.R.S., the following statement of basis and purpose.

BASIS AND PURPOSE

<u>Segment 5, West Clear Creek:</u>

The cadmium value of 2.9 ug/l for the temporary modifications is based on the Division=s proposal at the hearing. The manganese equation for the temporary modifications is based on the Climax hearing proposal which was based on toxicity tests using fathead minnows and ceriodaphnia dubia at four different hardness levels. The Radium 226 and 228 value of 10 piC/L (total recoverable) is based on a stipulation between the parties. It is to be measured at U-1 which is 0.3 miles downstream of the confluence of the West Fork of Clear Creek with Woods Creek, with a 60 day delay in reporting results in the discharge monitoring reports. The Commission has adopted this temporary modification in view of the uncertainty of the existing radium standard (e.g., the EPA has proposed a MCL of 20 piC/L each for radium 226 and radium 228 and the commission has scheduled a hearing in February 1994 to consider the statewide radionuclide standards) and because of the significant cost to Climax to meet the existing statewide radium standard. The Commission evaluated the standards for radium 226 of 21 piC/L and radium 228 of 6 piC/L proposed by Climax and considered the potential use of those standards in clean up actions. The Commission believes that further consideration should be given to the standards proposed by Climax in the statewide radionuclide hearing. The chronic zinc value for the temporary modifications is based on the Climax hearing proposal which was based on the recalculation method. The standards and temporary modifications agreed to herein will go into effect on July 9, 1993. The temporary modifications will expire, unless otherwise extended, on July 8, 1996. On July 8, 1996 unless the Commission has promulgated site-specific standards, the acute table value standard for zinc and the statewide standard for radium will be effective.

Segment 7, Woods Creek:

The site-specific criteria based standards for metals adopted for Segment 7 are based on a flow-dependent equation used by the Water Quality Control Division in the Urad and Henderson permits which incorporate the ambient concentration of metals in Segment 5, the acute and chronic flows for Segments 5 and 7, and the water quality standards or temporary modifications applicable in Segment 5. The equation and a description of its components are as follows:

$WQS_{WC} = ((Q_{WC} + Q_{WFCC}) X\ WQS_{WFCC} - (Q_{WFCC} X\ C_{WFCC})) /Q_{WC}$
WQS_{WC} = Water Quality Standards for Woods Creek
Q_{WC} = Flow for Woods Creek
Q_{WFCC} = Flow for West Fork Clear Creek
QS_{WFCC} = Water Quality Standards for West Fork Clear Creek
C_{WFCC} = Ambient Concentration in West Fork Clear Creek

The temporary modifications adopted by the Commission will lock in water quality improvements made by Climax to date, thus maintaining at least the status quo stream water quality, will ensure continued progress toward long-term improvements (the Commission recognizes that Climax is in the process of installing a water treatment plant at the Urad site which will be operational by July 1, 1993) and will provide further opportunity for the establishment of site-specific water quality standards. During the next three years, Climax will continue to monitor ambient chemical quality on Segments 5 and 7 and the aquatic community on Segment 5. In addition Climax will participate in the Clear Creek Watershed Initiative as well as the parties to this rulemaking with the objective of determining whether site-specific standards are appropriate. Methods used to develop site-specific standards shall be established with the participation of the Water Quality Control Division and the parties and shall consider designated downstream uses.

PARTIES TO THE NOVEMBER 2, 1992 RULEMAKING HEARING

1. Climax Molybdenum Company
2. City of Arvada
3. Division of Wildlife
4. Hazardous Materials & Waste Management Division, Colorado Department of Health
5. City of Westminster

38.38 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY, AND PURPOSE; OCTOBER 5, 1992 HEARING REGARDING SEGMENTS 2, 3, 4, AND 5 OF BIG DRY CREEK

The provisions of Colo. Rev. Stat. sections 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; and 25-8-402 (1989 Repel. Vol. 11A & 1992 Supp.) provide the specific statutory authority for adoption of these regulatory amendments.The Commission also adopted, in compliance with Colo. Rev. Stat. section 24-4-103(4) (1988 Repel. Vol. 10A & 1992 Supp.), the following statement of basis and purpose.

BASIS AND PURPOSE

A. Beryllium Standard Applicable to Segments 2, 3, 4, and 5 of Big Dry Creek.

Because of the presence of beryllium at the Rocky Flats Plant, the Commission has determined that a site-specific beryllium standard should be added to Big Dry Creek segments 2 through 5, to further assure protection of the downstream water supplies that rely on Standley Lake and Great Western Reservoir. Adoption of the beryllium standard for segments 2 and 3 (not on the Rocky Flats site) as well as for segments 4 and 5, is consistent with the Commission’s approach to the adoption of other numerical standards for these segments.

Subsequent to the last revisions to the South Platte Basin water quality standards, the Commission adopted a drinking water supply table in Table III of the Basic Standards and Methodologies for Surface Water for beryllium, equal to 0.0076 micrograms per liter (ug/l). 5 CCR 1002-8, section 3.1.16. The 0.0076 ug/l table value was based upon the 1990 IRIS data base cancer risk-based number. However, since the adoption of the Table III value for beryllium, the EPA has reevaluated the data and determined that there is only limited evidence of carcinogenicity via drinking water. Consequently, the EPA has recategorized beryllium as a Category II drinking water contaminant and promulgated a final drinking water rule providing a Maximum Contaminant Level Goal of 4 ug/l. 57 Fed. Reg. 31776, 31778 (July 17, 1992). Based upon the EPA's rationale as described in the federal register, the Commission believes that the 4 ug/l standard will be protective of the beneficial use of drinking water supply and so has adopted it as the water supply standard rather that the Table III value.

B. Readoption of "Table 2 - Site-Specific Radionuclide Standards" Applicable to Segments 2, 3, 4 and 5 of Big Dry Creek.

Following consideration of adoption of revisions to this regulation in January 1992, it was discovered that "Table 2 - Site-Specific Radionuclide Standards" was inadvertently omitted when the regulation, adopted by the Commission in January 1990, was filed with the Secretary of State, so that it did not appear in the official published version of the regulation. To correct this error, the Commission has readopted Table 2 in this proceeding. No substantive changes to the table have been considered or adopted.

C. Revision of Organic Standards and Practical Quantitation Limits Applicable to Segments 2, 3, 4 and 5 of Big Dry Creek.

The Commission has revised the organic standards and practical quantitation limits (PQLs) applicable to segments 2, 3, 4 and 5. These are included in a new subsection 3.8.5(2)(f) as a separate table denoted as Table 1A. This should clarify that the new Table 1A standards are applicable only to segments 2 through 5 of Big Dry Creek and that the presently existing tables in sections 3.8.5(2)(a) and (e) remain applicable to the balance of the South Platte, Laramie, Smoky Hill, and Republican River Basins.

The constituents appearing in Table 1A were chosen from the basin-wide tables in 5 CCR 1002-8, sections 3.8.5(2)(a) and (e) (10-91) and the site-specific Table 1 from 5 CCR 1002-8, section 3.8.5 (3-90). The standards and the PQLs for these constituents are derived from the state-wide tables, if there are state-wide standards and PQLs available. 5 CCR 1002-8, section 3.1.11(3) (10-91). The state-wide standards are adopted as site-specific standards for the limited constituents because they are based upon more current information than the former site-specific and basin-wide standards.

The state-wide standards for the individual organics composing halomethanes (HM) and polynuclear aromatic hydrocarbons (PAH) are adopted as the site-specific standards rather than the basin-wide standard for the group of HM and the pre-existing site-specific standard for the group of PAH. The basin-wide organic standards are adopted as site-specific standards for the organics for which there are no state-wide standards, except as noted. These include parathion, which is a class C carcinogen, and chloromethyl ether (BIS), which remains in the IRIS database since its adoption as a state-wide standard. The basin-wide standards for monohydric phenol, tetracholroethane and trichloroethylene are not adopted as site-specific standards. Monohydric phenol does not appear in the IRIS database and the other two organics appear to be typographical errors; the actual chemicals regulated by site-specific standards are trichloroethane 1,1,2 and tetrachloroethylene. Finally, the Commission retains the site-specific standards for simazine and atrazine because as stated in a previous statement of basis and purpose, these two herbicides are potential carcinogens, and both have been detected in water samples from Rocky Flats.

In July 1991, the Commission adopted PQLs for the state-wide organic chemical standards for use as compliance thresholds in discharge permits. The PQLs associated with the state-wide standards are applicable to segments 2, 3, 4 and 5 of Big Dry Creek in lieu of the basin-wide detection limits listed in 5 CCR 1002-8, section 3.8.5(2)(e). PQLs are detection levels based on the Colorado Department of Health's laboratory's best judgement for Gas Chromatography/Mass Spectrophotometry (GC/MS), except as otherwise noted in the "Basic Standards for Organic Chemicals" table in section 3.1.11. The underlying numeric standards and not the PQLs should be considered protective of water quality uses in segment 5, because detection levels vary from laboratory to laboratory and decrease as laboratory methods improve.

D. Interpretation of the "Free From Toxics" Narrative Standard Applicable to Segments 4 and 5.

In the January 1990 Rocky Flats site-specific hearing, the organics table (Table 1) contained a footnote referencing the narrative standards - "free from toxics" - found in the Basic Standards Applicable to Surface Waters of the State, 5 CCR 1002-8, section 3.1.11 (1)(d). That section provides, in part:

> ...state surface waters shall be free from substances attributable to human-caused point source or nonpoint source discharge in amounts, concentrations or combinations:
>
> (d) which are harmful to the beneficial uses or toxic to humans, animals, plants, or aquatic life;...

The footnote was inadvertently deleted when Table 1 was revised and reformatted, becoming the "Additional Organics Standards" table in the March 1991 basin-wide hearing. During the January 1990 rulemaking, the Commission interpreted the "free from toxics" narrative standard as zero due to the inability to predict with certainty all the chemicals of potential concern that were not then subject to numeric standards. Since then, the Commission, in the February 1991 site-specific ground water hearing, adopted an alternative approach with respect to constituents for which there are presently no numeric standards. The Commission is adopting that approach, found in 5 CCR 1002-8, section 5 CCR 1002-8, section 3.12.7(1)(c)(iv), as its interpretation of the surface water "free from toxics" standard in order to maintain consistency in regulation of the site-specific surface and ground waters.

The Commission interprets the surface water "free from toxics" standard found in section 3.1.11(1)(d) as follows with respect to segments 4 and 5 of Big Dry Creek. Where a toxic substance for which no numerical standard has been established is found in a detectable amount, notification shall be given as soon as possible to the operator of the Rocky Flats Plant; the United States Department of Energy; the United States Environmental Protection Agency; the Water Quality Control Division (which will consult as necessary with other components of the Colorado Department of Health); and the Cities of Arvada, Broomfield, Thornton and Westminster. Those entities will meet and attempt to reach a consensus concerning the appropriate numerical level for that substance. If consensus is achieved, the Division shall establish that number as a numerical protection level. Where consensus cannot be reached, the Division will determine the appropriate numerical protection level.

In setting a numerical protection level, the entities listed above will consider the classified uses of surface water segments 4 and 5 that need to be protected and establish the appropriate corresponding numerical protection levels for specific contaminants, based on those classified uses, as outlined in section 3.1.7 of the "Basic Standards and Methodologies for Surface Water." The entities will take into account reasonably available information.

A determination made by these entities or the Division in accordance with the procedure described above will not be deemed to constitute surface water quality standard-setting and will not be applicable outside segments 4 and 5.

If numerical protection levels are established by agreement of the entities, they will jointly petition the Commission for rulemaking to set a standard at the numerical protection level. If the Division establishes a numerical protection level without agreement of all entities, the Division shall ask the Commission to set a standard consistent with the numerical protection level.

If any interested person disagrees with a determination made by the Division in accordance with the procedure described above, it may petition the Commission to adopt a site-specific standard different from the numerical protection level. Any determination made by the Commission during the hearing process would then become binding on the Division, the Department of Energy, and the operator of the Rocky Flats Plant. At the request of the Department of Energy or the operator of the Rocky Flats Plant or an interested person, the Commission will consider such a hearing to be mandatory and de novo.

The footnote which was deleted from Table 1 when it was reformatted as the “Additional Organics Table” is readopted as footnote 1 of Table 1A.

E. Extension of the Goal Qualifier and Temporary Modifications Applicable to Segment 5.

1. Extension of the Temporary Modification for Radionuclides Applicable to Segment 5.

In the January 1990 hearing, the Commission provided that all water quality standards in segment 5 were subject to the temporary modification of “ambient quality” until February 1993. The Commission is extending this temporary modification, with respect to radionuclides only, until December 31, 1994.

The Commission has scheduled a rulemaking hearing for January 1994 to reconsider the current state-wide water quality standards for radionuclides. Following that hearing, the Commission has scheduled a rulemaking hearing for September 1994 to reconsider the site-specific radionuclides standards adopted for waters in the vicinity of the Rocky Flats Plant. In order to preserve the status quo with respect to radionuclide standards pending the outcome of that hearing, the Commission is extending the temporary modification on segment 5 as it applies to radionuclides until December 31, 1994.

2. Extension of Temporary Modification for Nonradionuclides Applicable to Segment 5.

The Commission is granting numeric temporary modifications of water quality standards applicable to segment 5 of Big Dry Creek for nine constituents.

In 1989, the Commission granted a temporary modification of all segment 5 standards of “ambient quality.” In doing so, the Commission stated:

It is recognized that Rocky Flats may not be able to meet the standards immediately and that temporary modifications may be necessary. However, insufficient data presently exists upon which to develop a full set of numerical temporary modifications at this time. It is expected that sufficient data should be generated in the next three years to allow time to collect adequate data for DOE to decide whether to seek numeric temporary modifications for particular parameters. 5 CCR 1002-8, section 3.8.30(3).

The threshold for granting a temporary modification of a standard is that the numeric standard is not being met at the present time. 5 CCR 1002-8, section 3.1.7(3). The data presented by the DOE and EG&G in this hearing indicate that there were only nine constituents for which the 85th percentile data value exceeded the water quality standards.

The Commission is adopting numeric temporary modifications of standards for nine constituents. The temporary modifications are based upon the 85th percentile of the ambient water quality data collected for carbon tetrachloride, tetrachloroethene, trichloroethylene, copper (total recoverable), iron (total recoverable), lead (total recoverable), zinc (total recoverable), manganese (dissolved) and ammonia (unionized).

The Doe and EG&G requested that the Commission should extend the temporary modification of “ambient quality” to all water quality standards in the segment. In support of their request, the DOE and EG&G argues that: segment 5 is used to collect and isolate water before discharge to downstream water supplies; requiring compliance with water quality standards in segment 5 would not result in additional protection to the public; requiring compliance with water quality standards in segment 5 would result in the construction of costly water treatment projects resulting in diversions of funds from the ongoing environmental cleanup at the plant site; and that ambient quality in segment 5 cannot be quantified because no location in segment 5 is representative of the segment. The Doe and EG&G further argued that narrative temporary modifications have not had an adverse effect on water quality in the last three years.

> ... that water is not withdrawn directly from Walnut or Woman Creek for water supply purposes. This classification has been added to these segments because of the Commission’s policy determination that it is appropriate to establish an extra layer of protection for the major water supplies in Great Western Reservoir and Standley Lake, particularly considering the proximity upstream of a major industrial, complex utilizing nuclear materials. 5 CCR 1002-8, section 3.8.30(2).

No Proposal was presented to the Commission to remove segment 5 from state waters or to remove any of the classified uses from the segment. The Commission’s policy determination to protect the water supply classification for the segment remains unchanged.

To be consistent with the regulation of other entities discharging to state waters, the Commission underscores the underlying water quality standards to be protective of water quality and uses in segment 5. The EPA and CDH have requested that the DOE implement interim measures consisting of a water quality plan which minimizes the use of the segment 5 instream ponds for treatment. Furthermore, it is the Commission’s belief that water quality and use protection levels should be based upon the water quality standards applicable to that segment and not upon any temporary modifications of the standards. The Commission does not believe that its actions will result in increased regulatory costs in order to comply with discharge permit requirements. Where effluent limits are based upon water quality standards, temporary modifications of water quality standards have been granted where the 85th percentile of data for each constituent exceeds the underlying standard. The temporary modifications granted reflect the standard methodology for characterizing ambient quality, therefore, the Commission does not believe that compliance with the discharge permit requirements should require extra treatment during the life of the temporary modifications. The DOE and EG&G argued that the standard methodology for characterizing ambient quality is not appropriate for segment 5 because they believe that the segment is so heterogenous that there is not uniformity to water quality throughout the segment. However, the Division testified that the 85th percentile methodology was adopted as a replacement for the mean plus standard deviation methodology in recognition of the fact that most stream water quality data is not normally distributed.

The Commission is adopting numeric, rather than narrative, temporary modifications. This is consistent with the general practice of the Commission. Numeric Temporary modifications will provide guidance to the EPA permit writers and will hold the DOE accountable for its discharges to state waters. Numeric temporary modifications should not place an undue burden on the DOE because they are based on the 85th percentile methodology for calculation of ambient quality.

Segment 5 water quality was determined in this hearing as the 85th percentile of the available data for segment 5. See 5 CCR 1002-8, section 3.1.7(1)(b)(ii). The application of the 85th percentile methodology is consistent with the Commission's actions in setting other temporary modifications throughout the state. Although DOE EG&G argued that the 85th percentile methodology did not result in a meaningful determination of segment 5 water quality, no alternative statistical methodology was proposed.

3. Extension of the Goal Qualifier for Use Classifications Applicable to Segment 5.

A "goal qualified" has been added to the classified uses to indicate that the segment 5 waters are not presently fully suitable but are intended to become fully suitable for the classified uses.

As similarly stated in the Statement of Basis and Purpose for the site-specific surface water standards adopted in January 1990, the Commission believes that segment 5 state waters should be returned as soon as possible to a condition that will support a full range of classified uses, including use as drinking water supply. As further stated in the previous Statement of Basis and Purpose, although plans have been made and funds have been spent to divert Walnut Creek and Woman Creek waters around Standley Lake and Great Western Reservoir - what the parties have termed, "Option B" - the water supply classification for these streams is currently appropriate. If in the future, permanent diversion structures are constructed, with an appropriate capacity to assure that Walnut and Woman Creek waters will not enter the two reservoirs, the Commission can reconsider the appropriateness of the water supply classification at that time.

The Commission's actions should not result in regulatory costs greater than those contemplated under the RCRA/CERCLA clean-up process.

PARTIES TO THE RULEMAKING HEARING NOVEMBER, 1992

1. EG&G Rocky Flats, Inc. and the United States Department of Energy
2. City of Broomfield
3. City of Westminster
4. City of Arvada

38.39 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; MARCH 1, 1993 HEARING:

The provisions of 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; and 25-8-402 C.R.S. provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted in compliance with 24-4-103(4), C.R.S., the following statement of basis and purpose.

BASIS AND PURPOSE:

The changes to the designation column eliminating the old High Quality 1 and 2 (HQ1, HQ2) designations, and replacing HQ1 with Outstanding Waters (OW) designation were made to reflect the new mandates of section 25-8-209 of the Colorado Water Quality Act which was amended by HB 92-1200. The Commission believes that the immediate adoption of these changes and the proposals contained in the hearing notice is preferable to the alternative of waiting to adopt them in the individual basin hearings over the next three years. Adoption now should remove any potential foe misinterpretation of the classifications and standards in the interim.

In addition, the Commission made the following minor revisions to all basin segments to conform them to the most recent regulatory changes:

1. The glossary of abbreviations and symbols were out of date and have been replaced by an updated version in section 3.8.6(2).

2. The organic standards in the Basic Standards were amended in October, 1991, which was subsequent to the basin hearings. The existing table was based on pre-1991 organic standards and are out of date and no longer relevant. Deleting the existing table and referencing the Basic Standards will eliminate any confusion as to which standards are applicable.

3. The table value for ammonia and zinc in the Basic Standards was revised in October, 1991. The change to the latest table value will bring a consistency between the tables in the basin standards and Basic Standards.

4. The addition of acute un-ionized ammonia is meant to bring a consistency with all other standards that have both the acute and chronic values listed. The change in the chlorine standard is based on the adoption of new acute and chronic criteria in the Basic Standards in October, 1991.

Finally, the Commission confirms that in no case will any of the minor update changes described above change or override any segment-specific water quality standards.

38.40 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE: AUGUST 2, 1993 RULEMAKING HEARING:

The provisions of 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; and 25-8-402, C.R.S. provide the specific statutory authority for adoption of these regulation amendments. The Commission also adopted in compliance with 24-4-103(4), C.R.S., the following statement of basis and purpose.

BASIS AND PURPOSE:

The expiration date for the temporary modification for sulfate on the South Platte, segment 7b, mainstem of Brush Creek and Filter Creek has been extended from April 30, 1994 to January 31, 1995 to facilitate the scheduled rulemaking hearing for this segment now scheduled for March, 1994. The Commission understands that changes to the current classifications for this segment are likely to be proposed which would result in altered, new or eliminated temporary modifications. Extending the current temporary modifications would accommodate that rulemaking schedule without disrupting regulatory decisions that are based on the current modifications.

38.41 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE, SEPTEMBER 7, 1993:

The provisions of 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; and 25-8-402 C.R.S. provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted in compliance with 24-4-103(4), C.R.S., the following statement of basis and purpose.

BASIS AND PURPOSE:

On November 30, 1991, revisions to "The Basic Standards and Methodologies for Surface Water", 3.1.0 (5 CCR 1002-8), became effective. As part of the revisions, the averaging period for the selenium criterion to be applied as a standard to drinking water supply classification was changed from a 1-day to a 30-day duration. The site-specific standards for selenium on drinking water supply segments were to be changed at the time of rulemaking for the particular basin. Only one river basin, the South Platte, has gone through basin-wide rulemaking since these revisions to the "Basic Standards". Through an oversight, the selenium standards was not addressed in the rulemaking for this basin and has since become an issue in a wasteload allocation being developed for segments 15 and 16 of the South Platte. Agreement on the wasteloads for selenium is dependent upon a 30-day averaging period for selenium limits in the effected parties permits. Therefore, the parties requested that a rulemaking hearing be held for the South Platte Basin to address changing the designation of the 10 ug/l selenium standard on all water supply segments from a 1-day to a 30-day standard. The Water Quality Control Division, foreseeing the possibility of a selenium issue arising elsewhere in the state, made a counter proposal to have one hearing to change the designation for the selenium standard on all water supply segments statewide. The Commission and the parties concerned with South Platte segments 15 and 16 agreed that this would be the most judicious way to address the issue.

The change in the averaging period may cause a slight increase in selenium loads to those segments which have CPDS permits regulating selenium on the basis of a water supply standard. However, these segments are only five in number and the use will still be fully protected on the basis that the selenium criterion is based on 1975 national interim primary drinking water regulations which assumed selenium to be a potential carcinogen. It has since been categorized as a non-carcinogen and new national primary drinking water regulations were promulgated in 1991 that raised the standard to 50 ug/l.

The Commission also corrected a type error in the TVS for Silver by changing the sign on the exponent for the chronic standard for Trout from + 10.51 to - 10.51.

38.42 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY, AND PURPOSE; FEBRUARY 8, 1994 HEARING ON SEGMENT 2 OF BIG DRY CREEK

The provisions of 25-8-202(1)(b), 25-8-204, and 25-8-402, C.R.S. provide specific statutory authority for adoption of this regulatory amendment. The Commission also adopted in compliance with 24-4-103(4), C.R.S. the following statement of basis and purpose.

The Cities of Westminster and Thornton submitted a rulemaking proposal to the Water Quality Control Commission in August, 1988 that included a numeric standard for total phosphorus in Standley Lake, Segment 2 of Big Dry Creek, South Platte Basin. The Commission did not adopt the proposed standards but requested that the parties jointly agree on a scope of work and funding mechanism to develop any necessary additional data to determine appropriate permanent water quality standards to protect Standley Lake as a water supply. Parties to the 1989 hearing, which included Westminster, Thornton, Northglenn, Arvada, Golden, and Jefferson County, commissioned a study by the U.S. Geological Survey to develop additional data on Standley Lake in 1989 and 1990. In September, 1993, the Cities of Westminster, Thornton, and Northglenn (the Standley Lake Cities) submitted a rulemaking proposal to the Commission for a narrative water quality standard for phosphorus and total inorganic nitrogen, and a control regulation for point and nonpoint sources of nutrients in the Standley Lake Drainage, consisting of the Upper Clear Creek Basin; that portion of the Lower Clear Creek Basin tributary to Standley Lake and to the three canals (Farmers High Line Canal, Church Ditch, and Croke Canal) supplying Standley Lake; and Standley Lake itself (the Standley Lake Drainage).

In December, 1993, the Clear Creek Watershed Management Agreement (Agreement) was developed and signed by local governmental and private entities that would be affected by the proposed standards and control regulation. The Agreement provided for submission by the parties of an alternative rulemaking proposal for a narrative standard for Standley Lake. The entities that are party to the Agreement include the Upper Clear Creek Basin Association, the City of Golden, the City of Arvada, Jefferson County, the Jefferson Center Metropolitan District, the City of Westminster, the City of Thornton, the City of Northglenn, the City of Idaho Springs, Clear Creek County, Gilpin County, the Blackhawk-Central City Sanitation District, the City of Blackhawk, Central City, the Town of Georgetown, the Town of Empire, the Town of Silverplume, the Central Clear Creek Sanitation District, the Alice/St. Mary's Metropolitan District, Clear Creek Skiing Corporation, Henderson Mine, the Church Ditch Company, the Farmers High Line Canal and Reservoir Company, and the Farmers Reservoir and Irrigation Company.

The Commission adopted the alternative proposal for a narrative standard, which provides that the trophic status of Standley Lake be maintained as mesotrophic. The purpose of this narrative standard is to protect the classified beneficial uses of Standley Lake by maintaining the existing trophic condition. Trophic state or condition is a descriptive classification based on lake nutrient status and the level of biological productivity. Lakes with few available nutrients and a low level of biological productivity are termed oligotrophic; those with high nutrient levels and high productivity are termed eutrophic. Lakes that are in between oligotrophic and eutrophic are termed mesotrophic.

Data collected over the last nine years for chlorophyll a for Standley Lake indicate that the Lake has been mesotrophic over that period. The trophic status of Standley Lake is based on the average magnitude of trophic state indicators measured during the period from March 1 through November 30. The various entities involved in this proceeding have different theories as to the mechanisms determining the water quality in Standley Lake. The Standley Lake Cities believe that there is a risk of algal growth that would impact water supply uses of the Lake in its current state. In any event, the trophic status of the Lake should be maintained at mesotrophic to minimize the risk of use impairment.

The Commission has adopted numeric phosphorus standards for three other Colorado lakes to maintain existing trophic condition. The narrative standard approach is used here as an alternative that provides flexibility in establishing nutrient control and reduction strategies in the Standley Lake Drainage. This flexibility is needed due to uncertainty in identifying significant nutrient contributors to the Lake, in predicting the specific in-lake nutrient concentrations required to maintain the mesotrophic condition, and in predicting Lake response to algae growth from nutrient reduction.

The Commission found that requirements in the Agreement to conduct water quality monitoring of the Standley Lake Drainage, as well as implementation of best management practices and controls on a voluntary basis, provide a reasonable approach to reducing nutrient loading in the Standley Lake Drainage and maintaining the mesotrophic condition of the Lake. The Commission's intent is that the maintenance of a mesotrophic status be monitored in a cooperative effort by entities in the Standley Lake Drainage and that no new or more stringent effluent limitations or nutrient wasteload allocations be included in wastewater discharge permits for point sources in the Clear Creek Basin.

It is the intent of the Commission and the parties to this hearing that the results of additional testing and monitoring, and of implementation of certain best management practices and controls on a voluntary basis will be summarized and reported to the Commission annually until the next triennial review of this narrative standard in 1997. The first such annual report shall be made available to the Commission in April of 1995. If at the Triennial Review in 1997 it appears that the narrative standard is not being met, and that substantial progress in reducing nutrient loads to the Lake is not being made, additional measures may be required in future rulemaking proceedings. Such additional measures could include numeric standards and/or effluent limitations for phosphorus and/or nitrogen in the Upper Clear Creek Basin, and additional best management controls in Standley Lake.

PARTY STATUS LIST
February 8, 1994

1. Cities of Westminster, Thornton and Northglenn
2. Denver Regional Council of Governments
3. City of Golden
4. Clear Creek Skiing Corporation
5. Upper Clear Creek Basin Authority
6. Colorado Department of Transportation
7. Jefferson Center Metropolitan District #1
8. Jefferson County
9. City of Arvada
10. Coors Brewing Company
11. Board of County Commissioners of the County of Gilpin and the Gilpin County Board of Health

38.43 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; APRIL 4, 1994 HEARING:

The provisions of 25-8-202(1) (b) and (2); 25-8-204; and 25-8-402 CHRIS provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted in compliance with 24-4-103(4), CHRIS, the following statement of basis and purpose.

BASIS AND PURPOSE:

Section 3.8.5(2) has been revised to delete an outdated reference to a former provision of this regulation and to simplify the language of this subsection.

The 50 ug/l dissolved manganese standard formerly listed for segment b of Boulder Creek has been deleted to correct an apparent clerical error. No water supply classification has ever been applied to this segment, so this standard is inappropriate.

Segment 5 of Big Dry Creek

The Commission postponed the statewide radionuclide standards hearing from the previously scheduled date, based on delays in EPA's promulgation of drinking water radionuclide standards. Therefore, it is appropriate to extend the expiration of the temporary modifications for radionuclide standards included in the segment 5 standards from December 31, 1994 to December 31, 1996, and the Commission has done so.

Segments 7a and b

The Commission has revised the segmentation of two tributaries to the South Plate River.The previous segments of 7a, all tributaries to the South Plate River below the confluence with the North Fork to the outlet of Chatfield Reservoir, and b, mainstem of Brush Creek and Filter Gulch from the source to the confluence with the South Plate, have been combined into a single segment, 7.

The substantive effect of this consolidation is to withdraw the water supply classification from the previous segment b, making it identical to the previous segment 7a and, thus, obviating the need for separate segments. In 1988, the Commission adopted a water supply classification for segment b. The water supply classification was established in order to protect water quality in the South Plate alluvium. In 1991, the Commission adopted an interim narrative standard for the Lower South Plate River Alluvium and Terrace Gravel System. See ' 3.12.5 (5 CCR 1002-8). The classification system adopted by the Commission in 1991 assures that the water quality of the South Plate Alluvium will be maintained. This eliminates the need for the water supply classification for Brush Creek and Filter Gulch.

The previous water supply classification was also based, in part, on the possibility of a hydrologic connection between Brush Creek and Filter Gulch to the ground water in the area of the Kassler Water Treatment Plant. However, evidence presented at the hearing demonstrated that the include of Brush Creek and Filter gulch on water quality in the South Plate alluvium is negligible and that the South Plate River is the major contributor to the alluvium in the area around the Kassler Water Treatment Plant.

When the Commission adopted the water supply classification for segment b in 1988, there was evidence of a possible future use for water supplied in the Denver water distribution system from the Kassler Plant should the Plant ever be reopened. However, the Kassler Plant has not been used as a water source since its termination in 1985, and there is no indication that the Kassler Plant will be reopened in the reasonably foreseeable future.

Clear Creek, Segments 14 and 15

Clear Creek segment 14 is currently classified for aquatic life warm 2, recreation 2, water supply and agriculture uses. Clear Creek segment 15 is classified for aquatic life warm 1 goal qualifier, recreation 2, water supply and agriculture uses. Temporary modifications are in existence for Segment 14 below the Croke Canal for cadmium, zinc, and copper. The temporary modifications are due to expire on June 30, 1994.

Coors operates two wastewater treatment plants at its facility in Golden, Colorado, discharging to Clear Creek segment 14 below the Croke Canal. The general wastewater treatment plant processes wastewater primarily from the City of Golden, but also from various industrial facilities which comprise the non-brewing operations at Coors. A process wastewater treatment plant processes only the waste from the brewing operations at Coors. The effluents from the two treatment plants are combined for discharge below the Croke Canal pursuant to Permit No. CO-0001163. During many months of the year the statistical flow in Clear Creek is very low or zero due to diversions for municipal and agricultural uses above the discharge. Consequently, the water quality standards are, in effect, the permit limits for the Coors discharge. If stream standards were to be set based upon table values and converted into discharge limitations, then the limits for copper and zinc could not be met with the current wastewater treatment technology. There is no economically feasible and technically reliable end of the pipe technology which would meet such low limits.

Brewing operations universally produce a waste which is high in biochemical oxygen demand. In the case of Coors, this results in highly alkaline wastewater. Alkalinity has an attenuating effect on the toxicity of certain metals to aquatic species. For this reason, Coors' effluent is capable of carrying metal levels that are above the current water quality standards without harm to the most sensitive aquatic organisms. Biomonitoring studies carried out by Coors consistently show that survival of Ceriodaphnia dubia and fathead minnows is very high even in 100 percent effluent. On the other hand, Clear Creek above the discharge point is often lethal to Ceriodaphnia dubia because of the high concentration of metals in Clear Creek and its low hardness and alkalinity. As a result of these observations, Coors conducted a study to be the basis for setting site-specific criteria-based standards proposed in this rulemaking.

Site-Specific Criteria Based Standards

The Commission's basic standards regulations provide for the establishment of site-specific water standards when justified by the results of a bioassay or comparable scientific study. It provides a mechanism for taking the wide variation of conditions that exist in Colorado into account when adopting site-specific standards. Adopting such site-specific standards simply means that different numerical standards are adequate to protect the uses in question. Colorado Water Quality Control Division guidelines for developing site-specific aquatic life criteria are comparable to EPA's water effect ratio method for setting aquatic life criteria. The Division guidance regards development of site-specific water quality criteria as appropriate when". . . existing standards, often based on laboratory defined criteria, are under protective or over protective of the aquatic life classification." The State guidance also refers to the need to protect the worse case conditions of in-stream toxicity. The water effect ratio procedure uses samples taken at low and high flow to address this concern. The procedure also uses the lowest, that is, the most conservative value, of the three that are generated. The Division guidance uses the most sensitive species to act as a surrogate for the protection of the ecosystem. The water effect ratio procedure uses Ceriodaphnia dubia as the most sensitive species and includes a secondary species to verify the results. The procedures establish the concentrations for metals that are acceptable for protecting the aquatic uses.

Coors conducted a water effect ratio study using biomonitoring tests to establish the level at which a metal is toxic in a given effluent and receiving water, specifically Clear Creek. In conducting the study, Coors worked closely with personnel from the Water Quality Control Division and EPA.

The study involved taking samples downstream of the discharge point, upstream of the discharge, and the effluent itself. Biomonitoring tests were run with samples at different dilutions with reconstituted laboratory water. The metals of interest are added in different concentrations in order to produce toxicity during the test. The data is used to establish the LC50 in accordance with the standard biomonitoring test procedures. Parallel tests are also performed with the same type of test organisms in reconstituted laboratory water with enough metal being added to produce an LC50 for the samples. The concentration of the metal that produced the LC50 in the downstream sample is then divided by the amount of metal that produced an LC50 in the reconstituted laboratory water. This ratio is called the water effect ratio. The ratio is designed to take into account the beneficial effect of the receiving stream and effluent that allow aquatic organisms to live at metals levels that are lethal in reconstituted laboratory water. Since reconstituted laboratory water is used in setting water quality standards by EPA, the water effect ratio is multiplied by the water quality standards to generate a new stream standard that is site-specific.

Coors chose Prospect Park in segment 15 as the downstream site, as it is sufficiently downstream of the effluent discharge so that mixing with the receiving stream is complete, but it is sufficiently close to the discharge point so that no other discharge would have been included in the sample. Two flow seasons were used and samples were taken at least three weeks apart as required by the water effect ratio guidance. Samples for upstream were taken at Vanover Park in golden above the Coors discharge point. Ceriodaphnia dubia and fathead minnows were used following accepted State and EPA protocol. As required, samples were spiked with specified metals in separate tests using copper, zinc and silver. The metal concentration for the Prospect Park sample was first adjusted to account for the amount of metals initially present in the sample before spiking. These final water effect ratio results were multiplied by the appropriate water quality standard to arrive at the site-specific criteria-based water quality standards. The analyses performed by Coors following the above procedure resulted in site-specific water quality standards that are now being proposed for zinc and copper.

South Mosquito Creek, Segments 2b and 2c

In 1987, the Commission adopted a three-year temporary modification for zinc in segment 2b and for zinc and mercury in segment 2c of South Mosquito Creek. The zinc temporary modifications were calculated from the sampling data collected below the London Mine Venture discharge. The underlying chronic zinc standards are 110 ug/1 and 250 ug/1, respectively. The temporary modifications for zinc are scheduled to expire on June 30, 1994. The current London Mine discharge permit referenced above is based upon the temporary modifications for zinc. Both the stream ambient data and the discharge data exceed the underlying standard. The underlying zinc standards are not being met due to human-induced conditions upstream from the London Mine, that is, historic mining activity has ceased. There is no current or anticipated mining activity occurring at the London Mine. Consequently, in the future the permit may deactivate. In the past, actions have been taken to improve the quality of the discharge by diverting flows with high levels of metals inside the mine. If necessary, additional future actions will be evaluated. The available stream data are limited, particularly dissolved data, but will continue to be collected during the period of an extended temporary modification. The current limited data support the extension of the temporary modifications and additional data will continue to be collected from the stream and the mine discharge. The proposed temporary modifications are based upon sampling data.Further, natural surface drainage over surface zinc exposures into No Name Creek may cause South Mosquito Creek to contain more zinc than the standard would, at times, allow.

PARTIES TO THE RULEMAKING HEARING APRIL, 1994

1. U.S. Department of Energy and EG&G Rocky Flats, Inc.
2. Martin Marietta
3. Coors Brewing Company
4. London Mine Venture
5. City of Arvada
6. City of Westminster
7. City of Broomfield

38.44 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY, AND PURPOSE; OCTOBER 11, 1994 HEARING:

The provisions of 25-8-202(1) (b) and (2); 25-8-204; and 25-8-402 CHRIS provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted in compliance with 24-4-103(4), CHRIS, the following statement of basis and purpose.

BASIS AND PURPOSE:

The dissolved oxygen standards applicable to segment 15 prior to this hearing were:

5.0 mg/L May 1 to July 31 for Early Life Stage (ELS); and
4.5 mg/L August 1 to April 30 for Older Life State (OLS).

These values were initially adopted in 1986 with the 5.0 mg/L ELS period ending on July 15. Although not adopted as such by the Commission, the EPA approved these values as instantaneous minima. EPA further declined to approve the application period of the 4.5 mg/L standard during the period July 16 through July 31. Subsequently, another hearing was held in 1987 and the period of application for the ELS was changed to July 31 to satisfy EPA. In the 1991 South Plate River basin hearing, the Commission "continued" the then applicable dissolved oxygen standards and stated its intention that these standards be applied as minimum 1-day means in conformance with the Division's established modeling procedures. At that time, the Commission, the Division and Metro agreed that Metro would do additional studies to form the basis for acute and chronic site-specific standards for Segment 15. These studies were undertaken by Metro with input and participation by the Division, EPA and the DOW. Based on the results of these studies, Metro proposed the dissolved oxygen standards included in the hearing notice for this hearing.

Prior to the hearing, EPA stated that a number of the proposed revisions did not satisfy its evaluation criteria and EPA did not have sufficient basis to approve certain portions of the proposal. On the other hand, EPA stated that enough information was presented to justify the acceptance of the following standards for Segment 15:

1. Early life stage protection period 7-day average 5.0 mg/L;
2. Older life stage protection period 1-day 2.0 mg/L instantaneous concentration; and
3. Older life stage 30-day average 4.5 mg/L.

EPA recommended that the Commission not take action on the standards until:

1. The actual results of dissolved oxygen improvements in the vicinity of 88th Avenue were documented and provide a basis for downstream reaeration designs;

2. Further studies to confirm the time of year, abundance, and location of early life stage of fish in Segment 15 have been conducted; and

3. Further laboratory tests on additional species have been done to confirm early life stage mortality and growth inhibition resulting from insufficient dissolved oxygen.

As a result, the October 1994 Commission hearing was continued to February 1995 so that the parties could develop a Memorandum of Understanding which addressed the outstanding concerns. Such a Memorandum of Understanding has been signed by the Division, the Division of Wildlife, EPA and Metro and is a part of the record in this proceeding. The Commission is adopting the final underlying DO standards, the interim underlying standards and the temporary modifications recommended in the Memorandum of Understanding.

The final underlying standards consist of those DO standards for which sufficient information was presented in the record by Metro for approval by EPA and adoption by the Commission.

The interim underlying standards for the ELS 1-Day Minimum and OLS 7-Day Mean of Minimums are based on the EPA national criteria for dissolved oxygen. It is anticipated that Metro will propose modifying these standards as a result of the further studies to be completed.

The temporary modifications for the 1-Day Minimums (ELS and OLS) and the 7-Day Mean of Minimums consist of the currently existing ambient conditions as monitored in 1993 and 1994 by the Division and Metro. These temporary modifications are effective until December 31, 1997.

It is anticipated that a hearing will be scheduled before the Commission in the spring of 1997 to consider modifications to the interim underlying DO standards. Metro may also request that revised temporary modifications be adopted to provide the time needed for construction of any improvements required to meet the 1997 standards.

PARTIES TO THE RULEMAKING HEARING

1. Metro Wastewater Reclamation District
2. Division of Wildlife

38.45 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY, AND PURPOSE: APRIL 10, 1995 HEARING (SEGMENTS 4 AND 5 OF BIG DRY CREEK)

The provisions of 25-8-202(1)(b) and (2); and 25-8-204 and 25-8-402 CHRIS provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted, in compliance with 24-4-103(4), CHRIS, the following statement of basis and purpose.

BASIS AND PURPOSE:

A. Summary

In this rulemaking proceeding, the Commission (1) resegmented segment 4 of Big Dry Creek into segments 4a and 4b, such that North and South Walnut Creek and Walnut Creek, from the outlet of ponds A-4 and B-5 to Indiana Street, now constitute segment 4b (upon which all of former segment 4's standards shall apply with the exception of the un-ionized ammonia standard which shall be removed from the segment), and all portions of segment 4 (on both Walnut and Woman Creeks) other than segment 4b shall be redesignated as segment 4a; and (2) removed the un-ionized ammonia standard (both the underlying standard and temporary modifications) from segment 5 of Big Dry Creek.

B. Background

In December, 1989, the Commission revised the segmentation for tributaries to Big Dry Creek at the Rocky Flats Environmental Technology Site (“RFETS” or “the Site”) by creating separate segments for portions of Walnut and Woman Creek drainages. Segment 4 encompassed all of Woman Creek and its tributaries except Pond C-2, an off-channel runoff storage pond, and those portions of Walnut Creek and tributaries above Great Western Reservoir except segment 5. Segment 5 encompassed those portions of North Walnut and South Walnut Creeks which feed, in part, the A- and B-series ponds directly downstream of the plant site and Pond C-2 on Woman Creek.

In the October, 1992 hearing, the WQCC adopted temporary modifications to standards on segment 5 for nine constituents, including un-ionized ammonia. The temporary modifications for ammonia were set to expire on April 1, 1996, after which the underlying standards of 0.06/0.1 mg/l (un-ionized) were to be in effect. Segment 4 ammonia standards of 0.06/0.1 mg/l did not include temporary modifications. The Division provided testimony at that hearing that the cost of an ammonia removal system for a wastewater treatment plant similar in size to that at RFETS would be upwards of $1.25 million.

C. Commission Decision

The results of DOE and EG&G's Bioassessment and Physical/Chemical Characterization of Walnut Creek and Woman Creek demonstrate that the impairment of aquatic life in segment 5 of Walnut Creek and in those portions of existing segment 4 of Walnut Creek below Ponds A-4 and B-5 is due to flow and habitat constraints rather than water quality conditions due to ammonia. As a result, the high cost of an ammonia removal system would be unjustified in light of the minimal expected improvement to be gained in Walnut Creek. Therefore, the Commission decided to accept the stipulation submitted and signed by all the parties at the rulemaking hearing to resegment segment 4 in the RFETS area, create a new segment 4b which has all of segment 4's standards with the exception of un-ionized ammonia, redesignate all remaining portions of segment 4 as segment 4a, and eliminate the un-ionized ammonia standard from segment 5.

Past Commission action is consistent with the action taken here. When the Commission removed the ammonia standard for segment b of Coal Creek, it did so on the basis of similar aquatic life impairment in the segment due to lack of flow, and the limited benefits that would be gained by the requirement of a costly ammonia removal system.

In making its decision, the Commission has considered EPA's view that the NPDES permit for the RFETS wastewater plant will be issued without an ammonia removal requirement, although additional ammonia monitoring will be required, and the Division's indication that it foresees no difficulty in issuing '401 certification on the basis of the present facts. The Commission's decision is also based on evidence that uses in downstream segments will be protected.

The Commission is also mindful that the Option B water diversion project protecting water supplies downstream of the Rocky Flats Plant is scheduled for completion within the next two years. This project will consist of a 100-year flood detention reservoir on Woman Creek to protect Standley Lake (the drinking water supply of the local cities of Westminster, Northglenn, and Thornton), and the elimination of Great Western Reservoir as a water supply for the City of Broomfield, with the procurement of an equivalent replacement water supply. Because of Option B, water flowing off plant site is not anticipated to affect any drinking water supplies downstream; thus, the local communities, DOE, the Division, and the Commission concur that the classifications and standards for the Big Dry Creek watershed should be reconsidered once Option B is in place.

PARTIES TO THE RULEMAKING HEARING FEBRUARY 13, 1995

1. United States Department of Energy and EG&G Rocky Flats, Inc.
2. The City of Westminster
3. The City of Broomfield
4. Colorado Division of Wildlife
**5. The City of Arvada
**6. U.S. Environmental Protection Agency's Region VIII Office

**Indicates Mailing List Status.

38.46 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE (1995 Silver hearing)

The provisions of CHRIS 25-8-202(1)(b), (2) and 25-8-204; provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted in compliance with 24-4-103(4) CHRIS the following statement of basis and purpose.

BASIS AND PURPOSE

The changes described below are being adopted simultaneously for surface water in all Colorado river basins.

This action implements revisions to the Basic Standards and Methodologies for Surface Water adopted by the Commission in January, 1995. As part of a July, 1994 rulemaking hearing, the Commission considered the proposal of various parties to delete the chronic and chronic (trout) table values for silver in Table III of the Basic Standards. As a result of that hearing, the Commission found that the evidence demonstrated that ionic silver causes chronic toxicity to fish at levels below that established by the acute table values. It was undisputed that silver is present in Colorado streams and in the effluent of municipal and industrial dischargers in Colorado. The evidence also demonstrated that the removal of silver from wastewater can be costly. However, there was strongly conflicting scientific evidence regarding the degree to which silver does, or could in the absence of chronic standards, result in actual toxicity to aquatic life in Colorado surface waters. In particular, there was conflicting evidence regarding the degree to which the toxic effects of free silver are mitigated by reaction with soluble ligands to form less toxic compounds and by adsorption to particulates and sediments.

The Commission concluded that there is a need for additional analysis of the potential chronic toxicity of silver in streams in Colorado. The Commission encouraged the participants in that hearing, and any other interested parties, to work together to develop additional information that will help resolve the differences in scientific opinions that were presented in the hearing. The Commission believes that it should be possible to develop such information within the next three years.

In the meantime, the Commission decided as a matter of policy to take two actions. First, the chronic and chronic (trout) table values for silver have been repealed for the next three years. The Commission is now implementing this action by also repealing for the next three years, in this separate rulemaking hearing, all current chronic table value standards for silver previously established on surface waters in Colorado. Any acute silver standards and any site-specific silver standards not based on the chronic table values will remain in effect. The Commission intends that any discharge permits issued or renewed during this period will not include effluent limitations based on chronic table value standards, since such standards will not currently be in effect. In addition, at the request of any discharger, any such effluent limitations currently in permits should be deleted.

The second action taken by the Commission was the readoption of the chronic and chronic (trout) table values for silver, with a delayed effective date of three years from the effective date of final action. The Commission also is implementing this action by readopting chronic silver standards with a corresponding delayed effective date at the same time that such standards are deleted from the individual basins. The Commission has determined that this is an appropriate policy choice to encourage efforts to reduce or eliminate the current scientific uncertainty regarding in-stream silver toxicity, and to assure that Colorado aquatic life are protected from chronic silver toxicity if additional scientific information is not developed. If the current scientific uncertainty persists after three years, the Commission believes that it should be resolved by assuring protection of aquatic life.

In summary, in balancing the policy considerations resulting from the facts presented in the July 1994 rulemaking hearing and in this hearing, the Commission has chosen to provide relief for dischargers from the potential cost of treatment to meet chronic silver standards during the next three years, while also providing that such standards will again become effective after three years if additional scientific information does not shed further light on the need, or lack of need, for such standards.

Finally, the Division notes that arsenic is listed as a TVS standard in all cases where the Water Supply classification is not present. This is misleading since Table III in the Basic Standards lists an acute aquatic life criterion of 360 ug/l and a chronic criterion of 150 ug/l for arsenic, but a more restrictive agriculture criterion of 100 ug/l. It would be clearer to the reader of the basin standards if, for each instance where the standard "As(ac/ch)=TVS" appears, the standard "As=100(Trec)" is being inserted as a replacement. This change should make it clear that the agriculture protection standard would prevail in those instances where the more restrictive water supply use protective standard (50 ug/l) was not appropriate because that classification was absent.

The chemical symbol for antimony (Sb) was inadvertently left out of the "Tables" section which precedes the list of segments in each set of basin standards. The correction of this oversight will aid the reader in understanding the content of the segment standards. Also preceding the list of segment standards in each basin is a table showing the Table Value Standards for aquatic life protection which are then referred to as "TVS" in the segment listings. For cadmium, two equations for an acute table value standard should be shown, one for all aquatic life, and one where trout are present. A third equation for chronic table value should also be listed. The order of these three equations should be revised to first list the acute equation, next the acute (trout) equation, followed by the chronic equation. This change will also aid the reader in understanding the intent of the Table Value Standards.

PARTIES TO THE PUBLIC RULEMAKING HEARING JUNE 12, 1995

1. Coors Brewing Company
2. The Silver Coalition
3. Cyprus Climax Metals Company
4. The City of Fort Collins
5. The City of Colorado Springs

38.47 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE (December, 1995 Rulemaking)

The provisions of 25-8-202(1)(b), (2); 25-8-204; and 25-8-402 CHRIS provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted in compliance with 24-4-103(4) CHRIS the following statement of basis and purpose.

BASIS AND PURPOSE

The temporary modifications addressed in this hearing for segment 5 of Clear Creek for cadmium, manganese, zinc and radium were previously adopted with an expiration date of July 8, 1996. The Commission has extended the temporary modifications to March 31, 1997 so that these temporary modifications can be considered along with other issues in the July, 1996 hearing.

38.48 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE (December, 1996 Rulemaking)

The provisions of 25-8-202(1)(b), (2); 25-8-204; and 25-8-402 CHRIS provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted in compliance with 24-4-103(4) CHRIS the following statement of basis and purpose.

BASIS AND PURPOSE

The temporary modifications addressed in this hearing for segment 5 of Big Dry Creek were previously adopted with expiration dates of April 1, 1996 (for non-radionuclides) and December 31, 1996 (for radionuclides). The Commission has extended the temporary modifications to April 1, 1997 so that these temporary modifications can be considered along with other issues in a December, 1996 rulemaking hearing to consider surface and ground water quality standard issues for waters in the vicinity of the Rocky Flats Plant.

PARTIES TO THE RULEMAKING PROCEEDING

1. United States Department of Energy and Kaiser-Hill Company, LLC
2. City of Broomfield

38.49 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE (West Fork of Clear Creek and Woods Creek, Segments 5 and 7 of Clear Creek, July, 1996)

The provisions of 25-8-202(1)(b), (2); 25-8-204; and 25-8-402 CHRIS provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted in compliance with 24-4-103(4) CHRIS the following statement of basis and purpose.

BASIS AND PURPOSE

The Commission adopted temporary modifications for Cd, Mn, Zn and Ra as a result of the November 2, 1992 hearing. These temporary modifications expire on March 31, 1997. The need for temporary modifications for cadmium and zinc no longer exist. Therefore they are deleted and underlying table values are in effect. The need for radium temporary modification continues to exist for the same reasons set forth in the Basis and Purpose statement that accompanied the November 2, 1992 rulemaking. At this time a statewide radionuclide hearing is scheduled for July, 1997. This hearing may resolve the radium issue in this segment.

The site-specific manganese standard is based on a toxicity study commissioned by Climax. This study established a hardness based relationship for manganese toxicity on brown trout. Therefore, the table value based standard of 1000 ug/l is deleted and the hardness based equation is added. Due to the seasonal variation in hardness in Woods Creek and the West Fork of Clear Creek, the Commission intends that the hardness based equation for manganese to be applied on a seasonal basis in implementing the standard. Climax has committed to maintain the treatment levels for manganese it has achieved in the three years prior to this hearing. In the event that ambient stream levels of manganese exceed levels achieved in 1994 - 1996, the Commission may reconsider the manganese standard adopted herein. The Commission is aware that the Division of Wildlife may develop additional toxicity information on manganese in the future. Such information may provide a basis for reconsideration of the site-specific standard for manganese adopted by the Commission in this rulemaking.

PARTIES TO THE PUBLIC RULEMAKING HEARING JULY 8, 1996

1. Climax Molybdenum Company
2. State of Colorado, Division of Wildlife
3. City of Westminster
4. U.S. EPA Region VIII
5. City of Golden

38.50 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE (December 1996)

The provisions of 25-8-202(1)(b), (2); 25-8-204; and 25-8-402 CHRIS provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted in compliance with 24-4-103(4) CHRIS the following statement of basis and purpose.

BASIS AND PURPOSE

1. Summary

   In this rulemaking proceeding, the Commission reclassified Great Western Reservoir (Segment 3 of Big Dry Creek) from aquatic life warm water class 1 to class 2 and recreation class 1 to class 2, and revised the water quality standards to match the revised classifications. The Commission added an agriculture classification for segment 3 and retained the segment 3 water supply classification, but removed water supply standards. The Commission has also adopted changes to water quality standards in Segments 1, 2, 4a and 4b to reflect recent changes to or adoption of basic standards, changes in ambient conditions, and significant changes in the watershed. Finally, the Commission has adopted changes to water quality standards in Segment 5 to reflect recent changes to or adoption of basic standards, and changes in ambient conditions some of which require temporary modifications.

2. Background

   a. Segment 1

      The Commission adopted additional standards to protect the aquatic life and agricultural uses in place on Segment 1. While the segment has been classified for the warm water aquatic life class 2 and agricultural uses since 1981 only limited standards were assigned. Evidence provided at this hearing showed a significant increase in the number and species of fish present in the segment when compared to the evidence presented in 1981 and the Commission felt a higher level of protection was warranted. The Commission also adopted a chronic nitrite standard of 4.5 mg/l based on a recommendation that this level should be a maximum concentration allowed for waters whose chloride levels exceed 22 mg/l and contain fathead minnows and other nonsensitive fish species.

   b. Segment 2

      The Commission deleted the site-specific organic standards identified in Table 1A. Table 1A was adopted in 1989 prior to the Commission's adoption of basic standards for organic compounds. Table 1A was retained in 1992 because, although for most parameters the site-specific standards were identical to the basic standards, the table contained a few unique site-specific standards. The Commission has since adopted basic standards for all compounds found in Table 1A, and since the basic standards are applicable in Segment 2 Table 1A was deleted.

   c. Segment 3

      The changes adopted in this hearing for segment 3 are summarized above. Great Western Reservoir was initially constructed in 1904. Thereafter, it was used as an irrigation reservoir until the 1950's when it was developed as a water supply reservoir by Broomfield.

In the initial South Plate River Basin rulemaking in 1981, the Commission classified Great Western Reservoir for water supply use only and adopted water supply related standards. In 1984, the City of Broomfield requested that Great Western Reservoir also be classified as Aquatic Life Warm Water 1 and Recreation 1 and that corresponding water quality standards be adopted. The basis for Broomfield's request was to provide additional protection to its water supply. The Commission adopted these additional use classifications and standards because the existing water quality met the standards even though the Class 1 aquatic life and recreation uses did not in fact exist.

In 1989, the Commission again responded to Broomfield's request to further protect the Great Western Reservoir water supply. The Commission established new segments, classifications and standards for Walnut and Woman Creeks. In this action, the Commission included, among other things, water supply classifications for Walnut and Woman Creeks even though these uses did not in fact exist in these segments. The basis for this action was “to establish an extra layer of protection for the major water supplies in Great Western Reservoir and Standley Lake, particularly considering the proximity upstream of a major industrial, complex utilizing nuclear materials.” In the 1989 rulemaking, as well as in subsequent rulemakings, Broomfield stated that it would be appropriate to reconsider the classifications and standards of Big Dry Creek if physical changes were made whereby the threat to Broomfield's water supply was removed. Such changes will be implemented in 1997 with the elimination of Great Western Reservoir as a water supply by January 1, 1998, at the latest. In the 1995 rulemaking, the Commission stated:

Because of Option B, water flowing off plant site is not anticipated to affect any drinking water supplies downstream, thus, the local communities, DOE, the Division, and the Commission concur that the classifications and standards for the Big Dry Creek Watershed should be reconsidered once Option B is in place.

After the Great Western Reservoir Replacement Project is fully implemented in 1997, Great Western Reservoir will no longer be used as a water supply. Instead, Broomfield will use Great Western Reservoir as a storage facility for a waste water reuse project. Broomfield requested the Commission to modify the classifications and standards of Great Western Reservoir to reflect these changes in use effective January 1, 1998.

d. <u>Segments 4a and 4b</u>

In 1989 the Commission established Use Classifications and Water Quality Standards for Segment 4, which was subsequently divided (in 1995) into Segments 4a and 4b. The Commission adopted standards for reasons similar to those on which it based its action for Segment 3: - - as an added layer of protection for water users, especially water supplies, located downstream of a “major industrial complex utilizing nuclear materials”.

Since 1989, a number of changes have taken place in the upper portion of the Big Dry Creek watershed. The two most significant changes are the implementation of Option B, described above, and the initiation of cleanup and closure of the Rocky Flats Environmental Technology Site.

In addition to the Great Western Reservoir Replacement Project, Option B projects also include the Woman Creek Reservoir, part of the Standley Lake Protection Project. This project was completed in 1995, and successfully isolated Standley Lake from the Woman Creek drainage, which crosses Rocky Flats. Together, these projects have significantly changed water flows and configurations in the Big Dry Creek watershed, assuring protection of water supplies for Broomfield, Westminster and other neighboring municipalities.

Another significant change was that the Cold War officially ended in September 1991, marking an end to the nuclear weapons production era in this country. As a result, the mission of Rocky Flats was changed from weapons manufacturing to cleanup and closure; the DOE entered into discussions with the Colorado Department of Public Health and Environment and the Environmental Protection Agency to develop a new, comprehensive cleanup agreement for the Site, including a Vision for the Site's future, a commitment from DOE to remove the significant stockpile of nuclear materials from Rocky Flats by the year 2015, and an Action Level and Standards Framework that establishes numeric values that DOE, EPA and CDPHE will use to determine whether remedial action is necessary and how extensive such action must be to protect human health and the environment. DOE, EPA and CDPHE signed the final Rocky Flats Cleanup Agreement (RFCA) July 19, 1996.

The clean-up of Rocky Flats is expected to result in significant long-term improvements in the watershed of Big Dry Creek with respect to quantities and types of materials. However, during cleanup and de-activation and decommissioning there will be significant materials handling and removal activities which may impact water quality.

With respect to water quality, the Vision requires that ultimately “water leaving [Rocky Flats] will be of acceptable quality for any use.” During the active cleanup period, currently estimated to occur during the next 10 to 15 years, water quality should allow the attainment of all classified uses except drinking water supply.

No change in use classification was proposed for Segments 4a and 4b. Because the final Vision for Rocky Flats is to protect all uses, the Water Supply use classification is retained on Segments 4a and 4b, with some modification to the related water quality standards during the active cleanup period. Water Supply Use standards based on primary drinking water standards are retained because downstream waters flow near populated areas where human contact with the water is possible. The agricultural standard for nitrate (100 mg/l) and the aquatic life protection standard for nitrite (4.5 mg/l[ch] based upon chloride concentrations per footnote 5, Table II, Inorganic Parameters of the Basic Standards and Methodologies for Surface Water) were adopted as temporary modifications. Water supply standards will remain the underlying standards. This will not pose a health risk because there is normally no connection of Segment 4 waters with existing water supplies. Water supply standards based on secondary drinking water standards (non-health based criteria), iron, manganese, chloride and sulfate, are removed because they do not pose a health risk.

To establish these temporary modifications for the period of active remediation at Rocky Flats, which DOE currently estimates will last 10 to 15 years, the Commission adopted the temporary modifications for a period of twelve years, expiring in the year 2009, subject to triennial review.

These temporary modifications meet the criteria in Section 3.1.7(3)(a) of the Commission regulations. Human induced conditions exist which are correctable within a twenty year period, but a period of years will be required to implement the measures necessary to achieve compliance with the underlying standard. The elevated nitrate and nitrite levels are due to past human activities which a combination of human efforts in source control and natural processes will reduce or remove. If ground water contamination plume controls necessary to meet the underlying nitrate/nitrite standards are operated during the period of Site cleanup, resources may have to be diverted from the highest risk problems now facing the Site to fund that operation. Moreover, the most cost-effective use of resources to address the nitrate/nitrite contamination would be containment and closure of the source, as described further below.

Rocky Flats is implementing cleanup activities that will ultimately reduce nitrate and nitrite levels in ground water and loadings to surface water. The solar evaporation ponds were identified as the source area causing the highest nitrate levels in the ground water. Remedial actions are planned to ensure the contaminant source will be mitigated to protect surface water quality. Under the current DOE planning assumptions, the solar ponds will be closed by 2003. A decrease in ground water nitrate levels will have to occur after closure to achieve compliance with the underlying standard of 10 mg/l. The adoption of these temporary modifications will allow DOE to consider less expensive alternatives than currently in place for handling the contaminated ground water. The nitrate/nitrite temporary modifications will not increase health risks in downstream segments under the present situation in the Big Dry Creek basin because existing drinking water supplies have been or will soon be protected from contact with Site discharges. (See Section 2b above.) Also, nitrate loadings to the Site stream segments during the remediation period will not cause exceedences of ground water quality standards downgradient of the Site. DOE agreed to find an acceptable method to meet the applicable temporary modification.

Changes to water quality standards for uranium and gross beta are based on ambient conditions in Woman Creek. Based on the observed 85th percentile of ambient surface water conditions, the uranium standard for Woman Creek was changed to 11 pCi/L and the gross beta standard was changed to 8 pCi/L. These ambient standards are more restrictive than the gross beta drinking water guidance and the proposed EPA MCL for uranium. The use of ambient concentrations as stream standards is appropriate until the Commission takes action on statewide radionuclide standards.

With the concurrent action taken by the Commission to revise the basic standard for plutonium from 15 to 0.15 pCi/L and add a basic standard of 0.15 pCi/L for americium, the existing Site-specific standards of 0.05 pCi/L for plutonium and americium were dropped from Table 2. The basic standards for these two radionuclides are now applicable to Segments 4a and 4b. Application of the basic standard is appropriate for these segments because they are human health risk-based standards, protective against a 10-6 cancer risk associated with residential exposure, consistent with Commission policy.

Finally, Table 1A, which contains additional standards for organic parameters, was deleted for the same reasons identified in the discussion of Segment 2, above.

e. Segment 5

Changes made in Segments 4a and 4b described above were also made in Segment 5, which is restricted to the on-site ponds and upstream waters of Walnut Creek. Temporary modifications listed in Table 3 for six organic parameters were adopted in Segment 5 based on Safe Drinking Water Act maximum contaminant levels (MCLs). These levels are less stringent than the underlying “water + fish” basic standards, but are more restrictive than 1) the temporary modifications for organic parameters that were previously in effect, and 2) the aquatic life basic standards.

In the 1995 hearing on un-ionized ammonia, the Commission determined that Segment 5 does not constitute a fishery due to flow and habitat constraints. As explained elsewhere in this Statement of Basis and Purpose, waters leaving the Site will no longer flow into water supply reservoirs. (See Sections 2b and 2c above.) Therefore, non-achievement of the underlying water + fish standards in Segment 5 will not adversely affect human health. Moreover, the chronic aquatic life protection standards for these six organic parameters are 2 to 4 orders-of-magnitude higher than the adopted temporary modifications, so aquatic life in Segment 5 will also not be adversely affected as a result of adoption of the temporary modifications. Finally, adoption of these temporary modifications will not adversely affect classified uses downstream because Segment 5 is entirely within the Rocky Flats Environmental Technology Site boundary. At the downstream end of Segment 5, which is still within the Site boundary, surface waters will meet the underlying standards both during and after the period of active remediation.

To establish these temporary modifications for the period of active remediation at Rocky Flats, which DOE currently estimates will last 10 to 15 years, the Commission is adopting these temporary modifications for a period of twelve years, expiring in the year 2009, subject to triennial review

These temporary modifications will allow the use of more cost-effective passive, in situ source control and plume remediation methods. If statewide standards had to be met in Segment 5 during the period of remediation, then ground water plumes contaminated with organic chemicals would have to be pumped continually and treated in above-ground facilities. Consequently, DOE would not be able to address its highest priority risks first and would ultimately spend more for remediation than currently planned.

With the concurrent action taken by the Commission to revise the basic standard for plutonium from 15 to 0.15 pCi/L and add a basic standard of 0.15 pCi/L for americium, the existing Site-specific standards of 0.05 pCi/L for plutonium and americium were dropped from Table 2. The basic standards for these two radionuclides are now applicable to Segment 5. Application of the basic standards is appropriate for this segment because the standard is human health risk-based, protective against a 10-6 cancer risk associated with residential exposure, consistent with Commission policy.

3. Basis for the Commission Decision

a. Segment 3 Use Classifications

Although Broomfield proposed that the water supply classification be removed, the Commission has retained the water supply classification even though Great Western Reservoir will no longer be used as a water supply. This assures that the Commission action is in compliance with the section of the federal Water Quality Standards Regulation (40 CFR 131.3(a)) which states that uses which are in place on November 28, 1975, will be maintained. Since the Reservoir will be abandoned as a domestic water supply by Broomfield and they have stated they have no plans to reinstate that use, there is no need for water supply standards to protect any present or future use. Further, the reclaimed wastewater that will be held by Great Western Reservoir will not be suitable for water supply. It will be suitable and will actually be used for agriculture purposes. Therefore, the Commission has added the agricultural classification.

In addition, the Commission has changed the aquatic life warm water 1 classification to class 2 because the class 1 use never has existed in fact and because the water in Great Western Reservoir will not be suitable for class 1. Class 2 is appropriate in this case because Great Western Reservoir waters are not capable of sustaining a wide variety of warm water biota, including sensitive species due to physical habitat, water flows or levels that result in substantial impairment of the abundance and diversity of species.

The Commission has changed the recreation class 1 classification to class 2 because the class 1 use never existed in fact and because the water in Great Western Reservoir will not be suitable for class 1 (i.e., the water is not suitable or intended to become suitable for recreation activities in or on the water such as swimming and boating). The waters will be suitable for recreation uses on or about the water such as lakeside recreation. Therefore, Recreation Class 2 is appropriate.

b. <u>Segment 1 Water Quality Standards</u>

The Commission adopted additional standards to protect the aquatic life and agricultural uses in place on Segment 1. While the segment has been classified for the warm water aquatic life class 2 and agricultural uses since 1981 only limited standards were assigned. Evidence provided at this hearing showed a significant increase in the number and species of fish present in the segment when compared to the evidence presented in 1981 and the Commission felt a higher level of protection was warranted. The Commission also adopted a chronic nitrite standard of 4.5 mg/l based on a recommendation that this level should be a maximum concentration allowed for waters whose chloride levels exceed 22 mg/l and contain fathead minnows and other nonsensitive fish species.

The Commission rejected a proposal by the Division of Wildlife to adopt a more stringent unionized ammonia standard for segment 1, at 0.06 mg/l, because the Commission felt that there was not enough evidence to justify adopting the more stringent standard at the present time. The Commission encourages the Cities discharging to this segment, the Division of Wildlife and the Water Quality Control Division to work together to assess the future instream conditions in this segment resulting from anticipated effluent dechlorination efforts and municipal water supply and wastewater discharge operational changes.

c. <u>Segment 2 Water Quality Standards</u>

The Commission deleted the site-specific organic standards identified in Table 1A. Table 1A was adopted in 1989 prior to the Commission's adoption of basic standards for organic compounds. Table 1A was retained in 1992 because, although for most parameters the site-specific standards were identical to the basic standards, the table contained a few unique site-specific standards. The Commission has since adopted basic standards for all compounds found in Table 1A, and since the basic standards are applicable in Segment 2, Table 1A was deleted. The water supply based beryllium standard was moved to the numeric standards for metals.

d. Segment 3 Water Quality Standards

The Commission changed the fecal coliform standard from 200/100 ml to 2000/100 ml to reflect the change to the recreation class 2 classification. The chronic unionized ammonia standard was changed from 0.06 to 0.10 mg/l to reflect the change to the aquatic life warm water class 2 classification. Nitrite was changed from 0.5 to 2.7 mg/l based on application of footnote 5 Table II Inorganic Parameters of the Basic Standards and Methodologies for Surface Water. Nitrate, chloride and sulfate were deleted as a result of the conclusion that there is no current or foreseeable water supply use of this reservoir. Based on the absence of water supply use and addition of the agriculture classification, the following metals standards were changed; As(ac) = 50 (Trec) to 100 (Trec), CrIII(ac) = 50 (Trec) to CrIII(ac/ch) = TVS and the following standards were deleted; Fe(ch) = 300 (dis), Mn(ch) = 50(dis). Selenium was changed from 10(Trec) to 20 (ac) and 5(ch) to reflect the revised selenium standards adopted by the Commission in 1995. Finally, due to the absence of a water supply use, the site specific organics standards and water supply based beryllium standard were deleted. An agriculture based beryllium standard of 100 ug/l was added to the metals table. All of the changes for segment 3 will be effective January 1, 1998, to assure that Broomfields new water supply is fully in place.

e. Segments 4a and 4b Water Quality Standards

The Commission retained water supply as a use classification for Segments 4a and 4b, but as explained in the background above, because the water is not presently used for water supply, secondary drinking water-based standards for iron, manganese, chloride and sulfate were removed, the standard for nitrate was temporarily modified to 100 mg/L and the nitrite standard was temporarily modified to 4.5 mg/L. For Walnut Creek, all of these changes will be effective January 1, 1998, to assure that Broomfields new water supply is fully in place. Ambient standards for total uranium of 11 pCi/L and 8 pCi/L for gross beta were adopted for the Woman Creek portion of Segment 4 to reflect the most current monitoring results for these waters, and basic standards for plutonium and americium were adopted for all portions of Segments 4a and 4b. Selenium was changed from 10 (Trec) to 20 (ac) and 5(ch) to reflect the revised selenium Table Value criteria adopted by the Commission in 1995. Table 1A site-specific standards were deleted. The qualifier adding the standard for beryllium was deleted by the addition of Be (ch)=4 to the numeric standards for metals.

f. Segment 5 Water Quality Standards

The Commission retained water supply as a use classification for Segment 5, but because the water is not used for water supply, secondary drinking water-based standards for iron, manganese, chloride and sulfate were removed, and the standard for nitrate was temporarily modified to 100 mg/L and nitrite was temporarily modified to 4.5 mg/L. Ambient standards for total uranium of 11 pCi/L and 8 pCi/L for gross beta were adopted for the Woman Creek portion of Segment 5 to reflect the most current monitoring results for these waters. Site specific standards for plutonium and americium were deleted to allow the newly adopted basic standards to apply to Segment 5. Selenium was changed from 10 (Trec) to 20 (ac) and 5(ch) to reflect the revised selenium Table Value criteria adopted bv the Commission in 1995.

Temporary modifications are adopted for parameters contained in Table 3 to reflect existing conditions and the temporary modification for radionuclides of ambient quality was removed.

g. Segment 3 Antidegradation Designation

The “Use Protected” designation was added based on the aquatic life warm water class 2 classification of Great Western Reservoir. This designation is consistent with the existing designations of Big Dry Creek Segments 1, 4a, 4b and 5.

PARTIES TO THE RULEMAKING

1. State of Colorado Division of Wildlife
2. U.S. Department of Energy
3. Kaiser-Hill Company, LLC
4. City of Broomfield
5. City of Westminster
6. U.S. EPA Region VIII
7. City of Thornton
8. City of Arvada
9. City of Northglenn

38.51 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE

The provisions of § 25-8-402 C.R.S. provide the specific statutory authority for adoption of these regulatory amendments.The Commission also adopted in compliance with § 24-4-103(4) C.R.S. the following statement of basis and purpose:

BASIS AND PURPOSE

In accordance with a 1995 Memorandum of Understanding between the Metro District, the Water Quality Control Division, the Colorado Division of Wildlife, and the U.S. Environmental Protection Agency, the Metro District completed during 1995 and 1996 seven supplemental laboratory tests of effects of varying levels of dissolved oxygen on particular species of fish. These tests were designed to provide additional information to assist in setting a final Older Life Stage 7-Day Mean of Minimums standard and a final Early Life Stage 1-Day (acute) standard.

Based on the tests performed for the Metro District, it was concluded that a 2.0 mg/L dissolved oxygen (“D.O.”) standard for Older Life Stage 7-Day Mean of Minimums will protect fish from acute effects and is also likely to protect older life stages from adverse effects on growth. To assure protection from adverse effects on growth, a 2.5 mg/L standard for the Older Life Stage 7-Day Mean of Minimums was adopted.

In tests to provide a basis for an acute (instantaneous) standard for early life stages, it was concluded that a standard of about 3.0 mg/L would protect most fish likely to be in Segment 15 from adverse effects on survival during early life stages. Six fish species were tested in the laboratory during early life stages. Five fish were fully protected from adverse effects on survival at acute D.O. levels above 2.0 mg/L during early life stages. One fish species tested, the plains killifish, demonstrated approximately a 20% reduction in hatching and survival when exposed to repeated acute minima levels of 4.0, 3.0 and 2.0 mg/L, i.e., each of these levels resulted in the same effect on the plains killifish. Repeated acute levels of 1 mg/L resulted in greater suppression of hatch. It is recognized that a portion of the fish community in the river (10% - 20%) may have a reduction in hatch of approximately 20% at repeated D.O. minima below 5 mg/L D.O.

Based on the information that (1) Segment 15 is a Class 2 Aquatic Life stream with significant variations in flow and a predominantly unstable, sandy substrate, (2) there would be a minimal level of effect on the aquatic community as a whole (less than 5%), (3) that the cost of increased treatment outweighs the benefits to the fish community, and (4) the Metro District has agreed to make improvements to Segment 15 to improve the overall diversity and population of fish in the Segment; the Commission has determined that a site specific Early Life Stage 1-Day (acute) standard of 3.0 mg/L will be sufficiently protective for Segment 15.

The standards further provide for an Early Life Stage 7-Day average of 4.5 mg/l for the period July 1 to July 31 north of the Lupton Bottoms Ditch diversion. The Commission agrees with this modification of the Early Life Stage 7-Day average because it will avoid the necessity of building an active aeration facility in the lower end of Segment 15. It is expected that the 4.5 mg/l standard in this portion of Segment 15 will have little, if any, impact on growth and survival of fish. Any possible negative effect will be offset by the benefits of the other improvements (flow equalization, upstream drop structures and channel changes) to be made by the Metro District.

The temporary modifications and the schedule for the standards to become finally effective are based on the Metro District schedule for construction of improvements to increase the D.O. in Segment 15. The Water Quality Control Commission will review these Segment 15 D.O. standards and the implementation efforts in detail as a part of each triennial review until these standards become fully effective.

For the purpose of determining compliance with the standards, dissolved oxygen measurements shall only be taken in the flowing portion of the stream and at mid-depth, and at least six inches above the bottom of the channel. Dissolved oxygen measurements in existing man-made pools and in pools behind low-head dams built for reaeration are not to be used for determination of compliance with the standards. For the purpose of this regulation the extent of the man-made pools shall be defined in writing by the Division based on the best professional judgment of the Division and on advice by the Colorado Division of Wildlife and the U.S. Environmental Protection Agency. The intent of excluding the existing man-made structures from the instream compliance monitoring for dissolved oxygen is to recognize that these pools are not natural to the river and that they exacerbate low dissolved oxygen problems. In defining the extent of these pools, it is recognized that pools comprise areas of lower velocity, increased sedimentation, and greater depth than other areas of the river; however, there may not be a sharp demarcation of what constitutes a pool using these criteria. Because of this and because the extent of pol area may vary, the judgment and consensus of several stream biologists will be used to define the upstream extent of each pool.

The Commission took notice of a Memorandum of Understanding (“MOU”) between the Metro District, the WQCD, the DOW and EPA. This MOU sets forth the parties' agreement with respect to the dissolved oxygen standards. In addition, it details activities and improvements to be undertaken by the Metro District and includes an anticipated construction schedule. Among the improvements agreed to by the Metro District is flow equalization. Minimizing diurnal flow variations through construction and operation of flow equalization facilities is expected to provide important benefits to the aquatic life in Segment 15 of the South Platte River. With a reduction in daily variation in the river flow and the attendant improvement in fish habitat, the Commission finds that the site-specific numerical dissolved oxygen standards require less of a safety margin to provide sufficient protection to the aquatic life in Segment 15. The MOU provides that the Metro District agrees to design and construct facilities to significantly reduce variations in river flows caused by discharges from the Metro District's Central Treatment Plant.

PARTIES TO THE RULEMAKING HEARING

1. Metro Wastewater Reclamation District
2. Colorado Division of Wildlife

38.52 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE (April, 1997 Multiple Segments Hearing)

The provisions of 25-8-202(1)(a)and (b); 25-8-203; 25-8-204; and 25-8-402 C.R.S. provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted in compliance with 24-4-103(4) C.R.S. the following statement of basis and purpose.

BASIS AND PURPOSE

As a result of this hearing, the Commission has decided to revise the water quality classifications and standards for several segments, as enumerated below.

Upper South Platte Segments 2b and 2c

The Commission extended the temporary modifications that existed in segments 2b and 2c of the Upper South Platte River Basin because the underlying standards are not being met due to human-induced conditions that are deemed correctable within a 20-year period. The London Mine is cooperating with the Water Quality Control Division and Division of Minerals and Geology to obtain a §319 grant to study alternatives to reduce pollutant loadings in segments 2b and 2c and to implement actions to effect reductions in metals loading in these segments.

A new temporary modification for manganese was adopted in segment 2c. The basis for this temporary modification is ambient data which shows a slight exceedance of the water supply based table value standard of 50 ug/l.

The duration of the proposed extension of temporary modifications in segments 2b and 2c and new temporary modifications in segment 2c is for three years. This will allow time for implementation of the §319 project. Upon completion, London Mine and the Water Quality Control Division will reassess the water quality in segments 2b and 2c to see whether a further extension is warranted within the 20 year period included in §'3.1.7(3)(a)(i) of the Basic Standards.

Upper South Platte Segment 14

At the request of the Littleton/Englewood Wastewater Treatment Plant, the Commission revised the numeric water quality standard for dissolved manganese on segment 14 of the South Platte River from 50 ug/l to 190 ug/l. This revision is based on evidence that 190 ug/l is the 85th percentile of ambient dissolved manganese concentration in water samples taken during 1990, 1991, and 1996 from segment 14 of the South Platte River at a point upstream from the outfall of the Littleton/Englewood Wastewater Treatment Plant.

Upper South Platte Segment 15

For this hearing, the Water Quality Control Division proposed adopting “water + fish” organic chemical standards for segment 15. The Commission declined to adopt these standards for this segment at this time. The Commission does not believe that the information submitted provides sufficient evidence of recurring fishing in this segment that would result in a degree of exposure to potential pollutants that warrants the adoption of these standards. No information was included in the record regarding what fish species are present in segment 15.

Clear Creek Segment 14

Several changes to the standards for Clear Creek segment 14 were adopted. The first changes were to correct typographical errors in the table. They consisted of specifying a use-protected designation for the segment because of its aquatic life class 2 classification and moving the formulas for zinc and copper in the temporary modifications column to the main tables. (They were adopted as standards in 1993, not temporary modifications). The second, more substantive changes were to update the tables to reflect standards based on dissolved metals rather than the existing total recoverable. Data collected from 1990 through 1996 at a monitoring station located just upstream of the segment resulted in the adoption of substantially different standards for several metals. Temporary modifications were adopted for cadmium and manganese, with underlying standards based on the goals of metals removal associated with Superfund remediation projects in the upper Clear Creek basin. Ambient standards were not adopted for copper or zinc because of site-specific standards were adopted for these parameters in 1993 based on water effects ratio studies.

Big Thompson, Segments 1, 2, and 3

At the request of the Thompson River Project, the Commission upgraded the recreation classification for segments 1, 2, and 3 to Recreation Class 1 - Primary Contact based upon evidence that the actual uses of these segments currently include primary contact recreation.

PARTIES TO THE RULEMAKING HEARING

1. Littleton/Englewood Wastewater Treatment Plant
2. Thompson River Project
3. State of Colorado, Division of Wildlife
4. London Mine
5. City of Fort Collins
6. Metro Waste Water Reclamation District
7. Plum Creek Wastewater Authority
8. Jackson Creek Ranch, LLC
9. Coors Brewing Company
10. Perry Park Water & Sanitation District
11. North Front Range Water Quality Planning Association
12. U.S. EPA Region VIII

38.53 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; JULY, 1997 RULEMAKING

The provisions of sections 25-8-202 and 25-8-401, C.R.S., provide the specific statutory authority for adoption of the attached regulatory amendments. The Commission also adopted, in compliance with section 24-4-103(4) C.R.S., the following statement of basis and purpose.

BASIS AND PURPOSE

The Commission has adopted a revised numbering system for this regulation, as a part of an overall renumbering of all Water Quality Control Commission rules and regulations. The goals of the renumbering are: (1) to achieve a more logical organization and numbering of the regulations, with a system that provides flexibility for future modifications, and (2) to make the Commission's internal numbering system and that of the Colorado Code of Regulations (CCR) consistent. The CCR references for the regulations will also be revised as a result of this hearing.

38.54 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; NOVEMBER, 1998 RULEMAKING

The provisions of C.R.S. 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; and 25-8-402; provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted in compliance with 24-4-103(4) C.R.S. the following statement of basis and purpose.

BASIS AND PURPOSE

The Commission has recently approved a new schedule for triennial reviews of water quality classifications and standards for all river basins in Colorado. In this hearing the Commission has extended the expiration dates of temporary modifications [and, for the Animas Basin, the effective dates of underlying standards] without substantive review, so that the next substantive review of the temporary modifications can occur as part of the overall triennial review of water quality standards for the particular watershed. This will avoid the need for multiple individual hearings that would take staff resources away from implementation of the new triennial review schedule.

For segment 3 of St. Vrain Creek, the Commission has corrected the numerical standards by repealing dissolved iron and manganese standards and revising the arsenic standard, since there is no water supply classification for this segment.

38.55 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; May, 1999 RULEMAKING

The provisions of C.R.S. 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; and 25-8-402; provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted in compliance with 24-4-103(4) C.R.S. the following statement of basis and purpose.

BASIS AND PURPOSE

Segment 5 of Big Dry Creek includes a series of ponds that lie below the Rocky Flats Environmental Technology Site (RFETS) sewage treatment plant outfall (discharge point STP1). These ponds are part of what is known as the B-Series ponds. More specifically, these ponds are designated as ponds B3, B4 and B5, in upstream to downstream order. This segment is currently classified and has numeric standards for radionuclides, including americium and plutonium.

During the decommissioning of the site, certain cleanup activities may increase the risk of an accidental release of radioactive materials into the sewage treatment plant (STP) collection system, and then into the environment. There may also be releases from soils as a result of surface runoff, which have in the past resulted in some short term excursions above stream standards in the Walnut Creek drainage. In either case, the specific parameters of concern are americium and plutonium.

While the risk of a release from the STP may be very small, if a release did occur, the ponds would reduce the potential for an off-site release to downstream segments. The current draft NPDES permit for the sewage allows RFETS to use an outfall that currently exists above the ponds - referred to as STP1. But, there are no numeric effluent limitations for americium or plutonium assigned to outfall STP1, due to legal disputes about the applicability of such limits.

The permit includes a second outfall below the ponds - known as STP2, which in effect is limited for americium and plutonium through a separate CERCLA based control mechanism - the Rocky Flats Cleanup Agreement (RFCA). While this outfall is not yet constructed, it is envisioned that eventually it will be the primary outfall for the STP.

Even after STP2 is operational, the permit will allow the discharge from STP1 under special circumstances. In order to allow this type of discharge, and because of the existing periodic excursions of stream standards - that are due to man-made conditions that will eventually be remediated, temporary modifications to the underlying numeric americium and plutonium standards are being adopted.

Although the current radionuclide standards have generally been attained in segment 5 in the past, the temporary modifications are being adopted due to the unique challenges associated with decommissioning a nuclear weapons facility. The temporary modifications are narrative standards, allowing the Walnut Creek portion of segment 5 americium and plutonium levels to be higher than the current underlying standards - up to a maximum level of whatever is necessary to maintain the numerical standards in the downstream segment. This downstream segment has compliance points and instream limits on americium and plutonium as part of the Rocky Flats Cleanup Agreement which require that the levels of these parameters be maintained within the stream standards.

The temporary modifications must be in place before the 401 Certification can be issued for the NPDES permit. The ultimate term of these temporary modifications is envisioned to be during the entire period of decommissioning, with an expiration date of December 31, 2009. The NPDES permit and several RFCA associated documents that are currently being revised directly affect the level of protection afforded to segment 5 and downstream segments. In order to ensure that adequate protections are included in these documents within a reasonable period of time, the temporary modifications will initially be adopted with an expiration date of December 31, 2000. During, the May, 2000, triennial review of the South Platte River Basin standards, the temporary modifications may be extended to December 31, 2009, to coincide with site closure, if there is sufficient reason to believe that downstream water quality standards will still be protected.

Because the STP does not discharge into the Woman Creek drainage, the temporary modifications adopted in the rulemaking only apply to the Walnut Creek drainage. The temporary modifications do not apply to the Woman Creek portion of the Big Dry Creek, segment 5, namely Pond C-2.

PARTIES TO THE RULEMAKING HEARING

1. City of Broomfield
2. City of Westminster
3. U.S. Department of Energy
4. Rocky Mountain Remediation Services, LLC
5. Kaiser-Hill, CO., LLC

38.56 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; SEPTEMBER, 2000 RULEMAKING

The provisions of sections 25-8-202(1)(b); 25-8-204; and 25-8-402, C.R.S., provide the specific statutory authority for the adoption of these regulatory amendments. The Commission also adopted, in compliance with section 24-4-103(4), C.R.S., the following statement of basis and purpose.

BASIS AND PURPOSE

Background and Overview

This rulemaking hearing was originally noticed to consider proposals by the Cherry Creek Basin Water Quality Authority (Cherry Creek Authority) for (1) revisions to the phosphorus standard for Cherry Creek Reservoir, (2) revisions to the Cherry Creek Reservoir Control Regulation, Regulation #72, and (3) approval of related amendments to the Denver Regional Council of Governments' (DRCOG) section 208 plan (Clean Water Plan). Prior to the hearing, because DRCOG did not approve and submit to the Commission proposed section 208 plan amendments, the Commission ruled that revisions to that plan would not be considered in this proceeding. If amendments to the section 208 plan are approved and submitted by DRCOG in the future, the Commission will consider them at that time.

As a result of the September, 2000 hearing, the Commission adopted revisions to the water quality standards for Cherry Creek Reservoir. Specifically, the Commission repealed the previous 35 ug/l phosphorus standard and adopted a seasonal mean chlorophyll a standard of 15 ug/l, measured in the upper three meters of the water column for the months of July through September, to apply annually, with an expected rate of compliance of nine years out of ten. As discussed further below, to implement this standard the Commission is also establishing a seasonal mean total phosphorus target of 40 ug/l.

Based on its initial deliberations following this hearing, the Commission decided not to adopt any revisions to the Cherry Creek Reservoir Control Regulation at this time. Rather, the Commission is continuing the portion of this rulemaking proceeding relating to potential revisions to the Control Regulation, to be considered further at the May, 2001 Commission meeting. In order to provide some guidance to the Water Quality Control Division (Division) staff, the Cherry Creek Authority, and other interested persons as efforts proceed to development appropriate Control Regulation revisions, this Basis and Purpose discussion provides the Commission's initial perspective on a number of the Control Regulation issues raised in this proceeding.

Chlorophyll a Standard and Total Phosphorus Target

As noted above, the Commission has repealed the previous 35 ug/l phosphorus standard and adopted a seasonal mean chlorophyll a standard of 15 ug/l, measured in the upper three meters of the water column for the months of July through September, to apply annually, with an expected rate of compliance of nine years out of ten. The Commission intends that the Division will develop a sampling methodology for implementation of this standard that is representative of overall reservoir quality.

In 1985, the Commission set a total phosphorus standard of 35 ug/l for Cherry Creek Reservoir, to limit chlorophyll a levels, thereby limiting eutrophication of the reservoir, and thus protecting the beneficial uses of the reservoir. The reservoir is classified for the following uses: Aquatic Life Warm 1, Recreation 1, Water Supply and Agriculture. The 35 ug/l total phosphorus standard was applied as a mean concentration during the growing season of July through September. In addition, a target of 15 ug/l chlorophyll a was established. The chlorophyll a target was also applied as a seasonal mean concentration. The Commission also adopted a full set of numeric standards to protect the uses of the reservoir. The phosphorus standard became effective May 30, 1985.

The statement of basis and purpose for the Commission's 1985 adoption of standards states that the intent of the total phosphorus standard was to limit chlorophyll a levels and thereby protect the classified beneficial uses of the reservoir. "The purpose for adopting the .035 mg/L P standard for Cherry Creek Reservoir is to maintain the chl a level in Cherry Creek Reservoir at no higher than .015 mg/L." The 1982 Clean Lakes study of the reservoir determined that a range of chlorophyll a concentrations of 10 to 20 ug/l was identified as protective of the aquatic life uses, while a narrower range of 10 to 15 ug/l was determined to be protective of swimming. The chlorophyll a goal of 15 ug/l was a compromise level to protect both recreational and aquatic life uses.

In this rulemaking, evidence was presented that during each year from 1992 through 1999, the seasonal means for total phosphorus have been significantly higher than the 35 ug/l total phosphorus standard. In addition, several seasonal mean chlorophyll a values have exceeded the 15 ug/l chlorophyll a goal, particularly in recent years.

In this action, the Commission has adopted a chlorophyll a standard with a total phosphorus target. The Commission has selected this approach because the chlorophyll a level more directly relates to the uses to be protected than does total phosphorus. Chlorophyll a is a direct measure of algal biomass and overall productivity of the reservoir. The concentration of chlorophyll a reflects the aesthetic acceptability of the reservoir for recreational purposes. High concentrations of algae reduce the transparency of the reservoir. Swimming may be more desirable in waters of high transparency and low nutrient content. Aesthetically, people prefer clear, less green water to swim in.

Although excess algae is perceived by some to be merely an aesthetic quality, algal blooms resulting from excess nutrients can have profound consequences on the chemistry and biology of the reservoir. For example, there can be a shift in the algal community resulting in dominance by blue-green algae, which can produce taste and odor problems in the reservoir. High algal biomass can result in oxygen depletion in the lower waters during the summer and autumn. The oxygen depletion can result in fish kills.

Total phosphorus is used as a target to control production of chlorophyll a. There is uncertainty in the relationship between total phosphorus and chlorophyll a in Cherry Creek Reservoir, and the relationship could change in the future. Therefore, a 15 ug/l chlorophyll a standard with a total phosphorus target minimizes the need to revisit the standard in the future. The level of total phosphorus can be adjusted in the control regulation over time, if necessary, as more is learned about this relationship.

The Commission has determined that the chlorophyll a standard should apply annually. The Commission intends that the rate of compliance with the standard should be nine years out of ten on a rolling average. In other words, if for any ten-year period the seasonal mean chlorophyll a standard is met for at least nine of those years, the reservoir will be considered to be in attainment of the standard. Instantaneous exceedances are allowed in individual samples, so long as the seasonal mean for the standard is attained.

The total phosphorus target of 40 ug/l is based upon a regression model of seasonal mean total phosphorus versus seasonal mean chlorophyll a from 1992 to 1999 at Cherry Creek Reservoir. The Division used the 90% confidence intervals of the regression line to determine the target level of total phosphorus that would attain the 15 ug/l chlorophyll a standard. Therefore, it would be expected that for a given growing season, one would be 90 percent confident that a total phosphorus level of 40 ug/l would result in a chlorophyll a level at or below 15 ug/l.

Control Regulation Issues

As noted above, the Commission has chosen not to adopt any revisions to the Cherry Creek Reservoir Control Regulation, Regulation #72, at this time. Based upon the Commission’s decision regarding adoption of the new chlorophyll a standard for the reservoir, the Commission believes that it would be beneficial for the Division, the Cherry Creek Authority and other interested persons to further examine appropriate revisions to the Control Regulation. In order to provide time for these discussions to occur, the portion of this proceeding relating to potential revisions to the Control Regulation is being continued to the May, 2001 Commission meeting. The Commission requests that prior to that time the Division work cooperatively with the Cherry Creek Authority and other interested persons to develop a new proposal for Control Regulation revisions.

