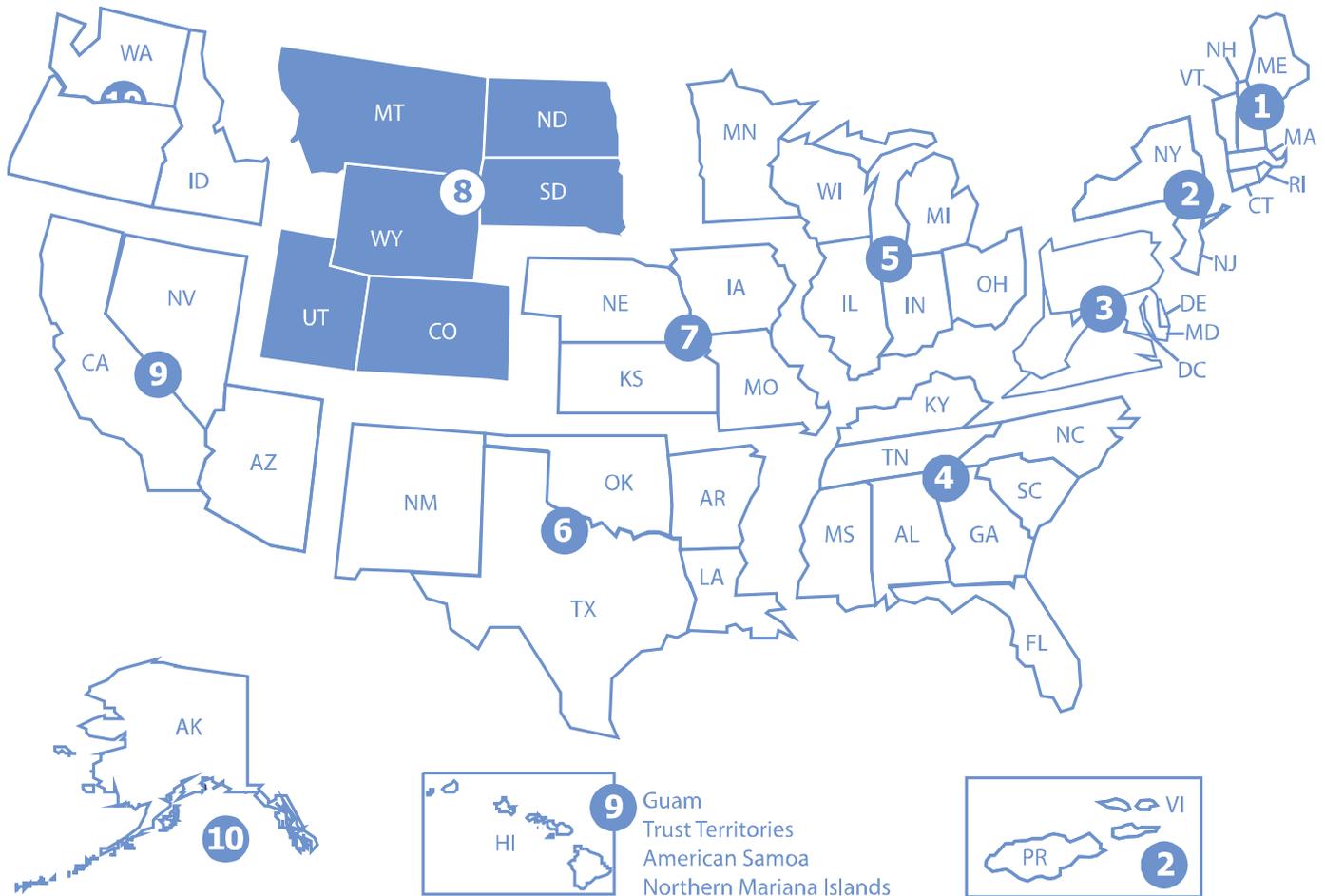




Support Document for the Revised National Priorities List Final Rule – Bonita Peak Mining District



**Support Document for the
Revised National Priorities List
Final Rule
Bonita Peak Mining District
September 2016**

**Site Assessment and Remedy Decisions Branch
Office of Superfund Remediation and Technology Innovation
Office of Land and Emergency Management
U.S. Environmental Protection Agency
Washington, DC 20460**

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Executive Summary

Section 105(a)(8)(B) of CERCLA, as amended by SARA, requires that the EPA prepare a list of national priorities among the known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States. An original National Priorities List (NPL) was promulgated on September 8, 1983 (48 FR 40658). CERCLA requires that EPA update the list at least annually.

This document provides responses to public comments received on the Bonita Peak Mining District site, proposed on April 7, 2016 (81 FR 20277). This site is being added to the NPL based on an evaluation under EPA's Hazard Ranking System (HRS) in a final rule published in the *Federal Register* in September 2016.

Introduction

This document explains the rationale for adding the Bonita Peak Mining District site in San Juan County, Colorado to the National Priorities List (NPL) of uncontrolled hazardous waste sites and provides responses to public comments received on this site listing proposal. The EPA proposed this site to the NPL on April 7, 2016 (81 FR 20277). This site is being added to the NPL based on an evaluation under the Hazard Ranking System (HRS) in a final rule published in the *Federal Register* in September 2016.

Background of the NPL

In 1980, Congress enacted the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. Sections 9601 *et seq.* in response to the dangers of uncontrolled hazardous waste sites. CERCLA was amended on October 17, 1986, by the Superfund Amendments and Reauthorization Act (SARA), Public Law No. 99-499, stat., 1613 *et seq.* To implement CERCLA, EPA promulgated the revised National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR Part 300, on July 16, 1982 (47 FR 31180), pursuant to CERCLA Section 105 and Executive Order 12316 (46 FR 42237, August 20, 1981). The NCP, further revised by EPA on September 16, 1985 (50 FR 37624) and November 20, 1985 (50 FR 47912), sets forth guidelines and procedures needed to respond under CERCLA to releases and threatened releases of hazardous substances, pollutants, or contaminants. On March 8, 1990 (55 FR 8666), EPA further revised the NCP in response to SARA.