In order to provide some guidance to the Division, the Cherry Creek Authority, and other interested persons as efforts proceed to develop appropriate Control Regulation revisions, the Commission offers the following initial perspective on a number of the Control Regulation issues raised in this proceeding:

1. Concern was expressed by the Division and several other participants in the hearing regarding potential in-lake phosphorus management by the application of alum. The Commission believes that control efforts should emphasize preventive, source control measures and that in-lake treatment options should be at the bottom of the priority list. Moreover, the Commission expressed concern regarding the potential negative impacts of in-lake treatment on aquatic life and water quality.

2. The Cherry Creek Authority proposed a methodology that accounts for the pounds of phosphorus delivered to the reservoir as an "in-stream delivery ratio" of what is actually released into the watershed. The Commission is not necessarily opposed to use of the in-stream delivery ratio concept, but is not yet persuaded of its viability. Concerns were expressed regarding whether this concept appropriately accounts for a long-term mass balance for phosphorus. The Commission believes that there is a need for more data and analysis to provide a strong rationale that this concept will work before it is implemented as a basis for the provisions of the Control Regulation.

3. The current Control Regulation authorizes a phosphorus trading program for the Cherry Creek watershed. In adopting the trading program in 1997, the Commission stated that "[t]he goal of the Trading Program is to allow those trades which will have a net water quality benefit in the Basin and maintain the inlake chlorophyll a level of 15 ug/l." Data that has become available subsequent to adoption of the trading program raises significant concerns regarding current attainment of this chlorophyll a level, which is now being established as a standard for the reservoir. Therefore, the Commission now has serious reservations about the suitability of the trading program until such time as the reservoir is in compliance with the chlorophyll a standard.

4. The Commission believes that an effective public education component should be included in the overall efforts to improve and subsequently maintain the quality of Cherry Creek Reservoir.

5. The Commission believes that there may be a need for strong stormwater discharge controls in the Cherry Creek Basin, as one component of overall control efforts. Development of a revised Control Regulation should carefully review the status of current stormwater controls and the possible need for additional measures.

6. For any revised Control Regulation, the Commission believes that there is a need for a comprehensive, ongoing overall monitoring program to demonstrate that the total maximum daily load established is being achieved.

7. The Commission does not believe that the need for or cost-effectiveness of reverse osmosis treatment has been demonstrated at this time.

In summary, the Commission believes that efforts to develop a revised Control Regulation should focus on identifying what source control efforts are feasible, particularly over the next three to six years, to move aggressively toward compliance with the 15 ug/l chlorophyll a standard. The Commission recognizes that at present there is still legitimate debate and disagreement regarding what level of water quality is attainable in the reservoir over the long run. However, the evidence demonstrates that there are a number of technically and financially feasible projects and other control efforts that have not yet been implemented.

The Commission has determined as a matter of policy that at this time it is appropriate to maintain a conservatively protective chlorophyll a standard and associated total phosphorus target as the basis for near-term control efforts. As those efforts are implemented over time and more information is developed regarding influences on and the attainability of identified levels of reservoir water quality, both the Control Regulation and the underlying standards can be revisited. Indeed, the statutory triennial review process requires that they be revisited at three-year intervals. In the meantime, the Commission urges all interested parties to work cooperatively to determine the most effective measures to implement in the next few years to move aggressively toward improvement of the quality of the water in Cherry Creek Reservoir.

PARTIES TO THE RULEMAKING

1. The Cherry Creek Basin Water Quality Authority
2. The City of Greenwood Village
3. Roxborough Park Metropolitan District
4. Plum Creek Wastewater Authority
5. Colorado Division of Wildlife
6. Arapahoe County Water & Wastewater Authority
7. The City of Thornton
8. Denver Regional Council of Governments
9. Clean Water Action
10. United Citizens of Arapahoe Neighborhoods
11. Chatfield Watershed Authority
12. U.S. Environmental Protection Agency, Region VIII
13. The City of Westminster
15. Sierra Club
16. Warm Water Coalition
17. Cherry Creek State Park
18. Colorado Trout Unlimited

38.57 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; NOVEMBER, 2000 RULEMAKING

The provisions of C.R.S. 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; and 25-8-402; provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted in compliance with 24-4-103(4) C.R.S. the following statement of basis and purpose.

BASIS AND PURPOSE

A. <u>Resegmentation</u>

Some renumbering and/or creation of new segments was made in the basin due to information which showed that: a) the original reasons for segmentation no longer applied; b) new water quality data showed that streams should be resegmented based on changes in their water quality; and/or c) certain segments could be grouped together in one segment because they had similar quality and uses. The following changes were made:

<u>Upper So. Platte segment 6</u> was split into segments 6a, 6b and 6c to reflect the difference in water quality standards and land use, namely segment 6a is the portion above the Chatfield Reservoir, segment 6b is the reservoir, and segment 6c is the portion below the reservoir.

<u>Upper So. Platte segment 16</u> was divided into 16a, 16b and 16c to reflect the difference between Sand Creek and the other tributaries, and to recognize the uses of Aurora Reservoir. The mainstem of Sand Creek became segment 16a; Aurora Reservoir became 16 b, and the all remaining tributary portion became 16c.

Clear Creek segment 13 was divided into two segments to address differences in water quality and uses. Segment 13a is the mainstem and tributaries above Black Hawk's water supply; 13b is the mainstem and tributaries below Black Hawk's water supply to the confluence with Clear Creek.

Clear Creek segment 14 was split into segments 14a and 14b to reflect differences in access for recreational use. The dividing point is the Denver Water conduit #16 crossing, approximately .5 miles above Youngfield Street, with 14b, the lower segment having a recreation 1a classification.

Clear Creek segment 16 was split into segments 16a and 16b to reflect actual water supply uses. Lean Gulch and its tributaries above the outlet of Maple Grove Reservoir will be segment 16a.

Clear Creek segment 17 was divided into two segments to recognize the difference in uses of Arvada reservoir. Arvada Reservoir is now segment 17a, with the remaining tributaries to Ralston Creek as segment 17b.

Clear Creek segment 18b was reconfigured to reflect actual water supply uses. Kelly Lake and Van Bibber Creek above the Kelly Lake diversion were moved to Clear Creek segment 18a.

St. Vrain Creek segment 4 was divided into two segments to address the water quality in James Creek which has been affected by historical mining. Segment 4a is now Lefthand Creek and tributaries except for James Creek, and Segment 4b is James Creek and its tributaries.

Big Thompson segment 4 was split into segment 4a, 4b and 4c to reflect differences in uses and water quality characteristics. The dividing point between 4a and 4b is the Greeley-Loveland Canal diversion. Segment 4a, above the diversion will have water supply and aquatic life cold 2 uses. The dividing point between segments 4b and 4c is County Road 11H, above the Loveland wastewater treatment plant.

Cache la Poudre segments 1 and 2 were combined into a new segment 1. This combines those waters within the Rawah, Neota, Comanche Peak and Cache la Poudre Wilderness Areas with those in the Rocky Mountain National Park into 1 segment.

Cache la Poudre segments 3 and 4 were combined into segment 2. This combines the mainstem, and waters tributary to the Upper Cache la Poudre (and not in segment 1) into 1 segment. Segments 3 and 4 were deleted.

Middle South Platte segment 3 was split into segment 3 and segment 5 to reflect differences in recreational uses. Segment 3 remains the "all tributaries" segment; segment 5 will be Lone Tree, Crow, and Boxelder Creeks.

Lower So. Platte segment 2 This "all tributaries" segment was split into portions that have perennial flow and support diverse aquatic communities and those that do not. Segment 2b is the portion on the north side of the river with aquatic communities and segment 2a is the portion without. Vancil Reservoir was moved to segment 5.

Republican River segment 6 was reconfigured to reflect aquatic life uses. Chief Creek was moved to segment 3 which has an aquatic life cold 1 classification.

B. Wetlands

In March 1993, the Commission amended the Basic Standards and Methodologies for Surface Water, Regulation #31 (5 CCR 1002-31) to include wetlands in the stream classification and standards system for the State. Due to that action, it became necessary to revise the segment description for all segments of the “all tributary” type to clarify that wetlands are also part of the tributary system for a given mainstem segment. All tributary wetlands now clearly carry the same classifications and standards as the stream to which they are tributary as provided for in 31.13(1)(e)(iv).

C. Manganese

The aquatic life manganese criterion was initially changed in the 1997 revisions to the Basic Standards (5 CCR 1002-31) from a single chronic dissolved criterion to acute and chronic hardness-based equations. The equations were further modified in the 2000 revisions to the Basic Standards. The new manganese acute and chronic equations were added as table value standards in 38.6(3). As a result of the adoption of these new TVS, all segments classified for aquatic life use that had a chronic total recoverable manganese standard of 1,000 ug/l had the 1,000 standard stricken and replaced with Mn (ac/ch)=TVS.

D. Selenium

The regulation in 38.6 (3) listed the table value standards for selenium as Acute=135 ug/L and Chronic=17 ug/L. This was updated to reflect the existing acute and chronic criteria for selenium listed in the Basic Standards as Acute= 18.4 ug/L and Chronic= 4.6 ug/L which was adopted in 2000 by the Commission. This change means that all segments with standards for selenium given as TVS now have these lower acute and chronic standards. Because of this change, on all segments classified for a water supply use, the chronic total recoverable selenium of 10 ug/L was stricken and replaced with Se (ac/ch)=TVS.

E. Outstanding Waters Designations

Several segments or waterbodies were designated outstanding waters (OW) due to their meeting certain criteria pursuant to section 31.8(2)(a). Other segments that already had the OW designation but whose classifications and/or standards were inconsistent with the those prescribed by the Commission for OW waters in other basins in Colorado were corrected. These changes are discussed below for each segment.

1) Add Outstanding Waters Designation: Segments which already include wilderness areas in their description were designated OW. The water quality of the following segments met the 12 parameter test and other requirements of 31.8(2)(a):

Upper So. Platte segment 1b
Bear Creek segment 7
Clear Creek segment 19
Boulder Creek segment 1
St. Vrain segment 1
Big Thompson segment 1

2) Add classifications and standards: Classifications (recreation 1, aquatic life cold 1, water supply and agriculture) and table value standards were added to two segments that already were designated OW, to be consistent with Commission actions in other basins. These segments are:

Cache La Poudre segment 1 (newly configured)
Laramie River segment 1

F. Temporary Modifications

There were several segments which had temporary modifications that were reviewed, and decisions were made as to delete them or to extend them, either as is or with modification of the numeric limits.

Upper So. Platte segment 2b, Mainstem of Mosquito Creek from the confluence with South Mosquito Creek to its confluence with the Middle Fork of the South Platte River: This segment had a temporary modification for zinc. The TMDL for iron, lead, manganese, cadmium and zinc in the Mosquito Creek areas was submitted to EPA in June 2000. The Commission determined, after review of the information presented at the hearing, that the temporary modification should be revised to reflect data collected from the segment in the past few years. It was determined that an expiration date of 6/30/04 would provide sufficient time for the Division, the Division and Minerals and Geology, and the stakeholders to determine the appropriate steps to address the issue.

Upper So. Platte segment 2c, South Mosquito Creek from the source to the confluence with Mosquito Creek: This segment had temporary modifications for cadmium, iron, zinc and manganese. Water quality in segment 2c is highly affected by the discharge of water from two tunnels, and waters in segment 2c flow into segment 2b, discussed above. The temporary modifications were revised to reflect current information and extended to 6/30/04.

Upper So Platte segment 15 Mainstem of South Platte River from the Burlington Ditch Diversion in Denver to a point immediately below the confluence with Big Dry Creek: Temporary modifications for fecal coliform and E. coli at existing quality, for chronic selenium of 5.2 ug/L and acute selenium of 18.4 ug/L were adopted for this segment that will expire 6/30/04.

Upper So Platte segment 16a Mainstem of Sand Creek from the source to the confluence with the South Platte River: Temporary modifications for chronic selenium of 12 ug/L with no acute selenium standard were adopted for this segment that will expire 6/30/04.

Clear Creek segment 14, Mainstem of Clear Creek from the Farmers Highline Canal diversion in Golden Colorado to Youngfield Street in Wheatridge, Colorado: This segment had temporary modifications for cadmium and manganese. The temporary modifications were reviewed and deleted to reflect data collected recently from the segment.

Big Dry Creek segment 5, Mainstems of North and South Walnut Creek including all tributaries, lakes and reservoirs, from their sources to the outlets of ponds A-4 and B-5, on Walnut Creek, and Ponds C-2 on Woman Creek. All three ponds are located on Rocky Flats property: This segment had temporary modifications for americium and plutonium set to expire 6/30/01 and nitrate and nitrite set to expire 12/31/09. The Commission decided to delete the americium and plutonium temporary modifications. The original reason for adopting those modifications was to expedite 401 certification of the NPDES permit. Since DOE has chosen not to reconfigure the outfall and that proposed reconfiguration formed part of the basis for the americium and plutonium temporary modifications, these modifications are no longer needed on that basis. In regards to the nitrate and nitrite temporary modifications, the Commission decided to keep the expiration date.

Big Dry Creek segment 4a: Mainstem and all tributaries to Woman and Walnut Creeks from sources to Standley Lake and Great Western Reservoir except for specific listings in Segments 4b and 5. This segment had temporary modifications for nitrate and nitrite set to expire 12/31/09. The Commission decided to keep the expiration date.

Big Dry Creek segment 4b, North and South Walnut Creek and Walnut Creek, from the outlet of ponds a-4 and b-5 to Indiana Street This segment had temporary modifications for nitrate and nitrite set to expire 12/31/09. The Commission decided to keep the expiration date.

Big Thompson segment 4c, Mainstem of the Big Thompson from County Road 11 to I-25: A temporary modification for fecal coliform of 2000 and E coli of 181 was adopted for this segment that will expire 6/30/2004.

Big Thompson segment 5, Mainstem of the Big Thompson River from I-25 to the confluence with the South Platte River: Temporary modifications for chronic selenium of 8 ug/L, and fecal coliform of 2000 /100 ml were adopted for this segment that will expire 6/30/2004.

Big Thompson segment 9, Mainstem of the Little Thompson River from the Culver Ditch diversion to the confluence with the Big Thompson River: A temporary modification for chronic selenium of 12 ug/L was adopted for this segment that will expire 6/30/2004.

Clear Creek segment 13b, Mainstem of North Clear Creek including all tributaries, lakes reservoirs, and wetlands from a point just below the City of Black Hawk's water supply intakes to the confluence with Clear Creek: Temporary modifications were adopted for chronic cadmium (6.9 ug/L), copper (45 ug/L), total recoverable iron (17,292 ug/L), manganese (4,570 ug/L) and zinc (1750 ug/L) which will expire 6/30/2004.

G. Recreation Classifications/Fecal Coliform and E. Coli Standards

The biological standards were updated to include the dual standards for E. coli and fecal coliform, which were adopted by the Commission in the 2000 revisions to the Basic Standards. As stated in the statement of basis for the Basic Standards revisions, the Commission intends that dischargers will have the option of either parameter being used in establishing effluent limitations in discharge permits. In making section 303(d) listing decisions, in the event of a conflict between fecal coliform and E coli data, the E. coli data will govern. The Commission believes that these provisions will help ease the transition from fecal coliform to E. coli standards.

In a continuation of the Commission's efforts to comply with the requirements contained in the federal Clean Water Act that all waters of the nation should be suitable for recreation in and on the water (known as the "swimmable" goal), the Commission reviewed all Recreation Class 2 segments. In Colorado, the "swimmable" goal translates into Recreation Class 1a, with the 200/100 ml fecal coliform and 126/100 ml E. Coli standards, and Class 1b with the 325/100 ml fecal coliform and 205/100 ml E. coli standards. Class 1a indicates waters where primary contact uses have been documented or are presumed to be present. Class 1b indicates waters where a reasonable level of inquiry has not documented any class 1 uses, but no use attainability analysis has been performed demonstrating that a recreation class 2 classification is appropriate. To maintain the existing Recreation Class 2 with the 2000/100 ml standard on a segment, it must be shown that there is minimal chance that a Recreation Class 1 activity could exist (e.g. ephemeral or small streams that have insufficient depth to support any type of Recreation Class 1 use or very restricted access).

The classifications for segments previously classified Recreation Class 1 were changed in this hearing to Class 1a, to reflect the revisions to the Basic Standards. This does not represent a substantive change in the status for these segments. A recreation 1a classification of a segment is not intended to imply that primary contact recreation would be allowed by the owner or operator of any water body in the segment. A recreation 1a classification is intended to only affect the segment's use classification and water quality standards, and does not imply public or recreational access to waters with restricted access within the segment.

Based on the information received in the record that showed Recreation Class 1a uses are in place in at least a portion of the segment, the Commission changed the following formerly Class 2 segments to Class 1a with a 200/100 ml fecal coliform and 126/100 ml E. coli standard:

Upper South Platte segments: 1a, 14
Saint Vrain segments: 6
Middle South Platte segments: 1, 3
Big Thompson segments: 4a(from 5/1 - 10/15), 4b(from 5/1 - 10/15). 4c(from 5/1 - 10/15), 6, and 14
Cache La Poudre segments: 11, 12, 13a

The following segments were classified Recreation Class 1a based on the policy reflected in the Basic Standards and Methodologies for Surface Water without a factual determination that there are existing Class 1 uses on these segments. These include segments for which the Division's Exhibit 2 for this hearing states that there are "documented or potential" uses, without other evidence of existing Class 1 uses being present in the record.

Upper So. Platte segments: 1b, 4, 5a, 5b, 5c, 7, 9, 10a, 10b, 11a, 15, 16a, 16b, 16c, 17a
Cherry Creek segments: 1, 3, and 4
Bear Creek segments: 1a, 1b, 2, 3, 4a, 5, 7
Clear Creek segments: 1, 5, 8, 12, 13a, 13b, 14b, 15, 16a, 17b
Big Dry Creek segment: 4a
Boulder Creek segments: 1, 3, 5, 6, 7a, 7b, 8, 10, 11
Saint Vrain segments: 1, 2, 3, and 5
Middle So. Platte segment 4
Big Thompson segments: 9, 10
Cache La Poudre segments: 7, 8, 10, 15, and 16
Lower So. Platte segments: 1, 2b
Republican segments: 1, 3, 4, and 5

For the segments listed immediately above, the last paragraph of section 31.6(2)(b) will apply to future changes to the recreation classification where a proper showing is made through a use attainability analysis that a recreation Class 2 classification is appropriate, without application of the other downgrading criteria in this section. Moreover, the Commission is relying in part on testimony from EPA that completion of a use attainability analysis showing that a lower recreation classification is appropriate satisfies applicable downgrading criteria. Based on these factors, the Commission intends that in a future rulemaking hearing the test for adopting a recreation Class 2 classification would be the same as if it had been considered in this hearing.

Based on evidence in the record that a reasonable level of inquiry has failed to identify any existing class 1 recreation uses, the Commission changed the following segment to Class 1b with a 325/100 ml fecal coliform and 205/100 ml E. coli standard:

Big Thompson segment 5(from 5/1 - 10/15)

The following segments retained their Recreation Class 2 classification with 2,000/100mL fecal coliform and 630/100 ml E. coli standard because use attainability analyses demonstrate that a Recreation Class 1a or 1b use is unattainable.

Clear Creek segments: 7, 14a, 16b, 17a, 18a, and 18b
Big Dry Creek segments: 1, 3, 4b, 5, 6
Big Thompson segments: 4a, 4b, 4c, 5 (10/16 - 4/30)
Cache La Poudre segment 13b
Lower So. Platte segment 2a
Republican segments: 6, 7

The classification for Clear Creek segment 14a is based on the fact that access to this portion of the stream is restricted, since it is located principally on Coors Brewery property, is fenced and patrolled. The classifications for Clear Creek segments 16b, 18a, and 18b and Big Dry Creek segments 1 and 6 are based on the fact that these are narrow, shallow streams and that no evidence was presented that any portion of the streams are conducive to full body immersion. In addition, for Big Dry Creek segment 1, there was evidence that canoeing has occurred only on a supervised basis for a limited stretch, and the decision also considers the steepness of the stream banks, thick riparian vegetation that limits access, the fact that the bike path is set back from the stream in many areas and that the lower portion of the stream runs through a primarily agricultural area. Also, for Big Dry Creek segment 6 there was evidence that this is an ephemeral stream and that Fortune Reservoir will not be releasing water to this stream. For Clear Creek segment 17a, Arvada Reservoir, the basis for the Class 2 conclusion is that the reservoir is fenced, posted as no swimming, and patrolled, with only boating

H. Aquatic Life Segments without Full Standards

The Commission reviewed information regarding Aquatic Life Class 2 segments where the full set of inorganic aquatic life protection standards have not been applied. Generally, these are dry segments with only rudimentary aquatic life. The Commission's policy has been that rather than adopt the full set of inorganic standards for these segments, standards for dissolved oxygen, pH and fecal coliform provide sufficient protection. The segments which were reviewed in this hearing and for which sufficient evidence was received for them to retain their present classifications and standards are:

Lower So. Platte segment 2a
Clear Creek segment 8
Boulder Creek segment 4c (numerics are for water supply)
Republican segments 6, 7

Segments where investigation showed that fish populations were present were upgraded with the addition of the full suite of inorganic standards. These segments are:

Upper So. Platte segments 11a, 16a, 16b, and 16c
Cherry Creek segment 4
Clear Creek segments 16, 18b
Big Dry Creek segment 1
Boulder Creek segments 8, 11
Saint Vrain segment 6
Middle So. Platte segment 3
Big Thompson segments 6, 10
Cache La Poudre segments 8, 13
Lower So. Platte segment 2b

I. Ambient Quality-Based Standards

There are several segments in the South Platte Basin that contain ambient standards. Ambient standards are adopted where natural or irreversible man-induced conditions result in water quality levels higher than table value standards. EPA had requested that the Commission review the information that is the basis for these standards as well as any new information that would indicate whether they are still appropriate, need to be modified, or should be dropped. The Division reviewed the reason for the ambient standards and provided testimony that justified ambient standards being retained without adjustment on the following segments:

Upper So. Platte segments 2b, 2c, 5a, 14, and 15
Clear Creek segment 11 (Cu, Mn, Zn only)
Clear Creek segments 2,13b, 14
Big Dry Creek segments 2, 3, 4a, 4b, 5, 6

The Division reviewed the information about ambient water quality levels and provided testimony that justified the ambient standards on Upper So. Platte segment 6c, Mn(ch) = 90 ug/l (dis).

The ambient standard for gross beta on the Woman Creek portion of Big Dry Creek segment 4a was corrected. It had originally been proposed and adopted as 8, not the value of 5 as shown in the table.

Ambient standards were removed from the following segments due to new data and/or changes to the basic standards which indicated ambient standards were no longer appropriate:

Clear Creek segment 3a, changed to Pb(ac/ch) = TVS
Clear Creek segment 11, changed to Cd(ac/ch) = TVS
Middle So. Platte segment 1, changed to Fe(ch) = 1000(trec)
Lower So. Platte segment 1, changed to Fe(ch) = 1000(trec)
Big Thompson segment 9, changed to Fe(ch) = 1000(trec)

J. <u>Organic Standards</u>

The organic standards were updated to include changes which were adopted by the Commission in the 2000 revisions to the Basic Standards (see 31.11 in Regulation No. 31). “Water + Fish” organic standards are presumptively applied to all aquatic life class 1 streams which also have a water supply classification, and are applied to aquatic life class 2 streams which also have a water supply classification, on a case-by-case basis. The “Fish Ingestion” organic standards are presumptively applied to all aquatic life class 1 streams which do not have a water supply classification, and are applied to aquatic life class 2 streams which do not have a water supply classification, on a case-by-case basis. Existing site-specific applications of additional organics (as noted in the Qualifier column of Table 38.6) were modified to conform to this change.

Information was reviewed regarding Aquatic Life Class 2 segments that have fish that are presently being taken for human consumption or have fisheries that would indicate the potential for human consumption. That information showed that additional segments had the potential for consumption of fish. These waterbodies, which include the urban and rural lakes where fishing routinely occurs, were designated to receive the full protection of numeric Fish Ingestion organic standards:

Upper South Platte segment 16c
Middle South Platte segments 1 and 3
Big Thompson segments 4 and 6
Cache La Poudre segments 11 and 12

The waterbodies which also have water supply classifications and therefore need water + fish organics are:

Clear Creek segments 17a, 17b
Cache la Poudre segment 8

Water bodies that had existing "additional organics" were examined to determine which needed water + fish organics and which needed fish ingestion organics. The following segments changed to water + fish organics:

Bear Creek segments 1b, 4a, 4b, 4c and 5
Big Thompson segment 3
Cache la Poudre segments 7, 10

The following segment changed from additional organics to fish ingestion organics:

Middle So. Platte segment 4

K. Water Supply Classifications

These segments had the Water Supply classification added to them. The associated water supply standards will now apply to segments:

Clear Creek segments 2, 13a and 16a
Cache La Poudre segment 8
Big Thompson 4a

L. Modification of Water Supply Standards

Water supply standards were modified to conform to the changes made by the Commission in the 2000 revisions to the Basic Standards (see Regulation No. 31 at 31.11(6)). The Commission modified the water supply standards for iron, manganese, and sulfate that are based on secondary drinking water standards (based on esthetics as opposed to human-health risks). The numeric values in the tables were changed to Fe(ch) = WS(dis), Mn(ch) = WS(dis), and SO4 = WS. These abbreviations mean that for all surface waters with an actual water supply is, the less restrictive of the following two options shall apply as numerical standards, as discussed in the Basic Standards and Methodologies 31.11(6): either (i) existing quality as of January 1, 2000; or (ii) iron = 300 ug/L (dissolved); Manganese = 50 ug/L (dissolved); Sulfate = 250 mg/l (dissolved). For all surface waters with a "water supply" classification that are not in actual use as a water supply, no water supply standards are applied for iron, manganese or sulfate, unless the Commission determined as the result of a site-specific rulemaking hearing that such standards are appropriate.

M. Other Site-Specific Revisions

Upper So Platte segment 5c: The upper pH limit was corrected and changed from 8.5 to 9.0.

Upper So Platte segment 14: The seasonal class 1 recreational designation was changed to a year round class 1a.

Upper So. Platte segment 15: As a result of this hearing, the Commission has decided to revise the pH standard for a two mile reach of Segment 15 of the So Plate River (Segment 15) to expand the permissible pH range of this reach to a range of 6.0 to 9.0. The Metro District submitted evidence that its effluent periodically can be depressed below a pH of 6.5 through natural biological treatment processes; however, its effluent does not go below a pH of 6.0. The Metro District would not consistently be able to meet a pH permit limit set at the current pH stream standard of 6.5.

In making its decision to change the pH standard, the most important question for the Commission was the protection of aquatic life in Segment 15. The Metro Waste Water Reclamation District submitted good scientific evidence that the fish and biota in Segment 15 would be protected at the pH level of 6.0. The District also showed that the River pH naturally rebounds even when the Metro District's pH level is below 6.5. The Commission also considered evidence showing that a number of other states have pH range standard of 6.0 to 9.0. Finally, the Metro District also submitted information showing that adding chemicals to its effluent to raise pH or changing facilities and operations to raise pH would be an unnecessary and unreasonable expenditure of public funds.

Upper So. Platte segment 17c, Bowmar Lake. The site-specific aluminum standard was changed from Al(ch) = 200, to Al(ch) = TVS. The dissolved oxygen criterion was corrected and changed from 6.0 to 5.0 mg/l. This reflects the water quality for an Aquatic Life Warm 1 fishery.

Big Thompson segment 13. This segment lacked Aquatic Life, Recreation, and Agriculture Classifications. Aquatic Life Warm 2, Recreation 1, and Agriculture Classifications with their associated standards were added to this segment.

Cache la Poudre segment 13b. A site-specific ammonia standard of 0.1 mg/L was set for this segment.

Boulder Creek segment 11. Water supply classification was added.

Lower So. Platte segment 3. The dissolved oxygen standard was corrected and changed from 6.0 to 5.0. This reflects the water quality standards for warm water fisheries.

N. Farmers Reservoir and Irrigation Company Proposal

The Farmers Reservoir and Irrigation Company (FRICO) proposed the adoption of total phosphorus and total nitrogen standards and more restrictive fecal coliform standards for Upper South Platte River segments 14 and 15 and for Middle South Platte River segments 1, 3 and 4. Based upon the evidence submitted in this rulemaking, the Commission has decided not to adopt the standards proposed by FRICO.

With respect to the proposed fecal coliform standards, the available evidence does not support a determination that the risks posed by agricultural worker contact with irrigation water or by consumption of raw edible crops is greater than the risk posed by primary contact recreation uses. The Commission is adopting recreation class 1a standards for each of these five segments as a result of this hearing. Therefore, no need has been demonstrated at this time for the adoption of more restrictive fecal coliform standards to protect the designated uses of these segments.

FRICO proposed the adoption of nitrogen and phosphorus standards to address the eutrophic conditions in Barr Lake and Milton Lake. Although the evidence does indicate concerns regarding the existing water quality in both of these reservoirs, the Commission does not believe that an adequate technical basis has been provided at this time for the specific numerical nutrient standards proposed. The Commission does believe that there is a need for an effort to address the issue of South Platte plains reservoir eutrophication, and that consideration should be given to a possible Clean Lakes Study as one alternative to advance the understanding of these systems.

Finally, the Commission does not believe that the evidence submitted supports the contention by FRICO that the proposed 2.0 mg/l total nitrogen standard is necessary to protect sensitive crops irrigated by water from the segments in question.

O. City of Thornton Proposal

The City of Thornton (Thornton) advanced two alternative proposals in this hearing. Alternative 1 proposed that numerical standards be added to Upper South Platte River segments 6 and 14 for giardia lamblia, nitrate, total organic carbon (TOC) and phosphorus. In its prehearing statement, Thornton withdrew its nitrate proposal. Alternative 2 proposed the adoption of a narrative standard providing that the water quality in these segments "be improved and maintained to remove present impairments to water supply uses and to allow water supply uses applying the standards of 5 CCR 31.13(d) at all times." The proposed standard also provided that: "Implementation of the narrative standard will be by agreement of the stakeholders on required numeric water quality standards and the means to achieve those standards." Based upon the evidence submitted in this rulemaking, the Commission has decided not to adopt either Thornton proposal.

With respect to alternative 1, the evidence submitted does not support the proposed giardia lamblia standard as an appropriate pathogen indicator or as a direct measurement of human health risk. The evidence does not distinguish giardia levels or risk at these locations as compared to other waters in the state, and does not demonstrate that the proposed standard is needed to protect the water supply use for these segments. With respect to TOC, the evidence does not support a conclusion that the gross measure of TOC is an appropriate or effective measurement to address potential human health concerns regarding specific organic compounds such as disinfection by-products. Finally, although phosphorus levels may have an impact on the trophic condition of the terminal storage reservoirs that are filled by water from the segments in question, the Commission does not believe that an adequate technical basis has been provided at this time for the specific numerical standards proposed.

The Commission has decided not to adopt alternative 2 because it believes that more analysis is needed before reaching conclusions regarding the adequacy of the existing water quality in these segments for water supply use and potential implementation mechanisms to assure that adequate quality is maintained. The Commission believes that the issue of adequate water quality for effluent-dominated water supply segments warrants further consideration. The Commission urges the interested parties to work together on resolving this issue, with leadership from the Division.

PARTIES TO THE RULEMAKING HEARING

1. The City of Thornton
2. River Watch
3. Selenium Stakeholder Group of Conoco, Inc., Metro Wastewater Reclamation District, Ultramar Diamond Shamrock, and the City of Aurora
4. Farmers Reservoir and Irrigation Company
5. Climax Molybdenum Company
6. Metro Wastewater Reclamation District
7. Centennial Water and Sanitation District
8. The City of Broomfield
9. The City of Fort Collins
10. Kodak Colorado Division
11. London Mine LLC
12. The Denver Regional Council of Governments
13. United States Department of Energy, Rocky Flats Field Office
14. Coors Brewing Company
15. The City of Arvada
16. The City and County of Denver, Acting By and Through its Board of Water Commissioners
17. Colorado Bird Observatory
18. The Colorado Wastewater Utility Council
19. Upper South Platte Watershed Protection Association

20. The Town of Lochbuie
21. The City of Northglenn
22. The City of Black Hawk
23. The City of Golden
24. The City and County of Denver
25. The City of Aurora, Colorado, acting by and through its Utility Enterprise
26. Kaiser-Hill Company LLC
27. Lockheed Martin Astronautics
28. Thompson Water Users Association
29. The Cache La Poudre Water Users= Association
30. U.S. Department of the Interior
31. The Upper Clear Creek Watershed Association
32. North Front Range Water Quality Planning Association
33. The City of Westminster
34. The South Adams County Water and Sanitation District
35. The City of Glendale
36. Colorado River Water Conservation District
37. The City of Loveland
38. The Supervisory Committee of the Littleton/Englewood Wastewater Treatment Plant
39. Roxborough Park Metropolitan District
40. Plum Creek Wastewater Authority
41. The Chatfield Watershed Authority
42. Boxelder Sanitation District
43. The Northern Colorado Water Conservancy District and its Municipal Subdistrict
44. Colorado Division of Wildlife
45. The City of Brighton
46. U.S. EPA Region VIII
47. The City of Greeley

38.58 FINDINGS IN SUPPORT OF ADOPTION OF EMERGENCY REVISIONS TO REGULATION NO. 38, CLASSIFICATIONS AND NUMERIC STANDARDS SOUTH PLATTE RIVER BASIN, LARAMIE RIVER BASIN, REPUBLICAN RIVER BASIN, SMOKY HILL RIVER BASIN [5 CCR 1002-38]

The Commission adopted revisions to Regulation No. 38, Classifications And Numeric Standards South Platte River Basin, Laramie River Basin, Republican River Basin, Smoky Hill River Basin, on February 3, 2001.

The published version of Regulation No. 38 contains a number of typographical errors. The Water Quality Control Division uses the water quality standards in this regulation to calculate Colorado Discharge Permit System permit effluent limits. Where the Division must use the standards containing typographical errors, the permit limitations would be calculated incorrectly. Depending on the individual circumstances, this could lead to discharge of pollutants that might adversely impact public health. In other circumstances, a discharger might be forced to expend additional funds to meet an effluent limitation based on a published standard that contains typographical errors.

If the Commission does not adopt revisions to Regulation 38 on an emergency basis, discharge permits may be issued incorrectly; that would result in an unnecessary adverse impact on the public. The Commission finds that immediate adoption of these revisions to Regulation 38 is imperatively necessary to preserve public health and welfare and that compliance with the requirements of section 24-4-103, C.R.S., would be contrary to the public interest.

38.59 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; SEPTEMBER, 2001, RULEMAKING

The provisions of C.R.S. 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; and 25-8-402; provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted in compliance with 24-4-103(4) C.R.S. the following statement of basis and purpose.

BASIS AND PURPOSE

As the result of a November, 2000 rulemaking hearing, the Commission adopted numerous changes to this regulation. Subsequent to final adoption and publication of those changes, several errors in the revised regulation were identified. These errors, including errors in the equations in the TVS table and footnotes to that table, and omissions in the dissolved oxygen standards footnotes for segment 15, were originally corrected in an emergency rulemaking hearing on May 14, 2001. In this rulemaking the Commission has re-adopted these corrections to make the emergency rule changes permanent.

38.60 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE, DECEMBER, 2001 RULEMAKING

The provisions of sections 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; and 25-8-402, C.R.S., provide the specific statutory authority for adoption of the attached regulatory amendments. The Commission also adopted, in compliance with section 24-4-103(4), C.R.S., the following statement of basis and purpose.

BASIS AND PURPOSE

In the spring of 2001, the Commission established a new schedule for major rulemaking hearings for each of its water quality classifications and standards regulations, as part of the triennial review process. As part of the transition to this new schedule, in order to facilitate an efficient and coordinated review of all water quality standards issues in this basin, in this hearing the Commission decided to extend the existing temporary modifications of water quality standards previously adopted for segments in this basin, so that such temporary modifications will not expire prior to the next scheduled major rulemaking hearing for this basin.

38.61 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; JULY, 2004 RULEMAKING

The provisions of C.R.S. 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; and 25-8-402; provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted in compliance with 24-4-103(4) C.R.S. the following statement of basis and purpose.

BASIS AND PURPOSE

A. Waterbody Segmentation

Some renumbering and/or creation of new segments was made in the basin due to information which showed that: a) the original reasons for segmentation no longer applied; b) new water quality data showed that streams should be resegmented based on changes in their water quality; and/or c) certain segments could be grouped together in one segment because they had similar quality and uses. The following changes were made:

The description of Clear Creek segment 10 was clarified to exclude specific listings in Clear Creek segment 19.

The description of Clear Creek segment 18a was modified to remove Leyden Creek and Van Bibber Creek and extend the segment to the confluence with Clear Creek in recognition of recreational uses. Leyden Creek and Van Bibber Creek were moved to Clear Creek segment 18b.

Little Dry Creek was moved from Clear Creek segment 16b to Clear Creek segment 18b to reflect its uses.

Boulder Creek segment 12 was deleted (Boulder Reservoir) as it was determined this waterbody is in the St. Vrain Creek basin.

St. Vrain Creek segment 7 was created (Boulder Reservoir, Coot Lake, and Left Hand Valley Reservoir).

Middle South Platte River segment 1 was broken into 1a and 1b to accommodate the site-specific dissolved oxygen standard applied on the South Platte River from the confluence with Big Dry Creek to the confluence with St. Vrain Creek.

Middle South Platte River segment 4 was amended to add Milton Reservoir.

Certain tributaries in the vicinity of Denver International Airport were placed into separate segments to accommodate site-specific standards:

Upper South Platte segments	16d: Second Creek 16e: Third Creek 16f: Barr Lake Tributary
Middle South Platte segments	3b: Hayesmount Tributaries 5b: Boxelder Creek

A separate segment, Upper South Platte segment 16g, was established for Marcy Gulch to accommodate site-specific standards.

A new Clear Creek segment 9b was established to accommodate site-specific standards for Trail Creek.

B. Recreation Classifications and Standards

Based on the information received that showed Recreation Class 1a uses are in place or are presumed to be present in at least a portion of the segment, the Commission changed the following segments from Recreation Class 2 to Recreation Class 1a with a 200/100 ml fecal coliform and 126/100 ml E. coli standard:

Clear Creek segment 18a

The Commission also changed the existing Recreation Class 2 classification to Class 1b for the following segments, with corresponding fecal coliform and E. coli standards:

Big Dry Creek segment 1
ache La Poudre 13b (seasonal)

The following segment retained its Recreation Class 2 classification, however the Commission changed the standard to 200/100 ml fecal coliform and 126/100 ml E. coli standard.

Clear Creek segment 17a

The following segments retained their Recreation Class 2 classification with 2,000/100mL fecal coliform and 630/100 ml E. coli standard after sufficient evidence was received that a Recreation Class 1a or 1b use was not attainable.

Clear Creek segment 7
Big Dry Creek segment 3
Big Dry Creek segment 4b
Big Dry Creek segment 5a and 5b
Big Dry Creek segment 6
Middle South Platte River segment 5
Lower South Platte River segment 6
Lower South Platte River segment 7
The following segments retained their seasonal Recreation Class 1a/Recreation Class 2 classification.

Big Thompson River segment 4a
Big Thompson River segment 4b
Big Thompson River segment 4c
The following segments retained their seasonal Recreation Class 1b/Recreation Class 2 classification.

Big Thompson River segment 5

C. Aquatic Life Segments without Full Standards

The Commission reviewed information regarding Aquatic Life Class 2 segments where the full set of inorganic aquatic life protection standards have not been applied. Generally, these are dry segments with only rudimentary aquatic life. There were no changes adopted by the Commission.

D. Revised Aquatic Life Use Classifications

The Commission reviewed information regarding existing aquatic communities. There were no Aquatic Life Use Classifications changes adopted by the Commission.

E. Ambient Quality-Based Standards

There are several segments in the South Platte, Laramie, Republican, and Smoky Hill River Basins that are assigned ambient standards. Ambient standards are adopted where natural or irreversible man-induced conditions result in exceedances of table value standards. EPA had requested that the Commission review the information that is the basis for these standards as well as any new information that would indicate whether they are still appropriate, need to be modified, or should be dropped.

The Commission did not adopt any changes to the ambient quality-based standards.

F. Temporary Modifications

There were several segments where temporary modifications that reflect current ambient conditions were adopted or retained. Temporary modifications were generally set to expire on February 28, 2010 to coincide with the next triennial review except as otherwise noted. The segments and the constituents are:

Upper South Platte River segment 4; Cu(ch), Zn(ch)
Upper South Platte River segment 5b, Zn(ch)
Upper South Platte River segment 15; E. Coli, F. Coli
Upper South Platte River segment 16a; Se(ch), Se(ac)=no standard
Upper South Platte River segment 16c; Se(ch), Se(ac)=no standard
Clear Creek segment 2; Cu(ch), Mn(ch), Zn(ch)
Clear Creek segment 3a; Zn(ch)
Clear Creek segment 3b; Pb(ch), Zn(ch)
Clear Creek segment 6; Zn(ch)
Clear Creek segment 9a; Cu(ch)
Clear Creek segment 9b, Cd(ch), Cu(ch), Mn(ch), Pb(ch), Zn(ch)
Clear Creek segment 11; Mn(ch), Zn(ch)
Clear Creek segment 13b; Cd(ch), Mn(ch), Zn(ch)
Clear Creek segment 15; E. Coli
Big Dry Creek segment 1; E. Coli, Se(ch), F. Coli
Big Dry Creek segment 5: NO3, NO2, 6 organic chemicals
Boulder Creek segment 2; E. Coli for the portion below Broadway Street in Boulder
Boulder Creek segment 7b; E. Coli
Boulder Creek segment 10; E. Coli
St. Vrain Creek segment 4b; Cu(ch), Pb(ch)
St. Vrain Creek segment 6; Se(ch)
Middle South Platte River segment 1b; NH3 (ch)
Middle South Platte River segment 5a; NH3 (ch)
Middle South Platte River segment 5b; D.O.
Big Thompson River segment 4b; Se(ch)
Big Thompson River segment 5; Se(ch)
Big Thompson River segment 9; Se(ch), E. Coli
Big Thompson River segment 10; Se(ch)
Cache La Poudre River segments 11 and 12; NO2 as a 30-day average
Cache La Poudre River segment 12; E. Coli for the portion below Eaton Draw in Greeley
Lower South Platte River segment 1; Se(ch), NO3 (ch)
Lower South Platte River segment 2b; Se(ch) for Springdale Creek, Se(ch) and E. Coli for Beaver Creek

The following segments had temporary modifications which are being removed because current ambient conditions are meeting the underlying standards:

Upper South Platte segment 2c; Fe (dis)
Upper South Platte River segment 15; Se (dis)
Clear Creek segment 13b; Fe (dis)
Big Dry Creek segment 4a and 4b; NO3, NO2
Big Thompson segment 4c; F. Coli, E. Coli

G. Addition of Water Supply Use Classification and Standards

These segments had the Water Supply classification added to them. The associated water supply standards will now apply to segments:

Upper South Platte River segment 5b
Clear Creek segment 18b
Middle South Platte River segment 1a
Middle South Platte River segment 1b
Middle South Platte River segment 4
Lower South Platte River segment 1

H. Agriculture Standards

Numeric Standards to protect Agricultural Uses were adopted for the following segments:

Lower South Platte River segment 2a
Republican River segments 6 and 7.

I. Use Protected Designation

Use Protected Designation was added to Upper South Platte River segment 16a. The Use Protected Designation was adopted by the Commission in 2000 but was inadvertently omitted in the regulation.

K. Other Site-Specific Revisions

1. Upper South Platte Segments 2a, 2b, 2c

The Commission made the following changes to Segment 2b, Mosquito Creek and Segment 2c, South Mosquito Creek.

Segmentation: South Mosquito Creek from the source to the confluence with No Name Creek was removed from Segment 2c and put in Segment 2a.

Water Quality Standards: The Commission adopted type iii temporary modifications based on uncertainty for Mosquito Creek of Zn (ch) = 283 µg/L and South Mosquito Creek of Zn (ch) = 400 µg/L and Cd (ch) = 3.3 µg/L; and underlying standards for Mosquito Creek of Zn (ch) = 220 µg/L and South Mosquito Creek Zn (ch) = 280 µg/L.

There are two significant sources of zinc in the Mosquito Creek Basin, the London Mine Water Tunnel and the Extension Tunnel. The Water Tunnel flow is about ten times the flow of the Extension Tunnel and the Extension Tunnel zinc concentrations is about one hundred times the Water Tunnel. The zinc load from the Extension Tunnel greatly exceeds the load from the Water Tunnel. Based on the evidence presented, the Commission found that it is economically infeasible to treat the Water Tunnel flows with currently available treatment technology. However, it is feasible to treat the Extension Tunnel flows. Under current limited operations, the Extension Tunnel Treatment Plant produces water with an estimated 85th percentile zinc concentration of 5,000 µg/L. The Commission heard evidence that the existing Extension Tunnel treatment plant can be upgraded to improve its reliability and will likely be able to achieve water with a 30-day average concentration of 500 µg/L.

The temporary modifications for Segments 2b and 2c were based on the 85th percentile of the predicted zinc concentrations with treatment at the Extension Tunnel (5,000 µg/L) and the underlying standards for Segments 2b and 2c were based on the assumption that the Extension Tunnel treatment can achieve levels of 500 µg/L. No treatment of the Water Tunnel discharge was assumed in developing the temporary modifications or underlying standards for either segment. Monthly design flows were those included in the 2001 TMDL developed by the Division for the Extension Tunnel and actual flows for the Water Tunnel. The duration of the temporary modifications is through February 28, 2007.

The Commission's action establishing a technology-based standard and temporary modifications in this case is based on the unique facts and assumptions associated with the London Mine and Mosquito Creek Basin site, including the willingness of THF Prairie Center Development to undertake improvement and operation of the Extension Tunnel Treatment Plant. The Commission does not intend this action to establish a precedent for any other site-specific water quality standards. It is the Commission’s intent that these standards should be reviewed and updated as appropriate based on the stream monitoring data collected after the completion of improvements and full operation of the Extension Tunnel Treatment Plant. Finally, the Commission notes that there is a need to continue to review in the future the feasibility of reducing zinc levels in these waters by means other than treatment of the extension tunnel discharge.

2. Upper South Platte River Segments 6a and 6b

The Chatfield Watershed Authority submitted two alternative proposals for a temporary modification of water quality standards for total phosphorus and selected metals in Segments 6a and 6b of the South Platte River Basin. The temporary modifications were requested in response to concerns over the potential effects of runoff from the Hayman Wildlands Fire. The runoff may contain increased levels of total phosphorus and metals, which impede attainment of water quality standards in the South Platte River system and Chatfield Reservoir.

The Authority and the Division have concluded that additional monitoring data is required to establish whether there is a basis for temporary modifications and, if any, the appropriate numeric values to adopt. The Authority therefore withdrew its proposal for a temporary modification of standards. The Authority, in cooperation and coordination with the Division and other interested parties has committed to the development and implementation of a monitoring plan designed to collect needed data on both metals and nutrients within Chatfield Watershed, including Chatfield Reservoir. Additional monitoring data will help the Chatfield Authority and the Division determine what, if any, long-term modifications may be necessary to the uses and water quality standards for Chatfield Reservoir

The point source and storm water discharge permit holders in the Chatfield Watershed, which contribute a small percentage of the total phosphorus load to the Reservoir, discharge regulated constituents, including phosphorus. These dischargers will continue treatment and best management practices so as to minimize nutrient and metal loads in the Chatfield Watershed. The Authority and the Division have agreed that point source discharge permit holders and stormwater permittees who are in compliance with their permit limits and terms for a constituent will not have those limits or terms modified prior to any future adjustment of classifications or standards by the Commission to the extent any observed water quality standards exceedances are attributable to other factors such as the Hayman Fire. However, the Authority has agreed to cooperate with the Division in the identification and promotion of enhanced stormwater control BMPs which could be implemented on a voluntary basis prior to any such adjustment if warranted by monitored conditions in the watershed.

3. Upper South Platte segments 6c, 10a, 14, 15, 16a, 16g and Middle South Platte segment 1a

The South Platte Coalition for Urban River Evaluation, Metro Wastewater Reclamation District, and the Plum Creek Wastewater Authority cooperated on a study to develop adjustments to the acute and chronic numeric standards for copper using a water effect ratio (WER). The segments in question are the mainstem segments of the Upper and Middle South Platte Rivers from the confluence with Marcy Gulch to the confluence with the St. Vrain River (USP River Segments 6c (downstream of Marcy Gulch), 14, 15 and new Middle South Platte Segment 1a (commencing at the confluence with Big Dry Creek and continuing to a point just upstream of the confluence with the St. Vrain River), Plum Creek Segment 10a (below Plum Creek Wastewater Authority discharge), Marcy Gulch (new USP Segment 16g) and Sand Creek (USP Segment 16a).

The standards are adjusted to include the mean final water-effect ratio calculated for each segment. These WERs were developed using Streamlined Water-Effect Ratio Procedures for the Discharges of Copper USEPA-2001 (USEPA-822-R-01-005), based on toxicity testing and The Biotic Ligand Model: Technical Support Document for its Application to the Evaluation of Water Quality Criteria for Copper USEPA 2003 (USEPA-822-R-03-027), which predicts copper toxicity to four common freshwater species using site water quality data. Specifically, EPA's 2003 draft Copper Criteria that relies on the BLM was used to confirm the results of the Streamlined Water-Effect Ratio (SWER) Procedure.

The proponents submitted evidence that indicated that simply relying on EPA's Streamlined Water Effect Ratio Procedure would have resulted in a larger adjustment to the acute and chronic table values for copper. Application of the BLM resulted in a more conservative adjustment to the table value standards. The results of the BLM are specifically sensitive to changes in alkalinity and dissolved organic carbon (DOC) in the site water. In this instance, the site water quality data did not indicate a seasonal variation in DOC or alkalinity, to a degree that resulted in any significant seasonal variation in the BLM results. The parties acknowledge that this lack of seasonality may not be present in all waters and future application of the BLM method should include an analysis of seasonal variability. The parties also acknowledge that should additional species be added to the BLM that they would be considered in future BLM model runs.

4. Upper South Platte Segment 15

The Commission extended the temporary modifications for fecal coliform and E.coli = existing quality because the standards are not being met because of human-induced conditions deemed correctable within a twenty-year period. The Commission recognizes that the Metro District has voluntarily operated its facilities to meet the underlying TVS and that the District is in the process of upgrading its treatment facility at a cost of $7.8 million to reliably meet TVS.

The Commission adopted site-specific dissolved oxygen (D.O.) standards for Segment 15 in 1995. However, since these site-specific standards were adopted portions of the text were inadvertently deleted from the Colorado Code of Regulations. The Commission re-adopted the 1995 standards to ensure that a complete and accurate text of the site-specific D.O. standards is included in the regulations.

5. Upper South Platte segment 16a

The City of Aurora, Suncor Energy, and Valero Energy (Selenium Stakeholders) requested the Colorado Water Quality Control Commission (Commission) extend the temporary modification pursuant to section 31.7(3)(a) of the Basic Standards for selenium on Upper South Platte River Basin Segment 16a (Sand Creek). More time is needed to determine the appropriate selenium standard for Segment 16a.

The Selenium Stakeholders developed a study plan in March 2001 to identify sources of elevated selenium in Sand Creek and determine if they are man-made or natural sources, and to determine the appropriate selenium standard for Segments 15 and 16a. Studies included collecting water quality, sediment quality, habitat, fish population and density, fish tissue, and macroinvertebrate samples for Sand Creek. Technical memoranda summarized data, and were critiqued and discussed with the Water Quality Control Division, EPA Region 8, Colorado Division of Wildlife, and US Fish and Wildlife Service (collectively the "Agencies"). The refineries also examined treatment and alternative discharge options. The data collection efforts outlined in the Study Plan were completed in October 2003; however, the Selenium Stakeholders and Agencies agreed that there is not enough information on the sources of elevated selenium concentrations in Sand Creek to come forward to the Commission with a recommendation at this time. Furthermore, the US EPA is in the process of developing an update to the selenium criteria document that may help to better define appropriate selenium standards for Segment 16a. Additional time is necessary to determine the source of the selenium, its impact on aquatic life, and determine an appropriate standard.

6. Upper South Platte Segments 16d, 16e, 16f; Middle South Platte Segments 3b, 5b

The Commission adopted resegmentation and corresponding site-specific dissolved oxygen standards for segments in the vicinity of Denver International Airport (DIA). These changes were proposed by DIA following a site-specific study that included an extensive stakeholder process. Ambient-quality-based numerical dissolved oxygen standards were adopted for Second Creek, Third Creek and Box Elder Creek. Narrative dissolved oxygen standards were adopted for Barr Lake and Hayesmount Tributaries.

The adoption of these site-specific, ambient quality-based dissolved oxygen standards is based upon the cumulative information provided by three separate, credible lines of evidence provided during this rulemaking. The Commission's action is dependent on the unique, site-specific nature of this cumulative evidence and should not be interpreted as precedent for the revision of dissolved oxygen standards for other Colorado surface waters.

First, the evidence resulting from the Receiving Water Study demonstrates that the previously effective table value standards for dissolved oxygen are exceeded by natural conditions in Second Creek. It further showed that there is not a substantial difference in the dissolved oxygen levels attained naturally in Second Creek and those attained in Third Creek, taking into account the influence of DIA.

Second, the biological evidence provided demonstrates that there are more biota present in the streams impacted by DIA's operations than would be present without the presence of DIA. The evidence indicates that habitat and flow are the primary stressors limiting the aquatic life use for these segments. It is not apparent that increased controls of fugitive releases of deicing fluid from DIA would result in increases in aquatic life in the affected segments.

Third, the evidence demonstrates that DIA is currently implementing a state-of-the-art system for the control of aircraft deicing fluids. These controls are implemented pursuant to a stormwater discharge permit. In addition, DIA will remain a predominant land use in this area for the foreseeable future and will continue to be required to utilize aircraft deicing fluid for air travel safety. Therefore, remaining fugitive releases of such fluids can reasonably be viewed as irreversible at this time. This conclusion can and should be revisited in the future if available control technologies continue to evolve and improve.

The ambient standards adopted for Second Creek, Third Creek and Box Elder Creek were calculated based on extensive field data. Daytime only data (6:30 a.m. to 6:30 p.m.) were used in the calculation of the ambient standards because it is anticipated that in the future, field data will be collected during those hours. In addition, a review of available data from downstream waters demonstrates that the table value dissolved oxygen standard is attained.

A site-specific narrative dissolved oxygen standard was adopted for Hayesmount and Barr Lake tributaries. These water bodies are ephemeral with flow only occurring in response to precipitation events. No dissolved oxygen data are available for these surface waters to calculate an ambient quality based standard. The aquatic habitat associated with these waters is greatly limited and any residual water following a stormwater runoff event will be present only for very short periods of time. Accordingly, the narrative dissolved oxygen requirements to protect Class 2 Warm Water Aquatic Life and Agriculture uses are appropriate.

The Colorado Division of Wildlife (CDOW) participated in the stakeholder process and stated that it was in general agreement with DIA's proposal, but had a few reservations. CDOW remains interested in conducting additional chemical and biological monitoring on the segments subject to DIA's proposal, and will contemplate incorporating sampling on the subject segments into their annual biological monitoring program. CDOW intends to prepare proposed sampling plans for discussion with DIA. DIA may participate in the collection of additional chemical and biological data on the relevant segments on a voluntary basis.

FRICO also participated in the stakeholder process, but opposed the DIA proposal. In its Responsive Prehearing Statement, FRICO offered alternative proposals for re-segmentation and dissolved oxygen standards relating to Recreation 1a, Agricultural, and Water Supply use classifications. It also raised other concerns related to the proposal and/or DIA's industrial stormwater discharge. Based on the written material and oral testimony provided for this hearing, the Commission concludes that FRICO's concerns have been effectively rebutted and that adoption of the proposal is appropriate. The alternative resegmentation proposed by FRICO is inconsistent with the Commission's general approach to segmentation, which is based upon natural drainages, not transbasin water diversions. FRICO has not demonstrated that the proposed dissolved oxygen standards are inadequate to protect aquatic life, or that additional dissolved oxygen standards are necessary to protect other uses of downstream waters. The Commission supports the efforts of the Division's stormwater program to seek agreement on notification of FRICO of events at DIA that could affect downstream water quality.

7. Upper South Platte Segment 16g

The Commission created a new segment 16g for Marcy Gulch, which was previously included in the segment 16c "all tributaries" segment. In addition to the site-specific copper water effects ratio adopted for this segment as noted above, the Commission found that the "fish ingestion" standards for organic chemicals should not apply to this segment. Specifically, the Commission found that Marcy Gulch does not contain fish of a catchable size and that fishing does not take place on a recurring basis. Because Centennial withdrew its request for site-specific ammonia standards for this segment, the Commission determined that it was inappropriate to revise the Marcy Gulch ammonia standard in this hearing.

8. Clear Creek Segments 2, 9a, 9b, 11, and 13b

Type iii temporary modifications were adopted for selected trace metals in Clear Creek segments 2, 9a and 9b, 11 and 13b. These temporary modifications are based on ambient water quality levels, using the 85th percentile values calculated by the Water Quality Control Division from the period of record 1999-2003 for a systematic and consistent database developed and maintained by various stakeholders.

Clear Creek segment 13b currently has temporary modifications in place for cadmium, copper, iron, manganese, and zinc. The temporary modifications for cadmium, manganese, and zinc were recalculated based on the most recent 5 years of record, and adopted as described above. The previous temporary modifications for copper and iron are no longer needed (ambient data shows the current underlying standards are being met) and were therefore deleted.

The Commission created a new segment 9b, encompassing Trail Creek, and adopted standards reflecting ambient water quality. Trail Creek has water quality not representative of either segment 2, of which it was formerly part, or the rest of segment 9.

Underlying standards for segments 2, 9a, 11 and 13b remain unchanged; they will be reviewed after the completion of the efforts to resolve uncertainty, as described below.

Numerous efforts are underway to clean up sources of metals pollution in this heavily mining impacted area, including Superfund projects. There remains considerable uncertainty concerning what level of water quality can ultimately be achieved. Examples of recent remediation projects include Argo Tunnel water treatment, Little 6, Big 5 and Minnesota Mine tailings pile removal. EPA and CDPHE have investigated many additional sites for remediation. A primary effort is nearing completion involving Superfund Operable Unit 4 (OU4), principally involving conditions in the North Fork (segments 13a and b), but including a few areas along the mainstem. This RI/FS and the ROD are due to be completed in 2004. A CDPHE remediation project in Virginia Canyon is due to begin this year. The Upper Clear Creek Watershed Association ("UCCWA") anticipates receipt of a Section 319 grant in 2004 to identify additional non-point source projects, potential funding sources and implementation issues to be resolved prior to cleanups. UCCWA submitted a Plan to Resolve Uncertainty for Clear Creek segments 2, 9a, 11 and 13b. The information generated under the plan is expected to permit the Commission to determine the extent to which existing quality is the result of natural or irreversible human-induced conditions, and to adopt an appropriate standard.

Ambient quality-based temporary modifications are adopted until the above studies are completed and the uncertainty regarding the underlying standards is resolved. These are adopted as type iii temporary modifications pursuant to §31.7(3)(a)(iii) of the Basic Standards. As provided in §31.7(3)(b) of the Basic Standards, the Commission intends that the temporary modifications be used in establishing any applicable control requirements while they are in effect, due to the uncertainty that warranted the adoption of the temporary modifications. The evidence supports the following findings by the Commission with respect to Clear Creek segments 2, 9a, 11 and 13b:

1. There is an appropriate plan in place to remove the uncertainty;

2. The plan includes an implementation schedule that will resolve the uncertainty within the time required for Colorado to develop total maximum daily loads, if needed;

3. The plan is, as of July 2004, being implemented.

9. Clear Creek Segment 5

Segment 5, Mainstem of West Clear Creek from the confluence with Woods Creek to the confluence with Clear Creek.

The Commission adopted site-specific zinc standards based on the protection of cold water biota, resulting in a new acute equation, e0.8404(ln(hard))+1.8810, and a new chronic equation, e0.8404(ln(hard))+1.5127, for this segment. These equations were derived using the recalculation procedure removing warm water biota from an updated version of the U.S. EPA zinc toxicity database (expanded from the “1995 updates”). To develop the site-specific standards for Segment 5, a new acute database was created consisting of only those species expected to represent the biota typical of cold water, high elevation stream systems. Non-resident amphipods and isopods were included as surrogates for mayflies which are resident species but for which no toxicity data exist at this time. The four most sensitive genera from this database were identified and a new final acute value (FAV) and acute equation were determined. The final chronic value (FCV) and resultant chronic equation were calculated using an updated acute-to-chronic ratio (2.891). The Commission believes that acute and chronic zinc criteria based on coldwater biota (i.e., trout and benthic macroinvertebrates) are more representative of the conditions present in this segment than TVS. The Commission recognizes that if mayfly toxicity data become available in the future that such data would be considered in the zinc recalculation process.

10. Big Dry Creek Segment 1

The Water Quality Control Division proposed that the classification of Big Dry Creek Segment 1 be changed from Recreation Class 2 to Recreation Class 1a. Broomfield opposed this change based on a 2000 Use Attainability Analysis and a 2003 Student Survey of Recreational Uses. To resolve the issue, Broomfield proposed that the segment be classified Recreation Class 1b. The Commission adopted this revised proposal.

Broomfield proposed a narrative temporary modification for selenium of existing quality based on uncertainty. The Division proposed a numeric temporary modification of 7 µg/L. Based on additional selenium data submitted by Broomfield, the Division revised its proposal to 11 µg/L. Broomfield agreed with this revised proposal and it was adopted by the Commission.

11. Big Dry Creek Segment 5

Segment 5 contains a goal qualifier (last column Table 1) and temporary modifications for nitrate, nitrite and several organic parameters (Table 3). The Division proposed that the temporary modifications and goal qualifier expiration dates be moved from 2009 to 2006 to coincide with the accelerated date for cleanup and closure of Rocky Flats set by DOE and Kaiser-Hill. These two parties have provided assurance that "active remediation of groundwater contamination … will continue past the completion of the contract between DOE and Kaiser-Hill" and that it will be the responsibility of DOE to oversee this work. They also stated that it is their "intent to accelerate the timeframe to meet the underlying standards." Based on these commitments and the fact that this portion of the site cannot be taken off the National Priorities List until the ongoing remediation efforts are completed, the Division withdrew the proposal for the earlier expiration dates.

The Commission added a footnote to Table 2 providing that for the portions of Walnut and Woman Creeks within Segment 5 (where the majority of the surface disturbing cleanup activities are currently occurring) the methodology for determining attainment is changed to allow for a 12-month flow-weighted rolling average (computed monthly) method to measure ambient levels of plutonium and americium. The Commission has determined that this change is appropriate due to the unique circumstances related to the accelerated Rocky Flats clean up.

The Division proposed temporary modifications for fecal coliform and E. Coli, Broomfield agreed with this proposal and it was adopted by the Commission.

In addition, for Big Dry Creek segment 5, secondary drinking water standards were removed that had been incorrectly added to this segment. The Commission determined in its 1996 Regulation No. 38 Rulemaking Hearing that secondary drinking water standards would not be applied for Big Dry Creek segments 4a, 4b and 5.

12. Middle South Platte Segment 1a

The Commission adopted a change to the D.O. standards for the upper reach of Middle South Platte Segment 1 (from Big Dry Creek to the St. Vrain Creek) to be consistent with the site-specific standards immediately upstream in Segment 15 of the Upper South Platte River. This change recognizes that the South Platte River is effluent dominated (e.g., effluent makes up a majority of the flow in the River during a majority of the year).

The Metro District undertook extensive studies of DO and the affects of low-DO levels on aquatic life during the 1990's. These studies included toxicology testing of nine different species of fish that are either found or expected in the South Platte River and clearly showed that fish can tolerate short-term DO levels below the current statewide standard for warm water aquatic life of 5.0 mg/L. This work resulted in the site-specific DO standard the Commission adopted for Segment 15 of the South Platte River. That site-specific DO standard includes instantaneous standards for both older life stages (8/1 - 3/31) of 2.0 mg/L, and early life stages (4/1 - 7/31) of 3.0 mg/L. Early life stages are further protected by a 7-day average DO standard of 5.0 mg/L, while older life stages have a 30-day average DO standard of 4.5 mg/L. Regular aquatic life sampling events in Segment 15 have demonstrated these site-specific DO standards are protective of the aquatic life in the segment.

14. Middle South Platte Segment 6

Lost Creek is as its name describes a creek that disappears. Two segments are separated by dry land with no visible stream channel for more than one mile. The segment south of US Highway 76 is characterized by unconnected ditches that disappear into fields and pumped wells. This segment is located in the Lost Creek Ground Water Basin. It is a designated over-appropriated ground water basin. Well pumping for irrigated agriculture reduces groundwater tables and result in tail water ditches having no flow for significant time periods. Irrigation ponds regularly are pumped dry and freeze in the winter. Rudimentary benthic matter found in tail water ditches, seasonal stock ponds and isolated wetlands created by irrigation seepage is not tributary to the segment of Lost Creek north of Highway 76 that is tributary to the South Platte River. Further depletion of the Basin ground water by exportation is anticipated in the future. A use attainability analysis was submitted supporting a Recreational Class 2 use. Evidence demonstrated no access to and no recreational use of Don Sloan's two stock ponds that also receive treated effluent for storage and land application.

15. Other Miscellaneous Revisions

Numeric standards associated with a water supply classification were deleted from Upper South Platte segment 7, since that classification was previously removed from this segment.

Upper South Platte River segment 5b and Lower South Platte River segment 1, water supply TVS for arsenic and chromium III were applied.

Cherry Creek segment 2, E. Coli = 126/100 ml was applied.

Clear Creek segment 5, the water supply TVS for chromium III was applied.

Boulder Creek segment 4c and 4d, Cowdrey Drainage, had site-specific standards that were changed to table value standards.

The Commission corrected several typographical and spelling errors, and clarified segment descriptions.

PARTIES TO THE RULEMAKING HEARING

1. Upper Clear Creek Watershed Association
2. Selenium Stakeholders Group
3. Town of Keenesburg & Don Sloan
4. Chatfield Watershed Authority
5. The City and County of Denver, Department of Aviation, Denver International Airport
6. London Mine LLC
7. Climax Molybdenum
8. Plum Creek Wastewater Authority
9. Centennial Water & Sanitation District
10. Metro Wastewater Reclamation District
11. South Platte CURE
12. City and County of Broomfield
13. The City of Aurora,
14. Kaiser-Hill Company, LLC
15. Colorado Division of Wildlife
16. The City of Littleton
17. The Water Supply and Storage Company

18. North Front Range Water Quality Planning Association
19. The United States Department of Energy, Rocky Flats Project Office
20. Farmer's Reservoir and Irrigation Company
21. THF Prairie Center Development, LLC
22. The City of Westminster
23. The Supervisory Committee of the Littleton/Englewood Wastewater
24. Colorado Trout Unlimited
25. The City of Golden
26. South Suburban Park & Recreation District
27. Roxborough Park Metropolitan District
28. Lockheed Martin Space Systems Company
29. The Northern Colorado Water Conservancy District
30. U.S. EPA Region VIII
31. City of Black Hawk
32. Xcel Energy
33. Denver Regional Council of Governments

38.62 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; DECEMBER 12, 2005 RULEMAKING, EFFECTIVE DATE OF MARCH 2, 2006

The provisions of C.R.S. 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; and 25-8-402; provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted in compliance with 24-4-103(4) C.R.S. the following statement of basis and purpose.

BASIS AND PURPOSE

In the process of digitally mapping the segments in the South Platte River Basin, Laramie River Basin, Republican River Basin, and Smoky Hill River Basin, the Division discovered errors and inconsistencies between segment descriptions. To resolve these issues the Commission adopted changes in the following segment descriptions:

Upper South Platte segment 16a
Middle South Platte segment 5a

38.63 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; AUGUST 14, 2006 RULEMAKING, EFFECTIVE DATE OF SEPTEMBER 30, 2006

As a result of this hearing, the Commission adopted a temporary modification of "existing quality" for the Wapiti Meadows Wetlands portion of segment 2 of the Big Thompson River. The temporary modification is for dissolved oxygen, e. coli, ammonia, nitrate, boron, cadmium, copper, lead, mercury, nickel, selenium, silver and zinc and expire on 12/31/2009. Upper Thompson Sanitation District's (UTSD) effluent provides essentially the entire flow to the wetland. The existing quality is thus defined as the historical quality of the UTSD discharge to Wapiti Wetlands. For the purposes of permitting during the course of the temporary modification, existing quality means continuation of current UTSD effluent quality.

This temporary modification is based upon uncertainty regarding the appropriate underlying standards needed to protect the water quality dependant functions of the wetland. The temporary modification recognizes current conditions and allows time for the UTSD and others to conduct a study of the existing wetland and determine appropriate attainable ambient-based numeric standards to protect the wetland, and to evaluate the water quality dependant functions of the wetland, including flood flow alteration/sedimentation, toxic materials retention, nutrient removal, wildlife diversity and abundance, ground water recharge and recreation. A study plan, which was jointly developed by the UTSD, the Division, the Bureau of Reclamation, and EPA, was submitted to the Commission.

The results of the study could also become the basis for adopting a site-specific wetlands use classification as provided for in section 31.13 of The Basic Standards and Methodologies For Surface Water (Regulation 31). The Commission anticipates that this option will be considered at the time underlying standards for this segment are reviewed by the Commission.

PARTIES TO THE RULEMAKING

1. The Upper Thompson Sanitation District
2. North Front Range Water Quality Planning Association

38.64 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE: January 2007 Rulemaking Hearing; Final Action February 12, 2007; Revisions effective July 1, 2007

The provisions of section 25-8-202(1)(b), 25-8-204; 25-8-402, C.R.S., provide the specific statutory authority for adoption. The Commission also adopted, in compliance with section 24-4-103(4) C.R.S., the following statement of basis and purpose.

BASIS AND PURPOSE:

The Commission revised the basin-wide temperature standards as part of the 2007 rulemaking hearing. These changes clarify the numeric temperature standards that will be in effect until the basin-wide rulemaking hearing in June of 2009. At that time, the Commission intends to consider segment specific temperature standards for all segments with aquatic life uses.

The Commission applied 17°C as an interim chronic standard for small, high elevation streams that are likely to be habitat for brook trout and cutthroat trout. First, second and third order streams are defined at section 31.5 in the Basic Standards.

The Commission also applied 18.2°C as an interim chronic standard to waters designated by the Colorado Wildlife Commission as “Gold Medal Fisheries”. The Commission agrees that it is important to protect these fisheries that provide important recreational and tourism opportunities in the headwaters of Colorado. This standard is based on a criterion to protect rainbow trout. The Colorado Division of Wildlife presented evidence that rainbow trout thrive in Gold Medal fisheries because they are provided the necessary forage base and thermal conditions to maximize their consumption and growth. Because these thermal conditions also represent the upper temperature tolerance range for this species, it was determined that an interim standard of 20°C would not be adequate to protect these fisheries.

For the remainder of the cold water segments, the Commission left the current 20°C in place as an interim standard with the clarification that it is a chronic standard. The existing 30°C criterion for warm water segments was left in place as an interim standard with the clarification that is also to be applied as a chronic standard.

PARTIES TO THE RULEMAKING HEARING

1. The Temperature Group (City of Aurora, City of Boulder, Colorado Springs Utilities, Littleton/Englewood Wastewater Treatment, The Metro Wastewater Reclamation District, Colorado Mining Association, Colorado Rock Products Association, Tri-State Generation & Transmission Assn., Xcel Energy, Denver Water, Northern Colorado Water Conservancy District, Southeastern Colorado Water Conservancy District)
2. City of Grand Junction
3. City of Loveland
4. City of Pueblo
5. Metro Wastewater Reclamation District
6. City of Aurora
7. City of Boulder

8. Colorado River Water Conservation District
9. Colorado Wastewater Utility Council
10. Bear Creek Watershed Association
11. Chatfield Watershed Authority
12. Mountain Coal Company, L.L.C.
13. Northern Colorado Water Conservancy District
14. Colorado Rock Products Association
15. Littleton/Englewood Wastewater Treatment Plant
16. Northwest Colorado Council of Governments
17. Southeastern Colorado Water Conservancy District
18. Colorado Mining Association
19. Colorado Division of Wildlife
20. South Platte Coalition for Urban River Evaluation
21. City and County of Denver
22. City of Colorado Springs and Colorado Springs Utilities
23. City of Westminster
24. Board of Water Works of Pueblo
25. Coors Brewing Company
26. City and County of Broomfield
27. Centennial Water and Sanitation District
28. Plum Creek Wastewater Authority
29. Climax Molybdenum Company
30. Cripple Creek & Victor Gold Mining Company
31. Tri-State Generation and Transmission Association
32. Xcel Energy
33. Sky Ranch Metropolitan District No. 2
34. Parker Water and Sanitation District
35. CAM-Colorado and CAM Mining LLC
36. Aggregate Industries – WCR, Inc.
37. Grand County Water and Sanitation District #1, Winter Park Water and Sanitation District, Winter Park West Water and Sanitation District and Fraser Sanitation District
38. Trout Unlimited and Colorado Trout Unlimited
39. Colorado Contractors Association
40. United States Environmental Protection Agency, Region 8
41. Hot Springs Lodge and Pool
42. Denver Regional Council of Governments

38.65 STATEMENT OF BASIS SPECIFIC STATUTORY AUTHORITY AND PURPOSE MARCH 2007 RULEMAKING REGARDING AMMONIA STANDARDS

The provisions of C.R S. 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; and 25-8-402; provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted in compliance with 24-4-103(4) C.R.S. the following statement of basis and purpose.

BASIS AND PURPOSE:

At the June 2005 Basic Standards rulemaking, the Commission adopted the 1999 Update of Ambient Water Quality Criteria for Ammonia (US EPA, Office of Water, EPA-822-R-99-014, December 1999) as the numeric ammonia criteria for Colorado. These new criteria are in the form of total ammonia rather than un-ionized ammonia. The Commission modified the ammonia equations in 35.6(3) and footnotes to conform to Regulation # 31.

Consistent with the approach outlined in the Basic Standards statement of basis and purpose, the Commission provided flexibility for dischargers faced with the possibility of new, more stringent effluent limits.

Temporary modifications were generally set to expire on 12/31/11. This date is set far enough in the future to allow facilities to consider their specific circumstances and to develop a plan regarding how to proceed, yet soon enough to assure that facilities are making progress in developing facility plans. For those that feel the underlying standards are inappropriate, time is allowed to study the receiving water and develop a proposal for an alternate standard. For those that need time to plan, finance or construct new facilities, time is allowed to develop that facility improvement plan.

The intent of the Commission is that in general, the permits for dischargers to warm water segments, that need time to achieve compliance, will contain schedules of compliance in the next renewal. The Commission understands that such a compliance schedule may include time to complete necessary sub-tasks or milestones. For example, this might include time to do facility planning, make financing arrangements, pre-design, design, construction, startup and commissioning.

There are several opportunities to revisit the duration of the temporary modifications before they expire on 12/31/2011. For those segments in the Upper and Lower Colorado Basins (Regulations # 33 and 37), persons can come forward at the Issues Formulation hearing in November 2007 with their intent to seek a site-specific adjustment in the June 2008 hearing. For those segments in the South Platte Basin (Regulation No 38), persons can come forward at the Issues Formulation hearing in November 2008 with their intent to seek a site-specific adjustment in the June 2009 hearing. In addition, all of these temporary modifications will be subject to the Annual Temporary Review process which will have hearings in December 2009 and 2010.

The Commission intends that the temporary modifications adopted in this rulemaking are “type i” temporary modifications, with specific exceptions where a demonstration was made that there is uncertainty regarding the appropriateness of the underlying standard.

The Commission has adopted “type iii” temporary modifications for Upper South Platte segment 5c with an expiration date of 12/31/10; and a “type i” temporary modification for Upper South Platte segment 15 with an expiration date of 12/31/2014.

The issues raised in this rulemaking hearing have highlighted the need to clarify the relationship between the temporary modification tool and the compliance schedule tool in Colorado’s water quality management program. The Commission requests that the Division consider this issue further, with input from interested stakeholders, and bring forth any suggested revisions/clarifications for the 2010 Basic Standards rulemaking.

In the meantime, because of the Commission’s previously expressed concerns regarding the unique and widespread challenges associated with compliance with the new ammonia standards, the Commission’s intent with respect to temporary modifications and compliance schedules regarding these new ammonia standards is as follows:

- Where a demonstration has been made that a period of time longer than the end of 2011 will be required for compliance with the new ammonia standards, the Commission has approved an appropriate site-specific temporary modification expiration date.

- For segments where the 12/31/11 expiration date applies, and for which discharge permit renewals may be issued prior to that date, it is the Commission’s intent, consistent with section 31.14(15)(a), that the Division have the authority to issue compliance schedules that may not result in full attainment of the ammonia standard prior to expiration of the renewal permit. Such compliance schedules should be issued only where the Division determines that a specific demonstration has been made that additional time is needed to attain the standard. In such cases, the Commission anticipates that permits would include milestones that assure reasonable progress toward attainment of the standard.

The Commission also adopted a site-specific period for the protection of early life stages for Upper South Platte Segment 15 and Middle South Platte Segment 1a that is consistent with early-life stage assumption included in the site-specific dissolved oxygen standard for these segments. This early life stage period is the result of significant scientific investigation performed during the mid 1990's when the dissolved oxygen standard was developed.

PARTIES TO THE RULEMAKING

1. Boxelder Sanitation District
2. Estes Park Sanitation District
3. City of Pueblo
4. The City of Boulder
5. The Metro Wastewater Reclamation District
6. The Colorado Wastewater Utility Council
7. The Paint Brush Hills Metropolitan District
8. The Grand County Water & Sanitation District #1, the Winter Park West Water & Sanitation District, the Fraser Sanitation District and the Winter Park Water & Sanitation District
9. Mountain Water & Sanitation District
10. The Town of Gypsum
11. The City of Grand Junction
12. City and County of Broomfield
13. Centennial Water & Sanitation District
14. Town of Erie
15. The City of Fort Collins
16. Plum Creek Wastewater Authority
17. The City of Sterling
18. Eastern Adams County Metropolitan District
19. The City of Littleton
20. Two River Metro District
21. H Lazy F Mobile Home Park
22. Rock Gardens Mobile Home
23. Blue Creek Ranch
24. The City of Greeley
25. US EPA

38.66 STATEMENT OF BASIS SPECIFIC STATUTORY AUTHORITY AND PURPOSE: JULY 9, 2007 RULEMAKING FOR CACHE LA POUDRE SEGMENTS 11 AND 12; EFFECTIVE SEPTEMBER 30, 2007

The provisions of C.R S. 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; and 25-8-402; provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted in compliance with 24-4-103(4) C.R.S. the following statement of basis and purpose.

BASIS AND PURPOSE:

Fort Collins originally proposed site-specific water effect ratios for Segments 11 and 12 of the Cache la Poudre River using a combination of the streamlined Water Effect Ratio (WER) and the Biotic Ligand Model (BLM). Similar proposals were submitted by two parties in the June 2007 Arkansas River Basin hearing. These proposals were opposed by the Division and EPA who recommended that type iii temporary modifications be adopted pursuant to Regulation 31.7(3)(a)(iii). Ultimately in the Arkansas Basin hearing, the Commission adopted temporary modifications of "current condition" with an expiration date of December 31, 2009. Fort Collins modified its proposal in this proceeding accordingly.

This temporary modification recognizes the uncertainty created by the evolving guidance regarding use of the WER, BLM, or other appropriate copper standard to protect the aquatic life use, as well as uncertainty about whether protective levels can feasibly be attained in the effluent of the Fort Collins WWTF. An additional source of uncertainty is whether or not a translator study will provide adequate relief for the WWTF.

The temporary modification has been set to expire on December 31, 2009. During the term of the temporary modification, Fort Collins will investigate the efficacy of a translator from dissolved criterion to a potentially dissolved (or total recoverable) permit limit. In addition, the Commission anticipates that there will be an expanded dialogue between EPA, the Division and interested parties regarding the appropriate methods for setting site-specific copper stream standards.

With a 2009 expiration date, Fort Collins' progress will be reported to the Commission at the December 2007 and December 2008 annual Temporary Modification Review hearing, and the need for the temporary modification will be reviewed at that time. If a translator is inadequate, the Commission recognizes that more time may be needed to develop a site-specific standards proposal.

The temporary modification is set at “current condition.” It is the intention of the Commission that when implementing this temporary modification in a CDPS permit, and interpreting the term current condition, the division will assess the current effluent quality, recognizing that it changes over time due to variability in treatment plant removal efficiency and influent loading from industrial, commercial, and residential sources. One necessary element of an approach to maintain the current condition would be a requirement that the total loading from commercial and industrial contributors be maintained at that level as of the date of adoption of the temporary modification and that neither the concentration nor the frequency of high concentration shall increase over historic levels and frequency.

PARTIES TO THE RULEMAKING HEARING

1. City of Fort Collins
2. City of Greeley
3. U. S. Environmental Protection Agency, Region 8

38.67 STATEMENT OF BASIS SPECIFIC STATUTORY AUTHORITY AND PURPOSE: JULY 9, 2007 RULEMAKING FOR BOULDER CREEK SEGMENT 9; EFFECTIVE SEPTEMBER 30, 2007

The provisions of C.R S. 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; and 25-8-402; provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted in compliance with 24-4-103(4) C.R.S. the following statement of basis and purpose.

BASIS AND PURPOSE:

The city of Boulder (“Boulder”) originally proposed a Biotic Ligand Model (BLM)-based copper Water Effect Ratio (WER) for Segment 9 of Boulder Creek from the city of Boulder wastewater treatment plant (WWTP) point of discharge to the confluence with Coal Creek. After discussions with the Division and EPA regarding use of the Biotic Ligand Model in Colorado, Boulder revised its proposal by requesting a type iii temporary modification for copper based on uncertainty pursuant to Rule 31.7(3)(a). The Commission adopted Boulder’s revised proposal.

The temporary modification recognizes the uncertainty created by the evolving guidance regarding use of a WER, BLM, or other appropriate copper standard to protect the aquatic life use in Colorado, as well uncertainty about whether protective levels can feasibly be attained in the effluent of the Boulder WWTP. An additional source of uncertainty is whether or not a translator study will provide adequate relief for the WWTP.

The temporary modification has been set to expire on December 31, 2009. During the term of the temporary modification Boulder will investigate whether a copper translator (from a dissolved criterion to a potentially dissolved or total recoverable permit limit) will address its needs. In addition, the Commission anticipates that there will be an expanded dialogue between EPA, the Division and interested parties regarding the appropriate methods for setting site-specific copper stream standards.

With a 2009 expiration date, Boulders' progress will be reported to the Commission at the December 2007 and December 2008 annual Temporary Modification Review hearings and the need for a temporary modification expiration date beyond December 31, 2009 will be reviewed at that time. If a translator is inadequate, the Commission recognizes that more time may be needed to develop a site-specific standards proposal.

The temporary modification is set at "current condition." It is the intention of the Commission that when implementing this temporary modification in a CDPS permit, and interpreting the term current condition, the Division will assess the current effluent quality, recognizing that it changes over time due to variability in treatment plant removal efficiency and influent loading from industrial, commercial, and residential sources. One necessary element of an approach to maintain the current condition would be a requirement that the total loading from commercial and industrial contributors be maintained at that level as of the date of adoption of the temporary modification and that neither the concentration nor the frequency of high concentration shall increase over historic levels and frequency.

PARTIES TO THE RULEMAKING HEARING

1. City of Boulder
2. City of Lafayette
3. U. S. Environmental Protection Agency, Region 8

38.68 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE: DECEMBER 10, 2007 RULEMAKING REGARDING TEMPORARY MODIFICATIONS; EFFECTIVE MARCH 1, 2008

The provisions of C.R S. 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; and 25-8-402; provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted in compliance with 24-4-103(4) C.R.S. the following statement of basis and purpose.

BASIS AND PURPOSE

Pursuant to the requirements in the Basic Standards (at 31.7(3)), the Commission reviewed the status of temporary modifications to determine whether the temporary modification should be modified, eliminated or extended.

Language was added to subsection 38.6(2) to explain the terms "type i" and "type iii" temporary modifications.

In three general cases, the Commission decided to delete temporary modifications, thereby allowing the underlying standards to go into effect:

a. Segments with no known permitted dischargers:

- Upper So. Platte segment 5b, Geneva Creek, temporary modification for zinc.
- Lower So. Platte segment 2b, temporary modifications for selenium and E coli.

b. Segments with permitted dischargers where the dischargers are not expected to discharge the parameters of concern at levels that exceed the standard:

- Upper So. Platte segment 4, temporary modification for copper and zinc.
- Upper So. Platte segment 15, temporary modifications for fecal coliform and E. coli.
- Clear Creek segment 15, temporary modifications for E. coli.
- Big Dry Creek segment 1, temporary modifications for fecal coliform and E. coli.
- Boulder Creek segment 2, temporary modifications for E. coli.
- Boulder Creek segment 7b, temporary modifications for E. coli.
- Boulder Creek segment 10, temporary modifications for E. coli.
- Big Thompson segment 5, temporary modifications for selenium.
- Big Thompson segment 9, temporary modifications for selenium and E coli.
- Big Thompson segment 10, temporary modifications for selenium.
- St. Vrain segment 4b, temporary modifications for copper and lead.
- Cache La Poudre segment 12, temporary modifications for E. coli.
- Lower So. Platte segment 1, temporary modifications for selenium.

c. Segments where there may be permitted dischargers but for which no questions have been raised about the appropriateness of the standard. In these cases, instream levels exceed the previous ammonia TVS or the existing nitrate standard:

- Middle So. Platte segment 1b, temporary modification for ammonia.
- Middle So. Platte segment 5b, temporary modification for ammonia.
- Lower So. Platte segment 1, temporary modification for nitrate.

Temporary modifications provide time for sand and gravel dischargers to work with the Division to determine the most appropriate way to make progress towards resolving non-attainment of underlying selenium standards. The Commission added “type iii”, but took no action on the expiration date for the following segments.

- St Vrain segment 6, temporary modification for selenium.
- Big Thompson segment 4b, temporary modification for selenium.

Because parties are working to resolve uncertainty and are on schedule to address these segments at the regularly scheduled basin-wide rulemaking (June 2009), the Commission either added “Type iii” or made the reference consistent, but took no action on the expiration date for the temporary modifications for the following segments:

<u>Upper So Platte segments 16a and 16c:</u> (temporary modifications for selenium). The Selenium Stakeholders presented evidence that they are making progress on their study of selenium sources and appropriate underlying standards and will make a proposal for the 2009 rulemaking hearing.

<u>Big Dry Creek segment 5:</u> (temporary modifications for nitrate, nitrite, benzene, carbon tetrachloride, 1,2-dichloroethanen, 1,1-dichloroethene, tetrachloroethylene, and trichloroethylene). The temporary modification was identified as a “type i” temporary modification. The Department of Energy submitted evidence that progress is continuing and that the temporary modifications are necessary because of the Clean Up agreement.

<u>Boulder Creek, segment 9, Cache La Poudre segments 11 and 12:</u> (temporary modification for copper). The City of Boulder (Boulder Creek) and the City of Fort Collins (Cache La Poudre) submitted evidence that they are making progress on their translator studies.

Clear Creek segments 2, 3a, 3b, 6, 9a, 9b, 11, 13b: (temporary modifications for zinc, lead, copper, manganese, and cadmium - not all segments have all metals). Evidence was submitted that indicated that the Upper Clear Creek Watershed Association is making progress on their study of appropriate underlying standards and will make a proposal for the 2008 rulemaking temporary modification review hearing. The Commission adjusted the expiration date to 7/1/2009.

Big Dry Creek segment 1: The Big Dry Creek Cities presented evidence that the natural or irreversible human-induced ambient water quality levels for selenium in Big Dry Creek Segment 1 at times exceed the relevant table value standard, and an ambient quality based standard, calculated in a manner consistent with Basic Standards requirements, is adequate to protect classified uses. The Commission accepts the Big Dry Creek Cities' evidence as accurate. The Commission expressly finds that the natural or irreversible human-induced ambient water quality levels for selenium in Big Dry Creek Segment 1 exceed the relevant table value standard. Moreover, the proposed ambient quality based standard is adequate to protect classified uses and represents the highest reasonably attainable standard, based on analysis of available data that show elevated instream conditions are attributable to natural or irreversible human induced conditions.

Strong seasonal variation associated with highly managed flow conditions (e.g., releases of irrigation water from Standley Lake) significantly influences selenium concentrations, particularly in the portion of the stream above the wastewater treatment plants. As a result, the Commission adopts seasonal ambient quality based site-specific standards for selenium applicable to Big Dry Creek Segment 1. During the irrigation season (April through October), ambient standards are 7.4 µg/L chronic (dis) and TVS µg/L acute (dis). Ambient-based non-irrigation season (November through March) standards are 15 µg/L chronic (dis) and 19.1 µg/L acute (dis). These calculations are based on the 85% (chronic) and the 95% (acute for the non-irrigation season) of the ambient selenium data collected at three specific instream monitoring locations (bdc1.5, bdc2.0 and bdc4.0) upstream of the three municipal wastewater treatment plant discharges, however, it is the Commission's intent that the existing spatial variability of selenium in Big Dry Creek be maintained. This composite approach was jointly developed by the Cities and the Water Quality Control Division as a reasonable method to establish the ambient based standards and to assess attainment of future stream standards for Segment 1 of Big Dry Creek. The ambient quality based site-specific standards for selenium (acute and chronic) shall apply to the entirety of Big Dry Creek Segment 1. The Commission also removes the temporary modification currently in place for selenium in Big Dry Creek Segment 1.

PARTIES TO THE RULEMAKING

1. Big Dry Creek Cities (City of Westminster, City of Northglenn, and City and County of Broomfield)
2. Colorado Rock Products Association
3. City of Grand Junction
4. City of Colorado Springs and Colorado Springs Utilities
5. Upper Clear Creek Watershed Association
6. City of Black Hawk and Black Hawk / Central City Sanitation District
7. Department of Energy Office of Legacy Management
8. City of Aurora
9. Shell Frontier Oil & Gas, Inc.
10. City of Boulder
11. Tri-Lakes Wastewater Treatment Facility
12. Security Sanitation District
13. City of Fort Collins
14. Metro Wastewater Reclamation District
15. U.S. EPA

38.69 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE: NOVEMBER 10, 2008 RULEMAKING FOR UPPER SOUTH PLATTE SEGMENT 6b; EFFECTIVE MARCH 30, 2009 [Eff. 03/30/2009]

The provisions of C.R S. 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; and 25-8-402; provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted in compliance with 24-4-103(4) C.R.S. the following statement of basis and purpose.

BASIS AND PURPOSE

The Commission revised the site-specific phosphorus standard and changed the chlorophyll goal to a standard for Chatfield Reservoir (Upper South Platte segment 6b) and revised the Chatfield Reservoir Control Regulation (Regulation No 73) to be consistent with these revised standards.

Current Review: The Commission directed the Division to undertake a technical review of the scientific basis for the Chatfield Reservoir phosphorus standard for the following reasons:

A. The phosphorus standard has been exceeded several times in the last decade, while the associated chlorophyll goal has not. The incongruity suggests that the original basis for linking chlorophyll and phosphorus concentrations in the lake should be revisited.

B. The protocol for computing the average phosphorus concentration, which determines attainment of the phosphorus standard, needs to be clarified. The evolution of sampling protocols for Chatfield Reservoir may have inadvertently created a bias in the average phosphorus concentration, with the potential to make it inconsistent with the original intent of the standard.

C. A review commissioned by the Basin Authority in 2005 identified concerns about the TMAL and the underlying assumptions. Based in part on this review, the Commission directed the Division and the Authority “to examine the TMAL and its underlying assumptions.”

The technical review showed:

A. Current Condition: Chatfield Reservoir presently has good water quality and uses are being attained. The Commission believes that good conditions have been maintained by having implemented effective phosphorus control strategies through adoption of Control Regulation No. 73. The data record amassed through more than 20 years of water quality monitoring shows that trophic condition has remained stable, and it provides a comprehensive basis for assessing the variability in those characteristics (chlorophyll and phosphorus) of trophic condition that are recommended as standards.

B. Characterizing Chlorophyll: Typical summer average chlorophyll is about 6 µg/l, and there has been no trend for increasing concentration over the 26-year period of study. Concentrations vary from year to year, but have exceeded 10 µg/l only 5 times in 24 years, and only twice since 1990.

C. Role of Phosphorus: The Commission believes that eutrophication of Chatfield Reservoir has been averted through the control of phosphorus loads from the watershed. Adoption of the control regulation made this possible by imposing concentration limits on point source discharges and by facilitating implementation of nonpoint source management. There has been no trend for increasing phosphorus in Plum Creek, where most of the development has occurred. Domestic dischargers are to be commended for their role in making this effort a success.

D. Characterizing Phosphorus: Typical summertime concentrations of phosphorus have been about 0.020 mg/L, and there has been no trend for increasing phosphorus in the lake. Summer median concentrations have exceeded 0.030 mg/L in only 3 of 24 years. It is appropriate to maintain phosphorus as a standard, rather than a goal, because of its importance in characterizing trophic condition, and because it is the direct link to the control regulation.