Section 105(a)(8)(A) of CERCLA, as amended by SARA, requires that the NCP include

criteria for determining priorities among releases or threatened releases throughout the United States for the purpose of taking remedial action and, to the extent practicable, take into account the potential urgency of such action, for the purpose of taking removal action.

Removal action involves cleanup or other actions that are taken in response to emergency conditions or on a short-term or temporary basis (CERCLA Section 101). Remedial action is generally long-term in nature and involves response actions that are consistent with a permanent remedy for a release (CERCLA Section 101). Criteria for placing sites on the NPL, which makes them eligible for remedial actions financed by the Trust Fund established under CERCLA, were included in the HRS. EPA promulgated the HRS as Appendix A of the NCP (47 FR 31219, July 16, 1982). On December 14, 1990 (56 FR 51532), EPA promulgated revisions to the HRS in response to SARA, and established the effective date for the HRS revisions as March 15, 1991.

Section 105(a)(8)(B) of CERCLA, as amended, requires that the statutory criteria provided by the HRS be used to prepare a list of national priorities among the known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States. The list, which is Appendix B of the NCP, is the NPL.

An original NPL of 406 sites was promulgated on September 8, 1983 (48 FR 40658). At that time, an HRS score of 28.5 was established as the cutoff for listing because it yielded an initial NPL of at least 400 sites, as suggested by CERCLA. The NPL has been expanded several times since then, most recently on April 7, 2016 (81 FR 20252). The Agency also has published a number of proposed rulemakings to add sites to the NPL. The most recent proposal was on April 7, 2016 (81 FR 20277).

Development of the NPL

The primary purpose of the NPL is stated in the legislative history of CERCLA (Report of the Committee on Environment and Public Works, Senate Report No. 96-848, 96th Cong., 2d Sess. 60 [1980]).

The priority list serves primarily informational purposes, identifying for the States and the public those facilities and sites or other releases which appear to warrant remedial actions. Inclusion of a

facility or site on the list does not in itself reflect a judgment of the activities of its owner or operator, it does not require those persons to undertake any action, nor does it assign liability to any person. Subsequent government actions will be necessary in order to do so, and these actions will be attended by all appropriate procedural safeguards.

The NPL, therefore, is primarily an informational and management tool. The identification of a site for the NPL is intended primarily to guide EPA in determining which sites warrant further investigation to assess the nature and extent of the human health and environmental risks associated with the site and to determine what CERCLA-financed remedial action(s), if any, may be appropriate. The NPL also serves to notify the public of sites EPA believes warrant further investigation. Finally, listing a site may, to the extent potentially responsible parties are identifiable at the time of listing, serve as notice to such parties that the Agency may initiate CERCLA-financed remedial action.

CERCLA Section 105(a)(8)(B) directs EPA to list priority sites among the known releases or threatened release of hazardous substances, pollutants, or contaminants, and Section 105(a)(8)(A) directs EPA to consider certain enumerated and other appropriate factors in doing so. Thus, as a matter of policy, EPA has the discretion not to use CERCLA to respond to certain types of releases. Where other authorities exist, placing sites on the NPL for possible remedial action under CERCLA may not be appropriate. Therefore, EPA has chosen not to place certain types of sites on the NPL even though CERCLA does not exclude such action. If, however, the Agency later determines that sites not listed as a matter of policy are not being properly responded to, the Agency may consider placing them on the NPL.

Hazard Ranking System

The HRS is the principle mechanism EPA uses to place uncontrolled waste sites on the NPL. It is a numerically based screening system that uses information from initial, limited investigations -- the preliminary assessment and site inspection -- to assess the relative potential of sites to pose a threat to human health or the environment. HRS scores, however, do not determine the sequence in which EPA funds remedial response actions, because the information collected to develop HRS scores is not sufficient in itself to determine either the extent of contamination or the appropriate response for a particular site. Moreover, the sites with the highest scores do not necessarily come to the Agency's attention first, so that addressing sites strictly on the basis of ranking would in some cases require stopping work at sites where it was already underway. Thus, EPA relies on further, more detailed studies in the remedial investigation/feasibility study that typically follows listing.

The HRS uses a structured value analysis approach to scoring sites. This approach assigns numerical values to factors that relate to or indicate risk, based on conditions at the site. The factors are grouped into three categories. Each category has a maximum value. The categories are:

- likelihood that a site has released or has the potential to release hazardous substances into the environment;
- characteristics of the waste (toxicity and waste quantity); and
- people or sensitive environments (targets) affected by the release.

Under the HRS, four pathways can be scored for one or more threats as identified below:

- Ground Water Migration (S_{gw})
- drinking water

- Surface Water Migration (S_{sw})
The following threats are evaluated for two separate migration components, overland/flood migration and ground water to surface water.
 - drinking water
 - human food chain
 - sensitive environments
- Soil Exposure (S_s)
 - resident population
 - nearby population
 - sensitive environments
- Air Migration (S_a)
 - population
 - sensitive environments

After scores are calculated for one or more pathways according to prescribed guidelines, they are combined using the following root-mean-square equation to determine the overall site score (S), which ranges from 0 to 100:

$$S = \sqrt{\frac{S_{gw}^2 + S_{sw}^2 + S_s^2 + S_a^2}{4}}$$

If all pathway scores are low, the HRS score is low. However, the HRS score can be relatively high even if only one pathway score is high. This is an important requirement for HRS scoring because some extremely dangerous sites pose threats through only one pathway. For example, buried leaking drums of hazardous substances can contaminate drinking water wells, but -- if the drums are buried deep enough and the substances not very volatile -- not surface water or air.