E. Old Relationship Between Chlorophyll and Phosphorus: The existing phosphorus standard is not consistent with the existing chlorophyll goal. Phosphorus concentrations at or below the level of the standard have yielded chlorophyll much lower than the goal. The mismatch is the result of relying entirely on one year of data and assuming that all variation in chlorophyll is explained completely by the phosphorus concentration in the reservoir.

F. Defining a New Chlorophyll-Phosphorus Linkage: The conventional regression approach used in the Clean Lakes Study to link chlorophyll and phosphorus in the context of trophic condition has shown its weaknesses. The Division believes a better linkage is based on the simple ratio of chlorophyll to phosphorus, which records the net responsiveness of the resident algal community to the amount of phosphorus present in the lake. It is a “net” value because it reflects the balance of growth (nutrients, light, temperature) and loss (grazing, washout, settling) processes. The measured ratios offer an empirical basis for defining expectations for chlorophyll given the available phosphorus.

G. Allowable Frequency of Exceedance: The original nutrient criteria (phosphorus standard and chlorophyll goal) did not specify the frequency with which exceedances would be allowed. There is no general precedent for nutrient criteria, which are assessed once a year on the basis of a seasonal average, but the Division believes that one exceedance is allowable in five years.

H. Sampling Requirements: A more complete definition of sampling protocols is needed to clarify the basis for assessing attainment of these site-specific standards in the future.

Revised Water Quality Standards for Chatfield Reservoir: With the benefit of the lengthy historical record now available, the Commission believes it is appropriate to set chlorophyll and phosphorus standards consistent with the trophic condition that has been maintained. The Commission adopted a chlorophyll standard of 10 µg/l and a phosphorus standard of 0.030 mg/L to preserve the intended trophic condition and protect uses. Each standard is to be attained in four of five years.

Because the phosphorus and chlorophyll standards are defined as seasonal averages, some additional guidance is required concerning timing and location of samples to be used in calculating the average. Samples are to be collected at a site near the dam and should be representative of conditions in the mixed layer. Past monitoring has resulted in 6 samples during the summer months (July, August, and September); it is anticipated that the same level of effort will be applied in the future. For assessment, the average (arithmetic mean) is calculated for the summer samples in each year.

<u>Development of Assessment Thresholds</u>: For Chatfield Reservoir, a distinction is made between the standard and an assessment threshold. The assessment threshold is designed to address the concern about the risk of incorrectly counting an exceedance when a high summer value is the result of natural variability, but does not indicate a substantive change in trophic condition. The approach is justified by the special nature of the pollutants (chlorophyll and phosphorus are not toxic) and the site-specific nature of the concern about false exceedances. Another reason for establishing an assessment threshold that is different than the standard is that the site-specific standard is derived from historical data, which creates the expectation that a number of exceedances will occur. Natural variability, especially for chlorophyll, is sufficient to produce much more uncertainty in the assessed value than in the standard, which was derived from the set of all summer averages. The Commission is establishing assessment thresholds for Chatfield Reservoir nutrient standards based on this unique combination of circumstances and does not intend this action to be a precedent for other standards and/or other segments. “Assessment thresholds” were developed by calculating the standard error of each summer average. A regression of the upper confidence limit on the average provides an equation that can be used to specify the upper confidence limit (90%) for any particular concentration (e.g., the standard). Assessment thresholds were added in section 38.6,(4) with a reference in the standards table “qualifier” column.” The resulting assessment thresholds were chlorophyll = 11.2 µg/l, summer average, 1 in 5 year allowable exceedance frequency and phosphorus = 0.035 mg/l, summer average, 1 in 5 year allowable exceedance frequency.

At the same time that this change was adopted in Regulation No. 38, the Commission adopted changes in the Control Regulation for Chatfield Reservoir (Regulation No. 73) that are consistent with the revised standard.

PARTIES TO THE RULEMAKING

1. Chatfield Watershed Association
2. Plum Creek Wastewater Authority
3. Colorado Division of Wildlife
4. Roxborough Water and Sanitation District
5. Dominion Water and Sanitation District
6. U. S. EPA
7. Denver Regional Council of Governments

38.70 STATEMENT OF BASIS SPECIFIC STATUTORY AUTHORITY AND PURPOSE: DECEMBER 2008 RULEMAKING REGARDING TEMPORARY MODIFICATIONS; EFFECTIVE MARCH 30, 2009[Eff. 03/30/2009]

The provisions of C.R S. 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; and 25-8-402; provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted in compliance with 24-4-103(4) C.R.S. the following statement of basis and purpose.

BASIS AND PURPOSE

Pursuant to the requirements in the Basic Standards (at section 31.7(3)), the Commission reviewed the status of temporary modifications to determine whether the temporary modification should be modified, eliminated or extended.

Segments with no change to expiration dates:

Temporary modifications provide time for sand and gravel dischargers to work with the Division to determine the most appropriate way to make progress toward resolving non-attainment of underlying selenium standards. The Commission took no action on the expiration date for the following segments. The temporary modifications will expire on 2/28/10.

St Vrain segment 6: temporary modification for selenium
Big Thompson segment 4b: temporary modification for selenium.

Because parties are working to resolve uncertainty and are on schedule to address these segments at the regularly scheduled basin-wide rulemaking (June 2009), the Commission took no action on the expiration date for the temporary modifications for the following segments:

Upper So. Platte segment 5c: (temporary modifications for ammonia). The Mountain Water and Sanitation District presented evidence that they are making progress on their study of aquatic life classification and appropriate underlying standards and will make a proposal for the June 2009 rulemaking hearing.

Big Dry Creek segment 5: (temporary modifications for nitrate, nitrite, benzene, carbon tetrachloride, 1,2-dichloroethane, 1,1-dichloroethene, tetrachloroethylene, and trichloroethylene). The Department of Energy submitted evidence that progress is continuing and that the temporary modifications will be addressed in the June 2009 rulemaking hearing.

Boulder Creek, segment 9, Cache La Poudre segments 11 and 12: (temporary modification for copper). The City of Boulder (Boulder Creek) and the City of Fort Collins (Cache La Poudre) submitted evidence that they are making progress on their translator studies.

Big Thompson, segment 2, Wapiti Meadow: (temporary modification for dissolved oxygen, E coli, ammonia, nitrate, boron cadmium, copper, lead, mercury, nickel, selenium, silver and zinc). The Upper Thompson Sanitation District submitted evidence that they are making progress on developing site-specific standards for the wetland and will make a proposal for the June 2009 rulemaking hearing.

Upper Clear Creek basin: The Commission considered proposals regarding temporary modifications and underlying standards for Clear Creek segments 2, 3a, 3b, 6, 9a, 9b, 11 and 13b.

Manganese acute and chronic aquatic life standards were added to segments 2 and 9b.

The Commission declined to modify other underlying standards at this time and noted that it would be willing to revisit underlying standards in the June 2009 basin-wide hearing, including any proposals from the Upper Clear Creek Watershed Association.

Since there are no permitted dischargers, the Commission deleted the temporary modification, thereby allowing the underlying standards to go into effect for the following segments:

Clear Creek segments 3a, 3b, 6 and 9b.

The numeric temporary modifications for segments 2, 9b, 11 and 13b were revised to reflect current conditions. A new temporary modification of the iron standard was added for segment 13b. A ten year period of record was used in these cases because of the wider range of hydrologic conditions that is captured by this period. These type iii temporary modifications were set to expire on 12/31/2014 as follows:

Clear Creek segment 2: Cu= 7.4 µg/l, Zn= 254 µg/l
Clear Creek segment 9a: Cu= 9.6 µg/l
Clear Creek segment 11: Zn= 325 µg/l
Clear Creek segment 13b: Cd= 4.7 µg/l, Mn= 3841 µg/l, Zn= 1582 µg/l, Fe(trec)= 7941 µg/l.

Since considerable water quality improvement in this basin has been made since 2000, the Commission adopted an alternative baseline to be used for antidegradation review for the reviewable segments (segments 1, 2, 4, 3a, 3b, 6, 9a, 9b, 10 and 13a). A notation was added to the designation column of reviewable segments “9/30/00 baseline does not apply”. Pursuant to section 31.8(3)(c)(ii)(B) of the Basic Standards, the baseline will be determined at the time of the first new or increased water quality impact. This will ensure that the improved water quality will be used as the baseline.

Sand Creek, Upper So. Platte segment 16a: Suncor Energy, (U.S.A.), Inc. (Suncor) requested the Commission to extend the type iii temporary modification pursuant to section 31.7(3)(a) of the Basic Standards for selenium of segment 16a of the South Platte River (Sand Creek) to 12/31/2014. More time is needed to determine what criteria are necessary to protect the use in Segment 16a and how additional treatment will be provided.

The Commission extended the selenium temporary modifications and updated the underlying narrative standard with the notation of “current condition” rather than a numeric value. The Commission's intent of using the notation “current condition” is to preserve the status quo during the term of the temporary modification. Dischargers to this segment shall maintain the existing selenium water quality and loading characteristics of their effluent, as reflected in current permits. The Commission does not intend the temporary modifications to apply to new facilities or in Preliminary Effluent Limitations.

Toll Gate, East and West Toll Gate Creeks, Upper So Platte segment 16h: The City of Aurora presented evidence that the natural or irreversible human-induced ambient water quality levels for selenium in Toll Gate Creek, East Toll Gate Creek, and West Toll Gate Creek at times exceed the relevant table value standard, and that an ambient quality-based standard, calculated in a manner consistent with Basic Standards requirements, is adequate to protect classified uses. The Commission accepts the City of Aurora’s evidence as accurate. The Commission expressly finds that the natural or irreversible human-induced ambient water quality levels for selenium in Toll Gate Creek, East Toll Gate Creek, and West Toll Gate Creek exceed the relevant table value standard. Moreover, the proposed ambient quality based standard is adequate to protect classified uses and represents the highest reasonably attainable standard, based on analysis of available data that show elevated instream conditions are attributable to natural or irreversible human-induced conditions.

The Commission created a new segment, segment 16h, and adopted ambient quality-based site-specific standards for selenium applicable to Toll Gate Creek, East Toll Gate Creek, and West Toll Gate Creek in Segment 16h. The ambient quality-based standards are based on the 85th percentile (chronic) and the 95th percentile (acute) of the selenium data collected at three specific instream monitoring locations (TG6, ET1 and WT1). The instream attainment locations have been added to section 38.6(4). Percentiles are:

Toll Gate Creek (TG6): 85th percentile = 26.5 μg/l chronic (dis), 95th percentile = 29.5 μg/l acute (dis).

East Toll Gate Creek (ET1): 85th percentile = 14.3 μg/l chronic (dis), 95th percentile = 15.9 μg/l acute (dis).

West Toll Gate Creek (WT1): 85th percentile = 50.6 μg/l chronic (dis), 95th percentile = 119.2 μg/l acute (dis).

The Commission removed the temporary modification currently in place for selenium in Toll Gate Creek, East Toll Gate Creek, and West Toll Gate Creek in Segment 16c, and added “16h” to the list of exceptions in the 16c segment description.

PARTIES TO THE RULEMAKING

1. Upper Clear Creek Watershed Association

2. City of Aurora
3. Suncor Energy (USA)
4. Tri-Lakes Wastewater Treatment Facility; Upper Monument Creek Regional Wastewater Treatment Facility; Security Sanitation District; and Fountain Sanitation District
5. Hazardous Materials and Waste Management Division and the U.S. Environmental Protection Agency's Superfund Remediation Programs
6. Colorado Division of Wildlife
7. City of Boulder
8. U.S. Department of Energy, Office of Legacy Management
9. City of Black Hawk and Black Hawk/Central City Sanitation District
10. City of La Junta
11. City of Fort Collins
12. Colorado Trout Unlimited
13. U.S. EPA
14. City of Colorado Springs and Colorado Springs Utilities

38.71 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE: JANUARY 12, 2009 RULEMAKING; EFFECTIVE MARCH 30, 2009

The provisions of C.R.S. 25-8-202(1)(b) and (2); 25-8-204; and 25-8-402 provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted in compliance with 24-4-103(4) C.R.S. the following statement of basis and purpose.

BASIS AND PURPOSE

The Commission considered revisions to Table 2 standards for uranium, gross alpha and gross beta for segments 4a, 4b, and 5 of Big Dry Creek.

The previous uranium standards (10 pCi/L for Walnut Creek and 11 pCi/L for Woman Creek) were set in 1996 based on the then current ambient conditions. Recently, post-closure surface water runoff has decreased and the relative contribution of uranium from groundwater has increased. However, the effects of this hydrologic change have not been quantified. In addition, increased treatment of the Solar Pond Plume area will result in a decrease in uranium from that source. Since there is continued uncertainty about the eventual equilibrium surface water uranium concentrations, the Commission decided that human health-based criteria were more appropriate than table value standards, new ambient-based standards or maintaining the current standards. The question of determining the "lowest practical level" will be left to the future when DOE completes a feasibility study of enhanced treatment of the Solar Pond Plume.

The Commission adopted a total uranium standard of 16.8 µg/L to protect human health since the goal for the Rocky Flats site has been to protect all uses. This concentration-based criterion was derived using a reference dose of 0.0006 mg/kg/day and a relative source contribution of 0.8 (see Policy 96-2, Equation 1-1). Based upon a conversion factor of 0.67 pCi/µg uranium, 16.8 µg/L equates to 11.3 pCi/L.

The gross alpha and gross beta standards were deleted. Gross alpha was removed because the site-specific standards for specific alpha-emitting radionuclides are adequate to protect water quality and designated uses. Gross beta was removed because beta emitters are not present at the site at levels above background.

PARTIES TO THE RULEMAKING

1. U.S. Department of Energy, Office of Legacy Management
2. City of Northglenn
3. City of Westminster
4. City and County of Broomfield

5. City of Thornton
6. U.S. EPA

38.72 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE: MARCH 10, 2009 RULEMAKING REGARDING CHERRY CREEK RESERVOIR; FINAL ACTION AUGUST 10, 2009; EFFECTIVE DATE JANUARY 1, 2010

The provisions of C.R S. 25-8-202(1) (b), (c) and (2); 25-8-204; 25-8-205 and 25-8-402; C.R.S. provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted in compliance with 24-4-103(4) C.R.S. the following statement of basis and purpose.

At the same time that these changes were adopted in Regulation #38, the Commission adopted consistent changes in Regulation #72, Cherry Creek Reservoir Control Regulation (5 CCR 1002-72).

BASIS AND PURPOSE

The classified uses for the Cherry Creek Reservoir (Reservoir) include warm water aquatic life class 1, recreation class E (formerly 1a), water supply, and agriculture. The Reservoir is mildly eutrophic and has limited releases given the primary role of Cherry Creek Dam as a flood control structure. As a result of the data and analyses brought forward as part of the March 2009 Rulemaking Hearing, the Commission adopted revisions to the water quality standard for chlorophyll *a* in the Reservoir. Specifically, the Commission has changed the seasonal chlorophyll *a* standard from15 µg/l to18 µg/l to be attained four out of five years. The Commission also adopted the “class E” recreation classification to replace the previous “class 1a” label, and replaced the fecal coliform numeric standard with an E. coli numeric standard of 126/100ml to be consistent with Regulation #31 (5 CCR 1007-31). In conjunction with the adoption of a revised chlorophyll *a* standard, the Commission also adopted a number of changes to Regulation #72 (5 CCR 1002-72).

Background and Overview

During the September 2000 Rulemaking Hearing, the Commission repealed the prior total phosphorus water quality standards for the Reservoir and adopted a chlorophyll *a* standard of 15 µg/l (previously a “goal”), to be measured in the upper three meters of the water column during July through September. At that time, the Commission recognized that further data was needed to establish a scientifically appropriate chlorophyll *a* standard. To this end, the Commission directed the Cherry Creek Basin Water Quality Authority (Authority), with oversight by the Water Quality Control Division (Division), to conduct a number of special studies.

In 2000, the Commission also retained a Total Maximum Annual Load (TMAL) of 14,270 pounds of total phosphorus to the Reservoir provided in Regulation #72, with a consideration that this be a “phased TMAL” while the Authority completed the requested studies. An in-lake phosphorus goal, which was a July through September seasonal average, was set at 40 µg/l based on the Division’s 90% confidence level that this goal would result in the attainment of the chlorophyll *a* standard.

The Commission further recognized in the 2000 Rulemaking Hearing the uncertain relationship between chlorophyll *a* and total phosphorus, such that the correlation resulting from that Rulemaking Hearing could change based on the analysis of the additional data obtained by the identified studies. The Commission’s recognition of that uncertainty and the data modeling information obtained since that time provide the basis for adjusting the chlorophyll *a* standard in this rulemaking.

Chlorophyll *a* Standard

Between 1999 and 2008, the Authority gathered data to expand the data set used by the Commission to reach its decisions in the September 2000 Rulemaking. The Authority used this data and previously collected data in its modeling efforts to evaluate whether a chlorophyll *a* standard of 15 µg/l could feasibly be attained nine out of ten years. The Authority concluded that such a standard could not be attained and set forth to identify a feasibility-based chlorophyll *a* standard.

<u>The Current Standard is not Attainable.</u> Based on the evidence presented in the prehearing filings and at the March 2009 rulemaking hearing, the Commission agrees that a chlorophyll *a* standard of15 µg/l cannot be feasibly attained nine out of ten years.

The Commission reaches this conclusion, based on the evidence presented throughout this process, for three reasons. First, the current chlorophyll *a* standard was an admitted compromise between parties with competing interests, where scarce Reservoir data existed to support the parties' respective positions. Second, to achieve a chlorophyll *a* standard of15 µg/l, the Reservoir's long-term seasonal (July to September) mean chlorophyll *a* concentration would need to be less than10 µg/l, a value not observed within the Reservoir since 1991. The only way to achieve a long-term average summer chlorophyll *a* concentration at that level would be to require the reduction of flow-weighted total phosphorus concentrations into the Reservoir by more than 30percent beyond the lowest value observed entering the Reservoir. Finally, even the background concentrations are substantially above the concentration needed to achieve a chlorophyll *a* concentration of15 µg/l.

<u>Current Water Quality Protection Efforts.</u> The evidence indicates that although the Cherry Creek Basin has experienced unprecedented growth during the past 20 years, the Authority and its partners have succeeded in implementing nutrient controls to help maintain the Reservoir's water quality. The Commission acknowledges that the Authority, its member agencies, and partners have improved wastewater treatment and have installed best available technology, installed nonpoint source controls, and utilized its land use agency responsibilities to control phosphorus in the watershed and inflow to the Reservoir.

The evidence also indicates that the Authority considered additional watershed management practices that it could implement in the future. By reviewing the outcome of the Authority's analyses presented during this rulemaking process, the Commission concludes that the additional practices identified to date are not feasible at this time. Some practices would be exorbitantly expensive, and it is unclear when and to what extent additional nutrient reductions might be realized within the Reservoir. Nutrient reductions depend in part on future development and current economic conditions create uncertainty regarding the pace and scope of future development. In addition, access and liability-based legal issues may preclude the Authority from implementing certain future practices.

The Commission also acknowledges that the Authority and its member agencies are committed to continuing watershed improvements, understanding that the watershed conditions are expected to improve with time and effort. While the Commission acknowledges that the additional future watershed management practices considered by the Authority are infeasible at this time, the Commission expects current water quality management strategies to continue and, as necessary, become more aggressive over time to attain water quality objectives and protect the uses of the Reservoir.

<u>Science and Policy Support the Commission's Adoption of a 18 µg/l Chlorophyll *a* Standard.</u> Based on the evidence advanced by the parties to this rulemaking, the Commission concludes that the appropriate assessment period by which to measure attainment with the standard should be five years, with attainment expected in four out of five years. The Commission understands that an assessment period of five years will allow the Division and the Authority to respond more promptly to attainment issues, such that water quality can be managed more effectively. Moreover, the Commission acknowledges that this adjusted assessment period would also preclude longer periods of time during which the standard could be exceeded, which could have a greater adverse impact on the Reservoir's water quality.

Recognizing that the 15 µg/l standard is not attainable, the Commission has chosen to set a standard that provides protection of reservoir uses to the maximum degree practical, recognizing present uncertainty as to the specific chlorophyll a level that will prove to be attainable over time. The Commission has determined as a matter of policy that it would be premature to set a chlorophyll a standard based solely on the assumption that no additional improvement is feasible. The Commission believes that it is important to retain the goal of full protection of the Reservoir's uses.

The adopted standard (18 µg/L) was developed from a prediction of the "most likely" chlorophyll *a* concentration and a measured variability component. Prediction of the most likely chlorophyll *a* concentration (16.2 µg/L) was based on an equation, created through the reservoir modeling effort, relating chlorophyll to input, flow-weighted phosphorus concentration (0.177 mg/L). The most likely chlorophyll concentration represents a long-term mean, which is not the appropriate value for a standard to be attained 80% of the time (in four of five years). The 80^{th} percentile value is calculated from the long-term mean and a measured variability component (standard deviation of 2.3 µg/L). The standard deviation used in this calculation is smaller than the one proposed by the CCBWQA, which had argued that it should be based on an 8-year record of "existing conditions." However, the Commission chose to base the standard on the most recent five years of data as a matter of policy, to better reflect optimism about what can be achieved for this reservoir. Because chlorophyll concentrations have been less variable over the last five years than over the last eight years, a smaller standard deviation is employed in development of the appropriate standard.

Future Watershed Practices

Given the Authority's duty to continue its water quality control management strategies, the Commission's adoption of a 18 µg/l chlorophyll *a* standard will not result in a reduction or change in the Authority's commitment to controlling chlorophyll *a* in the Reservoir. The Commission's adoption of revisions to Regulation #72 (5 CCR 1002-72) reflect the Authority's commitment to maintain current water quality management strategies and, as necessary, become more aggressive over time to attain water quality objectives and protect the uses of the Reservoir.

In accordance with statutory requirements, both the control regulation and the underlying standards will be revisited as efforts are implemented over time, such that more information is developed regarding influences on, and the attainability of, identified levels of Reservoir water quality.

PARTIES TO THE RULEMAKING

1. Cherry Creek Basin Water Quality Authority
2. Parker Water and Sanitation District
3. Colorado Division of Wildlife
4. Arapahoe County Water and Wastewater Authority
5. Meridian Metropolitan District
6. City of Greenwood Village
7. U. S. Environmental Protection Agency (EPA), Region 8
8. City of Aurora Water Department
9. Denver Water

38.73 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE: MAY 11, 2009 RULEMAKING; FINAL ACTION AUGUST 10, 2009; EFFECTIVE JANUARY 1, 2010

The provisions of C.R S. 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; and 25-8-402; provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted in compliance with 24-4-103(4) C.R.S. the following statement of basis and purpose.

BASIS AND PURPOSE

The Commission revised the site-specific narrative nutrient criteria to include numeric standards for chlorophyll and total phosphorus for Bear Creek Reservoir (Bear Creek segment 1c).

Current Review: The Commission directed the Division to undertake a technical review of the scientific basis for the Bear Creek Reservoir narrative nutrient standard and Control Regulation (Regulation #74) for the following reasons:

A. There are no numeric goals for assessing water quality conditions related to excessive algal growth.

B. There is no firm basis for determining what level of nutrient control is consistent with the water quality goals.

C. The allowable load is not specified in the Control Regulation, making it impossible to determine the appropriateness of allocations.

D. There is an implied acceptance of aeration as a permanent basis for treating the symptoms of algal productivity that is higher than the target specified in the narrative standard.

The technical review showed:

A. Current Condition: Water quality has been monitored in Bear Creek Reservoir since 1987. The reservoir is more productive than allowed by the existing narrative standard, which specifies a target trophic condition between mesotrophic and eutrophic. A more productive condition has been sustained despite significant reductions in external phosphorus load. The present level of productivity would cause depletion of hypolimnetic oxygen (also contrary to the narrative standard) if aerators were not operated to destratify the reservoir.

B. Characterizing Chlorophyll: Chlorophyll concentrations declined after phosphorus loads were reduced. Since 1995, typical summer average chlorophyll is about 24 μ g/L, but there are large differences among years. The differences appear to be associated with hydraulic residence time such that the highest average chlorophyll concentrations tend to be the years of longest residence time (lowest inflow).

C. Role of Internal Phosphorus Load: External phosphorus loads were reduced significantly in the early 1990s largely through efforts made by domestic dischargers to control effluent phosphorus concentrations. As a result, phosphorus concentrations at the beginning of summer are relatively low. However, through the process of internal release, phosphorus concentrations increase steadily through the summer months. The net effect of internal release is more conspicuous in low-flow years, because high inflows provide more dilution. Over the long term, internal release should diminish because the external load has been reduced, but it could take 10-15 years until internal release becomes negligible.

D. Characterizing Phosphorus: Phosphorus concentrations declined sharply after controls were imposed in the early 1990s. Since 1995, typical summertime concentrations of phosphorus have been about 44 μ g/L, but there are large differences among years. Differences are associated with hydraulic residence time as mentioned previously for chlorophyll. It is appropriate to set a numeric standard for phosphorus because of its importance in characterizing trophic condition, and because it is the direct link to the control regulation.

E. Defining a Chlorophyll-Phosphorus Linkage: The simple ratio of chlorophyll to phosphorus defines the site-specific, net responsiveness of the resident algal community to the availability of phosphorus. It is a “net” value because it reflects the balance of growth (nutrients, light, temperature) and loss (grazing, washout, settling) processes. For the purpose of linking chlorophyll and phosphorus standards, which are summer average concentrations, the response ratio also must be a seasonal value derived from Bear Creek Reservoir.

F. Allowable Frequency of Exceedance: There is no general precedent for setting an allowable frequency of exceedance for nutrient criteria, which are assessed once a year on the basis of a seasonal average, but the Division believes that one exceedance in five years is an appropriate frequency for allowable exceedances.

Revised Water Quality Standards for Bear Creek Reservoir: With the benefit of the lengthy historical record now available, the Commission believes it is appropriate to set numeric chlorophyll and phosphorus standards. Both standards are considered attainable when the internal release of phosphorus becomes negligible, which is expected to occur in less than 20 years. Each standard has an allowable exceedance frequency of once in five years.

A. Chlorophyll Standard: The Commission adopted a chlorophyll standard of 10 μ g/L. The existing narrative was translated to a numeric value by defining the chlorophyll concentration at the mesotrophic-eutrophic boundary. A concentration of 8 μ g/L, which represents the boundary according to the OECD trophic classification scheme, was accepted as the typical condition expected for Bear Creek Reservoir. The typical value was translated to an 80th percentile (once-in-five year exceedance threshold) using a very strong statistical relationship developed from a set of Colorado lakes. The 80th percentile value, which is 10 μ g/L, is the chlorophyll standard.

B. Phosphorus Standard: The Commission adopted a phosphorus standard of 32 μ g/L. The standard is calculated by use of a response ratio that relates the observed summer average chlorophyll concentration to the observed summer average phosphorus concentration. The median of historical distribution of response ratios (0.318) was used on the assumption that all historical values are equally likely to represent future conditions. The Commission heard testimony that a larger ratio (and thus a smaller phosphorus standard) might be preferred, but was not persuaded that a statistical argument or a mechanistic explanation would support that position.

C. Assessment: Because the phosphorus and chlorophyll standards are defined as seasonal averages, some additional guidance is required concerning timing and location of samples to be used in calculating the average. Samples are to be collected at a site in deep water near the dam and should be representative of conditions in the mixed layer. Past monitoring has resulted in 5 or 6 samples during the summer months (July, August, and September); it is anticipated that the same level of effort will be applied in the future. For assessment, the average (arithmetic mean) is calculated for the summer samples in each year.

At the same time that this change was adopted in Regulation #38, the Commission considered changes in the Control Regulation for Bear Creek Reservoir (Regulation #74) that would be consistent with the revised standard. The Commission decided to make no changes to Regulation #74 at this time, preferring instead to wait for TMDL development to establish new phosphorus allocations that can be implemented in the Control Regulation.

Adoption of a Temporary Modification for Chlorophyll and Phosphorus Standards in Bear Creek Reservoir: The underlying standards are not being attained in most years due to the seasonal augmentation of phosphorus concentrations from internal sources. It is uncertain how long internal release will persist, although it is expected that it will disappear within 20 years. In addition, the existing TMDL with wasteload allocations is now canceled by the new standard, and there is uncertainty about how the new standards might be translated into point source permit limits. A type iii temporary modification set at “existing conditions” to expire 12/31/2014, is adopted in order to recognize the uncertainty regarding how soon the internal load will be reduced. It will also provide certainty regarding effluent limits over the short term while a TMDL is completed which will include new wasteload allocations. During the interim, sediment monitoring will be initiated to track internal phosphorus levels over time. Progress on resolving uncertainty will be reviewed in the annual temporary modification hearings in December 2012 and 2013.

PARTIES TO THE RULEMAKING

1. Colorado Division of Wildlife
2. Bear Creek Watershed Association
3. U. S. Environmental Protection Agency (EPA), Region 8
4. Denver Water

38.74 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; JUNE 8, 2009 RULEMAKING, FINAL ACTION AUGUST 10, 2009, EFFECTIVE JANUARY 1, 2010

The provisions of C.R.S. 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; and 25-8-402; provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted in compliance with 24-4-103(4) C.R.S. the following statement of basis and purpose.

BASIS AND PURPOSE:

A. Waterbody Segmentation

The Commission decided to split lakes and reservoirs from segments that contained both streams and lakes and reservoirs so that new temperature standards could be adopted. The water supply use was presumptively applied to these segments in the absence of information indicating that the water supply use is neither existing nor potentially existing. Lakes and reservoirs were deleted from the following segments that previously encompassed both streams and lakes and reservoirs:

Upper South Platte River Segments 1a, 1b, 2a, 3, 4, 5b, 7, 8, 9, 11a, 11b, 16c, and 16g
Cherry Creek Segment 4
Bear Creek Segments 1a, 3, 4a, 5, and 7
Clear Creek Segments 1, 2, 3a, 6, 9a, 9b, 10, 12, 13a, 13b, 16a, 17b, 18a, and 19
Big Dry Creek Segment 1
Boulder Creek Segments 1, 2, 3, 4a, 4b, 6, 8, and 11
St. Vrain Creek Segments 1, 2, 4a, 4b, 5, and 6
Middle South Platte River Segment 3a
Big Thompson River Segments 1, 2, 6, 8, and 10
Cache La Poudre River Segments 1, 2, 6, 8, and 13a
Laramie River Segments 1 and 2
Lower South Platte River Segments 2a and 2b
Republican River Segments 6 and 7

The following lakes and reservoirs segments were created:

Upper South Platte River Segments 18, 19, 20, 21, 22, and 23
Cherry Creek Segments 5 and 6
Bear Creek Segments 1d, 8, 9, 10, 11, and 12
Clear Creek Segments 20, 21, 22, 23, 24, and 25
Big Dry Creek Segment 7
Boulder Creek Segments 13, 14, 15, 16, and 17
St. Vrain Creek Segments 8, 9, 10, 11, 12, and 13
Middle South Platte River Segment 7
Big Thompson River Segments 15, 16, 17, 18, and 19
Cache La Poudre River Segments 17, 18, 19, 20, 21 and 22
Laramie River Segments 3 and 4
Lower South Platte River Segments 4 and 5
Republican River Segment 8

The following segments were deleted when the constituent waterbodies were merged with other segments:

Upper South Platte River Segments 6c and 10b
Bear Creek Segments 4b and 4c

Some renumbering and/or creation of new segments was made due to information which showed that: a) the original reasons for segmentation no longer applied; b) new water quality data showed that streams should be resegmented based on changes in their water quality; and/or c) certain segments could be grouped together in one segment because they had similar quality and uses. In particular, segmentation was changed to facilitate adoption of the new temperature standards into individual segments. The following changes were made:

Upper South Platte River 1a: The segment description was amended to exclude lakes and reservoirs, and the segment now ends at the inlet of Cheesman Reservoir. Lakes and reservoirs formerly included in this segment are now part of Segment 19. The portion of the segment from Cheesman Reservoir to a point immediately above the confluence with the North Fork of the South Platte River is now part of Segment 6a. The alteration of the segment boundary, the amendment of the description, and the resultant creation of Segment 19 were necessary to facilitate the adoption of appropriate temperature standards.

Upper South Platte River 1b: The segment description was amended to exclude lakes and reservoirs. Lakes and reservoirs formerly included in this segment are now part of Segment 18. The amendment of the description and the resultant creation of Segment 18 were necessary to facilitate the adoption of appropriate temperature standards.

Upper South Platte River 2a: The segment description was amended to exclude lakes and reservoirs. Lakes and reservoirs formerly included in this segment are now part of Segment 19. The amendment of the description and the resultant creation of Segment 19 were necessary to facilitate the adoption of appropriate temperature standards.

Upper South Platte River 3: The segment description was amended to exclude lakes and reservoirs. Lakes and reservoirs formerly included in this segment are now part of Segment 19. The amendment of the description and the resultant creation of Segment 19 were necessary to facilitate the adoption of appropriate temperature standards.

Upper South Platte River 4: The segment description was amended to exclude lakes and reservoirs. Lakes and reservoirs formerly included in this segment are now part of Segment 19. The amendment of the description and the resultant creation of Segment 19 were necessary to facilitate the adoption of appropriate temperature standards.

Upper South Platte River 5b: The segment description was amended to exclude lakes and reservoirs. Lakes and reservoirs formerly included in this segment are now part of Segment 19. The amendment of the description and the resultant creation of Segment 19 were necessary to facilitate the adoption of appropriate temperature standards.

Upper South Platte River 5d: This segment was created to encompass the portion of Gooseberry Gulch and its tributaries downstream of Sunset Trail in order to retain trout-specific standards for acute cadmium and chronic silver that are being deleted from Segment 5c. This segment was formerly a portion of Segment 5c.

Upper South Platte River 6a: The segment description now begins at the outlet of Cheesman Reservoir. The added portion of the segment, which extends from the Cheesman outlet to a point immediately above the confluence with the North Fork of the South Platte River, was formerly in Segment 1a. The alteration of the segment boundary was necessary to facilitate the adoption of appropriate temperature standards.

Upper South Platte River 6c: The Commission deleted segment 6c and revised the description for Segment 14, incorporating the section of the mainstem South Platte River currently in segment 6c into Segment 14. This change was necessary for the purpose of setting appropriate temperature standards. This change was based on use-attainability analyses provided by Centennial Water and Sanitation District and the Division, which indicated this portion of the South Platte River has temperature and fish communities more appropriately classified as warm water aquatic life with warm stream tier II as the appropriate temperature standard. This finding is based on fish community sampling conducted over a 20-yr period and temperature data collected for nearly 9 years. The retention of water in Chatfield Reservoir sufficiently warms the water in the South Platte River so that a cold water biological community cannot be fully supported, nor can a cold water temperature standard be attained. Most of the aquatic community consists of warm water species.

Although the Commission has determined that the aquatic community and ambient temperatures are not consistent with a cold water aquatic life classification for the stretch of the river below Chatfield Reservoir, the Commission recognizes the continued presence of trout in this stream reach. The Commission also recognizes that the upper reaches of the South Platte below Chatfield Reservoir provide an important urban fishery resource, including a trout fishery supported by Colorado Division of Wildlife stocking. Therefore, the Commission strongly supports the ongoing efforts of stakeholder groups to improve the fishery habitat below Chatfield. Maintaining and improving this fishery that provides nearby fishing access for those in the Denver metropolitan area is an important and worthwhile goal.

Upper South Platte River 7: The segment description was amended to exclude lakes and reservoirs. Lakes and reservoirs formerly included in this segment are now part of Segment 19. The amendment of the description and the resultant creation of Segment 19 were necessary to facilitate the adoption of appropriate temperature standards.

Upper South Platte River 8: The segment description was amended to exclude lakes and reservoirs. Lakes and reservoirs formerly included in this segment are now part of Segment 20. The amendment of the description and the resultant creation of Segment 20 were necessary to facilitate the adoption of appropriate temperature standards.

Upper South Platte River 9: The segment description was amended to exclude lakes and reservoirs. Lakes and reservoirs formerly included in this segment are now part of Segment 20. The amendment of the description and the resultant creation of Segment 20 were necessary to facilitate the adoption of appropriate temperature standards.

Upper South Platte River 10a: The segment description was amended to incorporate a remnant of Segment 10b (described below). Lakes and reservoirs which would have been included in this segment are now part of Segment 20. The amendment of the description and the resultant creation of Segment 20 were necessary to facilitate the adoption of appropriate temperature standards.

Upper South Platte River 10b: The segment has been deleted to address a long-standing lack of clarity about the disposition of West Plum Creek and its tributaries. The small portion of West Plum Creek above Perry Park pond, as well as Stark Creek and Gove Creek below the National Forest boundary, that were formerly in this segment are now part of Segment 10a. Lakes and reservoirs which would have been included in this segment are now part of Segment 20. The amendment of the description and the resultant creation of Segment 20 were necessary to facilitate the adoption of appropriate temperature standards.

Upper South Platte River 11a: The segment description was amended to exclude lakes and reservoirs. Lakes and reservoirs formerly included in this segment are now part of Segment 21. The amendment of the description and the resultant creation of Segment 21 were necessary to facilitate the adoption of appropriate temperature standards.

Upper South Platte River 11b: The segment description was amended to exclude lakes and reservoirs. Lakes and reservoirs formerly included in this segment are now part of Segment 21. The amendment of the description and the resultant creation of Segment 21 were necessary to facilitate the adoption of appropriate temperature standards.

Upper South Platte River 14: The segment description now begins at the outlet from Chatfield Reservoir. The portion of the segment from the Chatfield outlet to Bowles Avenue was formerly in Segment 6c. The alteration of the segment boundary was necessary to facilitate the adoption of appropriate temperature standards.

Upper South Platte River 16c: The segment description was amended to exclude lakes and reservoirs. Lakes and reservoirs formerly included in this segment are now part of Segment 22 or 23. The amendment of the description and the resultant creation of Segments 22 and 23 were necessary to facilitate the adoption of appropriate temperature standards.

Upper South Platte River 16g: The segment description was amended to exclude lakes and reservoirs. Lakes and reservoirs formerly included in this segment are now part of Segment 22 or 23. The amendment of the description and the resultant creation of Segments 22 and 23 were necessary to facilitate the adoption of appropriate temperature standards.

Upper South Platte River 18: The segment description was created to encompass lakes and reservoirs within the boundaries of the Lost Creek and Mt. Evans Wilderness areas. This segment includes lakes and reservoirs formerly within Upper South Platte River Segment 1b.

Upper South Platte River 19: The segment description was created to encompass lakes and reservoirs in the South Platte River system from headwaters to Chatfield Reservoir, except for specific listings in Segment 18. It includes Antero, Spinney Mountain, Elevenmile, Cheesman, and Strontia Springs. This segment includes lakes and reservoirs formerly within Upper South Platte River Segments 1a, 2a, 3, 4, 5b, and 7.

Upper South Platte River 20: The segment description was created to encompass lakes and reservoirs in the Plum Creek system within National Forest boundaries, and lakes and reservoirs in the Bear Creek drainage (part of the Plum Creek system) between the National Forest boundary and to the inlet of Perry Park Reservoir (Douglas County). This segment includes lakes and reservoirs formerly within Upper South Platte River Segments 8, 9, and 10b.

Upper South Platte River 21: The segment description was created to encompass lakes and reservoirs in the Plum Creek system except for specific listings in Segment 20. This segment includes lakes and reservoirs formerly within Upper South Platte River Segments 11a and 11b.

Upper South Platte River 22: The segment description was created to encompass lakes and reservoirs in watersheds tributary to the South Platte River from the outlet of Chatfield Reservoir to a point immediately below the confluence with Big Dry Creek, except for specific listings in the subbasins of the South Platte River, and in Segments 16b, 17a, 17b, 17c, and 23. This segment includes lakes and reservoirs formerly within Upper South Platte River Segments 16c and 16g.

Upper South Platte River 23: The segment description was created to encompass lakes and reservoirs in watersheds tributary to the South Platte River within City and County of Denver, except for specific listings in the subbasins of the South Platte River, and in Segments 16b, 17a, 17b, and 17c. This segment includes lakes and reservoirs formerly within Upper South Platte River Segments 16c and 16g.

Cherry Creek 4: The segment description was amended to exclude lakes and reservoirs. Lakes and reservoirs formerly included in this segment are now part of Segment 5 or 6. The amendment of the description and the resultant creation of Segments 5 and 6 were necessary to facilitate the adoption of appropriate temperature standards.

Cherry Creek 5: The segment description was created to encompass lakes and reservoirs in the Cherry Creek system from the source of East and West Cherry Creeks to the confluence with the South Platte River, except for specific listings in Segments 2 and 6. This segment includes lakes and reservoirs formerly within Cherry Creek Segment 4.

Cherry Creek 6: The segment description was created to encompass lakes and reservoirs in the Cherry Creek system that are within the boundaries of the City and County of Denver. This segment includes lakes and reservoirs formerly within Cherry Creek Segment 4.

Bear Creek 1a: The segment description was amended to exclude lakes and reservoirs, and the segment now ends at the inlet of Evergreen Lake. Lakes and reservoirs formerly included in this segment are now part of Segment 1d (Evergreen Lake) or 9. The portion of the segment from Evergreen Lake to the Harriman Ditch is now new Segment 1e. The alteration of the segment boundary, the amendment of the description, and the resultant creation of Segments 1e and 9 were necessary to facilitate the adoption of appropriate temperature standards. The description also was amended to exclude the mainstem of Bear Creek from the source to the boundary of the Mt. Evans Wilderness Area; that portion of the mainstem was moved to Segment 7, which includes all tributaries within the Wilderness Area.

Bear Creek 1c: The segment description now contains only Bear Creek Reservoir. Soda Lakes were moved to the new Segment 11, which is a warm water aquatic life segment. The fish species present in Soda Lakes are more representative of a warm water lake.

Bear Creek 1d: The segment description was created for Evergreen Lake, which was formerly within Segment 1a. Creation of Segment 1d was necessary to facilitate the adoption of appropriate temperature standards.

Bear Creek 1e: The segment description was created for the portion of the Bear Creek mainstem between the outlet of Evergreen Lake and the Harriman Ditch, which was formerly part of Segment 1a. Creation of Segment 1e was necessary to facilitate the adoption of appropriate temperature standards.

Bear Creek 3: The segment description was amended to exclude lakes and reservoirs. Lakes and reservoirs formerly included in this segment are now part of Segment 9. The amendment of the description and the resultant creation of Segment 9 were necessary to facilitate the adoption of appropriate temperature standards.

Bear Creek 4a: The segment description was amended to exclude lakes and reservoirs and to adjust the downstream boundary consistent with a change to Segment 1a. Lakes and reservoirs formerly included in this segment are now part of Segment 11. The amendment of the description and the resultant creation of Segment 11 were necessary to facilitate the adoption of appropriate temperature standards. The boundary change necessitates moving Cub Creek to Segment 5.

Bear Creek 4b: The segment has been deleted. Swede Gulch and associated wetlands formerly in this segment were incorporated into Segment 5. Lakes and reservoirs formerly included in this segment are now part of Segment 10. The amendment of the description and the resultant creation of Segment 10 were necessary to facilitate the adoption of appropriate temperature standards.

Bear Creek 4c: The segment has been deleted. Swede Gulch and associated wetlands formerly in this segment were incorporated into Segment 5. Lakes and reservoirs formerly included in this segment are now part of Segment 10. The amendment of the description and the resultant creation of Segment 10 were necessary to facilitate the adoption of appropriate temperature standards.

Bear Creek 5: The segment description was amended to exclude lakes and reservoirs, and to remove streams in the Turkey Creek system. Lakes and reservoirs formerly included in this segment are now part of Segment 10 or 12. Streams in the Turkey Creek system are now part of Segment 6a. The description also has been amended to incorporate Swede and Kerr Gulches formerly included in Segments 4b and 4c, and Cub Creek, which was formerly part of Segment 4a. The amendments of the description and the resultant creation of Segments 6a, 10, and 12 were necessary to facilitate the adoption of appropriate temperature standards.

Bear Creek 6a: The segment description was created for the portion of the Turkey Creek system that was formerly part of Segment 5. Creation of Segment 6a was necessary to facilitate the adoption of appropriate temperature standards. The decision to create Segment 6a and companion Segment 6b, rather than assign a higher (unused) number, was influenced by a desire to keep the elements of Turkey Creek in close proximity in the tables.

Bear Creek 6b: The segment description matches that of former Segment 6.

Bear Creek 7: The segment description was amended to exclude lakes and reservoirs. Lakes and reservoirs formerly included in this segment are now part of Segment 8. The amendment of the description and the resultant creation of Segment 8 were necessary to facilitate the adoption of appropriate temperature standards. In addition, the description was amended to incorporate the mainstem of Bear Creek within the Wilderness Area, which formerly was part of Segment 1a.

Bear Creek 8: The segment description was created to encompass lakes and reservoirs in the Bear Creek system from the sources to the boundary of the Mt. Evans Wilderness area. This segment includes lakes and reservoirs formerly within Bear Creek Segment 7.

Bear Creek 9: The segment description was created to encompass lakes and reservoirs in the Bear Creek system from the boundary of the Mt. Evans Wilderness area to the outlet of Evergreen Lake. This segment includes lakes and reservoirs formerly within Bear Creek Segments 1a and 3, except for Evergreen Lake.

Bear Creek 10: The segment description was created to encompass lakes and reservoirs in drainages of Swede Gulch, Sawmill Gulch, Troublesome Gulch, and Cold Springs Gulch from source to confluence with Bear Creek. This segment includes lakes and reservoirs formerly within Bear Creek Segments 4b, 4c, and 5.

Bear Creek 11: The segment description was created to encompass lakes and reservoirs from the outlet of Evergreen Lake to the confluence with the South Platte River, except as specified in Segments 1c, 10, and 12; it includes Soda Lakes. This segment includes lakes and reservoirs formerly within Bear Creek Segments 1c and 4a.

Bear Creek 12: The segment description was created to encompass lakes and reservoirs in the Turkey Creek system from the source to the inlet of Bear Creek Reservoir.

Clear Creek 2a: This segment was created to encompass the mainstem of Clear Creek, including all tributaries and wetlands, from the I-70 bridge above Silver Plume to a point just above the confluence with West Fork Clear Creek, except for specific listings in Segments, 3a and 3b. The resegmentation of Segment 2 was necessary in order to better represent differences in water quality between this segment and Segments 2b and 2c.

Clear Creek 2b: This segment was created to encompass the mainstem of Clear Creek, including all tributaries and wetlands, from the confluence with West Fork Clear Creek to a point just below the confluence with Mill Creek, except for specific listings in Segments 4 through 8. The resegmentation of Segment 2 was necessary in order to better represent differences in water quality between this segment and Segments 2a and 2c.

Clear Creek 2c: This segment was created to encompass the mainstem of Clear Creek, including all tributaries and wetlands, from a point just below the confluence with Mill Creek to a point a point just above the Argo Tunnel discharge, except for specific listings in Segments 9a, 9b, and 10. The resegmentation was necessary in order to better represent differences in water quality between this segment and Segments 2a and 2b.

Clear Creek Segment 20: This segment was created to encompass lakes and reservoirs within the boundary of the Mt. Evan Wilderness Area. This segment includes lakes and reservoirs formerly within Segment 19.

Clear Creek Segment 21: This segment was created to encompass lakes and reservoirs within the Clear Creek system from its source to the Farmer’s Highline Canal diversion in Golden, Colorado, except for those in Segments 20, 22, and 25; and Upper Long Lake. This segment includes lakes and reservoirs formerly within Segments 1, 2, 3a, 6, 9a, 9b, and 10.

Clear Creek Segment 22: This segment was created to encompass lakes and reservoirs within the North Clear Creek drainage from a point just below the confluence with Chase Gulch to its confluence with Clear Creek. This segment includes lakes and reservoirs formerly within Segment 13b.

Clear Creek Segment 23: This segment was created for Ralston Reservoir. This segment includes a lakes/reservoir formerly within Segment 17b.

Clear Creek Segment 24: This segment was created to encompass lakes and reservoirs in the Clear Creek system from the Farmers Highline Canal diversion in Golden, Colorado to the confluence with the South Platte River, except for specific listings in Segments 17a, 21, and 23.

Clear Creek Segment 25: This segment was created for Guanella Reservoir. Guanella Reservoir was formerly within either Segment 2 or 5. It is not clear to which segment it belonged.

Big Dry Creek Segment 7: This segment was created to encompass lakes and reservoirs in the Big Dry Creek system from the source to the confluence with the South Platte River, except for specific listings in Segments 2, 3, and 5. This segment includes lakes and reservoirs formerly within Segment 1.

Boulder Creek Segment 2a: This segment description was amended to remove the portion of the Boulder Creek system from a point immediately below the confluence with North Boulder Creek to a point immediately above the confluence with South Boulder Creek. The Commission moved that portion of the Boulder Creek system to a newly created Segment 2b, to facilitate the adoption of appropriate temperature standards.

Boulder Creek Segment 2b: This segment was created to encompass the Boulder Creek system from a point immediately below the confluence with North Boulder Creek to a point immediately above the confluence with South Boulder Creek. The Commission created this segment from portions of the Boulder Creek system split from Segment 2a to facilitate the adoption of appropriate temperature standards.

Boulder Creek Segment 13: This segment was created to encompass lakes and reservoirs tributary to Boulder Creek that are within the boundary of the Indian Peaks Wilderness Area. This segment includes lakes and reservoirs formerly in Segment 1.

Boulder Creek Segment 14: This segment was created to encompass lakes and reservoirs tributary to Boulder Creek from the source to a point immediately above the South Boulder Creek confluence. This segment includes lakes and reservoirs formerly in Segments 2 and 3.

Boulder Creek Segment 15: This segment was created to encompass lakes and reservoirs tributary to South Boulder Creek from the source to Highway 93 and all lakes and reservoirs tributary to Coal Creek from the source to Highway 93. This segment includes lakes and reservoirs formerly in Segments 4a, 4b and 6.

Boulder Creek Segment 16: This segment was created to encompass lakes and reservoirs tributary to South Boulder Creek from Highway 93 to the confluence with Boulder Creek and all lakes and reservoirs tributary to Coal Creek from Highway 93 to the confluence with Boulder Creek. This segment includes lakes and reservoirs formerly in Segments 4b and 8.

Boulder Creek Segment 17: This segment was created to encompass lakes and reservoirs tributary to Boulder Creek from a point immediately below the South Boulder Creek confluence to the confluence with St. Vrain Creek. This segment includes lakes and reservoirs formerly in Segment 11.

St. Vrain Creek Segment 2a: The segment description was amended to remove the portion of the St. Vrain Creek system from the eastern boundary of the Roosevelt National Forest to Hygiene Road. The Commission moved that portion of the St. Vrain Creek system to a newly created Segment 2b, to facilitate the adoption of appropriate temperature standards.

St. Vrain Creek Segment 2b: This segment was created to encompass the St. Vrain Creek system from the eastern boundary of the Roosevelt National Forest to Hygiene Road. The Commission created this segment from portions of the St. Vrain Creek system split from Segment 2a to facilitate the adoption of appropriate temperature standards.

St. Vrain Creek Segment 4a: This segment description was amended to remove the portion of the Left Hand Creek system from a point immediately below the confluence with James Creek to Highway 36. The Commission moved that portion of the Left Hand Creek system to a newly created Segment 4c, to facilitate the adoption of appropriate temperature standards.

St. Vrain Creek Segment 4c: This segment was created to encompass the Left Hand Creek system from a point immediately below the confluence with James Creek to Highway 36. The Commission created this segment from portions of the Left Hand Creek system split from Segment 4a to facilitate the adoption of appropriate temperature standards.

St. Vrain Creek Segment 8: This segment was created to encompass lakes and reservoirs tributary to St. Vrain Creek that are within the boundary of the Indian Peaks Wilderness Area and Rocky Mountain National Park. This segment includes lakes and reservoirs formerly in Segment 1.

St. Vrain Creek Segment 9: This segment was created to encompass lakes and reservoirs tributary to St. Vrain Creek from sources to Hygiene Road. This segment includes lakes and reservoirs formerly in Segment 2.

St. Vrain Creek Segment 10: This segment was created to encompass lakes and reservoirs tributary to Left Hand Creek from sources to Highway 36. This segment includes lakes and reservoirs formerly in Segments 4a and 4b.

St. Vrain Creek Segment 11: This segment was created to encompass Barbour Ponds. This segment includes lakes and reservoirs formerly in Segment 3.

St. Vrain Creek Segment 12: This segment was created to encompass lakes and reservoirs tributary to Left Hand Creek from Highway 36 to the confluence with St. Vrain Creek. This segment includes lakes and reservoirs formerly in Segment 5.

St. Vrain Creek Segment 13: This segment was created to encompass lakes and reservoirs tributary to St. Vrain Creek from Hygiene Road to the confluence with the South Platte River. This segment includes lakes and reservoirs formerly in Segment 6.

Middle South Platte River Segment 5a: This segment description was amended to remove Crow Creek and Box Elder Creek from their sources to their confluences with the South Platte River. The Commission moved those portions of Crow Creek and Box Elder Creek to a newly created Segment 5c, to facilitate the adoption of appropriate temperature standards.

Middle South Platte River Segment 5c: This segment was created to encompass Crow Creek and Box Elder Creek from their sources to their confluences with the South Platte River. The Commission created this segment by splitting Crow Creek and Box Elder Creek from Segment 5a to facilitate the adoption of appropriate temperature standards.

Middle South Platte River Segment 7: This segment was created to encompass lakes and reservoirs tributary to the South Platte River from a point immediately below the confluence with Big Dry Creek to the Weld/Morgan County line. This segment includes lakes and reservoirs formerly in Segment 3a.

Big Thompson River Segment 15: This segment was created to encompass lakes and reservoirs tributary to the Big Thompson River within Rocky Mountain National Park. This segment includes lakes and reservoirs formerly in Segment 1.

Big Thompson River Segment 16: This segment was created to encompass lakes and reservoirs tributary to the Big Thompson River from the boundary of Rocky Mountain National Park to the Home Supply Canal diversion. This segment includes lakes and reservoirs formerly in Segment 2.

Big Thompson River Segment 17: This segment was created to encompass lakes and reservoirs tributary to the Big Thompson River from the Home Supply Canal diversion to the confluence with the South Platte River. This segment includes lakes and reservoirs formerly in Segment 6.

Big Thompson River Segment 18: This segment was created to encompass lakes and reservoirs tributary to the Little Thompson River from the source to the Culver Ditch diversion. This segment includes lakes and reservoirs formerly in Segment 8.

<u>Big Thompson River Segment 19:</u> This segment was created to encompass lakes and reservoirs tributary to the Little Thompson River from the Culver Ditch diversion to the confluence with the Big Thompson River. This segment includes lakes and reservoirs formerly in Segment 10.

<u>Cache La Poudre River Segment 2a:</u> This segment description was amended to remove the portion of the Cache La Poudre River system from a point immediately below the confluence with the South Fork Cache La Poudre River to the Monroe Gravity Canal/North Poudre Supply canal diversion. The Commission moved that portion of the Cache La Poudre system to a newly created Segment 2b, to facilitate the adoption of appropriate temperature standards.

<u>Cache La Poudre River Segment 2b:</u> This segment was created to encompass the Cache La Poudre system from a point immediately below the confluence with the South Fork Cache La Poudre River to the Monroe Gravity Canal/North Poudre Supply canal diversion. The Commission created this segment from portions of the Cache La Poudre system split from Segment 2a to facilitate the adoption of appropriate temperature standards.

<u>Cache La Poudre River Segment 13a:</u> This segment description was amended to remove North Branch Boxelder Creek, South Branch Boxelder Creek and Sand Creek from their sources to their confluences with the mainstem of Boxelder Creek. The Commission moved that portion of the Cache La Poudre system to a newly created Segment 13c, to facilitate the adoption of appropriate temperature standards.

<u>Cache La Poudre River Segment 13c:</u> This segment was created to encompass North Branch Boxelder Creek, South Branch Boxelder Creek and Sand Creek from their sources to their confluences with the mainstem of Boxelder Creek. The Commission created this segment from portions of the Cache La Poudre system split from Segment 13a to facilitate the adoption of appropriate temperature standards.

<u>Cache La Poudre River Segment 17:</u> This segment was created to encompass lakes and reservoirs tributary to the Cache La Poudre River from within Rocky Mountain National Park and the Rawah, Neota, Comanche, and Cache La Poudre Wilderness Area. This Segment includes lakes and reservoirs formerly in segment 1.

<u>Cache La Poudre River Segment 18:</u> This segment was created to encompass lakes and reservoirs tributary to the Cache La Poudre River from the boundaries of Rocky Mountain National Park and the Rawah, Neota, Comanche, and Cache La Poudre Wilderness Area to the Monroe Gravity Canal/North Poudre Supply Canal diversion. This Segment includes lakes and reservoirs formerly in segment 2.

<u>Cache La Poudre River Segment 19:</u> This segment was created to encompass lakes and reservoirs tributary to the North Fork of the Cache La Poudre River from the source to the inlet of Halligan Reservoir. This segment includes lakes and reservoirs formerly in Segment 6.

<u>Cache La Poudre River Segment 20:</u> This segment was created to encompass lakes and reservoirs tributary to the North Fork of the Cache La Poudre River from the inlet of Halligan Reservoir to the confluence with the Cache La Poudre River. This segment includes lakes and reservoirs formerly in Segment 8.

<u>Cache La Poudre River Segment 21:</u> This segment was created to encompass lakes and reservoirs tributary to the Cache La Poudre River from the Monroe Gravity Canal/North Poudre Supply Canal diversion to the confluence with the South Platte River. This segment includes lakes and reservoirs formerly in Segment 13a, with the exception of Fossil Creek Reservoir.

<u>Cache La Poudre River Segment 22:</u> This segment was created to encompass Fossil Creek Reservoir, which was formerly in Segment 13a.

Laramie River Segment 2a: This segment description was amended to remove the portion of the Laramie River mainstem from the National Forest boundary to the Colorado/Wyoming border. The Commission moved that portion of the Laramie River mainstem to a newly created Segment 2b, to facilitate the adoption of appropriate temperature standards.

Laramie River Segment 2b: This segment was created to encompass the Laramie River mainstem from the National Forest boundary to the Colorado/Wyoming border. The Commission created this segment from portions of the Laramie River system split from Segment 2a to facilitate the adoption of appropriate temperature standards.

Laramie River Segment 3: This segment was created to encompass lakes and reservoirs tributary to the Laramie River from within the Rawah Wilderness Area. This segment includes lakes and reservoirs formerly in Segment 1.

Laramie River Segment 4: This segment was created to encompass lakes and reservoirs tributary to the Laramie River from the Rawah Wilderness Area to the Colorado/Wyoming border. This segment includes lakes and reservoirs formerly in Segment 2.

Lower South Platte River Segment 2b: This segment description was amended to remove a portion of Beaver Creek from its source to the Fort Morgan Canal. This upper portion of Beaver Creek is now in Segment 2a.

Lower South Platte River Segment 4: This segment was created to encompass lakes and reservoirs tributary to the South Platte River from the Weld/Morgan County line to the Colorado/Nebraska border. This segment includes lakes and reservoirs formerly in Segment 2a.

Lower South Platte River Segment 5: This segment was created to encompass lakes and reservoirs tributary to the South Platte River north of the South Platte River and below 4,500 feet in elevation in Morgan County, north of the South Platte River in Washington County, north of the South Platte River and below 4,200 feet in elevation in Logan County, north of the South Platte River and below 3,700 feet in elevation in Sedgwick County, and the mainstems of Beaver Creek, Bijou Creek and Kiowa Creek from their sources to the confluence with the South Platte River. This segment includes lakes and reservoirs formerly in Segment 2b.

Republican River Segment 8: This segment was created to encompass lakes and reservoirs tributary to the Republican and Smoky Hill Rivers in Colorado. This segment includes lakes and reservoirs formerly in Segments 6 and 7.

B. Revised Aquatic-Life Use Classifications

The Commission reviewed information regarding existing aquatic communities. The following changes to the aquatic-life use classification were made based on review of the fish communities:

Upper South Platte River Segment 10b: Cold 1 to Warm 1 (now part of Segments 8 and 10a)
Upper South Platte River Segment 12: Cold 1 to Warm 1
Upper South Platte River Segment 6c: Cold 1 to Warm 1 (now part of Segment 14)
Bear Creek Segment 1c (Soda Lakes only): Cold 1 to Warm 2 (now part of Segment 11)

C. Recreation Classifications and Standards

As part of the Basic Standards hearing of 2005, recreation classifications were revised into four new classifications. The Commission reviewed the previous segment classifications (1a, 1b and 2) and determined the appropriate new classification based on classification criteria presented as part of the Basic Standards Hearing, use attainability analyses or other basis. In addition, during the 2005 Basic Standards Hearing, the transition from the use of the fecal coliform standard to *E. coli* standard was completed. Fecal coliform criteria were deleted from the numeric standards.

Based on information that showed existing primary contact recreation use is in place in at least a portion of the segment, the Commission converted the following segments from Recreation Class 1a to Recreation Class E with a 126/100 ml *E. coli* standard:

Upper South Platte River Segments 1a, 1b, 2a, 2b, 2c, 3, 4, 5a, 5b, 6a, 6b, 7, 8, 9, 10a, 11a, 11b, 12, 13, 14, 15, 16a, 16b, 16c, 16d, 16e, 16f, 16g, 16h, 17a, 17b, and 17c
Cherry Creek Segments 1, 2, 3, and 4
Bear Creek Segments 1a, 1b, 1c, 2, 3, 4a, 5, 6b, and 7
Clear Creek Segments 1, 2a, 3a, 3b, 4, 5, 6, 8, 9a, 9b, 10, 11, 12, 13a, 13b 14b, 15, 16a, 18a, and 19
Big Dry Creek Segments 2 and 4a
Boulder Creek Segments 1, 2a, 3, 4a, 4b, 4c, 4d, 5, 6, 7a, 7b, 8, 9, 10, and 11
St. Vrain Creek Segments 1, 2a, 3, 4a, 4b, 5, 6, and 7
Middle South Platte River Segments 1a, 1b, 3a, 3b, and 4
Big Thompson River Segments 1, 2, 3, 4a, 4b, 4c, 6, 7, 8, 9, 10, 11, 12, 13, and 14
Cache La Poudre River Segments 1, 2a, 6, 7, 8, 9, 10, 11, 12, 13a, 14, 15, and 16
Laramie River Segments 1 and 2a
Lower South Platte River Segments 1, 2b, and 3
Republican River Segments 1, 2, 3, 4, and 5

The following segments were converted from Recreation Class 1b to Recreation Class P with a 205/100 ml *E. coli* standard:

Big Dry Creek Segment 1
Big Thompson River Segment 5
Cache La Poudre River Segment 13b

Based on a review of existing Use Attainability Analyses showing that primary contact recreation does not occur or is not attainable, the following segments were converted to Recreation Class N classification with a 630/100 ml *E. coli* standard:

Clear Creek Segments 7, 14a, 16b, and 18b
Big Dry Creek Segments 3, 5, and 6
Middle South Platte River Segments 5a, 5b, and 6
Big Thompson River Segments 4a, 4b, 4c, and 5
Cache La Poudre River Segment 13b
Lower South Platte River Segment 2a
Republican River Segments 6 and 7

The following segment was converted from Recreation Class 2 to Recreation Class N classification, with a 126/100 ml *E. coli* standard in conformance with Commission decisions in 2004.

Clear Creek Segment 17a

The Department of Energy (DOE) provided information supporting the appropriateness of retaining the recreation N use classification for the portion of Big Dry Creek Segment 5 located within the Central Operable Unit (COU) in its responsive pre-hearing statement. The Hazardous Materials and Waste Management Division confirmed this information to be accurate. Recreational activities are currently prohibited within the COU and are expected to continue to be prohibited for the next 20 years. The final record of decision for the Rocky Flats Site, the Rocky Flats Legacy Management Agreement (RFLMA), and the environmental covenants currently prohibit recreational uses for the COU. Fences, “no trespassing” signs, and operational controls currently prevent public access to the COU. A portion of Big Dry Creek Segment 5, North Walnut Creek from its source to the western edge of the COU, lies outside of the COU. DOE proposed and the Commission agreed to move this portion of North Walnut Creek from Segment 5 to Segment 4b. Additionally, DOE proposed and the Commission agreed to move a portion of Big Dry Creek Segment 4b, which lies inside the COU, to Segment 5.

Based on conditions that have changed from those originally limiting the recreational use in an existing Use Attainability Analysis, the following segment was converted to from Recreation Class 2 to Recreation Class P with a 205/100 ml *E. coli* standard:

Big Dry Creek Segment 4b

Because there has not been a reasonable level of inquiry about existing recreational uses and no recreational use attainability analysis has been completed, the following segment was converted from Recreation 1a to Recreation Class U with a 126/100 ml *E.coli* standard:

Upper South Platte Segment 5c

The following segment was converted from a Recreation Class 1a to Recreation Class U (with the same numeric criterion) since there is no public access allowed at Ralston Reservoir and there is no information that primary contact is an existing use.

Clear Creek Segment 17b

Newly created segments had the same Recreation use classification as the segment they were split from, unless there was insufficient evidence to support keeping that classification or evidence to show that the use classification was inappropriate. The newly created segments for which the Recreation use classification was changed are now classified Recreation Class U with a 126/100 ml *E. coli* standard:

Upper South Platte Segment 5d
Clear Creek Segments 23 and 24
Lower South Platte Segment 4
Republican River Segment 8

D. Addition of Water Supply Use Classification and Standards

Based on review of information regarding the location of public water supplies, Water Supply use classifications and standards were added to the following segment:

Cache La Poudre Segment 13a

The Water Supply use classification and standards were added presumptively to the following new lake segments:

Upper South Platte Segments 19 (only those lakes incorporated from Segment 7), 21, and 22
Cherry Creek Segment 5
Boulder Creek Segment 16
St Vrain Segments 11 and 13

Middle South Platte Segment 7
Big Thompson Segments 17 and 19
Lower South Platte Segments 4 and 5
Republican Segment 8

E. Agriculture Standards

A review of the standards associated with the Agriculture use classification showed that many segments were missing a nitrate standard protective of the use. A nitrate standard, NO_3 =100, was added to the following segments classified for Agriculture use:

Upper South Platte River Segments 5a, 7, 11a, 11b, 16a, 16c, 16d, 16e, 16f, 16g, 16h, 17a, 17b, and 17c
Cherry Creek Segment 4
Boulder Creek Segments 7a and 7b
St. Vrain Creek Segments 3 and 6
Middle South Platte River Segments 3a, 3b, and 5a
Big Thompson River Segments 4b, 4c, 5, 6, 9, and 10
Cache La Poudre River Segments 11, 12, 13b, and 16
Lower South Platte River Segments 2b and 3
Republican River Segment 4

F. Changes to Antidegradation Designation

As part of the 2005 Basic Standards hearing, the Commission revised the criteria for antidegradation designations.

Maintaining UP Protection: The twelve-parameter test was applied where possible to determine if use-protection remains warranted for segments classified for warm-water aquatic life class 2; however, that showing can be overcome if there is adequate data showing that the water is effluent-dominated. The Commission maintained the Use Protected designation for the following segments based on a showing that the segments are effluent dominated:

Upper South Platte River Segment 15
Middle South Platte River Segment 1a

Decoupling Aquatic Life Cold 2 and UP: The Commission eliminated the direct linkage between cold-water aquatic life class 2 and the use-protected designation and in the absence of data showing that the water quality is not high quality, the cold 2 segments revert to reviewable. All cold-water aquatic life class 2 segments that are use-protected were reviewed to determine if that designation is still warranted. The following segments are now reviewable:

Upper South Platte River Segments 5c and 7
Bear Creek Segments 1b and 5
Clear Creek Segments 12, and 17b
Boulder Creek Segment 6
Big Thompson River Segments 3 and 4a
Cache La Poudre River Segments 7, 8 and 10

Decoupling Aquatic Life Warm 2 and UP The Commission decided that the presence of a warm-water aquatic life class 2 would still be a presumptive basis for applying a use-protected designation; however, that presumption can be overcome if there is data showing that the water is of high quality. All warm water aquatic life class 2 segments were reviewed to determine if the use protected designation is still warranted. The following segment(s) are now reviewable:

Upper South Platte River Segments 16a and 16h
Cherry Creek Segments 1 and 3
Bear Creek Segment 4a
Boulder Creek Segment 7b
St. Vrain Creek Segment 5
Middle South Platte River Segments 1b , and 5a
Big Thompson River Segments 4b, 4c, 5, and 9
Cache La Poudre River Segments 11, 12, and 13b
Lower South Platte River Segment 1
Republican River Segment 5

Removing UP from Aquatic Life Warm 1: The twelve-parameter test was applied where possible to determine if use-protection remains warranted for segments classified for warm-water aquatic life class 1. The following segments are now reviewable:

Upper South Platte River Segments 10a and 17a
Bear Creek Segment 2
Clear Creek Segment 15
Boulder Creek Segments 5 and 10
St. Vrain Creek Segment 3
Republican River Segment 1

Removing UP from Aquatic Life Cold 1: The twelve-parameter test was applied where possible to determine if use-protection remains warranted for segments classified for cold-water aquatic life class 1. The following segment is now reviewable:

Clear Creek Segment 5

G. Ambient Quality-Based Standards

There are 18 segments in the Basin that have ambient standards. Ambient standards are adopted where natural or irreversible man-induced conditions result in exceedances of table value standards. The Commission reviewed the information that is the basis for these standards as well as any new information that would indicate whether they are still appropriate, need to be modified, or should be dropped. The Commission did not adopt any changes to the following ambient quality-based standards.

Upper South Platte River Segment 2b: Zn(ch) = 220 µg/L
Upper South Platte River Segment 2c: Zn(ch) = 280 µg/L
Upper South Platte River Segment 5a (all metals Trec unless otherwise noted): Cd(ch)=2 µg/L,CrVI(ch)=25 µg/L,Cu(ch)=18 µg/L(dis), Fe(ch) = 1200 µg/L , Pb(ch)=4, Mn(ch)=530 µg/L(dis),Hg(ch)=0.05 µg/L,Ni(ch)=50 µg/L,Ag(ch)=1 µg/L
Upper South Platte River Segment 14: Mn(ch) = 190 µg/L (dis)
Upper South Platte River Segment 15: Mn(ch) = 400 µg/L (dis)
Clear Creek Segment 7: all metals
Clear Creek Segment 9b: Zn(ch) = 200 µg/L
Clear Creek Segment 11: Cu(ch) = 17 µg/L
Clear Creek Segment 13b: Fe(ch) = 5400 µg/L (Trec), Cu(ch) = 64 µg/L
Big Dry Creek Segment 1: Se(ch) = 7.4 µg/L(April 1 to October 31) ; Se(ch) = 15 µg/Land Se(ac) = 19.1 µg/L(November 1 to March 31)
Big Dry Creek Segments 2, 3, 4a, 4b, and 5: Plutonium, Americium, Tritium, and Uranium (see Table 2 of Regulation 38 for individual numbers), Be(ch) = 4 µg/L
Middle South Platte River Segment 5b: D.O.(ch) = 4.7 mg/l (qualifier)

The Commission *did* adopt changes to the following ambient quality based standards:

Clear Creek Segment 14a: Mn(ch) = 500 µg/L , modified to 244 µg/L
Clear Creek Segment 14b: Mn(ch) = 500 µg/L , modified to 244 µg/L

H. Water Effects Ratios (WERs)

The Commission reviewed the basis for pre-existing WER-based site-specific copper and zinc standards.

Copper: Current information indicates that the WER may not be the most appropriate method to use to set site-specific standards for copper. However, EPA's guidance for implementing the Biotic Ligand Model to set site-specific copper standards is not yet fully developed. The Commission replaced the standards based upon WERs with temporary modifications (set at the WER values) for the following segments. These type iii temporary modifications will expire 12/31/2014.

Upper South Platte River Segments 10a, 14, 15, 16a, 16g
Clear Creek Segments 14a, 14b, and 15

Zinc: The zinc WER was adopted in 1994. The Commission reviewed the summary report from the 1994 study. Although much has changed in the watershed, the Commission concludes that the zinc WER is still protective of the use for the following segments:

Clear Creek Segments 14a, 14b, and 15

I. Aquatic Life Metals Standards

New Table Value Standards: As part of the Basic Standards hearing of 2005, new zinc and cadmium table values were adopted. The acute and chronic zinc and cadmium equations in 38.6(3) were modified to conform to Regulation No. 31.

Chromium III Standards: A review of chromium III standards showed that the standard associated with the Water Supply use classification was not protective of aquatic life where the average hardness was less than 61 mg/l. A chromium standard, CrIII(ch)=TVS was added to following segments with an Aquatic Life use classification and average hardness values less than 61 mg/l.

Upper South Platte River Segments 2a, 3, 4, 5b, and 9
Bear Creek Segments 1a, 1b, 3, and 7
Clear Creek Segments 1, 3a, 3b, 6, 9a, 10, and 17b
Boulder Creek Segments 1, 2, and 3
St. Vrain Creek Segments 1 and 2
Big Thompson River Segments 1 and 2
Cache La Poudre River Segments 1, 2, and 6

J. Arsenic Standards

For arsenic, each use (except recreation) has a different arsenic ("As") value, including Fish Ingestion (FI) and Water Plus Fish (W+F). In different combinations of uses, different values become the most limiting. In order to eliminate the confusion, the Commission added the operative value to the individual segments. The following matrix displays the most limiting arsenic criteria.

Most Limiting Arsenic Criteria Depending on the Possible Combinations of Uses and Qualifiers	
If the Use Classifications were:	**These Arsenic Standards were Applied (dissolved unless otherwise noted)**
Class 1 aquatic life, water supply	As(ac) = 340, As(ch) = 0.02(Trec)
Class 2 aquatic life (water + fish standards), water supply	As(ac) = 340, As(ch) = 0.02(Trec)
Class 2 aquatic life (no fish ingestion standards), water supply	As(ac) = 340, As(ch) = 0.02 - 10(Trec)
Class 1 aquatic life	As(ac) = 340, As(ch) = 7.6(Trec)
Class 2 aquatic life (fish ingestion standards)	As(ac) = 340, As(ch) = 7.6(Trec)
Class 2 aquatic life (no fish ingestion standards), agriculture	As(ac) = 340, As(ch) = 100(Trec)
Agriculture only	As(ch) = 100(Trec)
Water supply only	As(ch) = 0.02 - 10(Trec)

K. Uranium Standards

At the 2005 Basic Standards rulemaking hearing, the Commission changed the drinking water supply table value for uranium from 40 pCi/L to 30 µg/L.

L. Water +Fish and Fish Ingestion Standards

The reference to “Water+Fish *Organics*” was corrected to “Water+Fish *Standards*” and the reference to “Fish Ingestion *Organics*” was corrected to “Fish Ingestion *Standards*” to incorporate the appropriate standards from both the organics table and the metal parameter table in Regulation #31.

For the following segments, the Fish Ingestion Standards were removed

Upper South Platte Segment 16c: Fish Ingestions standards were applied to this segment in 2000, based on evidence that fishing was occurring in urban and rural lakes and ponds (see 38.57.J). In this hearing the lakes and reservoirs were moved to Segment 22 and accordingly, the Fish Ingestions standards were removed from Segment 16c and placed on Segment 22.

Middle South Platte Segment 1a: Fish Ingestions standards were applied to this waterbody before it was divided into 1a and 1b at the confluence with St. Vrain Creek, based on evidence that fish were being taken or had the potential to be taken for human consumption and that fishing takes place on a recurring basis. It was later divided, recognizing the substantial flow is contributed by St. Vrain Creek. Aquatic life sampling data for the upper portion (Segment 1a) presented by the Metro District provided evidence that the fish assemblage in Segment 1a is dominated by small, native minnow species that do not reach a catchable size. In addition, the Metro Districts’ routine biweekly sampling has not found evidence that fishing occurs on a recurring basis in Segment 1a. Accordingly, the Commission removed the Fish Ingestion qualifier from Segment 1a. The Commission made no change to the Fish Ingestion standards on Segment 1b.

M. Temporary Modifications

All temporary modifications were re-examined to determine whether to delete or extend them, either as existing or with modifications of the numeric standards. Because of the June 2005 changes to Regulation #31, temporary modifications were not automatically extended if non-attainment persisted.

Ammonia: The following segments have type i temporary modifications for chronic ammonia that were amended to clarify the chronic standard’s value as either 0.06 or 0.10 mg/l, rather than just “TVS old.” As specified in 61.8(2)(c)(iii) (the Permit Rules, Regulation #61), where a temporary modification has been adopted, limits in permits are to be set based on the temporary modification and the provision strictly limiting the loading from the facility does not apply. These temporary modifications will be subject to review and rulemaking for the two years before their scheduled expiration in order to track progress towards the full attainment of water body standards and uses.

Segments amended to read NH_3(ch)=0.06 mg/L:

Upper South Platte River Segments 10a, 11b, 14, 16c, and 16g
Clear Creek Segment 15
Boulder Creek Segments 7b, 9, and 10
St. Vrain Creek Segment 3
Cache La Poudre River Segments 13a and 22
Lower South Platte River Segment 2b

Segments amended to read NH_3(ch)=0.10 mg/L:

Upper South Platte River Segments 15 and 16a
Cherry Creek Segments 3 and 4
Bear Creek Segment 4a
Big Dry Creek Segments 1 and 3
St. Vrain Creek Segment 6
Middle South Platte River Segments 1a and 3a
Big Thompson River Segments 5, 6, 9, and 10
Cache La Poudre River Segments 11, 12, and 13b
Lower South Platte River Segment 1

Other Ammonia temporary modifications: Upper South Platte Segment 5c has a type iii temporary modification for ammonia. The expiration date has been extended from 12/31/2010 to 12/31/2011. Mountain Water and Sanitation District (MWSD) has been making progress toward resolving uncertainty regarding the appropriate underlying standard. During the course of the extended temporary modification, MWSD will investigate what ammonia standards are feasible based upon economic considerations and EPA may release an updated ammonia guidance containing new information pertinent to the determination of an appropriate underlying standard.

"Current Condition": The Commission adopted temporary modification for the following segments and pollutants with the notation of "current condition" rather than a numeric value. The Commission's intent of using this notation is to preserve the status quo during the term of the temporary modification. Discharges to those segments shall continue to be authorized to discharge the subject pollutant at their current permitted concentration and flow levels. Although the permitted levels authorize the discharges to increase pollutant loading over past levels, the Commission expects that actual discharge levels will be variable and that existing water quality may be marginally changed, since discharge flow levels may increase and concentration levels will likely continue similar to actual levels to date in order for the discharger to assure that the effluent limitations continue to be met. The Commission does not intend that temporary modifications set at "current condition" apply to new or expanded facilities. With respect to existing facilities, the Commission intends that for facilities discharging into segments having a temporary modification, implementation of the underlying standard into permits is to take place as soon as feasible after the standard becomes effective in accordance with established requirements of the Basic Standards and Methodologies for Surface Water. The progress on resolving the uncertainty will be reviewed in the annual Temporary Modification hearing in December of the two years preceding the expiration.

Upper South Platte Segment 14, selenium: Public Service Company of Colorado proposed a type iii temporary modification for selenium on Upper South Platte Segment 14. There is significant uncertainty concerning the long-term underlying selenium standard. Time is needed to (1) determine the source of the upstream selenium, which exceeds the underlying selenium standard of 4.6 μg/L; (2) wait for EPA's new selenium criteria and implementation guidance; (3) determine a standard that will protect the aquatic life use in Segment 14; and (4) evaluate selenium treatment options. The temporary modification will expire on December 31, 2013.

Upper South Platte Segments 14, 15 and 16g, temperature: The Commission adopted type iii temporary modifications of the temperature standard for these segments. The temporary modifications will expire on 12/31/2014. During the term of the temporary modification, the Commission expects that the domestic wastewater facilities will, in cooperation with other dischargers and the Division, explore options for developing new underlying site-specific temperature standards including refined numeric site-specific standards, ambient–based site-specific standard and narrative site-specific standards although permit implementation strategies are not yet fully developed for all of these. In addition, although not currently available, a facility–specific variance approach may be permissible by the end of the temporary modification period. This option, the framework of which still needs to be developed, may be an appropriate solution for the following facilities and other discharges to address temperature-related issues within their respective segments:

Upper So Platte Segment 14: Littleton/Englewood Wastewater Treatment Facility
Upper So Platte Segment 15: Metro Wastewater Reclamation District
Upper So Platte Segment 16g: Centennial Water and Sanitation District

Clear Creek Segment 13b, temperature: The Commission adopted a type iii temporary modification of the temperature standard for Segment 13b. The temporary modification will expire on 12/31/2014. During the term of the temporary modification CERCLA and Black Hawk / Central City Sanitation District will characterize the fish species that are expected to be present and will gather data to more accurately characterize the temperature of the discharge and the temperature of Clear Creek.

Clear Creek Segments 14a, 14b, and 15, temperature: The Commission adopted a type iii temporary modification of the temperature standard for Segments 14a, 14b and 15. The temporary modification will expire on 12/31/2014. During the term of the temporary modification and as part of the study dealing with the appropriate Aquatic Life classification, MillerCoors will perform additional fish sampling, flow, and temperature analysis with the objective of resolving the uncertainty associated with the appropriate use classification and temperature standards. MillerCoors will also further address issues associated with attainability of the temperature standards.

Boulder Creek Segment 9, copper: The Commission extended the type iii temporary modification of the copper standard for Boulder Creek Segment 9. The City of Boulder is still in the process of evaluating the Biotic Ligand Model (BLM) for possible development of a site-specific copper standard and also evaluating a copper translator to apply to the current wastewater treatment facility copper effluent limit. Additional time is needed to conduct further sampling and to wait for EPA’s guidance on use of the BLM to develop site-specific criteria.

Middle South Platte Segment 4, pH: The Division proposed a type iii temporary modification of the pH standard for Barr Lake and Milton Reservoir (Middle South Platte Segment 4) because investigations suggest that the standards may not be attainable through achievable controls of nutrient inputs. However, the Commission has not determined at this time that the underlying standards are not attainable and reserves this determination until future hearings. Water quality investigations conducted as part of the TMDL development work indicate non-attainment of the pH standard. Regardless, the TMDL will be written to the underlying pH standard. The opportunity to consider a temporary modification in this hearing arose before the TMDL modeling has been completed, and the feasibility of controls have been fully assessed. The Commission finds that there is enough uncertainty regarding the standard to warrant a type iii temporary modification in addition to evidence that point source dischargers would likely have compliance problems with probable effluent limits. This temporary modification will assure that individual wasteload allocations in the TMDL will not be implemented before the uncertainty regarding the underlying standard is resolved (see 31.14(15)(b)(i)). The temporary modification is set at expire on 12/31/2014. During the term of the temporary modification, the TMDL will be completed and focus will then shift to assessing the feasibility of necessary nutrient controls.

Big Thompson Segment 2, Wapiti Meadows D.O., E. coli, NH3, NO3, B, Cd, Cu, Pb, Hg, Ni, Se, Ag, Zn: The Commission extended the temporary modification for these constituents until 12/31/2014. During the interim, Upper Thompson Sanitation District, in consultation with the Division, EPA and CDOW, will prepare a Plan of Action to continue sampling of water into and out of the Wapiti Meadows, characterize the functions of the wetland, explore regulatory and treatment alternatives, and develop a proposal for the appropriate classification and standards for the wetland.

Other Temporary Modifications, numeric

Temporary modifications (type iii) for selenium and copper were adopted where there were both exceedances of the current standard and dischargers on the segment. The temporary modifications will expire on 12/31/2014 which should cover the time it takes for EPA to promulgate new criteria (for selenium) and finish implementation guidance (for selenium and copper). These temporary modifications will be reviewed in 2012 and 2013.

Boulder Creek Segment 8: Se(ch) = 12.2 µg/l(dis)
St. Vrain Segment 2b: Cu(ch) = 6.0 µg/l(dis)
Middle South Platte Segment 1a: Se(ch) = 6.9 µg/l(dis)
Big Thompson Segment 2: Cu(ch) = 2.5 µg/l(dis)
Big Thompson Segment 5: Se(ch) = 5.7 µg/l(dis)
Big Thompson Segment 9: Se(ch) = 13.1 µg/l(dis)
Cache La Poudre Segment 11: Se(ch) = 5.4 µg/l(dis)
Cache La Poudre Segment 12: Se (ch) = 7.1 µg/l(dis)
Cache La Poudre Segment 13b: Se(ch) = 13.0 µg/l(dis)
Lower South Platte Segment 1: Se(ch) = 12.3 µg/l(dis)

Copper WERs: The Commission replaced the standards based upon Copper WERs with temporary modifications (set at the WER values) for the following segments. These type iii temporary modifications will expire 12/31/2014. (See section H, above)

Upper South Platte River Segments 10a, 14, 15, 16a, 16g
Clear Creek Segment 14a, 14b, and 15

The following temporary modifications (expire 12/31/2014) were revised based upon resegmentation:

Clear Creek Segment 2a: Zn(ch) = 353 µg/l (dis) (type i)
Clear Creek Segment 2c: Cu(ch) = 11.4 µg/l (dis) (type iii)

The new temporary modifications (expire 12/31/2014) were set to ambient quality-based numeric values for the following segments:

Clear Creek Segment 2a: Zn(ac) = 586 µg/l (dis)(type i) , Cd(ch) = 1.54 µg/l(dis)(type iii)
Clear Creek Segment 11: Cd(ch) = 1.42 µg/l(dis) (type iii)

The following temporary modifications were deleted:

Clear Creek Segment 2a (formerly part of 2): Cu(ch) = 7.4 µg/l (dis)
Clear Creek Segment 11: Zn(ch) = 325 µg/l (dis)

The following segments had temporary modifications that were deleted from the tables since, as part of the Commission action in December 2008, they were to be allowed to expire:

Cache la Poudre River Segments 11, 12: copper

N. Temperature

As part of the Basic Standards hearing of 2007, new table values were adopted for temperature. Temperature standards were applied to individual segments based upon the distribution of fish species, as provided by the CDOW, temperature data, and other available evidence.

The following segments are cold stream tier one (CS-I):

Upper South Platte River Segments 1a, (summer season adjusted to April – Oct)
Upper South Platte River Segments 1b, 2a, 2b, 2c, 3, 4, 5a, 5b, 8, and 9
Bear Creek Segments 1a, 3, 6b, and 7
Clear Creek Segments 1, 2a, 2b, 2c, 3a, 3b, 4, 5, 6, 7 (also CL), 8, 9a, 9b, 10, 11, 13a, 13b, and 19
Boulder Creek Segments 1, 2a, 3, and 4a
St. Vrain Creek Segments 1, 2a, 4a, and 4b
Big Thompson River Segment 1
Cache La Poudre River Segments 1, 2a, 6, and 13c
Laramie River Segments 1 and 2a

The following segments are cold stream tier two (CS-II):

Upper South Platte River Segments 5c, 5d, 6a, 7, and 13
Bear Creek Segments 1b, 1e, 5, and 6a
Clear Creek Segments 12 and 17b
Boulder Creek Segments 2b, 4b, and 6
St. Vrain Creek Segments 2b and 4c
Big Thompson River Segments 2, 3, 4a, 7, and 8
Cache La Poudre River Segments 2b, 7, 8, 9, and 10
Laramie River Segment 2b
Republican River Segment 3

The following segments are warm stream tier one (WS-I):

Upper South Platte River Segments 10a, 11b, 12, and 15
Upper South Platte River Segments 14 (summer season adjusted to Feb 14-Nov)
Bear Creek Segment 4a
Big Dry Creek Segments 1, 4a, and 6
St. Vrain Creek Segments 3 and 5
Middle South Platte River Segments 3a and 5a
Big Thompson River Segments 4b, 4c, 5 and 6
Cache La Poudre River Segments 11, 12, and 13a
Republican River Segments 1, 4, 5, and 6

The following segments are warm stream tier two (WS-II):

Upper South Platte River Segments 11a, 16a, 16c, 16g, and 16h
Cherry Creek Segments 1, 3, and 4
Bear Creek Segment 2
Clear Creek Segments 14a, 14b, 15, 16a, 16b, 18a, and 18b
Big Dry Creek Segments 4b and 5 (also WL)
Boulder Creek Segments 4c, 4d, 5, 7a, 7b, 8, 9, 10, and 11
St. Vrain Creek Segment 6
Middle South Platte River Segments 1a, 1b, and 5c
Big Thompson River Segments 9 and 10
Cache La Poudre River Segment 13b

Lower South Platte River Segments 1, 2a, and 2b

The following segments are warm stream tier four (WS-IV):

Upper South Platte River Segments 16d, 16e, and 16f
Middle South Platte River Segments 3b, 5b, and 6
Republican River Segment 7

The following segments are cold lakes (CL):

Upper South Platte River Segments 18, 19 (also CLL), and 20
Bear Creek Segments 8, 9, 10, and 12
Clear Creek Segments 7 (also CS-I), 20, 21, 22, and 25
Boulder Creek Segments 13, 14 (also CLL), and 15 (also CLL)
St. Vrain Creek Segments 8, 9 (also CLL), and 10
Big Thompson River Segments 15, 16 (also CLL), and 18
Cache La Poudre River Segments 15, 17, 18 (also CLL), 19, and 20 (also CLL)
Laramie River Segments 3 and 4

The following segments are cold lakes larger than 100 acres surface area (CLL):

Upper South Platte River Segments 6b and 19 (also CL)
Bear Creek Segments 1c and 1d
Clear Creek Segments 17a and 23
Boulder Creek Segments 14 (also CL) and 15 (also CL)
St. Vrain Creek Segment 9 (also CL)
Big Thompson River Segments 11 and 16 (also CL)
Cache La Poudre River Segments 14, 18 (also CL), and 20 (also CL)

The following segments are warm lakes (WL):

Upper South Platte River Segments 16b, 17a, 17b, 17c, 21, 22, and 23
Cherry Creek Segments 2, 5, and 6
Bear Creek Segment 11
Clear Creek Segment 24
Big Dry Creek Segments 2, 3, 5 (also WS-II) and 7
Boulder Creek Segments 16 and 17
St. Vrain Creek Segments 7, 11, 12, and 13
Middle South Platte River Segments 4 and 7
Big Thompson River Segments 12, 13, 14, 17, and 19
Cache La Poudre River Segments 16, 21, and 22
Lower South Platte River Segments 3, 4, and 5
Republican River Segments 2 and 8

Ambient-based summer temperature standards were adopted for several large lakes and reservoirs (collectively referred to as lakes). The table value WAT standard is not attainable in many large lakes (> 100 acres in surface area) including many lakes with apparently healthy fish populations. Summertime temperature for large lakes and reservoirs (collectively referred to as lakes) is very well correlated to the lake's elevation. Since the thermal properties are natural or man-induced irreversible (in the case of reservoirs) the Commission adopted ambient temperature standards for large lakes wherever data were available to characterize a WAT. For lakes, the WAT is assumed to be equivalent to the average temperature of the mixed layer.

Upper So. Platte Segment 6b	Chatfield Res.	April-December T(WAT)= 23.5°C
Upper So. Platte Segment 19	Antero Res.	April-December T(WAT)= 19.6°C
	Spinney Mt. Res.	April-December T(WAT)= 20.2°C
	Eleven Mile Res.	April-December T(WAT)= 19.8°C
	Cheesman Res.	April-December T(WAT)= 21.9°C
	Strontia Spr. Res.	April-December T(WAT)= 22.6°C
	Platte Canyon Res.	March-Dec T(WAT)= 25.0°C
Bear Creek Segment 1c	Bear Cr Res.	April-December T(WAT)= 23.3°C
Boulder Creek Segment 15	Gross Res.	April-December T(WAT)= 19.4°C
Big Thompson Segment 11	Carter Lake	April-December T(WAT)= 22.7°C
Cache La Poudre Segment 14	Horsetooth Res.	April-December T(WAT)= 22.8°C
Cache La Poudre Segment 20	Seaman Res.	April-December T(WAT)= 22.5°C
Lower So. Platte Segment 3	Jackson Res.	April-December T(WAT)= 28.1°C
	No. Sterling Res.	April-December T(WAT)= 26.1°C
	Jumbo Res.	April-December T(WAT)= 27.0°C

O. Big Dry Creek Segment 2, Standley Lake, Numeric Nutrient Criteria:

The Commission adopted a new numeric standard for chlorophyll for Standley Lake and modified the existing narrative trophic status standard by removing a sentence about implementation.

Background: In 1988, the Commission began consideration of nutrient standards for Standley Lake when the Cities of Westminster and Thornton proposed numeric standards. The Commission did not adopt the criteria and asked the stakeholders to work together to gather data upon which to base permanent water quality standards to protect Standley Lake as a water supply. In 1993, the parties returned to the Commission with proposals for narrative standards and a control regulation for point and nonpoint sources of nutrient in the Standley Lake Drainage. At the conclusion of the February 1994 hearing, the Commission adopted an alternative to the original proposal that states: “The trophic status of Standley Lake shall be maintained as mesotrophic as measured by a combination of common indicator parameters such as total phosphorus, chlorophyll *a*, secchi depth, and dissolved oxygen. Implementation of this narrative standard shall only be by Best Management Practices and controls implemented on a voluntary basis.” (Reg. 38)

Over the 16 years since adoption, federal and State drinking water regulations have become more stringent. Of particular concern to the Public Water Systems that rely on Standley Lake is compliance with regulations for potentially carcinogenic disinfection byproducts. Higher concentrations of algae can lead to higher levels of disinfection byproduct precursors as well as trigger taste and odor compounds that are not readily treated or controlled with conventional water treatment. Despite evolution in the nature of concerns, there has been no advancement in finding agreement on a quantitative definition of “mesotrophic” (although there is general agreement that the lake has been mesotrophic during this time period). These concerns led the Cities of Westminster, Northglenn, and Thornton, (the “Standley Lake Cities”), to request adoption of a site specific numeric standard for chlorophyll a for Standley Lake set at a level to characterize the status quo, or current condition.

Revised Water Quality Standards for Standley Lake: The Cities have monitored water quality in Standley Lake for many years. The last 14 years of chlorophyll data and seven years of total phosphorus data have been placed in the record. Those years represent periods suitable for defining current condition.

With the benefit of the lengthy historical record now available, the Commission believes it is appropriate to set a chlorophyll standard consistent with the conditions that have been maintained. The Commission adopted a chlorophyll standard of 4 µg/L to preserve the current conditions and protect uses. This standard is to be attained in four of five years.

The chlorophyll standard is defined as a 9-month average (the average of the nine monthly averages of samples taken from March through November); winter samples are excluded because they cannot be collected safely in all years. Samples are to be collected in a manner consistent with the historical record (photic zone at site 10). It is anticipated that the level of sampling effort applied in the future will be the same as that applied in the past (i.e., at least one sample in each of the nine months). For assessment, the average (arithmetic mean) is calculated each year.

The Water Quality Control Division proposed that a numeric phosphorus standard also be adopted for Standley Lake, but the Commission has declined to adopt such a standard at this time. The chlorophyll standard is adopted principally to address the public health concern raised by the Standley Lake Cities. A chlorophyll standard based on current conditions is intended to control the contribution of algae to the formation of disinfection byproduct precursors. This chlorophyll standard is not intended as a substitute for the current narrative standard regarding the overall trophic status of the reservoir, and therefore the Commission has decided as a matter of policy to retain the narrative standard at this time, with a slight modification. The Commission deleted the sentence regarding implementation of the narrative standard as unnecessary. The Commission encourages the Standley Lake Cities to work with the Division and other interested parties to explore the development of numeric nutrient standards for Standley Lake in the future.

Development of Assessment Thresholds: Consistent with methodology developed for Chatfield Reservoir, a distinction is made between the standard and an assessment threshold. The assessment threshold is designed to address the concern about the risk of incorrectly counting an exceedance when a high summer value is the result of natural variability, but does not indicate a substantive change in current conditions. The approach is justified by the special nature of the parameter (chlorophyll is not toxic) and the site-specific nature of the concern about false exceedances. Another reason for establishing an assessment threshold that is different than the standard is that the site-specific standard is derived from historical data, which creates the expectation that a number of exceedances will occur. Natural variability, especially for chlorophyll, is sufficient to produce much more uncertainty in the assessed value than in the standard, which was derived from the set of all 9-month averages. An assessment threshold was developed by calculating the standard error of each 9-month average from which the 90th percentile value of the average was determined. A regression of the 90th percentile value (upper confidence limit) on the average provides an equation that can be used to specify the upper confidence limit (90%) for any particular concentration (e.g., the standard). Using a standard of 4.0 µg/L, the assessment threshold was determined to be 4.4 µg/L. This value was added in section 38.6 (4) with a reference in the standards table "qualifier" column."

P. Other Site-Specific Revisions:

Upper South Platte River Segment 5c: The trout-specific standards for chronic silver and acute cadmium were deleted.

Upper South Platte River Segment 15, Mercury: Existing site-specific standards for mercury are removed in absence of recent data to support maintaining them. Standard is changed to Hg(ch)=0.01(Tot).

Upper South Platte River Segment 15 and Middle South Platte Segment 1a, Dissolved Oxygen Assessment Criteria: The Commission added assessment criteria to clarify the assessment of dissolved oxygen standards for these segments. In 1996, the Commission adopted Statement of Basis and Purpose language indicating that for the purpose of determining the attainment of the site-specific dissolved oxygen standards for these segments, dissolved oxygen measurements in man-made pools are not to be used. This provision was added to section 38.6(4)(c).

Clear Creek Segments 2a, 2c, 3a, 3b, and 11: Site-specific recalculated acute and chronic zinc standards were adopted for these segments. The recalculated equations were developed to be protective of the community which is expected to occur in the riverine portions of the Upper Clear Creek Watershed.

Colorado Trout Unlimited proposed that segment 2a be further divided into two segments, with the boundary at Georgetown Reservoir, with ambient quality-based standards that are sometimes more restrictive than the recalculation-based standards adopted for the new lower segment. The Commission declines to adopt this proposal. As noted above, the recalculation-based standards adopted for this segment are appropriate to protect the aquatic life use. The Commission acknowledges that the water quality improves in the lower portion of Segment 2a (the mainstem from Georgetown to the West Fork). The Commission supports efforts to maintain and improve the water quality in this portion of the stream but does not believe that the adoption of standards based on ambient quality that is better than that determined necessary to protect the aquatic life use is the appropriate means to do so. This segment is reviewable and antidegradation provisions will apply to any future proposals for a new or increased discharge of pollutants to this segment. Improvements to existing quality will be dependent principally on the extent of future CERCLA clean-ups in this basin.

Big Dry Creek Segment 1: The Commission added assessment locations to section 38.6(4) to record the assessment strategy for the seasonal ambient quality based site-specific standards for selenium applicable to Big Dry Creek Segment 1 that were adopted in December 2007 and recorded in the Statement of Basis at that time. Attainment of the standard is to be assessed with data based on three specific instream monitoring locations (bdc1.5, bdc2.0 and bdc4.0) upstream of the three municipal wastewater treatment plant discharges.

Boulder Creek Segment 8: To reflect the Agriculture use classification and absence of a Water Supply use classification, NO_3 =10 was changed to NO_3 =100.

Cache La Poudre Segment 13a: To reflect the addition of the Water Supply use classification, CrIII(ac/ch)=TVS was changed to CrIII(ch)=TVS and NO_3 =10, Cl=250, SO_4 = WS, CrIII(ac)=50(Trec), Fe(ch)=WS(dis), and Mn(ch)=WS(dis) were added.

Lower South Platte Segment 2b, Resegmentation of Beaver Creek: Based on the results of a Use Attainability Analysis prepared by the Metro Wastewater Reclamation District, the Commission determined that it is appropriate to move the portion of Beaver Creek beginning at its source to the Fort Morgan Canal from Lower South Platte segment 2b to Lower South Platte Segment 2a. Segment 2a has standards necessary to protect the following uses: Aquatic Life Warm 2 (with numeric standards only to protect rudimentary aquatic life), Recreation N (Not primary contact recreation), and Agriculture. Evidence presented showed that this is a naturally ephemeral reach of Beaver Creek, consistent with the other tributaries included in Lower South Platte Segment 2a.

Q. Other changes

The Commission corrected several typographical and spelling errors, and clarified segment descriptions. The abbreviation for chlorine was changed from Cl2 to Cl_2, and the (ac) and (ch) designations were removed from the inorganic standards where that designation was not appropriately applied.

The Commission made the following segment-specific typographical corrections:

Upper South Platte Segment 5a:added B=0.75, which is present for all other comparable segments.

Upper South Platte Segment 7: added CrIII(ch)=TVS to complete the standard for aquatic life.

Upper South Platte Segment 16b: changed the following standards, which were inconsistent with the aquatic life classification of this segment: changed standards for D.O.=5.0 mg/L and NO_2 = 0.5; added Cd(ac)=TVS and Ag(ch)=TVS to replace existing salmonid equation; removed D.O.(sp)=7.0 mg/L.

Clear Creek Segment 7: The segment description was modified to specify the inclusion of Lower Urad Reservoir.

Clear Creek Segment 9a: replaced "to" with "of" in the segment description. Added "20" to expiration date of "2014."

Clear Creek Segment 13b: replaced "(trec)" with "(ch)" in temporary modification for iron and added "(Trec)" at the end for consistent nomenclature.

Clear Creek Basin footnotes: deleted "* REFER TO STATEMENT OF BASIS AND PURPOSE" because it did not appear to have a reference.

Big Dry Segments 4a and 4b: changed Hg(ac)=0.01(Tot) to Hg(ch) = 0.01(Tot).

Middle South Platte Segment 1b: deleted the temporary modification for ammonia in order to reflect changes that were made as a part of the December 10, 2007 temporary modifications Rulemaking Hearing.

The Commission clarified segment descriptions through the following changes:

Upper South Platte Segment 17a: change "City Park Lake" to "City Park Lakes" because it should encompass all lakes in the park.

Clear Creek Segment 3a: Added "Segments" to the description preceding 3b and 19 for clarification.

Clear Creek Segment 11: Added "a point just above" to clarify the segment description.

Clear Creek Segment 13a: Revised description to include North Clear Creek from its source to Chase Gulch, all of Four Mile Gulch, Chase Gulch itself, and Eureka Gulch. The terminal points on this new segment approximately coincide with the lowest actual and potential water supply intakes located on each of these streams.

Clear Creek Segment 13b: Added "a point just below the confluence with Chase Gulch" to clarify the origin of the segment in relation to Segment 13a.

Clear Creek Segment 14b: Added "a point just below" to the segment description in order to clarify that the segment originates at a point just below Youngfield Street.

Clear Creek Segment 16a: replaced "outlet" with "inlet" for clarity because Maple Grove Reservoir is no longer part of the segment.

Boulder Creek Segment 6: Revised "highway" to read "Highway".

Boulder Creek Segment 7a: Revised "highway" to read "Highway".

St. Vrain Creek Segment 5: Revised "highway" to read "Highway".

St. Vrain Creek Segment 6: Added Segment "4c" to clarify the segment exceptions.

Middle South Platte River Segment 3a: Deleted Segment "4" from the list of exceptions because lakes and reservoirs were removed from this segment.

Big Thompson River Segment 1: This segment description was clarified to include the mainstem of Big Thompson River from its source to the boundary of Rocky Mountain National Park. The

Commission clarified this description because the previous description excluded the mainstem of the Big Thompson River while including only streams and wetlands tributary to the Big Thompson River within the boundaries of Rocky Mountain National Park.

Big Thompson River Segment 10: Added “confluence with the” to clarify the segment description.

Cache La Poudre River Segment 13a: Deleted Segments “14”, “15” and “16” and added Segments “6”, “7”, “8” and “13c” to clarify the segment exceptions. Modified the segment description to include tributaries and wetlands to the Cache La Poudre from the Monroe Gravity Canal/North Poudre Supply canal diversion to a point immediately above the confluence with the North Fork of the Cache La Poudre River.

Cache La Poudre River Segment 13b: Revised “la” to read “La”.

Lower South Platte River Segment 2a: Deleted Segment “3” from the list of exceptions because lakes and reservoirs were removed from this segment.

R. Other Revisions Considered

Several site-specific revisions proposed by parties to the hearing were considered by the Commission and not adopted, including those summarized below:

Upper South Platte Segment 6a

The Chatfield Watershed Authority proposed that this segment should be divided into two segments, split at the point of the Roxborough Water and Sanitation District/Dominion Metropolitan District wastewater discharge. A temporary modification for temperature would have been applied to the lower segment. The Commission declined to adopt the requested resegmentation or temporary modification. The Commission believes that the potential impact described by the Authority is speculative at this time. The design capacity of the currently permitted wastewater discharge is small enough that dilution precludes the need for a temperature effluent limitation, and the Roxborough facility has connected its effluent to the Littleton/Englewood facility so that it no longer discharges at this point, The timing and volume of a future Dominion discharge at this location is currently speculative.

Upper South Platte Segment 10a

Plum Creek Wastewater Authority proposed that a separate segment be created for West Plum Creek. The Commission determined that the evidence does not support different temperature standards for West Plum Creek, based on expected aquatic life species. Because the two segments would have the same standards, there is no reason to resegment the existing segment 10a into two segments.

Upper South Platte Segment 15

The Metro Wastewater Reclamation District originally proposed that a temporary modification for mercury be adopted for this segment. After discussions with the Division, Metro withdrew its request. However, Public Service Company of Colorado continued to support the proposal. The Commission declines to adopt the requested temporary modification. The Commission determined that this proposed temporary modification is not necessary, since the evidence submitted does not demonstrate that Metro will have a compliance problem in meeting an effluent limitation based on the mercury standard and that a compliance problem for Xcel has not been demonstrated at this time.

Cherry Creek Segment 5

Reuter-Hess Reservoir, which is currently under construction, is located within the new Cherry Creek segment 5 created by this rulemaking. Parker Water and Sanitation District proposed that no water quality classifications or standards be adopted at this time for Reuter-Hess Reservoir. The Commission rejects this proposal, which means that the classifications and standards adopted for Cherry Creek segment 5 will apply to Reuter-Hess. The water quality classifications and table value standards adopted for segment 5 are appropriate for the protection of water quality in lakes and reservoirs in the absence of information indicating that other classifications or standards are appropriate. The Commission notes that because Reuter-Hess Reservoir is not yet filled there is currently no site-specific water quality data for the reservoir. Revisions to the adopted classifications and standards can be considered in future triennial reviews if warranted based on data.

Cache la Poudre Segment 10

The Northern Colorado Water Conservancy District proposed that site-specific, ambient quality-based temperature standards be adopted for Cache la Poudre segment 10. The Commission has determined that adoption of site-specific standards for this segment is not appropriate at this time, since there has not yet been an adequate study to determine whether such standards are appropriate, and whether any site-specific standards would warrant resegmentation. The Commission encourages Northern Water to work with the Division and other interested parties to further examine the appropriate temperature standards for these waters prior to the next triennial review.

PARTIES TO THE RULEMAKING

1. Parker Water and Sanitation District
2. Mountain Water and Sanitation District
3. Plum Creek Wastewater Authority
4. Chatfield Watershed Authority
5. Centennial Water and Sanitation District
6. Littleton/Englewood Wastewater Treatment Plant
7. Bear Creek Watershed Association
8. Metro Wastewater Reclamation District
9. Public Service Company of Colorado
10. Upper Clear Creek Watershed Association
11. Standley Lake Cities (Cities of Westminster, Northglenn, and Thornton)
12. City of Boulder
13. Upper Thompson Sanitation District/Bureau of Reclamation
14. Colorado Division of Wildlife
15. Colorado Trout Unlimited
16. Farmers Reservoir and Irrigation Company
17. Clear Creek Watershed Foundation
18. City of Arvada
19. City and County of Denver
20. Denver Water
21. City of Black Hawk and the Black Hawk / Central City Sanitation District
22. Department of Energy, Office of Legacy Management
23. City of Golden
24. East Cherry Creek Valley Water and Sanitation District
25. Barr Lake and Milton Reservoir Watershed Association
26. Northern Colorado Water Conservancy District
27. Hazardous Materials and Waste Management Division / U.S. EPA Superfund Remediation Programs
28. City and County of Broomfield
29. City of Fort Collins
30. MillerCoors, LLC

31. Climax Molybdenum Company
32. Waste Management of Colorado, Inc.
33. South Platte Coalition for Urban River Evaluation (SP CURE)
34. U. S. Environmental Protection Agency (EPA), Region 8
35. City of Greeley
36. City of Aurora
37. North Front Range Water Quality Planning Association
38. Clear Creek County
39. Suncor Energy (U.S.A.), Inc.
40. City of Littleton
41. Town of Empire
42. Town of Silver Plume

38.75 STATEMENT OF BASIS SPECIFIC STATUTORY AUTHORITY AND PURPOSE DECEMBER 2009 RULEMAKING REGARDING TEMPORARY MODIFICATIONS; FINAL ACTION FEBRUARY 8, 2010; EFFECTIVE DATE JUNE 30, 2010

The provisions of C.R S. 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; and 25-8-402; provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted in compliance with 24-4-103(4) C.R.S. the following statement of basis and purpose.

BASIS AND PURPOSE

Pursuant to the requirements in the Basic Standards (at 31.7(3)), the Commission reviewed the status of temporary modifications to determine whether the temporary modification should be modified, eliminated or extended.

<u>Ammonia:</u> Temporary modifications of ammonia standards on 31 segments were reviewed.

Deleted: Ammonia temporary modifications were deleted on the following segments because in most cases permits had recently been reissued for dischargers on the segments. Compliance schedules in the permits are adequate to address any necessary treatment plant upgrade issues. In other cases, no permits now discharge to this segment.

Upper South Platte segments 14, 16c, and 16g
Cherry Creek segment 3
Bear Creek segment 4a
Clear Creek segment 15
Big Thompson River segments 6 and 10
Cache la Poudre River segments 11 and 13b

Modified: The Commission extended the expiration date of the ammonia temporary modification on Middle South Platte segment 1a to 12/31/2014. This segment is immediately downstream of Upper South Platte segment 15. The ammonia temporary modification for segment 15 was set to expire on December 31, 2014 in recognition of wastewater treatment plant upgrades at the Hite Facility that are planned and will not be fully operational until that time. The influence of the Hite Facility’s discharge extends into Middle South Platte segment 1a.

No action: The Commission took no action on the ammonia temporary modifications on the following segments. These will expire 12/31/2011 and will be reviewed again in the December 2010 Temporary Modification hearing.

Upper South Platte segments 5c, 10a, 11b, and 16a
Cherry Creek segment 4
Big Dry Creek segments 1 and 3

Boulder Creek segments 7b, 9, and 10
St Vrain Creek segments 3 and 6
Middle South Platte River segment 3a
Big Thompson River segments 5, and 9
Cache la Poudre River segments 12, 13a, and 22
Lower South Platte segments 1 and 2b

Other Parameters: The following temporary modifications were also reviewed and the expiration dates extended to 12/31/2015, to coincide with the next basin review. This should cover the time it takes for EPA to promulgate new criteria and finish implementation guidance. These temporary modifications will be reviewed in 2013 and 2014.

St Vrain Creek segment 6 selenium
Big Thompson River segment 4b selenium

PARTIES TO THE RULEMAKING

1. City of Grand Junction
2. City of Colorado Springs and Colorado Springs Utilities
3. Tri-Lakes, Upper Monument, Security and Fountain Wastewater Treatment Facilities
4. Paint Brush Hills Metropolitan District
5. Pueblo West Metropolitan District
6. City of La Junta
7. Seneca Coal Company
8. Tri-State Generation and Transmission Association
9. Plum Creek Wastewater Authority
10. Centennial Water and Sanitation District
11. City and County of Broomfield
12. City of Fort Collins
13. Metro Wastewater Reclamation District
14. City of Black Hawk and the Black Hawk/Central City Sanitation District
15. Colorado Division of Wildlife
16. U.S. Environmental Protection Agency

38.76 STATEMENT OF BASIS SPECIFIC STATUTORY AUTHORITY AND PURPOSE: APRIL12, 2010 RULEMAKING; FINAL ACTION APRIL 12, 2010; EFFECTIVE DATE JUNE 30, 2010

The provisions of C.R.S. 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; and 25-8-402; provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted in compliance with 24-4-103(4) C.R.S. the following statement of basis and purpose.

BASIS AND PURPOSE

Pursuant to Regulation 31.7(3)(a)(iii), the Commission may grant a temporary modification where there is significant uncertainty regarding the appropriate long-term underlying standard. The Commission found that significant uncertainty exists as to the selenium standard necessary to protect the aquatic life use. This uncertainty is expected to be resolved when EPA revises its 304(a) criteria and issues implementation guidance for selenium. The Commission also found that ambient selenium levels in Marcy Gulch exceed the existing underlying standard and that time is needed to determine whether this is the result of natural or irreversible human-induced conditions. In view of the uncertainty and its anticipated resolution, the Commission adopted a temporary modification of current conditions (Type iii) with an expiration date of 12/31/15 for segment 16g of the Upper South Platte River.

38.77 STATEMENT OF BASIS SPECIFIC STATUTORY AUTHORITY AND PURPOSE JULY 2010 RULEMAKING REGARDING TEMPORARY MODIFICATIONS; EFFECTIVE DATE NOVEMBER 30, 2010

The provisions of C.R S. 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; and 25-8-402; provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted in compliance with 24-4-103(4) C.R.S. the following statement of basis and purpose.

BASIS AND PURPOSE

The Commission has decided to delay the basin-wide review of water quality classifications and standards for this basin until June 2015, to accommodate an issue-specific rulemaking for nutrient criteria in June 2011. Consistent with that decision, the expiration dates of the temporary modifications on the following segments that are currently scheduled to expire on 12/31/2014 are extended to 12/31/2015. These will be reviewed again in a Temporary Modification hearing prior to the June 2015 basin-wide hearing.

Upper South Platte	10a (Cu only), 14(Cu & T only), 15(Cu & T only), 16a(Se & Cu), 16g
Bear Creek	1c
Clear Creek	2a, 2c, 9a, 11, 13b, 14a, 14b, 15
Boulder Creek	8, 9(Cu only)
St. Vrain	2b
Middle South Platte	Se only:1a, 4
Big Thompson	2, 5(Se only), 9(Se only)
Cache La Poudre	Se only: 11, 12, 13b
Lower South Platte	Se only: 1.

The Commission would like to emphasize that its intent and expectation is that the issues that necessitated adoption of these temporary modification should be resolved as soon as possible and in a manner that takes full advantage of the opportunities provided by the December 2013 review of temporary modifications. The Commission recognizes that it is important to resolve uncertainty regarding the underlying standards so that temporary modifications can be eliminated and any needed pollution controls can be put in place in a timely manner.

PARTIES TO THE RULEMAKING HEARING

1. Town of Avon
2. City of Black Hawk and Black Hawk/Central City Sanitation District
3. Northern Colorado Water Conservancy District and the Municipal Subdistrict, Northern Colorado Water Conservancy District
4. City of La Junta
5. XTO Energy, Inc.
6. City of Pueblo
7. City of Colorado Springs and Colorado Springs Utilities
8. U.S. Environmental Protection Agency

38.78 STATEMENT OF BASIS SPECIFIC STATUTORY AUTHORITY AND PURPOSE DECEMBER 2010 RULEMAKING REGARDING TEMPORARY MODIFICATIONS; FINAL ACTION JANUARY 10, 2011; EFFECTIVE DATE JUNE 30, 2011

The provisions of C.R S. 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; and 25-8-402; provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted in compliance with 24-4-103(4) C.R.S. the following statement of basis and purpose.

BASIS AND PURPOSE

Pursuant to the requirements in the Basic Standards (at 31.7(3)), the Commission reviewed the status of temporary modifications to determine whether the temporary modification should be modified, eliminated or extended.

Temporary modifications of ammonia standards on 20 segments were reviewed.

Deleted: Ammonia temporary modifications were deleted on the following segments because permits had recently been reissued for dischargers on the segments. In these cases, compliance schedules in the permits are adequate to address any necessary treatment plant upgrade issues

Big Dry Creek segments 1 and 3

No action: The Commission took no action on the ammonia temporary modifications on the following segments. These temporary modifications will be allowed to expire on 12/31/2011.

Upper So Platte segments 5c, 10a, 11b, and 16a
Cherry Creek segment 4
Boulder Creek segment 7b, 9, and 10
St Vrain segment 3, and 6
Middle So Platte segment 3a
Big Thompson segment 5 and 9
Cache la Poudre segment 12, 13a, and 22
Lower So Platte segment 1 and 2b.

PARTIES TO THE RULEMAKING HEARING

1. Paint Brush Hills Metropolitan District
2. Tri-State Generation and Transmission Association
3. Seneca Coal Company
4. Mountain Water and Sanitation District
5. City of Grand Junction
6. Colorado Division of Wildlife
7. City of Boulder
8. U. S. Environmental Protection Agency
9. City of Colorado Springs and Colorado Springs Utilities

38.79 FINDINGS IN SUPPORT OF ADOPTION OF EMERGENCY REVISIONS TO REGULATION NO. 38, CLASSIFICATIONS AND NUMERIC STANDARDS FOR SOUTH PLATTE RIVER BASIN, LARAMIE RIVER BASIN REPUBLICAN RIVER BASIN, SMOKY HILL RIVER BASIN (5 CCR 1002-38)

Pursuant to sections 25-8-208, 25-8-402(5), and 24-4-103(6), C.R.S., the Commission adopted a revision to Regulation No. 38, Classifications and Numeric Standards for South Platte River Basin, Laramie River Basin Republican River Basin, Smoky Hill River Basin on December 13, 2011.

The Colorado Department of Transportation (“CDOT”), the Regional Transportation district (“RTD”) and the City and County of Denver (“Denver”), requested an emergency adoption of a revision to the water-plus- fish arsenic standard for Segment 14 of the Upper South Platte River Basin in order to facilitate the issuance of Colorado Discharge Permit System (CDPS) permits to segment 14 with chronic arsenic effluent limitations that are achievable with current and reasonable treatment capabilities.

In August of 2005 the Commission adopted revisions to the Basic Standards and Methodologies for Surface Waters (Regulation #31) to add a water-plus-fish table value standard of for chronic arsenic of 0.02 micrograms per liter (µg/L). Water- plus- fish standards are numeric human health-based water quality standards that are calculated protective values that take into account the combined exposure from the pollutant in drinking water and the pollutant accumulated in fish flesh. This criterion was generally adopted for water bodies with drinking water and aquatic life class 1 use designations in the basin hearings between 2006 and 2009.

The proposal on December 13, 2011 was to revise the water- plus- fish water quality standard for arsenic on Segment 14 from 0.02 micrograms per liter (µg/L) to a range of 0.02 –7.6 µg/L. The Division proposed the revision to the chronic arsenic standard for Segment 14 based on circumstances where entities that have been assigned chronic arsenic effluent limitations in a CDPS permit at or near the 0.02 µg/L cannot achieve their chronic arsenic effluent limitations with treatment that may be beyond the current reasonable limit of technology. The Division examined the basis for the water- plus- fish standard and provided the Commission a policy option for an alternate water plus fish table value standard for chronic arsenic that it believed would be protective of human health for Segment 14 (7.6 is below the Safe Drinking Water Act protective level of 10 µg/L). Testimony was presented that as a practical matter, 3.0 µg/L is the lowest level that is technologically achievable. Testimony was also presented that there is uncertainty regarding the arsenic level necessary to protect the water plus fish use and regarding the extent to which the arsenic levels are reversible (i.e., whether the levels in the ground water and the river are natural or human-induced irreversible).

As a matter of policy, the Commission has decided that since the technologically achievable arsenic level is less stringent than the calculated W+F criterion, the W+F criterion for segment 14 will be a hybrid, based on a range of 0.02-3.0 µg/L. The first number in the range shall be the strictly health-based value, based on the Commission's established methodology for human health-based standards that protect against the combined exposure of drinking water and eating fish. The second number in the range is the technologically achievable value of 3.0 µg/L. The Commission adopted this revision in the form of a temporary modification in recognition of the uncertainty regarding use-protective values and achievability. The temporary modification has an expiration date of December 12, 2012.

Control requirements, such as discharge permits effluent limitations, shall be established using the first number in the range as the ambient water quality target, provided that no effluent limitation shall require an "end of pipe" discharge level more restrictive than the second number in the range during the effective period for this temporary modification.

The Commission found that the revision was necessary since achieving arsenic discharge permit limitations that result from the current arsenic standard appears to be technologically unachievable. CDOT, RTD, and the City and County of Denver (CCD) have expended significant public funds for multiple projects administered by these entities in attempting to comply with the limits.

Therefore, the Commission has determined that emergency adoption of the temporary modification of the chronic arsenic standard for Segment 14 is appropriate under these specific circumstances. The Commission finds that these amount to exigent circumstances which warrant emergency adoption of these revisions to the relevant water quality standards pursuant to section 25-8-208. The Commission further finds that these emergency revisions are imperatively necessary to preserve public health and welfare and that compliance with the procedural requirements of section 24-4-103, C.R.S., resulting in further delay, would be contrary to the public interest.

These revisions shall be effective December 13, 2011 and shall remain in effect until the effective date of permanent regulations or one year, whichever comes first. The Commission intends to reconsider this issue in its August 2012 rulemaking proceedings. The Division shall develop a proposal that the Commission will consider for notice in April 2012.

38.80 STATEMENT OF BASIS SPECIFIC STATUTORY AUTHORITY AND PURPOSE JUNE 13, 2011 RULEMAKING REGARDING TEMPORARY MODIFICATIONS; EFFECTIVE DATE JANUARY 1, 2012

The provisions of C.R S. 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; and 25-8-402; provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted in compliance with 24-4-103(4) C.R.S. the following statement of basis and purpose.

BASIS AND PURPOSE

The Commission's decision to delay consideration of nutrient criteria until March 2012, resulted in cancelation of the December 2011 review of temporary modifications. Accordingly, the Commission considered the expiration dates of temporary modifications expiring on or before December 31, 2012 in a written comment rulemaking. The following temporary modifications were deleted because they will have expired as of the effective date of this revision:

Upper So Platte segments 5c, 10a, 11b, and 16a (NH_3)
Cherry Creek segment 4 (NH_3)
Boulder Creek segments 7b, 9, and 10 (NH_3)
St Vrain Creek segments 3 and 6 (NH_3)
Middle So Platte segment 3a (NH_3)
Big Thompson River segments 5 and 9 (NH_3)
Cache la Poudre River segment 12, 13a, and 22 (NH_3)
Lower So Platte River segments 1 and 2b (NH_3)

Big Dry Creek segment 5: The Commission deleted Table 3 because the temporary modifications expired on January 1, 2010. The temporary modification for nitrate and nitrite had been applied to the Walnut Creek portion of segment 5. The temporary modifications for benzene, carbon tetrachloride, 1,2-dichloroethane, 1,1-dichloroethene, tetrachloroethylene, and trichloroethylene were applied to all of segment 5. All other organic and radiologic parameters are covered by the Basic Standards.

The Commission also modified the standards table to remove reference to Table 3 and to remove the words "Goal qualifier for all use classifications, expires 12/31/09".

38.81 STATEMENT OF BASIS SPECIFIC STATUTORY AUTHORITY AND PURPOSE AUGUST 13, 2012 RULEMAKING; EFFECTIVE DATE DECEMBER 31, 2012

The provisions of C.R S. 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; and 25-8-402; provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted in compliance with 24-4-103(4) C.R.S. the following statement of basis and purpose.

BASIS AND PURPOSE

The Commission adopted on a permanent basis the revisions to Regulation # 38, Classifications and Numeric Standards for South Platte River Basin, Laramie River Basin Republican River Basin, Smoky Hill River Basin, which had been adopted on an emergency basis on December 13, 2011, and extended the expiration date of the temporary modification. The Commission is readopting the rationale for that temporary modification at this time, while anticipating a future review of arsenic criteria and standards in an April 2013 rulemaking

Prior to the December 2011 emergency rulemaking, the Colorado Department of Transportation ("CDOT"), the Regional Transportation district ("RTD") and the City and County of Denver ("Denver"), requested an emergency adoption of a revision to the water-plus-fish (W+F) arsenic standard for Segment 14 of the Upper South Platte River Basin in order to facilitate the issuance of Colorado

Discharge Permit System (CDPS) permits to segment 14 with chronic arsenic effluent limitations that are achievable with current and reasonable treatment capabilities.

In August of 2005 the Commission adopted revisions to the Basic Standards and Methodologies for Surface Waters (Regulation #31) to add a W+F table value standard of for chronic arsenic of 0.02 micrograms per liter (µg/L). W+F standards are numeric human health-based water quality standards that are calculated protective values that take into account the combined exposure from the pollutant in drinking water and the pollutant accumulated in fish flesh. This criterion was generally adopted for water bodies with drinking water and aquatic life class 1 use designations in the basin hearings between 2006 and 2009.

The proposal on December 13, 2011 was to revise the W+F water quality standard for arsenic on Segment 14 from 0.02 micrograms per liter (µg/L) to a range of 0.02 –7.6 µg/L. The Division proposed the revision to the chronic arsenic standard for Segment 14 based on circumstances where entities that have been assigned chronic arsenic effluent limitations in a CDPS permit at or near the 0.02 µg/L cannot achieve their chronic arsenic effluent limitations with treatment that may be beyond the current reasonable limit of technology. The Division examined the basis for the W+F standard and provided the Commission a policy option for an alternate W+F table value standard for chronic arsenic that it believed would be protective of human health for Segment 14 (7.6 is below the Safe Drinking Water Act protective level of 10 µg/L). Testimony was presented that as a practical matter, 3.0 µg/L is the lowest level that is technologically achievable. Testimony was also presented that there is uncertainty regarding the arsenic level necessary to protect the W+F use and regarding the extent to which the arsenic levels are reversible (i.e., whether the levels in the ground water and the river are natural or human-induced irreversible).

As a matter of policy, the Commission decided that since the technologically achievable arsenic level is less stringent than the calculated W+F criterion, the W+F criterion for segment 14 will be a hybrid, based on a range of 0.02-3.0 µg/L. The first number in the range shall be the strictly health-based value, based on the Commission's established methodology for human health-based standards that protect against the combined exposure of drinking water and eating fish. The second number in the range is the technologically achievable value of 3.0 µg/L. The Commission adopted this revision in the form of a temporary modification in recognition of the uncertainty regarding use-protective values and achievability. In the emergency action, the temporary modification was adopted with an expiration date of December 12, 2012. In this rulemaking, the Commission is extending the expiration date to October 31, 2013. The Commission anticipates that there will be a rulemaking hearing in April 2013 to address the substantive issues regarding arsenic criteria in Regulation #31 and arsenic standards in all basins. The extended expiration date is intended to provide time for that additional review.

Control requirements, such as discharge permits effluent limitations, shall be established using the first number in the range as the ambient water quality target, provided that no effluent limitation shall require an "end of pipe" discharge level more restrictive than the second number in the range during the effective period for this temporary modification.

The Commission found that the revision was necessary since achieving arsenic discharge permit limitations that result from the current arsenic standard appears to be technologically unachievable. CDOT, RTD, and the City and County of Denver (CCD) have expended significant public funds for multiple projects administered by these entities in attempting to comply with the limits.

38.82 STATEMENT OF BASIS SPECIFIC STATUTORY AUTHORITY AND PURPOSE: OCTOBER 9, 2012 RULEMAKING FOR BOULDER CREEK SEGMENT 9; EFFECTIVE MARCH 1, 2013

The provisions of C.R S. 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; and 25-8-402; provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted the following statement of basis and purpose pursuant to C.R.S 24-4-103(4).

BASIS AND PURPOSE

The Commission adopted a temporary modification for arsenic set at “current condition” for Boulder Creek Segment 9, pursuant to Regulation 31.7(3)(a)(i)&(ii)(A), (B), and (C). This temporary modification is set to expire on 6/30/2017.

Monitoring data indicate that ambient concentrations of arsenic in Segment 9 exceed “water + fish” table value standards and there is significant uncertainty as to the source and cause (i.e., naturally occurring or irreversible human-induced) of elevated arsenic concentrations in the stream. There is also uncertainty regarding the water quality standard necessary to protect current and future uses. Finally, there is uncertainty regarding the timing of implementing attainable source controls or treatment. The City of Boulder, which is authorized to discharge into Segment 9 under a CDPS permit, demonstrated that it has a predicted water quality effluent limit compliance problem.

The temporary modification is set at “current condition.” The Commission intends that, when implementing this temporary modification in a CDPS permit and interpreting the term “current condition,” the Division will assess the current effluent quality, recognizing that it changes over time due to variability in treatment plant removal efficiency and influent loading from natural sources in the raw drinking water sources, industrial, commercial, and residential sources. Maintaining the current condition will include maintaining total loading from commercial and industrial contributors at the levels existing on the date of adoption of the temporary modification.

The Commission found that there was substantial uncertainty about the arsenic standard necessary to protect the uses, and the extent to which existing arsenic concentrations are the result of natural or irreversible human-induced conditions. Therefore, this temporary modification falls within both type A and B under Regulation #31, section 31.7(3)(a)(ii). The Commission adopted this temporary modification to allow time for the City of Boulder to continue a comprehensive monitoring program to identify the sources of arsenic in the City of Boulder raw drinking water sources and Segment 9, and to determine the extent these sources represent naturally occurring or irreversible human-induced conditions. The adopted temporary modification also will allow time to evaluate a recalculated arsenic standard for possible future adoption as a site-specific standard for Segment 9.

PARTIES TO THE RULEMAKING HEARING

1. City of Boulder
2. Environmental Protection Agency
3. Littleton/Englewood Wastewater Treatment Plant

38.83 STATEMENT OF BASIS SPECIFIC STATUTORY AUTHORITY AND PURPOSE DECEMBER 10, 2012 RULEMAKING; FINAL ACTION JANUARY 14, 2013 EFFECTIVE DATE JUNE 30, 2013

The provisions of C.R S. 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; and 25-8-402; provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted in compliance with 24-4-103(4) C.R.S. the following statement of basis and purpose.

BASIS AND PURPOSE

Pursuant to the requirements in the Basic Standards (at 31.7(3)), the Commission reviewed the status of temporary modifications scheduled to expire before December 31, 2014, to determine whether the temporary modification should be modified, eliminated or extended.

Temporary modifications standards on two segments were reviewed. The Basic Standards Statement of Basis for the 2010 hearing records the Commission’s intent regarding temporary modifications. (see 31.48 at I.A)

Since temporary modifications have no impact on other aspects of Colorado's water quality management program such as the 303(d) list, the Non-point Source Program or the Total Maximum Daily Load (TMDL) Program, it is fitting that temporary modifications only be used where there are permitted discharges that would face unreasonable consequences in the absence of a temporary modification (e.g., a permit compliance schedule to meet a standard that is significantly uncertain).

No action: The Commission took no action on the temporary modifications on the following segments which are receiving waters for permitted discharges. These temporary modifications will be reviewed again at the annual temporary modification hearing in December 2013.

Upper South Platte segment 15, Ammonia, expiration date 12/31/2014
Middle South Platte segment 1a, Ammonia, expiration date 12/31/2014.

PARTIES TO THE RULEMAKING HEARING

1. City of Pueblo
2. Seneca Coal Company
3. Tri-State Generation and Transmission Association
4. Eagle River Water and Sanitation District
5. Board of County Commissioners for the County of Gunnison, Colorado
6. Colorado Parks and Wildlife
7. High Country Citizens' Alliance
8. Bill Thiebaut, DA for 10^{th} Judicial District and the Office of the DA for the 10^{th} Judicial District
9. City of Colorado Springs
10. Town of Crested Butte
11. Upper Gunnison River Water Conservancy District
12. U.S. Energy Corp.
13. Gunnison County Stockgrowers Association, Inc.
14. Environmental Protection Agency
15. Cherokee Metropolitan District
16. Fountain Sanitation District
17. Lower Fountain Metropolitan Sewage Disposal District
18. Monument Sanitation District
19. Palmer Lake Sanitation District
20. Town of Monument
21. Academy Water and Sanitation District
22. Tri-Lakes Wastewater Treatment Facility
23. Town of Palmer Lake
24. Woodmoor Water and Sanitation District No. 1
25. Upper Monument Creek Regional Wastewater Treatment Facility

38.84 FINDINGS IN SUPPORT OF ADOPTION OF EMERGENCY REVISIONS TO REGULATION #38, CLASSIFICATIONS AND NUMERIC STANDARDS FOR SOUTH PLATTE RIVER BASIN, LARAMIE RIVER BASIN REPUBLICAN RIVER BASIN, SMOKY HILL RIVER BASIN (5 CCR 1002-38)

Pursuant to sections 25-8-208, 25-8-402(5), and 24-4-103(6), C.R.S., the Commission adopted a revision to Regulation #38, Classifications and Numeric Standards for South Platte River Basin, Laramie River Basin Republican River Basin, Smoky Hill River Basin on May 13, 2013.

The United States Fish and Wildlife Service, Rocky Mountain Arsenal National Wildlife Refuge ("Refuge") proposed to split Upper South Plate segment 22, and create a new segment, Upper South Platte River segment 22b, that encompasses the lakes and reservoirs on the Refuge property. These lakes are known as Lake Mary, Lake Ladora, Upper Derby Lake, and Lower Derby Lake. The new segment will retain the Aquatic Life Warm 2, Recreation E, and Agriculture uses and standards, but the Water Supply use classification will be removed. The Refuge provided evidence to the Commission that there is no water supply use from the lakes and that a water supply use is precluded by the 1989 Federal Facilities Agreement for the Arsenal. In addition, consumption of fish from these leakes is precluded by this same Agreement and by 50 C.F.R. § 32.25.

In 1998, as a matter of public interest, the United States entered into an agreement to trade its water rights delivered by the Highline Canal in exchange for Denver Water reclaimed water to be delivered by September 2011. This line would deliver much of the water needed by the Refuge. In the interim, Highline water was supposed to continue. This agreement was amended to substitute potable water for Highline water, which allowed for the Highline Canal to be abandoned within the Refuge. This temporary agreement expires on September 30, 2013. Due to drought conditions, it is in the public interest to maximize the conservation of potable water supplies in the Denver Metropolitan area. The preferred alternate for the Refuge is reclaimed water delivered by Denver Water. For all intents and purposes, the reclaimed water is available for delivery right now via a pipeline that was completed in 2012. This emergency rulemaking will expedite the process for the U.S. EPA to issue an NPDES permit for the discharge of the reclaimed water to the lakes within the Refuge where it can be used for irrigation. In addition, the inability of the Refuge to utilize the reclaimed water line is negatively impacting Denver Water's ability to implement its reclaimed water system in northeast Denver.

The factors that necessitated an emergency rulemaking are: 1) due to drought conditions, it is in the public interest to maximize conservation of potable water supplies in the Denver Metropolitan area; 2) a substantial economic investment of public funds has been made in the construction of a reclaimed water pipeline to the Refuge; 3) the current contract between Denver Water and the Refuge to provide potable water to maintain the lake levels and support the prairie restoration efforts expires in September 2013 and groundwater pumping will not be sufficient for this purpose; and 4) failure to utilize the reclaimed pipeline to deliver water to the Refuge adversely affects other users of that pipeline. The Commission therefore finds that these circumstances warrant an emergency rule as necessary for the preservation of the public welfare and that compliance with notice requirements would be contrary to the public interest.

These revisions shall be effective May 13, 2013 and shall remain in effect until the effective date of permanent regulations, or one year, whichever comes first.

38.85 STATEMENT OF BASIS SPECIFIC STATUTORY AUTHORITY AND PURPOSE APRIL 8, 2013 RULEMAKING; FINAL ACTION MAY 13, 2013 EFFECTIVE DATE SEPTEMBER 30, 2013

The provisions of C.R S. 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; and 25-8-402; provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted in compliance with 24-4-103(4) C.R.S. the following statement of basis and purpose.

BASIS AND PURPOSE

In August of 2005, the Commission adopted revisions to the Basic Standards and Methodologies for Surface Waters (Regulation #31) to add a Water + Fish (W+F) table value standard for chronic arsenic of 0.02 micrograms per liter (μg/L). W+F standards are numeric human health-based water quality standards that are calculated protective values that take into account the combined exposure from the pollutant in drinking water and the pollutant accumulated in fish flesh. This criterion automatically went into effect for Aquatic Life Class 1 waters which also have a Domestic Water Supply use, when the changes to the Basic Standards became effective. It was also adopted on a segment by segment basis for Aquatic Life class 2 waters with Domestic Water Supply where the Commission determined there are fish of a catchable size of species that are normally consumed. Because of the complicated nature of the arsenic standards, specific values were added to the basin tables in the basin hearings between 2006 and 2009.

In this hearing, the Commission adopted temporary modifications for W+F chronic arsenic where a permitted discharger with a water quality–based effluent limit compliance problem exists. The adopted temporary modification is listed in the regulation tables as "As(ch)=hybrid". An explanation of the temporary modification and its expected implementation into control requirements, such as Colorado Discharge Permit System (CDPS) effluent limitations, is described in 38.6(2)(d). The temporary modification was established by the Commission to allow for a temporarily less stringent application of the chronic arsenic standard in control requirements for both existing discharges and new or increased discharges.

For discharges existing on or before 6/1/2013, the temporary modification adopted for W+F chronic arsenic is "current condition", expiring on 12/31/2021. The Commission intends that, when implementing the temporary modification of "current condition" in a CDPS permit, the Division will assess the current effluent quality, recognizing that it changes over time due to variability in treatment facility removal efficiency and influent loading from natural or anthropogenic sources, and due to changes in the influent flow and concentration over time. Maintaining the current condition will include maintaining permitted total arsenic loading to a treatment facility from arsenic contributors at the levels existing on the effective date of the temporary modification, while expressly allowing for variability in such loading due to changes in effluent quality as described above and due to changes in the influent flow and concentration over time within the permitted design flow of that facility. The Commission understands that the Division's past practice implementing this requirement in permits has been through reporting regarding the arsenic loading to the facility, and not through numeric effluent limitations. The Commission intends that the Division will continue this practice. For facilities that lack enough representative data to quantify arsenic loading, the permittee may satisfy reporting requirements through narrative descriptions of potential sources of arsenic. No permit action shall be approved that allows an increase in permitted total arsenic loading to a treatment facility. The expiration date of the temporary modification was set at 12/31/21 to allow for CDPS permits that are issued prior to the effective date of anticipated changes to the chronic arsenic standard in the 2016 Basic Standards Rulemaking to not have the temporary modification expire within the term of a permit. The Commission adopted this temporary modification to allow time for the Division, dischargers and stakeholders to continue a workgroup process to resolve the uncertainty regarding the appropriateness of the W+F chronic arsenic standard of 0.02 μg/L with respect to a technologically feasible level of treatment.

For new or increased discharges that commence on or after 6/1/2013, the temporary modification adopted is As(ch) = 0.02–3.0 µg/L (Trec), expiring on 12/31/2021. The Commission decided that since the technologically achievable arsenic level is less stringent than the calculated W+F criterion, the temporary modification for new or increased discharges will be a range of 0.02-3.0 µg/L. The first number in the range is the health-based value, based on the Commission's established methodology for human health-based standards that protect against the combined exposure of drinking water and eating fish. The second number in the range is the Commission's initial determination of a technologically achievable value for arsenic, set at 3.0 µg/L. Control requirements, such as discharge permits effluent limitations, shall be established using the first number in the range as the ambient water quality target, provided that no effluent limitation shall require an "end of pipe" discharge level more restrictive than the second number in the range during the effective period for this temporary modification. The expiration date of the temporary modification was set at 12/31/21 to allow for CDPS permits that are issued prior to the effective date of anticipated changes to the chronic arsenic standard in the 2016 Basic Standards Rulemaking to not have the temporary modification expire within the term of a permit. The Commission adopted this temporary modification to allow time for the Division, dischargers and stakeholders to continue a workgroup process to resolve the uncertainty regarding the appropriateness of the W+F chronic arsenic standard of 0.02 µg/L with respect to a technologically feasible level of treatment.

The technologically feasible level of 3.0 µg/L for arsenic is based upon testimony heard by the Commission at the December 13, 2011 Emergency Revisions to Regulation #38. At the December 13, 2011 hearing, the Commission determined, as a practical manner, that 3.0 µg/L is the lowest level that is technologically achievable for common types of water treatment facilities. At the April 8, 2013 Rulemaking, the Commission heard testimony that concurred with the finding from December 13, 2011 that an initial reasonable lower limit of treatment technology for arsenic is 3.0 µg/L, pending further investigation by the Division, dischargers and stakeholders. The Division intends to address the uncertainty of the W+F chronic arsenic standard with respect to a technologically feasible level of treatment through a continued workgroup process, and propose a revised W+F chronic arsenic standards as part of the 2016 Basic Standards Rulemaking Hearing

Temporary modifications were adopted on the following segments. The segments identified have the previously adopted W+F chronic arsenic standard of 0.02 µg/L and an identified CDPS permit or permits that discharge immediately to or directly above the identified segment.

Upper South Platte River 1a
Upper South Platte River 2a
Upper South Platte River 2b
Upper South Platte River 3
Upper South Platte River 4
Upper South Platte River 5b
Upper South Platte River 6a
Upper South Platte River 8
Upper South Platte River 10a
Upper South Platte River 12
Upper South Platte River 13
Upper South Platte River 14
Bear Creek 1a
Bear Creek 1c
Bear Creek 1e
Bear Creek 2
Bear Creek 3
Bear Creek 6a
Clear Creek 1
Clear Creek 2a
Clear Creek 2c
Clear Creek 3a
Clear Creek 10

Clear Creek 11
Clear Creek 13a
Clear Creek 15
Clear Creek 17b
Clear Creek 21
Clear Creek 24
Boulder Creek 1
Boulder Creek 2a
Boulder Creek 2b
Boulder Creek 4a
Boulder Creek 5
Boulder Creek 9
Boulder Creek 10
Boulder Creek 14
St. Vrain Creek 1
St. Vrain Creek 2a
St. Vrain Creek 4b
St. Vrain Creek 4c
St. Vrain Creek 9
Middle South Platte River 1b
Big Thompson River 2
Big Thompson River 7
Big Thompson River 8
Big Thompson River 12
Cache La Poudre River 1
Cache La Poudre River 2a
Cache La Poudre River 2b
Cache La Poudre River 6
Cache La Poudre River 8
Cache La Poudre River 9
Cache La Poudre River 10
Laramie River 1
Laramie River 2a
Laramie River 2b
Republican River 3

PARTIES TO THE RULEMAKING HEARING

1. Colorado Mining Association
2. Union Gold, Inc.
3. Colorado Department of Transportation
4. City of Colorado Springs and Colorado Springs Utilities
5. Town of Crested Butte
6. Mountain Coal Company
7. Centennial Water and Sanitation District
8. MillerCoors, LLC
9. Plum Creek Wastewater Authority
10. Tri-State Generation & Transmission Association
11. Climax Molybdenum Company
12. Littleton/Englewood Wastewater Treatment Plant
13. Eagle River Water and Sanitation District
14. City of Boulder
15. City and County of Denver
16. Parker Water and Sanitation District
17. U.S. Energy Corp.
18. U.S. Environmental Protection Agency
19. City of Greeley

38.86 STATEMENT OF BASIS SPECIFIC STATUTORY AUTHORITY AND PURPOSE: APRIL 8, 2013 RULEMAKING FOR SAND CREEK, UPPER SOUTH PLATTE SEGMENT 16a; FINAL ACTION MAY 13, 2013; EFFECTIVE SEPTEMBER 30, 2013

The provisions of C.R S. 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; and 25-8-402; provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted the following statement of basis and purpose pursuant to C.R.S 24-4-103(4).

BASIS AND PURPOSE

The Commission considered the selenium and mercury standards for Sand Creek, segment 16a of the Upper South Platte Basin. Based on evidence presented in this hearing, the Commission divided the segment and adopted site-specific ambient-based selenium standards and a temporary modification of the mercury standard as follows.

Selenium and Resegmentation:

As determined in an earlier hearing (December 2008), the Toll Gate Creek system, a tributary to Sand Creek, has elevated levels of selenium caused by natural or irreversible human-induced sources. Ambient-based selenium standards were adopted for Toll Gate and its tributaries in that hearing. In this hearing, evidence was presented that the effects of Toll Gate Creek's contribution change the water quality characteristics of Sand Creek below its confluence with Toll Gate Creek, to the extent that the selenium levels exceed the relevant table value criteria. In this hearing, the Commission split the mainstem of Sand Creek into two segments, retaining the segment number (16a) and the table value selenium criteria above the confluence with Toll Gate Creek.

The Commission created a new segment, segment 16i, and adopted ambient quality-based site-specific standards for selenium applicable to the portion of Sand Creek below Toll Gate Creek. The ambient quality-based standards are based on the 85th percentile (chronic) and the 95th percentile (acute) of the selenium data collected at two specific instream monitoring locations: Sand Creek at the Peoria Street crossing (which has a station identifier of SWA) and Sand Creek just upstream of the Union Pacific Railroad crossing (which has a station identifier of SW1); each is upstream of a wastewater outfall. The most recent five years of data were used since there has been a persistent and significant increase in the concentration of selenium since 2008. Two assessment locations are appropriate since the selenium concentrations consistently decline along Sand Creek, probably due to influx of lower concentration groundwater, however the mechanism has not been identified. It is the Commission's intent to maintain this natural or human-induced irreversible pattern of water quality, and not to inadvertently create assimilative capacity.

The Commission added assessment locations to section 38.6(4)(f) to record the assessment strategy for ambient quality-based site-specific standards for selenium applicable to Sand Creek segment 16i. It is the Commission's intent that attainment of the standard is to be assessed separately with data from two specific monitoring locations (SWA and SW1). Further, it is the intent of the Commission that selenium effluent limits for any permitted discharge be calculated to assure attainment of the criteria only at the assessment location (SWA or SW1) closest to the discharge, even if the closest assessment location is upstream.

Mercury:

The Commission adopted a temporary modification of the mercury standard for the new segment 16i (the mainstem of Sand Creek from Toll Gate Creek to the confluence with the South Platte River). There have been several instances of total mercury concentrations in Sand Creek below Suncor's outfall exceeding the water quality standard. In addition, Suncor presented evidence that it will have a compliance problem with the water quality-based effluent limit based on the existing standard.

Mercury is a bioaccumulative pollutant and fish tissue is the endpoint of concern. The rate of bioaccumulation is variable, so there is uncertainty regarding the total mercury water column standard necessary to maintain fish tissue concentrations below the human health criteria of 0.3 mg/kg.

Suncor agreed to undertake a study to resolve the uncertainty, with the following conditions, to ensure that the fish tissue data collected is representative of the potential human health exposure to mercury:

- Fish tissue will be sampled multiple times per year, during variable flow conditions and seasons.
- Appropriate sampling methods will be used for capturing the larger fish individuals.
- The largest individuals caught will be sampled for each species at site SW2-1.
- Fish tissue samples will be collected as skinless filets, where possible.
- Suncor will submit an annual progress report with fish tissue data to the Division every year beginning in December 2013.
- Suncor will continue to collect monthly water quality samples and analyze them for total mercury at SW2-1 using the low-level detection method.
- Suncor will work with the Division and EPA to calculate the bioaccumulation factor for Sand Creek and to develop a site-specific standard.

The Temporary Modification is set to expire on 6/30/2017. This anticipates that Suncor will report progress to the Commission in the December 2015 annual Temporary Modification hearing, and that the uncertainty will be resolved during the December 2016 annual hearing. The Commission is adopting the mercury temporary modification for the newly created Segment 16i with the notation of “current condition” rather than a numeric value. It is the Commission’s intent that this will preserve the status quo during the term of the temporary modification. The Commission does not intend that this temporary modification will apply to new facilities or in Preliminary Effluent Limitations.

PARTIES TO THE RULEMAKING HEARING

1. Suncor Energy (U.S.A.)
2. City of Aurora
3. Colorado Division of Parks and Wildlife
4. U.S. Environmental Protection Agency
5. Colorado Stone, Sand & Gravel Association

38.87 STATEMENT OF BASIS SPECIFIC STATUTORY AUTHORITY AND PURPOSE MARCH 11, 2014 RULEMAKING; EFFECTIVE DATE APRIL 30, 2014

The provisions of C.R S. 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; and 25-8-402; provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted in compliance with 24-4-103(4) C.R.S. the following statement of basis and purpose.

BASIS AND PURPOSE

The Commission adopted on a permanent basis the revisions to Regulation # 38, Classifications and Numeric Standards for South Platte River Basin, Laramie River Basin Republican River Basin, Smoky Hill River Basin, which had been adopted on an emergency basis on May 13, 2013.

In that rulemaking, the United States Fish and Wildlife Service, Rocky Mountain Arsenal National Wildlife Refuge (“Refuge”) proposed to split Upper South Platte segment 22, and create a new segment, Upper South Platte River segment 22b, that encompasses the lakes and reservoirs on the Refuge property. These lakes are known as Lake Mary, Lake Ladora, Upper Derby Lake, and Lower Derby Lake. The new segment will retain the Aquatic Life Warm 2, Recreation E, and Agriculture uses and standards, but the Water Supply use classification will be removed.

In this proceeding, the Commission removed the DO spawning and aluminum standards that were added during the previous action and replaced the chronic arsenic standard of 150 ug/L with 100 ug/L, consistent with the agriculture use.

The Refuge provided evidence to the Commission that there is no water supply use from the lakes and that a water supply use is precluded by the 1989 Federal Facilities Agreement for the Arsenal. In addition, consumption of fish from these lakes is precluded by this same Agreement and by 50 C.F.R. § 32.25.

PARTIES TO THE RULEMAKING HEARING

1. U.S. Fish and Wildlife Service, Rocky Mountain Arsenal National Wildlife Refuge
2. Denver Water

38.88 STATEMENT OF BASIS SPECIFIC STATUTORY AUTHORITY AND PURPOSE DECEMBER 9, 2013 RULEMAKING; FINAL ACTION MARCH 11, 2014 EFFECTIVE DATE JUNE 30, 2014

The provisions of C.R S. 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; and 25-8-402; provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted in compliance with 24-4-103(4) C.R.S. the following statement of basis and purpose.

BASIS AND PURPOSE

Pursuant to the requirements in the Basic Standards (at 31.7(3)), the Commission reviewed the status of Temporary Modifications scheduled to expire before December 31, 2015, to determine whether the Temporary Modification should be modified, eliminated or extended. Temporary Modifications standards on twenty-six segments were reviewed.

Allow to expire, delete: The Commission took no action on the Temporary Modification of the selenium standard on Upper South Platte segment 14. This Temporary Modification was deleted from the table because it expires 12/31/2013.

No action, will be reviewed again: The Commission took no action on the temporary modifications on the following segments. These temporary modifications will be reviewed again at the annual temporary modification hearing in December 2014.

- Site-specific compliance with ammonia criteria: Temporary Modifications of the ammonia standards for Upper South Platte segment 15 and Middle South Platte segment 1a were granted to allow time for compliance with revised ammonia standards. Metro Wastewater Reclamation District presented evidence that they are on schedule to make water quality improvements and that the Temporary Modification will no longer be needed after December 2014.

- Biotic ligand model-based copper Temporary Modifications: Individual SP CURE members and other interested regulated entities presented evidence that progress is being made to develop a biotic ligand model-based site specific standards. They are on schedule to make water quality standards proposals for consideration by the Commission in the basin-wide hearing in June 2015.

Upper South Platte segments 14, 15, 16g and 16i
Clear Creek segments 14a, 14b and 15
Boulder Creek segment 9

- Other Temporary Modifications: The following Temporary Modifications were reviewed and the Commission took no action. They will be reviewed again at the annual temporary modification hearing in December 2014, and again at the the basin-wide hearing in June 2015.

  Upper South Platte segment 14 temperature
  Upper South Platte segment 15 temperature
  Upper South Platte segment 16g temperature
  Bear Creek segment 1c chlorophyll a and phosphorus
  Clear Creek segment 2a cadmium and zinc
  Clear Creek segment 2c copper
  Clear Creek segment 9a copper
  Clear Creek segment 11 cadmium
  Clear Creek segment 13b cadmium and temperature
  Clear Creek segment 14a temperature
  Clear Creek segment 14b temperature
  Clear Creek segment 15 temperature
  Boulder Creek segment 8 selenium
  St Vrain Creek segment 2b copper
  St Vrain Creek segment 6 selenium
  Middle South Platte segment 1a selenium
  Middle South Platte segment 4 pH
  Big Thompson River segment 2 (Wapiti Meadows) DO, E coli, ammonia, nitrate boron, cadmium, copper, lead, mercury, nickel, selenium, silver and zinc
  Big Thompson River segment 4b selenium
  Big Thompson River segment 5 selenium
  Big Thompson River segment 9 selenium
  Cache La Poudre River segment 11 selenium
  Cache La Poudre River segment 13b selenium
  Lower South Platte segment 1 selenium

Site Specific Selenium Standards: The Commission considered site-specific ambient-based selenium standards for Upper South Platte Segment 16g (Marcy Gulch) and similar nearby tributaries to South Platte River Segment 14. Evidence submitted by Centennial Water & Sanitation District showed that selenium loading to Segment 16g results from natural sources and is not exacerbated by point source discharges or reversible anthropogenic factors. Marcy Gulch and nearby tributaries cross areas of selenium-bearing shale and groundwater that comes into contact with the shale increases in selenium concentration, which in turn contributes selenium when the groundwater enters the streams.

- Marcy Gulch (segment 16g): Although the Centennial sewer system does not have a large amount of inflow and infiltration, some groundwater with high selenium concentrations enters the system from residential areas within the Marcy Gulch drainage. This inflow increases the Centennial WWTP effluent selenium concentration at times to concentrations that exceed the table value standards. Centennial was not able to identify any industrial sources of selenium. Treatment at the Centennial WWTP results in incidental removal of selenium, and therefore further reductions in inflow and infiltration to control effluent selenium concentration would result in a loss of incidental treatment and a net increase in selenium loading to Marcy Gulch and the South Platte River. The Commission concluded that the contribution of selenium from groundwater to Marcy Gulch and to the Centennial WWTP is a natural or irreversible human-induced condition. Therefore, for Segment 16g, the Commission adopted site-specific ambient-based chronic and acute dissolved selenium standards. The chronic (13 µg/L) and acute (21 µg/L) standards are based on the 85th and 95th percentiles, respectively, of samples taken the same day from sites located upstream and downstream of the Centennial WWTP. In order to preserve the wide spatial and temporal variability of selenium concentrations in the segment and to protect against deterioration, the Commission defined assessment methods at Reg. 38.6(4)(g) in order to ensure that future assessment is consistent with the methods used to derive the standards. The Commission removed the temporary modification for selenium of “current conditions” that had previously been in place for Segment 16g

- Nearby tributaries Lee Gulch, Little’s Creek Big Dry Creek and Little Dry Creek, (segment 16j): The Commission also re-segmented Upper South Platte Segment 16c (All tributaries to the South Platte River from Chatfield Reservoir to Big Dry Creek), to facilitate the adoption of site-specific ambient-based selenium standards for several tributaries to the South Platte River near Marcy Gulch. The evidence submitted by Centennial, the City of Littleton and the City of Englewood demonstrated that each of the tributaries have natural or irreversible human-induced elevated selenium concentrations, that result from regional geology similar to that found in Marcy Gulch and in the Toll Gate Creek drainages. None of the tributaries have point source discharges contributing to selenium concentrations. Urbanization of the area is an irreversible condition that could contribute to an increase in groundwater coming into contact with selenium-bearing shale. The Commission created new Upper South Platte Segment 16j with site-specific ambient-based selenium standards as follows: Lee Gulch Se(ac/ch)=(TVS/10), Little’s Creek, Se(ac/ch)=(TVS/6), Big Dry Creek Se(ac/ch)=(26/23), and Little Dry Creek Se(ac/ch)=(TVS/11). The selenium standards for Segment 16j were calculated using data from locations near the confluence of each tributary with the South Platte River. The Commission specified assessment locations at Reg. 38.6(4)(h) in order to ensure that future assessment is consistent with the methods used to derive the standards. Other than the selenium standards, Segment 16j inherits the use classifications, antidegradation designation, and water quality standards from Segment 16c because the evidence was limited to selenium standards.

Clear Creek segment 13b (North Fork of Clear Creek): The Commission considered the temporary modification for Clear Creek segment 13b. Black Hawk/Central City Sanitation District and the City of Black Hawk (“BH/CCSD”) proposed extending the temporary modification for cadmium in Clear Creek Segment 13b. Evidence submitted by BH/CC shows that the metals concentrations in Clear Creek are the result of a combination of natural and human-induced conditions which are currently the focus of Superfund cleanup work. Additional cleanup is planned as part of OU4, including the construction of a new mine wastewater treatment plant to treat discharges from the National Tunnel, Gregory Gulch and Gregory Incline. Additional cleanup is also planned for the Quartz Hill mine tailings pile, including re-grading and capping. These efforts are not expected to be completed until 2015 at the earliest, and are expected to result in significant water quality improvements within Clear Creek, segment 13b. The degree of improvement is still uncertain and will not be known until after the treatment measures are implemented and the improvements are quantified.

The BH/CCSD has a predicted water quality-based effluent limit compliance problem for cadmium, however they do not have a predicted compliance problem for the other metals. Therefore, the Commission deleted the temporary modifications for manganese, zinc and iron. In addition, the

Commission extended the expiration date of the temporary modification for dissolved cadmium on Clear Creek Segment 13b to December 31, 2018, to allow time for the treatment measures to be implemented and the improvements to be quantified. The temporary modifications will be reviewed in the 2016 and 2017 annual temporary modification review hearing. A 2018 expiration date will allow for a 2016 review of the status of the temporary modification prior to the BH/CCSD permit renewal in 2017, and may lead to an extension of the temporary modification if that is determined appropriate based on information available at the 2016 review.

PARTIES TO THE RULEMAKING HEARING

1. Rio Grande Silver, Inc.
2. Black Hawk/Central City Sanitation District and City of Black Hawk
3. Centennial Water & Sanitation District, City of Littleton, City of Englewood
4. Colorado Parks and Wildlife
5. Homestake Mining Company of California
6. Metro Wastewater Reclamation District
7. South Platte Coalition for Urban River Evaluation (SP CURE)
8. City of Boulder
9. Seneca Coal
10. Tri-State Generation and Transmission Association
11. City of Fort Collins
12. MillerCoors, LLC
13. Environmental Protection Agency
14. Barr Lake and Milton Reservoir Watershed Association
15. Plum Creek Water Reclamation Authority

38.89 STATEMENT OF BASIS SPECIFIC STATUTORY AUTHORITY AND PURPOSE DECEMBER 8, 2014 RULEMAKING; FINAL ACTION JANUARY 12, 2015; EFFECTIVE DATE JUNE 30, 2015

The provisions of C.R S. 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; and 25-8-402; provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted in compliance with 24-4-103(4) C.R.S. the following statement of basis and purpose.

BASIS AND PURPOSE

Pursuant to the requirements in the Basic Standards (at 31.7(3)), the Commission reviewed the status of temporary modifications scheduled to expire before December 31, 2016, to determine whether the temporary modification should be modified, eliminated or extended.

No action: The Commission took no action on the temporary modifications on the following segments. Unless otherwise noted, these temporary modifications will expire 12/31/2015. The basin-wide review hearing is scheduled for June 2015 and it is anticipated that any remaining issues will be resolved in that hearing process.

Upper South Platte River segment 10a, copper
Upper South Platte River segment 14, copper, temperature
Upper South Platte River segment 15, ammonia, copper, temperature
Upper South Platte River segment 16g, copper, temperature
Upper South Platte River segment 16i, copper

Bear Creek Basin segment 1c, chlorophyll, total phosporus

Clear Creek Basin segment 2a, zinc , copper (expiration date of 7/01/2015)
Clear Creek Basin segment 2c, copper (expiration date of 7/01/2015)

Clear Creek Basin segment 9a, copper (expiration date of 7/01/2015)
Clear Creek Basin segment 11, copper (expiration date of 7/01/2015)
Clear Creek Basin segment 14a, copper, temperature
Clear Creek Basin segment 14b, copper, temperature
Clear Creek Basin segment 15, copper, temperature

Boulder Creek Basin segment 8, selenium (expiration date of 7/01/2015)
Boulder Creek Basin segment 9, Copper (expiration date of 7/01/2015)

St.Vrain Creek Basin segment 2b, copper
St.Vrain Creek Basin segment 6, selenium

Middle South Platte Basin segment 1a, selenium, ammonia
Middle South Platte Basin segment 4, Barr Lake and Milton Reservoirs, pH

Big Thompson River Basin segment 2, DO, E.coli, ammonia, nitrate, boron, cadmium, copper lead, mercury, nickel, selenium, silver, and zinc
Big Thompson River Basin segment 4b, selenium
Big Thompson River Basin segment 5, selenium
Big Thompson Basin River segment 9, selenium

Cache La Poudre River segment 11, selenium
Cache La Poudre River segment 12, selenium
Cache La Poudre River segment 13b, seleinum

Lower South Platte River Basin segment 1, selenium

Extension of Temporary Modification: Site-specific copper standards for Upper South Platte segment 10a based on the Biotic Ligand Model were proposed by Plum Creek Water Reclamation Authority (PCWRA). During the course of the hearing process and discussion with the Division, EPA and other parties, PCWRA modified its proposal. The Commission adopted PCWRA's modified proposal to extend the temporary modification to 12/31/2018 and change the statement of the temporary modification to "current condition". The Commission expects that PCWRA will participate in discussions in 2015 with the WQCD and other stakeholders about the FMB application of the BLM.

The Commission extended until July 1, 2020, the temporary modifications for Clear Creek Segment 2a zinc and for Segment 2c copper. The Commission found that: these segments are not currently meeting the respective standards; the Georgetown Wastewater Treatment Facility anticipates problems meeting the zinc standard; the Central Clear Creek Sanitation District Wastewater Treatment Facility anticipates problems meeting the copper standard, and; there are additional ongoing and future remedial activities for metals that could significantly contribute to achieving either or both of these standards. The extent of remedial activities by EPA and CDPHE under CERCLA and by other stakeholders is a key consideration in resolving the uncertainty as to appropriate water quality standards. The extension until July 1, 2020 is intended to allow review of these temporary modifications after the next (2019) CERCLA Five-Year Review is completed.

New Temporary Modification: The Commission adopted a new temporary modification of the ammonia standard in a portion of Upper South Platte segment 3, below the Florisant Water and Sanitation District wastewater treatment facility. Evidence was presented that the discharger has a compliance problem and there is significant uncertainty regarding whether there are feasible treatment options. This temporary modification will expire on December 31, 2017 and will be reviewed in the December 2015 annual review.

New Site-Specific Standards: The Commission adopted site-specific copper standards based on an investigation of the copper bioavailability of Segment 2 below the Upper Thompson Sanitation District's wastewater treatment plant outfall location that employed the Biotic Ligand Model (BLM) and the Fixed Monitoring Benchmark (FMB) methodologies. The original proposal introduced by UTSD was withdrawn and replaced with a compromise proposal offered by the Division. The compromise addressed some of the Division's technical concerns while UTSD avoided the added cost of preparing for another hearing and greatly reduced uncertainty about facility planning.

Based on a review of actual water chemistry and comparison of BLM results at several stations, the Commission elected to base its decision on analysis of data from Station M50, which is immediately downstream of the WWTP discharge. Stations further downstream showed less sensitivity to copper (higher FMB values), so basing the standard on Station M50 protects the downstream uses.

The data record at Station M50 included 115 sampling events from 2004 through 2014. Copper data did not meet the distributional assumption (lognormal) implicit in the BLM, but some additional processing ("trimming") yielded defensible values.

The BLM/FMB analysis resulted in acute and chronic water quality criteria for copper of 11µg/L and 7.5 µg/L, respectively, for the portion of segment 2 below the wastewater treatment plant. The Commission anticipates that these standards will be reviewed as a part of the basin hearing in June 2015, and the values may be modified based on additional technical guidance for analysis and interpretation of data supporting use of the BLM.

PARTIES TO THE RULEMAKING HEARING

1. Pioneer Natural Resources USA, Inc. and XTO Energy, Inc.
2. U.S. Energy Corp.
3. Plum Creek Water Reclamation Authority
4, Upper Clear Creek Watershed Association
5. Upper Thompson Sanitation District
6. Colorado Parks and Wildlife
7. U.S. Environmental Protection Agency
8. High Country Conservation Advocates
9. Metro Wastewater Reclamation District
10. Climax Molybdenum Company
11. Rio Grande Silver, Inc.
12. City of Pueblo
13. Tri-State Generation and Transmission, Inc.
14. Centennial Water and Sanitation District
15. Xcel Energy
16. MillerCoors
17. Seneca Coal Company
18. Peabody-Sage Creek Mining, LLC
19. City of Boulder

38.90 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; JUNE 9, 2015 RULEMAKING; FINAL ACTION AUGUST, 2014; EFFECTIVE DATE DECEMBER 31, 2015

The provisions of C.R.S. 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; and 25-8-402; provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted in compliance with 24-4-103(4) C.R.S. the following statement of basis and purpose.

BASIS AND PURPOSE:

A. Waterbody Segmentation

Some renumbering and/or creation of new segments was made to facilitate appropriate organization of waterbodies in this regulation. Renumbering and/or creation of new segments was made based on information that showed: a) the original reason for segmentation no longer applied; b) differences in water quality; and/or c) certain segments could be merged into one segment because they had similar water quality and uses. The following changes were made:

Upper South Platte River segments 11b and 12: Description of segment 12 expanded to include a portion of Bear Creek formerly in segment 11b to allow for Class 1 protection of Bear Creek.

Upper South Platte River segments 16c and 16k: Lakewood Gulch was removed from segment 16c and moved to new segment 16k to allow for Class 1 protection of Lakewood Gulch.

Cherry Creek segments 4a and 4b: This segment was split into segments 4a and 4b to allow for adoption of ambient based, site specific standards for selenium on segment 4b.

Clear Creek segments 7a and 7b: Segment 7 was split into segments 7a and 7b to separate lakes and streams.

Clear Creek segments 12a and 12b: This segment was split into segments 12a and 12b to allow for Class 1 protection of segment 12b.

Boulder Creek segments 1 and 4a: Description of segment 1 was expanded to include the tributaries and wetlands within the James Peak Wilderness Area which had been in segment 4a.

Boulder Creek segments 13 and 15: Description of lakes segment 13 was expanded to include the lakes within the James Peak Wilderness Area which had been in segment 15.

Boulder Creek segment 15: Gross Reservoir was removed from segment 15 and moved to new segment 18 to allow for Class 1 protection of Gross Reservoir.

Cache la Poudre River segments 10a and 10b: Segment 10 was split at the Larimer County Ditch to allow for Class 1 protection of the portion upstream of the Larimer County Ditch, which is now in new segment 10a. The remaining portion downstream of the Larimer County Ditch was moved to new segment 10b and remained Class 2.

Republican River segments 1, 2 and 8: Segment 2 was deleted and the lakes and reservoirs in this segment were moved to a new segment 9 at the end of the subbasin. This change was reflected in segment 8, which referenced segment 2 and now references segment 9. Bonny Reservoir was removed from the segment 1 description, as recent evidence indicates that the reservoir no longer holds water and is now managed as a state wildlife area.

Segment descriptions were also edited to improve clarity, correct typographical errors, and correct spelling errors. These changes are listed in Section S:

B. Revised Aquatic Life Use Classifications and Standards

Some segments were assigned an Aquatic Life use classification, but were missing one standard to protect that use. The Commission adopted the missing standards for the following segments:

Upper South Platte River segment: 2c (Cd ac)
Clear Creek segments: 11 (Cd trout), 17a and 17b (Ag ch trout)

Boulder Creek segments: 4d (Fe) and 5 (Fe)
Big Thompson River segment: 18 (DO)

The Commission reviewed information regarding the existing aquatic communities. Class 2 segments with high MMI scores or a wide variety of fish species were upgraded from Class 2 to Class 1.

The following segments were upgraded from Cold 2 to Cold 1:

Big Thompson River segment: 4a
Boulder Creek segment: 18 (Gross Reservoir)
Cache la Poudre River segments: 7 and 10a

The following segments were upgraded from Warm 2 to Warm 1:

Big Thompson River segment: 4b
Cache la Poudre River segments: 11 and 12
Republican River segment: 5

The Commission reviewed all Class 2 segments that have fish that are "of a catchable size and which are normally consumed and where there is evidence that fishing takes places on a recurring basis." Water + fish or fish ingestion standards were applied to the following segments:

Warm Class 2:

Upper South Platte River segment: 16i
Cherry Creek segment: 6
Clear Creek segment: 14b
Boulder Creek segment: 17
St. Vrain Creek segment: 12
Middle South Platte River segments: 1a, 1b, 3a and 4
Big Thompson River segments: 13 and 17
Lower South Platte River segment: 1

C. Recreation Classifications and Standards

The Commission reviewed information regarding the current Recreation use classifications and evidence pertaining to actual or potential primary contact recreation. In addition, newly created segments were given the same Recreation use classification as the segment from which they were split, unless there was insufficient evidence to support keeping that classification, or evidence to show that the existing use classification was inappropriate.

Based upon evidence that portions of these segments are publicly accessible and/or accessible to families who live in the area or visitors to public recreation lands in these segments, it was determined that there is the potential for primary contact recreation, including water play by children. The following segments with year-round or seasonal Recreation N standards were upgraded to Recreation P:

Lower South Platte River segment: 2a
Republican River segment: 6

Based upon evidence that portions of these segments are publicly accessible and located in a developed area where there is easy access for children, it was determined that primary contact recreation is expected to occur. The following segments with year-round or seasonal Recreation N standards were upgraded to Recreation E:

Clear Creek segments: 16b, 17a and 18b

The following segments with year-round or seasonal Recreation U standards were upgraded to Recreation P:

Lower South Platte River segment: 4

D. Water Supply Use Classification and Standards

The Commission added a Water Supply use classification and standards where the evidence demonstrated a reasonable potential for a hydrological connection between surface water and alluvial wells used for drinking water. The Water Supply use classification and standards were added to the following segments:

Upper South Platte River segments: 7, 11a, and 16j
Cherry Creek segments: 4a and 4b
Clear Creek segment: 5
Boulder Creek segments: 7a and 7b
Middle South Platte River segments: 3a and 5a
Big Thompson River segments: 4b and 9
Lower South Platte River segments: 2a and 3

A review of the segments with an existing Water Supply use classification showed that some segments were missing one or more standards to protect that use. The full suite of Water Supply standards was added to the following segments:

Cherry Creek segment: 5
St. Vrain Creek segment: 5
Big Thompson River segments: 17 and 19
Cache la Poudre segment: 21
Lower South Platte River segments: 4 and 5
Republican River segment: 8

Three segments have one or more numeric standards for water supply, but do not have the Water Supply use classification. The Division searched for alluvial wells on these segments and determined that there is not an existing Water Supply use. Therefore, the Water Supply standards were removed from the following segments:

Clear Creek segment: 13b
Boulder Creek segment: 8
St. Vrain Creek segment: 6

E. Agriculture Use Classification and Standards

A review of the segments with an existing Agriculture use classification showed that some segments were missing one or more standards to protect that use. The full suite of Agriculture standards were added to the following segments:

Clear Creek segments: 13b, 16b, 22 and 25
Big Dry Creek segments: 1 and 3

Molybdenum: In 2010, the Commission adopted a new standard for molybdenum to protect cattle from the effects of molybdenosis. The table value adopted at that time was 300 µg/l, but included an assumption of 48 mg/day of copper supplementation to ameliorate the effects of molybdenosis. State and local experts on cattle nutrition indicated that copper supplementation in the region is common, but is not universal. Therefore, the copper supplementation assumption was removed from the equation, which then yielded a standard of 160 µg/l. That standard was applied in recent basin reviews.

In this hearing, the Commission adopted a standard of 150 µg/L, based on an improved understanding of the dietary- and water-intake rates for various life-stages of cattle. This standard is protective of all life-stages of cattle (including lactating cows and growing heifers, steers and bulls) at all times of year.

The Agriculture table value assumes that the safe copper:molybdenum ratio is 4:1. Food and water intake is based on growing heifers, steers, and bulls consuming 6.7 kg/day of dry matter and 56.8 liters of water per day. Total copper and molybdenum intakes are calculated from the following equations:

Cu intake mg/day = [([Cu] forage, mg/kg) x (forage intake, kg/day)] + [([Cu] water, mg/l) x (water intake, L/day)] + (Cu supplementation, mg/day)

Mo intake mg/day = [([Mo] forage, mg/kg) x (forage intake, kg/day)] + [([Mo] water, mg/l) x (water intake, L/day)] + (Mo supplementation, mg/day)

The assumed values for these equations are as follows:

[Cu] forage = 7 mg/kg, [Mo] forage = 0.5 mg/kg, forage intake = 6.7 kg/day, [Cu] water = 0.008 mg/L, [Mo] water = 0.375 mg/L, water intake = 56.8 L/day, Cu supplementation = 0 mg/day, Mo supplementation = 0 mg/day.

A molybdenum standard of 150 µg/l was adopted for all segments in Regulation 38 that have an Agriculture use classification, and where livestock or irrigated forage are present or expected to be present. The following segments do not have an Agriculture or a Water Supply use classification. No molybdenum standard was applied to these segments:

Clear Creek segments: 7a, 7b and 8

The following segments (or portions of segments) have an Agriculture use classification and a Water Supply use, but livestock or irrigated forage are not expected to be present. A molybdenum standard of 210 µg/l was applied to these segments:

Upper South Platte River segment: 22a (McLellan Reservoir)
Clear Creek segments: 4 and 5

Grazing of cattle has recently occurred near Segment 5 (West Clear Creek) on the Buckland property (Guanella Ranch) just west of Empire, CO. However, only limited access exists for cattle to reach West Clear Creek, and discussions between Climax and the property owners have resulted in an agreement to eliminate access and fence cattle out of the creek prior to any future grazing. Because of this agreement, no livestock use of the Segment 5 is expected to occur in the future.

The following segments have an Agriculture use classification and no Water Supply use, but livestock or irrigated forage are not expected to be present. No molybdenum standard was applied to these segments:

Upper South Platte River segment: 16g
Clear Creek segment: 25

F. Changes to Antidegradation Designation

The Commission reviewed all Warm 2 segments designated Use Protected to determine if the Use Protected designation was still warranted. Based upon available water quality data that meet the criteria of 31.8(2)b, the Use Protected designation was removed from the following segment:

Cache la Poudre River segment: 13a

The Commission reviewed all Warm 1 segments designated Use Protected to determine if the Use Protected designation was still warranted. Based upon available water quality data that meet the criteria of 31.8(2)b, the Use Protected designation was removed from the following segment:

Boulder Creek segment: 7a

The Commission reviewed all Reviewable segments to determine if this Antidegradation designation was still warranted. Based upon available water quality data that fails to meet the criteria of 31.8(2)b, the Reviewable designation was removed and replaced with Use Protection in the following segment:

St. Vrain Creek segment: 4a

The following segments with Outstanding Waters designations were expanded to include the James Peak Wilderness Area:

Boulder Creek segments: 1 and 13

G. Ambient Standards

Ambient standards are adopted where natural or irreversible man-induced conditions result in exceedances of table value standards. The Commission reviewed the information that is the basis for these standards, as well as any new information that would indicate whether they are still appropriate, need to be modified, or should be removed.

New ambient-based standards were adopted for the following segments:

Cherry Creek segment 4b: Cottonwood Water and Sanitation District (CWSD) presented evidence in the form of a use attainability analysis (UAA) that the natural and irreversible human-induced ambient selenium concentrations in specific portions of Cottonwood Creek, upper Lone Tree Creek and middle Windmill Creek exceed the relevant table value standard. The UAA established that the highest attainable use in these reaches includes a low rate of fish deformity due to the naturally elevated levels of selenium. The Commission created a new Cherry Creek Segment 4b, defined as "Cottonwood Creek, including all tributaries and wetlands, from the source to Cherry Creek Reservoir" to facilitate the adoption of site-specific ambient-based selenium standards for specific portions of this small watershed, which are adequate to protect the classified, attainable use.

The Commission specified assessment locations at 38.6(4)(i) to ensure that the sites with water quality currently equal to or better than table value standards are protected. Multiple assessment locations are appropriate because the selenium concentrations decline abruptly and attain TVS standards in the lower reaches of Lone Tree, Cottonwood and Windmill Creeks. These assessment locations act as demarcation of the only portions where the elevated selenium levels are allowable. Where selenium levels are currently naturally elevated, concentrations are significantly higher during the winter months (October through February) and therefore seasonal standards were adopted to recognize the natural seasonal variation of selenium concentrations. While data to characterize summer selenium concentrations were limited on Windmill Creek, seasonal ambient standards were adopted based on evidence of a consistent seasonal selenium pattern observed in adjacent drainages.

It is the Commission's intent that the current natural in-channel processes (e.g., wetlands, infiltration) that remove the selenium are protected, with the intent that lower Cottonwood, Windmill, and Lone Tree Creeks (as defined in the assessment locations) continue to remain in attainment of TVS. The Commission notes that these natural processes that reduce selenium are currently maintained at very low flows. When implementing these standards, the Division shall assure that downstream uses and standards are protected. Evidence within the UAA was limited to selenium and therefore use classifications, anti-degradation designation, and water quality standards from parent segment 4 were applied to new segment 4b.

Although the Commission determined that adoption of the ambient-based selenium standard proposed by CWSD and the Division is appropriate, the Commission believes, without intending to establish or limit permit conditions, that follow-up biological monitoring is warranted to inform future review of the selenium standards. The Commission would expect the collection of additional baseline ("before") fish tissue selenium data in the Cottonwood Creek watershed below CWSD's intended point of discharge, and in Cherry Creek Reservoir. In addition, after the R.O. plant is re-started, the Commission would expect CWSD to collect fish tissue data to support a "before and after" evaluation of downstream effects in the tributaries and reservoir. The sampling should focus on the time of year when sensitive species and species that are high selenium-accumulators are expected to be gravid. This data will be used to evaluate whether the ambient-based standard is protective of the use. The Commission expects CWSD to develop a study plan in agreement with WQCD, CPW, EPA, CCBWQA and other interested parties.

Clear Creek segment 5: The Commission adopted water supply manganese standards representative of existing quality as of January 1, 2000 with assessment locations provided at 38.6(4)(j). The aquatic life manganese standards still apply throughout the segment.

H. Numeric Standards Changes

Changes were made to the following metals criteria to implement revisions adopted by the Commission in the 2010 Basic Standards rulemaking hearing.

Aluminum: Chronic aluminum standards adopted in 2010 are pH-dependent. When the pH is greater than 7.0, the new chronic aluminum standard uses a hardness-based equation. When pH is less than 7.0, the old chronic criterion of 87 µg/l or the new hardness-based equation applies, whichever is more stringent. The new acute aluminum criterion is a hardness-based equation that applies at all pH values. The hardness for both the chronic and acute aluminum hardness-based equations is capped at 220 mg $CaCO_3$/l, rather than the typical cap of 400 mg $CaCO_3$/l. The acute and chronic aluminum equations in 38.6(3) were modified to conform to Regulation No. 31.

Ammonia: Footnote 4 was replaced. The equations for the "NH_3=TVS" were deleted and replaced by language that explains the early life stage presence/absence assumptions.

Molybdenum: In 2010, the Commission adopted a new molybdenum standard of 210 µg/L to protect the Water Supply use.

Uranium: The Commission revised the uranium standard in 2010. The new standard is a hyphenated standard with two values (16.8 – 30 µg/L). The first value, which was added in 2010, is a strictly human health-based standard. The second value, which was the old standard, is EPA's maximum contaminant level (MCL), which is higher because it takes into account treatability and detection limits. A new section 38.5(3)(c)(i) was added to explain the hyphenated standard. Subsection 38.5(3)(d) was deleted because it was redundant with 38.5(3)(c).

Zinc: The Commission adopted revisions to the zinc equation in 2010. The new chronic zinc equation is slightly more stringent at hardness values less than 157 mg $CaCO_3$/l. The new acute zinc equation is slightly less stringent at all hardness values. The zinc(sculpin) equation was not adopted in Regulation No. 38 because sculpin are not expected in the South Platte River basin. The acute and chronic zinc equations in 38.6(3) were modified to conform to Regulation No. 31.

I. Numeric Standards: Biotic Ligand-Based Site-Specific Copper Standards

In the present hearing, the Commission adopted site-specific copper standards based on the Fixed Monitoring Benchmark (FMB) application of the Biotic Ligand Model (BLM). The Commission recognized that implementation guidance is still evolving, but was persuaded that the FMB will now yield criterion-based values that better reflect the toxicity of copper than is possible with the hardness-based TVS or WER-based values. However, there are some important considerations for the acquisition of input data and for the interpretation of output values that warrant attention in future proposals.

The Commission envisions applying the BLM primarily downstream of dischargers where concerns about effluent copper may legitimately be offset to some degree by ligands in the effluent that affect the toxicity of copper. Because the potential “benefit” of these ligands is very much dependent on the mix of effluent with the receiving stream, it is important for the model inputs to provide adequate representation of seasonal and hydrologic variability. Similarly, because water quality conditions change downstream, especially where there are significant hydrologic features (e.g., tributaries and other discharges), it is important to have multiple sites to represent spatial variability and assure downstream protection of uses.

To facilitate future review of the standards adopted in this hearing, the Commission expects proponents to commit to a “longevity plan” with continued monitoring and analysis of BLM parameters culminating in a review at the next basin hearing.

In this hearing, FMB-based copper standards were proposed for four segments in which standards previously had been WER-based:

Upper South Platte River segments 14, 15, and 16g
Middle South Platte River segment 01a.

In addition, the Commission revisited a proposal for Big Thompson segment 2 that received tentative approval at the temporary modifications hearing in December, 2014.

Upper South Platte Segment 15 and Middle South Platte Segment 1a, Below Metro

The Metro Wastewater Reclamation District (Metro) has provided a data set and accompanying analysis that the Commission has determined can be used as a model for future proposals. The multi-year data collection effort included biweekly sampling of all parameters required for the BLM at nine sites, providing complete spatial coverage of the two segments of interest (US15 and MS01a). Comparison of the FMB values across the sites facilitates the selection of one value that is protective in each segment. Addition of confidence intervals shows that the most protective values in each segment are not significantly different; hence, one value can be applied to both segments.

The application of confidence intervals enables future review of the standards adopted in this hearing. The Commission recognizes that the water quality conditions prevailing today may be changed in the future if water management practices or wastewater treatment processes or flows change in the future. Insofar as the FMB is sensitive to parameters like pH or dissolved organic carbon that could change in the future, it is important to review the new standards regularly. Confidence intervals provide a basis for meaningful comparison of new and old determinations of the FMB at the same location.

Metro has agreed to continue all necessary data collection and evaluation activities to support review of the BLM-derived copper standards at the next Regulation No. 38 hearing.

Upper South Platte Segments 14 and 16g, Below Centennial W&SD

Centennial W&SD also applied the BLM to develop a proposal for copper standards. Although the spatial coverage of sites in the initial proposal was very limited, the Division added BLM results from six additional sites in rebuttal. The expanded spatial coverage provided a mutually acceptable proposal for Segment 14 and assured the Commission that the standard would be protective of the affected portion of that segment. The Commission will review these FMB-based standards in the next Basin Review Hearing, using data collected over the next five years, to ensure that FMB-based standards capture any changes in water quality. Centennial has agreed to continue all necessary data collection and evaluation activities to support review of the BLM-derived copper standards at the next Regulation No. 38 hearing

Big Thompson Segment 2, Below Upper Thompson Sanitation District

The modeling that was done to support the Commission's action in December 2014 was reviewed in light of the experience gained from work in this hearing with the BLM and FMB. The Commission found that the decisions made in the earlier hearing were consistent with the current work and supported by data and analysis.

Cherry Creek Segment 1, Below Parker Water and Sanitation District

Parker Water and Sanitation District (Parker) presented effluent data indicating that they have a predicted compliance problem with permit limits based on the copper hardness equation on Cherry Creek segment 1. Parker has initiated sampling for parameters required to use the BLM to derive a site-specific standard for copper. Robust derivation of site specific copper standards using the BLM requires temporal coverage of at least 2 years of monthly sampling at sites representative of the segment under consideration. As of this hearing, Parker did not have sufficient temporal coverage to use the model. Additionally, information presented in Parker's prehearing statements highlighted recent and future plant process changes which may influence the representativeness of recent sampling. Parker has agreed to continue sampling for 24 months following the last planned operational changes so a more representative dataset can be utilized to derive a site-specific standard for copper with confidence. Given the uncertainty about the appropriate underlying standard, and the predicted compliance problem, the Commission approved a temporary modification for copper set to "current conditions" with an expiration date of 12/31/2020.

J. Numeric Standards: Site-Specific Mercury Standard

The Commission adopted a site-specific total mercury standard of 0.026 µg/L as a chronic, 30-day average standard with a 1-in-3 year exceedance frequency on a portion of Upper South Platte Segment 16i, from Brighton Boulevard to the confluence with the South Platte River. The table value standard of 0.01 µg/L remains the standard for this segment upstream of Brighton Boulevard.

Suncor collected total mercury fish tissue data and unfiltered water samples for total mercury and methylmercury analysis from two sites on Sand Creek between Brighton Boulevard and the Burlington Ditch. Suncor targeted the highest trophic level species in Sand Creek for mercury sampling and collected skinless filets from the largest individuals of each species to analyze for wet-weight total mercury.

Fish tissue bioaccumulation factors (BAFs) were calculated, in part, following EPA's 2010 *Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion.* The calculations also follow recommendations from a 2013 study (Riva-Murray et al.) conducted by the U.S. Geological Survey (USGS) and the U.S. EPA National Exposure Research Laboratory to optimize stream water mercury sampling for the purpose of developing mercury fish tissue BAFs. The site-specific standard was derived using the following equations:

Site-specific BAF (L/kg) = [arithmetic mean mercury fish tissue concentration in mg/kg wet weight] / [85th percentile methylmercury water concentration in mg/L]

Methylmercury water quality criterion (µg/L) = 10^{-9} x [0.3 mg/kg fish tissue] /[site-specific BAF (L/kg)]

Total mercury water quality criterion (µg/L) = methylmercury criterion * median ratio of total Hg:MeHg

A site-specific BAF was calculated for each species. The methylmercury water quality criterion was calculated using only the species with the highest BAF (*Lepomis cyanellus*, green sunfish) rather than a weighted average of all larger species. While the green sunfish are less than five inches in length and unlikely to be consumed, this ensures that the site-specific standard will prevent average fish tissue concentrations from exceeding 0.3 mg/kg for all species. The median ratio of total mercury to methylmercury was calculated in order to translate the protective methylmercury water column value to a total mercury water column standard. Although methylmercury is the form of mercury that bioaccumulates, the standard is based upon total mercury, because mercury can change forms in the environment.