Other Mechanisms for Listing

There are two mechanisms other than the HRS by which sites can be placed on the NPL. The first of these mechanisms, authorized by the NCP at 40 CFR 300.425(c)(2), allows each State and Territory to designate one site as its highest priority regardless of score. The last mechanism, authorized by the NCP at 40 CFR 300.425(c)(3), allows listing a site if it meets the following three requirements:

- Agency for Toxic Substances and Disease Registry (ATSDR) of the U.S. Public Health Service has issued a health advisory that recommends dissociation of individuals from the release;
- EPA determines the site poses a significant threat to public health; and
- EPA anticipates it will be more cost-effective to use its remedial authority than to use its emergency removal authority to respond to the site.
-

Organization of this Document

The following section contains EPA responses to site-specific public comments received on the proposal of the Bonita Peak Mining District site on April 7, 2016 (81 FR 20277). The site discussion begins with a list of commenters, followed by a site description, a summary of comments, and Agency responses to each comment. A concluding statement indicates the effect of the comments on the HRS score for the site.

Glossary

The following acronyms and abbreviations are used throughout the text:

Agency	U.S. Environmental Protection Agency
ARAR	Applicable or relevant and appropriate requirements
ARSG	Animas River Stakeholders Group
BCF	Bio Concentration Factor
BPMD	Bonita Peak Mining District
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C. Sections 9601 <i>et seq.</i> , also known as Superfund
CFR	Code of Federal Regulations
CIP	Community involvement plan
CLP	EPA Contract Laboratory Program
CMA	Colorado Mining Association
CRQL	Contract-required quantitation limit
DL	Detection limit
EPA	U.S. Environmental Protection Agency
FOIA	Freedom of Information Act
FR	Federal Register
FS	Feasibility study
HRS	Hazard Ranking System, Appendix A of the NCP
HRS score	Overall site score calculated using the Hazard Ranking System; ranges from 0 to 100
HWQ	Hazardous waste quantity
MCL	Maximum contaminant level
µg/kg	Microgram per kilogram
NMED	New Mexico Environment Department
NPL	National Priorities List, Appendix B of the NCP
OSMI	Ouray Silver Mines Inc.
PPE	Probable point of entry
PRP	Potentially responsible party
RfD	Reference Dose
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of decision
SARA	Superfund Amendments and Reauthorization Act
SCDM	Superfund Chemical Data Matrix
SGC	Sunnyside Gold Corporation

SJCA	San Juan Citizens Aliance
SJLHC	San Juan Land Holding Company
SOP	Standard operating procedure
SQL	Sample quantitation limit
TDL	Target distance limit
VCUP	Voluntary cleanup program
WQCD	Water Quality Control Division

1. List of Commenters and Correspondence

EPA-HQ-OLEM-2016-0152-0003	Correspondence, dated February 29, 2016, from John W. Hickenlooper, Governor, State of Colorado.
EPA-HQ-OLEM-2016-0152-0007	Comment, submitted April 12, 2016, submitted by Bonita Peak Mining District, San Juan County.
EPA-HQ-OLEM-2016-0152-0008	Comment, dated April 23, 2016, submitted by Don Bachman.
EPA-HQ-OLEM-2016-0152-0009	Comment, submitted April 28, 2016, submitted by Brad Clark.
EPA-HQ-OLEM-2016-0152-0010	Comment, submitted May 2, 2012, submitted by Anonymous.
EPA-HQ-OLEM-2016-0152-0011	Comment, submitted May 9, 2016, submitted by Anonymous.
EPA-HQ-OLEM-2016-0152-0012	Comment, submitted May 9, 2016, submitted by Leo McCormick.
EPA-HQ-OLEM-2016-0152-0013	Comment, submitted May 10, 2016, submitted by Anonymous.
EPA-HQ-OLEM-2016-0152-0014	Comment, submitted May 10, 2016, submitted by Anonymous.
EPA-HQ-OLEM-2016-0152-0015	Comment, submitted May 10, 2016, submitted by Bob Kuhnert.
EPA-HQ-OLEM-2016-0152-0016	Comment, submitted May 12, 2016, submitted by Anonymous.
EPA-HQ-OLEM-2016-0152-0017	Comment, submitted May 16, 2016, submitted by Michael Constantine.
EPA-HQ-OLEM-2016-0152-0018	Comment, dated May 12, 2016, submitted by Aaron Brill, Chief Executive Officer, Silverton Mountain Ski Area.
EPA-HQ-OLEM-2016-0152-0019	Comment, submitted May 23, 2016, submitted by Richard Grossman.
EPA-HQ-OLEM-2016-0152-0020	Comment, dated April 23, 2016, submitted by Don Bachman.
EPA-HQ-OLEM-2016-0152-0021	Comment, submitted April 28, 2016, submitted by John Wright.
EPA-HQ-OLEM-2016-0152-0023	Comment, submitted May 27, 2016, submitted by Caleb Laieski.
EPA-HQ-OLEM-2016-0152-0024	Comment, submitted May 27, 2016, submitted by Caleb Laieski. (Duplicate Submission)
EPA-HQ-OLEM-2016-0152-0025	Comment, submitted May 27, 2016, submitted by Tom Sykes.
EPA-HQ-OLEM-2016-0152-0026	Comment, submitted May 31, 2016, submitted by Anonymous.
EPA-HQ-OLEM-2016-0152-0027	Comment, submitted May 31, 2016, submitted by Anonymous.

EPA-HQ-OLEM-2016-0152-0028	Comment, submitted June 2, 2016, submitted by Anonymous.
EPA-HQ-OLEM-2016-0152-0029	Comment, submitted June 2, 2016, submitted by Anonymous.
EPA-HQ-OLEM-2016-0152-0030	Comment, dated May 25, 2016, submitted by La Plata County Board of Commissioners.
EPA-HQ-OLEM-2016-0152-0031	Comment, submitted June 7, 2016, submitted by Mark Levin.
EPA-HQ-OLEM-2016-0152-0032	Comment, submitted June 7, 2016, submitted by Ed Morlan, Executive Direction, Region 9 Economic Development District of Southwest Colorado, Inc.
EPA-HQ-OLEM-2016-0152-0033	Comment, submitted June 7, 2016, submitted by Anonymous.
EPA-HQ-OLEM-2016-0152-0034	Comment, dated June 6, 2016, submitted by Stephen Fearn.
EPA-HQ-OLEM-2016-0152-0035	Comment, submitted June 7, 2016, submitted by Anonymous.
EPA-HQ-OLEM-2016-0152-0036	Comment, dated May 17, 2016, submitted by William Corwin.
EPA-HQ-OLEM-2016-0152-0037	Comment, submitted June 8, 2016, submitted by Anonymous.
EPA-HQ-OLEM-2016-0152-0038	Comment, submitted June 8, 2016, submitted by Andrea Schuster.
EPA-HQ-OLEM-2016-0152-0039	Comment, submitted June 8, 2016, submitted by Anne Upshaw.
EPA-HQ-OLEM-2016-0152-0040	Comment, dated June 8, 2016, submitted by Colorado Goldfields Inc.
EPA-HQ-OLEM-2016-0152-0041	Comment, submitted June 14, 2016, submitted by Tom Schillaci, Producer of Environmental Documentary Video.
EPA-HQ-OLEM-2016-0152-0042	Comment, submitted June 8, 2016, submitted by Anonymous.
EPA-HQ-OLEM-2016-0152-0043	Mass Comment, posted June 15, 2016, submitted by Conservation Colorado.
EPA-HQ-OLEM-2016-0152-0044	Mass Comment, posted June 15, 2016, submitted by San Juan Citizens Alliance.
EPA-HQ-OLEM-2016-0152-0045	Comment, dated June 13, 2016, submitted by The City of Farmington.
EPA-HQ-OLEM-2016-0152-0046	Comment, dated June 13, 2016, submitted by Colorado Mining Association.
EPA-HQ-OLEM-2016-0152-0047	Comment, submitted June 15, 2016, submitted by Anonymous.
EPA-HQ-OLEM-2016-0152-0048	Comment, dated June 13, 2016, submitted by State of New Mexico Environment Department, Office of the Secretary.

EPA-HQ-OLEM-2016-0152-0049	Comment, dated June 13, 2016, submitted by Ouray Silver Mines Inc. (OSMI).
EPA-HQ-OLEM-2016-0152-0050	Comment, dated June 13, 2016, submitted by Geosyntec on behalf of San Juan Land Holding Company, LLC (SJLHC).
EPA-HQ-OLEM-2016-0152-0051	Comment, posted June 15, 2016, submitted by Ty Churchwell, San Juan Mountains, Trout Unlimited, on behalf of Trout Unlimited.
EPA-HQ-OLEM-2016-0152-0052	Comment, dated June 13, 2016, submitted by William Simon.
EPA-HQ-OLEM-2016-0152-0053	Comment, posted June 15, 2016, submitted by Anonymous.
EPA-HQ-OLEM-2016-0152-0054	Comment, posted June 23, 2016, submitted by Larry Perino, Reclamation Manager, Sunnyside Gold Corporation.
EPA-HQ-OLEM-2016-0152-0055	Comment, posted July 8, 2016, Submitted by L. McCormick
EPA-HQ-OLEM-2016-0152-0056	Comment, posted July 11, 2016, submitted by Russell Begaye, President and Jonathan M. Nez, Vice President, The Navajo Nation

2. Site Description

The Bonita Peak Mining District site (the Site) is located within headwaters of the Animas River watershed in the San Juan and Silverton calderas which were subject to intensive mining beginning in the 1870s. The Site is the result of the commingled release of hazardous substances, mainly metals, due to the operation, abandonment and/or discontinued operation of mines in the Upper Animas, Cement Creek and Mineral Creek drainages of the Animas River. The contaminated surface water from acid mine drainage extends throughout the drainage basins.

The San Juan caldera and the Silverton caldera together form the dominant geologic feature of the Site and vicinity. Mining of the ore bodies in the mining district has resulted in the exposure of the ore in mine shafts, in mine tailings piles, and in waste rock piles to aerobic conditions, which has in turn lead to pH depression, solubilization and mobilization of toxic metals. Acid mine drainage has contaminated the creeks in the three drainages. The acid mine drainage discharge has been measured to be in the millions of gallons a day and estimated to involve the loading of at least hundreds of pounds of hazardous substances a day.

In the Bonita Peak Mining District, mining has occurred from the 1870s until present. Some of the mining activities in the mining district were small operations lasting for a decade or so, but other mining operations employed hundreds of miners, operating for 50 years or more and mining millions of tons of ore. At many of these mines, following termination of operations, no activities were taken to prevent acid mine drainage from continuing to surface water. Some actions have been taken since cessation of mining operations to prevent flow from mine shaft adits and waste piles, however, these actions were not comprehensive in scope.