Existing quality for this chronic standard is defined as the 85^{th} percentile for permitting and assessment purposes. Attainment of the standard shall be assessed by comparing the weighted 85^{th} percentile total mercury concentration from both assessment locations at 38.6(4)(f) to the site-specific criterion.

Fish tissue concentrations in the South Platte River are expected to be protected despite the increase in the site-specific standard on Sand Creek. This is due to the low concentrations of mercury previously found in fish flesh in the South Platte River during a time when the mercury concentrations from Sand Creek were much higher. When the relatively small volume of water in Sand Creek and higher mercury concentrations are combined with the greater volume of water in the South Platte River and low ambient water column concentrations, the change in concentration downstream of the confluence is negligible. Based on permitted low flow conditions, the projected mercury concentrations in the South Platte River would attain the existing 0.01 µg/L standard even when mercury concentrations in Sand Creek were as high as 0.053 µg/L (approximately two times the adopted standard in segment 16i).

K. Temporary Modifications

All existing Temporary Modifications were examined to determine if they should be allowed to expire or if they should be extended, either unchanged or with changes to the numeric limits. Temporary modification of copper standards for Cherry Creek segment 1 is discussed above (section I). Temporary modification temperature standards are discussed below in section M.

The Commission deleted or allowed to expire on 12/31/2015 certain temporary modifications on the following segments:

Upper South Platte River segments: 14, 15, 16g and 16i
Clear Creek segments: 9a, 11, 14a, 14b and 15
Boulder Creek segment: 9
St. Vrain Creek segments: 2b and 6Middle South Platte River segments: 1a and 4
Big Thompson River segments: 2 and 5
Cache la Poudre River segments: 11 and 12
Lower South Platte River segment: 1

The Commission revised or extended Temporary Modification on the following segments:

Bear Creek segment: 1c
Clear Creek segment: 2c, 13b
Boulder Creek segment: 8
Big Thompson River segments: 4b and 9
Cache la Poudre River segment: 13b

To remain consistent with the Commission's decisions regarding arsenic in section 38.85, all existing temporary modifications for arsenic of "As(ch)=hybrid" (expiration date of 12/31/21) were retained. An arsenic temporary modification was added to the following segments, which had an existing or newly added chronic arsenic standard 0.02 µg/L and a permitted discharger with a water quality–based effluent limit compliance problem:

Upper South Platte River segments: 2c and 22a
Bear Creek segments: 1b, 4a, 5, 6b and 11
Clear Creek segment: 5, 9a, 11 and 14b
Boulder Creek segments: 3, 4b and 7a
St. Vrain Creek segments: 2b and 7
Middle South Platte River segments: 1a, 3a and 4
Big Thompson River segments: 3, 4a and 4b
Cache la Poudre River segment: 10b
Lower South Platte River segment: 1

The Commission adopted Temporary Modifications on the following segments:

Upper South Platte River segments: 10a, 14 and 15
Cherry Creek segment: 1
Clear Creek segments: 2c, 7a, 7b and 11
Boulder Creek segment: 9

Upper South Platte segment 10a: The Commission adopted a temporary modification for manganese in segment 10a of the Upper South Platte River. PCWRA presented information that shows a demonstrated water quality based effluent compliance problem. The Commission reviewed the temporary modification implementation plan submitted by PCWRA. Based on that plan, along with the compliance problem and uncertainty regarding the standard, the Commission adopted a "Current Conditions" temporary modification to the manganese standard in Upper South Platte segment 10a with an expiration date of 6/30/2019.

Upper South Platte segment 14: The Commission adopted a temporary modification for chloride in segment 14 of the Upper South Platte River. Centennial presented information that shows a predicted water quality based effluent limit compliance problem. The Commission reviewed the temporary modification implementation plan submitted by Centennial. Based on that plan, along with the compliance problem and uncertainty regarding the standard the Commission adopted a "Current Conditions" temporary modification to the chloride standard in Upper South Platte segment 14 with an expiration date of 12/31/2020.

Upper South Platte segment 15: The Commission adopted a temporary modification for chloride and sulfate in Segment 15 of the Upper South Platte River. Public Service Company presented information that shows a predicted water quality based effluent limit compliance problem. The Commission reviewed the temporary modification implementation plan submitted by Public Service Company. Based on that plan, along with the compliance problems and uncertainty regarding the standards the Commission adopted a "Current Conditions" temporary modification to the chloride and sulfate standards in Upper South Platte segment 15 with an expiration date of 12/31/2020.

Clear Creek segment 2c: The Commission adopted a new temporary modification for cadmium and revised the temporary modification for copper both with an expiration date of 7/01/2020. Evidence submitted by the CCCSD identifies that it would continue to have a permit compliance problem if ambient quality was implemented in its discharge permit. During the effective period of this temporary modification, copper and cadmium limits for existing dischargers to Segment 2c will be authorized to continue based on past facility performance (existing effluent quality) unless a more stringent limitation is reasonably achievable without requiring significant investment in facility infrastructure, consistent with Regulation 31.14(16).

Big Thompson segment 9: Little Thompson River, Big Thompson Segment 9: The Division's noticed proposal for this segment originally included a "current conditions" temporary modification as a result of the basin wide practice of extending selenium temporary modifications on segments that continue to indicate impairment. The Town of Milliken presented evidence of a compliance problem with the permit limits based on the underlying selenium table value standard as well as evidence that elevated selenium levels originate from naturally occurring, selenium rich shale and also proposed the same changes. In order to ensure that the current condition in segment 9 is protected over the duration of the temporary modification, the Division changed its proposal to reflect existing quality in the form of a numeric temporary modification. Ambient selenium conditions at a long term monitoring site above the outfall indicate the 85th percentile of selenium concentrations equal 12.3 µg/l. Therefore, the Commission extended the expiration date of the temporary modification to 12/31/2020 and changed the numeric value in the temporary modification for selenium from 13.1 µg/l to 12.3 µg/l to reflect the addition of more recent data. It is the Commission's intent that no assimilative capacity is created through this action.

The Town of Milliken has volunteered to complete a phased plan to evaluate potential selenium impacts to fish populations within the segment. Milliken will develop a detailed sampling and analysis plan for the first phase in coordination with a qualified consultant and CPW by 7/15/2015. Sampling will commence as soon as technically practicable in 2015 and will first focus on fish tissue selenium analysis of ovaries/eggs of larger female fish, and muscle or whole body analysis for other fish. Milliken's commitment to follow-up phases is contingent on Milliken's continued intent to utilize their existing surface water discharge permit. If necessary, and after coordination between CDPHE, Milliken, and CPW, a second phase of the study will be to evaluate larval fish deformity rates and/or selenium bioaccumulation through the foodchain. Results of this analysis will be presented at a future Temporary Modifications Rulemaking Hearing in 2018 or 2019 or before. If the results demonstrate that uses are protected, an ambient-based site-specific standard may be appropriate.

L. Temperature Standards

The Commission adopted new criteria for temperature in 2007. In June 2009, segment-specific temperature standards were adopted by the Commission for all segments with an Aquatic Life use classification in the South Platte River basin.

In June 2010, revisions of the temperature criteria in Regulation No. 31 resulted in changes to warm stream temperature tiers. The expected range of the razorback sucker is also habitat for the more thermally sensitive white sucker. Because the temperature tier applied to a segment is based on the most thermally sensitive species, the razorback sucker tier had never been applied. Therefore, the Commission deleted the razorback sucker tier (warm stream tier III), and included the razorback sucker in warm stream tier II. In implementation of these changes, the Commission changed all warm stream tier IV segments to warm stream tier III to conform with the 2010 revisions, which affected the following segments:

Upper South Platte River segments: 16d, 16e and 16f
Middle South Platte River segments: 3b, 5b and 6
Republican River segment: 7

In 2010, the Commission also reformatted the temperature criteria in 31.16 Table I and updated the values based on new data included in the Colorado Temperature Database. Several corrections were made to the temperature criteria. Both the Arctic grayling and golden shiner were moved from stream tiers to the cold and warm lake tiers, respectively, because both species are found only in lakes. Additionally, a typographical error in the chronic temperature criterion for cold stream tier II and large lakes and reservoirs was corrected.

Changes were made to bring Regulation No. 38 into conformity with all of the 2010 revisions to the Basic Standards for temperature, including updating the temperature tables at 38.6(3).

Based upon new information on the species expected to occur, the Commission changed the temperature standard from CS-II to CS-I for the following segments:

Clear Creek segment: 12b

Ambient temperature standards for lakes

In the 2009 triennial review, the WAT standard was found to be unattainable for a number of cold large lakes and reservoirs with apparently healthy cold-water fish populations. Because summertime temperature in the mixed layer for large lakes and reservoirs is very well correlated to the waterbody's elevation, the Commission adopted ambient temperature standards for large lakes wherever data were available to characterize a WAT and the thermal characteristics of the lakes and reservoirs were determined to be the result of natural or irreversible man-induced conditions.

However, the 2010 revisions to the dissolved oxygen criteria in Regulation No. 31 altered how lakes and reservoirs are assessed for temperature and dissolved oxygen. The Commission decided that dissolved oxygen may be less than the applicable standard in the lower portion of a lake or reservoir except where Regulation No. 31 footnote 5(c)(iii) applies or a site-specific standard has been adopted.

Footnote 5(c)(iii) states:

> When a lake or reservoir is stratified, the mixed layer may exceed the criteria in Table 1 provided that an adequate refuge exists in water below the mixed layer. Adequate refuge depends on concurrent attainment of applicable dissolved oxygen standards. If the refuge is not adequate because of dissolved oxygen levels, the lake or reservoir may be included on the 303(d) List as "impaired" for dissolved oxygen, rather than for temperature.

Therefore, the ambient standards adopted by the Commission in 2009, which were based solely on the WAT and did not account for the concept of refuge, may no longer be appropriate or protective of the aquatic life use. To ensure that adequate refuge is defined in a way that protects the Aquatic Life use, the Commission adopted Footnote D which was applied to the temperature standard for deep stratified lakes. Footnote D states "Assessment of adequate refuge shall rely on the Cold Large Lake table value temperature criterion and applicable dissolved oxygen standard rather than the site-specific temperature standard", and was applied to following lake segments:

Upper South Platte River segment: 19 (Eleven Mile Reservoir)
Boulder Creek segment: 18 (Gross Reservoir)
Big Thompson River segment: 11 (Carter Lake)
Cache la Poudre River segment: 14 (Horsetooth Reservoir)

M. Temperature Temporary Modifications

At the basin hearing in 2009 and in subsequent hearings, concerns have been registered about the implementation of temperature standards. In particular, major POTWs discharging to streams with an Aquatic Life Warm classification have expressed reservations about the technical basis for winter standards and concerns about compliance prospects.

These concerns have occupied much of the Commission's time at this hearing and are likely to do so again at the Basic Standards hearing next year. Although the issues cannot be resolved completely today, the Commission has taken two actions that will provide some guidance for future actions. The first is to adopt temporary modifications in a way that acknowledges compliance problems common to most dischargers to warm streams, and the second is to comment on what has been learned about resolving temperature problems.

Temporary modifications have been adopted for all segments with an Aquatic Life Warm classification where a discharger has shown a compliance problem. The temporary modifications are restricted for most segments, to the winter season (December-February). The exception is for Cache la Poudre segment 12, where the Commission decided, for reasons explained below, that it was appropriate to adopt a temporary modification for the full year rather than just the winter months. Year-round temporary modifications were also adopted for Upper South Platte segment 15 and Clear Creek segments 11, 14a, 14b, and 15, where work is underway on discharger specific variance proposals. Most of these temporary modifications will be in effect through 12/31/2020, which is synchronized with the next South Platte basin hearing.

The Commission is aware that not all parties are satisfied with temporary modifications at this time. In particular, Littleton/Englewood put considerable effort into development of a site-specific proposal that was not adopted. Consequently, it may be helpful for the Commission to comment again on possible approaches to resolving temperature issues.

At the last South Platte basin hearing in 2009 (see 38.74(M)), temporary modifications and site-specific standards were adopted in some of the same segments that were considered at the present hearing. Specifically with respect to Upper South Platte segments 14, 15, and 16g, the Commission stated its expectation that "domestic wastewater facilities will, in cooperation with other dischargers and the Division, explore options for developing new underlying site-specific temperature standards including refined numeric site-specific standards, ambient–based site-specific standard and narrative site-specific standards although permit implementation strategies are not yet fully developed for all of these." In addition, the Commission commented on a "facility-specific variance approach … [that] may be an appropriate solution…." It is apparent now that the facilities in question have worked largely independently and have relied on different approaches.

In the years following adoption of temperature criteria, interested parties have amassed temperature data from many segments in the South Platte basin. The extensive records of spatial and temporal temperature patterns have done much to inform the Commission about the influence of POTW discharges on stream temperature. In warm streams, a large discharge can increase stream temperature as much as 10 degrees C in the winter, but may cause relatively little change in the summer. This potential compliance problem occurs primarily in the winter months.

The options for addressing temperature issues remain essentially the same now as they were in 2009, except that the "facility-specific variance" (now the DSV) is officially available. What has changed is that there is now a more complete appreciation of the level of difficulty for developing a successful proposal. Development of a site-specific standard (criterion or ambient; numeric or narrative) is a challenging undertaking that is hampered by the paucity of scientific information regarding wintertime thermal requirements of warm water fish communities. The challenge is compounded by having to determine which species are expected to occur in the fish community. These are not new difficulties and they will continue to confront future efforts.

The record in this hearing included expressions of concerns about the implementation of temperature standards, the feasibility of meeting temperature standards, and the scientific basis for the warm-water winter temperature standards. These concerns involve multiple aspects of the State's clean water program, including standards, permitting, and engineering. The Commission supports the use of Division resources across multiple units to address uncertainties about the temperature standards and their implementation.

From the Commission's perspective, it is important to see a showing that a proposed change to a temperature standard will protect the use. The bar for demonstrating protectiveness of temperature standards was set high in previous hearings and documents, and it has not changed. In adopting changes to temperature regulations in 2007 (see 31.45), the Commission broadened provisions protecting spawning to "ensure that the thermal requirements for successful migration, spawning, egg incubation, fry rearing and other reproductive functions are met". The Commission specifically linked winter criteria to protection of reproductive functions.

While the Commission understands that the absence of formal guidance may make the development of a standard more difficult, it does not absolve the proponent of the responsibility to show that the proposed standard will meet the intent of the regulation. Proposals submitted to date have encountered stiff challenges from the Division, EPA and CPW largely on the question of protectiveness. The alternative to developing a new use-based standard, which was suggested as early as 2007, would be to seek a variance (DSV). A DSV, perhaps sector-based, would provide the foundation for reasonable incremental progress to reduce winter heat load to streams without imposing an unachievable compliance schedule.

1. Warm Stream Temporary Modifications:

Littleton/Englewood (L/E), South Platte segment 14: L/E has proposed relaxing the temperature standards in December and February in Segment 14. The proposal is based largely on field studies and relies on this evidence to show that one of the temperature-sensitive species – the Johnny darter – is not suffering adverse effects from increased winter temperatures downstream of the outfall. The proposal failed because there was no showing that the proposed standards would be protective, specifically, L/E has not demonstrated that the proposed standards would protect all life stages including reproduction and early life stages. Field studies are generally insufficient because the effects of confounding factors are not addressed adequately. Site-specific criteria are generally based on controlled studies in the laboratory.

Instead, the Commission accepts the Division's proposal that a temporary modification is appropriate at this time. It affords L/E, and other parties with similar issues, the opportunity to work together to find a path forward either in the Basic Standards hearing proceedings or through the collective work that is now proceeding on the feasibility of treatment (cooling) options.

PCWRA, Centennial, Boulder, Ft Collins, multiple segments: Plum Creek Water Reclamation Authority (Upper South Platte segment 10a) Centennial (Upper South Platte segments 16g and 14), Boulder (Boulder Creek segment 9, and Fort Collins (Cache La Poudre segment 11) all proposed solutions for winter temperature effluent limit compliance problems. The Commission agrees that there are concerns about compliance with temperature limits that are common to several parties to this hearing. In Warm streams, dischargers are likely to experience compliance problems in the winter (Dec-Feb). Winter is also the season in which thermal requirements are poorly known for species expected to occur in Warm streams. The combination of compliance problems and uncertainty about the underlying standards is a necessary condition for a temporary modification.

It is the Commission's hope that workgroup efforts prior to the Basic Standards hearing will help resolve uncertainty about the winter temperature standards. However, even if a better technical basis emerges from that hearing, there is no guarantee that it will resolve all of the compliance problems expected by many of the dischargers. Consequently, the Commission encourages all parties to consider what progress can be made regarding the scope of an alternatives analysis that might support a DSV.

Greeley, Cache la Poudre segment 12: The standards in this segment affect several dischargers, two of which participated in the present hearing. Consequently, the Commission lacks a complete picture of temperature patterns and potential problems. The City of Greeley, which discharges near the downstream end of Segment 12, predicts compliance problems in the summer, but not in the winter. The compliance problems may be associated in part with times when ambient temperatures exceed the standard.

Temperature data on the record are not adequate to determine if ambient temperatures are elevated throughout Segment 12 or only at the downstream end. The City of Fort Collins submitted data for a site at the downstream end of adjacent Segment 11, which does not show the same attainment problem. There is uncertainty about the underlying standard in Segment 12, and resolution of that uncertainty likely will affect other dischargers (e.g., Windsor and Carestream). Resolution, if it results in an ambient standard for all or part of Segment 12, may also reduce the likelihood of compliance problems for Greeley.

Greeley has adequate justification for a temporary modification in the summer, but has no compliance problem in the winter. Regarding the potential for compliance problems in the winter, the Commission believes that the evidence from other segments, including Cache La Poudre Segment 11, is sufficiently compelling to justify a temporary modification for the winter months. Permit limits for the discharger at the downstream end of Segment 11 (Ft Collins Drake) may be affected by proximity to Segment 12. In addition, the Windsor and Carestream facilities would seem likely to have winter compliance problems, although the evidence is not currently on the record.

Metro, Upper South Platte segment 15: In this hearing the Commission extended the expiration date for the temperature temporary modification on Upper South Platte segment 15. The temporary modification, set at current conditions, will expire on 12/31/2020. The Metro District will continue to refine a temperature discharger-specific variance proposal for the Robert W. Hite Treatment Facility with input from the Division, Colorado Parks and Wildlife, U.S. EPA Region 8, and South Adams County Water and Sanitation District for future consideration by the Commission.

MillerCoors, Clear Creek segments 11, 14a, 14b, 15: The Commission extended the “current conditions” temporary modifications for temperature until June 30, 2019 for Segments 14a, 14b and 15 and adopted a new temporary modification for temperature on Segment 11 from a point immediately downstream of the 6th Avenue Bridge to the Farmers Highline Canal diversion, also with a June 30, 2019 expiration date. MillerCoors has shown that there is uncertainty about whether a discharger-specific variance may be appropriate and will complete an alternatives analysis with input from the Division, U.S. EPA Region 8 and other interested stakeholders to address the uncertainty.

2. Cold Stream Temporary Modifications:

Black Hawk Central City, Clear Creek segment 13b: The Commission extended the expiration date for the temperature temporary modification for Segment 13b. The temporary modification, set at current condition, will now expire on December 31, 2020. BHCCSD and Black Hawk provided temperature data demonstrating a predicted compliance issue year-round. In addition, there remains uncertainty regarding the appropriate temperature standard for Segment 13b; while aquatic life is currently limited by poor water quality and habitat, water quality conditions are expected to improve. The EPA and Colorado Hazardous Materials Waste Management Division plan to construct a water treatment plant in the upper portion of Segment 13b that will remove metals from the Gregory Incline, Gregory Gulch ground water, and the National Tunnel; extension of the temporary modification will allow time for BHCCSD and Black Hawk to evaluate the effects of improved water quality on aquatic life in Segment 13b following water treatment plant construction and determine the appropriate temperature standards for Segment 13b.

BHCCSD and Black Hawk submitted an outline of a plan to collect additional temperature data from existing sites and other sites in Segment 13b to better characterize the longitudinal temperature variability of the stream. During the summer of 2015, BHCCSD and Black Hawk will also conduct side by side temperature measurements in the stream to verify the accuracy of temperature measurements that have been collected to-date. BHCCSD and Black Hawk also plan to review water quality data collected by UCCWA. BHCCSD and Black Hawk will continue to collect benthic macroinvertebrate data and will coordinate with CPW to collect additional fish population data to better characterize the species and life stages expected to be present in Segment 13b. Additionally, BHCCSD and Black Hawk initiated a discussion with UCCWA at its May 2015 meeting regarding riparian restoration potential within Segment 13b, and will continue the dialogue during the period of the temporary modification. An UCCWA agenda item will be scheduled for the fall of 2015. BHCCSD and Black Hawk will also evaluate whether a discharger specific variance would be consistent with 31.7(4). The Commission expects that BHCCSD and Black Hawk will work with the Division and CPW to develop the detailed plan within the next year. At the December 2018 temporary modification review hearing, the Commission will consider extending the duration of the temporary modification if more time is needed to evaluate the recovery of the aquatic life community and determine the appropriate temperature standards, or if other delays occur, particularly related to construction of the water treatment plant

Climax, Clear Creek segments 7a and 7b: The Commission adopted a new temporary modification of the temperature standard for these segments of “current conditions” for the months of October, November, April, and May. The Commission recognizes that there is uncertainty about the appropriate temperature standard because of recent channel improvements done by Climax Molybdenum Company in Woods Creek between Upper Urad Reservoir and Lower Urad Reservoir in 2012-2015. It is uncertain whether and how the channel improvements will affect in-stream temperatures or whether sensitive life stages of cold water fish will be expected to be present in the short reach of restored surface channel downstream of the Henderson water treatment facility outfall on Woods Creek.

The Commission adopted the temporary modifications with an expiration date of June 30, 2023. Climax will delay site-specific studies in Woods Creek, to allow Climax to complete construction and establish operational practices for water management and control of the new channels, and evaluate conditions in the channels including possible establishment of aquatic life in the channels. Conditions may change once the new channel stabilizes; therefore, an extended temporary modification duration is appropriate. The Commission will review progress on the study plan at the 2019 Issues Formulation Hearing for the South Platte Basin.

N. Nutrients

In March 2012, the Commission adopted interim nutrient values in the Basic Standards (Regulation No. 31) and created a new statewide control regulation (Regulation No. 85) to address nutrients in Colorado. Regulation 31.17 includes interim nutrient values for total phosphorus, total nitrogen, and chlorophyll *a* for both lakes and reservoirs, and rivers and streams. Due to the phased implementation approach adopted with these criteria (31.17(e)), the Commission adopted only total phosphorus and chlorophyll *a* standards at this time. Nitrogen standards were not considered as part of this rulemaking hearing, but will be considered in the next triennial review, currently scheduled for June 2020.

Total phosphorus and chlorophyll *a* standards were adopted for waters upstream of all permitted domestic wastewater treatment facilities discharging prior to May 31, 2012 or with preliminary effluent limits requested prior to May 31, 2012, and any non-domestic facilities subject to Regulation No. 85 effluent limits and discharging prior to May 31, 2012. A new section (4) was added at 38.5 describing implementation of the interim nutrient values into the tables at 38.6, and includes a table which lists these facilities and the segment to which they discharge.

For segments located entirely above these facilities, nutrient standards apply to the entire segment.

For segments with portions downstream of these facilities, *nutrient standards only apply above these facilities*. A footnote “C” was added to the total phosphorus and chlorophyll *a* standards in these segments. The footnote references the table of qualified facilities at 38.5(4).

For segments located entirely below these facilities, nutrient standards do not apply.

For rivers and streams segments, total phosphorus standards were adopted for segments with an aquatic life use. Chlorophyll *a* standards were adopted for segments with either an E or P recreation use classification.

For lakes and reservoirs segments, a Footnote B was added to total phosphorus and chlorophyll standards adopted for lakes in the tables at 38.6, as these standards only apply to lakes larger than 25 acres.

31.17(e)(iii) also allows the Commission to adopt numeric nutrient standards for Direct Use Water Supply (DUWS) lakes and reservoirs. No proposals were made to adopt standards based on this provision in this rulemaking (see section O).

31.17(e)(iii) also allows the Commission to adopt numeric nutrient standards for circumstances where the provisions of Regulation No. 85 are not adequate to protect waters from existing or potential nutrient pollution. No proposals were made to adopt standards based on this provision in this rulemaking.

Chlorophyll *a* standards were adopted for the following segments:

Upper South Platte River segments: 1a, 1b, 2a, 2c, 3, 4, 5a, 5b, 7, 8, 9, 10a, 11a, 11b, 12, 13, 16c, 16d, 16f, 16h, 16i, 16j, 16k,18 and 19
Cherry Creek segments: 1, 4a, 4b and 5
Bear Creek segments: 1a, 3, 5, 6a, 7, 8 and 9
Clear Creek segments: 1, 2a, 2b, 2c, 3a, 3b, 4, 5, 6, 9a, 9b, 10, 13a, 13b, 16a, 16b, 17a, 17b, 18a, 18b, 19, 20, 21, 22 and 24
Boulder Creek segments: 1, 2a, 2b, 3, 4a, 4b, 4c, 4d, 6, 7a, 8, 13, 14, 15 and 18
St. Vrain Creek segments: 1, 2a, 2b, 4a, 4b, 4c, 5 and 10
Middle South Platte River segments: 3a and 3b
Big Thompson River segments: 1, 2, 6, 7, 8, 9 and 10
Cache la Poudre River segments: 1, 2a, 2b, 6, 8, 9, 13a, 13b, 13c, 16, 18, 19, 20 and 21
Laramie River segments: 2a, 3 and 4
Lower South Platte River segments: 2a, 2b, 3, 4 and 5
Republican River segments: 3, 4, 5, 6 and 9

Total Phosphorus standards were adopted for the following segments:

Upper South Platte River segments: 1a, 1b, 2a, 2c, 3, 4, 5a, 5b, 7, 8, 9, 10a, 11a, 11b, 12, 13,16c, 16d, 16f, 16h, 16i, 16j, 16k, 18 and 19
Cherry Creek segments: 1, 4a, 4b and 5
Bear Creek segments: 1a, 3, 5, 6a, 7, 8, and 9
Clear Creek segments: 1, 2a, 2b, 2c, 3a, 3b, 4, 5, 6, 7a, 9a, 9b, 10, 12, 13a, 13b, 16a, 16b, 17a, 7b, 18a, 18b, 19, 20, 21, 22, 23, 24 and 25
Boulder Creek segments: 1, 2a, 2b, 3, 4a, 4b, 4c, 4d, 6, 7a, 8, 13, 14, 15 and 18
St. Vrain Creek segments: 1, 2a, 2b, 4a, 4b, 4c, 5 and 10
Middle South Platte River segments: 3a, 3b, 5a, 5c and 6
Big Thompson River segments: 1, 2, 6, 7, 8, 9 and 10
Cache la Poudre River segments: 1, 2a, 2b, 6, 8, 9, 13a, 13b, 13c, 16, 18, 19, 20 and 21
Laramie River segments: 2a, 3 and 4
Lower South Platte River segments: 2a, 2b, 3, 4 and 5
Republican River segments: 3, 4, 5, 6, 7 and 9

Big Dry Creek Segment 1: Total phosphorus and chlorophyll-a standards do not apply to the mainstem of Big Dry Creek downstream of Standley Lake, because Standley Lake is filled by ditches that withdraw water downstream of multiple permitted domestic wastewater treatment facilities.

1. Site-Specific Total Phosphorus Standards

The Commission continues to support a phased implementation approach to adoption of nutrient criteria. However, it is also clear from evidence on the record that some segments merit special consideration. The Cherry Creek Basin Water Quality Authority (CCBWQA) submitted data in its responsive statement showing that background phosphorus levels exceed TVS. The Division concurs with this finding, which also has been documented in previous hearings related to Watershed Control Regulation No. 72. A background concentration has been established to support estimation of phosphorus loads to Cherry Creek Reservoir, but it is not yet known if that concentration should be applied uniformly as a stream standard throughout the basin.

A similar situation, albeit with less supporting evidence, has been identified by the Bear Creek Watershed Association (BCWA) in Bear Creek Segment 7. In this case, the evidence suggests that fen wetlands have background phosphorus levels that exceed TVS even though streams in the same segment do not have elevated phosphorus levels. It is not yet known what background level would be appropriate or if it varies among the fens.

The Commission applauds the efforts of CCBWQA and BCWA to obtain, and make available for this hearing, data that improve our understanding of existing conditions within each basin. Site-specific standards are needed for all, or part, of the segments for which phosphorus standards have been proposed, but there is uncertainty about the habitat type or the geographic scope of applicability for site-specific standards (or conversely for the TVS). Resolving the uncertainty will require additional sampling to obtain representative data. A temporary modification cannot be used to provide the additional time because adoption of the phosphorus standard, as proposed in this hearing, would not result in a compliance problem for a discharger. However, delaying the effective date by five years would give CCBWQA, BCWA, and/or any other interested party or parties time to collect additional data and propose site-specific phosphorus standards as appropriate.

Total Phosphorus standards were given a delayed effective date of 12/31/2020 in the following segments:

Cherry Creek Segments 1, 4a and 4b
Bear Creek Segment 7 (wetland fens)

2. Bear Creek Reservoir Total Phosphorus and Chlorophyll *a* Standards

The site-specific standards for chlorophyll *a* and total phosphorus have been revised in response to US EPA's disapproval of the Commission's 2009 action. The purpose for the revised standards remains consistent with the Commission's original goal of shifting the trophic condition to the mesotrophic-eutrophic boundary. The numeric values for chlorophyll and phosphorus have changed because the data set has been expanded by several years and an improved methodology has been applied. As before, the standards were developed using only data from Bear Creek Reservoir. Each standard is defined for average summer concentrations and has an allowable exceedance frequency of once in five years.

A. Chlorophyll Standard: The Commission revised the chlorophyll standard to 12.2 μg/L. If summer average chlorophyll concentrations in the reservoir exceed 12.2 μg/L more than once in five years, it would be firm evidence that the trophic condition goal of the pre-existing narrative (mesotrophic-eutrophic boundary) was not being met. The exceedance threshold of 12.2 μg/L was derived with a “translator” developed with data from Bear Creek Reservoir. The translator connects the concentration at the allowable exceedance frequency (once in five years) to the typical concentration at the mesotrophic-eutrophic boundary (8 μg/L).

B. Phosphorus Standard: The Commission revised the phosphorus standard to 22.2 μg/L. The standard is calculated in two steps based on the methodology used to develop statewide nutrient criteria for the 2012 Nutrient hearing. The first step involves the creation of a statistical “linkage” between phosphorus and chlorophyll based on summer average concentrations measured in Bear Creek Reservoir. The linkage is used to define the phosphorus concentration corresponding to the mesotrophic-eutrophic boundary in this reservoir; that concentration is 16 μg/L. The second step involves a translator for phosphorus that performs the same function described for the chlorophyll translator described above. The concentration at the exceedance threshold is 22.2 μg/L.

C. Assessment: The phosphorus and chlorophyll standards are defined as seasonal averages. Samples are to be collected at a site in deep water near the dam and should be representative of conditions in the mixed layer. Past monitoring has resulted in 5 or 6 samples during the summer months (July, August, and September); it is anticipated that the same level of effort will be applied in the future. For assessment, the average (arithmetic mean) is calculated for the summer samples in each year.

D. Independent Applicability: The chlorophyll and phosphorus standards are considered independently applicable. That is, impairment can be determined with either parameter without confirmation by the other parameter. Although the parameters are linked biologically – algae require phosphorus to grow – the linkage is “noisy” in a statistical sense because phosphorus cannot compel algae to grow (i.e., other limiting factors complicate the relationship). Independent applicability establishes a more sensitive basis for assessing departures from the target trophic condition since regulation of phosphorus cannot be used to guarantee attainment of the chlorophyll standard. Independent applicability is a practical way to adapt regulation to a complex natural relationship where neither constituent is toxic (at least not at the target levels).

E. Adoption of a Temporary Modification for Chlorophyll and Phosphorus: The underlying standards are not attained presently due to the seasonal augmentation of phosphorus concentrations from internal sources. A temporary modification set at “current conditions” to expire 12/31/2020, is adopted in order to recognize the uncertainty regarding how soon the internal load will be reduced. The Division, in conjunction with the Bear Creek Watershed Association, is working on studies to determine what management strategies might be feasible for reducing or controlling internal phosphorus release. Progress on resolving uncertainty will be reviewed in the annual temporary modification hearings in December 2018 and 2019.

O. Direct Use Water Supply Sub-classification

Also in the March 2012 rulemaking hearing, the Commission adopted a sub-classification of the Domestic Water Supply Use called “Direct Use Water Supply Lakes and Reservoirs Sub-classification” (Regulation 31, at 31.13(1)(d)(i)). This sub-classification is for Water Supply lakes and reservoirs where there is a plant intake location in the lake or reservoir or a man-made conveyance from the lake or reservoir that is used regularly to provide raw water directly to a water treatment plant that treats and disinfects raw water. The Commission has begun to apply this sub-classification and anticipates that it will take several basin reviews to evaluate all the reservoirs in the basin. The Commission adopted the DUWS sub-classification on the following reservoirs and added “DUWS” to the classification column in the standards tables. The public water systems are listed along with the reservoirs and segments.

Upper South Platte River segment 16b: Aurora Reservoir (City of Aurora)

Upper South Platte River segment 19: Strontia Springs Reservoir (Denver Water Board)

Upper South Platte River segment 21: Aurora Rampart Reservoir (City of Aurora)

Upper South Platte River segment 22a: McLellan Reservoir (Centennial W&SD), Quincy Reservoir (City of Aurora)

Bear Creek segment 1d: Evergreen Lake (Evergreen Metro District)

Clear Creek segment 17a: Arvada Reservoir (City of Arvada)

Clear Creek segment 23: Ralston Reservoir (Denver Water Board, City of Arvada, North Table Mtn W&S)

Clear Creek segment 24: Maple Grove Reservoir (Cons Mutual/Maple Grove)

Big Dry Creek segment 2: Standley Lake (City of Northglenn, City of Thornton, City of Westminster)

Boulder Creek segment 14: Lakewood Reservoir (City of Boulder)

Boulder Creek segment 15: Kossler Lake (City of Boulder)

Boulder Creek segment 17: Baseline Reservoir (City of Lafayette), Marshall Lake (City of Louisville), Thomas Reservoir (Town of Erie) and Waneka Reservoir (City of Lafayette)

St. Vrain Creek segment 7: Boulder Reservoir (City of Boulder) Spurgeon (Lefthand WD,Niwot)and Left Hand Valley Reservoir (Lefthand WD,Niwot)

St. Vrain Creek segment 10: Joder Reservoir (Lefthand WD,Niwot)

St. Vrain Creek segment 13: Burch Lake (City of Longmont)

Big Thompson River segment 11: Carter Lake (City of Louisville)

Big Thompson River segment 12: Boyd and Loveland Lakes (City of Greeley)

Big Thompson River segment 13: Berthoud (Town of Berthoud) and Johnstown Reservoir (Town of Johnstown)

Big Thompson River segment 14: Lonetree Reservoir (Town of Johnstown)

Big Thompson River segment 16: St. Mary's Lake (Prospect Mtn)

Cache la Poudre River segment 14: Horsetooth Reservoir (City of Ft. Collins, Soldier Canyon FP, Spring Canyon W&SD, City of Greeley, Platte River Power Authority)

Cache la Poudre River segment 21: North Poudre Reservoir No. 3 (Town of Wellington)

31.17(e)(iii) also allows the Commission to adopt numeric nutrient standards for Direct Use Water Supply ("DUWS") lakes and reservoirs. No standards were adopted based on this provision in this rulemaking.

P. Chromium III Standards

A review of the chromium III standards showed that uses were not always adequately protected by the standards currently in the tables. For example, the acute Aquatic Life standard is not protective of Water Supply at any hardness, so the Water Supply standard of CrIII(ac)=50(Trec) was added to all segments with a Water Supply use. Additionally, the chronic standard to protect the Aquatic Life use classification may not be protective of the Agriculture use in some high-hardness situations. Therefore, a chromium III standard of CrIII(ch)=100(Trec) was added to segments with Aquatic Life and Agriculture use classifications, but no Water Supply use. At hardness less than 145 mg/L, the Agriculture standard is not protective of the Aquatic Life use, so the chronic chromium III Aquatic Life standard should be included/retained in all segments with an Aquatic Life use.

Uses	Acute	Chronic
Water supply (with or without Agriculture)	CrIII(ac) = 50(Trec)	CrIII(ch) = TVS
No water supply (with Agriculture)	CrIII(ac) = TVS	CrIII(ch) = TVS and CrIII(ch) = 100(Trec)
Aquatic Life Only (without Water Supply or Agriculture)	CrIII(ac) = TVS	CrIII(ch) = TVS

The Commission updated chronic chromium III standards to be consistent with the matrix for the following segments:

Upper South Platte River segments: 1a, 1b, 2b, 2c, 5c, 5d, 6a, 6b, 7, 8, 10a, 11a, 11b, 12, 13, 14, 15, 16a, 16b, 16c, 16d, 16e, 16f, 16g, 16h, 16i, 16j, 17a, 17b, 17c, 18, 19, 20, 21, 22a, 22b and 23

Cherry Creek segments: 1, 2, 3, 4a, 4b, 5 and 6

Bear Creek segments: 1c, 2, 4a, 5, 6a, 6b, 10, 11 and 12

Clear Creek segments: 2a, 2b, 2c, 4, 5, 9b, 11, 12, 13b, 14a, 14b, 15, 16a, 16b, 17a, 18a, 18b, 19, 21, 22, 23, 24 and 25

Big Dry Creek segments: 1, 2, 3, 4a, 4b, 5, 6 and 7

Boulder Creek segments: 4a, 4b, 4c, 4d, 5, 6, 7a, 7b, 8, 9, 10, 11, 13, 14, 15, 16 and 17

St. Vrain Creek segments: 3, 4a, 4b, 4c, 6, 7, 8, 9, 10, 11 and 13

Big Thompson River segments: 3, 4a, 4b, 4c, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18 and 19

Middle South Platte River segment: 3a, 3b, 5a, 5b, 5c and 7

Cache la Poudre River segments: 7, 8, 9, 10a, 10b, 11, 12, 13b, 13c, 14, 15, 16, 17, 18, 19, 20, 21 and 22

Laramie River segments: 1, 2a, 2b, 3 and 4

Lower South Platte River segments: 2a, 2b, 3, 4 and 5

Republican River segments: 1, 3, 4, 5, 8 and 9

Q. Other Standards for the Protection of Agriculture and Water Supply Uses

Similar to the issue identified in Section P above, there were additional segments where one or more uses are not adequately protected by current standards. For instance, depending on hardness, the Aquatic Life standards for cadmium, lead, and nickel were not protective of the Water Supply use. The Division reviewed all segments in Regulation No. 38 to determine if the current standards applied to each segment are fully protective of the assigned uses, and revised or added standards where appropriate.

A cadmium Water Supply standard was added to the following segments because the acute Aquatic Life standard is not protective when the hardness was greater than 200 mg/L in non-trout streams and 345 mg/L in trout streams. A lead Water Supply standard was added to the following segments because the acute Aquatic Life standard is not protective when hardness is greater than 79 mg/L. A nickel Water Supply standard was added to the following segments because the chronic Aquatic Life standard is not protective when hardness is greater than 216 mg/L. Cadmium, lead, and nickel Water Supply standards were added to the following segments:

Upper South Platte River segments: 1a, 1b, 2a, 2b, 2c, 3, 4, 5b, 5c, 5d, 6a, 6b, 7, 8, 9, 10a, 11a, 12, 13, 14, 15, 16b, 16i, 16j, 18, 19, 20, 21 and 22a
Cherry Creek segments: 1, 2, 3, 4a, 4b and 5
Bear Creek segments: 1a, 1b, 1c, 1d, 1e, 2, 3, 4a, 5, 6a, 6b, 7, 8, 9, 10, 11 and 12
Clear Creek segments: 1, 2a, 2b, 2c, 3a, 3b, 4, 5, 6, 9a, 9b, 10, 11, 12, 13a, 14a, 14b, 15, 16a, 17a, 17b, 18a, 18b, 19, 20, 21, 23 and 24
Big Dry Creek segments: 2, 4a, 4b, 5, 6 and 7
Boulder Creek segments: 1, 2a, 2b, 3, 4a, 4b, 4c, 4d, 5, 6, 9, 10, 11, 13, 14, 15, 16 and 17
St. Vrain Creek segments: 1, 2a, 2b, 4a, 4b, 4c, 5, 7, 8, 9, 10, 11, 12 and 13
Middle South Platte River segments: 1a, 1b, 4 and 7
Big Thompson River segments: 1, 2, 3, 4a, 4b, 7, 8, 11, 12, 13, 14, 15, 16, 17, 18 and 19
Cache la Poudre River segments: 1, 2a, 2b, 6, 7, 8, 9, 10a, 10b, 13a, 13c, 14, 15, 17, 18, 19, 20 and 21
Laramie River segments: 1, 2a, 2b, 3 and 4
Lower South Platte River: 1, 2a, 3, 4 and 5
Republican River: 1, 3, 5, 8 and 9

R. Other Site-Specific Revisions

Marston Forebay: Section 25-8-101(19), C.R.S., and Rule 31.5(38) of Regulation 38 defines “State Waters” as excluding “all water withdrawn for use until use and treatment have been completed.” The Commission finds and determines for the following reasons that water contained within Marston Forebay meets this exclusion. Marston is an off-channel forebay, fed through Denver Water’s Conduit 20, which diverts water from the South Platte River, and Conduit 15, which diverts water from Bear Creek. Water withdrawn from these two man-made conveyances is held in Marston until treated at the adjacent Marston Water Treatment Plant and used within Denver Water’s potable water distribution system. Marston Forebay is located on a topographical rise and therefore has no surface water influence, other than precipitation. In addition, there is no infiltration of groundwater into the Forebay, and the amount of infiltration from the Forebay to groundwater is de minimis and inconsistent. The Forebay is surrounded by four dams and a dike, and four operational toe-drain systems that capture and manage seepage from the Forebay. There is also no managed fishery at Marston Forebay, and public access to the Forebay is restricted. The Commission created a new section 38.7 “Commission’s Determinations Regarding State Waters” an listed Marston Forebay in this new section. In addition, a qualifier pointing at 38.7 was added to Upper South Platte segment23.

Clear Creek segments 7a and 7b: The Commission adopted Table Value Standards for Woods Creek and Lower Urad Reservoir for the protection of aquatic life. The Commission recognizes that there is uncertainty about the appropriate metals standards because of recent channel improvements done by Climax Molybdenum Company in Woods Creek between Upper Urad Reservoir and Lower Urad Reservoir in 2012 to 2015. It is uncertain whether and how the channel improvements will affect metals or whether sensitive life stages of cold water fish will be expected to be present in the short reach of restored surface channel downstream of the Henderson water treatment facility on Woods Creek. The Commission adopted temporary modifications for cadmium, copper, iron, lead, mercury, nickel, silver and zinc with an expiration date of 6/30/2023. (The temperature temporary modification is discussed above in section M.)

The Commission adopted the temporary modifications with an expiration date of June 30, 2023. Climax will delay site-specific studies in Woods Creek, to allow Climax to complete construction and establish operational practices for water management and control of the new channels, and evaluate conditions in the channels including possible establishment of aquatic life in the channels. Conditions may change once the new channel stabilizes; therefore, an extended temporary modification duration is appropriate. The Commission will review progress on the study plan at the 2019 Issues Formulation Hearing for the South Platte Basin.

<u>Clear Creek segments 14a, 14b, and 15:</u> An expiration date of 12/31/2020 was added to all segments with a site-specific standard based upon water effect ratios. These standards are derived by measuring the toxicity of a pollutant to test organisms in laboratory water compared with the receiving water, including effluent. Changes in water chemistry, such as hardness, alkalinity and the concentrations of other toxics can all impact the toxicity of a specific pollutant, such as zinc. If there are significant changes in the chemistry of the receiving water or the effluent, then the water effect ratio analysis must be repeated and the site-specific standard updated to reflect current conditions. Since the water effect ratio studies for these segments were completed in the 1990s, the Commission applied an expiration date to require re-evaluation of these standards at the next triennial review.

Big Dry Creek segment 1, assessment locations: A site-specific standard for selenium for Big Dry Creek Segment 1 was adopted in 2007. In this hearing, the Commission replaced the assessment location bdc4.0 with bdc4.5 to provide safer access for field staff collecting samples. Bdc4.5 is located approximately one-half mile downstream of bdc4.0. Bdc4.5 represents instream conditions upstream of the City of Northglenn’s discharge, which was the original purpose of sampling location bdc4.0. Attainment of the selenium standard will be assessed based on data collected at bdc1.5, bdc2.0 and bdc4.5. Data collected at the former site bdc4.0 may continue to be used for assessment. A typographical correction was also made for sampling location bdc2.0.

S. Typographical and Other Errors

The following edits were made to improve clarity and correct typographical errors:

- For Upper South Platte segments 9 and 20, “a.k.a. Waucondah Reservoir” was added to clarify the location of the waterbody.
- For Upper South Platte segment 10a, the second “Temporary Modification” was deleted and the expiration date was moved to a new line for clarity and consistency
- For Upper South Platte segment 12, a space was added to “Class1”.
- For Upper South Platte segment 16a, the selenium standards were split over two lines (i.e., Se(ac)=TVS and Se(ch)=TVS). The Division combined these (i.e., Se(ac/ch)=TVS) to be consistent with formatting elsewhere. Similarly, for Clear Creek Segment 2b, the Division combined the Zn(ac)=TVS and Zn(ch)=TVS into Zn(ac/ch)=TVS. For Clear Creek Segment 16a, the Division combined the Cd(ac)=TVS and Cd(ch)=TVS into Cd(ac/ch)=TVS.
- For Upper South Platte segments 16h, 16i, and 16j, the Division standardized the formatting of the site-specific selenium standards to be consistent among segments.
- For Upper South Platte segment 21, the Division corrected the chronic arsenic standard, which was missing a digit (i.e., “0.02-0(Trec)” was replaced with “0.02-**1**0(Trec)”).
- For Upper South Platte segment 22b and St. Vrain Creek Segment 6, the Division corrected the chronic arsenic standard by adding “(Trec)”, consistent with formatting elsewhere.
- For Bear Creek segments 1c, 1d, 1e, 2, and 3, the “equals” sign was missing from the chronic iron standard for water supply. The Division corrected this typo.
- For Bear Creek segment 1c, the temporary modifications were reformatted for consistency.
- For Bear Creek segment 9, specific naming of Summit Lake was included to increase clarity.
- For Bear Creek segment 11, there was an extra space in the segment description. The Division corrected this typo.
- For Clear Creek segments 4, 5, 6, 7a, 8, the stream name was corrected as “West” Fork Clear Creek.
- For Clear Creek segment 9a, the typo “the” was removed.
- For Clear Creek segments 12 and 23, the Division corrected a formatting issue in the metals column.
- For Clear Creek segment 13a, punctuation was corrected.
- For Clear Creek segment 13b, the extra space after the word “Gulch” was deleted.
- For Clear Creek segment 21, the extra comma after the word “CO” was deleted.
- For Clear Creek segment 21 and 22, the word “baseline” was capitalized for consistency.
- For Clear Creek segment 24, the space within the word “Segments” was deleted.

- For Clear Creek segment 25, the description was revised to provide a more detailed location description.
- For Big Dry Creek segment 4b, the extra period at the end of the description was deleted.
- For Big Dry Creek segment 5, the typo “a” was removed and “for segment 5” was added to complete the note.
- For Boulder Creek segment 1, the segment description was expanded to include James Peak Wilderness Area and “s” was added to “Area”.
- For Boulder Creek segment 2b, the typo “the” was removed.
- For Boulder Creek segment 4a, the segment description was amended to exclude listings in segment 1 for clarity.
- For Boulder Creek segment 13, the segment description was expanded to include James Peak Wilderness Area and “s” was added to “Area”.
- For Boulder Creek segment 14, Lakewood Reservoir was added to the segment description for identification of DUWS.
- For Boulder Creek segment 15, Gross Reservoir was removed from this segment and moved to new segment 18. The description of segment 15 was amended to exclude listings in segment 13 and 18 for clarity.
- For St. Vrain Creek segment 7, Spurgeon Reservoir was added to the segment description for identification of DUWS. Additionally, the “and” between Coot Lake and Left Hand was deleted.
- For Middle South Platte segment 5b, the spelling of “Boxelder” was changed to Box Elder to be consistent with maps.
- For Middle South Platte segment 6, the Division added (ch) to all of the Metals standards to be consistent with formatting elsewhere.
- For Middle South Platte segment 6, the description was clarified by replacing “Lost Creek from Interstate 76 south…” with “Lost Creek from the source to Interstate 76….”
- For Big Thompson segment 16, St. Mary’s Lake was added to the segment description for identification of DUWS.
- For Cache le Poudre segments 2a and 10a, the spelling “Monroe” was changed to “Munroe”, the word “Headgate” was added, and the description was clarified by replacing “/North Poudre Supply canal diversion” with “(also known as the North Poudre Supply Canal diversion)”.
- For Lower South Platte segment 4, both the nitrate and nitrite standards were duplicated in the Inorganic column of the tables. The Division deleted the least restrictive nitrate/nitrite set.
- For Republican River segment 5, the Division deleted an extra “the” from the segment description.

PARTIES TO THE RULEMAKING HEARING

1. Big Dry Creek Watershed Association
2. City of Black Hawk and Black Hawk/Central City Sanitation District

3. City of Boulder
4. Centennial Water and Sanitation District
5. Central Clear Creek Sanitation District
6. Climax Molybdenum Company
7. Cottonwood Water and Sanitation District
8. Denver Water
9. City of Fort Collins
10. Front Range Energy
11. City of Greeley
12. Littleton/Englewood Wastewater Treatment Plant
13. Metro Wastewater Reclamation Fistrict
14. MillerCoors
15. Town of Milliken
16. Parker Water and Sanitation District
17. Plum Creek Water Reclamation Authority
18. Public Service Company of Colorado
19. Suncor Energy (U.S.A.) Inc
20. City of Northglenn
21. Colorado Parks and Wildlife
22. City of Westminster
23. Bear Creek Watershed Association
24. Upper Clear Creek Watershed Association
25. City of Golden
26. U.S. Environmental Protection Agency
27. South Adams County Water and Sanitation District
28. Colorado Trout Unlimited
29. City and County of Broomfield
30. City and County of Denver
31. Chatfield Watershed Authority
32. Town of Castle Rock
33. Douglas County Public Works
34. Cherry Creek Basin Water Quality Authority

38.91 STATEMENT OF BASIS AND PURPOSE REGARDING THE ADOPTION OF NON-SUBSTANTIVE CHANGES TO THE CLASSIFICATION AND NUMEIRC STANDARDS FOR SOUTH PLATTE RIVER BASIN, LARAMIE RIVER BASIN, REPUBLICAN RIVER BASIN, SMOKY HILL RIVER BASIN, JANUARY 11, 2016 RULEMAKING; EFFECTIVE DATE MARCH 1, 2016

The provisions of C.R.S. 25-8-202(1)(i) and 25-8-401(2) provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted in compliance with 24-4-103(4) C.R.S. the following statement of basis and purpose.

BASIS AND PURPOSE

The Commission, in a public rulemaking hearing adopted extensive changes to the format of this regulation. The Commission does not intend to change any existing designations, use classifications or standards, or the implementation of any standards as the results of changing the format.

This rulemaking was in response to longstanding issues with managing the information contained in the standards tables. The changes made in this hearing reflect a change from storing the information in word processing documents to storing the information in a relational database. This change in platform will provide better consistency, facilitate error checking as well as a more readable format for the standards tables. Storing the information in a database allows it to be used more efficiently by other programs in the Division.

While it was the Commission's intent not to change the substantive meaning of the regulations in this rulemaking, in cases where there was ambiguity the revised regulation reflects the Commission's interpretation of the previous format based on Regulation #31 (the Basic Standards and Methodologies for Surface Water) and the experience of the Commission and its staff.

Overall format changes: The new format displays parameters by name, rather than by period table element abbreviations. The section formerly titled "Temporary Modifications and Qualifiers" does not appear in the new format. Instead, there is a separate section for qualifiers, and an "Other" section. Temporary modifications, variances and other footnotes are displayed in the "Other" section. Many items that were formerly in the "Temporary Modifications and Qualifiers" column will be displayed in the "Other" column and will have a different appearance or modified wording, although the information is substantively the same. Each footnote in the "Other" section is preceded by a heading that indicates where the footnote applies:

- Footnotes regarding a use classification will begin with the heading "Classification…"
- Footnotes regarding the antidegradation designation begin with the heading "Designation…"
- Footnotes that relate to a particular standard begin with the name of the parameter, for example "Selenium(chronic)= …"

Also, since there is more room for information within each segment, footnotes "B" and "C" were replaced with the full text in each segment where these footnotes were applied. Footnote "A" was maintained because the text is too long to be displayed in the "Other" section for each segment where it applies. Footnote "D" was changed to footnote "B" and was maintained because the text is too long to be displayed in the "Other" section.

Constraints of the new format: Some adjustments were made to the way that data is displayed in order to be compatible with the functions of the Standards Database. Database organization requires that information which relates to multiple standards must be attached to each individual parameter. For example, a segment with a temporary modification listed for "all parameters" in the old format will have a temporary modification listed for each individual parameter in the new format. There are also spacing constraints in the new format, which require some information to be moved either to the "other" box on the new format, or moved out of the segment entirely and into another location in the regulation.

Clarification of changes: The shift to a database organizational structure required consistency in the way each data element is addressed. To insure that data is stored and displayed correctly, the following changes were made.

- The "type" of temporary modification is no longer displayed in the segment tables, since they have no regulatory effect and have been inconsistently displayed.
- In the old format, waters that had a reviewable antidegradation designation were identified by the absence of either "UP" or "OW" in the designation column. These segments now display the word "reviewable" under the designation heading. There needed to be a value in the designation column for every segment.
- Dissolved standards are not specifically noted as dissolved in the new format. All metals standards are dissolved unless noted with a "T" or a "t". For example, a manganese standard in the old format of "WS(dis") is displayed as "WS" in the new format.
- A new footnote 7 was added to clarify that although E. coli is listed in the "chronic" column, the standard is a two-month geometric mean rather than a 30-day average. The language of footnote 7 was taken from Regulation 31, Table 1, footnote 7.

- A new footnote 8 was added to indicate that all phosphorus standards are based upon the concentration of total phosphorus. In the old format, individual phosphorus standards were noted as "total" in some basins and not others.

- A new footnote 9 was added to clarify that although pH is listed in the "acute" column, the standard is not applied as a 1-day average. The language of footnote 7 was taken from Regulation 31, Table 1, footnote 3.

- Physical and Biological Parameters: Some parameters are not specifically identified in the old format segment tables as acute or chronic. The new format requires that each parameter is placed in either the acute or chronic column. Specifically, these parameters and the basis for being identified as acute or chronic are as follows:

  - pH (acute) – Regulation #31, Table 1, footnote 3

  - E. Coli (chronic) – Regulation #31, Table 1, footnote 7

  - D.O. (chronic) – Regulation #31, Table 1, footnote 1

  - cyanide (acute) – Regulation #31, Table 2

  - sulfide (chronic) - Regulation #31, Table 2

  - nitrate (acute) - Regulation #31, Table 2

  - nitrite (chronic) – not specified in Regulation #31. Nitrite has been implemented as a 30-day average standard in permits and assessments.

  - chloride (chronic) Regulation #31, Table 2

  - boron (chronic) - Regulation #31, Table 2

  - sulfate (chronic) Regulation #31, Table 2

- In the old format, uranium standards for Big Dry Creek were shown in the attached table, but not listed with each segment. The new format includes the uranium standards for Big Dry Creek Segments 2-7. These were added because the new format displays every parameter. If uranium standards are not listed in the segment table, then it appears to communicate that there is not a uranium standard. There is still a footnote to refer to the table for the other site-specific radionuclide standards.

- Some site-specific standards had too much information to be contained in the new table, so it was moved to 38.6(4) (Upper South Platte Segments 16h, 16i, 16j and Cherry Creek Segment 4b).

38.92 STATEMENT OF BASIS SPECIFIC STATUTORY AUTHORITY AND PURPOSE DECEMBER 14, 2015 RULEMAKING; FINAL ACTION JANUARY 11, 2016; EFFECTIVE DATE JUNE 30, 2016

The provisions of C.R S. 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; and 25-8-402; provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted in compliance with 24-4-103(4) C.R.S. the following statement of basis and purpose.

BASIS AND PURPOSE

Pursuant to the requirements in the Basic Standards (at 31.7(3)), the Commission reviewed the status of temporary modifications scheduled to expire before December 31, 2017 to determine whether the temporary modification should be modified, eliminated or extended. Temporary modification of standards on one segment was reviewed.

> Upper South Platte segment 3: Temporary modification of ammonia. The Town of Florisant is making progress toward resolution of uncertainty regarding the underlying chronic cadmium, copper and zinc standards. The Commission made no change to the expiration date of 6/30/2017 because the original time allotment was deemed adequate.

PARTIES TO THE RULEMAKING HEARING

1. City of Delta
2. Resurrection Mining Company
3. U.S. Energy Corp.
4. City of Pueblo
5. Peabody Sage Creek Mining and Seneca Coal Company
6. Climax Molybdenum Company
7. Rio Grande Silver
8. City of Colorado Springs and Colorado Springs Utilities
9. Tri-State Generation and Transmission Association, Inc.
10. High Country Conservation Advocates
11. U.S. Environmental Protection Agency
12. Colorado Parks and Wildlife
13. Town of Crested Butte and Coal Creek Watershed Coalition
14. Public Service Company of Colorado

38.93 STATEMENT OF BASIS SPECIFIC STATUTORY AUTHORITY AND PURPOSE OCTOBER 11, 2016 RULEMAKING; FINAL ACTION NOVEMBER 14, 2016; EFFECTIVE DATE MARCH 1, 2017

The provisions of C.R S. 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; and 25-8-402; provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted in compliance with 24-4-103(4) C.R.S. the following statement of basis and purpose.

BASIS AND PURPOSE

A. Adoption and Re-examination of Discharger-Specific Variances

In 2010, the Commission adopted the discharger specific variance (DSV) provisions at Regulation 31.7(4), which allow a temporary water quality standard to be adopted in cases where water quality based effluent limits are not feasible to achieve. A DSV is a hybrid standard that maintains the long-term water quality goal of fully protecting all designated uses, while temporarily authorizing an alternative effluent limit (AEL) to be developed for a specific pollutant and specific point source discharge where compliance with the water quality based effluent limit (WQBEL) is not feasible.

Pursuant to 40 CFR 131.14(b)(1)(v)-(vi), the Commission must re-evaluate every DSV with a duration longer than five years and provide EPA notice of the results within 30 days of the completion of the re-evaluation process. If the Commission does not complete this action, the federal regulation states that the DSV will no longer be the applicable water quality standard for purposes of the Clean Water Act. This re-evaluation is consistent with Commission Regulation 31.7(4), which requires that the Commission re-examine all DSVs not less than once every three years. For purposes of EPA's notice requirement, the Commission's re-evaluation can be completed at two different points: 1) at the completion of a publicly noticed informational hearing where the Commission has re-examined the DSV and determined that no changes to the DSV are to be formally considered through the rulemaking process; and 2) at the effective date of a rulemaking hearing where the Commission has formally considered changes to the DSV.

B. Upper South Platte River Segments 15 and 16i (Suncor Energy (U.S.A.) Inc.)

The Commission adopted a DSV for Upper South Platte River Segments 15 and 16i for selenium that represents the highest degree of protection of the classified uses that is feasible for the Suncor Energy (U.S.A.) Inc. Commerce City Refinery. For selenium, the effluent limits for Suncor shall not be more restrictive than a 30-day average of 24 µg/L prior to 12/31/2023. During the duration of the DSV, Suncor will continue to study selenium treatment optimization and technologies to inform future Commission review of the DSV. The Commission will conduct a re-evaluation of the DSV during the triennial review process for this regulation. At the time of the issues scoping hearing and the issues formulation hearing for this regulation, the Division will review all existing and readily available information and provide comments to the Commission regarding whether the DSV continues to be the highest attainable condition. The Commission also expects that Suncor will submit a progress report for the Commission's review of the DSV and the AEL during the June 2020 South Platte Basin rulemaking hearing. The Commission will obtain public input on the re-evaluation through the triennial review process. For purposes of EPA's notice requirement, the Commission's re-examination of the Suncor DSV will be completed at the effective date of the June 2020 South Platte Basin rulemaking hearing, and the Commission will submit the results of the re-evaluation to EPA no later than 30 days after the effective date of the South Platte Basin rulemaking.

The requirements of the DSV will be either the AEL identified at the time of the adoption of the variance, or the highest attainable condition identified during any re-evaluation rulemaking hearing held by the Commission.

PARTIES TO THE RULEMAKING HEARING

1. Suncor Energy (U.S.A.) Inc.
2. City of Las Animas
3. Colorado Parks and Wildlife
4. U.S. Environmental Protection Agency
5. City of La Junta
6. Town of Nucla

38.94 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; DECEMBER 12, 2016 RULEMAKING; FINAL ACTION JANUARY 9, 2017; EFFECTIVE DATE JUNE 30, 2017

The provisions of C.R.S. 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; and 25-8-402; provide the specific statutory authority for adoption of these regulatory amendments. The commission also adopted in compliance with 24-4-103(4) C.R.S. the following statement of basis and purpose.

BASIS AND PURPOSE

Pursuant to the requirements in the Basic Standards (at 31.7(3)), the commission reviewed the status of temporary modifications scheduled to expire before December 31, 2018, to determine whether the temporary modifications should be modified, eliminated or extended.

Current temporary modifications of standards on three segments were reviewed.

No action: The commission took no action on the temporary modifications on the following segments.

Upper South Platte Segment 3: temporary modification of the ammonia standards (expire 12/31/2017) below the Florissant Waste Water Treatment Facility. The Town of Florissant obtained funding to upgrade its facility and a progress report indicated the facility is on track to comply with ammonia effluent limits.

Upper South Platte Segment 10a: temporary modification of the copper standards (expire 12/31/2018) below the Plum Creek Water Reclamation facility outfall. PCWRA continues to make progress on data collection for a Biotic Ligand Model (BLM) based site specific standard.

Clear Creek Segment 13b: temporary modification of the cadmium standard (expire 12/31/2018). Black Hawk/Central City Sanitation District continues to make progress on resolving the uncertainty.

New Temporary Modifications

St Vrain Segments 6 and 7: temporary modifications of the total recoverable and dissolved iron standards and the dissolved manganese standard were added to these segments. Raytheon presented evidence regarding uncertainty of these standards and a compliance problem. These temporary modifications will expire on 12/31/2020 and will be reviewed beginning in 2018.

New Temporary Modifications of the Arsenic Standard:

Consistent with the actions taken in 2013, the commission adopted a temporary modification of the arsenic standard on segments on the following list, with an expiration date of 12/31/2021. At the April 8, 2013 rulemaking, the commission heard testimony that concurred with the finding from a December 13, 2011 hearing that an initial reasonable lower limit of treatment technology for arsenic is 3.0 μg/L, pending further investigation by the division, dischargers and stakeholders. The temporary modification was established by the commission to allow for a temporarily less stringent application of the chronic arsenic standard in control requirements for both existing discharges and new or increased discharges.

Upper South Platte Segment 16b
Upper South Platte Segment 19
Cherry Creek Segment 2
Clear Creek Segment 2b
Clear Creek Segment 6
Clear Creek Segment 12b
Big Dry Creek Segment 2
Boulder Creek Segment 17
St Vrain Segment 4a
St Vrain Segment 12

Middle South Platte Segment 7
Big Thompson Segment 14
Big Thompson Segment 16
Big Thompson Segment 17
Cache la Poudre Segment 7
Republican Segment 1

PARTIES TO THE RULEMAKING HEARING

1. Colorado Parks and Wildlife
2. Resurrection Mining Company
3. Public Service Company of Colorado
4. City of Pueblo
5. Peabody Sage Creek Mining Company and Seneca Coal Company
6. Tri-State Generation and Transmission Association, Inc.
7. Climax Molybdenum Company
8. Rio Grande Silver, Inc.
9. Mt. Emmons Mining Company
10. Plum Creek Water Reclamation Authority
11. Environmental Protection Agency
12. Raytheon Company
13. City of Boulder Open Space and Mountain Parks
14. High Country Conservation Advocates
15. City of Colorado Springs and Colorado Springs Utilities
16. City of Black Hawk and Black Hawk/Central City Sanitation District
17. Town of Crested Butte and Coal Creek Watershed Coalition
18. Parker Water and Sanitation District

38.95 STATEMENT OF BASIS SPECIFIC STATUTORY AUTHORITY AND PURPOSE APRIL 10, 2017 RULEMAKING; FINAL ACTION APRIL 10, 2017; EFFECTIVE DATE JUNE 30, 2017

The provisions of C.R S. 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; and 25-8-402; provide the specific statutory authority for adoption of these regulatory amendments. The commission also adopted in compliance with 24-4-103(4) C.R.S. the following statement of basis and purpose.

BASIS AND PURPOSE

In this hearing, the commission made several corrections to Regulation 38. Several errors have been identified which do not reflect the commission’s intended decisions from recent hearings.

A. South Platte Segment 16i

The commission made a correction to the discharger specific variance for selenium on Upper South Platte Segment 16i that was originally adopted on October 11, 2016. The variance is expressed as a hybrid standard, with the first number as the underlying standard previously adopted by the commission for the segment. The underlying chronic selenium standard for this portion of Segment 16i is 9.0 µg/L (see 38.6(4)(f) for site-specific standards and assessment locations). Therefore, the first number in the variance should be 9.0 µg/L.

B. Clear Creek Segments 14a and 14b

The commission deleted the arsenic temporary modification from Clear Creek Segment 14a and adopted an arsenic temporary modification on Clear Creek Segment 14b. When the commission took preliminary final action on changes from the June 2015 Regulation 38 rulemaking hearing, the commission decided not to adopt the proposed arsenic temporary modification on Clear Creek Segment 14a. During the formation of final action documents, the arsenic temporary modification was inadvertently removed from Clear Creek Segment 14b instead of Clear Creek 14a.

C. Big Thompson Segment 2

The commission corrected the antidegradation designation for Big Thompson River Segment 2. During the June 2015 Regulation 38 rulemaking hearing, the antidegradation designation was inadvertently changed from reviewable to use protected. Because this change was in error and data are available to show waters in this segment are high quality, the commission has removed the used protected designation and reapplied the reviewable designation to Big Thompson River Segment 2.

38.96 STATEMENT OF BASIS SPECIFIC STATUTORY AUTHORITY AND PURPOSE; DECEMBER 11, 2017 RULEMAKING; FINAL ACTION DECEMBER 11, 2017; EFFECTIVE DATE JANUARY 31, 2018

The provisions of C.R S. 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; and 25-8-402; provide the specific statutory authority for adoption of these regulatory amendments. The commission also adopted, in compliance with 24-4-103(4) C.R.S., the following statement of basis and purpose.

BASIS AND PURPOSE

In this hearing, the commission made corrections to Regulation No. 38. Several errors have been identified which do not reflect the commission’s intended decisions from recent hearings.

A. South Platte Segment 16i

The commission made corrections to the standards applied to Upper South Platte Segment 16i. This segment currently has Agriculture, Aquatic Life Warm 2, and Recreation E uses, and a Fish Ingestion Standards qualifier. However, several Water Supply standards (cadmium, chromium III, lead, and nickel) were erroneously assigned to this segment. Because this segment does not have a Water Supply use, the commission deleted the Water Supply-based standards for cadmium, chromium III, lead, and nickel, and retained the standards to protect Aquatic Life and Agriculture uses. The commission also corrected the chronic arsenic standard. Because this segment has a Fish Ingestion Standards qualifier, the commission replaced the existing Agriculture-based chronic arsenic standard of 100(T) μg/L with the Fish Ingestion-based chronic standard of 7.6(T) μg/L.

B. South Platte Segment 22a

The commission made a correction to the qualifiers on Upper South Platte Segment 22a. The commission replaced the “Fish Ingestion Standards” qualifier with the “Water + Fish Standards” qualifier because this segment has a Water Supply use.

C. Clear Creek Segment 3b

The commission made a correction to the standards applied to Clear Creek Segment 3b. The acute arsenic standard of 50(T) μg/L was intended to be deleted during the 2015 Regulation No. 38 hearing, but was erroneously retained. The commission deleted the acute arsenic standard of 50(T) μg/L and retained the arsenic standards to protect the Aquatic Life and Water Supply uses.

D. Clear Creek Segments 6 and 21

The commission made a correction to the description of Clear Creek Segment 6. This segment included an exception for Segment 7; this was replaced with Segment 7a.

The commission made a correction to the description of Clear Creek Segment 21. This segment included an exception for Segment 7; this was replaced with Segment 7b.

38.97 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; DECEMBER 11, 2017 RULEMAKING; FINAL ACTION JANUARY 8, 2018; EFFECTIVE DATE JUNE 30, 2018

The provisions of C.R.S. 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; and 25-8-402; provide the specific statutory authority for adoption of these regulatory amendments. The commission also adopted in compliance with 24-4-103(4) C.R.S. the following statement of basis and purpose.

BASIS AND PURPOSE

Pursuant to the requirements in the Basic Standards (at 31.7(3)), the commission reviewed the status of temporary modifications scheduled to expire before December 31, 2019 to determine whether the temporary modification should be modified, eliminated, or extended.

No action: The commission took no action on the temporary modifications on the following segments:

Upper South Platte Segment 3: temporary modification of the ammonia standard below the Florissant Wastewater Treatment Facility (expires 12/31/2017). The Town of Florissant obtained funding to upgrade its facility and a progress report indicated the facility is on track to comply with ammonia effluent limits. The commission took no action on this temporary modification and it was deleted from the table because it expires 12/31/2017.

Upper South Platte Segment 10a: temporary modifications of the copper (expires 12/31/2018; applies below the Plum Creek Water Reclamation Authority) and manganese (expires 6/30/2019) standards. Plum Creek Water Reclamation Authority continues to make progress on resolving the uncertainty underlying both temporary modifications. The commission made no change to the expiration date as the original time allotment was deemed adequate to resolve the uncertainty.

Clear Creek Segments 11, 14a, 14b, and 15: temporary modification of the temperature standard (expires 6/30/2019). MillerCoors continues to make progress on resolving the uncertainty. The commission made no change to the expiration date as the original time allotment was deemed adequate to resolve the uncertainty.

Clear Creek Segment 13b: temporary modification of the cadmium standard (expires 12/31/2018). Black Hawk and Central City Sanitation District continues to make progress on resolving the uncertainty. The commission made no change to the expiration date as the original time allotment was deemed adequate to resolve the uncertainty.

New temporary modifications of the arsenic standard:

Consistent with the actions taken in 2013, the commission adopted a temporary modification of the arsenic standard on segments on the following list, with an expiration date of 12/31/2021. At the April 8, 2013 rulemaking, the commission heard testimony that concurred with the finding from a December 13, 2011 rulemaking hearing that an initial reasonable lower limit of treatment technology for arsenic is 3.0 µg/L, pending further investigation by the division, dischargers and stakeholders. The temporary modification was established by the commission to allow for a temporarily less stringent application of the chronic arsenic standard in control requirements for both existing discharges and new or increased discharges.

Cherry Creek Segment 3
Boulder Creek Segment 7b

PARTIES TO THE RULEMAKING HEARING

1. Peabody Sage Creek Mining Company, Seneca Coal Company and Twentymile Coal, LLC
2. Tri-State Generation and Transmission Association, Inc.
3. Colorado Parks and Wildlife
4. Environmental Protection Agency
5. City of Black Hawk and Black Hawk/Central City Sanitation District
6. Rio Grande Silver, Inc.
7. MillerCoors LLC
8. Plum Creek Water Reclamation Authority
9. Public Service Company of Colorado
10. City of Pueblo

38.98 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; DECEMBER 10, 2018 RULEMAKING; FINAL ACTION JANUARY 14, 2019; EFFECTIVE DATE JUNE 30, 2019

The provisions of C.R.S. 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; and 25-8-402; provide the specific statutory authority for adoption of these regulatory amendments. The commission also adopted in compliance with 24-4-103(4) C.R.S. the following statement of basis and purpose.

BASIS AND PURPOSE

Pursuant to the requirements in the Basic Standards (at 31.7(3)), the commission reviewed the status of temporary modifications scheduled to expire before December 31, 2020 to determine whether the temporary modifications should be modified, eliminated, or extended.

For the temporary modifications set to expire after the effective date of this hearing, the commission reviewed progress toward resolving the uncertainty in the underlying standard and/or the extent to which conditions are a result of natural or anthropogenic conditions, and evaluated whether the temporary modifications were still necessary. The commission took no action on the following temporary modifications:

Upper South Platte Segment 10a (COSPUS10a): temporary modification of the temperature standards (expires 12/31/2020). Plum Creek Water Reclamation Authority continues to make progress to resolve the uncertainty. The commission made no change to the expiration date, as the original time allotment was deemed adequate to resolve the uncertainty.

Upper South Platte Segment 14 (COSPUS14): temporary modifications of the chloride and temperature standards (expire 12/31/2020). Centennial Water and Sanitation District continues to make progress to resolve the uncertainty in the chloride standard. Centennial and South Platte Water Renewal Partners (formerly Littleton/Englewood) continue to make progress to resolve the uncertainty in the temperature standard. The commission made no change to the expiration dates, as the original time allotment was deemed adequate to resolve the uncertainty.

Upper South Platte Segment 15 (COSPUS15): temporary modifications of the chloride, sulfate, and temperature standards (expire 12/31/2020). Public Service Company of Colorado continues to make progress to resolve the uncertainty in the chloride and sulfate standards. Metro Wastewater Reclamation District continues to make progress to resolve the uncertainty in the temperature standard. The commission made no change to the expiration dates, as the original time allotment was deemed adequate to resolve the uncertainty.

Upper South Platte Segment 16g (COSPUS16g): temporary modification of the temperature standards (expires 12/31/2020). Centennial continues to make progress to resolve the uncertainty in the temperature standard. The commission made no change to the expiration date, as the original time allotment was deemed adequate to resolve the uncertainty.

Bear Creek Segment 1c (COSPBE01c): temporary modifications of the chlorophyll a and phosphorus standards (12/31/2020). The division is currently working on a model intended to resolve uncertainty in the standards and inform TMDL development. The commission made no change to the expiration date, as the original time allotment was deemed adequate to resolve the uncertainty.

Clear Creek Segment 2a (COSPCL02a): temporary modification of the acute and chronic zinc standards (expires 7/1/2020). Georgetown continues to make progress to resolve the uncertainty. The commission made no change to the expiration date, as the original time allotment was deemed adequate to resolve the uncertainty.

Clear Creek Segment 2c (COSPCL02c): temporary modifications of the chronic copper and chronic cadmium standards (expire 7/1/2020). Central Clear Creek Sanitation District continues to make progress to resolve the uncertainty. The commission made no change to the expiration date, as the original time allotment was deemed adequate to resolve the uncertainty.

Clear Creek Segment 13b (COSPCL13b): temporary modification of the temperature standards (expires 12/31/2020). City of Black Hawk / Black Hawk Central City Sanitation District continues to make progress to resolve the uncertainty. The commission made no change to the expiration date, as the original time allotment was deemed adequate to resolve the uncertainty.

Boulder Creek Segment 9 (COSPBO09): temporary modification of the acute and chronic temperature standards (expires 12/31/2020). The City of Boulder continues to make progress to resolve the uncertainty. The commission made no change to the expiration date, as the original time allotment was deemed adequate to resolve the uncertainty.

St. Vrain segments 6 and 7 (COSPSV06 and COSPSV07, respectively): temporary modifications of the chronic iron and acute and chronic manganese standards (expire 12/31/2020). Raytheon Boulder continues to make progress to resolve the uncertainty. The commission made no change to the expiration date, as the original time allotment was deemed adequate to resolve the uncertainty.

Big Thompson Segment 9 (COSPBT09): temporary modification of the chronic selenium standard (expires 12/31/2020). The Town of Milliken continues to make progress to resolve the uncertainty. The commission made no change to the expiration date, as the original time allotment was deemed adequate to resolve the uncertainty.

Cache la Poudre Segment 11 (COSPCP11): temporary modification of the acute and chronic temperature standards (expires 12/31/2020). The City of Fort Collins continues to make progress to resolve the uncertainty. The commission made no change to the expiration date, as the original time allotment was deemed adequate to resolve the uncertainty.

Cache la Poudre Segment 12 (COSPCP12): temporary modification of the acute and chronic temperature standards (expires 12/31/2020). The City of Fort Collins and the City of Greeley continue to make progress to resolve the uncertainty. The commission made no change to the expiration date, as the original time allotment was deemed adequate to resolve the uncertainty.

The commission deleted the temporary modifications on the following segments:

Cherry Creek Segment 1 (COSPCH01): temporary modification of the chronic copper standard (expires 12/31/2020). The commission deleted this temporary modification because progress was not being made on the plan to resolve uncertainty and alternative regulatory tools are available to dischargers with copper compliance concerns.

Cherry Creek Segment 3 (COSPCH03): temporary modification of the chronic arsenic standard (expires 12/31/2021). The commission deleted this temporary modification because it was adopted in error. The temporary modification is more stringent than the underlying standard.

Boulder Creek Segment 7b (COSPBO07b): temporary modification of the chronic arsenic standard (expires 12/31/2021). The commission deleted this temporary modification because it was adopted in error. The temporary modification is more stringent than the underlying standard.

Boulder Creek Segment 8 (COSPBO08): temporary modification of the chronic selenium standard (expires 12/31/2020). The commission deleted this temporary modification because progress was not being made on the plan to resolve uncertainty and alternative regulatory tools are available to dischargers with selenium compliance concerns.

Big Thompson Segment 4b (COSPBT04b): temporary modification of the chronic selenium standard (expires 12/31/2020). The commission deleted this temporary modification because progress was not being made on the plan to resolve uncertainty and alternative regulatory tools are available to dischargers with selenium compliance concerns.

Cache la Poudre Segment 13b (COSPCP13b): temporary modification of the chronic selenium standard (expires 12/31/2020). The commission deleted this temporary modification because progress was not being made on the plan to resolve uncertainty and alternative regulatory tools are available to dischargers with selenium compliance concerns.

The commission took no action on temporary modifications that were set to expire on or before the effective date of this hearing. The commission deleted the following temporary modifications, which were allowed to expire:

Upper South Platte Segment 10a (COSPUS10a) - copper and manganese
Clear Creek segments 11, 14a, 14b and 15 (COSPCL11, COSPCL14a, COSPCL14b, and COSPCL15, respectively) – temperature
Clear Creek Segment 13b (COSPCL13b) - cadmium

Regarding the cadmium temporary modification on Clear Creek Segment 13b (COSPCL13b):

The commission determined that the Black Hawk/Central City Sanitation District does not currently have a demonstrated or predicted water quality-based effluent limit compliance problem, and that it was appropriate to allow the temporary modification to expire on 12/31/2018.

Significant uncertainty remains in this segment regarding the water quality standards necessary to protect current and/or future uses and whether existing quality is the result of natural or irreversible human-induced conditions. Specifically, it is uncertain whether instream concentrations will attain the underlying cadmium standards following implementation of CERCLA remedies at the CDPHE/EPA Mine Water Treatment Plant. Furthermore, uncertainty exists as to what the highest attainable use will be and when data and other relevant information will be available to characterize that use.

38.99 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; DECEMBER 9, 2019 RULEMAKING; FINAL ACTION JANUARY 13, 2020; EFFECTIVE DATE JUNE 30, 2020

The provisions of C.R.S. 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; and 25-8-402; provide the specific statutory authority for adoption of these regulatory amendments. The commission also adopted in compliance with 24-4-103(4) C.R.S. the following statement of basis and purpose.

BASIS AND PURPOSE

Pursuant to the requirements in the Basic Standards (at 31.7(3)), the commission reviewed the status of temporary modifications scheduled to expire before December 31, 2021 to determine whether the temporary modifications should be modified, eliminated, or extended.

For the temporary modifications set to expire after the effective date of this hearing, the commission reviewed progress toward resolving the uncertainty in the underlying standard and/or the extent to which conditions are a result of natural or anthropogenic conditions, and evaluated whether the temporary modifications were still necessary.

A. Temporary Modifications for Standards Other than Arsenic

The commission took no action on the following temporary modifications:

Upper South Platte Segment 15 (COSPUS15): temporary modifications of the chronic chloride, chronic sulfate, and acute and chronic temperature standards (expire 12/31/2020). Public Service Company of Colorado continues to make progress to resolve the uncertainty in the chloride and sulfate standards. Metro Wastewater Reclamation District continues to make progress to resolve the uncertainty in the temperature standard and is working to develop a proposal for a discharger specific variance in the June 2020 rulemaking hearing. The commission made no change to the expiration dates, as the original time allotment was deemed adequate to resolve the uncertainty.

Upper South Platte Segment 16g (COSPUS16g): temporary modification of the acute and chronic temperature standards, 12/1 to 2/29 (expires 12/31/2020). Centennial continues to make progress to resolve the uncertainty in the temperature standard. The commission made no change to the expiration date, as the original time allotment was deemed adequate to resolve the uncertainty.

Clear Creek Segment 13b (COSPCL13b): temporary modification of the acute and chronic temperature standards (expires 12/30/2020). City of Black Hawk / Black Hawk Central City Sanitation District continues to make progress to resolve the uncertainty and to investigate what level of temperature reduction is technologically feasible to achieve. The commission made no change to the expiration date, as the original time allotment was deemed adequate to resolve the uncertainty.

St. Vrain segments 6 and 7 (COSPSV06 and COSPSV07): temporary modifications of the chronic iron and acute and chronic manganese standards (expire 12/31/2020). Raytheon Boulder continues to make progress to resolve the uncertainty and is working to develop a proposal for site-specific standards in the June 2020 rulemaking hearing. The commission made no change to the expiration date, as the original time allotment was deemed adequate to resolve the uncertainty.

Big Thompson River Segment 9 (COSPBT09): temporary modification of the chronic selenium standard (expires 12/31/2020). The Town of Milliken continues to make progress to resolve the uncertainty. The commission made no change to the expiration date, as the original time allotment was deemed adequate to resolve the uncertainty.

The commission modified the temporary modifications on the following segment:

Upper South Platte Segment 10a (COSPUS10a): temporary modification of the acute and chronic temperature standards, 12/1 to 2/29 (expires 12/31/2020). Plum Creek Water Reclamation Authority continues to make progress to resolve the uncertainty. The commission retained the Maximum Weekly Average Temperature temporary modification, but deleted the Daily Maximum (DM) temporary modification because instream temperature data show that the underlying Warm Stream Tier I (WS-I) DM temperature standard is being attained. The commission made no change to the expiration date, as the original time allotment was deemed adequate to resolve the uncertainty.

The commission deleted the temporary modifications on the following segments:

Upper South Platte Segment 14 (COSPUS14): temporary modification of the chronic chloride standard (expires 12/31/2020). The commission deleted this temporary modification because instream chloride data show that the underlying chloride standard is being attained.

Upper South Platte Segment 14 (COSPUS14): temporary modification of the acute and chronic temperature standards, 12/1 to 2/13 (expire 12/31/2020). The commission deleted this temporary modification because instream temperature data show that the underlying WS-I temperature standards are being attained.

Bear Creek Segment 1c (COSPBE01c): temporary modifications of the chronic chlorophyll a and phosphorus standards (12/31/2020). The commission deleted these temporary modifications because progress was not being made on the plan to resolve uncertainty and there are no existing permitted dischargers with demonstrated or predicted compliance problems for these parameters.

Boulder Creek Segment 9 (COSPBO09): temporary modification of the acute and chronic temperature standards, 12/1 to 2/29 (expires 12/31/2020). The commission deleted this temporary modification because instream temperature data show that the underlying Warm Stream Tier II (WS-II) temperature standards are being attained.

Cache la Poudre River Segment 11 (COSPCP11): temporary modification of the acute and chronic temperature standards, 12/1 to 2/29 (expires 12/31/2020). The commission deleted this temporary modification because instream temperature data show that the underlying WS-I temperature standards are being attained.

Cache la Poudre River Segment 12 (COSPCP12): temporary modification of the acute and chronic temperature standards (expires 12/31/2020). The commission deleted this temporary modification because instream temperature data show that the underlying WS-I temperature standards are being attained.

The commission took no action on temporary modifications that were set to expire on or before the effective date of this hearing. The commission deleted the following temporary modifications, which were allowed to expire:

Clear Creek Segment 2a (acute and chronic zinc)
Clear Creek Segment 2c (chronic copper and chronic cadmium)

B. Temporary Modifications for Arsenic

The temporary modification of the chronic arsenic standard, which applies to numerous segments with a standard of 0.02 µg/l to protect the Water + Fish use, was extended from 12/31/2021 to 12/31/2024. No changes were made to the temporary modification operative values at 38.6(2)(c). For discharges existing on or before 6/1/2013, the temporary modification remains at As(ch)=current condition and numeric effluent limits will be developed by the division using the division's implementation method (WQCD Exhibit L). For new or increased discharges that commence on or after 6/1/2013, the temporary modification remains at 0.02–3.0 µg/L (total recoverable). The extension provides time to resolve the uncertainty in the underlying standard for arsenic to protect human health. Significant uncertainty remains regarding the appropriate standard to protect the use and the extent to which ambient levels of arsenic are the result of natural or irreversible conditions. In addition, there is widespread instream non-attainment of the underlying standard and predicted or demonstrated compliance problems with permit limits based on the underlying standard, as demonstrated in the division's Prehearing Statement.

It is anticipated that the uncertainty regarding the appropriate underlying standard for arsenic to protect human health will be resolved by June 2024, with the adoption of new statewide arsenic use-based standards. The division presented (WQCD Exhibit E) a detailed plan to resolve the multifaceted uncertainty for arsenic. The plan includes conducting a field study to investigate the proportion of inorganic (versus total) arsenic in the tissue of fish collected from Colorado waters, deriving a bioaccumulation or bioconcentration factor for arsenic, appropriate for use in Colorado, and characterizing ambient levels of arsenic in surface waters and groundwater statewide. As discussed below, the division will also be gathering, through permit requirements, targeted data from facilities benefiting from the arsenic temporary modification (WQCD Exhibit D). These data will help the division to better understand the contribution of arsenic in effluent from permitted facilities to ambient levels of arsenic in Colorado waters and will inform the extent to which ambient levels of arsenic are the result of natural or irreversible conditions.

Effluent arsenic concentration data from facilities throughout the state demonstrate that many facilities will likely have issues meeting effluent limits based on the anticipated revised arsenic water quality standard to protect human health. As a result, there is a widespread need to make progress to understand sources of arsenic and options for source control and treatment. To ensure such progress is made, when implementing the “current condition” temporary modification in permits, the division will include additional permit Terms and Conditions, which may include requirements for additional monitoring, source identification, and characterization of source control and treatment options for reducing arsenic concentrations in effluent (WQCD Exhibit D). Under the duration of the temporary modification, facilities would not be required to implement facility improvements to meet a specified effluent limit; however, facilities may be required to evaluate arsenic source control and treatment options for their facility. For purposes of evaluating options to reduce arsenic concentrations in effluent, the arsenic treatment removal recognized in the 2013 Arsenic Rulemaking (3 µg/L) can be used as a point of reference until the uncertainty in the underlying standard is resolved. Implementation guidance for these requirements was included in WQCD Exhibit D. These requirements are reasonable and would not cause undue economic burden for facilities, but will ensure that progress is being made toward future attainment of the underlying standards and protection of the classified uses. Implementation of these requirements would function to increase the amount of time facilities would have for long-term planning and encourage data collection that would facilitate implementation of the most appropriate source reduction and treatment options and selection of the most appropriate regulatory pathways once the new underlying standard is adopted for arsenic.

C. Implementation of Current Condition Temporary Modifications into Permits

Several parties to the hearing raised concerns regarding the implementation of current condition temporary modifications into permits, as described in WQCD Exhibit L. The commission was persuaded that the division has existing legal authority to proceed with implementation of these temporary modifications in the absence of a rule or policy addressing this specifically. However, the commission believes it would be beneficial to develop a policy, and therefore requested that the division work toward developing a division policy about how the division will proceed with implementing current condition temporary modifications into permits. The commission requested that the division report back to the commission next year, potentially as part of the division's annual update to the commission regarding the 10-Year Water Quality Roadmap, regarding what the division believes is a reasonable timeline and process for developing such a policy. The commission encouraged the division to continue with its current efforts at transparency and implementation of current condition temporary modifications consistent with the evidence presented in the rulemaking, including Exhibit L, into permits prior to the development of a policy.

38.100 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; DECEMBER 9, 2019 RULEMAKING; FINAL ACTION JANUARY 13, 2020; EFFECTIVE DATE JUNE 30, 2020

The provisions of C.R.S. 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; and 25-8-402; provide the specific statutory authority for adoption of these regulatory amendments. The commission also adopted in compliance with 24-4-103(4) C.R.S. the following statement of basis and purpose.

BASIS AND PURPOSE

A. Aquatic Life Standards for Cadmium

Cadmium is a naturally-occurring element frequently found alongside other metals, and numerous treatment techniques are available to remove cadmium from wastewater. Cadmium has both acute and chronic effects on aquatic life, and can negatively impact survival, growth, reproduction, immune and endocrine systems, development, and behavior.

The commission revised the hardness-based cadmium table value standards to protect the Aquatic Life use. The updated standards incorporate toxicity data that have become available since the cadmium standards were last updated in the 2005 Regulation No. 31 rulemaking hearing. The updated standards are based on the United States Environmental Protection Agency's (EPA) "Aquatic Life Ambient Water Quality Criteria – 2016" and toxicity data that have become available since EPA's recommended criteria were released in 2016.

The updated standards include two acute equations (acute(cold) and acute(warm)) and one chronic equation. The acute(cold) and chronic equations are the same as the acute and chronic criteria recommended by EPA in 2016. The acute(cold) equation, which is lowered to protect trout, is protective of trout and other sensitive cold water species and applies in segments classified as Aquatic Life Cold Class 1 or 2. The acute(warm) equation, which is not lowered to protect trout, is protective of warm water species and applies in segments classified as Aquatic Life Warm Class 1 or 2. The chronic equation is protective of both cold and warm water aquatic life and applies in segments classified as either Aquatic Life Cold Class 1 or 2 or Aquatic Life Warm Class 1 or 2.

Compared to the previous cadmium table value standards, the updated standards are generally less stringent. The acute(cold) standard is less stringent than the previous acute(trout) standard when water hardness is greater than 45 mg/L $CaCO_3$. The acute(warm) equation is less stringent than the previous acute standard when water hardness is greater than 101 mg/L $CaCO_3$. The updated chronic equation is less stringent than the previous chronic standard at all water hardness values.

In the past, Colorado has had separate acute equations for waters with trout and waters without trout. The updated standards include separate acute equations for cold waters (both with and without trout) and warm waters. This change in approach is due to the addition of toxicity data showing that sculpin, which inhabit cold waters, are also sensitive to cadmium. To ensure protection of sculpin and other sensitive cold water aquatic life in waters where trout are absent, the acute(cold) equation applies to all cold waters. As a result, the acute trout (tr) qualifier for cadmium is no longer needed on select cold water segments and was deleted from all segments where it had applied.

B. Clarifications to Appendix 38-1

To improve the clarity and usability of the tables, an acronym list was added to the front of Appendix 38-1 and the footnote referencing Section 38.6 was also simplified.

38.101 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; JUNE 8, 2020 RULEMAKING; FINAL ACTION AUGUST 10, 2020; EFFECTIVE DATE DECEMBER 31, 2020

The provisions of C.R.S. 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; and 25-8-402; provide the specific statutory authority for adoption of these regulatory amendments. The commission also adopted in compliance with 24-4-103(4) C.R.S. the following statement of basis and purpose.

BASIS AND PURPOSE

A. Water Body Segmentation

Some segments were renumbered, combined, or new segments were created to facilitate appropriate organization of water bodies in this regulation. Renumbering and/or creation of new segments was made based on information that showed: a) the original reason for segmentation no longer applied; b) significant differences in uses, water quality and/or physical characteristics warrant a change in standards on only a portion of the existing segment; and/or c) certain segments could be merged into one segment because they had similar water quality and uses. The following changes were made:

Upper South Platte segments 2b and 2c (COSPUS02b and COSPUS02c): The portion of Mosquito Creek from the confluence with South Mosquito Creek to Road #698 (39.270971, 106.098846) was moved from Segment 2b to Segment 2c. This move facilitated removal of the Water Supply use from Segment 2c, which now includes South Mosquito Creek, No Name Creek, and the portion of Mosquito Creek from South Mosquito Creek to Road #698. The Water Supply use was retained on Segment 2b, which includes the portion of Mosquito Creek from Road #698 to the Middle Fork of the South Platte River.