The commingled release of acid mine drainage from the mining operations in the mining district extends through the three drainages considered. The commingled release impacts targets along and within each of the three drainages. Two fisheries are located within the target distance limit (TDL), one in Animas River (Howardsville) and one in the South Fork Mineral Creek (SF Mineral Creek) and scored as subject to Level II contamination. Sensitive environments are present at the Site, and the Site is in a habitat known to be used by the Federally designated threatened species, the Canada Lynx. There are more than 20 miles of HRS-eligible wetland frontage which includes freshwater emergent, freshwater forested/shrub, and riverine wetlands along the in-water segments

which are subject to potential contamination. This wetland frontage is located along the Upper Animas River drainage, the Cement Creek drainage, the Mineral Creek drainage, and the downstream of the confluence portion of the Animas River.

3. Summary of Comments

The Honorable John W. Hickenlooper, Governor of Colorado, supports placement of the Site on the NPL.

EPA received comments from 29 commenters that expressed support for the proposed listing. Three of these commenters, San Juan Citizens Alliance (SJCA), Conservation Colorado (Web), and Trout Unlimited, submitted petition lists with 418, 777, and 36 signatures respectively.

Two commenters expressed concern regarding the availability of information and referred to active FOIA requests for additional information. Sunnyside Gold Corporation (SGC) and Mr. Schillaci submitted FOIA requests to obtain additional information that is potentially pertinent to the listing process.

The Navajo Nation, La Plata County, SGC, Ouray Silver Mines Inc. (OSMI), Brad Clark, State of New Mexico Environment Department (NMED), the City of Farmington, SJLHC, and two anonymous commenters questioned the extent of the proposed BPMD site.

SGC and SJLHC commented that the description of the Site is overly simplified and did not adequately describe the Site. In particular, SGC submitted comments noting alleged omissions or inconsistencies in describing the Site.

SGC commented that EPA's actions extended beyond its authority, in attempting to aggregate multiple facilities that did not independently meet the listing criteria. SGC asserted that an aggregation justification had not been provided to support the aggregation in the BPMD HRS documentation record.

The Navajo Nation, SGC, La Plata County, Trout Unlimited, NMED, SJLHC, William Simon, Mr. Clark, Mr. Schillaci, and one anonymous commenter questioned the level of community involvement and coordination with States and/or Tribes. SJLHC and Trout Unlimited expressed concern that sufficient transparency and public involvement for the Site was not completed. The Navajo Nation commented that all local communities, including those downstream, should be allowed to participate in the Superfund process. In coordinating with local stakeholders, Mr. Simon asserted that the ASRG could collaborate with EPA to help address the water quality issues associated with the Site. SGC also commented that it believed that EPA should commit to the reasonable assurances requested by the Town of Silverton Board of Trustees, the San Juan County Board of Commissioners, and the Governor of Colorado as part of involving the community in the addition of the Site to the NPL.

Trout Unlimited and Mr. Levin commented that delays might occur as a result of listing. Trout Unlimited urged EPA to delist sites that are deemed inappropriate for continued listing, and Mr. Levin expressed concern that liability issues, resulting from listing, may impact the timeliness of cleanup efforts.

SGC, NMED, OSMI, Trout Unlimited, Mr. William Corwin, Mr. Tom Schillaci, Mr. Mark Levin, Mr. William Simon, and one anonymous commenter expressed concern regarding the assignment of liability for the contamination associated with the Site.

Mr. Stephen Fearn, CMA, OSMI, Mr. Levin, Mr. Simon, and one anonymous commenter urged consideration of the alternatives to listing that may be available to EPA. CMA, OSMI, Mr. Levin, and an anonymous commenter requested that the Site be addressed under other CERCLA authority. Mr. Wright asserted that funding from EPA should be transferred to USGS and ARSG to allow these groups to address the Site.

Colorado Goldfields, SGC, NMED, OSMI, Mr. Fearn, Mr. Aaron Brill, Mr. Leo McCormick, Mr. Levin and Mr. Simon expressed concern of perceived financial issues associated with placing the Site on the NPL. Colorado Goldfields, Mr. Fearn, Mr. Aaron Brill, Mr. Leo McCormick, Mr. Levin, and one anonymous commenter expressed concern over perceived economic impacts that listing could cause, and SGC, Trout Unlimited, NMED, OSMI, Colorado Goldfields, Mr. Schillaci, Mr. Levin, and Mr. Simon submitted comments questioning whether adequate funding could be secured for the costs associated with Site cleanup.

OSMI, La Plata County, the City of Farmington, Mr. Fearn and Mr. Simon, and one anonymous commenter asserted that the Site did not pose a risk to human health and the environment or that listing the Site may not address the real risks to human health and the environment. In particular, Mr. Simon commented that including 48 of the mines serve little purpose, as the real issue is impacts from draining adits in upper Cement Creek and the Mayflower Mill Tailings ponds, which account for metal loading of similar quantity as that from the area in Cement Creek. La Plata County, OSMI Colorado Goldfields and the City of Farmington commented that adding the Site to NPL may not adequately address the relative risk, risk associated with the Animas watershed, or the contamination present.

NMED submitted comments on EPA's and the State of Colorado's objectivity, asserting that EPA has in the past inadequately dealt with contamination in the Region. NMED referred to the Gold King Mine blowout as an alleged example of EPA's bias. NMED also expressed concern that EPA has not taken the necessary steps to ensure that all parties impacted by decisions are well founded in data and objective.

SGC, the Navajo Nation, SJLHC, NMED, OSMI, Colorado Goldfields, Trout Unlimited, La Plata County, Colorado Mining Association, the City of Farmington, Mr. Corwin, Mr. Schillaci, Mr. Brill, and an anonymous commenter submitted comments regarding remedial activities, suggesting approaches to remediation, and consideration of removal and reclamation activities. The Navajo Nation, SJLHC, NMED, and Mr. Simon provided suggestions for approaches for remediation to be considered in evaluating the Site. In particular, the Navajo Nation commented that best practices should be implemented before conducting remedial actions to ensure that no further releases will occur, urging the continuous monitoring of water quality. SGC stressed that voluntary cleanup actions have occurred.