Cherry Creek segments 5 and 7 (COSPCH05 and COSPCH07): Rueter-Hess Reservoir was moved from Segment 5 to new Segment 7 to facilitate adoption of a Class 1 Aquatic Life use classification based on the presence of a diverse fish community. Parker Water stated that it may seek removal of the Agricultural use classification from Segment 7 in a future hearing if evidence shows that there is no existing or reasonably expected agricultural use of water stored in the reservoir. A Direct Use Water Supply sub-classification was added to recognize the conveyance of raw water to a treatment facility. Parker Water provided information clarifying that the source water for Rueter-Hess Reservoir is diverted from Cherry Creek below a qualified discharger which means that application of interim numeric nutrient standards is not appropriate at this time, and expressed an interest in working with stakeholders to develop site-specific nutrient standards. As part of this change, an exception for Segment 7 was added to the segment description for Segment 5.

Clear Creek segments 12a and 12b (COSPCL12a and COSPCL12b): The portion of Beaver Brook from Highway 40 to the confluence with Soda Creek, and the mainstem of Soda Creek from the source to the confluence with Clear Creek, were moved from Segment 12a to Segment 12b. Segment 12b previously contained only the portion of Beaver Brook from the source to Highway 40 and is classified as Aquatic Life Cold 1 with CS-I temperature standards. The move facilitated changing the Aquatic Life use (from Cold 2 to Cold 1) and the temperature standards (from CS-II to CS-I) based on presence of brook trout in these water bodies.

St. Vrain Segment 6 (COSPSV06): Segment 6 was resegmented into 6a and 6b to recognize the presence of existing and potential future Water Supply use in a portion of the parent segment. Segment 6a includes the portion of Dry Creek and tributaries from the source to the inlet of Boulder Reservoir and Segment 6b retained the rest of the stream portions from the parent segment. This resegmentation facilitated the adoption of the Water Supply use classification for Segment 6b.

Big Dry Creek Segment 5 (COSPBD05): Lakes and reservoirs from Segment 5 were moved into new Segment 5b. This was to be consistent with the convention of keeping lakes and reservoirs in separate segments from streams. Segment 5a retained the stream portions from the parent segment. As part of this change, an exception for Segment 5a was added to the segment description for Segment 4a and an exception for Segment 5b was added to the segment description for Segment 7.

Big Thompson segments 2, 3, 4a, 4b, 4c, and 7 (COSPBT02, COSPBT03, COSPBT04a, COSPBT04b, COSPBT04c, COSPBT07): Segments 2, 3, and 4a were combined into Segment 2, as the uses and standards are the same for all three segments as a result of upgrades to the Aquatic Life use (from Cold 2 to Cold 1) on Segment 3 and Recreation use (from seasonal N/E to year-round E) on Segment 4a. From Segment 2, the exception of Segment 7 was deleted, which resulted in moving the mainstem of the North Fork of the Big Thompson River from the Rocky Mountain National Park boundary to the confluence with the Big Thompson River to Segment 2 (the uses and standards are the same for segments 2 and 7). From Segment 2, the references to Black Canyon Creek and Glacier Creek below Estes Park water treatment plant were deleted, as this portion of these waters is outside of the Rocky Mountain National Park boundary and is in Segment 2 by default. To minimize the number of deleted segments retained as placeholders, Segment 4a was deleted, Segment 4b was renamed Segment 3, and Segment 4c was renamed Segment 4; segments 4b and 4c were then also deleted. The result of all changes combined is that waters previously in segments 2, 3, 4a, 4b, 4c, and 7 now occupy segments 2, 3, 4, and 7.

Cache la Poudre segments 2b and 3 (COSPCP02b and COSPCP03): Elkhorn Creek, including its tributaries and wetlands, from the source to a point immediately above the confluence with Manhattan Creek, was moved from Segment 2b to Segment 3. The move facilitated changing the temperature standards from CS-II to CS-I based on presence of brook trout in Elkhorn Creek and its tributaries above Manhattan Creek. As part of this change, an exception for Segment 3 was added to the segment description for Segment 2b.

Cache la Poudre segments 7, 8, and 9 (COSPCP07, COSPCP08, COSPCP09): Segments 7, 8 (except for a few tributaries), and 9 were combined into Segment 7, as the uses and standards are the same for all three segments as a result of upgrades to the Aquatic Life use (from Cold 2 to Cold 1) on Segment 8. Segment 7 has CS-II temperature standards. Some Segment 8 tributaries (Middle Fork Rabbit Creek, Stonewall Creek, North Fork Lone Pine Creek, and South Fork Lone Pine Creek, including all tributaries and wetlands) remained in Segment 8 to facilitate changing the Aquatic Life use from Cold 2 to Cold 1 and the temperature standards from CS-II to CS-I. As a result of these changes, Segment 9 is now vacant (shown as “Deleted.” in Appendix 38-1).

Cache la Poudre segments 11 and 12 (COSPCP11 and COSPCP12): Modifications were made to segments 11 and 12 to facilitate changes to the Aquatic Life use and temperature standards on a portion of Segment 11, and to add a Water Supply use to Segment 11 and a portion of Segment 12. The boundary between segments 11 and 12 was moved upstream, and Segment 12 was divided into segments 12a and 12b.

The portion of the mainstem of the Cache la Poudre River from Shields Street in Fort Collins to Prospect Road (40.567159, -105.027237) in Fort Collins remained in Segment 11 and the Aquatic Life use was changed from Warm 1 to Cold 1, the temperature standards were changed from WS-I to CS-II, and a Water Supply use was added. The portion of Segment 11 from Prospect Road to the confluence with Boxelder Creek was moved to the next downstream segment (Segment 12) to facilitate retention of the existing Aquatic Life Warm 1 use and WS-I temperature standards. As a result of this move, the upstream boundary of Segment 12 was moved approximately 2.75 miles upstream from Boxelder Creek to Prospect Road.

Segment 12 was divided into 12a and 12b to facilitate adoption of the Water Supply use on the upper portion of the segment. Segment 12a includes the mainstem of the Cache la Poudre River from Prospect Road to U.S. Hwy 85 (40.423323, -104.678956) in Greeley and has a Water Supply use. Segment 12b includes the portion of the Cache la Poudre River from U.S. Hwy 85 to the confluence with the South Platte River and was not assigned a Water Supply use.

In summary, Segment 11 (from Shields Street to Prospect Road) now has Aquatic Life Cold 1 and Water Supply uses, Segment 12a (Prospect Road to U.S. Hwy 85) remains Aquatic Life Warm 1 and a Water Supply use was added, and for Segment 12b no use classification changes were adopted.

Cache la Poudre segments 13b and 13c (COSPCP13b and COSPCP13c): The mainstem of Boxelder Creek from the source to above Slab Canyon Wash was moved from Segment 13b to Segment 13c to facilitate changing the Aquatic Life use from Warm to Cold. Segments 13b and 13c were then switched so that the segments were ordered from upstream to downstream. New Segment 13b contains Boxelder Creek from the source to Slab Canyon Wash, and the mainstems of South Branch of Boxelder Creek, Northern Branch of Boxelder Creek, and Sand Creek. New Segment 13c contains of Boxelder Creek from Slab Canyon to the confluence of the Cache la Poudre River.

Lower South Platte Segment 1 (COSPLS01): Segment 1 was split into segments 1a and 1b. Segment 1a includes the South Platte River from the Weld/Morgan County line to the Morgan/Washington County line. Segment 1b includes the South Platte River from the Morgan/Washington County line to the Colorado/Nebraska border. This resegmentation facilitates changing the Aquatic Life use from Warm 2 to Warm 1 and the temperature standards from WS-II to WS-I on Segment 1a.

Lower South Platte segments 2a and 2b (COSPLS02a and COSPLS02b): Segments 2a and 2b were combined into new Segment 2, as the uses and standards are the same for both segments as a result of upgrades to the Aquatic Life use (from Warm 2 to Warm 1) on both segments and the Recreation use (from P to E) on Segment 2a, and the addition of the Water Supply use on Segment 2b. The segment description for Segment 2 is the same as Segment 2a, except it no longer has an exception for Segment 2b.

Lower South Platte Segment 3 (COSPLS03) and Middle South Platte Segment 8 (COSPMS08): Riverside Reservoir was moved from Lower South Platte Segment 3 to new Middle South Platte Segment 8. This change was made because Riverside Reservoir is actually in the Middle South Platte sub-basin.

Lower South Platte segments 4 and 5 (COSPLS04 and COSPLS05): Segments 4 and 5 were combined into Segment 4, as the uses and standards are the same for both segments as a result of application of the full suite of Aquatic Life standards on Segment 4 and an upgrade of the Recreation use (from P to E) on Segment 4. The segment description for Segment 4 was changed to eliminate the exception for Segment 5. Segment 5 was deleted.

Republican River segments 8 and 9 (COSPRE08 and COSPRE09): Segments 8 and 9 were combined into Segment 8, as the uses and standards are the same for both segments as a result of application of the full suite of Aquatic Life standards and upgrades to the Aquatic Life use (from Warm 2 to Warm 1) and Recreation use (from U to E) on Segment 8. The segment description for Segment 8 was changed to eliminate the exception for Segment 9. Segment 9 was deleted.

Segment descriptions were also edited to improve clarity, correct typographical errors, and correct spelling errors. These changes are listed in Section O.

B. Aquatic Life Use Classifications and Standards

The commission reviewed information regarding the current Aquatic Life use classifications and evidence pertaining to existing aquatic communities. In addition, newly created segments were given the same Aquatic Life use classification as the segment from which they were split, unless there was evidence to show that the existing use classification was inappropriate.

Some segments assigned an Aquatic Life use classification were missing one or more standards to protect that use. The commission adopted the missing standards for the following segments:

Cherry Creek: 4a (chronic total recoverable iron), 4b (chronic total recoverable iron)
Big Dry Creek: 4b (acute and chronic ammonia), 5a (acute and chronic ammonia), 5b (acute and chronic ammonia)
Lower South Platte River: 2 (full suite of aquatic life use standards), 4 (full suite of aquatic life use standards)
Republican River: 6 (full suite of aquatic life use standards), 7 (full suite of aquatic life use standards), 8 (full suite of aquatic life use standards)

The commission reviewed information regarding the existing aquatic communities. No segments were lacking an Aquatic Life use, but Class 2 segments with high MMI scores (or other metrics indicating a diverse benthic macroinvertebrate community) and/or a wide variety of fish species, including sensitive species, were upgraded from Class 2 to Class 1.

The following segments were upgraded from Cold 2 to Cold 1:

Bear Creek: 1b
Cache la Poudre River: 8, 13b

The following segments were upgraded from Warm 2 to Warm 1:

Upper South Platte River: 15, 16i
Cherry Creek: 1, 3, 7
Clear Creek: 18a
Big Dry Creek: 1
Boulder Creek: 7b, 8, 11
Middle South Platte River: 1a, 1b, 5c
Big Thompson River: 5, 9, 19
Cache la Poudre River: 13a, 13c
Lower South Platte River: 1a, 2
Republican River: 6, 8

Clear Creek Segment 14a (COSPCL14a): The commission did not adopt the division's proposal to upgrade the Aquatic Life use classification on Clear Creek Segment 14a from Warm 2 to Warm 1 based on the evidence in the hearing. Some commissioners were concerned about the evidence regarding the presence of a wide variety of species, and other commissioners determined insufficient recent data were available to support an upgrade of the Aquatic Life use classification at this time.

Big Dry Creek Segment 1 (COSPBD01): While Water + Fish standards are typically applied to all Class 1 Aquatic Life segments which also have a Water Supply classification, the commission declined to apply the fish ingestion portion of the water + fish human health standards on Big Dry Creek segment 1 based on evidence presented that indicated fishing is not taking place on a recurring basis.

The commission reviewed information regarding the existing aquatic communities. For segments where the existing aquatic communities are not aligned with the Aquatic Life use, the following segments were changed from Warm to Cold:

The following segments were upgraded from Warm 1 to Cold 1:

Cache la Poudre River: 11

The following segment was upgraded from Warm 2 to Cold 1:

St. Vrain Creek: 5

The lists above include Aquatic Life use changes that apply to entire segments. Significant differences in the Aquatic Life use that warrant a change on only a portion of a segment are described in Section A (Water Body Segmentation).

The Aquatic Life Warm 1 Goal Qualifier was removed from the following segment because fish and benthic macroinvertebrate data demonstrate a wide variety of biota, including sensitive species, is currently being sustained:

Clear Creek: 15

The commission reviewed all Class 2 segments that have fish that are "of a catchable size and which are normally consumed and where there is evidence that fishing takes place on a recurring basis." Water + Fish or Fish Ingestion standards were applied to the following segments:

Clear Creek: 3b, 13b
Big Dry Creek: 7
Cache la Poudre River: 22
Lower South Platte River: 4

C. Recreation Use Classifications and Standards

The commission reviewed information regarding the current Recreation use classifications and evidence pertaining to actual or potential primary contact recreation. In addition, newly created segments were given the same Recreation use classification as the segment from which they were split, unless there was evidence to show that the existing use classification was inappropriate. The lists in this section include Recreation use changes that apply to entire segments. Significant differences in the Recreation use that warrant a change on only a portion of a segment are described in Section A (Water Body Segmentation).

Based upon evidence that portions of these segments are publicly accessible and located in a developed area where there is easy access for children, it was determined that primary contact recreation is expected to occur. The following segments with a Recreation P use classification and standards were upgraded to Recreation E:

Big Dry Creek: 1, 4b
Big Thompson River: 5 (changed from seasonal P application to year-round E)
Lower South Platte River: 2, 4

Based upon evidence that portions of these segments are publicly accessible and located in a developed area where there is easy access for children, it was determined that primary contact recreation is expected to occur. The following segments with a Recreation N use classification and standards were upgraded to Recreation E:

Big Dry Creek: 6

Big Thompson River: 3 (changed from seasonal N application to year-round E), 4 (changed from seasonal N application to year-round E), 5 (changed from seasonal N application to year-round E)

Based upon evidence that portions of these segments are publicly accessible and/or accessible to families who live in the area or visitors to public recreation lands in these segments, it was determined that primary contact recreation is expected to occur, including water play by children. The following segments with a Recreation U use classification and standards were upgraded to Recreation E:

Clear Creek: 17b, 24
Republican River: 8

Based upon evidence that portions of these segments are publicly accessible and/or accessible to families who live in the area or visitors to public recreation lands in these segments, it was determined that there is the potential for primary contact recreation, including water play by children. However, at this time, existing primary contact uses were not identified. Therefore, the following segments with a Recreation N use classification and standards were upgraded to Recreation P:

Cache la Poudre River: 13c (changed from seasonal N application to year-round P)
Republican River: 7

D. Water Supply Use Classification and Standards

The commission reviewed information regarding the current Water Supply use classifications and evidence pertaining to potable water supplies. In addition, newly created segments were given the same Water Supply use classification as the segment from which they were split, unless there was evidence to show that the existing use classification was inappropriate. The lists in this section include Water Supply use changes that apply to entire segments. Significant differences in the Water Supply use that warrant a change on only a portion of a segment are described in Section A (Water Body Segmentation).

The commission added a Water Supply use classification and standards where the evidence demonstrated surface waters are used for drinking water and/or there is a reasonable potential for a hydrological connection between surface water and alluvial wells used for drinking water. The Water Supply use classification and standards were added to the following segments:

Upper South Platte River: 11b, 16a, 16e, 16k
Clear Creek: 13b
Big Dry Creek: 1
Boulder Creek: 8

St. Vrain Creek: 3, 6b
Middle South Platte River: 5c
Big Thompson River: 5, 6
Cache la Poudre River: 11, 12a, 13c
Republican River: 4, 6

Cache la Poudre River segments 11 and 12a (COSPCP11 and COSPCP12a): The commission adopted the Water Supply use classification and standards on Cache la Poudre River segments 11 and 12a with a 5 year delayed effective date (12/31/2025) due to the City of Fort Collins and Front Range Energy's challenges related to gathering information regarding the use of existing domestic water supply wells, as well as future uses, due to stay-at-home orders and resource limitations related COVID-19 (Coronavirus Disease 2019).

The commission removed the Water Supply use classification and standards where the evidence demonstrated that a Water Supply use does not currently exist due to flow or other conditions, and that such a use is not reasonably expected in the future due to water rights, source water options, or other conditions. The Water Supply standard for chloride was retained for these segments, given concerns regarding the protection of aquatic life by the existing Water Supply standards. The Water Supply use classification and standards, except for chloride, were removed from the following segments:

Upper South Platte River: 2c

Upper South Platte River Segment 2c (COSPUS02c): The commission removed the Water Supply use classification and standards from South Mosquito Creek, the portion of Mosquito Creek above Road #698 (39.270971, -106.098846), and No Name Creek. Evidence was presented that demonstrated that the Water Supply use does not currently exist, has not existed since 1978, and is not reasonably expected in the future due to the current land zoning and ownership and the significant depth of existing wells.

The commission retained the 250 mg/L chronic (30-day average) standard for chloride as an interim step, based on evidence presented in earlier hearings demonstrating the toxic effects of chloride on aquatic life. Retaining the current chloride standard is necessary to protect the assigned Aquatic Life uses and to ensure that these waters are free from substances that are toxic to aquatic life in accordance with 31.11(1)(a)(iv). The commission retained the numeric standard for chloride because narrative standards have often proved challenging to implement, and interim numeric standards will provide implementable interim standards while allowing time for development of robust replacement criteria based on the latest scientific information.

The commission recognizes that there is scientific uncertainty about the appropriate standards for chloride and/or sulfate to protect the Aquatic Life use, and that appropriate standards may need to recognize that toxicity is affected by site water characteristics (similar to the influence of hardness on the toxicity of dissolved metals). The commission's intention is that future revisions to the numeric standards assigned to this segment, and also to Regulation No. 31 (i.e., aquatic life-based table values chloride and/or sulfate), can be considered if: (1) EPA issues new or updated CWA § 304(a) Aquatic Life criteria recommendations, (2) another state adopts new or revised Aquatic Life criteria and EPA approves, or (3) protective criteria otherwise become available that incorporate the latest scientific information on the risks to aquatic life posed by these pollutants.

E. Agriculture Use Classification and Standards

The commission reviewed information regarding the current Agriculture use classifications and evidence pertaining to livestock watering and crop irrigation for the three segments lacking an Agriculture use (Clear Creek segments 7a, 7b, and 8). Based on an evaluation of the available data and information, no changes were adopted at this time.

F. Other Standards to Protect Aquatic Life and Recreation Uses

The commission declined to adopt EPA's revised 304(a) Aquatic Life criteria for selenium, ammonia, and aluminum at this time; however, the division is committed to evaluating these new criteria. Studies are currently underway for each parameter to improve understanding of these criteria in the context of water quality conditions in Colorado and how these criteria may be adopted and implemented in Colorado in the future.

EPA has also released updated criteria or guidance for several other parameters, including copper (Aquatic Life), *E. coli* (Recreation), cyanotoxins (Recreation), and the human health risk exposure assumptions. However, the division does not recommend adopting EPA's recommendations for these parameters at this time, as these items are not included on the division's 10-year water quality roadmap.

G. Antidegradation Designations

The commission reviewed all segments designated Use Protected to determine if the Use Protected designation was still warranted. Based upon available water quality data, the Use Protected designation was upgraded to Reviewable on the following segments:

Boulder Creek: 11

<u>Upper South Platte River Segment 15 (COSPUS15), Middle South Platte River Segment 1a (COSPMS01a), and Clear Creek Segment 15 (COSPCL15):</u> The commission declined to adopt the division's proposal to upgrade the antidegradation classification from Use Protected to Reviewable on Upper South Platte River segment 15 and Middle South Platte River segment 1a. Additionally, the commission changed the antidegradation classification from Reviewable to Use Protected on Clear Creek segment 15. In its proposal to upgrade Upper South Platte River segment 15 and Middle South Platte River segment 1a to reviewable and to maintain Clear Creek segment 15 as reviewable the Division presented evidence and arguments that these segments did not qualify for use protected status under the tests set forth in section 31.8(2)(b). Other parties presented evidence and arguments that these segments should be designated as use protected under the tests set forth in section 31.8(2)(b) and the statutory language, "Use-protected waters shall be those waters with existing quality that is not better than necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water." CRS 25-8-209(4). Despite the regulatory language, the commission decided that as a matter of policy, due to the unique circumstances and evidence presented in this hearing for these particular segments, it is more consistent with the statutory language for these segments to be classified as Use Protected.

For Upper South Platte River Segment 15 and Middle South Platte River Segment 1a, the commission retained the Use Protected designation based on the weight of the evidence including that the segments receive multiple treated wastewater discharges, aquatic habitat is impacted by flow reductions from multiple manmade diversions, and there was insufficient evidence to demonstrate that existing water quality is better than necessary to support fishable and swimmable uses. For example, in Upper South Platte River Segment 15, water quality exceedances have been observed for *E. coli*, cadmium (dissolved), ammonia, temperature, and chlorophyll 'a', and Middle South Platte River Segment 1a is currently on the section 303(d) list for *E. coli*, and water quality standard exceedances have been observed for dissolved oxygen and chlorophyll 'a'.

For Clear Creek Segment 15, the commission changed the antidegradation designation to Use Protected based on the weight of the evidence including that the segments receive multiple treated wastewater discharges, aquatic habitat is impacted by flow reductions from multiple manmade diversions, and the existing water quality is not better than necessary to support fishable and swimmable uses. For example, Clear Creek Segment 15 is currently on the section 303(d) list for organic sediment, temperature, ammonia, and *E. coli*.

The Commission’s policy decision that these segments should be designated Use Protected based on existing quality is substantially influenced by the fact that these segments have been impacted by water quality pollutants for decades. However, the commission also noted that marked improvements in water quality have occurred over time and that improved water quality conditions may warrant reconsideration in the future. The Commission notes that water quality impacts resulting from a spill or other short term water quality condition would present very different circumstances, which the Commission is not addressing in the current action.

H. Ambient Quality-based Site-specific Standards

Site-specific ambient quality-based standards are adopted where a comprehensive analysis has been conducted demonstrating that ambient water quality levels elevated above the water quality standards are a result of natural conditions or are infeasible to reverse, but are adequate to protect the highest attainable use (31.7(1)(b)(ii)). All existing ambient-based standards were reviewed and no revisions were made.

Cherry Creek Segment 4b (COSPCH04b): During the 2015 Regulation No. 38 rulemaking hearing, the commission adopted site-specific ambient quality-based standards for selenium for Segment 4b and directed Cottonwood Water and Sanitation District (CWSD) to develop a study plan in agreement with stakeholders to collect additional baseline data that would support a "before and after discharge” evaluation of aquatic life. In this rulemaking, CWSD provided an update to the commission regarding the study plan developed and implemented for baseline data collection and describing activities completed since 2015. Given the potential detrimental effect of increased selenium to the downstream Aquatic Life use after discharge from the plant resumed in early 2020, CWSD agreed to a longevity plan that details continued data collection and highest attainable use evaluation activities to support review of the ambient-based standards. The plan includes equivalent or better sampling as the “before” study to demonstrate whether the site-specific standards are appropriate to protect downstream aquatic communities such as the commercially important walleye fishery in Cherry Creek Reservoir. The commission will review these site-specific ambient quality-based standards in the next Regulation No. 38 rulemaking hearing using data collected by CWSD over the next five years to determine if the site-specific standards are still appropriate and protective of the Aquatic Life use in Segment 4b and downstream waters.

I. Site-specific Criteria-based Standards

Site-specific criteria-based standards are adopted where site-specific studies demonstrate standards other than table value standards are appropriate (31.7(1)(b)(iii)). All existing criteria-based site-specific standards were reviewed, and where appropriate were revised, allowed to expire, or deleted. Site-specific standards were allowed to expire from the following segments:

Clear Creek: 14a (acute and chronic zinc), 14b (acute and chronic zinc), 15 (acute and chronic zinc)

Site-specific copper standards based on the Fixed Monitoring Benchmark (FMB) application of the Biotic Ligand Model (BLM) were adopted for multiple segments during the December 2014 temporary modifications rulemaking (Big Thompson Segment 2) and the June 2015 Regulation No. 38 rulemaking (Upper South Platte segments 14, 15, and 16g and Middle South Platte Segment 1a). When these site-specific standards were adopted, proponents agreed to longevity plans that included continued monitoring and analysis of BLM parameters to facilitate review of the standards at the future basin hearings (38.90(I)).

Using these data, the commission reviewed all segments with BLM-based standards for copper. To determine if water quality conditions had changed significantly and standards revisions were necessary, existing BLM-based standards were compared to BLM-based standards calculated from the more recent datasets using a 95 percent confidence interval approach.

Based on an evaluation of more recent data, BLM-based site-specific copper standards were not revised for the following segments:

Upper South Platte River: 14, 16g
Big Thompson River: 2

Based on an evaluation of more recent data, BLM-based site-specific copper standards were revised for the following segments:

Upper South Platte River: 15
Middle South Platte River: 1a

The commission will review these BLM-based standards in the next Regulation No. 38 rulemaking hearing using data collected over the next five years to ensure that BLM-based standards capture any changes in water quality. Centennial Water and Sanitation District, Metro Wastewater Reclamation District, and Upper Thompson Sanitation District have agreed to longevity plans to continue all necessary data collection and evaluation activities to support review of the BLM-derived copper standards at the next Regulation No. 38 hearing.

J. Temporary Modifications

All existing temporary modifications were examined to determine whether they should be deleted, modified, extended, or left unchanged.

1. Temporary Modifications for Standards Other than Arsenic

The commission allowed to expire on 12/31/2020 temporary modifications on the following segments:

Upper South Platte River: 10 (temperature), 15 (chloride, sulfate)
Clear Creek: 7a (cadmium, copper, iron, lead, mercury, nickel, silver, zinc), 7b (cadmium, copper, iron, lead, mercury, nickel, silver, zinc)
Clear Creek: 13b (temperature)
St. Vrain Creek: 6 (manganese), 7 (iron and manganese)
Big Thompson River: 9 (selenium)

<u>Clear Creek Segment 13b (COSPCL13b):</u> Black Hawk and the Black Hawk – Central City Sanitation District withdrew its proposal to extend the existing temperature temporary modification for Segment 13b based on its agreement with the division, EPA, and CPW that a temporary modification is not the most appropriate regulatory tool to address temperature issues at its treatment facility at this time. Uncertainty remains regarding the appropriate underlying standards and the extent of contributions from natural and irreversible human-induced conditions; however, Black Hawk – Central City Sanitation District currently has no effluent limits for temperature in their permit and may qualify for a compliance schedule for temperature limits when the permit is renewed. In addition, Black Hawk is expected to evaluate whether it may be possible to attain effluent limits based on the current underlying standard. The commission expects that the division will continue to work with Black Hawk and the Black Hawk – Central City Sanitation District regarding the use of appropriate regulatory tools, including temporary modifications or discharger specific variances, as new information becomes available regarding the uncertainties related to temperature on Segment 13b.

St. Vrain segments 6 and 7 (COSPSV06 and COSPSV07): The commission allowed the temporary modifications for manganese on Segment 6 and iron and manganese on Segment 7 to expire on 12/31/2020, as the underlying water quality standards are being attained.

The commission modified the following temporary modifications:

Upper South Platte River: 15, 16g
Clear Creek: 7a (temperature), 7b (temperature)
St. Vrain Creek: 6a

Upper South Platte Segment 15 (COSPUS15): Metro Wastewater Reclamation District proposed a one year extension to the existing “current condition” temporary modification for temperature (expires 12/31/2020, new expiration 12/31/2021). The extension of the temporary modification is based on Metro’s information showing continued instream non-attainment of temperature standards and predicted compliance problems with water quality-based effluent limits (WQBELs). Additional time is needed to finish developing a proposal for a discharger specific variance (DSV). Metro has committed to a plan to resolve uncertainty that includes ongoing monitoring and reporting of instream and effluent temperature, as well as providing annual updates to the division in June through the duration of the temporary modification, beginning in 2020 (Metro Exhibit 12).

Upper South Platte Segment 16g (COSPUS16g): Centennial Water & Sanitation District provided an update to the commission regarding progress being made in implementing the existing plan to resolve uncertainty and demonstrating the ongoing need for the temporary modification of the chronic temperature standard (expires 12/31/2020). Centennial presented information that shows continued instream non-attainment of chronic temperature standards, predicted compliance problems with water quality-based effluent limits (WQBELs) during the winter months, and significant uncertainty regarding the appropriate chronic winter temperature standards. Centennial demonstrated the need for an extension of the temporary modification to provide time to complete an alternatives analysis to determine feasible alternatives for controlling temperature at its facility and potentially develop a discharger-specific variance. More time is also needed to collect additional temperature data, characterize the highest attainable Aquatic Life use, potentially participate in temperature standards studies, engage with stakeholders, and review low-cost options to improve water quality. Centennial has committed to providing annual updates to the division each June through the duration of the temporary modification, beginning in 2021, and final results of the alternatives analysis will be provided to the division by June 2023.

Based on this information, the commission adopted an extension of the temporary modification (MWAT = “current condition”, 12/1-2/29) with the plan to resolve uncertainty submitted by Centennial (Exhibit 6). The temporary modification applies only for the periods with concurrent instream non-attainment and WQBEL non-compliance (December through February) and expires December 31, 2025. The operative value of the temporary modification is the narrative “current condition.” In future reviews of this temporary modification, the commission will use the following values to compare to the most recent five years of representative data to determine if effluent and waterbody quality is maintained and ensure that the existing uses are protected. These values are for use by the commission in future reviews of the temporary modification and are not intended to direct the division’s implementation of "current condition" temporary modifications in permits:

1) winter (12/1-2/29), effluent (MWAT = 19.2°C, based on data for December, January and February from 1/1/2008 - 12/31/2015)

2) winter (12/1-2/29), instream (MWAT = 17.4°C, at site "Downstream of Marcy Gulch" based on data for December, January and February from 1/01/2008 - 12/31/2015)

Additionally, the commission will consider whether seasonal trends of warming and cooling have been maintained.

Clear Creek segments 7a and 7b (COSPCL07a and COSPCL07b): Climax Molybdenum Company provided an update to the commission regarding progress being made in implementing the existing plan to resolve uncertainty and demonstrating the ongoing need for the temporary modifications for chronic and acute temperature, copper, and zinc; chronic cadmium, iron, lead, mercury, nickel, and silver for Clear Creek segments 7a and 7b that are set to expire 6/30/2023. The commission deleted the temporary modifications for metals based on an evaluation of the available instream and effluent data that demonstrated attainment of the standards instream and the lack of a water quality-based effluent limit (WQBEL) compliance issue.

For temperature, Climax's update demonstrated continued instream nonattainment, predicted compliance issues, and remaining uncertainty regarding the appropriate underlying standards to protect the uses and the extent to which instream conditions are reversible. Climax also provided an updated plan to resolve uncertainty (Exhibit 5) that included details regarding the scheduled investigations and reporting required to resolve the uncertainty by 6/30/2023. Additionally, the temporary modification was narrowed to apply only for the periods with concurrent instream non-attainment and predicted WQBEL non-compliance (MWAT = "current condition", 10/1-11/30 and 4/1-5/31). The operative value of the temporary modification is the narrative "current condition" and the expiration date remains unchanged.

In future reviews of this temporary modification, the commission will use the following values to compare to the most recent five years of representative data to determine if effluent quality is maintained and ensure that the existing uses are protected. These values are for use by the commission in future reviews of the temporary modification and are not intended to direct implementation of "current condition" temporary modifications in permits:

1) 4/1-5/31, effluent (MWAT = 13.1°C, based on data for April and May from 1/1/2014 - 12/17/2019)

2) 10/1-11/30, effluent (MWAT = 13.9°C, based on data for October and November from 1/1/2014 - 12/17/2019)

Additionally, the commission will consider whether seasonal trends of warming and cooling have been maintained.

Data to adequately characterize the status quo of the waterbody at the time the temporary modification was originally adopted were not available. It is the commission's expectation that as more data become available to characterize instream waterbody temperature conditions, representative numeric values to represent instream status quo will be determined as soon as possible for the commission's use in future reviews of this temporary modification.

St. Vrain Segment 6a (COSPSV06a): For Segment 6a, the commission extended the "current condition" temporary modification for total recoverable iron from 12/31/2020 to 6/30/2023 to provide time for Raytheon to investigate the sources and characterize the highest attainable use. Raytheon provided an updated plan to resolve uncertainty that includes a detailed timeline for data collection and updates every 6 months to the division and stakeholders (Revised Exhibit 4). The commission determined that a temporary modification continues to be justified based on demonstrated instream non-attainment, uncertainty regarding the underlying standard, demonstrated compliance problems, and a robust plan to resolve the uncertainty and eliminate the need for the temporary modification by 6/30/2023.

The operative value of the temporary modification is the narrative "current condition." The temporary modification for iron was first adopted by the commission in December 2016. Data to characterize the baseline condition when the temporary modification was adopted are available for Seep 1 and Seep 2, and more recent water quality data are available for the site 300 feet downstream of Seep 2. In future reviews of this temporary modification, the commission will use the following values to compare to the most recent five years of representative data to determine if effluent quality is maintained and ensure that the existing uses are protected. These values are for use by the commission in future reviews of the temporary modification and are not intended to direct implementation of "current condition" temporary modifications in permits:

1) Seep 1: 50th percentile = 420 µg/L and maximum = 2,920 µg/L, based on data from 11/9/2011-12/1/2016

2) Seep 2: 50th percentile = 3,825 µg/L and maximum = 13,000 µg/L, based on data from 2/6/2012-12/1/2016

3) 300 feet downstream of Seep 2: 50th percentile = 275 µg/L and maximum = 3,370 µg/L, based on data from 11/2/2016-2/6/2020

2. Temporary Modifications for Arsenic

To remain consistent with the commission's decisions regarding arsenic in section 38.99, all existing temporary modifications for arsenic of "As(ch)=hybrid" (expiration date of 12/31/24) were retained. In addition, for segments where a Water Supply or Aquatic Life use change resulted in a corresponding revision of the arsenic standard, an arsenic temporary modification was adopted for the 0.02 µg/L Water + Fish numeric standard in recognition of existing and predicted compliance issues, instream nonattainment, and the uncertainty regarding the water quality standard necessary to protect current and/or future uses and the extent to which ambient concentrations of arsenic are natural or irreversible (31.7(3)).

The division submitted a plan to resolve uncertainty in the 2019 Temporary Modifications rulemaking. The division plans to propose revised standards for arsenic as soon as possible following updated toxicological information from EPA's Integrated Risk Information System (IRIS) and completion of ongoing studies to better understand arsenic conditions in Colorado. Furthermore, per the conditions of the revised and extended temporary modification at 38.6(2)(c) (effective 6/30/2020 and expires 12/31/2024), and based on the widespread need to make progress to understand sources of arsenic and set forth processes for lowering arsenic in discharges, additional permit Terms and Conditions (T&Cs) are being implemented for facilities benefitting from the "current condition" temporary modification. These T&Cs may include requirements for additional monitoring, source identification, and characterization of source control and treatment options for reducing arsenic concentrations in effluent. The commission recognizes the need to resolve the uncertainty in the arsenic standards and ensure that human health is adequately protected.

Temporary modifications for arsenic were added to the following segments:

Upper South Platte River: 11a, 15, 16i, 16k
Cherry Creek: 1, 3, 4b, 7
Clear Creek: 13b, 18a
Boulder Creek: 7b, 8, 11
St. Vrain Creek: 3, 5, 6b
Big Thompson River: 5, 6, 9
Cache la Poudre River: 13a, 13b, 13c
Lower South Platte River: 2
Republican River: 4, 6

As a result of a change to the underlying arsenic standard due to removal of the Water Supply use, the temporary modification for arsenic is no longer needed and was removed from the following segment:

Upper South Platte River: 2c

K. Discharger Specific Variances

There is currently one discharger specific variance (DSV) for selenium which applies to two segments (Upper South Platte segments 15 and 16i). The commission reviewed the basis for this DSV and the available information regarding Suncor Energy (U.S.A.) Inc.'s progress toward achieving the alternate effluent limit. The commission determined that the alternative effluent Limit (AEL) adopted in 2016 continues to represent the highest attainable water quality that is feasible for Suncor to achieve. Therefore, the commission determined that this DSV is still appropriate and does not require revision at this time.

L. Temperature Standards

The commission revised temperature criteria in Regulation No. 31 in 2007, and again in 2010, based on the development of the Colorado Temperature Database and a lengthy stakeholder process. In 2015, the new temperature standards were adopted for all segments with an Aquatic Life use classification in Regulation No. 38. In June 2016, temperature criteria in Regulation No. 31 were further revised, including changes to the temperature table value standards, revision of warm water winter acute standards, and the addition of footnotes to protect lake trout and mountain whitefish.

1. **Colorado Temperature Database Update:** The Colorado Temperature Database was updated in 2016 to reflect the most recent research regarding the thermal requirements of Colorado’s fishes, which allowed for adoption of an overall update of the cold and warm water acute and chronic temperature table value standards. In this hearing, the commission adopted revisions at 38.6(3) to bring this regulation into conformity with the revised table value standards found in Table I of Regulation No. 31.

2. **Warm Water Winter Acute Table Values:** The 2016 updates to the temperature database also allowed for the adoption of revisions to the warm water winter acute table values. When seasonal numeric temperature standards were first adopted in 2007, warm water winter acute and chronic standards were simply set at half the summer season table values, recognizing a pattern seen in cold waters. In 2016, the acute winter table values for warm water fish were revised based on lethal temperature thresholds established in laboratory experiments for fish acclimated to “winter” temperatures. Standards derived using this new method more accurately protect warm water fish from acute thermal effects in winter. In this hearing, the commission adopted revisions at 38.6(3) to bring this regulation into conformity with the revised warm water winter acute temperature table value standards found in Table I of Regulation No. 31.

3. **Mountain Whitefish and Lake Trout Footnotes:** In 2016, the commission adopted two footnotes to Table I of Regulation No. 31 to allow for additional thermal protection of mountain whitefish and lake trout where appropriate. These species were given special summer standards due to their thermal sensitivity and limited distributions. Lake trout occur in only a small number of lakes and reservoirs, and thermally-sensitive early life stages of mountain whitefish are known to occur only in certain cold waters during certain times of the year.

While early life stages of mountain whitefish are known to be the most thermally-sensitive, the time period these early life stages occur can vary from site to site. Mountain whitefish spawn in the fall, but timing of spawning, incubation, and emergence all depend on a variety of site-specific factors, including water temperature. The incubation period takes longer when water is colder, and that will delay hatching, emergence, and migration of fry. Depending on when spawning occurs and the water temperature in which the eggs are spawned and incubated, the incubation period could last through late spring.

Based on information provided by CPW, thermally-sensitive early life stages of mountain whitefish occur in certain water bodies in Regulation No. 38. Spawning begins in October and the fry life stage is complete by May in these water bodies. Therefore, only limited application of the mountain whitefish summer temperature standards to protect eggs, larvae, and fry is necessary.

In segments currently assigned CS-I temperature standards, the application of the mountain whitefish summer temperature standards is not necessary. The winter season included in CS-I temperature standards (i.e., October to May) is expected to cover the period when mountain whitefish early life stages are expected to occur (i.e., October to May). In addition, the CS-I winter standards are more stringent than the mountain whitefish summer standards. Therefore, because the CS-I temperature standards are protective of mountain whitefish early life stages, the commission did not adopt the mountain whitefish summer standards on segments with CS-I temperature standards. While the commission made no changes to the temperature standards, mountain whitefish spawning and early life stages are known to occur in the following CS-I segment:

Cache la Poudre River: 2a

In this hearing, the commission adopted standards to protect lake trout on a site-specific basis where information provided by CPW indicated that this species occurs and protection from thermal impacts is appropriate. Adoption of lake trout standards is dependent on two factors: the existing temperature tier (cold lake or cold large lake) and whether a site-specific temperature standard was already in place. For cold lakes, only the chronic lake trout standard was adopted, as the acute cold lake temperature standard (21.2°C) is more protective than the acute lake trout standard (22.4°C). The chronic lake trout standard (16.6°C) is more protective than the chronic cold lake temperature standard (17.0°C). For cold large lakes, both acute and chronic lake trout standards were adopted unless there was a site-specific standard in place. Acute and chronic lake trout standards (22.4 and 16.6°C, respectively) are more protective than acute and chronic cold large lake standards (24.2 and 18.3°C, respectively). Lake trout standards were not proposed where an existing site-specific standard is applied.

Temperature standards to protect lake trout were applied to the following segments:

Upper South Platte River: 19 (Jefferson Lake DM and MWAT)
Clear Creek: 21 (Chase Gulch Reservoir MWAT)
Boulder Creek: 14 (Barker Reservoir MWAT), 18 (Gross Reservoir DM)
Big Thompson River: 11 (Carter Reservoir DM)

Cache la Poudre River: 18 (Barnes Meadow Reservoir MWAT; Chambers Lake DM and MWAT)

4. **Refinement of Temperature Standards:** Since temperature criteria were revised in Regulation No. 31 in 2007, the division and others have worked to ensure that appropriate temperature standards were adopted for segments throughout the state. At times, this effort to assign temperature standards has also included reevaluation of the existing Aquatic Life use classifications, and use revisions have been proposed and adopted where appropriate. Incremental progress continues as temperature standards are refined based on the experience and data gains that have occurred since initial adoption of temperature standards.

   In the 2016 Regulation No. 31 hearing, the commission declined to adopt the division's proposal for statewide solutions for temperature transition zones and shoulder seasons, in favor of a basin-by-basin consideration of temperature standards on a site-specific basis. The basin-by-basin approach was selected as it allows for consideration of temperature attainability and ambient quality-based site-specific temperature standards issues in the context of multiple lines of evidence and site-specific contravening evidence. The sections below describe the considerations and methods used to develop and support the site-specific temperature standards revisions adopted in this basin hearing.

   i. Existing Uncertainty: While a great deal of progress has been made regarding the development and implementation of temperature standards, uncertainty still remains for some segments due to the lack of site-specific temperature or aquatic community information or conflicts between the lines of evidence. To address the uncertainty, additional data collection has been conducted where possible, and all new information collected since the last basin review was evaluated.

   ii. Attainability: Following the commission's 2016 direction to consider attainability issues using a basin-by-basin approach, the division reviewed all available information to identify segments where attainability issues may exist based upon available instream temperature data and expected in-stream summer maximum weekly average temperatures (MWATs). Expected MWATs were determined using regression analysis of temperature and elevation and the NorWeST Stream Temperature Regional Database and Model. This screening found that many segments, or portions of segments, were not expected to attain the summer or winter chronic temperature standards. These waters were targeted for additional review, as were waters listed as impaired for temperature on the 2020 303(d) List.

   iii. Aquatic Life Use: For these selected segments, the division conducted a comprehensive, site-specific review of the existing use classification and temperature standards. Fishery data provided by CPW was evaluated to identify fish species expected to occur, whether reproduction is expected (i.e., stocked, transient, or resident species), age class structures, and any other relevant information regarding aquatic life communities. For segments where little or no information on fish species expected to occur existed, fish population data from adjacent and representative water bodies was utilized when possible.

iv. Thermal Drivers: In cases where temperature standards to protect the highest attainable use were determined, but the temperature standards were not attainable, site-specific factors that influence in-stream temperature were evaluated to identify any correctable anthropogenic thermal sources. All available data on temperature, hydrology, hydro-modification, canopy cover, groundwater influence, point and non-point thermal sources, and other relevant information was reviewed.

Temperature standards have been implemented and reviewed in Regulation No. 38 during three triennial reviews - 2009, 2015, and 2020. The level of emphasis and effort dedicated to understanding the aquatic community and temperature standards implementation during these reviews has resulted in a great deal of progress and application of appropriate temperature standards across the basin. Accordingly, no site-specific temperature standards and fewer Aquatic Life use revisions were necessary compared to previous basin reviews.

Based upon a review of information regarding the species expected to occur, temperature data, physical habitat, land cover/use, groundwater inputs, flow conditions, and all other available information regarding thermal drivers, no segments were identified as warranting a change to less stringent temperature standards as a result of water quality that is not feasible to improve or where the thermal regime is the result of natural conditions, but is sufficient to protect the highest attainable use.

Based upon information regarding the species expected to occur, the commission adopted revisions of temperature standards to protect thermally-sensitive species for the segments listed below.

The following segments were changed from CS-II to CS-I:

Cache la Poudre River: 3, 8

The following segments were changed from WS-I to CS-II:

St. Vrain Creek: 5
Cache la Poudre River: 11

Cache la Poudre Segment 11 (COSPCP11): Based on fish data collected by various entities and provided to the division by CPW that show the presence of cold water species, including reproducing brown trout and longnose sucker, the commission changed the Aquatic Life use from Warm 1 to Cold 1 and temperature standards from Warm Stream Tier I to Cold Stream Tier II (CS-II). Northern Colorado Water Conservancy District and the City of Fort Collins opposed this change due to uncertainty regarding the attainability of CS-II table value standards in this segment and their intent to pursue site-specific temperature standards at a later hearing. Adoption of CS-II temperature standards to protect the existing Aquatic Life use is necessary and appropriate; however, site-specific refinements may be warranted as additional information and analyses become available regarding the highest attainable Aquatic Life use and feasible temperature control. The commission appreciates the work of the Cache la Poudre Transition Zone work group and supports its continued work. It is the commission's intent that the division will continue to work with interested parties, through the existing Cache la Poudre Transition Zone workgroup and other relevant forums, to determine whether site-specific standards, such as feasibility-based ambient standards or criteria-based standards, are appropriate for this segment, and/or if a compliance schedule or discharger specific variance(s) is appropriate for dischargers to Segment 11 such as Fort Collins.

The following segments were changed from WS-II to WS-I:

Boulder Creek: 7b
Middle South Platte River: 1a, 1b
Cache la Poudre River: 13c
Lower South Platte River: 1a

Further investigation of the appropriate temperature standards is needed, so no changes were adopted at this time for the following segments:

Clear Creek: 14a, 14b, and 15

<u>Clear Creek segments 14a, 14b, and 15 (COSPCL14a, COSPCL14b, COSPCL15):</u> These segments are currently assigned Warm Stream Tier II temperature standards. However, the commission recognizes that there is uncertainty about the appropriate temperature standards applied to these segments based on fish data available from CPW for Clear Creek segments 14a and 15 that show the presence of several cold water species, including consistent catches of large numbers of brown trout and longnose suckers, and occasional catches of rainbow trout, and single-year catches of brook trout and cutthroat trout. Reproduction of cold water species has not been investigated in any of these segments. No fish data are available for Segment 14b, which is a short segment located between segments 14a and 15. These data raise questions regarding the appropriateness of the Warm Stream Tier II temperature standards for these segments. It is the commission's intent that the division will continue to work with CPW and interested parties to resolve the uncertainty regarding whether these populations are self-sustaining, and to what degree the drop structure at the most upstream portion of Segment 14a is obstructing upstream return of cold water fish flushed downstream.

M. Direct Use Water Supply Sub-classification

In the March 2012 rulemaking hearing, the commission adopted a sub-classification of the Domestic Water Supply Use called “Direct Use Water Supply Lakes and Reservoirs Sub-classification” (DUWS), in Regulation No. 31, at 31.13(1)(d)(i). This sub-classification is for Water Supply lakes and reservoirs where there is a plant intake location in the lake or reservoir or a man-made conveyance from the lake or reservoir that is used regularly to provide raw water directly to a water treatment plant that treats and disinfects raw water. The commission began to apply this sub-classification in 2013 and anticipated that it would take several basin reviews to evaluate all the reservoirs in the basin. The commission adopted the DUWS sub-classification on the following reservoirs and added “DUWS” to the classification column in the standards tables:

Upper South Platte River: 19 (Woodland Park Reservoir), 22a (Marshall Reservoir)
Cherry Creek: 7 (Rueter-Hess Reservoir)
Clear Creek: 21 (Hole in the Ground Reservoir, Chase Gulch Reservoir, Beaver Brook Reservoir No. 2)
Big Dry Creek: 7 (Welton Reservoir)
Boulder Creek: 17 (Goosehaven Reservoir, Erie Lake, Twomile Canyon Reservoir)
Big Thompson River: 16 (Mirror Lake) and 17 (Pinewood Lake)

N. Standards Corrections and Clarifications

1. **Duration of Nitrite Standard:** The division withdrew its proposal to change the nitrite standard from chronic to acute for multiple segments throughout Regulation No. 38. This withdrawal was based on information provided by CPW (Exhibit 2) demonstrating that the standard is currently and appropriately listed in the tables as chronic, as was recommended by the Nitrogen Cycle Committee of the Basic Standards Review Task Force, and adopted by the commission in 1986.

2. **Uranium:** To improve the clarity of the regulation, the commission included references to the basin-wide uranium standards at 38.5(3) in the Appendix 38-1 tables. For the acute and chronic uranium standards for all segments, the commission included a reference to 38.5(3) to clarify that the basic standard at 38.5(3) applies to all waters in Regulation No. 38. Because these standards already applied basin-wide, there is no practical effect of this change.

3. **Mercury:** To improve the clarity of the regulation, the commission added Total Recoverable notation (T) to the mercury Aquatic Life and Water Supply standards. The standards apply to the total recoverable fraction of all forms, both organic and inorganic, of mercury in water. Multiple forms of mercury exist in the environment and these forms differ dramatically in both their potential to cause toxic effects and their availability for uptake by organisms. Certain aquatic conditions can lead to the conversion to the highly bioaccumulative, toxic, organic form (methylmercury). The mercury standards are designed to provide protection from the accumulation of those toxic forms and therefore, the standards address all forms of mercury. The addition of the Total Recoverable notation does not represent a change in current Colorado policy or procedures.

O. Correction of Typographical and Other Errors and Segmentation Clarification

The following edits were made to the regulation and Appendix 38-1 to improve clarity and correct typographical errors:

- The formatting of the tables in Appendix 38-1 was modified to include only parameters that have been adopted in a majority of segments. The tables include rows for physical and biological, inorganic, and metals for all parameters which the commission commonly adopts into segments. In segments where there is no numeric standard for a commonly adopted parameter, a blank row for that parameter is included to show the commission's site-specific decision not to adopt a numeric standard for that parameter. The commission removed beryllium and aluminum from all segments where no standard has been adopted because these parameters have only been adopted on a site-specific basis, rather than basin-wide.

- Information was added at 38.6(5) specifying that the mercury standards apply to the total recoverable fraction of all forms, both organic and inorganic, of mercury in water.

- Information was added at 38.6(5) specifying that the ammonia, nitrate, and nitrate standards are to be reported as nitrogen. This is consistent with the description of the standards as they are included in Table II of Regulation No. 31.

- Information regarding site-specific ammonia and dissolved oxygen standards previously adopted for Upper South Platte Segment 15 and Middle South Platte Segment 1a was moved from Appendix 38-1 to 38.6(4) and edited for clarity.

- Information regarding site-specific radionuclide standards previously adopted for Big Dry segments 2, 3, 4a, 4b, 5 was moved from Appendix 38-1 to 38.6(4) and edited for clarity.

- Some segments that were previously deleted, but were reserved as placeholders in Appendix 38-1, were permanently removed from the appendix. Previously-deleted segments that are necessary to maintain continuous numbering of segments were retained. The following previously-deleted segments were not necessary to maintain continuous numbering of segments, and were removed from Appendix 38-1:

  Upper South Platte River: US06c, US10b
  Bear Creek: 4b and 4c

- Existing site-specific temperature standards were reformatted in the tables to provide clarity and consistency for the following segments:

  Upper South Platte River: 6b, 19
  Bear Creek: 1b, 1c, 1e
  Boulder Creek: 18
  Big Thompson River: 11
  Cache la Poudre River: 14, 20
  Lower South Platte River: 3

- The segment descriptions in Appendix 38-1 were reviewed, and minor revisions were made to several segments to correct grammar, punctuation, and typos, and improve sentence structure. The purpose of these changes was to improve clarity and consistency of the segment descriptions.

  Upper South Platte River: 2a, 3, 4, 7, 8, 11b, 16c, 19, 21, 22a, 23
  Cherry Creek: 4a
  Bear Creek: 3, 6a,11
  Clear Creek: 2a, 2b, 2c, 3a, 6, 10, 13b, 16b, 21, 24
  Big Dry Creek: 1, 4a, 4b, 5a, 7
  Middle South Platte River: 3a, 5c
  Big Thompson River: 2, 3, 4, 19
  Cache la Poudre River: 1, 6, 7, 13a, 18, 21
  Laramie River: 2a, 4
  Lower South Platte River: 3, 4
  Republican River: 1, 3, 6, 8

- Coordinates were added to several segment descriptions to facilitate location of segment boundaries.

  Upper South Platte River: 16d, 16e, 16f
  Big Thompson River: 2, 3, 6, 8, 9, 10, 16, 17, 18, 19
  Cache la Poudre River: 2b, 10a, 10b, 13a, 16, 18, 21

- Bear Creek Segment 7: The effective date of 12/31/2020 for phosphorus(chronic) was deleted from the ‘Other’ column, as the standard will be effective on the effective date of this regulation.

- Cherry Creek segments 1, 4a, and 4b: The effective date of 12/31/2020 for phosphorus(chronic) was deleted from the ‘Other’ column, as the standard will be effective on the effective date of this regulation.

- Clear Creek Segment 12a: Added missing footnote “A” that accompanies Arsenic(T) standard of 0.02-10 µg/L.

- Clear Creek Segment 12b: The designation for the 0.02 µg/L arsenic standard for Water Supply was changed from arsenic to arsenic(T) to reflect the correct fraction of arsenic protective of the use.

- Clear Creek Segment 16b: The exception for Segment 17a was removed. Segment 17a is a lakes and reservoirs segment, while Segment 16b is a stream segment.

- Big Dry segments 2, 4a, 4b, 5a, and 5b: The beryllium standards were changed from beryllium to beryllium(T) to reflect the correct fraction of beryllium that is protective of the use.

- Big Thompson Segment 1: The exception of Segment 2 was unnecessary and was deleted for clarity.

- Big Thompson Segment 6: Exceptions were for segments 7 through 10 were added for clarity.

- Big Thompson Segment 17: Exceptions for segments 18 and 19 were added for clarity.

- Cache la Poudre Segment 2b: An exception for Segment 1 was added for clarity.

38.102 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; DECEMBER 14, 2020 RULEMAKING; FINAL ACTION DECEMBER 14, 2020; EFFECTIVE DATE FEBRUARY 14, 2021

The provisions of C.R.S. 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; and 25-8-402; provide the specific statutory authority for adoption of these regulatory amendments. The commission also adopted in compliance with 24-4-103(4) C.R.S. the following statement of basis and purpose.

BASIS AND PURPOSE

The commission deleted the temporary modification for chronic arsenic on Upper South Platte Segment 11b (COSPUS11b), which had an expiration date of 12/31/2024. An arsenic temporary modification was inadvertently adopted on this segment during the 2020 Regulation No. 38 rulemaking hearing; however, the temporary modification is more stringent than the underlying standard.

38.103 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; DECEMBER 14, 2020 RULEMAKING; FINAL ACTION FEBRUARY 8, 2021; EFFECTIVE DATE JUNE 30, 2021

The provisions of C.R.S. 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; and 25-8-402; provide the specific statutory authority for adoption of these regulatory amendments. The commission also adopted in compliance with 24-4-103(4) C.R.S. the following statement of basis and purpose.

BASIS AND PURPOSE

Pursuant to the requirements in the Basic Standards (at 31.7(3)), the commission reviewed the status of temporary modifications scheduled to expire before December 31, 2022 to determine whether the temporary modification should be modified, eliminated, or extended.

For the temporary modifications set to expire after the effective date of this hearing, the commission reviewed progress toward resolving the uncertainty in the underlying standard and/or the extent to which conditions are a result of natural or anthropogenic conditions, and evaluated whether the temporary modifications were still justified.

The commission took no action on the following temporary modifications:

Upper South Platte Segment 15 (COSPUS15): temporary modification of the acute and chronic temperature standards (expires 12/31/2021). Metro Wastewater Reclamation District continues to make progress to resolve the uncertainty in the temperature standards and is working to develop a proposal for a discharger specific variance. This temporary modification was extended by one year (to 12/31/2021) during the June 2020 Regulation No. 38 rulemaking hearing; as part of that hearing, Metro provided an update regarding progress being made in implementing the plan to resolve uncertainty and demonstrating the ongoing justification for the temporary modifications, including demonstrated instream nonattainment and predicted compliance issues. The commission made no change to the expiration date, as the original time allotment was deemed adequate to resolve the uncertainty.

St. Vrain Segment 6a (COSPSV06a): temporary modification of the chronic iron standard (expires 6/30/2023). As included in its plan to resolve uncertainty, Raytheon Company provided an update on its work to resolve the uncertainty in the chronic iron standard. Raytheon continues to make progress on resolving the uncertainty and eliminating the need for the temporary modification and determining the extent to which the existing quality is the result of natural or irreversible human-induced conditions. The commission made no change to the expiration date, as the original time allotment was deemed adequate to resolve the uncertainty.

38.104 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; JUNE 14-15, 2021 RULEMAKING; FINAL ACTION AUGUST 9, 2021; EFFECTIVE DATE DECEMBER 31, 2021

The provisions of C.R.S. 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; and 25-8-402; provide the specific statutory authority for adoption of these regulatory amendments. The commission also adopted in compliance with 24-4-103(4) C.R.S. the following statement of basis and purpose.

BASIS AND PURPOSE

I. DISCHARGER-SPECIFIC VARIANCES

The commission deleted subsections 38.6(6) (a) and (b), which described the regulatory basis and implementation of discharger-specific variances, because this information was revised and consolidated into 31.7(4).

II. CLEANUP, CORRECTIONS, AND CLARIFICATIONS

A. Sulfate

38.6(2)(b)(ii) was edited to clarify that the sulfate standard applies to dissolved sulfate concentrations. As an ion, sulfate is found in water only in the dissolved state; therefore, either unfiltered or filtered samples may be used to determine sulfate concentrations.

B. Reformat Hardness-based Equations

The following changes were made to the hardness-based table value standard equations at 38.6(3) to improve compatibility with Excel and align with corrections made to Regulation No. 31:

- Acute and chronic aluminum, chromium III, copper, lead, manganese, nickel, silver, uranium, and zinc: the first bracket was replaced with the symbol * and the second bracket was deleted from the equation.

- Acute and chronic cadmium: extra spaces were removed.

- Acute and chronic lead: the brackets were deleted and a parenthesis was moved within the conversion factor.

- Acute silver: ½ was replaced with 0.5* in the equation.

C. Chromium Footnote

The commission revised Footnote 6 of the Table Value Standards table to improve the clarity of the footnote, which directs the implementation of the trivalent (III) and hexavalent (VI) chromium standards when data for the individual valence states are unavailable. Chromium data are infrequently reported for chromium III and chromium VI individually. Instead, data are typically reported as the total of all valence states of chromium present in the sample. This is primarily due to the difficulty of accurately measuring chromium III concentrations and the instability of chromium when the sample is acidified for analysis of the total recoverable fraction. While chromium III and chromium VI are the valence states most often found in natural waters, chromium is unstable and can convert between forms in water and in the bodies of humans and aquatic life. However, chromium VI is more water soluble and a known carcinogen. Depending on the classified use, the chromium VI standards are the same as or more stringent than the chromium III standards (Table III). Therefore, when data for individual chromium species are unavailable, the use of the chromium VI standards to assess data reported as total chromium (i.e., the total of all valence states of chromium) will ensure protection of human health and aquatic life. In addition, Footnote 6 was modified to clarify that neither the sum of the concentrations of chromium III and chromium VI (when reported individually) nor the total chromium concentration (i.e., the total of all valence states of chromium) should exceed the Water Supply standards of 50 µg/L for chromium III and chromium VI in water bodies with a Water Supply use classification.

D. Housekeeping

The following edits were made to improve clarity, correct typographical errors, and improve consistency across the basin regulations (Regulation Nos. 32-38) and with Regulation No. 31:

- All variations of *E. coli* were edited to display a consistent format in the regulation and appendix tables.

- At 38.5(2) 'Table B' was added to the reference to organic standards at 31.11 to align with changes to Regulation No. 31.

- At 38.6(1), text was added to clarify that the tables in Appendix 38-1 only show the most stringent standards, and that additional, less stringent standards may be found in Regulation No. 31.

- The reference to the 'temporary modification and qualifiers' column at 38.6(2)(c)(i) was replaced with 'Other' to align with a previous change to the appendix tables.

- References to “Trec” were replaced with “total recoverable” or “T”.

- Footnote 4 of the Table Value Standards table was modified to clarify that the “T” in the chronic ammonia equations stands for temperature.

- Other minor edits were made to improve clarity and consistency.

COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT

WATER QUALITY CONTROL COMMISSION

5 CCR 1002-38

REGULATION NO. 38
CLASSIFICATIONS AND NUMERIC STANDARDS
FOR
SOUTH PLATTE RIVER BASIN, LARAMIE RIVER BASIN
REPUBLICAN RIVER BASIN, SMOKY HILL RIVER BASIN

APPENDIX 38-1
Stream Classifications and Water Quality Standards Tables

Effective 12/31/2021

Abbreviations and Acronyms

Aq	=	Aquatic
°C	=	degrees Celsius
CL	=	cold lake temperature tier
CLL	=	cold large lake temperature tier
CS-I	=	cold stream temperature tier one
CS-II	=	cold stream temperature tier two
D.O.	=	dissolved oxygen
DM	=	daily maximum temperature
DUWS	=	direct use water supply
E. coli	=	*Escherichia coli*
EQ	=	existing quality
mg/L	=	milligrams per liter
mg/m^2	=	milligrams per square meter
mL	=	milliliter
MWAT	=	maximum weekly average temperature
OW	=	outstanding waters
SSE	=	site-specific equation
T	=	total recoverable
t	=	total
tr	=	trout
TVS	=	table value standard
µg/L	=	micrograms per liter
UP	=	use-protected
WS	=	water supply
WS-I	=	warm stream temperature tier one
WS-II	=	warm stream temperature tier two
WS-III	=	warm stream temperature tier three
WL	=	warm lake temperature tier

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Upper South Platte River Basin

1a. Mainstem of the South Platte River from the source of the South and Middle Forks to the inlet of Cheesman Reservoir.

COSPUS01A	Classifications	Physical and Biological			Metals (ug/L)		
Designation	Agriculture		**DM**	**MWAT**		**acute**	**chronic**
Reviewable	Aq Life Cold 1	Temperature °C	CS-I*	CS-I*	Arsenic	340	---
	Recreation E		**acute**	**chronic**	Arsenic(T)	---	0.02
	Water Supply	D.O. (mg/L)	---	6.0	Cadmium	TVS	TVS
Qualifiers:		D.O. (spawning)	---	7.0	Cadmium(T)	5.0	---
Other:		pH	6.5 - 9.0	---	Chromium III	---	TVS
Temporary Modification(s):		chlorophyll a (mg/m^2)	---	150*	Chromium III(T)	50	---
Arsenic(chronic) = hybrid		E. coli (per 100 mL)	---	126	Chromium VI	TVS	TVS
Expiration Date of 12/31/2024					Copper	TVS	TVS
*chlorophyll a (mg/m^2)(chronic) = applies only above the facilities listed at 38.5(4).		**Inorganic (mg/L)**			Iron	---	WS
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4).			**acute**	**chronic**	Iron(T)	---	1000
*Uranium(acute) = See 38.5(3) for details.		Ammonia	TVS	TVS	Lead	TVS	TVS
*Uranium(chronic) = See 38.5(3) for details.		Boron	---	0.75	Lead(T)	50	---
*Temperature = summer criteria apply from 4/1-10/31		Chloride	---	250	Manganese	TVS	TVS/WS
		Chlorine	0.019	0.011	Mercury(T)	---	0.01
		Cyanide	0.005	---	Molybdenum(T)	---	150
		Nitrate	10	---	Nickel	TVS	TVS
		Nitrite	---	0.05	Nickel(T)	---	100
		Phosphorus	---	0.11*	Selenium	TVS	TVS
		Sulfate	---	WS	Silver	TVS	TVS(tr)
		Sulfide	---	0.002	Uranium	varies*	varies*
					Zinc	TVS	TVS

1b. All tributaries to the South Platte River, including wetlands within the Lost Creek and Mt. Evans Wilderness Areas.

COSPUS01B	Classifications	Physical and Biological			Metals (ug/L)		
Designation	Agriculture		**DM**	**MWAT**		**acute**	**chronic**
OW	Aq Life Cold 1	Temperature °C	CS-I	CS-I	Arsenic	340	---
	Recreation E		**acute**	**chronic**	Arsenic(T)	---	0.02
	Water Supply	D.O. (mg/L)	---	6.0	Cadmium	TVS	TVS
Qualifiers:		D.O. (spawning)	---	7.0	Cadmium(T)	5.0	---
Other:		pH	6.5 - 9.0	---	Chromium III	---	TVS
		chlorophyll a (mg/m^2)	---	150	Chromium III(T)	50	---
*Uranium(acute) = See 38.5(3) for details.		E. coli (per 100 mL)	---	126	Chromium VI	TVS	TVS
*Uranium(chronic) = See 38.5(3) for details.					Copper	TVS	TVS
		Inorganic (mg/L)			Iron	---	WS
			acute	**chronic**	Iron(T)	---	1000
		Ammonia	TVS	TVS	Lead	TVS	TVS
		Boron	---	0.75	Lead(T)	50	---
		Chloride	---	250	Manganese	TVS	TVS/WS
		Chlorine	0.019	0.011	Mercury(T)	---	0.01
		Cyanide	0.005	---	Molybdenum(T)	---	150
		Nitrate	10	---	Nickel	TVS	TVS
		Nitrite	---	0.05	Nickel(T)	---	100
		Phosphorus	---	0.11	Selenium	TVS	TVS
		Sulfate	---	WS	Silver	TVS	TVS(tr)
		Sulfide	---	0.002	Uranium	varies*	varies*
					Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Upper South Platte River Basin

2a. All tributaries to the South Platte River system, including all wetlands from the headwaters of the South and Middle Forks to a point immediately below the confluence with Tarryall Creek except for listings in Segment 1b, 2b and 2c.

COSPUS02A	Classifications
Designation	Agriculture
Reviewable	Aq Life Cold 1
	Recreation E
	Water Supply

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*chlorophyll a (mg/m²)(chronic) = applies only above the facilities listed at 38.5(4).
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4).
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	CS-I	CS-I
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	150*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.11*
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

2b. Mainstem of Mosquito Creek from Road #698 (39.270971, -106.098846) to its confluence with the Middle Fork of the South Platte River.

COSPUS02B	Classifications
Designation	Agriculture
UP	Aq Life Cold 1
	Recreation E
	Water Supply

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	CS-I	CS-I
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	---
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	---
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	---	220

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Upper South Platte River Basin

2c. South Mosquito Creek from the source to confluence with Mosquito Creek, Mosquito Creek from the confluence with South Mosquito Creek to Road #698 (39.270971, -106.098846), and No Name Creek from the source to the confluence with South Mosquito Creek.

COSPUS02C	Classifications
Designation	Agriculture
UP	Aq Life Cold 1
	Recreation E

Qualifiers:

Other:

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	CS-I	CS-I
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m^2)	---	150
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	100	---
Nitrite	---	0.05
Phosphorus	---	0.11
Sulfate	---	---
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	7.6
Cadmium	TVS	TVS
Chromium III	TVS	TVS
Chromium III(T)	---	100
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron(T)	---	1000
Lead	TVS	TVS
Manganese	TVS	TVS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	---	280

3. All tributaries to the South Platte River, including all wetlands from a point immediately below the confluence with Tarryall Creek to a point immediately above the confluence with the North Fork of the South Platte River, except for listings in Segment 1b.

COSPUS03	Classifications
Designation	Agriculture
Reviewable	Aq Life Cold 1
	Recreation E
	Water Supply

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*chlorophyll a (mg/m^2)(chronic) = applies only above the facilities listed at 38.5(4).
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4).
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	CS-I	CS-I
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m^2)	---	150*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.11*
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Upper South Platte River Basin

4. Mainstem of the North Fork of the South Platte River, including all tributaries and wetlands from the source to the confluence with the South Platte River, except for listings in Segments 1b, 5a, 5b, and 5c.

COSPUS04	Classifications
Designation	Agriculture
Reviewable	Aq Life Cold 1
	Recreation E
	Water Supply

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*chlorophyll a (mg/m²)(chronic) = applies only above the facilities listed at 38.5(4).
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4).
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	CS-I	CS-I
	acute	chronic
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	150*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.11*
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

5a. Mainstem of Geneva Creek from the source to the confluence with Scott Gomer Creek.

COSPUS05A	Classifications
Designation	Agriculture
Reviewable	Aq Life Cold 1
	Recreation E

Qualifiers:

Other:

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	CS-I	CS-I
	acute	chronic
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	3.5-9.0	---
chlorophyll a (mg/m²)	---	150
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	---
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	100	---
Nitrite	---	0.05
Phosphorus	---	0.11
Sulfate	---	---
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	7.6
Cadmium	---	---
Cadmium(T)	---	2
Chromium III	---	---
Chromium III(T)	---	100
Chromium VI	---	---
Chromium VI(T)	---	25
Copper	---	18
Iron(T)	---	1200
Lead	---	---
Lead(T)	---	4
Manganese	---	530
Mercury(T)	---	0.05
Molybdenum(T)	---	150
Nickel	---	---
Nickel(T)	---	50
Selenium	---	---
Selenium(T)	---	4.6
Silver	---	---
Silver(T)	---	1
Uranium	varies*	varies*
Zinc	---	190

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Upper South Platte River Basin

5b. Mainstem of Geneva Creek from the confluence with Scott Gomer Creek to the confluence with the North Fork of the South Platte River; all tributaries of Geneva Creek including wetlands from source to confluence with the North Fork of the South Platte River.

COSPUS05B

Designation	Classifications
Reviewable	Agriculture
	Aq Life Cold 1
	Recreation E
	Water Supply

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	CS-I	CS-I
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m^2)	---	150
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.11
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

5c. Mainstem of Gooseberry Gulch and all tributaries from source to Sunset Trail.

COSPUS05C

Designation	Classifications
Reviewable	Agriculture
	Aq Life Cold 2
	Recreation U
	Water Supply

Qualifiers:

Other:

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	CS-II	CS-II
	acute	**chronic**
D.O. (mg/L)	---	6.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m^2)	---	---
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	---
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02-10 [A]
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Upper South Platte River Basin

5d. Mainstem of Gooseberry Gulch and all tributaries from Sunset Trail to confluence with Elk Creek.

COSPUS05D	Classifications	Physical and Biological			Metals (ug/L)		
Designation	Agriculture		DM	MWAT		acute	chronic
Reviewable	Aq Life Cold 2	Temperature °C	CS-II	CS-II	Arsenic	340	---
	Recreation U		acute	chronic	Arsenic(T)	---	0.02-10 A
	Water Supply	D.O. (mg/L)	---	6.0	Cadmium	TVS	TVS
Qualifiers:		D.O. (spawning)	---	7.0	Cadmium(T)	5.0	---
Other:		pH	6.5 - 9.0	---	Chromium III	---	TVS
		chlorophyll a (mg/m^2)	---	---	Chromium III(T)	50	---
*Uranium(acute) = See 38.5(3) for details.		E. coli (per 100 mL)	---	126	Chromium VI	TVS	TVS
*Uranium(chronic) = See 38.5(3) for details.					Copper	TVS	TVS
		Inorganic (mg/L)			Iron	---	WS
			acute	chronic	Iron(T)	---	1000
		Ammonia	TVS	TVS	Lead	TVS	TVS
		Boron	---	0.75	Lead(T)	50	---
		Chloride	---	250	Manganese	TVS	TVS/WS
		Chlorine	0.019	0.011	Mercury(T)	---	0.01
		Cyanide	0.005	---	Molybdenum(T)	---	150
		Nitrate	10	---	Nickel	TVS	TVS
		Nitrite	---	0.05	Nickel(T)	---	100
		Phosphorus	---	---	Selenium	TVS	TVS
		Sulfate	---	WS	Silver	TVS	TVS(tr)
		Sulfide	---	0.002	Uranium	varies*	varies*
					Zinc	TVS	TVS

6a. Mainstem of the South Platte River from the outlet of Cheesman Reservoir to the inlet of Chatfield Reservoir.

COSPUS06A	Classifications	Physical and Biological			Metals (ug/L)		
Designation	Agriculture		DM	MWAT		acute	chronic
Reviewable	Aq Life Cold 1	Temperature °C	CS-II	CS-II	Arsenic	340	---
	Recreation E		acute	chronic	Arsenic(T)	---	0.02
	Water Supply	D.O. (mg/L)	---	6.0	Cadmium	TVS	TVS
Qualifiers:		D.O. (spawning)	---	7.0	Cadmium(T)	5.0	---
Other:		pH	6.5 - 9.0	---	Chromium III	---	TVS
Temporary Modification(s):		chlorophyll a (mg/m^2)	---	---	Chromium III(T)	50	---
Arsenic(chronic) = hybrid		E. coli (per 100 mL)	---	126	Chromium VI	TVS	TVS
Expiration Date of 12/31/2024					Copper	TVS	TVS
*Uranium(acute) = See 38.5(3) for details.		**Inorganic (mg/L)**			Iron	---	WS
*Uranium(chronic) = See 38.5(3) for details.			acute	chronic	Iron(T)	---	1000
		Ammonia	TVS	TVS	Lead	TVS	TVS
		Boron	---	0.75	Lead(T)	50	---
		Chloride	---	250	Manganese	TVS	TVS/WS
		Chlorine	0.019	0.011	Mercury(T)	---	0.01
		Cyanide	0.005	---	Molybdenum(T)	---	150
		Nitrate	10	---	Nickel	TVS	TVS
		Nitrite	---	0.05	Nickel(T)	---	100
		Phosphorus	---	---	Selenium	TVS	TVS
		Sulfate	---	WS	Silver	TVS	TVS(tr)
		Sulfide	---	0.002	Uranium	varies*	varies*
					Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Upper South Platte River Basin

6b. Chatfield Reservoir

COSPUS06B	Classifications
Designation	Agriculture
Reviewable	Aq Life Cold 1
	Recreation E
	Water Supply

Qualifiers:

Other:

*chlorophyll a (ug/L)(chronic) = measured through samples that are representative of the mixed layer during July-Sept, with an allowable exceedance frequency of 1in 5 yrs. See section 38.6(4) for assessment thresholds.
*Phosphorus(chronic) = See section 38.6(4) for assessment thresholds.
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.
*Temperature =
DM=CLL and MWAT=CLL from 1/1-3/31
DM=CLL and MWAT=23.5 from 4/1-12/31

Physical and Biological

		DM	MWAT
Temperature °C		varies*	varies*
		acute	**chronic**
D.O. (mg/L)		---	6.0
D.O. (spawning)		---	7.0
pH		6.5 - 9.0	---
chlorophyll a (ug/L)	7/1 - 9/30	---	10*
E. coli (per 100 mL)		---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.03*
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

7. All tributaries to the South Platte River, including all wetlands from a point immediately below the confluence with the North Fork of the South Platte River to the outlet of Chatfield Reservoir except for listings in Segments 8, 9, 10, 11, 12, and 13.

COSPUS07	Classifications
Designation	Agriculture
Reviewable	Aq Life Cold 2
	Recreation E
	Water Supply

Qualifiers:

Other:

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	CS-II	CS-II
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m^2)	---	150
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.11
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02-10 [A]
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Upper South Platte River Basin

8. Mainstems of East and West Plum Creek from the source to the boundary of National Forest lands, including all tributaries and wetlands within the Plum Creek drainage which are on National Forest Lands, except for the listing in Segment 9.

COSPUS08	Classifications
Designation	Agriculture
Reviewable	Aq Life Cold 1
	Recreation E
	Water Supply

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	CS-I	CS-I
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	150
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.11
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

9. Mainstem of Bear Creek, including all tributaries and wetlands from the source to the inlet of Perry Park Reservoir, a.k.a. Waucondah Reservoir (Douglas County).

COSPUS09	Classifications
Designation	Agriculture
Reviewable	Aq Life Cold 1
	Recreation E
	Water Supply

Qualifiers:

Other:

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	CS-I	CS-I
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	150
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.11
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Upper South Platte River Basin

10. Mainstems of East Plum Creek, West Plum Creek, and Plum Creek from the boundary of National Forest lands to Chatfield Reservoir, mainstems of Stark Creek and Gove Creek from the boundary of National Forest lands to their confluence.

COSPUS10	Classifications	Physical and Biological			Metals (ug/L)		
Designation	Agriculture		DM	MWAT		acute	chronic
Reviewable	Aq Life Warm 1	Temperature °C	WS-I	WS-I	Arsenic	340	---
	Recreation E		acute	chronic	Arsenic(T)	---	0.02
	Water Supply	D.O. (mg/L)	---	5.0	Cadmium	TVS	TVS
Qualifiers:		pH	6.5 - 9.0	---	Cadmium(T)	5.0	---
Other:		chlorophyll a (mg/m²)	---	150*	Chromium III	---	TVS
Temporary Modification(s):		E. coli (per 100 mL)	---	126	Chromium III(T)	50	---
Arsenic(chronic) = hybrid		Inorganic (mg/L)			Chromium VI	TVS	TVS
Expiration Date of 12/31/2024			acute	chronic	Copper	TVS	TVS
*chlorophyll a (mg/m²)(chronic) = applies only above the facilities listed at 38.5(4).		Ammonia	TVS	TVS	Iron	---	WS
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4).		Boron	---	0.75	Iron(T)	---	1000
*Uranium(acute) = See 38.5(3) for details.		Chloride	---	250	Lead	TVS	TVS
*Uranium(chronic) = See 38.5(3) for details.		Chlorine	0.019	0.011	Lead(T)	50	---
		Cyanide	0.005	---	Manganese	TVS	TVS/WS
		Nitrate	10	---	Mercury(T)	---	0.01
		Nitrite	---	0.5	Molybdenum(T)	---	150
		Phosphorus	---	0.17*	Nickel	TVS	TVS
		Sulfate	---	WS	Nickel(T)	---	100
		Sulfide	---	0.002	Selenium	TVS	TVS
					Silver	TVS	TVS
					Uranium	varies*	varies*
					Zinc	TVS	TVS

11a. All tributaries to the East Plum Creek system, including all wetlands which are not on national forest lands.

COSPUS11A	Classifications	Physical and Biological			Metals (ug/L)		
Designation	Agriculture		DM	MWAT		acute	chronic
UP	Aq Life Warm 2	Temperature °C	WS-II	WS-II	Arsenic	340	---
	Recreation E		acute	chronic	Arsenic(T)	---	0.02-10 A
	Water Supply	D.O. (mg/L)	---	5.0	Cadmium	TVS	TVS
Qualifiers:		pH	6.5 - 9.0	---	Cadmium(T)	5.0	---
Other:		chlorophyll a (mg/m²)	---	150	Chromium III	---	TVS
		E. coli (per 100 mL)	---	126	Chromium III(T)	50	---
*Uranium(acute) = See 38.5(3) for details.		Inorganic (mg/L)			Chromium VI	TVS	TVS
*Uranium(chronic) = See 38.5(3) for details.			acute	chronic	Copper	TVS	TVS
		Ammonia	TVS	TVS	Iron	---	WS
		Boron	---	0.75	Iron(T)	---	1000
		Chloride	---	250	Lead	TVS	TVS
		Chlorine	0.019	0.011	Lead(T)	50	---
		Cyanide	0.005	---	Manganese	TVS	TVS/WS
		Nitrate	10	---	Mercury(T)	---	0.01
		Nitrite	---	0.5	Molybdenum(T)	---	150
		Phosphorus	---	0.17	Nickel	TVS	TVS
		Sulfate	---	WS	Nickel(T)	---	100
		Sulfide	---	0.002	Selenium	TVS	TVS
					Silver	TVS	TVS
					Uranium	varies*	varies*
					Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Upper South Platte River Basin

11b. All tributaries to the West Plum Creek system, including all wetlands, which are not on national forest lands, except for listings in Segments 9 and 12.

COSPUS11B	Classifications
Designation	Agriculture
UP	Aq Life Warm 2
	Water Supply
	Recreation E

Qualifiers:

Other:

*chlorophyll a (mg/m²)(chronic) = applies only above the facilities listed at 38.5(4).
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4).
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	WS-I	WS-I
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	150*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	0.17*
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02-10 A
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

12. Mainstem of Garber Creek and Jackson Creek from the boundary of National Forest lands to the confluence with West Plum Creek; mainstem of Bear Creek from the outlet of Perry Park Reservoir, a.k.a. Waucondah Reservoir, to the confluence with West Plum Creek.

COSPUS12	Classifications
Designation	Agriculture
Reviewable	Aq Life Warm 1
	Recreation E
	Water Supply

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	WS-I	WS-I
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	150
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	0.17
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Upper South Platte River Basin

13. Mainstem of Deer Creek, including the North and South Forks, from the source to Chatfield Reservoir.

COSPUS13	Classifications
Designation	Agriculture
Reviewable	Aq Life Cold 1
	Recreation E
	Water Supply

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	CS-II	CS-II
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m^2)	---	150
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.11
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

14. Mainstem of the South Platte River from the outlet of Chatfield Reservoir to the Burlington Ditch diversion in Denver, Colorado.

COSPUS14	Classifications
Designation	Agriculture
Reviewable	Aq Life Warm 1
	Recreation E
	Water Supply

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*Copper(acute) = Copper BLM-based FMB
Cu FMB(ac)=31.5 ug/l
downstream of Marcy Gulch.
*Copper(chronic) = Copper BLM-based FMB
Cu FMB(ch)=20.8 ug/l
downstream of Marcy Gulch.
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.
*Temperature = summer criteria apply from 2/14 - 11/30

Physical and Biological

	DM	MWAT
Temperature °C	WS-I*	WS-I*
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m^2)	---	---
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	---
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	---	TVS*
Copper	TVS*	---
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/190
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Upper South Platte River Basin

15. Mainstem of the South Platte River from the Burlington Ditch diversion in Denver, Colorado, to a point immediately below the confluence with Big Dry Creek.

COSPUS15	Classifications
Designation	Agriculture
UP	Aq Life Warm 1
	Recreation E
	Water Supply

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024
temperature(DM/MWAT) = current condition*
Expiration Date of 12/31/2021

Discharger Specific Variance(s):
Selenium(acute) = TVS: no limit
Selenium(chronic) = TVS: 24 µg/L
Expiration Date of 12/31/2023

*Ammonia(acute) = See section 38.6(4) for site-specific standards.
*Ammonia(chronic) = See section 38.6(4) for site-specific standards.
*Copper(acute) = Copper BLM-based FMB Cu FMB(ac)=26.4 ug/l Downstream of the Metro Hite WWTF outfall.
*Copper(chronic) = Copper BLM-based FMB Cu FMB(ch)= 18.0 ug/l Downstream of the Metro Hite WWTF outfall.
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.
*D.O. (mg/L)(acute) = See section 38.6(4) for site-specific standards.
*D.O. (mg/L)(chronic) = See section 38.6(4) for site-specific standards.
*pH(acute) = 6.0 - 9.0 from 64th Ave. downstream 2 miles
*TempMod: temperature = Adopted 6/8/2009
*Variance: Selenium = see 38.6(6) for details.

Physical and Biological

	DM	MWAT
Temperature °C	WS-I	WS-I
	acute	**chronic**
D.O. (mg/L)	varies*	varies*
pH	6.0-9.0*	---
pH	6.5 - 9.0	---
chlorophyll a (mg/m^2)	---	---
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS*	TVS*
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	1.0	---
Phosphorus	---	---
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	---	TVS*
Copper	TVS*	---
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/400
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Upper South Platte River Basin

16a. Mainstem of Sand Creek from the confluence of Murphy and Coal Creek in Arapahoe County to the confluence with the Toll Gate Creek.

COSPUS16A	Classifications
Designation	Agriculture
Reviewable	Aq Life Warm 2
	Water Supply
	Recreation E

Qualifiers:

Other:

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	WS-II	WS-II
	acute	chronic
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m^2)	---	---
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	---
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02-10 A
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Upper South Platte River Basin

16b. Aurora Reservoir.

COSPUS16B	Classifications
Designation	Agriculture
Reviewable	Aq Life Warm 1
	Recreation E
	Water Supply
	DUWS

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	WL	WL
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (ug/L)	---	---
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	---
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

16c. All tributaries to the South Platte River, including all wetlands, from the outlet of Chatfield Reservoir, to a point immediately below the confluence with Big Dry Creek, except for listings in the subbasins of the South Platte River, and in Segments 16a, 16d, 16e, 16f, 16g, 16h, 16i, 16j, and 16k.

COSPUS16C	Classifications
Designation	Agriculture
UP	Aq Life Warm 2
	Recreation E

Qualifiers:

Other:

*chlorophyll a (mg/m²)(chronic) = applies only above the facilities listed at 38.5(4).
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4).
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	WS-II	WS-II
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	150*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	---
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	100	---
Nitrite	---	0.5
Phosphorus	---	0.17*
Sulfate	---	---
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	100
Cadmium	TVS	TVS
Chromium III	TVS	TVS
Chromium III(T)	---	100
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron(T)	---	1000
Lead	TVS	TVS
Manganese	TVS	TVS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Upper South Platte River Basin

16d. Second Creek from the source to the O'Brian Canal at 39.898789, 104.817661.

COSPUS16D	Classifications
Designation	Agriculture
UP	Aq Life Warm 2
	Recreation E

Qualifiers:

Other:

*chlorophyll a (mg/m^2)(chronic) = applies only above the facilities listed at 38.5(4).
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4).
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.
*D.O. (mg/L)(chronic) = 15th percentile of D.O. measurements collected between 6:30 a.m. and 6:30 p.m.

Physical and Biological

	DM	MWAT
Temperature °C	WS-III	WS-III
	acute	**chronic**
D.O. (mg/L)	---	3.3*
pH	6.5 - 9.0	---
chlorophyll a (mg/m^2)	---	150*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	---
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	100	---
Nitrite	---	0.5
Phosphorus	---	0.17*
Sulfate	---	---
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	100
Cadmium	TVS	TVS
Chromium III	TVS	TVS
Chromium III(T)	---	100
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron(T)	---	1000
Lead	TVS	TVS
Manganese	TVS	TVS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

16e. Third Creek from the source to the O'Brian Canal at 39.917346, -104.784028.

COSPUS16E	Classifications
Designation	Agriculture
UP	Aq Life Warm 2
	Water Supply
	Recreation E

Qualifiers:

Other:

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.
*D.O. (mg/L)(chronic) = 15th percentile of D.O. measurements collected between 6:30 a.m. and 6:30 p.m.

Physical and Biological

	DM	MWAT
Temperature °C	WS-III	WS-III
	acute	**chronic**
D.O. (mg/L)	---	4.0*
pH	6.5 - 9.0	---
chlorophyll a (mg/m^2)	---	---
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	---
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02-10 A
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Upper South Platte River Basin

16f. Barr Lake Tributary from the source to the Denver Hudson Canal at 39.941142, -104.748387.

COSPUS16F	Classifications
Designation	Agriculture
UP	Aq Life Warm 2
	Recreation E

Qualifiers:

Other:

*chlorophyll a (mg/m²)(chronic) = applies only above the facilities listed at 38.5(4).
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4).
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.
*D.O. (mg/L)(chronic) = When water is present, D.O. concentrations shall be maintained at levels that protect classified uses.

Physical and Biological

	DM	MWAT
Temperature °C	WS-III	WS-III
	acute	**chronic**
D.O. (mg/L)	---	narrative*
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	150*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	---
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	100	---
Nitrite	---	0.5
Phosphorus	---	0.17*
Sulfate	---	---
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	100
Cadmium	TVS	TVS
Chromium III	TVS	TVS
Chromium III(T)	---	100
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron(T)	---	1000
Lead	TVS	TVS
Manganese	TVS	TVS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

16g. Marcy Gulch, including all wetlands from the source to the confluence with the South Platte.

COSPUS16G	Classifications
Designation	Agriculture
UP	Aq Life Warm 2
	Recreation E

Qualifiers:

Other:

Temporary Modification(s):
temperature(MWAT) = current condition* 12/1 - 2/29
Expiration Date of 12/31/2025

*Copper(acute) = Copper BLM-based FMB Cu FMB(ac)=67.1 ug/l below the Centennial WWTF.
*Copper(chronic) = Copper BLM-based FMB Cu FMB(ch)=43.3 ug/l below the Centennial WWTF.
*Selenium(acute) = See section 38.6(4)(b) for assessment locations.
*Selenium(chronic) = See section 38.6(4)(b) for assessment locations.
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.
*TempMod: temperature(12/1 - 2/29) = downstream of Centennial WWTF. Adopted 6/8/2009

Physical and Biological

	DM	MWAT
Temperature °C	WS-II	WS-II
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	---
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	---
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	100	---
Nitrite	---	0.5
Phosphorus	---	---
Sulfate	---	---
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	100
Cadmium	TVS	TVS
Chromium III	TVS	TVS
Chromium III(T)	---	100
Chromium VI	TVS	TVS
Copper	---	TVS*
Copper	TVS*	---
Iron(T)	---	1000
Lead	TVS	TVS
Manganese	TVS	TVS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Selenium	21*	13*
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Upper South Platte River Basin

16h. Mainstem of West Toll Gate Creek, including all tributaries and wetlands, upstream of the confluence with East Toll Gate Creek. Mainstem of East Toll Gate Creek, including all tributaries and wetlands, upstream of the confluence with West Toll Gate Creek. Mainstem of Toll Gate Creek, downstream of the confluence of East and West Toll Gate Creeks, to the confluence with Sand Creek.

COSPUS16H	Classifications
Designation	Agriculture
Reviewable	Aq Life Warm 2
	Recreation E

Qualifiers:

Fish Ingestion Standards

Other:

*chlorophyll a (mg/m²)(chronic) = applies only above the facilities listed at 38.5(4).
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4).
*Selenium(acute) = See section 38.6(4)(b) for selenium standards and assessment locations.
*Selenium(chronic) = See section 38.6(4)(b) for selenium standards and assessment locations.
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological		
	DM	MWAT
Temperature °C	WS-II	WS-II
	acute	chronic
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	150*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)		
	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	---
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	100	---
Nitrite	---	0.5
Phosphorus	---	0.17*
Sulfate	---	---
Sulfide	---	0.002

Metals (ug/L)		
	acute	chronic
Arsenic	340	---
Arsenic(T)	---	7.6
Cadmium	TVS	TVS
Chromium III	TVS	TVS
Chromium III(T)	---	100
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron(T)	---	1000
Lead	TVS	TVS
Manganese	TVS	TVS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Selenium	varies*	varies*
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

16i. Mainstem of Sand Creek from the confluence with Toll Gate Creek to the confluence with the South Platte River.

COSPUS16I	Classifications
Designation	Agriculture
Reviewable	Aq Life Warm 1
	Recreation E

Qualifiers:

Other:

Discharger Specific Variance(s):
Selenium(acute) = TVS: no limit
Selenium(chronic) = 9: 24 µg/L
Expiration Date of 12/31/2023

*chlorophyll a (mg/m²)(chronic) = applies only above the facilities listed at 38.5(4).
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4).
*Mercury(T)(chronic) = 0.026 below Brighton Blvd, see section 38.6(4)(f) for mercury assessment locations
*Selenium(acute) = See section 38.6(4)(f) for selenium standards and assessment locations.
*Selenium(chronic) = See section 38.6(4)(f) for selenium standards and assessment locations.
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.
*Variance: Selenium = see 38.6(6) for details.

Physical and Biological		
	DM	MWAT
Temperature °C	WS-II	WS-II
	acute	chronic
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	150*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)		
	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	---
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	100	---
Nitrite	---	0.5
Phosphorus	---	0.17*
Sulfate	---	---
Sulfide	---	0.002

Metals (ug/L)		
	acute	chronic
Arsenic	340	---
Arsenic(T)	---	7.6
Cadmium	TVS	TVS
Chromium III	TVS	TVS
Chromium III(T)	---	100
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron(T)	---	1000
Lead	TVS	TVS
Manganese	TVS	TVS
Mercury(T)	---	0.01
Mercury(T)	---	0.026*
Molybdenum(T)	---	150
Nickel	TVS	TVS
Selenium	---	varies*
Selenium	varies*	---
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Upper South Platte River Basin

16j. Lee Gulch, Little's Creek, Big Dry Creek (Douglas and Arapahoe Counties), and Little Dry Creek, including all wetlands from the source to the confluence with the South Platte.

COSPUS16J	Classifications
Designation	Agriculture
UP	Aq Life Warm 2
	Recreation E
	Water Supply

Qualifiers:

Other:

*chlorophyll a (mg/m²)(chronic) = applies only above the facilities listed at 38.5(4).
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4).
*Selenium(acute) = See section 38.6(4)(h) for selenium standards and assessment locations.
*Selenium(chronic) = See section 38.6(4)(h) for selenium standards and assessment locations.
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	WS-II	WS-II
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	150*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	0.17*
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02-10 [A]
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	varies*	varies*
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

16k. Mainstem of Lakewood Gulch from the source to the confluence with the South Platte.

COSPUS16K	Classifications
Designation	Agriculture
Reviewable	Aq Life Warm 1
	Water Supply
	Recreation E

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*chlorophyll a (mg/m²)(chronic) = applies only above the facilities listed at 38.5(4).
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4).
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	WS-II	WS-II
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	150*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	0.17*
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Upper South Platte River Basin

17a. Washington Park Lakes, City Park Lakes, Rocky Mountain Lake, Berkely Lake.

COSPUS17A	Classifications	Physical and Biological			Metals (ug/L)		
Designation	Agriculture		DM	MWAT		acute	chronic
Reviewable	Aq Life Warm 1	Temperature °C	WL	WL	Arsenic	340	---
	Recreation E		acute	chronic	Arsenic(T)	---	7.6
Qualifiers:		D.O. (mg/L)	---	5.0	Cadmium	TVS	TVS
Other:		pH	6.5 - 9.0	---	Chromium III	TVS	TVS
		chlorophyll a (ug/L)	---	---	Chromium III(T)	---	100
*Uranium(acute) = See 38.5(3) for details.		E. coli (per 100 mL)	---	126	Chromium VI	TVS	TVS
*Uranium(chronic) = See 38.5(3) for details.		**Inorganic (mg/L)**			Copper	TVS	TVS
			acute	chronic	Iron(T)	---	1000
		Ammonia	TVS	TVS	Lead	TVS	TVS
		Boron	---	0.75	Manganese	TVS	TVS
		Chloride	---	---	Mercury(T)	---	0.01
		Chlorine	0.019	0.011	Molybdenum(T)	---	150
		Cyanide	0.005	---	Nickel	TVS	TVS
		Nitrate	100	---	Selenium	TVS	TVS
		Nitrite	---	0.5	Silver	TVS	TVS
		Phosphorus	---	---	Uranium	varies*	varies*
		Sulfate	---	---	Zinc	TVS	TVS
		Sulfide	---	0.002			

17b. Sloan's Lake.

COSPUS17B	Classifications	Physical and Biological			Metals (ug/L)		
Designation	Agriculture		DM	MWAT		acute	chronic
Reviewable	Aq Life Warm 1	Temperature °C	WL	WL	Arsenic	340	---
	Recreation E		acute	chronic	Arsenic(T)	---	7.6
Qualifiers:		D.O. (mg/L)	---	5.0	Cadmium	TVS	TVS
Other:		pH	6.5 - 9.0	---	Chromium III	TVS	TVS
		chlorophyll a (ug/L)	---	---	Chromium III(T)	---	100
*Uranium(acute) = See 38.5(3) for details.		E. coli (per 100 mL)	---	126	Chromium VI	TVS	TVS
*Uranium(chronic) = See 38.5(3) for details.		**Inorganic (mg/L)**			Copper	TVS	TVS
			acute	chronic	Iron(T)	---	1000
		Ammonia	TVS	TVS	Lead	TVS	TVS
		Boron	---	0.75	Manganese	TVS	TVS
		Chloride	---	---	Mercury(T)	---	0.01
		Chlorine	0.019	0.011	Molybdenum(T)	---	150
		Cyanide	0.005	---	Nickel	TVS	TVS
		Nitrate	100	---	Selenium	TVS	TVS
		Nitrite	---	0.5	Silver	TVS	TVS
		Phosphorus	---	---	Uranium	varies*	varies*
		Sulfate	---	---	Zinc	TVS	TVS
		Sulfide	---	0.002			

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Upper South Platte River Basin

17c. Bowles Lake, a.k.a. Patrick Reservoir or Bow Mar Lake.

COSPUS17C	Classifications
Designation	Agriculture
Reviewable	Aq Life Warm 1
	Recreation E

Qualifiers:

Other:

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	WL	WL
	acute	**chronic**
D.O. (mg/L)	---	5.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (ug/L)	---	---
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	---
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	100	---
Nitrite	---	0.5
Phosphorus	---	---
Sulfate	---	---
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Aluminum	TVS	TVS
Arsenic	340	---
Arsenic(T)	---	7.6
Cadmium	TVS	TVS
Chromium III	TVS	TVS
Chromium III(T)	---	100
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron(T)	---	1000
Lead	TVS	TVS
Manganese	TVS	TVS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

18. Lakes and reservoirs within the boundaries of the Lost Creek and Mt. Evans Wilderness areas.

COSPUS18	Classifications
Designation	Agriculture
OW	Aq Life Cold 1
	Recreation E
	Water Supply

Qualifiers:

Other:

*chlorophyll a (ug/L)(chronic) = applies only to lakes and reservoirs larger than 25 acres surface area.
*Phosphorus(chronic) = applies only to lakes and reservoirs larger than 25 acres surface area.
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	CL	CL
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (ug/L)	---	8*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.025*
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Upper South Platte River Basin

19. Lakes and reservoirs in the South Platte River system from headwaters to Chatfield Reservoir, except for listings in Segment 18. Includes Antero, Spinney Mountain, Elevenmile, Cheesman, and Strontia Springs.

COSPUS19	Classifications
Designation	Agriculture
Reviewable	Aq Life Cold 1
	Recreation E
	Water Supply
	DUWS*

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*chlorophyll a (ug/L)(chronic) = applies only above the facilities listed at 38.5(4), applies only to lakes and reservoirs larger than 25 acres surface area.
*Classification: DUWS applies to Strontia Springs and Woodland Park Reservoir only.
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4), applies only to lakes and reservoirs larger than 25 acres surface area.
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.
*Temperature = See 38.6(4) for temperature standards.

Physical and Biological

	DM	MWAT
Temperature °C	varies*	varies*
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (ug/L)	---	8*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.025*
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

20. Lakes and reservoirs in the Plum Creek system within National Forest boundaries; and lakes and reservoirs in the Bear Creek drainage between the National Forest boundary and to the inlet of Perry Park Reservoir, a.k.a. Waucondah Reservoir (Douglas County).

COSPUS20	Classifications
Designation	Agriculture
Reviewable	Aq Life Cold 1
	Recreation E
	Water Supply

Qualifiers:

Other:

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	CL	CL
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (ug/L)	---	---
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	---
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Upper South Platte River Basin

21. Lakes and reservoirs in the Plum Creek system except for listings in Segment 20.

COSPUS21	Classifications
Designation	Agriculture
Reviewable	Aq Life Warm 2
	Recreation E
	Water Supply
	DUWS*

Qualifiers:

Other:

*Classification: DUWS applies to Aurora Rampart only.
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	WL	WL
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (ug/L)	---	---
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	---
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02-10 A
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

22a. Lakes and reservoirs in watersheds tributary to the South Platte River from the outlet of Chatfield Reservoir to a point immediately below the confluence with Big Dry Creek, except for listings in the subbasins of the South Platte River, and in Segments 16b, 17a, 17b, 17c, 22b, and 23.

COSPUS22A	Classifications
Designation	Agriculture
Reviewable	Aq Life Warm 2
	Recreation E
	Water Supply
	DUWS*

Qualifiers:

Water + Fish Standards

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*Classification: DUWS applies to McLellan, Quincy and Marshall Reservoir only.
*Molybdenum(T)(chronic) = 210 ug/L for McLellan Reservoir
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	WL	WL
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (ug/L)	---	---
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	---
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Molybdenum(T)	---	210*
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Upper South Platte River Basin

22b. Lakes and reservoirs located in the Rocky Mountain Arsenal National Wildlife Refuge

COSPUS22B	Classifications	Physical and Biological			Metals (ug/L)		
Designation	Agriculture		DM	MWAT		acute	chronic
Reviewable	Aq Life Warm 2	Temperature °C	WL	WL	Arsenic	340	---
	Recreation E		acute	chronic	Arsenic(T)	---	100
Qualifiers:		D.O. (mg/L)	---	5.0	Cadmium	TVS	TVS
Other:		pH	6.5 - 9.0	---	Chromium III	TVS	TVS
		chlorophyll a (ug/L)	---	---	Chromium III(T)	---	100
*Uranium(acute) = See 38.5(3) for details.		E. coli (per 100 mL)	---	126	Chromium VI	TVS	TVS
*Uranium(chronic) = See 38.5(3) for details.		Inorganic (mg/L)			Copper	TVS	TVS
			acute	chronic	Iron(T)	---	1000
		Ammonia	TVS	TVS	Lead	TVS	TVS
		Boron	---	0.75	Manganese	TVS	TVS
		Chloride	---	---	Mercury(T)	---	0.01
		Chlorine	0.019	0.011	Molybdenum(T)	---	150
		Cyanide	0.005	---	Nickel	TVS	TVS
		Nitrate	100	---	Selenium	TVS	TVS
		Nitrite	---	0.5	Silver	TVS	TVS
		Phosphorus	---	---	Uranium	varies*	varies*
		Sulfate	---	---	Zinc	TVS	TVS
		Sulfide	---	0.002			

23. Lakes and reservoirs in watersheds tributary to the Upper South Platte River and within the City and County of Denver, except for listings in the other subbasins of the South Platte River and in Segments 17a and 17b.

COSPUS23	Classifications	Physical and Biological			Metals (ug/L)		
Designation	Agriculture		DM	MWAT		acute	chronic
Reviewable	Aq Life Warm 2	Temperature °C	WL	WL	Arsenic	340	---
	Recreation E		acute	chronic	Arsenic(T)	---	7.6
Qualifiers:		D.O. (mg/L)	---	5.0	Cadmium	TVS	TVS
Fish Ingestion Standards		pH	6.5 - 9.0	---	Chromium III	TVS	TVS
Other:		chlorophyll a (ug/L)	---	---	Chromium III(T)	---	100
		E. coli (per 100 mL)	---	126	Chromium VI	TVS	TVS
*See section 38.7 (Marston Forebay).		Inorganic (mg/L)			Copper	TVS	TVS
*Uranium(acute) = See 38.5(3) for details.			acute	chronic	Iron(T)	---	1000
*Uranium(chronic) = See 38.5(3) for details.		Ammonia	TVS	TVS	Lead	TVS	TVS
		Boron	---	0.75	Manganese	TVS	TVS
		Chloride	---	---	Mercury(T)	---	0.01
		Chlorine	0.019	0.011	Molybdenum(T)	---	150
		Cyanide	0.005	---	Nickel	TVS	TVS
		Nitrate	100	---	Selenium	TVS	TVS
		Nitrite	---	0.5	Silver	TVS	TVS
		Phosphorus	---	---	Uranium	varies*	varies*
		Sulfate	---	---	Zinc	TVS	TVS
		Sulfide	---	0.002			

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Cherry Creek Basin

1. Mainstem of Cherry Creek from the source of East and West Cherry Creek to the inlet of Cherry Creek Reservoir.

COSPCH01	Classifications	Physical and Biological				Metals (ug/L)		
Designation	Agriculture			DM	MWAT		acute	chronic
Reviewable	Aq Life Warm 1	Temperature °C		WS-II	WS-II	Arsenic	340	---
	Recreation E			acute	chronic	Arsenic(T)	---	0.02
	Water Supply	D.O. (mg/L)		---	5.0	Cadmium	TVS	TVS
Qualifiers:		pH		6.5 - 9.0	---	Cadmium(T)	5.0	---
Other:		chlorophyll a (mg/m²)		---	150*	Chromium III	---	TVS
		E. coli (per 100 mL)		---	126	Chromium III(T)	50	---
		Inorganic (mg/L)				Chromium VI	TVS	TVS
				acute	chronic	Copper	TVS	TVS
		Ammonia		TVS	TVS	Iron	---	WS
		Boron		---	0.75	Iron(T)	---	1000
		Chloride		---	250	Lead	TVS	TVS
		Chlorine		0.019	0.011	Lead(T)	50	---
		Cyanide		0.005	---	Manganese	TVS	TVS/WS
		Nitrate		10	---	Mercury(T)	---	0.01
		Nitrite		---	0.5	Molybdenum(T)	---	150
		Phosphorus		---	0.17*	Nickel	TVS	TVS
		Sulfate		---	WS	Nickel(T)	---	100
		Sulfide		---	0.002	Selenium	TVS	TVS
						Silver	TVS	TVS
						Uranium	varies*	varies*
						Zinc	TVS	TVS

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*chlorophyll a (mg/m²)(chronic) = applies only above the facilities listed at 38.5(4).
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4).
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

2. Cherry Creek Reservoir.

COSPCH02	Classifications	Physical and Biological				Metals (ug/L)		
Designation	Agriculture			DM	MWAT		acute	chronic
Reviewable	Aq Life Warm 1	Temperature °C		WL	WL	Arsenic	340	---
	Recreation E			acute	chronic	Arsenic(T)	---	0.02
	Water Supply	D.O. (mg/L)		---	5.0	Cadmium	TVS	TVS
Qualifiers:		pH		6.5 - 9.0	---	Cadmium(T)	5.0	---
Other:		chlorophyll a (ug/L)	7/1 - 9/30	---	18*	Chromium III	---	TVS
		E. coli (per 100 mL)		---	126	Chromium III(T)	50	---
		Inorganic (mg/L)				Chromium VI	TVS	TVS
				acute	chronic	Copper	TVS	TVS
		Ammonia		TVS	TVS	Iron	---	WS
		Boron		---	0.75	Iron(T)	---	1000
		Chloride		---	250	Lead	TVS	TVS
		Chlorine		0.019	0.011	Lead(T)	50	---
		Cyanide		0.005	---	Manganese	TVS	TVS/WS
		Nitrate		10	---	Mercury(T)	---	0.01
		Nitrite		---	0.5	Molybdenum(T)	---	150
		Phosphorus		---	---	Nickel	TVS	TVS
		Sulfate		---	WS	Nickel(T)	---	100
		Sulfide		---	0.002	Selenium	TVS	TVS
						Silver	TVS	TVS
						Uranium	varies*	varies*
						Zinc	TVS	TVS

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*chlorophyll a (ug/L)(chronic) = Season mean concentration measured in the upper three meters of the water column for the months of July through September with an exceedance frequency of once in five years.
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Cherry Creek Basin

3. Mainstem of Cherry Creek from the outlet of Cherry Creek Reservoir to the confluence with the South Platte River.

COSPCH03	Classifications	Physical and Biological			Metals (ug/L)		
Designation	Agriculture		DM	MWAT		acute	chronic
Reviewable	Aq Life Warm 1	Temperature °C	WS-II	WS-II	Arsenic	340	---
	Recreation E		acute	chronic	Arsenic(T)	---	0.02
	Water Supply	D.O. (mg/L)	---	5.0	Cadmium	TVS	TVS
Qualifiers:		pH	6.5 - 9.0	---	Cadmium(T)	5.0	---
Other:		chlorophyll a (mg/m^2)	---	---	Chromium III	---	TVS
Temporary Modification(s):		E. coli (per 100 mL)	---	126	Chromium III(T)	50	---
Arsenic(chronic) = hybrid		**Inorganic (mg/L)**			Chromium VI	TVS	TVS
Expiration Date of 12/31/2024			acute	chronic	Copper	TVS	TVS
*Uranium(acute) = See 38.5(3) for details.		Ammonia	TVS	TVS	Iron	---	WS
*Uranium(chronic) = See 38.5(3) for details.		Boron	---	0.75	Iron(T)	---	1000
		Chloride	---	250	Lead	TVS	TVS
		Chlorine	0.019	0.011	Lead(T)	50	---
		Cyanide	0.005	---	Manganese	TVS	TVS/WS
		Nitrate	10	---	Mercury(T)	---	0.01
		Nitrite	---	0.5	Molybdenum(T)	---	150
		Phosphorus	---	---	Nickel	TVS	TVS
		Sulfate	---	WS	Nickel(T)	---	100
		Sulfide	---	0.002	Selenium	TVS	TVS
					Silver	TVS	TVS
					Uranium	varies*	varies*
					Zinc	TVS	TVS

4a. All tributaries to Cherry Creek, including all wetlands, from the source of East and West Cherry Creeks to the confluence with the South Platte River except for listings in Segment 4b.

COSPCH04A	Classifications	Physical and Biological			Metals (ug/L)		
Designation	Agriculture		DM	MWAT		acute	chronic
UP	Aq Life Warm 2	Temperature °C	WS-II	WS-II	Arsenic	340	---
	Recreation E		acute	chronic	Arsenic(T)	---	0.02-10 A
	Water Supply	D.O. (mg/L)	---	5.0	Cadmium	TVS	TVS
Qualifiers:		pH	6.5 - 9.0	---	Cadmium(T)	5.0	---
Other:		chlorophyll a (mg/m^2)	---	150*	Chromium III	---	TVS
		E. coli (per 100 mL)	---	126	Chromium III(T)	50	---
*chlorophyll a (mg/m^2)(chronic) = applies only above the facilities listed at 38.5(4).		**Inorganic (mg/L)**			Chromium VI	TVS	TVS
*Phosphorus(chronic) = Applies only above the facilities listed at 38.5(4).			acute	chronic	Copper	TVS	TVS
*Uranium(acute) = See 38.5(3) for details.		Ammonia	TVS	TVS	Iron	---	WS
*Uranium(chronic) = See 38.5(3) for details.		Boron	---	0.75	Iron(T)	---	1000
		Chloride	---	250	Lead	TVS	TVS
		Chlorine	0.019	0.011	Lead(T)	50	---
		Cyanide	0.005	---	Manganese	TVS	TVS/WS
		Nitrate	10	---	Mercury(T)	---	0.01
		Nitrite	---	0.5	Molybdenum(T)	---	150
		Phosphorus	---	0.17*	Nickel	TVS	TVS
		Sulfate	---	WS	Nickel(T)	---	100
		Sulfide	---	0.002	Selenium	TVS	TVS
					Silver	TVS	TVS
					Uranium	varies*	varies*
					Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Cherry Creek Basin

4b. Cottonwood Creek, including all tributaries and wetlands, from the source to Cherry Creek Reservoir.

COSPCH04B	Classifications
Designation	Agriculture
UP	Aq Life Warm 2
	Recreation E
	Water Supply

Qualifiers:

Other:

*chlorophyll a (mg/m²)(chronic) = applies only above the facilities listed at 38.5(4).
*Phosphorus(chronic) = Applies only above the facilities listed at 38.5(4).
*Selenium(acute) = See section 38.6(4)(i) for selenium standards and assessment locations.
*Selenium(chronic) = See section 38.6(4)(i) for selenium standards and assessment locations.
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	WS-II	WS-II
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	150*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	0.17*
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02-10 A
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	varies*	varies*
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

5. Lakes and reservoirs in the Cherry Creek system from the source of East and West Cherry Creeks to the confluence with the South Platte River, except for listings in Segments 2, 6 and 7.

COSPCH05	Classifications
Designation	Agriculture
Reviewable	Aq Life Warm 2
	Recreation E
	Water Supply

Qualifiers:

Water + Fish Standards

Other:

*chlorophyll a (ug/L)(chronic) = applies only above the facilities listed at 38.5(4), applies only to lakes and reservoirs larger than 25 acres surface area.
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4), applies only to lakes and reservoirs larger than 25 acres surface area.
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	WL	WL
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (ug/L)	---	20*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	0.083*
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Cherry Creek Basin

6. Lakes and reservoirs in watersheds tributary to Cherry Creek within the City and County of Denver.

COSPCH06	Classifications
Designation	Agriculture
Reviewable	Aq Life Warm 2
	Recreation E

Qualifiers:

Fish Ingestion Standards

Other:

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	WL	WL
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (ug/L)	---	---
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	---
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	100	---
Nitrite	---	0.5
Phosphorus	---	---
Sulfate	---	---
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	7.6
Cadmium	TVS	TVS
Chromium III	TVS	TVS
Chromium III(T)	---	100
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron(T)	---	1000
Lead	TVS	TVS
Manganese	TVS	TVS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

7. Rueter-Hess Reservoir

COSPCH07	Classifications
Designation	Agriculture
Reviewable	Aq Life Warm 1
	Recreation E
	Water Supply
	DUWS

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	WL	WL
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (ug/L)	---	---
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	---
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Bear Creek Basin

1a. Mainstem of Bear Creek from the boundary of the Mt. Evans Wilderness area to the inlet of Evergreen Lake.

COSPBE01A	Classifications
Designation	Agriculture
Reviewable	Aq Life Cold 1
	Recreation E
	Water Supply

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*chlorophyll a (mg/m²)(chronic) = applies only above the facilities listed at 38.5(4).
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4).
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological		
	DM	MWAT
Temperature °C	CS-I	CS-I
	acute	chronic
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	150*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)		
	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.11*
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)		
	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

1b. Mainstem of Bear Creek from Harriman Ditch to the inlet of Bear Creek Reservoir.

COSPBE01B	Classifications
Designation	Agriculture
Reviewable	Aq Life Cold 1
	Recreation E
	Water Supply

Qualifiers:
Water + Fish Standards

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.
*Temperature =
DM=CS-II and MWAT=CS-II from 11/1-3/31
DM=CS-II and MWAT= 19.3 from 4/1-10/31

Physical and Biological		
	DM	MWAT
Temperature °C	varies*	varies*
	acute	chronic
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	---
E. coli (per 100 mL)	---	126

Inorganic (mg/L)		
	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	---
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)		
	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Bear Creek Basin

1c. Bear Creek Reservoir.

COSPBE01C	Classifications
Designation	Agriculture
Reviewable	Aq Life Cold 1
	Recreation E
	Water Supply

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*chlorophyll a (ug/L)(chronic) = mean concentration measured through collection of samples that are representative of the mixed layer during summer months (July, August, September) and with an exceedance frequency of once in five years.
*Phosphorus(chronic) = mean concentration measured through collection of samples that are representative of the mixed layer during summer months (July, August, September) and with an exceedance frequency of once in five years.
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.
*Temperature =
DM=CLL and MWAT=CLL from 1/1-3/31
DM=CLL and MWAT= 23.3 from 4/1-12/31

Physical and Biological

		DM	MWAT
Temperature °C		varies*	varies*
		acute	**chronic**
D.O. (mg/L)		---	6.0
D.O. (spawning)		---	7.0
pH		6.5 - 9.0	---
chlorophyll a (ug/L)	7/1 - 9/30	---	12.2*
E. coli (per 100 mL)		---	126

Inorganic (mg/L)

		acute	chronic
Ammonia		TVS	TVS
Boron		---	0.75
Chloride		---	250
Chlorine		0.019	0.011
Cyanide		0.005	---
Nitrate		10	---
Nitrite		---	0.05
Phosphorus	7/1 - 9/30	---	22.2*
Sulfate		---	WS
Sulfide		---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

1d. Evergreen Lake.

COSPBE01D	Classifications
Designation	Agriculture
Reviewable	Aq Life Cold 1
	Recreation E
	Water Supply
	DUWS

Qualifiers:

Other:

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	CLL	CLL
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (ug/L)	---	---
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	---
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Bear Creek Basin

1e. Mainstem of Bear Creek from the outlet of Evergreen Lake to the Harriman Ditch.

COSPBE01E	Classifications
Designation	Agriculture
Reviewable	Aq Life Cold 1
	Recreation E
	Water Supply

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.
*Temperature =
DM=CS-II and MWAT=CS-II from 11/1-3/31
DM=CS-II and MWAT= 19.3 from 4/1-10/31

Physical and Biological	DM	MWAT
Temperature °C	varies*	varies*
	acute	chronic
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	---
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	---
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

2. Mainstem of Bear Creek from the outlet of Bear Creek Reservoir to the confluence with the South Platte River.

COSPBE02	Classifications
Designation	Agriculture
Reviewable	Aq Life Warm 1
	Recreation E
	Water Supply

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	WS-II	WS-II
	acute	chronic
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	---
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	---
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Bear Creek Basin

3. All tributaries to Bear Creek, including all wetlands, from the source to the outlet of Evergreen Lake, except for listings in Segment 7.

COSPBE03	Classifications
Designation	Agriculture
Reviewable	Aq Life Cold 1
	Recreation E
	Water Supply

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*chlorophyll a (mg/m²)(chronic) = applies only above the facilities listed at 38.5(4).
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4).
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological		
	DM	MWAT
Temperature °C	CS-I	CS-I
	acute	chronic
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	150*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)		
	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.11*
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)		
	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

4. All tributaries to Bear Creek, including all wetlands, from the outlet of Evergreen Lake to the confluence with the South Platte River, except for specific listings in Segments 5, 6a, and 6b.

COSPBE04	Classifications
Designation	Agriculture
Reviewable	Aq Life Warm 2
	Recreation E
	Water Supply

Qualifiers:

Water + Fish Standards

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological		
	DM	MWAT
Temperature °C	WS-I	WS-I
	acute	chronic
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	---
E. coli (per 100 mL)	---	126

Inorganic (mg/L)		
	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	---
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)		
	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Bear Creek Basin

5. Swede, Kerr, Sawmill, Troublesome, and Cold Springs Gulches, and mainstem of Cub Creek from the source to the confluence with Bear Creek.

COSPBE05	Classifications
Designation	Agriculture
Reviewable	Aq Life Cold 2
	Recreation E
	Water Supply

Qualifiers:

Water + Fish Standards

Other:

Temporary Modification(s):

Arsenic(chronic) = hybrid

Expiration Date of 12/31/2024

*chlorophyll a (mg/m²)(chronic) = applies only above the facilities listed at 38.5(4).
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4).
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	CS-II	CS-II
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	150*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.11*
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

6a. Turkey Creek system, including all tributaries and wetlands, from the source to the inlet of Bear Creek Reservoir, except for listings in Segment 6b.

COSPBE06A	Classifications
Designation	Agriculture
Reviewable	Aq Life Cold 2
	Recreation E
	Water Supply

Qualifiers:

Water + Fish Standards

Other:

Temporary Modification(s):

Arsenic(chronic) = hybrid

Expiration Date of 12/31/2024

*chlorophyll a (mg/m²)(chronic) = applies only above the facilities listed at 38.5(4).
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4).
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	CS-II	CS-II
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	150*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.11*
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Bear Creek Basin

6b. Mainstem of North Turkey Creek, from the source to the confluence with Turkey Creek.

COSPBE06B	Classifications	Physical and Biological			Metals (ug/L)		
Designation	Agriculture		DM	MWAT		acute	chronic
Reviewable	Aq Life Cold 1	Temperature °C	CS-I	CS-I	Arsenic	340	---
	Recreation E		acute	chronic	Arsenic(T)	---	0.02
	Water Supply	D.O. (mg/L)	---	6.0	Cadmium	TVS	TVS
Qualifiers:		D.O. (spawning)	---	7.0	Cadmium(T)	5.0	---
Other:		pH	6.5 - 9.0	---	Chromium III	---	TVS
Temporary Modification(s):		chlorophyll a (mg/m²)	---	---	Chromium III(T)	50	---
Arsenic(chronic) = hybrid		E. coli (per 100 mL)	---	126	Chromium VI	TVS	TVS
Expiration Date of 12/31/2024					Copper	TVS	TVS
*Uranium(acute) = See 38.5(3) for details.		**Inorganic (mg/L)**			Iron	---	WS
*Uranium(chronic) = See 38.5(3) for details.			acute	chronic	Iron(T)	---	1000
		Ammonia	TVS	TVS	Lead	TVS	TVS
		Boron	---	0.75	Lead(T)	50	---
		Chloride	---	250	Manganese	TVS	TVS/WS
		Chlorine	0.019	0.011	Mercury(T)	---	0.01
		Cyanide	0.005	---	Molybdenum(T)	---	150
		Nitrate	10	---	Nickel	TVS	TVS
		Nitrite	---	0.05	Nickel(T)	---	100
		Phosphorus	---	---	Selenium	TVS	TVS
		Sulfate	---	WS	Silver	TVS	TVS(tr)
		Sulfide	---	0.002	Uranium	varies*	varies*
					Zinc	TVS	TVS

7. Mainstem and all tributaries to Bear Creek, including wetlands, within the Mt. Evans Wilderness Area.

COSPBE07	Classifications	Physical and Biological			Metals (ug/L)		
Designation	Agriculture		DM	MWAT		acute	chronic
OW	Aq Life Cold 1	Temperature °C	CS-I	CS-I	Arsenic	340	---
	Recreation E		acute	chronic	Arsenic(T)	---	0.02
	Water Supply	D.O. (mg/L)	---	6.0	Cadmium	TVS	TVS
Qualifiers:		D.O. (spawning)	---	7.0	Cadmium(T)	5.0	---
Other:		pH	6.5 - 9.0	---	Chromium III	---	TVS
		chlorophyll a (mg/m²)	---	150	Chromium III(T)	50	---
*Uranium(acute) = See 38.5(3) for details.		E. coli (per 100 mL)	---	126	Chromium VI	TVS	TVS
*Uranium(chronic) = See 38.5(3) for details.					Copper	TVS	TVS
		Inorganic (mg/L)			Iron	---	WS
			acute	chronic	Iron(T)	---	1000
		Ammonia	TVS	TVS	Lead	TVS	TVS
		Boron	---	0.75	Lead(T)	50	---
		Chloride	---	250	Manganese	TVS	TVS/WS
		Chlorine	0.019	0.011	Mercury(T)	---	0.01
		Cyanide	0.005	---	Molybdenum(T)	---	150
		Nitrate	10	---	Nickel	TVS	TVS
		Nitrite	---	0.05	Nickel(T)	---	100
		Phosphorus	---	0.11	Selenium	TVS	TVS
		Sulfate	---	WS	Silver	TVS	TVS(tr)
		Sulfide	---	0.002	Uranium	varies*	varies*
					Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Bear Creek Basin

8. Lakes and reservoirs in the Bear Creek system from the sources to the boundary of the Mt. Evans Wilderness area.

COSPBE08	Classifications	Physical and Biological			Metals (ug/L)		
Designation	Agriculture		DM	MWAT		acute	chronic
OW	Aq Life Cold 1	Temperature °C	CL	CL	Arsenic	340	---
	Recreation E		acute	chronic	Arsenic(T)	---	0.02
	Water Supply	D.O. (mg/L)	---	6.0	Cadmium	TVS	TVS
Qualifiers:		D.O. (spawning)	---	7.0	Cadmium(T)	5.0	---
Other:		pH	6.5 - 9.0	---	Chromium III	---	TVS
		chlorophyll a (ug/L)	---	8*	Chromium III(T)	50	---
		E. coli (per 100 mL)	---	126	Chromium VI	TVS	TVS
					Copper	TVS	TVS
		Inorganic (mg/L)			Iron	---	WS
			acute	chronic	Iron(T)	---	1000
		Ammonia	TVS	TVS	Lead	TVS	TVS
		Boron	---	0.75	Lead(T)	50	---
		Chloride	---	250	Manganese	TVS	TVS/WS
		Chlorine	0.019	0.011	Mercury(T)	---	0.01
		Cyanide	0.005	---	Molybdenum(T)	---	150
		Nitrate	10	---	Nickel	TVS	TVS
		Nitrite	---	0.05	Nickel(T)	---	100
		Phosphorus	---	0.025*	Selenium	TVS	TVS
		Sulfate	---	WS	Silver	TVS	TVS(tr)
		Sulfide	---	0.002	Uranium	varies*	varies*
					Zinc	TVS	TVS

*chlorophyll a (ug/L)(chronic) = applies only to lakes and reservoirs larger than 25 acres surface area.
*Phosphorus(chronic) = applies only to lakes and reservoirs larger than 25 acres surface area.
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

9. Lakes and reservoirs in the Bear Creek system from the boundary of the Mt. Evans Wilderness area to the inlet of Evergreen Lake; includes Summit Lake.

COSPBE09	Classifications	Physical and Biological			Metals (ug/L)		
Designation	Agriculture		DM	MWAT		acute	chronic
Reviewable	Aq Life Cold 1	Temperature °C	CL	CL	Arsenic	340	---
	Recreation E		acute	chronic	Arsenic(T)	---	0.02
	Water Supply	D.O. (mg/L)	---	6.0	Cadmium	TVS	TVS
Qualifiers:		D.O. (spawning)	---	7.0	Cadmium(T)	5.0	---
Other:		pH	6.5 - 9.0	---	Chromium III	---	TVS
		chlorophyll a (ug/L)	---	8*	Chromium III(T)	50	---
		E. coli (per 100 mL)	---	126	Chromium VI	TVS	TVS
					Copper	TVS	TVS
		Inorganic (mg/L)			Iron	---	WS
			acute	chronic	Iron(T)	---	1000
		Ammonia	TVS	TVS	Lead	TVS	TVS
		Boron	---	0.75	Lead(T)	50	---
		Chloride	---	250	Manganese	TVS	TVS/WS
		Chlorine	0.019	0.011	Mercury(T)	---	0.01
		Cyanide	0.005	---	Molybdenum(T)	---	150
		Nitrate	10	---	Nickel	TVS	TVS
		Nitrite	---	0.05	Nickel(T)	---	100
		Phosphorus	---	0.025*	Selenium	TVS	TVS
		Sulfate	---	WS	Silver	TVS	TVS(tr)
		Sulfide	---	0.002	Uranium	varies*	varies*
					Zinc	TVS	TVS

*chlorophyll a (ug/L)(chronic) = applies only above the facilities listed at 38.5(4), applies only to lakes and reservoirs larger than 25 acres surface area.
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4), applies only to lakes and reservoirs larger than 25 acres surface area.
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Bear Creek Basin

10. Lakes and reservoirs in drainages of Swede Gulch, Sawmill Gulch, Troublesome Gulch, and Cold Springs Gulch from source to confluence with Bear Creek.

COSPBE10	Classifications
Designation	Agriculture
Reviewable	Aq Life Cold 2
	Recreation E
	Water Supply

Qualifiers:

Water + Fish Standards

Other:

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	CL	CL
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (ug/L)	---	---
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	---
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

11. Lakes and reservoirs in the Bear Creek system from the outlet of Evergreen Lake to the confluence with the South Platte River, except for lakes and reservoirs in Segments 1c, 10, and 12; includes Soda Lakes.

COSPBE11	Classifications
Designation	Agriculture
Reviewable	Aq Life Warm 2
	Recreation E
	Water Supply

Qualifiers:

Water + Fish Standards

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	WL	WL
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (ug/L)	---	---
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	---
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Bear Creek Basin

12. Lakes and reservoirs in the Turkey Creek system from the source to the inlet of Bear Creek Reservoir.

COSPBE12	**Classifications**	**Physical and Biological**			**Metals (ug/L)**		
Designation	Agriculture		**DM**	**MWAT**		**acute**	**chronic**
Reviewable	Aq Life Cold 2	Temperature °C	CL	CL	Arsenic	340	---
	Recreation E		**acute**	**chronic**	Arsenic(T)	---	0.02
	Water Supply	D.O. (mg/L)	---	6.0	Cadmium	TVS	TVS
Qualifiers:		D.O. (spawning)	---	7.0	Cadmium(T)	5.0	---
Water + Fish Standards		pH	6.5 - 9.0	---	Chromium III	---	TVS
Other:		chlorophyll a (ug/L)	---	---	Chromium III(T)	50	---
		E. coli (per 100 mL)	---	126	Chromium VI	TVS	TVS
*Uranium(acute) = See 38.5(3) for details.					Copper	TVS	TVS
*Uranium(chronic) = See 38.5(3) for details.		**Inorganic (mg/L)**			Iron	---	WS
			acute	**chronic**	Iron(T)	---	1000
		Ammonia	TVS	TVS	Lead	TVS	TVS
		Boron	---	0.75	Lead(T)	50	---
		Chloride	---	250	Manganese	TVS	TVS/WS
		Chlorine	0.019	0.011	Mercury(T)	---	0.01
		Cyanide	0.005	---	Molybdenum(T)	---	150
		Nitrate	10	---	Nickel	TVS	TVS
		Nitrite	---	0.05	Nickel(T)	---	100
		Phosphorus	---	---	Selenium	TVS	TVS
		Sulfate	---	WS	Silver	TVS	TVS(tr)
		Sulfide	---	0.002	Uranium	varies*	varies*
					Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Clear Creek Basin

1. Mainstem of Clear Creek, including all tributaries and wetlands, from the source to the I-70 bridge above Silver Plume.

COSPCL01	Classifications	Physical and Biological			Metals (ug/L)		
Designation	Agriculture		**DM**	**MWAT**		**acute**	**chronic**
Reviewable*	Aq Life Cold 1	Temperature °C	CS-I	CS-I	Arsenic	340	---
	Recreation E		**acute**	**chronic**	Arsenic(T)	---	0.02
	Water Supply	D.O. (mg/L)	---	6.0	Cadmium	TVS	TVS
Qualifiers:		D.O. (spawning)	---	7.0	Cadmium(T)	5.0	---
Other:		pH	6.5 - 9.0	---	Chromium III	---	TVS
		chlorophyll a (mg/m^2)	---	150*	Chromium III(T)	50	---
		E. coli (per 100 mL)	---	126	Chromium VI	TVS	TVS
					Copper	TVS	TVS
		Inorganic (mg/L)			Iron	---	WS
			acute	**chronic**	Iron(T)	---	1000
		Ammonia	TVS	TVS	Lead	TVS	TVS
		Boron	---	0.75	Lead(T)	50	---
		Chloride	---	250	Manganese	TVS	TVS/WS
		Chlorine	0.019	0.011	Mercury(T)	---	0.01
		Cyanide	0.005	---	Molybdenum(T)	---	150
		Nitrate	10	---	Nickel	TVS	TVS
		Nitrite	---	0.05	Nickel(T)	---	100
		Phosphorus	---	0.11*	Selenium	TVS	TVS
		Sulfate	---	WS	Silver	TVS	TVS(tr)
		Sulfide	---	0.002	Uranium	varies*	varies*
					Zinc	TVS	TVS

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*chlorophyll a (mg/m^2)(chronic) = applies only above the facilities listed at 38.5(4).
*Designation: 9/30/00 Baseline does not apply
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4).
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

2a. Mainstem of Clear Creek, including all tributaries and wetlands, from the I-70 bridge above Silver Plume to a point just above the confluence with West Fork Clear Creek, except for listings in Segments 3a and 3b.

COSPCL02A	Classifications	Physical and Biological			Metals (ug/L)		
Designation	Agriculture		**DM**	**MWAT**		**acute**	**chronic**
Reviewable*	Aq Life Cold 1	Temperature °C	CS-I	CS-I	Arsenic	340	---
	Recreation E		**acute**	**chronic**	Arsenic(T)	---	0.02
	Water Supply	D.O. (mg/L)	---	6.0	Cadmium	TVS	TVS
Qualifiers:		D.O. (spawning)	---	7.0	Cadmium(T)	5.0	---
Other:		pH	6.5 - 9.0	---	Chromium III	---	TVS
		chlorophyll a (mg/m^2)	---	150*	Chromium III(T)	50	---
		E. coli (per 100 mL)	---	126	Chromium VI	TVS	TVS
					Copper	TVS	TVS
		Inorganic (mg/L)			Iron	---	WS
			acute	**chronic**	Iron(T)	---	1000
		Ammonia	TVS	TVS	Lead	TVS	TVS
		Boron	---	0.75	Lead(T)	50	---
		Chloride	---	250	Manganese	TVS	TVS/WS
		Chlorine	0.019	0.011	Mercury(T)	---	0.01
		Cyanide	0.005	---	Molybdenum(T)	---	150
		Nitrate	10	---	Nickel	TVS	TVS
		Nitrite	---	0.05	Nickel(T)	---	100
		Phosphorus	---	0.11*	Selenium	TVS	TVS
		Sulfate	---	WS	Silver	TVS	TVS(tr)
		Sulfide	---	0.002	Uranium	varies*	varies*
					Zinc	---	SSE*
					Zinc	SSE*	---

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*chlorophyll a (mg/m^2)(chronic) = applies only above the facilities listed at 38.5(4).
*Designation: 9/30/00 Baseline does not apply
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4).
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.
*Zinc(acute) = 0.978e^(0.8537[ln(hardness)]+1.9467)
*Zinc(chronic) = 0.986e^(0.8537[ln(hardness)]+1.8032)

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Clear Creek Basin

2b. Mainstem of Clear Creek, including all tributaries and wetlands, from the confluence with West Fork Clear Creek to a point just below the confluence with Mill Creek, except for listings in Segments 4 through 8.

COSPCL02B	Classifications
Designation	Agriculture
Reviewable*	Aq Life Cold 1
	Recreation E
	Water Supply

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*chlorophyll a (mg/m²)(chronic) = applies only above the facilities listed at 38.5(4).
*Designation: 9/30/00 Baseline does not apply
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4).
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	CS-I	CS-I
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	150*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.11*
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

2c. Mainstem of Clear Creek, including all tributaries and wetlands, from a point just below the confluence with Mill Creek to a point just above the Argo Tunnel discharge, except for listings in Segments 9a, 9b, and 10.

COSPCL02C	Classifications
Designation	Agriculture
Reviewable*	Aq Life Cold 1
	Recreation E
	Water Supply

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*chlorophyll a (mg/m²)(chronic) = applies only above the facilities listed at 38.5(4).
*Designation: 9/30/00 Baseline does not apply
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4).
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.
*Zinc(acute) = 0.978e^(0.8537[ln(hardness)]+1.9467)
*Zinc(chronic) = 0.986e^(0.8537[ln(hardness)]+1.8032)

Physical and Biological	DM	MWAT
Temperature °C	CS-I	CS-I
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	150*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.11*
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	---	SSE*
Zinc	SSE*	---

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Clear Creek Basin

3a. Mainstem of South Clear Creek, including all tributaries and wetlands, from the source to the confluence with Clear Creek, except for the listings in Segments 3b and 19.

COSPCL03A	**Classifications**
Designation	Agriculture
Reviewable*	Aq Life Cold 1
	Recreation E
	Water Supply

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*Designation: 9/30/00 Baseline does not apply
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.
*Zinc(acute) = 0.978e^(0.8537[ln(hardness)]+1.9467)
*Zinc(chronic) = 0.986e^(0.8537[ln(hardness)]+1.8032)

Physical and Biological	**DM**	**MWAT**
Temperature °C	CS-I	CS-I
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	150
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	**acute**	**chronic**
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.11
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	**acute**	**chronic**
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	---	SSE*
Zinc	SSE*	---

3b. Mainstem of Leavenworth Creek from source to confluence with South Clear Creek.

COSPCL03B	**Classifications**
Designation	Agriculture
Reviewable*	Aq Life Cold 2
	Recreation E
	Water Supply

Qualifiers:

Water + Fish Standards

Other:

*Designation: 9/30/00 Baseline does not apply
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.
*Zinc(acute) = 0.978e^(0.8537[ln(hardness)]+1.9467)
*Zinc(chronic) = 0.986e^(0.8537[ln(hardness)]+1.8032)

Physical and Biological	**DM**	**MWAT**
Temperature °C	CS-I	CS-I
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	150
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	**acute**	**chronic**
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.11
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	**acute**	**chronic**
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	---	SSE*
Zinc	SSE*	---

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Clear Creek Basin

4. Mainstem of West Fork Clear Creek from the source to the confluence with Woods Creek.

COSPCL04	Classifications
Designation	Agriculture
Reviewable*	Aq Life Cold 1
	Recreation E
	Water Supply
Qualifiers:	
Other:	

*Designation: 9/30/00 Baseline does not apply
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological		
	DM	**MWAT**
Temperature °C	CS-I	CS-I
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	150
E. coli (per 100 mL)	---	126

Inorganic (mg/L)		
	acute	**chronic**
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.11
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)		
	acute	**chronic**
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	210
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

5. Mainstem of West Fork Clear Creek from the confluence with Woods Creek to the confluence with Clear Creek.

COSPCL05	Classifications
Designation	Agriculture
Reviewable	Aq Life Cold 1
	Recreation E
	Water Supply
Qualifiers:	
Other:	

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*chlorophyll a (mg/m²)(chronic) = applies only above the facilities listed at 38.5(4).
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4).
*Manganese(chronic) = 393 ug/L at the mouth of West Fork, and 1480 ug/L below Woods Creek, see section 38.6(4)(j) for manganese assessment locations. Chronic TVS applies throughout segment.
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.
*Zinc(acute) = e^(0.8404[ln(hardness)]+1.8810)
*Zinc(chronic) = e^(08404[ln(hardness)]+1.5127)

Physical and Biological		
	DM	**MWAT**
Temperature °C	CS-I	CS-I
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	150*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)		
	acute	**chronic**
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.11*
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)		
	acute	**chronic**
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	varies*
Mercury(T)	---	0.01
Molybdenum(T)	---	210
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	---	SSE*
Zinc	SSE*	---

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Clear Creek Basin

6. All tributaries to West Fork Clear Creek, including all wetlands, from the source to the confluence with Clear Creek, except for listings in Segments 7a and 8.

COSPCL06	Classifications
Designation	Agriculture
Reviewable*	Aq Life Cold 1
	Recreation E
	Water Supply

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*Designation: 9/30/00 Baseline does not apply
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	CS-I	CS-I
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	150
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.11
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

7a. Mainstem of Woods Creek from the outlet of Upper Urad Reservoir to the confluence with West Fork Clear Creek.

COSPCL07A	Classifications
Designation	Aq Life Cold 2
UP	Recreation N

Qualifiers:

Other:

Temporary Modification(s):
temperature(MWAT) = current condition 10/1 - 11/30
temperature(MWAT) = current condition 4/1 - 5/31
Expiration Date of 6/30/2023

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	CS-I	CS-I
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	---
E. coli (per 100 mL)	---	630

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	---
Chloride	---	---
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	---	---
Nitrite	---	0.05
Phosphorus	---	0.11
Sulfate	---	---
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	150
Cadmium	TVS	TVS
Chromium III	TVS	TVS
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron(T)	---	1000
Lead	TVS	TVS
Manganese	TVS	TVS
Mercury(T)	---	0.01
Molybdenum(T)	---	---
Nickel	TVS	TVS
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Clear Creek Basin

7b. Lower Urad Reservoir

COSPCL07B	Classifications
Designation	Aq Life Cold 2
UP	Recreation N

Qualifiers:

Other:

Temporary Modification(s):
temperature(MWAT) = current condition 10/1 - 11/30
temperature(MWAT) = current condition 4/1 - 5/31
Expiration Date of 6/30/2023

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	CL	CL
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (ug/L)	---	---
E. coli (per 100 mL)	---	630

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	---
Chloride	---	---
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	---	---
Nitrite	---	0.05
Phosphorus	---	---
Sulfate	---	---
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	150
Cadmium	TVS	TVS
Chromium III	TVS	TVS
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron(T)	---	1000
Lead	TVS	TVS
Manganese	TVS	TVS
Mercury(T)	---	0.01
Molybdenum(T)	---	---
Nickel	TVS	TVS
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

8. Mainstem of Lion Creek from the source to the confluence with West Fork Clear Creek.

COSPCL08	Classifications
Designation	Aq Life Cold 2
UP	Recreation E

Qualifiers:

Other:

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	CS-I	CS-I
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	3.0-9.0	---
chlorophyll a (mg/m^2)	---	150
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	---	---
Boron	---	---
Chloride	---	---
Chlorine	---	---
Cyanide	---	---
Nitrate	---	---
Nitrite	---	---
Phosphorus	---	---
Sulfate	---	---
Sulfide	---	---

Metals (ug/L)	acute	chronic
Arsenic	---	---
Cadmium	---	---
Chromium III	---	---
Chromium VI	---	---
Copper	---	---
Iron	---	---
Lead	---	---
Manganese	---	---
Mercury(T)	---	---
Molybdenum(T)	---	---
Nickel	---	---
Selenium	---	---
Silver	---	---
Uranium	varies*	varies*
Zinc	---	---

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Clear Creek Basin

9a. Mainstem of Fall River, including all tributaries and wetlands, from the source to the confluence with Clear Creek.

COSPCL09A	Classifications
Designation	Agriculture
Reviewable*	Aq Life Cold 1
	Recreation E
	Water Supply

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*chlorophyll a (mg/m^2)(chronic) = applies only above the facilities listed at 38.5(4).
*Designation: 9/30/00 Baseline does not apply
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4).
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	CS-I	CS-I
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m^2)	---	150*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.11*
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

9b. Mainstem of Trail Creek, including all tributaries and wetlands from the source to the confluence with Clear Creek.

COSPCL09B	Classifications
Designation	Agriculture
Reviewable*	Aq Life Cold 1
	Recreation E
	Water Supply

Qualifiers:

Other:

*Designation: 9/30/00 Baseline does not apply
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	CS-I	CS-I
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m^2)	---	150
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.11
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	200

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Clear Creek Basin

10. Mainstem of Chicago Creek, including all tributaries and wetlands, from the source to the confluence with Clear Creek, except for listings in Segment 19.

COSPCL10	Classifications
Designation	Agriculture
Reviewable*	Aq Life Cold 1
	Recreation E
	Water Supply

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*chlorophyll a (mg/m²)(chronic) = applies only above the facilities listed at 38.5(4).
*Designation: 9/30/00 Baseline does not apply
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4).
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	CS-I	CS-I
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	150*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.11*
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

11. Mainstem of Clear Creek from a point just above the Argo Tunnel discharge to the Farmers Highline Canal diversion in Golden, Colorado.

COSPCL11	Classifications
Designation	Agriculture
UP	Aq Life Cold 1
	Recreation E
	Water Supply

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.
*Zinc(acute) = 0.978e^(0.8537[ln(hardness)]+1.9467)
*Zinc(chronic) = 0.986e^(0.8537[ln(hardness)]+1.8032)

Physical and Biological	DM	MWAT
Temperature °C	CS-I	CS-I
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	---
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	---
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	---	17
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	---	SSE*
Zinc	SSE*	---

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Clear Creek Basin

12a. All tributaries to Clear Creek, including all wetlands, from the Argo Tunnel discharge to the Farmers Highline Canal diversion in Golden, Colorado, except for listings in Segments 12b, 13a and 13b.

COSPCL12A	Classifications
Designation	Agriculture
Reviewable*	Aq Life Cold 2
	Recreation E
	Water Supply

Qualifiers:

Other:

*chlorophyll a (mg/m^2)(chronic) = applies only above the facilities listed at 38.5(4).
*Designation: 9/30/00 Baseline does not apply
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4).
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological		
	DM	MWAT
Temperature °C	CS-II	CS-II
	acute	chronic
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m^2)	---	150*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.11*
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02-10 [A]
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

12b. Beaver Brook, from the source to the confluence with Soda Creek, and Soda Creek, from the source to the confluence with Clear Creek.

COSPCL12B	Classifications
Designation	Agriculture
Reviewable*	Aq Life Cold 1
	Recreation E
	Water Supply

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*chlorophyll a (mg/m^2)(chronic) = applies only above the facilities listed at 38.5(4).
*Designation: 9/30/00 Baseline does not apply
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4).
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological		
	DM	MWAT
Temperature °C	CS-I	CS-I
	acute	chronic
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m^2)	---	150*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.11*
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Clear Creek Basin

13a. Mainstem of North Clear Creek, including all tributaries and wetlands, from its source to its confluence with Chase Gulch, and Four Mile Gulch, including all tributaries and wetlands, from their sources to their confluence with North Clear Creek and Eureka Gulch, including all tributaries and wetlands, from its source to its confluence with Gregory Gulch.

COSPCL13A	Classifications
Designation	Agriculture
Reviewable*	Aq Life Cold 1
	Recreation E
	Water Supply

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*Designation: 9/30/00 Baseline does not apply
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	CS-I	CS-I
	acute	chronic
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m^2)	---	150
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.11
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

13b. Mainstem of North Clear Creek including all tributaries and wetlands from a point just below the confluence with Chase Gulch to the confluence with Clear Creek, except for the listings in Segment 13a.

COSPCL13B	Classifications
Designation	Agriculture
UP	Aq Life Cold 2
	Water Supply
	Recreation E

Qualifiers:
Water + Fish Standards

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*chlorophyll a (mg/m^2)(chronic) = applies only above the facilities listed at 38.5(4).
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4).
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	CS-I	CS-I
	acute	chronic
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m^2)	---	150*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.11*
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	---	64
Iron	---	WS
Iron(T)	---	5400
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	---	740

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Clear Creek Basin

14a. Mainstem of Clear Creek from the Farmers Highline Canal diversion in Golden, Colorado to the Denver Water conduit #16 crossing.

COSPCL14A	Classifications	Physical and Biological			Metals (ug/L)		
Designation	Agriculture		DM	MWAT		acute	chronic
UP	Aq Life Warm 2	Temperature °C	WS-II	WS-II	Arsenic	340	---
	Recreation N		acute	chronic	Arsenic(T)	---	0.02-10 A
	Water Supply	D.O. (mg/L)	---	5.0	Cadmium	TVS	TVS
Qualifiers:		pH	6.5 - 9.0	---	Cadmium(T)	5.0	---
Other:		chlorophyll a (mg/m²)	---	---	Chromium III	---	TVS
		E. coli (per 100 mL)	---	630	Chromium III(T)	50	---
*Uranium(acute) = See 38.5(3) for details.		Inorganic (mg/L)			Chromium VI	TVS	TVS
*Uranium(chronic) = See 38.5(3) for details.			acute	chronic	Copper	TVS	TVS
		Ammonia	TVS	TVS	Iron	---	WS
		Boron	---	0.75	Iron(T)	---	1000
		Chloride	---	250	Lead	TVS	TVS
		Chlorine	0.019	0.011	Lead(T)	50	---
		Cyanide	0.005	---	Manganese	TVS	244
		Nitrate	10	---	Mercury(T)	---	0.01
		Nitrite	---	0.5	Molybdenum(T)	---	150
		Phosphorus	---	---	Nickel	TVS	TVS
		Sulfate	---	WS	Nickel(T)	---	100
		Sulfide	---	0.002	Selenium	TVS	TVS
					Silver	TVS	TVS
					Uranium	varies*	varies*
					Zinc	TVS	TVS

14b. Mainstem of Clear Creek from the Denver Water conduit #16 crossing to a point just below Youngfield Street in Wheat Ridge, Colorado.

COSPCL14B	Classifications	Physical and Biological			Metals (ug/L)		
Designation	Agriculture		DM	MWAT		acute	chronic
UP	Aq Life Warm 2	Temperature °C	WS-II	WS-II	Arsenic	340	---
	Recreation E		acute	chronic	Arsenic(T)	---	0.02
	Water Supply	D.O. (mg/L)	---	5.0	Cadmium	TVS	TVS
Qualifiers:		pH	6.5 - 9.0	---	Cadmium(T)	5.0	---
Water + Fish Standards		chlorophyll a (mg/m²)	---	---	Chromium III	---	TVS
Other:		E. coli (per 100 mL)	---	126	Chromium III(T)	50	---
Temporary Modification(s):		Inorganic (mg/L)			Chromium VI	TVS	TVS
Arsenic(chronic) = hybrid			acute	chronic	Copper	TVS	TVS
Expiration Date of 12/31/2024		Ammonia	TVS	TVS	Iron	---	WS
*Uranium(acute) = See 38.5(3) for details.		Boron	---	0.75	Iron(T)	---	1000
*Uranium(chronic) = See 38.5(3) for details.		Chloride	---	250	Lead	TVS	TVS
		Chlorine	0.019	0.011	Lead(T)	50	---
		Cyanide	0.005	---	Manganese	TVS	244
		Nitrate	10	---	Mercury(T)	---	0.01
		Nitrite	---	0.5	Molybdenum(T)	---	150
		Phosphorus	---	---	Nickel	TVS	TVS
		Sulfate	---	WS	Nickel(T)	---	100
		Sulfide	---	0.002	Selenium	TVS	TVS
					Silver	TVS	TVS
					Uranium	varies*	varies*
					Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Clear Creek Basin

15. Mainstem of Clear Creek from Youngfield Street in Wheat Ridge, Colorado, to the confluence with the South Platte River.

COSPCL15	Classifications
Designation	Agriculture
UP	Aq Life Warm 1
	Recreation E
	Water Supply

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	WS-II	WS-II
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m^2)	---	---
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	---
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

16a. Mainstem of Lena Gulch including all tributaries and wetlands from its source to the inlet of Maple Grove Reservoir.

COSPCL16A	Classifications
Designation	Agriculture
UP	Aq Life Warm 2
	Recreation E
	Water Supply

Qualifiers:

Other:

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	WS-II	WS-II
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m^2)	---	150
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.17
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02-10 [A]
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Clear Creek Basin

16b. All tributaries to Clear Creek from the Farmers Highline Canal diversion in Golden, Colorado to the confluence with the South Platte River, except for listings in Segments 16a, 17b, 18a and 18b.

COSPCL16B	Classifications
Designation	Agriculture
UP	Aq Life Warm 2
	Recreation E

Qualifiers:

Other:

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	WS-II	WS-II
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	150
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	---
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	100	---
Nitrite	---	0.5
Phosphorus	---	0.17
Sulfate	---	---
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	100
Cadmium	TVS	TVS
Chromium III	TVS	TVS
Chromium III(T)	---	100
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron(T)	---	1000
Lead	TVS	TVS
Manganese	TVS	TVS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

17a. Arvada Reservoir.

COSPCL17A	Classifications
Designation	Agriculture
UP	Aq Life Cold 2
	Recreation E
	Water Supply
	DUWS

Qualifiers:
Water + Fish Standards

Other:

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	CLL	CLL
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (ug/L)	---	8
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.025
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Clear Creek Basin

17b. Mainstem of Ralston Creek, including all tributaries and wetlands, from the source to the inlet of Arvada Reservoir.

COSPCL17B	Classifications	Physical and Biological			Metals (ug/L)		
Designation	Agriculture		**DM**	**MWAT**		**acute**	**chronic**
Reviewable	Aq Life Cold 2	Temperature °C	CS-II	CS-II	Arsenic	340	---
	Recreation E		**acute**	**chronic**	Arsenic(T)	---	0.02
	Water Supply	D.O. (mg/L)	---	6.0	Cadmium	TVS	TVS
Qualifiers:		D.O. (spawning)	---	7.0	Cadmium(T)	5.0	---
Water + Fish Standards		pH	6.5 - 9.0	---	Chromium III	---	TVS
Other:		chlorophyll a (mg/m²)	---	150	Chromium III(T)	50	---
Temporary Modification(s):		E. coli (per 100 mL)	---	126	Chromium VI	TVS	TVS
Arsenic(chronic) = hybrid					Copper	TVS	TVS
Expiration Date of 12/31/2024		**Inorganic (mg/L)**			Iron	---	WS
*Uranium(acute) = See 38.5(3) for details.			**acute**	**chronic**	Iron(T)	---	1000
*Uranium(chronic) = See 38.5(3) for details.		Ammonia	TVS	TVS	Lead	TVS	TVS
		Boron	---	0.75	Lead(T)	50	---
		Chloride	---	250	Manganese	TVS	TVS/WS
		Chlorine	0.019	0.011	Mercury(T)	---	0.01
		Cyanide	0.005	---	Molybdenum(T)	---	150
		Nitrate	10	---	Nickel	TVS	TVS
		Nitrite	---	0.05	Nickel(T)	---	100
		Phosphorus	---	0.11	Selenium	TVS	TVS
		Sulfate	---	WS	Silver	TVS	TVS(tr)
		Sulfide	---	0.002	Uranium	varies*	varies*
					Zinc	TVS	TVS

18a. Mainstem of Ralston Creek, including all tributaries and wetlands, from the outlet of Arvada Reservoir to the confluence with Clear Creek.

COSPCL18A	Classifications	Physical and Biological			Metals (ug/L)		
Designation	Agriculture		**DM**	**MWAT**		**acute**	**chronic**
UP	Aq Life Warm 1	Temperature °C	WS-II	WS-II	Arsenic	340	---
	Recreation E		**acute**	**chronic**	Arsenic(T)	---	0.02
	Water Supply	D.O. (mg/L)	---	5.0	Cadmium	TVS	TVS
Qualifiers:		pH	6.5 - 9.0	---	Cadmium(T)	5.0	---
Other:		chlorophyll a (mg/m²)	---	150	Chromium III	---	TVS
Temporary Modification(s):		E. coli (per 100 mL)	---	126	Chromium III(T)	50	---
Arsenic(chronic) = hybrid		**Inorganic (mg/L)**			Chromium VI	TVS	TVS
Expiration Date of 12/31/2024			**acute**	**chronic**	Copper	TVS	TVS
*Uranium(acute) = See 38.5(3) for details.		Ammonia	TVS	TVS	Iron	---	WS
*Uranium(chronic) = See 38.5(3) for details.		Boron	---	0.75	Iron(T)	---	1000
		Chloride	---	250	Lead	TVS	TVS
		Chlorine	0.019	0.011	Lead(T)	50	---
		Cyanide	0.005	---	Manganese	TVS	TVS/WS
		Nitrate	10	---	Mercury(T)	---	0.01
		Nitrite	---	0.5	Molybdenum(T)	---	150
		Phosphorus	---	0.17	Nickel	TVS	TVS
		Sulfate	---	WS	Nickel(T)	---	100
		Sulfide	---	0.002	Selenium	TVS	TVS
					Silver	TVS	TVS
					Uranium	varies*	varies*
					Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Clear Creek Basin

18b. Mainstem of Leyden Creek and Van Bibber Creek from their source to their confluence with Ralston Creek. Mainstem of Little Dry Creek from its source to its confluence with Clear Creek.

COSPCL18B	Classifications
Designation	Agriculture
UP	Aq Life Warm 2
	Recreation E
	Water Supply

Qualifiers:

Other:

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	WS-II	WS-II
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	150
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	0.17
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02-10 [A]
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

19. All tributaries to Clear Creek, including wetlands, within the Mt. Evans Wilderness Area.

COSPCL19	Classifications
Designation	Agriculture
OW	Aq Life Cold 1
	Recreation E
	Water Supply

Qualifiers:

Other:

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	CS-I	CS-I
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	150
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.11
Sulfate	---	250
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Clear Creek Basin

20. Lakes and reservoirs in the Clear Creek system that are within the boundary of the Mt. Evans Wilderness Area.

COSPCL20	Classifications	Physical and Biological			Metals (ug/L)		
Designation	Agriculture		DM	MWAT		acute	chronic
OW	Aq Life Cold 1	Temperature °C	CL	CL	Arsenic	340	---
	Recreation E		acute	chronic	Arsenic(T)	---	0.02
	Water Supply	D.O. (mg/L)	---	6.0	Cadmium	TVS	TVS
Qualifiers:		D.O. (spawning)	---	7.0	Cadmium(T)	5.0	---
Other:		pH	6.5 - 9.0	---	Chromium III	---	TVS
*chlorophyll a (ug/L)(chronic) = applies only to lakes and reservoirs larger than 25 acres surface area.		chlorophyll a (ug/L)	---	8*	Chromium III(T)	50	---
*Phosphorus(chronic) = applies only to lakes and reservoirs larger than 25 acres surface area.		E. coli (per 100 mL)	---	126	Chromium VI	TVS	TVS
*Uranium(acute) = See 38.5(3) for details.					Copper	TVS	TVS
*Uranium(chronic) = See 38.5(3) for details.		Inorganic (mg/L)			Iron	---	WS
			acute	chronic	Iron(T)	---	1000
		Ammonia	TVS	TVS	Lead	TVS	TVS
		Boron	---	0.75	Lead(T)	50	---
		Chloride	---	250	Manganese	TVS	TVS/WS
		Chlorine	0.019	0.011	Mercury(T)	---	0.01
		Cyanide	0.005	---	Molybdenum(T)	---	150
		Nitrate	10	---	Nickel	TVS	TVS
		Nitrite	---	0.05	Nickel(T)	---	100
		Phosphorus	---	0.025*	Selenium	TVS	TVS
		Sulfate	---	250	Silver	TVS	TVS(tr)
		Sulfide	---	0.002	Uranium	varies*	varies*
					Zinc	TVS	TVS

21. Lakes and reservoirs in the Clear Creek system from sources to the Farmer's Highline Canal diversion in Golden, CO, except for listings in Segments 7b, 20, 22, and 25. Upper Long Lake.

COSPCL21	Classifications	Physical and Biological			Metals (ug/L)		
Designation	Agriculture		DM	MWAT		acute	chronic
Reviewable*	Aq Life Cold 1	Temperature °C	varies*	varies*	Arsenic	340	---
	Recreation E		acute	chronic	Arsenic(T)	---	0.02
	Water Supply	D.O. (mg/L)	---	6.0	Cadmium	TVS	TVS
	DUWS*	D.O. (spawning)	---	7.0	Cadmium(T)	5.0	---
Qualifiers:		pH	6.5 - 9.0	---	Chromium III	---	TVS
Other:		chlorophyll a (ug/L)	---	8*	Chromium III(T)	50	---
Temporary Modification(s):		E. coli (per 100 mL)	---	126	Chromium VI	TVS	TVS
Arsenic(chronic) = hybrid					Copper	TVS	TVS
Expiration Date of 12/31/2024		Inorganic (mg/L)			Iron	---	WS
*chlorophyll a (ug/L)(chronic) = applies only to lakes and reservoirs larger than 25 acres surface area.			acute	chronic	Iron(T)	---	1000
*Classification: DUWS applies to Hole in the Ground Reservoir, Chase Gulch Reservoir, and Beaver Brook Reservoir No 2 only.		Ammonia	TVS	TVS	Lead	TVS	TVS
*Designation: 9/30/00 Baseline does not apply		Boron	---	0.75	Lead(T)	50	---
*Phosphorus(chronic) = applies only to lakes and reservoirs larger than 25 acres surface area.		Chloride	---	250	Manganese	TVS	TVS/WS
*Uranium(acute) = See 38.5(3) for details.		Chlorine	0.019	0.011	Mercury(T)	---	0.01
*Uranium(chronic) = See 38.5(3) for details.		Cyanide	0.005	---	Molybdenum(T)	---	150
*Temperature = DM and MWAT=CL from 1/1-3/31 Chase Gulch Reservoir DM=CL and MWAT=16.6 from 4/1-12/31 All others DM and MWAT=CL from 4/1-12/31		Nitrate	10	---	Nickel	TVS	TVS
		Nitrite	---	0.05	Nickel(T)	---	100
		Phosphorus	---	0.025*	Selenium	TVS	TVS
		Sulfate	---	WS	Silver	TVS	TVS(tr)
		Sulfide	---	0.002	Uranium	varies*	varies*
					Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Clear Creek Basin

22. Lakes and reservoirs in the North Clear Creek drainage from a point just below the confluence with Chase Gulch to the confluence with Clear Creek.

COSPCL22	Classifications
Designation	Agriculture
Reviewable*	Aq Life Cold 1
	Recreation E

Qualifiers:

Other:

*chlorophyll a (ug/L)(chronic) = applies only to lakes and reservoirs larger than 25 acres surface area.
*Designation: 9/30/00 Baseline does not apply
*Phosphorus(chronic) = applies only to lakes and reservoirs larger than 25 acres surface area.
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	CL	CL
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (ug/L)	---	8*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	---
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	100	---
Nitrite	---	0.05
Phosphorus	---	0.025*
Sulfate	---	---
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	7.6
Cadmium	TVS	TVS
Chromium III	TVS	TVS
Chromium III(T)	---	100
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron(T)	---	1000
Lead	TVS	TVS
Manganese	TVS	TVS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

23. Ralston Reservoir

COSPCL23	Classifications
Designation	Agriculture
Reviewable	Aq Life Cold 2
	Recreation U
	Water Supply
	DUWS

Qualifiers:

Water + Fish Standards

Other:

*chlorophyll a (ug/L)(chronic) = applies only to lakes and reservoirs larger than 25 acres surface area.
*Phosphorus(chronic) = applies only to lakes and reservoirs larger than 25 acres surface area.
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	CLL	CLL
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (ug/L)	---	8*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.025*
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Clear Creek Basin

24. Lakes and reservoirs in the Clear Creek system from the Farmers Highline Canal diversion in Golden, Colorado to the confluence with the South Platte River, except for listings in Segments 17a, 21 and 23.

COSPCL24	Classifications
Designation	Agriculture
Reviewable	Aq Life Warm 1
	Recreation E
	Water Supply
	DUWS*

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*chlorophyll a (ug/L)(chronic) = applies only above the facilities listed at 38.5(4), applies only to lakes and reservoirs larger than 25 acres surface area.
*Classification: DUWS applies to Maple Grove Reservoir only.
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4), applies only to lakes and reservoirs larger than 25 acres surface area.
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	WL	WL
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (ug/L)	---	20*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	0.083*
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

25. Guanella Reservoir (near Town of Empire, 39.758,-105.700)

COSPCL25	Classifications
Designation	Agriculture
Reviewable	Aq Life Cold 1
	Recreation E

Qualifiers:

Other:

*chlorophyll a (ug/L)(chronic) = applies only to lakes and reservoirs larger than 25 acres surface area.
*Phosphorus(chronic) = applies only to lakes and reservoirs larger than 25 acres surface area.
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	CL	CL
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (ug/L)	---	8*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	---
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	100	---
Nitrite	---	0.05
Phosphorus	---	0.025*
Sulfate	---	---
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	7.6
Cadmium	TVS	TVS
Chromium III	TVS	TVS
Chromium III(T)	---	100
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron(T)	---	1000
Lead	TVS	TVS
Manganese	TVS	TVS
Mercury(T)	---	0.01
Molybdenum(T)	---	---
Nickel	TVS	TVS
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Big Dry Creek Basin

1. Mainstem of Big Dry Creek, including all tributaries and wetlands, from the outlet of Standley Lake to the confluence with the South Platte River. Walnut Creek, including tributaries and wetlands, from the outlet of Great Western Reservoir to the confluence with Big Dry Creek.

COSPBD01	Classifications
Designation	Agriculture
UP	Aq Life Warm 1
	Water Supply
	Recreation E

Qualifiers:

Fish Ingestion Standards Do Not Apply

Other:

*chlorophyll a (mg/m²)(chronic) = applies only above the facilities listed at 38.5(4).
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4).
*Selenium(acute) = 19.1 ug/L from 11/1 - 3/31 TVS from 4/1 - 10/31.
Refer to Section 38.6(4)(d).
*Selenium(chronic) = 15 ug/L from 11/1 - 3/31 7.4 ug/L from 4/1 - 10/31.
Refer to Section 38.6(4)(d).
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	WS-I	WS-I
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	150*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	4.5
Phosphorus	---	0.17*
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02-10 A
Beryllium(T)	---	100
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	---	varies*
Selenium	varies*	---
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

2. Standley Lake.

COSPBD02	Classifications
Designation	Agriculture
Reviewable	Aq Life Warm 1
	Recreation E
	Water Supply
	DUWS

Qualifiers:

Other:

Temporary Modification(s):

Arsenic(chronic) = hybrid

Expiration Date of 12/31/2024

*chlorophyll a (ug/L)(chronic) = The trophic status of Standley Lake shall be maintained as mesotrophic as measured by a combination of common indicator parameters such as total phosphorus, chlorophyll a, secchi depth, and dissolved oxygen. Refer to Section 38.6(4)(e).
*Uranium(acute) = See 38.5(3) for details.
*Uranium(T)(chronic) = 3(t) Picocuries/Liter. See 38.6(4) for additional standards for segment 2.

Physical and Biological

	DM	MWAT
Temperature °C	WL	WL
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (ug/L)	---	4.0*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	---
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Beryllium(T)	---	4.0
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	---
Uranium(T)	---	3*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Big Dry Creek Basin

3. Great Western Reservoir.

COSPBD03	Classifications	Physical and Biological			Metals (ug/L)		
Designation	Agriculture		DM	MWAT		acute	chronic
UP	Aq Life Warm 2	Temperature °C	WL	WL	Arsenic	340	---
	Recreation N		acute	chronic	Arsenic(T)	---	100
	Water Supply	D.O. (mg/L)	---	5.0	Beryllium(T)	---	100
Qualifiers:		pH	6.5 - 9.0	---	Cadmium	TVS	TVS
Other:		chlorophyll a (ug/L)	---	---	Chromium III	TVS	TVS
		E. coli (per 100 mL)	---	630	Chromium III(T)	---	100
*Uranium(acute) = See 38.5(3) for details.		Inorganic (mg/L)			Chromium VI	TVS	TVS
*Uranium(T)(chronic) = 4(t) Picocuries/Liter. See 38.6(4) for additional standards for segment 3.			acute	chronic	Copper	TVS	TVS
		Ammonia	TVS	TVS	Iron(T)	---	1000
		Boron	---	0.75	Lead	TVS	TVS
		Chloride	---	---	Manganese	TVS	TVS
		Chlorine	0.019	0.011	Mercury(T)	---	0.01
		Cyanide	0.005	---	Molybdenum(T)	---	150
		Nitrate	100	---	Nickel	TVS	TVS
		Nitrite	---	2.7	Selenium	TVS	TVS
		Phosphorus	---	---	Silver	TVS	TVS
		Sulfate	---	---	Uranium	varies*	---
		Sulfide	---	0.002	Uranium(T)	---	4*
					Zinc	TVS	TVS

4a. Mainstem and all tributaries to Woman and Walnut Creeks from sources to Standley Lake and Great Western Reservoir, respectively, except for listings in Segments 4b and 5a.

COSPBD04A	Classifications	Physical and Biological			Metals (ug/L)		
Designation	Agriculture		DM	MWAT		acute	chronic
UP	Aq Life Warm 2	Temperature °C	WS-I	WS-I	Arsenic	340	---
	Recreation E		acute	chronic	Arsenic(T)	---	0.02-10 A
	Water Supply	D.O. (mg/L)	---	5.0	Beryllium(T)	---	4.0
Qualifiers:		pH	6.5 - 9.0	---	Cadmium	TVS	TVS
Other:		chlorophyll a (mg/m^2)	---	150	Cadmium(T)	5.0	---
		E. coli (per 100 mL)	---	126	Chromium III	---	TVS
*Uranium(acute) = See 38.5(3) for details.		Inorganic (mg/L)			Chromium III(T)	50	---
*Uranium(T)(chronic) = See 38.6(4) for additional standards for segment 4a.			acute	chronic	Chromium VI	TVS	TVS
		Ammonia	TVS	TVS	Copper	TVS	TVS
		Boron	---	0.75	Iron(T)	---	1000
		Chloride	---	---	Lead	TVS	TVS
		Chlorine	0.019	0.011	Lead(T)	50	---
		Cyanide	0.005	---	Manganese	TVS	TVS
		Nitrate	10	---	Mercury(T)	---	0.01
		Nitrite	---	0.5	Molybdenum(T)	---	150
		Phosphorus	---	0.17	Nickel	TVS	TVS
		Sulfate	---	---	Nickel(T)	---	100
		Sulfide	---	0.002	Selenium	TVS	TVS
					Silver	TVS	TVS
					Uranium	varies*	---
					Uranium(T)	---	16.8*
					Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Big Dry Creek Basin

4b. North Walnut Creek from its source to the western edge of the Central Operable Unit. North and South Walnut Creek and Walnut Creek, from the eastern edge of the Central Operable Unit on Rocky Flats Property to Indiana Street.

COSPBD04B	Classifications
Designation	Agriculture
UP	Aq Life Warm 2
	Recreation E
	Water Supply

Qualifiers:

Other:

*Uranium(acute) = See 38.5(3) for details.
*Uranium(T)(chronic) = See 38.6(4) for additional standards for segment 4b.

Physical and Biological

	DM	MWAT
Temperature °C	WS-II	WS-II
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	150
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	---
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	0.17
Sulfate	---	---
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02-10 A
Beryllium(T)	---	4.0
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	---
Uranium(T)	---	16.8*
Zinc	TVS	TVS

5a. North Walnut Creek from the western edge of the Central Operable Unit and South Walnut Creek from its source, including all tributaries and wetlands, to the eastern boundary of the Central Operable Unit.

COSPBD05A	Classifications
Designation	Agriculture
UP	Aq Life Warm 2
	Recreation N
	Water Supply

Qualifiers:

Other:

*Uranium(acute) = See 38.5(3) for details.
*Uranium(T)(chronic) = See 38.6(4) for additional standards for segment 5a.

Physical and Biological

	DM	MWAT
Temperature °C	WS-II	WS-II
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	---
E. coli (per 100 mL)	---	630

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	---
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	0.17
Sulfate	---	---
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02-10 A
Beryllium(T)	---	4.0
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	---
Uranium(T)	---	16.8*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Big Dry Creek Basin

5b. All lakes and reservoirs from the western edge of the Central Operable Unit to the eastern boundary of the Central Operable Unit and Pond C-2 on Woman Creek.

COSPBD05B	Classifications
Designation	Agriculture
UP	Aq Life Warm 2
	Recreation N
	Water Supply

Qualifiers:

Other:

*chlorophyll a (ug/L)(chronic) = applies only to lakes and reservoirs larger than 25 acres surface area.
*Phosphorus(chronic) = applies only to lakes and reservoirs larger than 25 acres surface area.
*Uranium(acute) = See 38.5(3) for details.
*Uranium(T)(chronic) = See 38.6(4) for additional standards for segment 5b.

Physical and Biological

	DM	MWAT
Temperature °C	WL	WL
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (ug/L)	---	20*
E. coli (per 100 mL)	---	630

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	---
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	0.083*
Sulfate	---	---
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02-10 A
Beryllium(T)	---	4.0
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	---
Uranium(T)	---	16.8*
Zinc	TVS	TVS

6. Upper Big Dry Creek and South Upper Big Dry Creek, from their source to Standley Lake.

COSPBD06	Classifications
Designation	Agriculture
UP	Aq Life Warm 2
	Recreation E
	Water Supply

Qualifiers:

Other:

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	WS-I	WS-I
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m^2)	---	150
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	0.17
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02-10 A
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Big Dry Creek Basin

7. Lakes and reservoirs in the Big Dry Creek system from the source to the confluence with the South Platte River, except for listings in Segments 2, 3, and 5b.

COSPBD07	Classifications
Designation	Agriculture
Reviewable	Aq Life Warm 2
	Recreation P
	Water Supply
	DUWS*

Qualifiers:

Water + Fish Standards

Other:

*chlorophyll a (ug/L)(chronic) = applies only above the facilities listed at 38.5(4), applies only to lakes and reservoirs larger than 25 acres surface area.
*Classification: DUWS applies to Welton Reservoir only.
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4), applies only to lakes and reservoirs larger than 25 acres surface area.
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	WL	WL
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (ug/L)	---	20*
E. coli (per 100 mL)	---	205

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	0.083*
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Beryllium(T)	---	100
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Boulder Creek Basin

1. All tributaries to Boulder Creek, including all wetlands, within the Indian Peaks and James Peak Wilderness Areas.

COSPBO01 | **Classifications**: Agriculture, Aq Life Cold 1, Recreation E, Water Supply

Designation: OW

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	CS-I	CS-I
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m^2)	---	150
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.11
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

2a. Mainstem of Boulder Creek, including all tributaries and wetlands, from the boundary of the Indian Peaks Wilderness Area to a point immediately below the confluence with North Boulder Creek, except for the specific listings in Segment 3.

COSPBO02A | **Classifications**: Agriculture, Aq Life Cold 1, Recreation E, Water Supply

Designation: Reviewable

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*chlorophyll a (mg/m^2)(chronic) = applies only above the facilities listed at 38.5(4).
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4).
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	CS-I	CS-I
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m^2)	---	150*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.11*
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Boulder Creek Basin

2b. Mainstem of Boulder Creek, including all tributaries and wetlands, from a point immediately below the confluence with North Boulder Creek to a point immediately above the confluence with South Boulder Creek.

COSPBO02B	Classifications	Physical and Biological			Metals (ug/L)		
Designation	Agriculture		DM	MWAT		acute	chronic
Reviewable	Aq Life Cold 1	Temperature °C	CS-II	CS-II	Arsenic	340	---
	Recreation E		acute	chronic	Arsenic(T)	---	0.02
	Water Supply	D.O. (mg/L)	---	6.0	Cadmium	TVS	TVS
Qualifiers:		D.O. (spawning)	---	7.0	Cadmium(T)	5.0	---
Other:		pH	6.5 - 9.0	---	Chromium III	---	TVS
Temporary Modification(s):		chlorophyll a (mg/m^2)	---	150*	Chromium III(T)	50	---
Arsenic(chronic) = hybrid		E. coli (per 100 mL)	---	126	Chromium VI	TVS	TVS
Expiration Date of 12/31/2024					Copper	TVS	TVS
*chlorophyll a (mg/m^2)(chronic) = applies only above the facilities listed at 38.5(4).		**Inorganic (mg/L)**			Iron	---	WS
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4).			acute	chronic	Iron(T)	---	1000
*Uranium(acute) = See 38.5(3) for details.		Ammonia	TVS	TVS	Lead	TVS	TVS
*Uranium(chronic) = See 38.5(3) for details.		Boron	---	0.75	Lead(T)	50	---
		Chloride	---	250	Manganese	TVS	TVS/WS
		Chlorine	0.019	0.011	Mercury(T)	---	0.01
		Cyanide	0.005	---	Molybdenum(T)	---	150
		Nitrate	10	---	Nickel	TVS	TVS
		Nitrite	---	0.05	Nickel(T)	---	100
		Phosphorus	---	0.11*	Selenium	TVS	TVS
		Sulfate	---	WS	Silver	TVS	TVS(tr)
		Sulfide	---	0.002	Uranium	varies*	varies*
					Zinc	TVS	TVS

3. Mainstem of Middle Boulder Creek, including all tributaries and wetlands, from the source to the outlet of Barker Reservoir, except for specific listings in Segment 1.

COSPBO03	Classifications	Physical and Biological			Metals (ug/L)		
Designation	Agriculture		DM	MWAT		acute	chronic
Reviewable	Aq Life Cold 1	Temperature °C	CS-I	CS-I	Arsenic	340	---
	Recreation E		acute	chronic	Arsenic(T)	---	0.02
	Water Supply	D.O. (mg/L)	---	6.0	Cadmium	TVS	TVS
Qualifiers:		D.O. (spawning)	---	7.0	Cadmium(T)	5.0	---
Other:		pH	6.5 - 9.0	---	Chromium III	---	TVS
Temporary Modification(s):		chlorophyll a (mg/m^2)	---	150*	Chromium III(T)	50	---
Arsenic(chronic) = hybrid		E. coli (per 100 mL)	---	126	Chromium VI	TVS	TVS
Expiration Date of 12/31/2024					Copper	TVS	TVS
*chlorophyll a (mg/m^2)(chronic) = applies only above the facilities listed at 38.5(4).		**Inorganic (mg/L)**			Iron	---	WS
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4).			acute	chronic	Iron(T)	---	1000
*Uranium(acute) = See 38.5(3) for details.		Ammonia	TVS	TVS	Lead	TVS	TVS
*Uranium(chronic) = See 38.5(3) for details.		Boron	---	0.75	Lead(T)	50	---
		Chloride	---	250	Manganese	TVS	TVS/WS
		Chlorine	0.019	0.011	Mercury(T)	---	0.01
		Cyanide	0.005	---	Molybdenum(T)	---	150
		Nitrate	10	---	Nickel	TVS	TVS
		Nitrite	---	0.05	Nickel(T)	---	100
		Phosphorus	---	0.11*	Selenium	TVS	TVS
		Sulfate	---	WS	Silver	TVS	TVS(tr)
		Sulfide	---	0.002	Uranium	varies*	varies*
					Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Boulder Creek Basin

4a. Mainstem of South Boulder Creek, including all tributaries and wetlands, from the source to the outlet of Gross Reservoir except for specific listings in Segment 1.

COSPBO04A	Classifications	Physical and Biological			Metals (ug/L)		
Designation	Agriculture		DM	MWAT		acute	chronic
Reviewable	Aq Life Cold 1	Temperature °C	CS-I	CS-I	Arsenic	340	---
	Recreation E		acute	chronic	Arsenic(T)	---	0.02
	Water Supply	D.O. (mg/L)	---	6.0	Cadmium	TVS	TVS
Qualifiers:		D.O. (spawning)	---	7.0	Cadmium(T)	5.0	---
Other:		pH	6.5 - 9.0	---	Chromium III	---	TVS
Temporary Modification(s):		chlorophyll a (mg/m^2)	---	150	Chromium III(T)	50	---
Arsenic(chronic) = hybrid		E. coli (per 100 mL)	---	126	Chromium VI	TVS	TVS
Expiration Date of 12/31/2024					Copper	TVS	TVS
*Uranium(acute) = See 38.5(3) for details.		**Inorganic (mg/L)**			Iron	---	WS
*Uranium(chronic) = See 38.5(3) for details.			acute	chronic	Iron(T)	---	1000
		Ammonia	TVS	TVS	Lead	TVS	TVS
		Boron	---	0.75	Lead(T)	50	---
		Chloride	---	250	Manganese	TVS	TVS/WS
		Chlorine	0.019	0.011	Mercury(T)	---	0.01
		Cyanide	0.005	---	Molybdenum(T)	---	150
		Nitrate	10	---	Nickel	TVS	TVS
		Nitrite	---	0.05	Nickel(T)	---	100
		Phosphorus	---	0.11	Selenium	TVS	TVS
		Sulfate	---	WS	Silver	TVS	TVS(tr)
		Sulfide	---	0.002	Uranium	varies*	varies*
					Zinc	TVS	TVS

4b. Mainstem of South Boulder Creek, including all tributaries and wetlands, from the outlet of Gross Reservoir to South Boulder Road, except for specific listings in Segments 4c and 4d.

COSPBO04B	Classifications	Physical and Biological			Metals (ug/L)		
Designation	Agriculture		DM	MWAT		acute	chronic
Reviewable	Aq Life Cold 1	Temperature °C	CS-II	CS-II	Arsenic	340	---
	Recreation E		acute	chronic	Arsenic(T)	---	0.02
	Water Supply	D.O. (mg/L)	---	6.0	Cadmium	TVS	TVS
Qualifiers:		D.O. (spawning)	---	7.0	Cadmium(T)	5.0	---
Other:		pH	6.5 - 9.0	---	Chromium III	---	TVS
Temporary Modification(s):		chlorophyll a (mg/m^2)	---	150*	Chromium III(T)	50	---
Arsenic(chronic) = hybrid		E. coli (per 100 mL)	---	126	Chromium VI	TVS	TVS
Expiration Date of 12/31/2024					Copper	TVS	TVS
*chlorophyll a (mg/m^2)(chronic) = applies only above the facilities listed at 38.5(4).		**Inorganic (mg/L)**			Iron	---	WS
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4).			acute	chronic	Iron(T)	---	1000
*Uranium(acute) = See 38.5(3) for details.		Ammonia	TVS	TVS	Lead	TVS	TVS
*Uranium(chronic) = See 38.5(3) for details.		Boron	---	0.75	Lead(T)	50	---
		Chloride	---	250	Manganese	TVS	TVS/WS
		Chlorine	0.019	0.011	Mercury(T)	---	0.01
		Cyanide	0.005	---	Molybdenum(T)	---	150
		Nitrate	10	---	Nickel	TVS	TVS
		Nitrite	---	0.05	Nickel(T)	---	100
		Phosphorus	---	0.11*	Selenium	TVS	TVS
		Sulfate	---	WS	Silver	TVS	TVS(tr)
		Sulfide	---	0.002	Uranium	varies*	varies*
					Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Boulder Creek Basin

4c. Mainstem of Cowdrey Drainage from the source below Cowdrey Reservoir #2 to the Davidson Ditch.

COSPBO04C	Classifications
Designation	Agriculture
UP	Aq Life Warm 2
	Recreation E
	Water Supply

Qualifiers:

Other:

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological		
	DM	**MWAT**
Temperature °C	WS-II	WS-II
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m^2)	---	150
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	0.17
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02-10 A
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

4d. Mainstem of Cowdrey Drainage from immediately downstream of the Davidson Ditch to the confluence with South Boulder Creek.

COSPBO04D	Classifications
Designation	Agriculture
UP	Aq Life Warm 2
	Recreation E
	Water Supply

Qualifiers:

Other:

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological		
	DM	**MWAT**
Temperature °C	WS-II	WS-II
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m^2)	---	150
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	0.17
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02-10 A
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Boulder Creek Basin

5. Mainstem of South Boulder Creek from South Boulder Road to the confluence with Boulder Creek.

COSPBO05	Classifications
Designation	Agriculture
Reviewable	Aq Life Warm 1
	Recreation E
	Water Supply

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	WS-II	WS-II
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m^2)	---	---
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	---
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

6. Mainstem of Coal Creek, including all tributaries and wetlands, from the source to Highway 93.

COSPBO06	Classifications
Designation	Agriculture
Reviewable	Aq Life Cold 2
	Recreation E
	Water Supply

Qualifiers:

Other:

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	CS-II	CS-II
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m^2)	---	150
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.11
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02-10 [A]
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Boulder Creek Basin

7a. Mainstem of Coal Creek from Highway 93 to Highway 36 (Boulder Turnpike).

COSPBO07A	Classifications
Designation	Agriculture
Reviewable	Aq Life Warm 1
	Recreation E
	Water Supply

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	WS-II	WS-II
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m^2)	---	150
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	0.17
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

7b. Mainstem of Coal Creek from Highway 36 to the confluence with Boulder Creek.

COSPBO07B	Classifications
Designation	Agriculture
Reviewable	Aq Life Warm 1
	Recreation E
	Water Supply

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	WS-I	WS-I
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m^2)	---	---
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	---
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Boulder Creek Basin

8. All tributaries to South Boulder Creek, including all wetlands from South Boulder Road to the confluence with Boulder Creek and all tributaries to Coal Creek, including all wetlands from Highway 93 to the confluence with Boulder Creek.

COSPBO08 | **Classifications**

Designation: UP

Classifications: Agriculture; Aq Life Warm 1; Water Supply; Recreation E

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*chlorophyll a (mg/m²)(chronic) = applies only above the facilities listed at 38.5(4).
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4).
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	WS-II	WS-II
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	150*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	0.17*
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

9. Mainstem of Boulder Creek from a point immediately above the confluence with South Boulder Creek to the confluence with Coal Creek.

COSPBO09 | **Classifications**

Designation: Reviewable

Classifications: Agriculture; Aq Life Warm 1; Recreation E; Water Supply

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	WS-II	WS-II
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	---
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	---
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Boulder Creek Basin

10. Mainstem of Boulder Creek from the confluence with Coal Creek to the confluence with St. Vrain Creek.

COSPBO10	Classifications	Physical and Biological			Metals (ug/L)		
Designation	Agriculture		**DM**	**MWAT**		**acute**	**chronic**
Reviewable	Aq Life Warm 1	Temperature °C	WS-II	WS-II	Arsenic	340	---
	Recreation E		**acute**	**chronic**	Arsenic(T)	---	0.02
	Water Supply	D.O. (mg/L)	---	5.0	Cadmium	TVS	TVS
Qualifiers:		pH	6.5 - 9.0	---	Cadmium(T)	5.0	---
Other:		chlorophyll a (mg/m^2)	---	---	Chromium III	---	TVS
Temporary Modification(s):		E. coli (per 100 mL)	---	126	Chromium III(T)	50	---
Arsenic(chronic) = hybrid		**Inorganic (mg/L)**			Chromium VI	TVS	TVS
Expiration Date of 12/31/2024			**acute**	**chronic**	Copper	TVS	TVS
*Uranium(acute) = See 38.5(3) for details.		Ammonia	TVS	TVS	Iron	---	WS
*Uranium(chronic) = See 38.5(3) for details.		Boron	---	0.75	Iron(T)	---	1000
		Chloride	---	250	Lead	TVS	TVS
		Chlorine	0.019	0.011	Lead(T)	50	---
		Cyanide	0.005	---	Manganese	TVS	TVS/WS
		Nitrate	10	---	Mercury(T)	---	0.01
		Nitrite	---	0.5	Molybdenum(T)	---	150
		Phosphorus	---	---	Nickel	TVS	TVS
		Sulfate	---	WS	Nickel(T)	---	100
		Sulfide	---	0.002	Selenium	TVS	TVS
					Silver	TVS	TVS
					Uranium	varies*	varies*
					Zinc	TVS	TVS

11. All tributaries to Boulder Creek, including all wetlands from a point immediately above the confluence with South Boulder Creek to the confluence with St. Vrain Creek, except for specific listings in Segments 5, 7a and 7b.

COSPBO11	Classifications	Physical and Biological			Metals (ug/L)		
Designation	Agriculture		**DM**	**MWAT**		**acute**	**chronic**
Reviewable	Aq Life Warm 1	Temperature °C	WS-II	WS-II	Arsenic	340	---
	Recreation E		**acute**	**chronic**	Arsenic(T)	---	0.02
	Water Supply	D.O. (mg/L)	---	5.0	Cadmium	TVS	TVS
Qualifiers:		pH	6.5 - 9.0	---	Cadmium(T)	5.0	---
Other:		chlorophyll a (mg/m^2)	---	---	Chromium III	---	TVS
Temporary Modification(s):		E. coli (per 100 mL)	---	126	Chromium III(T)	50	---
Arsenic(chronic) = hybrid		**Inorganic (mg/L)**			Chromium VI	TVS	TVS
Expiration Date of 12/31/2024			**acute**	**chronic**	Copper	TVS	TVS
*Uranium(acute) = See 38.5(3) for details.		Ammonia	TVS	TVS	Iron	---	WS
*Uranium(chronic) = See 38.5(3) for details.		Boron	---	0.75	Iron(T)	---	1000
		Chloride	---	250	Lead	TVS	TVS
		Chlorine	0.019	0.011	Lead(T)	50	---
		Cyanide	0.005	---	Manganese	TVS	TVS/WS
		Nitrate	10	---	Mercury(T)	---	0.01
		Nitrite	---	0.5	Molybdenum(T)	---	150
		Phosphorus	---	---	Nickel	TVS	TVS
		Sulfate	---	WS	Nickel(T)	---	100
		Sulfide	---	0.002	Selenium	TVS	TVS
					Silver	TVS	TVS
					Uranium	varies*	varies*
					Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Boulder Creek Basin

12. Deleted.

COSPBO12	Classifications	Physical and Biological			Metals (ug/L)		
Designation			**DM**	**MWAT**		**acute**	**chronic**
Qualifiers:			**acute**	**chronic**			
Other:		**Inorganic (mg/L)**					
			acute	**chronic**			

13. All lakes and reservoirs tributary to Boulder Creek that are within the boundary of the Indian Peaks and James Peak Wilderness Areas.