NMED and the City of Farmington expressed concern regarding benchmarks for metals, particularly lead that allegedly were not appropriately determined. NMED expressed concern for lead benchmarks in soil, while the City of Farmington expressed concern regarding the maximum contaminant levels (MCLs) for certain metals, including lead.

SGC, NMED and Colorado Mining Association, OSMI, SJLHC, Mr. Simon, Mr. Fearn, Mr. Leo M. McCormick, and two anonymous commenters submitted comments in opposition, commenting that technical errors were present in evaluation of the Site.

SGC, NMED, and an anonymous commenter submitted comments on the eligibility of hazardous substances that were either included or not included in the HRS documentation record at proposal, including questioning dissolved aluminum, dissolved manganese, the rationale for the eligibility of scored hazardous substances, and whether Iron should be considered a pollutant or contaminant at the Site.

SGC expressed concern regarding the aggregation of sources in the HRS documentation record. SGC alleged that a rationale was not provided for aggregating sources.

Mr. Fearn commented that sources were not accurately assessed. Specifically, Mr. Fearn asserted that the sources in the HRS documentation record at proposal were scored based on old information that may not be accurately reflecting the current state of the sources. Mr. Fearn also submitted comments questioning the scoring or evaluation of source containment, the source hazardous waste quantity, and other possible mines.

SGC, NMED, the Colorado Mining Association, OSMI, SJLHC, Mr. Simon, and Mr. Fearn expressed concern over the scoring of an observed release. SGC and Mr. Fearn submitted comments questioning the observed release by direct observation. SGC, NMED, the Colorado Mining Association, OSMI, SJLHC, Mr. Simon, and Mr. Wright questioned whether certain sampling data should be used to score an observed release by chemical analysis at the Site.

SGC, Mr. Leo M. McCormick, and an anonymous commenter expressed concern over the drinking water threat of the surface water pathway. SGC, Mr. Leo M. McCormick and an anonymous commenter submitted comments regarding the targets in the surface water pathway drinking water threat.

SGC expressed concern over scoring the human food chain threat of the surface water pathway. SGC questioned the scoring of targets in the human food chain threat of the surface water pathway, commenting that limited information was provided regarding the fishery scored. SGC also asserted that the method of scoring cadmium as the substance with the highest toxicity/persistence/bioaccumulation should be revised to be drainage specific.

SGC expressed concern over scoring the environmental threat of the surface water pathway. SGC asserted the method of scoring cadmium as the substance with the highest ecotoxicity/persistence/bioaccumulation should be revised to be drainage specific. SGC also questioned the scoring of habitat used by the Canada Lynx in the environmental threat, alleging a lack of support documenting the presence of the Canada Lynx and the threat to the Canada Lynx.

3.1 Support for Listing and Other Non-opposition Comments

Comment: The Honorable John W. Hickenlooper, Governor of Colorado, supports placement of the Site on the NPL. EPA received comments from 29 commenters that expressed support for the proposed listing. Three of these commenters, San Juan Citizens Alliance (SJCA), Conservation Colorado (Web), and Trout Unlimited, submitted petition lists with 418, 777, and 36 signatures respectively. The commenters in support of the listing include: Economic Development District of Southwest Colorado, Inc.; Conservation Colorado (Web); SJCA; The Board of County Commissioners of La Plata County; The New Mexico Environment Department (NMED); The Navajo Nation; Trout Unlimited; and a number of private citizens. Several commenters, including The City of Farmington, The Colorado Mining Association (CMA) and a number of private citizens submitted comments that did not express opposition to the proposed listing.

Commenters in support of the NPL listing cited various specific reasons for their support including those summarized below:

- Two commenters requested that the BPMD site be listed and remediated as quickly and thoroughly as possible. One commenter stated that that immediate remediation should be performed to prevent further environmental disasters similar to the Gold King Mine spill and opined that time has become a critical risk factor in preventing another blowout. Another resident commented that the hazardous waste needs to be removed as soon as possible as “a mine sits above a school, and is dangerously close to collapsing”.
- One local resident commented that EPA is not responsible for the Gold King mine incident and that previous owners are most likely responsible for the spill as environmental contamination from former mining operations was not mitigated. The same resident expressed the opinion that the Federal government “would be justified in seizing all remaining polluted mines” and that the mines could be annexed into national forest following remediation. This resident also requested that the contamination at the American Tunnel be addressed so another incident does not occur. Several residents stated that it was unlikely that EPA purposefully caused the Gold King Mine spill solely for the purpose of listing the Site on the NPL.
- One commenter stated that CERCLA will reduce heavy metal discharge into water bodies (Animas River, San Juan River, Lake Powell) that are considerably important for agriculture, tourism, and recreation. Several commenters stated that remediation of the Site may revitalize the environment and the local

economy through job creation, increased tourism, and clean water resources that are essential to local agriculture and recreational fishing. Several commenters noted that because it is unlikely mining will return to the area, tourism is essential to the local economy. A local resident stated that the BPMD area has an incredible landscape that attracts many visitors. This commenter and several others opined that restoring the environment to its natural conditions would boost tourism and as a result, stimulate the economy.

- Two citizens commented on the poor water quality of Cement Creek and the Animas River stating that both are discolored and have an unnatural yellow tint. One commenter stated that Cement Creek is so contaminated that it is seemingly devoid of all life, while a downstream resident requested that the BPMD site be placed at the top of the NPL as contaminants have been discharged into the river for decades, resulting in fish kills. Another resident also commented that the headwaters of the Animas River need to be remediated. One commenter stated that placing the Site on the NPL is in the best interest of the communities and natural ecosystems it impacts.
- Two commenters support the cleanup of BPMD and noted that if the contamination in the basin is not mitigated, the downstream water resources and communities will continue to be negatively impacted. SJCA, the Region 9, Economic Development District of Southwest Colorado, Inc. and other commenters noted that the Gold King Mine release and the continued existence of un-remediated and interconnected mines in the region continue to threaten the economies of downstream communities. One commenter noted that these local economies have still not recovered and downstream communities continue to be at risk for other blowouts that would further impact the local economy. The Region 9, Economic Development District of Southwest Colorado, Inc. and one local resident opined that a public investment in remediation of the Site now would be more beneficial in the long run as higher financial and environmental costs associated with another incident could be avoided.
- Two citizens commented that if the Site is not remediated, water quality will continue to degrade and the community will be at risk for another blow out. One commenter expressed the opinion that remediation will reduce this risk.
- The Navajo Nation commented that fresh, clean water from the San Juan River is essential to its economy as the water is used to irrigate fields and water livestock. The Nation also stated that contamination from the river, due to acid mine drainage and catastrophic events, directly affects local farmers and ranchers.
- Two commenters stated that the NPL listing process is a critical and necessary mechanism for realizing the cleanup at the Site. One commenter opined that the resources to mitigate contamination through other mechanisms are not currently available, especially since Good Samaritan laws have not been implemented in the state of Colorado. Several commenters noted that while small remediation projects have been implemented, they have not been enough to reduce economic and environmental impacts on downstream communities. SJCA commented that smaller remediation projects have been insufficient in solving the massive and complicated threat posed by the Site, while another commenter stated that the number of abandoned mines with toxic drainage is beyond the scope of small remediation projects.
- One citizen stated that while many opposed the listing of the BPMD site on the NPL in the past, had the area been listed previously and remediated, the Gold King Mine spill may have been avoided. The same citizen pointed to the Coeur d'Alene Mining District Site in Idaho stating that Superfund listing was the correct response in that situation to initiate and complete the remediation process. Another resident was unaware of the extent of the pollution until the spring of 2014 and stated that many residents, who have blocked remediation attempts, have done so at the expense of those living downstream.

Response: The EPA has added the Bonita Peak Mining District (BPMD) site to the NPL. Listing makes a site eligible for remedial action funding under CERCLA, and EPA will examine the Site to determine what response, including potential interim actions, are appropriate. EPA, working in conjunction with the State, the BLM and USFS, will determine the need for remedial activities and will include stakeholders as discussed in Section 3.6, Community Involvement/Coordination with States and Tribes, of this document. Remedial action decisions will take into account further site investigation results, other response alternatives, and other factors as appropriate.

3.2 FOIA Request / Lack of Supporting Documentation

Comment: Sunnyside Gold Corporation (SGC) submitted a comment related to a Freedom of Information Act (FOIA) request seeking information that was not part of the material in the docket. Tom Schillaci also submitted a comment referencing a FOIA request.

SGC's FOIA request, submitted February 16, 2015, sought information that it describes in its comment as "potentially pertinent to the listing process." SGC commented that it should "be permitted to supplement the HRS Record when EPA produces responsive documents." SGC commented that the EPA has previously chosen not to propose the Site for listing on the NPL and added that the considerations that caused EPA to forego a prior listing of the Site should be included in the present calculus. SGC requested that the EPA address EPA HRS Preliminary Scores and HRS Quickscores, and Scoring Narratives dated 2009- 2012; and HRS Preliminary Scores and HRS Quickscores and Scoring Narratives were prepared by URS Operating Services under START 3, EPA Region 8 Contract No. EP-W-05-050.

Mr. Schillaci stated that he filed a FOIA request to obtain additional information about the August 5, 2015, incident at the Gold King Mine. He did not express any concern with respect to the listing decision or the record supporting it.

Response: EPA has made all documents relied on in proposing the listing of the Bonita Peak Mining District site available to the public at <https://www.regulations.gov>, docket number EPA-HQ-OLEM-2016-0152. While government records are available to the public through FOIA, the FOIA process is entirely separate from the process for compiling the record for the listing decision, and documents released under FOIA do not necessarily have any bearing on the listing. Instead, the Bonita Peak Mining District docket at [regulations.gov](https://www.regulations.gov) is the authoritative source of documents pertinent to the listing decision. None of the previous scoring documents listed constitute an HRS site score for this site as configured, and this site has not previously been fully scored based on the information presently available. Therefore the preliminary scoring in these documents is not applicable to the present HRS site evaluation.

Although the FOIA requests are not relevant to the listing decision, below is an update on the EPA response to the two FOIA requests mentioned in the comments.

EPA is in the process of responding to SGC's FOIA request. EPA has completed an interim release of documents on August 1, 2016, and will be communicating further with SGC as our response progresses.

EPA completed a response to Mr. Schillaci's FOIA request in May 2016. The Agency responded to Mr. Schillaci's questions by providing links to information, and requested clarification on any specific documents he wanted. Mr. Schillaci did not provide any clarifications, and the request was subsequently closed. If Mr. Schillaci had been dissatisfied with the Agency's response to his FOIA requests, he had the right to appeal the decision through processes described in the Agency's official response letter to his FOIA request. SGC will have the same opportunity when the Agency completes its response to the SGC request. Information on Mr. Schillaci's request and the Agency's response is available at <https://foiaonline.regulations.gov/> by entering the tracking number EPA-R8-2016-006831 in the search box; information on the SGC request is available at the same site under tracking number EPA-R8-2015-004247.