COSPBO13	Classifications	Physical and Biological			Metals (ug/L)		
Designation	Agriculture		**DM**	**MWAT**		**acute**	**chronic**
OW	Aq Life Cold 1	Temperature °C	CL	CL	Arsenic	340	---
	Recreation E		**acute**	**chronic**	Arsenic(T)	---	0.02
	Water Supply	D.O. (mg/L)	---	6.0	Cadmium	TVS	TVS
Qualifiers:		D.O. (spawning)	---	7.0	Cadmium(T)	5.0	---
Other:		pH	6.5 - 9.0	---	Chromium III	---	TVS
		chlorophyll a (ug/L)	---	8*	Chromium III(T)	50	---
		E. coli (per 100 mL)	---	126	Chromium VI	TVS	TVS
					Copper	TVS	TVS
		Inorganic (mg/L)			Iron	---	WS
			acute	**chronic**	Iron(T)	---	1000
		Ammonia	TVS	TVS	Lead	TVS	TVS
		Boron	---	0.75	Lead(T)	50	---
		Chloride	---	250	Manganese	TVS	TVS/WS
		Chlorine	0.019	0.011	Mercury(T)	---	0.01
		Cyanide	0.005	---	Molybdenum(T)	---	150
		Nitrate	10	---	Nickel	TVS	TVS
		Nitrite	---	0.05	Nickel(T)	---	100
		Phosphorus	---	0.025*	Selenium	TVS	TVS
		Sulfate	---	WS	Silver	TVS	TVS(tr)
		Sulfide	---	0.002	Uranium	varies*	varies*
					Zinc	TVS	TVS

Other (COSPBO13):

*chlorophyll a (ug/L)(chronic) = applies only to lakes and reservoirs larger than 25 acres surface area.
*Phosphorus(chronic) = applies only to lakes and reservoirs larger than 25 acres surface area.
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Boulder Creek Basin

14. All lakes and reservoirs tributary to Boulder Creek from the source to a point immediately above the South Boulder Creek confluence, except as specified in Segment 13. This segment includes Barker and Lakewood Reservoir.

COSPBO14	Classifications
Designation	Agriculture
Reviewable	Aq Life Cold 1
	Recreation E
	Water Supply
	DUWS*

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*chlorophyll a (ug/L)(chronic) = applies only above the facilities listed at 38.5(4), applies only to lakes and reservoirs larger than 25 acres surface area.
*Classification: DUWS applies to Lakewood Reservoir only.
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4), applies only to lakes and reservoirs larger than 25 acres surface area.
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.
*Temperature =
DM and MWAT=CL,CLL from 1/1-3/31
Barker Reservoir
DM=CL and MWAT=16.6 from 4/1-12/31
All others
DM and MWAT=CL,CLL from 4/1-12/31

Physical and Biological		
	DM	MWAT
Temperature °C	varies*	varies*
	acute	chronic
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (ug/L)	---	8*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.025*
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

15. All lakes and reservoirs tributary to South Boulder Creek from the source to Highway 93. All lakes and reservoirs tributary to Coal Creek from the source to Highway 93 except for specific listings in segments 13 and 18.

COSPBO15	Classifications
Designation	Agriculture
Reviewable	Aq Life Cold 2
	Recreation E
	Water Supply
	DUWS*

Qualifiers:

Other:

*chlorophyll a (ug/L)(chronic) = applies only above the facilities listed at 38.5(4), applies only to lakes and reservoirs larger than 25 acres surface area.
*Classification: DUWS applies to Kossler Lake only.
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4), applies only to lakes and reservoirs larger than 25 acres surface area.
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological		
	DM	MWAT
Temperature °C	CL	CL
	acute	chronic
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (ug/L)	---	8*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.025*
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02-10 [A]
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Boulder Creek Basin

16. All lakes and reservoirs tributary to South Boulder Creek system from Highway 93 to the confluence with Boulder Creek. All lakes and reservoirs tributary to Coal Creek system from Highway 93 to the confluence with Boulder Creek.

COSPBO16	Classifications
Designation	Agriculture
Reviewable	Aq Life Warm 2
	Recreation E
	Water Supply

Qualifiers:

Other:

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	WL	WL
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (ug/L)	---	---
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	---
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02-10 A
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

17. All lakes and reservoirs tributary to Boulder Creek from a point immediately below the confluence with South Boulder Creek to the confluence with St. Vrain Creek, except as specified in Segments 15 and 16.

COSPBO17	Classifications
Designation	Agriculture
Reviewable	Aq Life Warm 2
	Recreation E
	Water Supply
	DUWS*

Qualifiers:

Water + Fish Standards

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*Classification: DUWS applies to Goosehaven Reservoir, Erie Lake, Twomile Canyon Reservoir, Baseline Reservoir, Marshall Reservoir, Thomas Reservoir and Waneka Reservoir only.
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	WL	WL
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (ug/L)	---	---
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	---
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Boulder Creek Basin

18. Gross Reservior.

COSPBO18	Classifications
Designation	Agriculture
Reviewable	Aq Life Cold 1
	Recreation E
	Water Supply

Qualifiers:

Other:

*chlorophyll a (ug/L)(chronic) = applies only above the facilities listed at 38.5(4), applies only to lakes and reservoirs larger than 25 acres surface area.
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4), applies only to lakes and reservoirs larger than 25 acres surface area.
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.
*Temperature =
DM and MWAT=CLL from 1/1-3/31
DM=22.4 and MWAT=19.4 from 4/1-12/31

Physical and Biological

	DM	MWAT
Temperature °C	varies*	varies*
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (ug/L)	---	8*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.025*
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
St. Vrain Creek Basin

1. All tributaries to St. Vrain Creek, including all wetlands, which are within the Indian Peaks Wilderness Area and Rocky Mountain National Park.

COSPSV01	Classifications
Designation	Agriculture
OW	Aq Life Cold 1
	Recreation E
	Water Supply

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	CS-I	CS-I
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m^2)	---	150
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.11
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

2a. Mainstem of St. Vrain Creek, including all tributaries and wetlands, from the boundary of the Indian Peaks Wilderness Area and Rocky Mountain National Park to the eastern boundary of Roosevelt National Forest.

COSPSV02A	Classifications
Designation	Agriculture
Reviewable	Aq Life Cold 1
	Recreation E
	Water Supply

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*chlorophyll a (mg/m^2)(chronic) = applies only above the facilities listed at 38.5(4).
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4).
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	CS-I	CS-I
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m^2)	---	150*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.11*
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
St. Vrain Creek Basin

2b. Mainstem of St. Vrain Creek, including all tributaries and wetlands, from the eastern boundary of Roosevelt National Forest to Hygiene Road.

COSPSV02B	Classifications
Designation	Agriculture
Reviewable	Aq Life Cold 1
	Recreation E
	Water Supply

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*chlorophyll a (mg/m^2)(chronic) = applies only above the facilities listed at 38.5(4).
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4).
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	CS-II	CS-II
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m^2)	---	150*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.11*
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

3. Mainstem of St. Vrain Creek from Hygiene Road to the confluence with the South Platte River.

COSPSV03	Classifications
Designation	Agriculture
Reviewable	Aq Life Warm 1
	Water Supply
	Recreation E

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	WS-I	WS-I
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m^2)	---	---
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	---
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
St. Vrain Creek Basin

4a. Mainstem of Left Hand Creek, including all tributaries and wetlands, from the source to a point immediately below the confluence with James Creek, except for specific listings in Segment 4b.

COSPSV04A	Classifications
Designation	Agriculture
UP	Aq Life Cold 1
	Recreation E
	Water Supply

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	CS-I	CS-I
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m^2)	---	150
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.11
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

4b. Mainstem of James Creek, including all tributaries and wetlands, from the source to the confluence with Left Hand Creek.

COSPSV04B	Classifications
Designation	Agriculture
Reviewable	Aq Life Cold 1
	Recreation E
	Water Supply

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	CS-I	CS-I
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m^2)	---	150
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.11
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
St. Vrain Creek Basin

4c. Mainstem of Left Hand Creek, including all tributaries and wetlands, from a point immediately below the confluence with James Creek to Highway 36.

COSPSV04C	Classifications	Physical and Biological			Metals (ug/L)		
Designation	Agriculture		DM	MWAT		acute	chronic
Reviewable	Aq Life Cold 1	Temperature °C	CS-II	CS-II	Arsenic	340	---
	Recreation E		acute	chronic	Arsenic(T)	---	0.02
	Water Supply	D.O. (mg/L)	---	6.0	Cadmium	TVS	TVS
Qualifiers:		D.O. (spawning)	---	7.0	Cadmium(T)	5.0	---
Other:		pH	6.5 - 9.0	---	Chromium III	---	TVS
Temporary Modification(s):		chlorophyll a (mg/m^2)	---	150	Chromium III(T)	50	---
Arsenic(chronic) = hybrid		E. coli (per 100 mL)	---	126	Chromium VI	TVS	TVS
Expiration Date of 12/31/2024					Copper	TVS	TVS
*Uranium(acute) = See 38.5(3) for details.		**Inorganic (mg/L)**			Iron	---	WS
*Uranium(chronic) = See 38.5(3) for details.			acute	chronic	Iron(T)	---	1000
		Ammonia	TVS	TVS	Lead	TVS	TVS
		Boron	---	0.75	Lead(T)	50	---
		Chloride	---	250	Manganese	TVS	TVS/WS
		Chlorine	0.019	0.011	Mercury(T)	---	0.01
		Cyanide	0.005	---	Molybdenum(T)	---	150
		Nitrate	10	---	Nickel	TVS	TVS
		Nitrite	---	0.05	Nickel(T)	---	100
		Phosphorus	---	0.11	Selenium	TVS	TVS
		Sulfate	---	WS	Silver	TVS	TVS(tr)
		Sulfide	---	0.002	Uranium	varies*	varies*
					Zinc	TVS	TVS

5. Mainstem of Left Hand Creek, including all tributaries and wetlands from Highway 36 to the confluence with St. Vrain Creek.

COSPSV05	Classifications	Physical and Biological			Metals (ug/L)		
Designation	Agriculture		DM	MWAT		acute	chronic
Reviewable	Aq Life Cold 1	Temperature °C	CS-II	CS-II	Arsenic	340	---
	Recreation E		acute	chronic	Arsenic(T)	---	0.02
	Water Supply	D.O. (mg/L)	---	6.0	Cadmium	TVS	TVS
Qualifiers:		D.O. (spawning)	---	7.0	Cadmium(T)	5.0	---
Other:		pH	6.5 - 9.0	---	Chromium III	---	TVS
Temporary Modification(s):		chlorophyll a (mg/m^2)	---	150	Chromium III(T)	50	---
Arsenic(chronic) = hybrid		E. coli (per 100 mL)	---	126	Chromium VI	TVS	TVS
Expiration Date of 12/31/2024					Copper	TVS	TVS
*Uranium(acute) = See 38.5(3) for details.		**Inorganic (mg/L)**			Iron	---	WS
*Uranium(chronic) = See 38.5(3) for details.			acute	chronic	Iron(T)	---	1000
		Ammonia	TVS	TVS	Lead	TVS	TVS
		Boron	---	0.75	Lead(T)	50	---
		Chloride	---	250	Manganese	TVS	TVS/WS
		Chlorine	0.019	0.011	Mercury(T)	---	0.01
		Cyanide	0.005	---	Molybdenum(T)	---	150
		Nitrate	10	---	Nickel	TVS	TVS
		Nitrite	---	0.5	Nickel(T)	---	100
		Phosphorus	---	0.11	Selenium	TVS	TVS
		Sulfate	---	WS	Silver	TVS	TVS(tr)
		Sulfide	---	0.002	Uranium	varies*	varies*
					Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
St. Vrain Creek Basin

6a. All tributaries to Dry Creek, including wetlands, from the source to the inlet of Boulder Reservoir.

COSPSV06A	Classifications	Physical and Biological			Metals (ug/L)		
Designation	Agriculture		DM	MWAT		acute	chronic
UP	Aq Life Warm 2	Temperature °C	WS-II	WS-II	Arsenic	340	---
	Recreation E		acute	chronic	Arsenic(T)	---	100
Qualifiers:		D.O. (mg/L)	---	5.0	Cadmium	TVS	TVS
Other:		pH	6.5 - 9.0	---	Chromium III	TVS	TVS
Temporary Modification(s):		chlorophyll a (mg/m^2)	---	---	Chromium III(T)	---	100
Iron(chronic) = current condition*		E. coli (per 100 mL)	---	126	Chromium VI	TVS	TVS
Expiration Date of 6/30/2023		Inorganic (mg/L)			Copper	TVS	TVS
			acute	chronic	Iron(T)	---	1000
*Uranium(acute) = See 38.5(3) for details.		Ammonia	TVS	TVS	Lead	TVS	TVS
*Uranium(chronic) = See 38.5(3) for details.		Boron	---	0.75	Manganese	TVS	TVS
*TempMod: Iron = Adopted 12/12/2016		Chloride	---	---	Mercury(T)	---	0.01
		Chlorine	0.019	0.011	Molybdenum(T)	---	150
		Cyanide	0.005	---	Nickel	TVS	TVS
		Nitrate	100	---	Selenium	TVS	TVS
		Nitrite	---	0.5	Silver	TVS	TVS
		Phosphorus	---	---	Uranium	varies*	varies*
		Sulfate	---	---	Zinc	TVS	TVS
		Sulfide	---	0.002			

6b. All tributaries to St. Vrain Creek, including wetlands from Hygiene Road to the confluence with the South Platte River, except for specific listings in the Boulder Creek subbasin and in Segments 4a, 4b, 4c and 5 and 6a.

COSPSV06B	Classifications	Physical and Biological			Metals (ug/L)		
Designation	Agriculture		DM	MWAT		acute	chronic
UP	Aq Life Warm 2	Temperature °C	WS-II	WS-II	Arsenic	340	---
	Water Supply		acute	chronic	Arsenic(T)	---	0.02-10 A
	Recreation E	D.O. (mg/L)	---	5.0	Cadmium	TVS	TVS
Qualifiers:		pH	6.5 - 9.0	---	Cadmium(T)	5.0	---
Other:		chlorophyll a (mg/m^2)	---	---	Chromium III	---	TVS
Temporary Modification(s):		E. coli (per 100 mL)	---	126	Chromium III(T)	50	---
Arsenic(chronic) = hybrid		Inorganic (mg/L)			Chromium VI	TVS	TVS
Expiration Date of 12/31/2024			acute	chronic	Copper	TVS	TVS
*Uranium(acute) = See 38.5(3) for details.		Ammonia	TVS	TVS	Iron	---	WS
*Uranium(chronic) = See 38.5(3) for details.		Boron	---	0.75	Iron(T)	---	1000
		Chloride	---	250	Lead	TVS	TVS
		Chlorine	0.019	0.011	Lead(T)	50	---
		Cyanide	0.005	---	Manganese	TVS	TVS/WS
		Nitrate	10	---	Mercury(T)	---	0.01
		Nitrite	---	0.5	Molybdenum(T)	---	150
		Phosphorus	---	---	Nickel	TVS	TVS
		Sulfate	---	WS	Nickel(T)	---	100
		Sulfide	---	0.002	Selenium	TVS	TVS
					Silver	TVS	TVS
					Uranium	varies*	varies*
					Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
St. Vrain Creek Basin

7. Boulder Reservoir, Coot Lake, Left Hand Valley Reservoir and Spurgeon Reservoir.

COSPSV07	Classifications
Designation	Agriculture
Reviewable	Aq Life Warm 1
	Recreation E
	Water Supply
	DUWS*

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*Classification: DUWS applies to Boulder, Spurgeon and Left Hand Valley Reservoirs only.
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	WL	WL
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (ug/L)	---	---
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	---
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

8. All lakes and reservoirs tributary to St. Vrain Creek that are within the boundary of the Indian Peaks Wilderness Area and Rocky Mountain National Park.

COSPSV08	Classifications
Designation	Agriculture
OW	Aq Life Cold 1
	Recreation E
	Water Supply

Qualifiers:

Other:

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	CL	CL
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (ug/L)	---	---
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	---
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
St. Vrain Creek Basin

9. All lakes and reservoirs tributary to St. Vrain Creek from sources to Hygiene Road, including Button Rock Reservoir, except as specified in Segment 8.

COSPSV09	Classifications
Designation	Agriculture
Reviewable	Aq Life Cold 1
	Recreation E
	Water Supply

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	CL,CLL	CL,CLL
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (ug/L)	---	---
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	---
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

10. All lakes and reservoirs tributary to Left Hand Creek from sources to Highway 36.

COSPSV10	Classifications
Designation	Agriculture
Reviewable	Aq Life Cold 1
	Recreation E
	Water Supply
	DUWS*

Qualifiers:

Other:

*chlorophyll a (ug/L)(chronic) = applies only above the facilities listed at 38.5(4), applies only to lakes and reservoirs larger than 25 acres surface area.
*Classification: DUWS applies to Joder Reservoir only.
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4), applies only to lakes and reservoirs larger than 25 acres surface area.
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	CL	CL
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (ug/L)	---	8*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.025*
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
St. Vrain Creek Basin

11. Barbour Ponds.

COSPSV11	Classifications
Designation	Agriculture
Reviewable	Aq Life Warm 1
	Recreation E
	Water Supply

Qualifiers:

Other:

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	WL	WL
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (ug/L)	---	---
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	---
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

12. All lakes and reservoirs tributary to Left Hand Creek from Highway 36 to the confluence with St. Vrain Creek, except as specified in Segment 7.

COSPSV12	Classifications
Designation	Agriculture
Reviewable	Aq Life Warm 2
	Recreation E
	Water Supply

Qualifiers:
Water + Fish Standards

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	WL	WL
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (ug/L)	---	---
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	---
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
St. Vrain Creek Basin

13. All lakes and reservoirs tributary to St. Vrain Creek from Hygiene Road to the confluence with the South Platte River, except as specified in Segments 7, 10, 11 and 12.

COSPSV13	Classifications
Designation	Agriculture
Reviewable	Aq Life Warm 2
	Recreation E
	Water Supply
	DUWS*

Qualifiers:

Other:

*Classification: DUWS applies to Burch lake only.
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	WL	WL
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (ug/L)	---	---
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	---
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02-10 A
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Middle South Platte River Basin

1a. Mainstem of the South Platte River from a point immediately below the confluence with Big Dry Creek to the confluence with St. Vrain Creek.

COSPMS01A	Classifications	Physical and Biological			Metals (ug/L)		
Designation	Agriculture		**DM**	**MWAT**		**acute**	**chronic**
UP	Aq Life Warm 1	Temperature °C	WS-I	WS-I	Arsenic	340	---
	Recreation E		**acute**	**chronic**	Arsenic(T)	---	0.02
	Water Supply	D.O. (mg/L)	varies*	varies*	Cadmium	TVS	TVS
Qualifiers:		pH	6.5 - 9.0	---	Cadmium(T)	5.0	---
Other:		chlorophyll a (mg/m^2)	---	---	Chromium III	---	TVS
		E. coli (per 100 mL)	---	126	Chromium III(T)	50	---
		Inorganic (mg/L)			Chromium VI	TVS	TVS
			acute	**chronic**	Copper	---	18.0*
		Ammonia	TVS*	TVS*	Copper	26.4*	---
		Boron	---	0.75	Iron	---	WS
		Chloride	---	250	Iron(T)	---	1000
		Chlorine	0.019	0.011	Lead	TVS	TVS
		Cyanide	0.005	---	Lead(T)	50	---
		Nitrate	10	---	Manganese	TVS	TVS/WS
		Nitrite	---	0.5	Mercury(T)	---	0.01
		Phosphorus	---	---	Molybdenum(T)	---	150
		Sulfate	---	WS	Nickel	TVS	TVS
		Sulfide	---	0.002	Nickel(T)	---	100
					Selenium	TVS	TVS
					Silver	TVS	TVS
					Uranium	varies*	varies*
					Zinc	TVS	TVS

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*Ammonia(acute) = See section 38.6(4) for site-specific standards.
*Ammonia(chronic) = See section 38.6(4) for site-specific standards.
*Copper(acute) = Copper BLM-based FMB
Cu FMB(ac)=26.4 ug/l
*Copper(chronic) = Copper BLM-based FMB
Cu FMB(ch)=18.0 ug/l
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.
*D.O. (mg/L)(acute) = See section 38.6(4) for site-specific standards.
*D.O. (mg/L)(chronic) = See section 38.6(4) for site-specific standards.

1b. Mainstem of the South Platte River from a point immediately below the confluence with St. Vrain Creek to the Weld/Morgan County Line.

COSPMS01B	Classifications	Physical and Biological			Metals (ug/L)		
Designation	Agriculture		**DM**	**MWAT**		**acute**	**chronic**
Reviewable	Aq Life Warm 1	Temperature °C	WS-I	WS-I	Arsenic	340	---
	Recreation E		**acute**	**chronic**	Arsenic(T)	---	0.02
	Water Supply	D.O. (mg/L)	---	5.0	Cadmium	TVS	TVS
Qualifiers:		pH	6.5 - 9.0	---	Cadmium(T)	5.0	---
Other:		chlorophyll a (mg/m^2)	---	---	Chromium III	---	TVS
		E. coli (per 100 mL)	---	126	Chromium III(T)	50	---
		Inorganic (mg/L)			Chromium VI	TVS	TVS
			acute	**chronic**	Copper	TVS	TVS
		Ammonia	TVS	TVS	Iron	---	WS
		Boron	---	0.75	Iron(T)	---	1000
		Chloride	---	250	Lead	TVS	TVS
		Chlorine	0.019	0.011	Lead(T)	50	---
		Cyanide	0.005	---	Manganese	TVS	TVS/WS
		Nitrate	10	---	Mercury(T)	---	0.01
		Nitrite	---	0.5	Molybdenum(T)	---	150
		Phosphorus	---	---	Nickel	TVS	TVS
		Sulfate	---	WS	Nickel(T)	---	100
		Sulfide	---	0.002	Selenium	TVS	TVS
					Silver	TVS	TVS
					Uranium	varies*	varies*
					Zinc	TVS	TVS

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Middle South Platte River Basin

2. Deleted.

COSPMS02	Classifications	Physical and Biological			Metals (ug/L)		
Designation			**DM**	**MWAT**		**acute**	**chronic**
Qualifiers:			**acute**	**chronic**			
Other:		**Inorganic (mg/L)**					
			acute	**chronic**			

3a. All tributaries to the South Platte River, including all wetlands, from a point immediately below the confluence with Big Dry Creek to the Weld/Morgan County line, except for listings in the subbasins of the South Platte River, and in Segments 3b, 5a, 5b, 5c, and 6.

COSPMS03A	Classifications	Physical and Biological			Metals (ug/L)		
Designation	Agriculture		**DM**	**MWAT**		**acute**	**chronic**
UP	Aq Life Warm 2	Temperature °C	WS-I	WS-I	Arsenic	340	---
	Recreation E		**acute**	**chronic**	Arsenic(T)	---	0.02
	Water Supply	D.O. (mg/L)	---	5.0	Cadmium	TVS	TVS
Qualifiers:		pH	6.5 - 9.0	---	Cadmium(T)	5.0	---
Water + Fish Standards		chlorophyll a (mg/m^2)	---	150*	Chromium III	---	TVS
Other:		E. coli (per 100 mL)	---	126	Chromium III(T)	50	---
Temporary Modification(s):		**Inorganic (mg/L)**			Chromium VI	TVS	TVS
Arsenic(chronic) = hybrid			**acute**	**chronic**	Copper	TVS	TVS
Expiration Date of 12/31/2024		Ammonia	TVS	TVS	Iron	---	WS
*chlorophyll a (mg/m^2)(chronic) = applies only above the facilities listed at 38.5(4).		Boron	---	0.75	Iron(T)	---	1000
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4).		Chloride	---	250	Lead	TVS	TVS
		Chlorine	0.019	0.011	Lead(T)	50	---
*Uranium(acute) = See 38.5(3) for details.		Cyanide	0.005	---	Manganese	TVS	TVS/WS
*Uranium(chronic) = See 38.5(3) for details.		Nitrate	10	---	Mercury(T)	---	0.01
		Nitrite	---	0.5	Molybdenum(T)	---	150
		Phosphorus	---	0.17*	Nickel	TVS	TVS
		Sulfate	---	WS	Nickel(T)	---	100
		Sulfide	---	0.002	Selenium	TVS	TVS
					Silver	TVS	TVS
					Uranium	varies*	varies*
					Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Middle South Platte River Basin

3b. Hayesmount Tributaries including the Upper Hayesmount Tributary from the source to the confluence with Box Elder Creek and the Lower Hayesmount Tributaries from the source to the Denver Hudson Canal.

COSPMS03B | **Classifications**

Designation	
UP	Agriculture
	Aq Life Warm 2
	Recreation E

Qualifiers:

Other:

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.
*D.O. (mg/L)(chronic) = When water is present, D.O. concentrations shall be maintained at levels that protect classified uses.

Physical and Biological

	DM	MWAT
Temperature °C	WS-III	WS-III
	acute	**chronic**
D.O. (mg/L)	---	narrative*
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	150
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	---
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	100	---
Nitrite	---	0.5
Phosphorus	---	0.17
Sulfate	---	---
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	100
Cadmium	TVS	TVS
Chromium III	TVS	TVS
Chromium III(T)	---	100
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron(T)	---	1000
Lead	TVS	TVS
Manganese	TVS	TVS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

4. Barr Lake and Milton Reservoir.

COSPMS04 | **Classifications**

Designation	
UP	Agriculture
	Aq Life Warm 2
	Recreation E
	Water Supply

Qualifiers:

Water + Fish Standards

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	WL	WL
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	---
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	---
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Middle South Platte River Basin

5a. Mainstem of Lone Tree Creek from the source to the confluence with the South Platte River.

COSPMS05A	Classifications
Designation	Agriculture
Reviewable	Aq Life Warm 2
	Recreation N
	Water Supply

Qualifiers:

Other:

*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4).
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	WS-I	WS-I
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	---
E. coli (per 100 mL)	---	630

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	0.17*
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02-10 A
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

5b. Mainstem of Box Elder Creek from the confluence with Coyote Run to the Denver Hudson Canal.

COSPMS05B	Classifications
Designation	Agriculture
UP	Aq Life Warm 2
	Recreation N

Qualifiers:

Other:

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.
*D.O. (mg/L)(chronic) = 15th percentile of D.O. measurements collected between 6:30 a.m. and 6:30 p.m.

Physical and Biological	DM	MWAT
Temperature °C	WS-III	WS-III
	acute	**chronic**
D.O. (mg/L)	---	4.7*
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	---
E. coli (per 100 mL)	---	630

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	---
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	100	---
Nitrite	10	---
Phosphorus	---	---
Sulfate	---	---
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	100
Cadmium	TVS	TVS
Chromium III	TVS	TVS
Chromium III(T)	---	100
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron(T)	---	1000
Lead	TVS	TVS
Manganese	TVS	TVS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Middle South Platte River Basin

5c. Mainstems of Crow Creek and Box Elder Creek from their sources to their confluences with the South Platte River, except for listings in Segment 5b.

COSPMS05C	Classifications
Designation	Agriculture
Reviewable	Aq Life Warm 1
	Water Supply
	Recreation N

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4).
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	WS-II	WS-II
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	---
E. coli (per 100 mL)	---	630

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	0.17*
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Middle South Platte River Basin

6. Lost Creek from the source to Interstate 76, including all its tributaries, stock ponds and wetlands.

COSPMS06	Classifications
Designation	Agriculture
UP	Aq Life Warm 2
	Recreation N
Qualifiers:	
Other:	

*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4).
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	WS-III	WS-III
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	---
E. coli (per 100 mL)	---	630

Inorganic (mg/L)

	acute	chronic
Ammonia	---	---
Boron	---	0.75
Chloride	---	---
Chlorine	---	---
Cyanide	0.2	---
Nitrate	100	---
Nitrite	10	---
Phosphorus	---	0.17*
Sulfate	---	---
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	100
Beryllium(T)	---	100
Cadmium	---	---
Cadmium(T)	---	10
Chromium III	---	---
Chromium III(T)	---	100
Chromium VI	---	---
Chromium VI(T)	---	100
Copper	---	---
Copper(T)	---	200
Iron	---	---
Lead	---	---
Lead(T)	---	100
Manganese	---	---
Manganese(T)	---	200
Mercury(T)	---	---
Molybdenum(T)	---	150
Nickel	---	---
Nickel(T)	---	200
Selenium	---	---
Selenium(T)	---	20
Silver	---	---
Uranium	varies*	varies*
Zinc	---	---
Zinc(T)	---	2000

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Middle South Platte River Basin

7. All lakes and reservoirs tributary to the South Platte River from a point immediately below the confluence with Big Dry Creek to the Weld/Morgan County line, except for listings in the subbasins of the South Platte River, and in segments 4 and 8.

COSPMS07	Classifications	Physical and Biological			Metals (ug/L)		
Designation	Agriculture		**DM**	**MWAT**		**acute**	**chronic**
Reviewable	Aq Life Warm 2	Temperature °C	WL	WL	Arsenic	340	---
	Recreation E		**acute**	**chronic**	Arsenic(T)	---	0.02
	Water Supply	D.O. (mg/L)	---	5.0	Cadmium	TVS	TVS
Qualifiers:		pH	6.5 - 9.0	---	Cadmium(T)	5.0	---
Water + Fish Standards		chlorophyll a (mg/m^2)	---	---	Chromium III	---	TVS
Other:		E. coli (per 100 mL)	---	126	Chromium III(T)	50	---
Temporary Modification(s):		**Inorganic (mg/L)**			Chromium VI	TVS	TVS
Arsenic(chronic) = hybrid			**acute**	**chronic**	Copper	TVS	TVS
Expiration Date of 12/31/2024		Ammonia	TVS	TVS	Iron	---	WS
*Uranium(acute) = See 38.5(3) for details.		Boron	---	0.75	Iron(T)	---	1000
*Uranium(chronic) = See 38.5(3) for details.		Chloride	---	250	Lead	TVS	TVS
		Chlorine	0.019	0.011	Lead(T)	50	---
		Cyanide	0.005	---	Manganese	TVS	TVS/WS
		Nitrate	10	---	Mercury(T)	---	0.01
		Nitrite	---	0.5	Molybdenum(T)	---	150
		Phosphorus	---	---	Nickel	TVS	TVS
		Sulfate	---	WS	Nickel(T)	---	100
		Sulfide	---	0.002	Selenium	TVS	TVS
					Silver	TVS	TVS
					Uranium	varies*	varies*
					Zinc	TVS	TVS

8. Riverside Reservoir.

COSPMS08	Classifications	Physical and Biological			Metals (ug/L)		
Designation	Agriculture		**DM**	**MWAT**		**acute**	**chronic**
UP	Aq Life Warm 1	Temperature °C	WL	WL	Arsenic	340	---
	Recreation E		**acute**	**chronic**	Arsenic(T)	---	0.02
	Water Supply	D.O. (mg/L)	---	5.0	Cadmium	TVS	TVS
Qualifiers:		pH	6.5 - 9.0	---	Cadmium(T)	5.0	---
Other:		chlorophyll a (mg/m^2)	---	20*	Chromium III	---	TVS
		E. coli (per 100 mL)	---	126	Chromium III(T)	50	---
*chlorophyll a (mg/m^2)(chronic) = applies only above the facilities listed at 38.5(4), applies only to lakes and reservoirs larger than 25 acres surface area.		**Inorganic (mg/L)**			Chromium VI	TVS	TVS
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4), applies only to lakes and reservoirs larger than 25 acres surface area.			**acute**	**chronic**	Copper	TVS	TVS
*Uranium(acute) = See 38.5(3) for details.		Ammonia	TVS	TVS	Iron	---	WS
*Uranium(chronic) = See 38.5(3) for details.		Boron	---	0.75	Iron(T)	---	1000
		Chloride	---	250	Lead	TVS	TVS
		Chlorine	0.019	0.011	Lead(T)	50	---
		Cyanide	0.005	---	Manganese	TVS	TVS/WS
		Nitrate	10	---	Mercury(T)	---	0.01
		Nitrite	---	0.5	Molybdenum(T)	---	150
		Phosphorus	---	0.083*	Nickel	TVS	TVS
		Sulfate	---	WS	Nickel(T)	---	100
		Sulfide	---	0.002	Selenium	TVS	TVS
					Silver	TVS	TVS
					Uranium	varies*	varies*
					Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Big Thompson River Basin

1. Mainstem of the Big Thompson River, including all tributaries and wetlands, within Rocky Mountain National Park.

COSPBT01	Classifications
Designation	Agriculture
OW	Aq Life Cold 1
	Recreation E
	Water Supply

Qualifiers:

Other:

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	CS-I	CS-I
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m^2)	---	150
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.11
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

2. Mainstem of the Big Thompson River from the boundary of Rocky Mountain National Park to the Greeley-Loveland Canal Diversion (40.397884, -105.106482). All tributaries to the Big Thompson River, including all wetlands, from the boundary of Rocky Mountain National Park to the Home Supply Canal diversion (40.424430, -105.210449).

COSPBT02	Classifications
Designation	Agriculture
Reviewable	Aq Life Cold 1
	Recreation E
	Water Supply

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*chlorophyll a (mg/m^2)(chronic) = applies only above the facilities listed at 38.5(4).
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4).
*Copper(acute) = 11 ug/L from immediately above the Upper Thompson Sanitation District's wastewater treatment plant outfall to the Home Supply Canal Diversion.
*Copper(chronic) = 7.5 ug/L from immediately above the Upper Thompson Sanitation District's wastewater treatment plant outfall to the Home Supply Canal Diversion.
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	CS-II	CS-II
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m^2)	---	150*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.11*
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	---	7.5*
Copper	11*	TVS
Copper	TVS	---
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Big Thompson River Basin

3. Mainstem of the Big Thompson River from the Greeley-Loveland Canal diversion (40.397884, -105.106482) to County Road 11H.

COSPBT03	Classifications
Designation: Reviewable	Agriculture
	Aq Life Warm 1
	Recreation E
	Water Supply

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	WS-I	WS-I
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	---
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	---
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

4. Mainstem of the Big Thompson River from County Road 11H to I-25.

COSPBT04	Classifications
Designation: Reviewable	Agriculture
	Aq Life Warm 2
	Recreation E

Qualifiers:

Fish Ingestion Standards

Other:

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	WS-I	WS-I
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	---
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	---
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	100	---
Nitrite	---	0.5
Phosphorus	---	---
Sulfate	---	---
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	7.6
Cadmium	TVS	TVS
Chromium III	TVS	TVS
Chromium III(T)	---	100
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron(T)	---	1000
Lead	TVS	TVS
Manganese	TVS	TVS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Big Thompson River Basin

5. Mainstem of The Big Thompson River from I-25 to the confluence with the South Platte River.

COSPBT05	Classifications	Physical and Biological			Metals (ug/L)		
Designation	Agriculture		DM	MWAT		acute	chronic
Reviewable	Aq Life Warm 1	Temperature °C	WS-I	WS-I	Arsenic	340	---
	Water Supply		acute	chronic	Arsenic(T)	---	0.02
	Recreation E	D.O. (mg/L)	---	5.0	Cadmium	TVS	TVS
Qualifiers:		pH	6.5 - 9.0	---	Cadmium(T)	5.0	---
Other:		chlorophyll a (mg/m²)	---	---	Chromium III	---	TVS
Temporary Modification(s):		E. coli (per 100 mL)	---	126	Chromium III(T)	50	---
Arsenic(chronic) = hybrid		**Inorganic (mg/L)**			Chromium VI	TVS	TVS
Expiration Date of 12/31/2024			acute	chronic	Copper	TVS	TVS
*Uranium(acute) = See 38.5(3) for details.		Ammonia	TVS	TVS	Iron	---	WS
*Uranium(chronic) = See 38.5(3) for details.		Boron	---	0.75	Iron(T)	---	1000
		Chloride	---	250	Lead	TVS	TVS
		Chlorine	0.019	0.011	Lead(T)	50	---
		Cyanide	0.005	---	Manganese	TVS	TVS/WS
		Nitrate	10	---	Mercury(T)	---	0.01
		Nitrite	---	0.5	Molybdenum(T)	---	150
		Phosphorus	---	---	Nickel	TVS	TVS
		Sulfate	---	WS	Nickel(T)	---	100
		Sulfide	---	0.002	Selenium	TVS	TVS
					Silver	TVS	TVS
					Uranium	varies*	varies*
					Zinc	TVS	TVS

6. All tributaries to the Big Thompson River, including all wetlands, from the Home Supply Canal diversion (40.424430, -105.210449) to the confluence with the South Platte River, except for listings in segments 7, 8, 9, and 10.

COSPBT06	Classifications	Physical and Biological			Metals (ug/L)		
Designation	Agriculture		DM	MWAT		acute	chronic
UP	Aq Life Warm 2	Temperature °C	WS-I	WS-I	Arsenic	340	---
	Water Supply		acute	chronic	Arsenic(T)	---	0.02
	Recreation E	D.O. (mg/L)	---	5.0	Cadmium	TVS	TVS
Qualifiers:		pH	6.5 - 9.0	---	Cadmium(T)	5.0	---
Water + Fish Standards		chlorophyll a (mg/m²)	---	150	Chromium III	---	TVS
Other:		E. coli (per 100 mL)	---	126	Chromium III(T)	50	---
Temporary Modification(s):		**Inorganic (mg/L)**			Chromium VI	TVS	TVS
Arsenic(chronic) = hybrid			acute	chronic	Copper	TVS	TVS
Expiration Date of 12/31/2024		Ammonia	TVS	TVS	Iron	---	WS
*Uranium(acute) = See 38.5(3) for details.		Boron	---	0.75	Iron(T)	---	1000
*Uranium(chronic) = See 38.5(3) for details.		Chloride	---	250	Lead	TVS	TVS
		Chlorine	0.019	0.011	Lead(T)	50	---
		Cyanide	0.005	---	Manganese	TVS	TVS/WS
		Nitrate	10	---	Mercury(T)	---	0.01
		Nitrite	---	0.5	Molybdenum(T)	---	150
		Phosphorus	---	0.17	Nickel	TVS	TVS
		Sulfate	---	WS	Nickel(T)	---	100
		Sulfide	---	0.002	Selenium	TVS	TVS
					Silver	TVS	TVS
					Uranium	varies*	varies*
					Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Big Thompson River Basin

7. Buckhorn Creek from the source to the confluence with the Big Thompson River.

COSPBT07	Classifications
Designation	Agriculture
Reviewable	Aq Life Cold 1
	Recreation E
	Water Supply

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*chlorophyll a (mg/m²)(chronic) = applies only above the facilities listed at 38.5(4).
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4).
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	CS-II	CS-II
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	150*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.11*
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

8. Mainstem of the Little Thompson River, including all tributaries and wetlands, from the source to the Culver Ditch diversion (40.259242, -105.200029).

COSPBT08	Classifications
Designation	Agriculture
Reviewable	Aq Life Cold 1
	Recreation E
	Water Supply

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	CS-II	CS-II
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	150
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.11
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Big Thompson River Basin

9. Mainstem of the Little Thompson River from the Culver Ditch diversion (40.259242, -105.200029) to the confluence with the Big Thompson River.

COSPBT09	Classifications
Designation	Agriculture
Reviewable	Aq Life Warm 1
	Recreation E
	Water Supply

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*chlorophyll a (mg/m^2)(chronic) = applies only above the facilities listed at 38.5(4).
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4).
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	WS-II	WS-II
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m^2)	---	150*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	0.17*
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

10. All tributaries to the Little Thompson River, including all wetlands, from the Culver Ditch diversion (40.259242, -105.200029) to the confluence with the Big Thompson River.

COSPBT10	Classifications
Designation	Agriculture
UP	Aq Life Warm 2
	Recreation E

Qualifiers:

Other:

*chlorophyll a (mg/m^2)(chronic) = applies only above the facilities listed at 38.5(4).
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4).
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	WS-II	WS-II
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m^2)	---	150*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	---
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	100	---
Nitrite	---	0.5
Phosphorus	---	0.17*
Sulfate	---	---
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	100
Cadmium	TVS	TVS
Chromium III	TVS	TVS
Chromium III(T)	---	100
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron(T)	---	1000
Lead	TVS	TVS
Manganese	TVS	TVS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Big Thompson River Basin

11. Carter Lake.

COSPBT11	Classifications	Physical and Biological			Metals (ug/L)		
Designation	Agriculture		**DM**	**MWAT**		**acute**	**chronic**
Reviewable	Aq Life Cold 1	Temperature °C	varies*	varies*	Arsenic	340	---
	Recreation E		**acute**	**chronic**	Arsenic(T)	---	0.02
	Water Supply	D.O. (mg/L)	---	6.0	Cadmium	TVS	TVS
	DUWS	D.O. (spawning)	---	7.0	Cadmium(T)	5.0	---
Qualifiers:		pH	6.5 - 9.0	---	Chromium III	---	TVS
Other:		chlorophyll a (ug/L)	---	---	Chromium III(T)	50	---
		E. coli (per 100 mL)	---	126	Chromium VI	TVS	TVS
*Uranium(acute) = See 38.5(3) for details.					Copper	TVS	TVS
*Uranium(chronic) = See 38.5(3) for details.		**Inorganic (mg/L)**			Iron	---	WS
*Temperature = DM and MWAT=CLL from 1/1-3/31 DM=22.4 and MWAT=22.7 from 4/1-12/31			**acute**	**chronic**	Iron(T)	---	1000
		Ammonia	TVS	TVS	Lead	TVS	TVS
		Boron	---	0.75	Lead(T)	50	---
		Chloride	---	250	Manganese	TVS	TVS/WS
		Chlorine	0.019	0.011	Mercury(T)	---	0.01
		Cyanide	0.005	---	Molybdenum(T)	---	150
		Nitrate	10	---	Nickel	TVS	TVS
		Nitrite	---	0.05	Nickel(T)	---	100
		Phosphorus	---	---	Selenium	TVS	TVS
		Sulfate	---	WS	Silver	TVS	TVS(tr)
		Sulfide	---	0.002	Uranium	varies*	varies*
					Zinc	TVS	TVS

12. Lake Loveland, Horseshoe Lake, Boyd Lake.

COSPBT12	Classifications	Physical and Biological			Metals (ug/L)		
Designation	Agriculture		**DM**	**MWAT**		**acute**	**chronic**
Reviewable	Aq Life Warm 1	Temperature °C	WL	WL	Arsenic	340	---
	Recreation E		**acute**	**chronic**	Arsenic(T)	---	0.02
	Water Supply	D.O. (mg/L)	---	5.0	Cadmium	TVS	TVS
	DUWS*	pH	6.5 - 9.0	---	Cadmium(T)	5.0	---
Qualifiers:		chlorophyll a (ug/L)	---	---	Chromium III	---	TVS
Other:		E. coli (per 100 mL)	---	126	Chromium III(T)	50	---
Temporary Modification(s):		**Inorganic (mg/L)**			Chromium VI	TVS	TVS
Arsenic(chronic) = hybrid			**acute**	**chronic**	Copper	TVS	TVS
Expiration Date of 12/31/2024		Ammonia	TVS	TVS	Iron	---	WS
*Classification: DUWS Applies to Boyd and Loveland Lakes only.		Boron	---	0.75	Iron(T)	---	1000
*Uranium(acute) = See 38.5(3) for details.		Chloride	---	250	Lead	TVS	TVS
*Uranium(chronic) = See 38.5(3) for details.		Chlorine	0.019	0.011	Lead(T)	50	---
		Cyanide	0.005	---	Manganese	TVS	TVS/WS
		Nitrate	10	---	Mercury(T)	---	0.01
		Nitrite	---	0.5	Molybdenum(T)	---	150
		Phosphorus	---	---	Nickel	TVS	TVS
		Sulfate	---	WS	Nickel(T)	---	100
		Sulfide	---	0.002	Selenium	TVS	TVS
					Silver	TVS	TVS
					Uranium	varies*	varies*
					Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Big Thompson River Basin

13. Berthoud Reservoir, Johnstown Reservoir.

COSPBT13	Classifications
Designation	Agriculture
UP	Aq Life Warm 2
	Recreation E
	Water Supply
	DUWS

Qualifiers:

Water + Fish Standards

Other:

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	WL	WL
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (ug/L)	---	---
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	---
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

14. Welch Reservoir, Lonetree Reservoir, Boedecker Lake, Lon Hagler Reservoir.

COSPBT14	Classifications
Designation	Agriculture
Reviewable	Aq Life Warm 1
	Recreation E
	Water Supply
	DUWS*

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*Classification: DUWS applies to Lonetree Reservoir only.
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	WL	WL
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (ug/L)	---	---
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	---
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Big Thompson River Basin

15. All lakes and reservoirs tributary to the Big Thompson River within Rocky Mountain National Park.

COSPBT15	Classifications
Designation	Agriculture
OW	Aq Life Cold 1
	Recreation E
	Water Supply

Qualifiers:

Other:

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	CL	CL
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (ug/L)	---	---
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	---
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

16. All lakes and reservoirs tributary to the Big Thompson River from the boundary of Rocky Mountain National Park to the Home Supply Canal diversion (40.424430, -105.210449). This segment includes Lake Estes and St Mary's Lake.

COSPBT16	Classifications
Designation	Agriculture
Reviewable	Aq Life Cold 1
	Recreation E
	Water Supply
	DUWS*

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*Classification: DUWS applies to St.Mary's Lake and Mirror Lake only.
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	CL,CLL	CL,CLL
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (ug/L)	---	---
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	---
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Big Thompson River Basin

17. All lakes and reservoirs tributary to the Big Thompson River from the Home Supply Canal diversion (40.424430, -105.210449) to the confluence with the South Platte River, except for listings in segments 12, 14, 18, and 19.

COSPBT17	Classifications
Designation	Agriculture
Reviewable	Aq Life Warm 2
	Recreation E
	Water Supply
	DUWS*

Qualifiers:

Water + Fish Standards

Other:

Temporary Modification(s):

Arsenic(chronic) = hybrid

Expiration Date of 12/31/2024

*Classification: DUWS applies to Pinewood Lake only.

*Uranium(acute) = See 38.5(3) for details.

*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	WL	WL
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (ug/L)	---	---
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	---
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

18. All lakes and reservoirs tributary to the Little Thompson River from the source to the Culver Ditch diversion (40.259242, -105.200029).

COSPBT18	Classifications
Designation	Agriculture
Reviewable	Aq Life Cold 1
	Recreation E
	Water Supply

Qualifiers:

Other:

*Uranium(acute) = See 38.5(3) for details.

*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	CL	CL
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (ug/L)	---	---
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	---
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Big Thompson River Basin

19. All lakes and reservoirs tributary to the Little Thompson River from the Culver Ditch diversion (40.259242, -105.200029) to the confluence with the Big Thompson River, except for listings in segments 11 and 13.

COSPBT19	Classifications
Designation	Agriculture
Reviewable	Aq Life Warm 1
	Recreation E
	Water Supply
Qualifiers:	
Other:	
*Uranium(acute) = See 38.5(3) for details.	
*Uranium(chronic) = See 38.5(3) for details.	

Physical and Biological	DM	MWAT
Temperature °C	WL	WL
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (ug/L)	---	---
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	---
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Cache La Poudre River Basin

1. Mainstem of the Cache La Poudre River, including all tributaries and wetlands, within Rocky Mountain National Park and the Rawah, Neota, Comanche Peak, and Cache La Poudre Wilderness Areas.

COSPCP01	Classifications
Designation	Agriculture
OW	Aq Life Cold 1
	Recreation E
	Water Supply

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	CS-I	CS-I
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m^2)	---	150
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.11
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

2a. Mainstem of the Cache La Poudre River, including all tributaries and wetlands, from the boundaries of Rocky Mountain National Park and the Rawah, Neota, Comanche Peak, and Cache La Poudre Wilderness Areas to a point immediately below the confluence with the South Fork Cache La Poudre River.

COSPCP02A	Classifications
Designation	Agriculture
Reviewable	Aq Life Cold 1
	Recreation E
	Water Supply

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*chlorophyll a (mg/m^2)(chronic) = applies only above the facilities listed at 38.5(4).
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4).
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	CS-I	CS-I
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m^2)	---	150*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.11*
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Cache La Poudre River Basin

2b. Mainstem of the Cache La Poudre River, including all tributaries and wetlands, from a point immediately below the confluence with the South Fork Cache La Poudre River to the Munroe Gravity Canal Headgate (also known as the North Poudre Supply Canal diversion; 40.691700, -105.255292), except for listings in segments 1 and 3.

COSPCP02B	Classifications
Designation	Agriculture
Reviewable	Aq Life Cold 1
	Recreation E
	Water Supply
Qualifiers:	
Other:	

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	CS-II	CS-II
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	150
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.11
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

3. Elkhorn Creek, including all tributaries and wetlands, from the source to a point immediately above the confluence with Manhattan Creek.

COSPCP03	Classifications
Designation	Agriculture
Reviewable	Aq Life Cold 1
	Recreation E
	Water Supply
Qualifiers:	
Other:	

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	CS-I	CS-I
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	150
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.11
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Cache La Poudre River Basin

4. Deleted.

COSPCP04	Classifications	Physical and Biological		Metals (ug/L)	
Designation		DM	MWAT	acute	chronic
Qualifiers:		acute	chronic		
Other:					
		Inorganic (mg/L)			
		acute	chronic		

5. Deleted.

COSPCP05	Classifications	Physical and Biological		Metals (ug/L)	
Designation		DM	MWAT	acute	chronic
Qualifiers:		acute	chronic		
Other:					
		Inorganic (mg/L)			
		acute	chronic		

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Cache La Poudre River Basin

6. North Fork of the Cache La Poudre River, including all tributaries and wetlands, from the source to the inlet of Halligan Reservoir.

COSPCP06	Classifications
Designation	Agriculture
Reviewable	Aq Life Cold 1
	Recreation E
	Water Supply

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	CS-I	CS-I
	acute	chronic
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m^2)	---	150
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.11
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

7. North Fork of the Cache La Poudre River, including all tributaries and wetlands, from the inlet of Halligan Reservoir to the confluence with the Cache La Poudre River, except for listings in segments 8 and 20.

COSPCP07	Classifications
Designation	Agriculture
Reviewable	Aq Life Cold 1
	Recreation E
	Water Supply

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	CS-II	CS-II
	acute	chronic
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m^2)	---	---
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	---
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Cache La Poudre River Basin

8. Middle Fork Rabbit Creek, including all tributaries and wetlands, from the source to the confluence with Rabbit Creek. Stonewall Creek, including all tributaries and wetlands, from the source to the confluence with the North Fork of the Cache La Poudre River. North Fork Lone Pine Creek and South Fork Lone Pine Creek, including all tributaries and wetlands, from the source to the confluence with Lone Pine Creek.

COSPCP08	**Classifications**
Designation	Agriculture
Reviewable	Aq Life Cold 1
	Recreation E
	Water Supply

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*chlorophyll a (mg/m²)(chronic) = applies only above the facilities listed at 38.5(4).
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4).
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological		
	DM	**MWAT**
Temperature °C	CS-I	CS-I
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	150*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)		
	acute	**chronic**
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.11*
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)		
	acute	**chronic**
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

9. Deleted.

COSPCP09	**Classifications**
Designation	

Qualifiers:

Other:

Physical and Biological		
	DM	**MWAT**
	acute	**chronic**

Inorganic (mg/L)		
	acute	**chronic**

Metals (ug/L)		
	acute	**chronic**

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Cache La Poudre River Basin

10a. Mainstem of the Cache La Poudre River from the Munroe Gravity Canal Headgate (also known as the North Poudre Supply Canal diversion; 40.691700, -105.255292) to a point immediately above the Larimer County Ditch diversion (40.656612, -105.185244).

COSPCP10A	Classifications
Designation	Agriculture
Reviewable	Aq Life Cold 1
	Recreation E
	Water Supply

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	CS-II	CS-II
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	---
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	---
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

10b. Mainstem of the Cache La Poudre River from a point immediately above the Larimer County Ditch diversion (40.656612, -105.185244) to Shields Street in Ft. Collins, Colorado.

COSPCP10B	Classifications
Designation	Agriculture
Reviewable	Aq Life Cold 2
	Recreation E
	Water Supply

Qualifiers:
Water + Fish Standards

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	CS-II	CS-II
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	---
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	---
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Cache La Poudre River Basin

11. Mainstem of the Cache La Poudre River from Shields Street in Ft. Collins to Prospect Road.

COSPCP11	Classifications
Designation	Agriculture
Reviewable	Aq Life Cold 1
	Water Supply*
	Recreation E

Qualifiers:

Other:

*Classification: effective 12/31/2025
*Chloride(chronic) = effective 12/31/2025
*Nitrate(acute) = effective 12/31/2025
*Nitrite(acute) = effective 12/31/2025
*Sulfate(chronic) = effective 12/31/2025
*Arsenic(T)(chronic) = effective 12/31/2025
*Cadmium(T)(acute) = effective 12/31/2025
*Chromium III(T)(acute) = effective 12/31/2025
*Iron(chronic) = effective 12/31/2025
*Lead(T)(acute) = effective 12/31/2025
*Manganese(chronic) = effective 12/31/2025
*Nickel(T)(chronic) = effective 12/31/2025
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	CS-II	CS-II
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	---
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250*
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10*	---
Nitrate	100	---
Nitrite	1*	2.7
Phosphorus	---	---
Sulfate	---	WS*
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02*
Arsenic(T)	---	7.6
Cadmium	TVS	TVS
Cadmium(T)	5.0*	---
Chromium III	TVS	TVS
Chromium III(T)	50*	100
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS*
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50*	---
Manganese	TVS	TVS
Manganese	---	WS*
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100*
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

12a. Mainstem of the Cache La Poudre River from Prospect Road to U.S. Hwy 85 in Greeley.

COSPCP12A	Classifications
Designation	Agriculture
Reviewable	Aq Life Warm 1
	Water Supply*
	Recreation E

Qualifiers:

Other:

*Classification: effective 12/31/2025
*Chloride(chronic) = effective 12/31/2025
*Nitrate(acute) = effective 12/31/2025
*Nitrite(acute) = effective 12/31/2025
*Sulfate(chronic) = effective 12/31/2025
*Arsenic(T)(chronic) = effective 12/31/2025
*Cadmium(T)(acute) = effective 12/31/2025
*Chromium III(T)(acute) = effective 12/31/2025
*Iron(chronic) = effective 12/31/2025
*Lead(T)(acute) = effective 12/31/2025
*Manganese(chronic) = effective 12/31/2025
*Nickel(T)(chronic) = effective 12/31/2025
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	WS-I	WS-I
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	---
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250*
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10*	---
Nitrate	100	---
Nitrite	1*	2.7
Phosphorus	---	---
Sulfate	---	WS*
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02*
Arsenic(T)	---	7.6
Cadmium	TVS	TVS
Cadmium(T)	5.0*	---
Chromium III	TVS	TVS
Chromium III(T)	50*	100
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS*
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50*	---
Manganese	TVS	TVS
Manganese	---	WS*
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100*
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Cache La Poudre River Basin

12b. Mainstem of the Cache La Poudre River from U.S. Hwy 85 in Greeley to the confluence with the South Platte River.

COSPCP12B	Classifications	Physical and Biological			Metals (ug/L)		
Designation	Agriculture		DM	MWAT		acute	chronic
Reviewable	Aq Life Warm 1	Temperature °C	WS-I	WS-I	Arsenic	340	---
	Recreation E		acute	chronic	Arsenic(T)	---	7.6
Qualifiers:		D.O. (mg/L)	---	5.0	Cadmium	TVS	TVS
Other:		pH	6.5 - 9.0	---	Chromium III	TVS	TVS
		chlorophyll a (mg/m^2)	---	---	Chromium III(T)	---	100
*Uranium(acute) = See 38.5(3) for details.		E. coli (per 100 mL)	---	126	Chromium VI	TVS	TVS
*Uranium(chronic) = See 38.5(3) for details.		**Inorganic (mg/L)**			Copper	TVS	TVS
			acute	chronic	Iron(T)	---	1000
		Ammonia	TVS	TVS	Lead	TVS	TVS
		Boron	---	0.75	Manganese	TVS	TVS
		Chloride	---	---	Mercury(T)	---	0.01
		Chlorine	0.019	0.011	Molybdenum(T)	---	150
		Cyanide	0.005	---	Nickel	TVS	TVS
		Nitrate	100	---	Selenium	TVS	TVS
		Nitrite	---	2.7	Silver	TVS	TVS
		Phosphorus	---	---	Uranium	varies*	varies*
		Sulfate	---	---	Zinc	TVS	TVS
		Sulfide	---	0.002			

13a. All tributaries to the Cache La Poudre River, including all wetlands, from the Munroe Gravity Canal Headgate (also known as the North Poudre Supply Canal diversion; 40.691700, -105.255292) to the confluence with the South Platte River, except for listings in segments 6, 7, 8, 13b, and 13c.

COSPCP13A	Classifications	Physical and Biological			Metals (ug/L)		
Designation	Agriculture		DM	MWAT		acute	chronic
Reviewable	Aq Life Warm 1	Temperature °C	WS-I	WS-I	Arsenic	340	---
	Recreation E		acute	chronic	Arsenic(T)	---	0.02
	Water Supply	D.O. (mg/L)	---	5.0	Cadmium	TVS	TVS
Qualifiers:		pH	6.5 - 9.0	---	Cadmium(T)	5.0	---
Other:		chlorophyll a (mg/m^2)	---	150*	Chromium III	---	TVS
Temporary Modification(s):		E. coli (per 100 mL)	---	126	Chromium III(T)	50	---
Arsenic(chronic) = hybrid		**Inorganic (mg/L)**			Chromium VI	TVS	TVS
Expiration Date of 12/31/2024			acute	chronic	Copper	TVS	TVS
*chlorophyll a (mg/m^2)(chronic) = applies only above the facilities listed at 38.5(4).		Ammonia	TVS	TVS	Iron	---	WS
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4).		Boron	---	0.75	Iron(T)	---	1000
*Uranium(acute) = See 38.5(3) for details.		Chloride	---	250	Lead	TVS	TVS
*Uranium(chronic) = See 38.5(3) for details.		Chlorine	0.019	0.011	Lead(T)	50	---
		Cyanide	0.005	---	Manganese	TVS	TVS/WS
		Nitrate	10	---	Mercury(T)	---	0.01
		Nitrite	---	0.5	Molybdenum(T)	---	150
		Phosphorus	---	0.17*	Nickel	TVS	TVS
		Sulfate	---	WS	Nickel(T)	---	100
		Sulfide	---	0.002	Selenium	TVS	TVS
					Silver	TVS	TVS
					Uranium	varies*	varies*
					Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Cache La Poudre River Basin

13b. Mainstem of Boxelder Creek from its source to a point immediately above Slab Canyon Wash. Mainstems of South Branch of Boxelder Creek, North Branch of Boxelder Creek, and Sand Creek from their sources to their confluences with the mainstem of Boxelder Creek.

COSPCP13B	Classifications
Designation	Agriculture
Reviewable	Aq Life Cold 1
	Recreation E
	Water Supply

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	CS-I	CS-I
	acute	chronic
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	150
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.11
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

13c. Mainstem of Boxelder Creek from a point immediately above Slab Canyon Wash to the confluence with the Cache La Poudre River.

COSPCP13C	Classifications
Designation	Agriculture
Reviewable	Aq Life Warm 1
	Water Supply
	Recreation P

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*chlorophyll a (mg/m²)(chronic) = applies only above the facilities listed at 38.5(4).
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4).
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	WS-I	WS-I
	acute	chronic
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	150*
E. coli (per 100 mL)	---	205

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	0.17*
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Cache La Poudre River Basin

14. Horsetooth Reservoir.

COSPCP14	Classifications	Physical and Biological			Metals (ug/L)		
Designation	Agriculture		DM	MWAT		acute	chronic
Reviewable	Aq Life Cold 1	Temperature °C	varies*	varies* B	Arsenic	340	---
	Recreation E		acute	chronic	Arsenic(T)	---	0.02
	Water Supply	D.O. (mg/L)	---	6.0	Cadmium	TVS	TVS
	DUWS	D.O. (spawning)	---	7.0	Cadmium(T)	5.0	---
Qualifiers:		pH	6.5 - 9.0	---	Chromium III	---	TVS
Other:		chlorophyll a (ug/L)	---	---	Chromium III(T)	50	---
		E. coli (per 100 mL)	---	126	Chromium VI	TVS	TVS
*Uranium(acute) = See 38.5(3) for details.					Copper	TVS	TVS
*Uranium(chronic) = See 38.5(3) for details.		Inorganic (mg/L)			Iron	---	WS
*Temperature = DM=CLL and MWAT=CLL from 1/1-3/31 DM=CLL and MWAT=22.8 from 4/1-12/31			acute	chronic	Iron(T)	---	1000
		Ammonia	TVS	TVS	Lead	TVS	TVS
		Boron	---	0.75	Lead(T)	50	---
		Chloride	---	250	Manganese	TVS	TVS/WS
		Chlorine	0.019	0.011	Mercury(T)	---	0.01
		Cyanide	0.005	---	Molybdenum(T)	---	150
		Nitrate	10	---	Nickel	TVS	TVS
		Nitrite	---	0.05	Nickel(T)	---	100
		Phosphorus	---	---	Selenium	TVS	TVS
		Sulfate	---	WS	Silver	TVS	TVS(tr)
		Sulfide	---	0.002	Uranium	varies*	varies*
					Zinc	TVS	TVS

15. Watson Lake.

COSPCP15	Classifications	Physical and Biological			Metals (ug/L)		
Designation	Agriculture		DM	MWAT		acute	chronic
Reviewable	Aq Life Cold 1	Temperature °C	CL	CL	Arsenic	340	---
	Recreation E		acute	chronic	Arsenic(T)	---	0.02
	Water Supply	D.O. (mg/L)	---	6.0	Cadmium	TVS	TVS
Qualifiers:		D.O. (spawning)	---	7.0	Cadmium(T)	5.0	---
Other:		pH	6.5 - 9.0	---	Chromium III	---	TVS
		chlorophyll a (ug/L)	---	---	Chromium III(T)	50	---
*Uranium(acute) = See 38.5(3) for details.		E. coli (per 100 mL)	---	126	Chromium VI	TVS	TVS
*Uranium(chronic) = See 38.5(3) for details.					Copper	TVS	TVS
		Inorganic (mg/L)			Iron	---	WS
			acute	chronic	Iron(T)	---	1000
		Ammonia	TVS	TVS	Lead	TVS	TVS
		Boron	---	0.75	Lead(T)	50	---
		Chloride	---	250	Manganese	TVS	TVS/WS
		Chlorine	0.019	0.011	Mercury(T)	---	0.01
		Cyanide	0.005	---	Molybdenum(T)	---	150
		Nitrate	10	---	Nickel	TVS	TVS
		Nitrite	---	0.05	Nickel(T)	---	100
		Phosphorus	---	---	Selenium	TVS	TVS
		Sulfate	---	WS	Silver	TVS	TVS(tr)
		Sulfide	---	0.002	Uranium	varies*	varies*
					Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Cache La Poudre River Basin

16. Reservoir #4 (40.719045, -105.033743), Water Supply Reservoir #3 (40.665205, -105.089882), Claymore Lake, College Lake, Dixon Reservoir, Robert Benson Lake, Black Hollow Reservoir, Seeley Lake.

COSPCP16	Classifications
Designation	Agriculture
UP	Aq Life Warm 1
	Recreation E

Qualifiers:

Other:

*chlorophyll a (ug/L)(chronic) = applies only above the facilities listed at 38.5(4), applies only to lakes and reservoirs larger than 25 acres surface area.
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4), applies only to lakes and reservoirs larger than 25 acres surface area.
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	WL	WL
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (ug/L)	---	20*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	---
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	100	---
Nitrite	---	0.5
Phosphorus	---	0.083*
Sulfate	---	---
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	7.6
Cadmium	TVS	TVS
Chromium III	TVS	TVS
Chromium III(T)	---	100
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron(T)	---	1000
Lead	TVS	TVS
Manganese	TVS	TVS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

17. All lakes and reservoirs tributary to the Cache La Poudre River within Rocky Mountain National Park and the Rawah, Neota, Comanche Peak, and Cache La Poudre Wilderness Areas.

COSPCP17	Classifications
Designation	Agriculture
OW	Aq Life Cold 1
	Recreation E
	Water Supply

Qualifiers:

Other:

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	CL	CL
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (ug/L)	---	---
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	---
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Cache La Poudre River Basin

18. All lakes and reservoirs tributary to the Cache La Poudre River from the boundaries of Rocky Mountain National Park and the Rawah, Neota, Comanche Peak, and Cache La Poudre Wilderness Areas to the Munroe Gravity Canal Headgate (also known as the North Poudre Supply Canal diversion; 40.691700, -105.255292).

COSPCP18	Classifications
Designation	Agriculture
Reviewable	Aq Life Cold 1
	Recreation E
	Water Supply

Qualifiers:

Other:

*chlorophyll a (ug/L)(chronic) = applies only to lakes and reservoirs larger than 25 acres surface area.
*Phosphorus(chronic) = applies only to lakes and reservoirs larger than 25 acres surface area.
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.
*Temperature = See 38.6(4) for temperature standards.

Physical and Biological	DM	MWAT
Temperature °C	varies*	varies*
	acute	chronic
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (ug/L)	---	8*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.025*
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

19. All lakes and reservoirs tributary to the North Fork of the Cache La Poudre River from the source to the inlet of Halligan Reservoir.

COSPCP19	Classifications
Designation	Agriculture
Reviewable	Aq Life Cold 1
	Recreation E
	Water Supply

Qualifiers:

Other:

*chlorophyll a (ug/L)(chronic) = applies only above the facilities listed at 38.5(4), applies only to lakes and reservoirs larger than 25 acres surface area.
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4), applies only to lakes and reservoirs larger than 25 acres surface area.
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	CL	CL
	acute	chronic
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (ug/L)	---	8*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.025*
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Cache La Poudre River Basin

20. All lakes and reservoirs tributary to the North Fork of the Cache La Poudre River from the inlet of Halligan Reservoir to the confluence with the Cache La Poudre River. This segment includes Halligan Reservoir and Seaman Reservoir.

COSPCP20	Classifications
Designation	Agriculture
Reviewable	Aq Life Cold 2
	Recreation E
	Water Supply

Qualifiers:

Water + Fish Standards

Other:

*chlorophyll a (ug/L)(chronic) = applies only above the facilities listed at 38.5(4), applies only to lakes and reservoirs larger than 25 acres surface area.
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4), applies only to lakes and reservoirs larger than 25 acres surface area.
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.
*Temperature =
DM and MWAT=CL,CLL from 1/1-3/31
Seaman Reservoir
DM=CLL and MWAT=22.5 from 4/1-12/31
All others
DM and MWAT=CL,CLL from 4/1-12/31

Physical and Biological

	DM	MWAT
Temperature °C	varies*	varies*
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (ug/L)	---	8*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.025*
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

21. All lakes and reservoirs tributary to the Cache La Poudre River from the Munroe Gravity Canal Headgate (also known as the North Poudre Supply Canal diversion; 40.691700, -105.255292) to the confluence with the South Platte River, except for listings in segments 14, 15, 16, 19, 20, and 22.

COSPCP21	Classifications
Designation	Agriculture
Reviewable	Aq Life Warm 2
	Recreation E
	Water Supply
	DUWS*

Qualifiers:

Other:

*chlorophyll a (ug/L)(chronic) = applies only above the facilities listed at 38.5(4), applies only to lakes and reservoirs larger than 25 acres surface area.
*Classification: DUWS applies to North Poudre Reservoir No. 3 only.
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4), applies only to lakes and reservoirs larger than 25 acres surface area.
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	WL	WL
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (ug/L)	---	20*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	0.083*
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02-10 [A]
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Cache La Poudre River Basin

22. Fossil Creek Reservoir.

COSPCP22	Classifications
Designation	Agriculture
UP	Aq Life Warm 2
	Recreation E

Qualifiers:

Fish Ingestion Standards

Other:

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	WL	WL
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (ug/L)	---	---
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	---
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	100	---
Nitrite	---	0.5
Phosphorus	---	---
Sulfate	---	---
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	7.6
Cadmium	TVS	TVS
Chromium III	TVS	TVS
Chromium III(T)	---	100
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron(T)	---	1000
Lead	TVS	TVS
Manganese	TVS	TVS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Laramie River Basin

1. All tributaries to the Laramie River, including all wetlands, which are within the Rawah Wilderness Area.

COSPLA01	Classifications
Designation	Agriculture
OW	Aq Life Cold 1
	Recreation E
	Water Supply

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	CS-I	CS-I
	acute	chronic
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m^2)	---	---
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	---
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

2a. Mainstem of the Laramie River from the source to the National Forest boundary, and all tributaries and wetlands from the source to the Colorado/Wyoming border, except for listings in Segment 1.

COSPLA02A	Classifications
Designation	Agriculture
Reviewable	Aq Life Cold 1
	Recreation E
	Water Supply

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	CS-I	CS-I
	acute	chronic
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m^2)	---	150
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.11
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Laramie River Basin

2b. Mainstem of the Laramie River from the National Forest boundary to the Colorado/Wyoming border.

COSPLA02B	Classifications
Designation	Agriculture
Reviewable	Aq Life Cold 1
	Recreation E
	Water Supply

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	CS-II	CS-II
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m^2)	---	---
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	---
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

3. All lakes and reservoirs tributary to the Laramie River within the Rawah Wilderness Area.

COSPLA03	Classifications
Designation	Agriculture
OW	Aq Life Cold 1
	Recreation E
	Water Supply

Qualifiers:

Other:

*chlorophyll a (ug/L)(chronic) = applies only to lakes and reservoirs larger than 25 acres surface area.
*Phosphorus(chronic) = applies only to lakes and reservoirs larger than 25 acres surface area.
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	CL	CL
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (ug/L)	---	8*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.025*
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Laramie River Basin

4. All lakes and reservoirs tributary to the Laramie River from the source to the Colorado/Wyoming border, except for listings in Segment 3.

COSPLA04	Classifications
Designation	Agriculture
Reviewable	Aq Life Cold 1
	Recreation E
	Water Supply

Qualifiers:

Other:

*chlorophyll a (ug/L)(chronic) = applies only to lakes and reservoirs larger than 25 acres surface area.
*Phosphorus(chronic) = applies only to lakes and reservoirs larger than 25 acres surface area.
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	CL	CL
	acute	**chronic**
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (ug/L)	---	8*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.025*
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Lower South Platte River Basin

1a. Mainstem of the South Platte River from the Weld/Morgan County line to the Morgan/Washington County line.

COSPLS01A	Classifications
Designation	Agriculture
Reviewable	Aq Life Warm 1
	Recreation E
	Water Supply
Qualifiers:	
Other:	

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	WS-I	WS-I
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	---
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	---
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

1b. Mainstem of the South Platte River from the Morgan/Washington County line to the Colorado/Nebraska border.

COSPLS01B	Classifications
Designation	Agriculture
Reviewable	Aq Life Warm 2
	Recreation E
	Water Supply
Qualifiers:	
Water + Fish Standards	
Other:	

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	WS-II	WS-II
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	---
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	---
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Lower South Platte River Basin

2. All tributaries to the South Platte River, including all wetlands, from the Weld/Morgan County line to the Colorado/Nebraska border.

COSPLS02	Classifications
Designation	Agriculture
UP	Aq Life Warm 1
	Recreation E
	Water Supply

Qualifiers:

Other:

Temporary Modification(s):

Arsenic(chronic) = hybrid

Expiration Date of 12/31/2024

*chlorophyll a (mg/m^2)(chronic) = applies only above the facilities listed at 38.5(4).
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4).
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	WS-II	WS-II
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m^2)	---	150*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	0.17*
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Beryllium(T)	---	4.0
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

3. Jackson Reservoir, Prewitt Reservoir, North Sterling Reservoir, Jumbo (Julesburg), Empire Reservoir, Vancil Reservoir.

COSPLS03	Classifications
Designation	Agriculture
UP	Aq Life Warm 1
	Recreation E
	Water Supply

Qualifiers:

Other:

*chlorophyll a (ug/L)(chronic) = applies only above the facilities listed at 38.5(4), applies only to lakes and reservoirs larger than 25 acres surface area.
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4), applies only to lakes and reservoirs larger than 25 acres surface area.
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.
*Temperature = See 38.6(4) for temperature standards.

Physical and Biological

	DM	MWAT
Temperature °C	varies*	varies*
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (ug/L)	---	20*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	0.083*
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Lower South Platte River Basin

4. All lakes and reservoirs tributary to the South Platte River from the Weld/Morgan County line to the Colorado/Nebraska border, except for listings in Segment 3.

COSPLS04	Classifications
Designation	Agriculture
Reviewable	Aq Life Warm 2
	Recreation E
	Water Supply

Qualifiers:

Water + Fish Standards

Other:

*chlorophyll a (ug/L)(chronic) = applies only above the facilities listed at 38.5(4), applies only to lakes and reservoirs larger than 25 acres surface area.
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4), applies only to lakes and reservoirs larger than 25 acres surface area.
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	WL	WL
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (ug/L)	---	20*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	0.083*
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Beryllium(T)	---	4.0
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Republican River Basin

1. Mainstem of the South Fork of the Republican River from a point 23 miles above the Colorado/Kansas border (39.582154, -102.350838) to the Colorado/Kansas border.

COSPRE01 **Classifications**

Designation	Classifications
Reviewable	Agriculture
	Aq Life Warm 1
	Recreation E
	Water Supply

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	WS-I	WS-I
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m^2)	---	---
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	---
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

2. Deleted.

COSPRE02 **Classifications**

Designation

Qualifiers:

Other:

Physical and Biological

	DM	MWAT
	acute	**chronic**

Inorganic (mg/L)

	acute	chronic

Metals (ug/L)

	acute	chronic

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Republican River Basin

3. Mainstem of the North Fork of the Republican River from the source to the Colorado/Nebraska border. Mainstem of Chief Creek from the source to the confluence with the North Fork of the Republican River.

COSPRE03	Classifications
Designation	Agriculture
Reviewable	Aq Life Cold 1
	Recreation E
	Water Supply

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*chlorophyll a (mg/m²)(chronic) = applies only above the facilities listed at 38.5(4).
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4).
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological		
	DM	MWAT
Temperature °C	CS-II	CS-II
	acute	chronic
D.O. (mg/L)	---	6.0
D.O. (spawning)	---	7.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	150*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)		
	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.05
Phosphorus	---	0.11*
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)		
	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS(tr)
Uranium	varies*	varies*
Zinc	TVS	TVS

4. Mainstem of the Arikaree River from the confluence of the North and South Forks to the Colorado/Kansas border.

COSPRE04	Classifications
Designation	Agriculture
Reviewable	Aq Life Warm 1
	Water Supply
	Recreation E

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological		
	DM	MWAT
Temperature °C	WS-I	WS-I
	acute	chronic
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	150
E. coli (per 100 mL)	---	126

Inorganic (mg/L)		
	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	0.17
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)		
	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Republican River Basin

5. Mainstem of Black Wolf Creek from the source to the confluence with the Arikaree River.

COSPRE05	Classifications
Designation	Agriculture
Reviewable	Aq Life Warm 1
	Recreation E
	Water Supply

Qualifiers:

Other:

*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	WS-I	WS-I
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m^2)	---	150
E. coli (per 100 mL)	---	126

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	0.17
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

6. All tributaries to the Republican River system in Colorado, including all wetlands, except for listings in segments 1, 3, 4 and 5.

COSPRE06	Classifications
Designation	Agriculture
UP	Aq Life Warm 1
	Water Supply
	Recreation P

Qualifiers:

Other:

Temporary Modification(s):
Arsenic(chronic) = hybrid
Expiration Date of 12/31/2024

*chlorophyll a (mg/m^2)(chronic) = applies only above the facilities listed at 38.5(4).
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4).
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological

	DM	MWAT
Temperature °C	WS-I	WS-I
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m^2)	---	150*
E. coli (per 100 mL)	---	205

Inorganic (mg/L)

	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	0.17*
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)

	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Beryllium(T)	---	100
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Republican River Basin

7. Mainstem of the North Fork of the Smoky Hill River and mainstem of the Smoky Hill River, including all tributaries and wetlands, from the source to the Colorado/Kansas border.

COSPRE07	Classifications
Designation	Agriculture
UP	Aq Life Warm 2
	Recreation P

Qualifiers:

Other:

*chlorophyll a (mg/m²)(chronic) = applies only above the facilities listed at 38.5(4).
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4).
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	WS-III	WS-III
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (mg/m²)	---	150*
E. coli (per 100 mL)	---	205

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	---
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	100	---
Nitrite	---	0.5
Phosphorus	---	0.17*
Sulfate	---	---
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	100
Beryllium(T)	---	100
Cadmium	TVS	TVS
Chromium III	TVS	TVS
Chromium III(T)	---	100
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron(T)	---	1000
Lead	TVS	TVS
Manganese	TVS	TVS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

8. All lakes and reservoirs tributary to the Republican River and Smoky Hill River in Colorado.

COSPRE08	Classifications
Designation	Agriculture
Reviewable	Aq Life Warm 1
	Recreation E
	Water Supply

Qualifiers:

Other:

*chlorophyll a (ug/L)(chronic) = applies only above the facilities listed at 38.5(4).
*Phosphorus(chronic) = applies only above the facilities listed at 38.5(4), applies only to lakes and reservoirs larger than 25 acres surface area.
*Uranium(acute) = See 38.5(3) for details.
*Uranium(chronic) = See 38.5(3) for details.

Physical and Biological	DM	MWAT
Temperature °C	WL	WL
	acute	**chronic**
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (ug/L)	---	20*
E. coli (per 100 mL)	---	126

Inorganic (mg/L)	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	250
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	10	---
Nitrite	---	0.5
Phosphorus	---	0.083*
Sulfate	---	WS
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	0.02
Beryllium(T)	---	4.0
Cadmium	TVS	TVS
Cadmium(T)	5.0	---
Chromium III	---	TVS
Chromium III(T)	50	---
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron	---	WS
Iron(T)	---	1000
Lead	TVS	TVS
Lead(T)	50	---
Manganese	TVS	TVS/WS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Nickel(T)	---	100
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

All metals are dissolved unless otherwise noted.
T = total recoverable
t = total
tr = trout

D.O. = dissolved oxygen
DM = daily maximum
MWAT = maximum weekly average temperature
See 38.6 for further details on applied standards.

STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS – FOOTNOTES

(A) Whenever a range of standards is listed and referenced to this footnote, the first number in the range is a strictly health-based value, based on the Commission's established methodology for human health-based standards. The second number in the range is a maximum contaminant level, established under the federal Safe Drinking Water Act that has been determined to be an acceptable level of this chemical in public water supplies, taking treatability and laboratory detection limits into account. Control requirements, such as discharge permit effluent limitations, shall be established using the first number in the range as the ambient water quality target, provided that no effluent limitation shall require an "end-of-pipe" discharge level more restrictive than the second number in the range. Water bodies will be considered in attainment of this standard, and not included on the Section 303(d) List, so long as the existing ambient quality does not exceed the second number in the range.

(B) Assessment of adequate refuge shall rely on the Cold Large Lake table value temperature criterion and applicable dissolved oxygen standard rather than the site-specific temperature standard.

Editor's Notes

History

Rules 38.5, 38.64 eff. 07/01/2007.

Rules 38.6, 38.65 eff. 09/01/2007.

Rule 38.6 eff. 09/30/2007.

Rules 38.66, 38.67 eff. 09/30/2007.

Rules 38.6, 38.36, 38.52, 38.65, 38.66, 38.67 corrections eff. 10/11/2007.

Rules 38.6, 38.68 eff. 03/01/2008.

Rules 38.6, 38.69, 38.70, 38.71 eff. 03/30/2009.

Rules 38.5, 38.6, 38.72, 38.73, 38.74 eff. 01/01/2010.

Rules 38.6 (Tables 1-39), 38.75, 38.76 eff. 06/30/2010

Rules 38.6 (Tables 1-40), 38.77 eff. 11/30/2010.

Rules 38.6 (Tables 1-39), 37.78 eff. 06/30/2011.

Rules 38.6 (Table pg. 4), 38.79 emer. rule eff. 12/13/2011; expired 12/13/2012.

Rules 38.6 (Tables pgs. 2, 3, 4, 10, 19, 21, 23, 24, 25, 30, 33, 34, 36), 38.80 eff. 01/01/2012.

Rules 38.6 (Table pg. 4), 38.81 eff. 12/31/2012.

Rules 38.6 (Table pg. 20), 38.82 eff. 03/01/2013.

Rules 38.6 (Tables pgs. 6-7), 38.84 emer. rule eff. 05/13/2013.

Rule 38.83 eff. 06/30/2013.

Rules 38.6 (Tables pgs. 1-37), 38.85-38.86 eff. 09/30/2013.

Rules 38.6 Upper South Platte River segments 22a-22b, 38.87 eff. 04/30/2014.

Rules 38.6(4)(g)-(h), Upper South Platte River segments 14-16j, Bear Creek segment 1c, Clear Creek segments 2a-2c, 9a, 11, 13b, 14a-15, Boulder Creek segments 8–9, St. Vrain Creek segments 2b, 6, Middle South Platte River segments 1a, 4, Big Thompson River segments 2, 4b, 5, 9, Cache La Poudre River segments 11, 13b, Lower South Platte River segment 1, 38.88 eff. 06/30/2014.

Rules 38.6 Upper South Platte River segments 3, 10a, Clear Creek segments 2a, 2c, 15, Big Thompson River segment 2, 38.89 eff. 06/30/2015.

Rules 38.3, 38.5, 38.6(2)-(4), 38.7, 38.90, Stream Classifications and Water Quality Standards Tables eff. 12/31/2015.

Rules 38.5, 38.6, 38.91, Appendix 38-1 eff. 03/01/2016.

Rule 38.92 eff. 06/30/2016.

Rules 38.6(6), 38.93, Appendix 38-1 eff. 03/01/2017.

Rules 38.6(6)(c), 38.94, 38.95, Appendix 38-1 eff. 06/30/2017.

Rule 38.96, Appendix 38-1 Upper South Platte Segments 16i, 22a, Clear Creek Segments 3b, 6, 21 eff. 01/31/2018.

Rule 38.97, Appendix 38-1 eff. 06/30/2018.

Rule 38.98, Appendix 38-1 eff. 06/30/2019.

Rules 38.6, 38.99, 38.100, Appendix 38-1 eff. 06/30/2020.

Rules 38.2-38.3, 38.5-38.6, 38.101, Appendix 38-1 eff. 12/31/2020.

Rules 38.102, Appendix 38-1 eff. 02/14/2021.

Rules 38.103, Appendix 38-1 eff. 06/30/2021.

Rules 38.5-38.6, 38.104, Appendix 38-1 eff. 12/31/2021.

Appendix K: FYR Public Notices

JCPH says COVID-19 numbers trending in wrong direction in Jeffco

Data show cases, hospitalizations increasing

BY PAUL ALBANI-BURGIO
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In a statement published online on Sept. 1, Jefferson County Public Health listed several pieces of recent data that together suggest the COVID-19 is worsening across Jefferson County, with the majority of impacts now falling on unvaccinated residents.

Among the datapoints showing increases are new cases. According to the report, there were 767 new cases of COVID-19 in Jeffco from Aug. 24-29. That is a 68.2% increase from the same period last month, when there were 456 new cases from July 23-29.

Hospitalizations have also been increasing significantly, the report said. The 14-day rolling average for hospitalizations had doubled from 0.4 per 100,000 people from July 10-23 to 0.8 per 100,000 people from Aug. 10-23. There were 41 Jeffco residents hospitalized with confirmed COVID-19 as of Sept. 1.

However, the data indicates the vast majority of both new COVID-19 cases and hospitalizations are in unvaccinated residents. Of all new cases in the past two months, 83.5% were among people who were unvaccinated or only partially vaccinated. Similarly, 82.9% of the people hospitalized in the past two months were unvaccinated or partially vaccinated.

Overall, 71.9% of Jeffco residents age 12 and over are fully vaccinated against COVID-19 while another 5.1% are partially vaccinated. Given the increased transmissibility of the Delta variant, public health experts now estimate that at least 80% vaccination coverage is needed to reach herd immunity, according to the JCPH report.

The Delta variant, which spreads more than twice as easily from one person to another, is now responsible for nearly 100% of COVID-19 cases in Colorado.

"At this point in the pandemic, reading or hearing data about COVID-19 can seem routine or intangible. In reality, these numbers represent our Jeffco community members — neighbors, parents, children, friends and coworkers — who are still suffering from this virus," said Christine Billings, JCPH's Head of Pandemic Response, in the report.

Prevention recommendations

The JCPH reports includes the following prevention recommendations:

Get vaccinated-To find a free COVID-19 vaccine close to home, any day of the week, at www.jeffco.us/vaccinesignup. Immunocompromised individuals who received the Moderna or Pfizer vaccine are now eligible to get a third vaccine dose at least 28 days after their second dose.

Wear a mask indoors. The CDC recommends that everyone ages 2+ wear a mask in indoor public settings, regardless of vaccination status, in high or substantial risk areas.

If you have COVID-19 symptoms or have been exposed, get tested.If you have any symptoms of COVID-19 or if you have been exposed to COVID-19, get tested and isolate until you receive your results. Get tested even if your symptoms are mild and even if you have been vaccinated. If your test is positive, continue to isolate for 10 days

Add other layers of protection when possible. Social distancing, avoiding large crowds, gathering outdoors rather than indoors, improving ventilation (air flow) and regular handwashing are additional ways to prevent COVID-19.

Jeffco First Responders tackle Hurricane Ida

Local search and rescue team deploys to help out in Gulf Coast

BY BOB WOOLEY
BWOOLEY@COLORADOCOMMUNITYMEDIA.COM

Members of Colorado's Urban Search and Rescue Task Force One (CO TF-1) were activated Aug. 27 for an Aug. 28 deployment to Lafayette, Louisiana.

The 45 task force members and 3 incident support team members, hailing from 14 Colorado fire agencies, have been providing search and rescue efforts, conducting searches of structures and doing damage assessments

in the wake of Hurricane Ida. The

SEE TASK FORCE, P15

The doctor is in

Mike O'Donnell, who lives in the Floyd Hill area, participates in the county's Sept. 1 vaccination clinic at the new collaborative care center. It was the county's first time hosting a clinic at the center in Idaho Springs, as staff moved into the building on Aug. 18.

PHOTOS BY CORINNE WESTEMAN

The county's new collaborative care center, at 1969 Miner St. in Idaho Springs, is open for business with the Centura Health clinic on the first floor and county public health and human services offices on the second. County staff moved into the building Aug. 18.

Long-awaited collaborative care center opens in Idaho Springs

BY CORINNE WESTEMAN
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Last Wednesday, Clear Creek County Public Health had a new venue for its weekly vaccination clinic.

After years of planning, design and construction, the county's collaborative care center has opened in Idaho Springs.

The two-story building at 1969 Miner St. houses the Centura Health clinic on the first floor and the county's public health and human services departments on the second floor, along with Jefferson Center for Mental Health and the Clear Creek Advocates.

After driving by it often while it was being built, Floyd Hill's Mike O'Donnell finally got to see it for himself when he attended the Sept. 1 vaccination clinic. O'Donnell, who did roofing work at the lumberyard that used to be on the site, thought the collaborative care center's second floor had nice views.

"They're just getting going," he said of the new building.

County staff moved into the building on Aug. 18, and there are still a few smaller issues to work out and last-minute items to complete ahead of the grand opening, which is planned for early October.

Beth Luther, the county's operations manager, said she's working to acquire furniture for the first-floor and second-floor lobbies. The first-floor lobby will also feature a tenant directory and a donor wall, which are both in the works right now.

Also on the first floor is an unfinished suite that Luther said will be home to a physical therapy group, which has signed a three-year lease. The group was scheduled to finish designs this week, and once the suite is built out, the group hopes to move in this winter.

"It would be nice to have a (physical therapy) hub here," Luther said, adding that going to the next closest one is a long commute.

Also on the first floor is a closet that Luther describes as "a room of opportunity."

With broadband fiber cables less than 50 yards away from the new building, the county is working with the Colorado Department of Transportation to connect to those through a conduit under the parking lot and host a server room in the first-floor closet. Luther said internet service providers can then host racks in the server room to better reach their customer bases.

In a nutshell, this plan will allow the county to partner with internet service providers to expand internet access and make it more affordable for people across Clear Creek, she stated.

Meanwhile, in the parking lot, the county will be adding electric vehicle charging ports that will be able to charge four cars simultaneously, she said.

Moving up to the second floor, Luther explained that Clear Creek will be partnering with the Idaho Springs Historical Society to hang large historical photos throughout the new building. These will be similar to the ones at the main county building in Georgetown, she explained.

For the second floor, Luther said she's waiting on furniture for the staff lounge and shared conference room. There's also work to be done finishing the lobby, which will have a children's waiting area and a small permanent food pantry.

Overall, county staff members said there have been a few kinks to work out with moving into a new building, but the space is great and feels like a true upgrade.

"We're still growing and we want to accommodate everything," Public Health Director Tim Ryan said. "It's a building for the public."

Ryan invited anyone visiting the collaborative care center to provide feedback on what they believe is a public need.

He used the second-floor food pantry as an example, saying that because not everyone can get to Loaves & Fishes when it's open, the organization provided items for the county to distribute at the collaborative care center. This way, Ryan said, the two entities reach more people.

Ryan and Tammy Frey, who is the Human Services Department's assistance programs coordinating supervisor, both said they appreciate being in a new space and anticipate a lot of collaborative work between the two departments.

Frey said the building's arrangement will allow her to introduce clients to other personnel and resources while they are visiting her, and described the overall experience as a "one-stop shop" for people's physical, mental and emotional health.

"It's good to have everything in one building," she said.

It's Your Turn: Life in the Peak to Peak

TROUT LAKE TRESTLE PHOTO BY AMANDA MELDRUM

PHOTO BY BARBARA HARDT

Thanks for the smiles!

A HUGE thanks goes out this week to Martina Cook for many smiles, delicious meals, tasty cocktails, incredible music and your friendship over the years.

The Mineshaft closed their doors this week, after a tough year including opening a business during a pandemic.

May you find a new space that allows you to continue your hard work, taking care of our community with down home meals and a lot of love in every recipe.

Today I lift my glass to you. *Sláinte*.

COLORADO Department of Public Health & Environment

EPA United States Environmental Protection Agency

Sixth Five-Year Review and Community Interviews for the Central City/Clear Creek Superfund Site

Gilpin and Clear Creek County, Colorado

The Colorado Department of Public Health and Environment, in cooperation with the U.S. Environmental Protection Agency (EPA), is conducting the sixth five-year review of the Central City/Clear Creek Superfund Site in Gilpin and Clear Creek counties, Colorado. Five-year reviews provide an opportunity to evaluate the implementation and performance of remedies to determine whether they are protective of human health and the environment. The site's sixth five-year review will finish in 2022.

The Central City/Clear Creek Superfund Site was listed on the National Priorities List in 1983, making it a Superfund site. The Study Area encompasses the approximately 400 square mile Clear Creek watershed. The area has been impacted by heavy metals from historic mining operations, including impacts to aquatic life and potentially human health. Cleanup to date has been focused primarily on addressing the impacts to surface water and includes: treatment of point-source discharges and contaminated water; waste pile stabilization, capping, off-site disposal and diversion of run-on water; development of a repository to consolidate and manage mine waste rock and tailings; and other activities. Cleanup activities and investigations at the site are ongoing.

We want to hear from you!

Community members are encouraged to participate in community interviews to share information that may be helpful in the five-year review process. To schedule an interview, please reach out to the contact below by October 29, 2021:

Jeannine Natterman, Public Involvement Coordinator
Colorado Department of Public Health and Environment
jeannine.natterman@state.co.us
303-692-3303

Current site information is available at https://cdphe.colorado.gov/central-city-clear-creek.

Tammy Storey talks about education.

Judy Amabile addresses the crowd.

Susan Berumen announces her candidacy for Commissioner in District 2.

Gilpin Democrat Fundraising Event 2021

Continued from page 8

> "For the first time in Medicare's history, we're going to add dental benefits, vision benefits, and hearing benefits in eight weeks..."
>
> \- U.S. Congressman Joe Neguse (District 2)

The Fundraiser also provided the opportunity for Gilpin resident Susan Berumen to officially announce her candidacy as Commissioner for District 2. Commissioner Isenhart is term-limited and will leave office at the end of 2022. Berumen announced that she has been active on PTA's, was a Girl Scout leader, is currently on the board of trustees for the Gilpin Library, and is on the Mountain Task Force to get a medical center in the County. "My goal is the be the little county that roared," said Berumen," since we're small, we need to be a squeaky wheel and work hard with our state legislators and our federal legislators."

The Denver Post, LLC

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The undersigned **Nicole Maestas**
being first duly sworn under oath, states and affirms as follows:

1. He/she is the legal Advertising Reviewer of The Denver Post, LLC, publisher of The Denver Post and Your Hub.
2. The Denver Post and Your Hub are newspapers of general circulation that have been published continuously and without interruption for at least fifty-two weeks in Denver County and meet the legal requisites for a legal newspaper under Colo. Rev. Stat. 24-70-103.
3. The notice that is attached hereto is a true copy, published in The Denver Post on the following date(s):

September 7, 2021

Nicole Maestas
Signature

Subscribed and sworn to before me this
8 day of September, 2021.

Kay Dapice
Notary Public

(SEAL)

KAY C DAPICE
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID 19944012554
MY COMMISSION EXPIRES AUGUST 19, 2022

COLORADO
Hazardous Materials & Waste Management Division
Department of Public Health & Environment

EPA United States Environmental Protection Agency

Sixth Five-Year Review and Community Interviews for the Central City/Clear Creek Superfund Site Gilpin and Clear Creek County, Colorado

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Jeannine Natterman, Public Involvement Coordinator
Colorado Department of Public Health and Environment
jeannine.natterman@state.co.us
303-692-3303

Current site information is available at https://cdphe.colorado.gov/central-city-clear-creek.