EPA reiterates, however, that the FOIA process is separate from this rulemaking and the EPA will not address FOIA claims in this action. Neither the HRS score nor the listing decision is affected by FOIA-related comments.

Regarding SGC's comments on previous HRS scoring attempts, none of the previous scoring documents listed constitute an HRS site score, and this site has not previously been fully scored. At the time that these previous documents may have been generated, complete information about this site had not been fully gathered and these

documents do not constitute an attempt to provide an HRS site score. The EPA listed the BPMD site on the NPL based on its HRS score in the present rulemaking.

These comments result in no change to the HRS score or the Bonita Peak Mining District docket, and no change in the decision to place the Site on the NPL.

3.3 Site Boundaries

Comment: The Navajo Nation, La Plata County, SGC, Ouray Silver Mines Inc. (OSMI), State of New Mexico Environment Department (NMED), the City of Farmington, SJLHC, and two anonymous commenters questioned the extent of the proposed BPMD site and whether other releases of contamination in the watershed should be considered in this listing.

SGC commented that there is no support for any conclusion that water from the Sunnyside Mine pool has traveled to the listed mine workings. SGC stated that it has never owned or operated the Gold King Mine, and did not take part in work being done at that mine. SGC commented that there have never been any workings that would connect the Sunnyside Mine to either the Gold King Mine or the Red & Bonita Mine. SGC stated that engineered concrete bulkheads were installed in the Sunnyside Mine to isolate the mine from other workings and the Animas Basin. SGC further commented that any workings connecting the Sunnyside Mine with the Mogul Mine/Grand Mogul Mine or Gold Prince are above the level of the mine pool. However, SGC commented that its reclamation plan, and later the Court-and agency-approved Consent Decree, were designed to and did isolate the water in the mine pool.

An anonymous commenter commented that there are only two or three minor areas in the Upper Animas that need attention and the Animas River Stakeholders Group (ARSG) is planning to address these areas. The anonymous commenter also asserted that the Board of County Commissioners and Town Trustees should tell EPA to limit its activities precisely to the Upper Cement Creek area where EPA's own negligence caused the problem. SJLHC and an anonymous commenter commented that only areas that could be remediated should be included in the Site. SJLHC commented that using a watershed approach and evaluating the relative loading of sources would avoid having the entire district tied up as a Superfund site for decades. An anonymous commenter stated that the two remediable environmental problems were the impoundment of water in the Sunnyside Mine that is now leaking and the leaching of metals from the Mayflower Mill tailings pond.

The City of Farmington, La Plata County, NMED, and an anonymous commenter questioned the extent of the Site. The City of Farmington and the Navajo Nation commented that the Site listing should recognize that the boundaries extend to other locations where contamination is identified along the Animas River and to downstream areas impacted by the Gold King mine "blowout." The City of Farmington also commented that protection should be offered to parties in New Mexico from this site or other future events. La Plata County and the Navajo Nation commented that human health and risks should not only be investigated in San Juan County, but also for all downstream users. NMED and the Navajo Nation commented that hazardous materials have migrated downstream from the BPMD Site into the State of New Mexico for years. NMED and the Navajo Nation questioned whether a focus on fewer than 50 mining areas is sufficient to protect New Mexico's downstream water, soil, and health from dangerous contaminants emanating from thousands of abandoned mines in the Animas watershed.

OSMI asserted other pathways should be taken into consideration in adding the Site to the NPL. OSMI asserted that the rising water table associated with bulk-heading of mine adits has increased hydrostatic pressure that is likely to increase discharges of mine-influenced water through ground water to surface migration. OSMI commented that the ground water migration pathway "may not need to be considered in the listing of the BPMD" but that "it is an important part of evaluating the overall system."

Response: In response to comments related to the scope of the site, the BPMD site consists of a commingled release of metals originating from numerous mines and mine-related activities in the Animas River watershed. Mining operations were conducted at numerous mines, and releases due to the mining operations are impacting three drainages (Upper Animas River, Mineral Creek and Cement Creek) within the Animas River watershed.

A site, as defined by the HRS is:

Area(s) where a hazardous substance has been deposited, stored, disposed, or placed, or has otherwise come to be located. Such areas may include multiple sources and may include the area between sources. (Section 1.1, *Definitions*, of the HRS (55 FR 51587, December 14, 1990, emphasis added).

Placing a site on the NPL is based on an evaluation, in accordance with the HRS, of a release or threatened release of hazardous substances, pollutants, or contaminants and EPA has discretion in defining sources to be included. At the BPMD site, EPA scored 19 mines based on information available for a complete HRS evaluation and have considered for further action 29 other mines, including two study areas that information suggests are contributing to the contamination in the watershed. The mines and study areas, which were not scored as part of the HRS site score but mentioned in the HRS documentation record at proposal, are specifically called out and identified separately as “Other possible Mines and Mine Related Sources” (see pages 47-50, 90-91, 118 of the HRS documentation record at proposal).

With respect to comments about the downstream extent of the site boundary, CERCLA Section 105(a) (8) (A) requires the EPA to list national priorities among the known “releases or threatened releases” of hazardous substances; thus, the focus is on the release, not precisely delineated boundaries. Further, CERCLA Section 101(a) defines a “facility” as the “site” where a hazardous substance has been “deposited, stored, placed, or otherwise come to be located.” The “come to be located” language gives the EPA broad authority to clean up contamination when it has spread from the original source. On March 31, 1989 (54 FR 13298), the EPA stated:

HRS scoring and the subsequent listing of a release merely represent the **initial** [emphasis added] determination that a certain area may need to be addressed under CERCLA. Accordingly, EPA contemplates that the preliminary description of facility boundaries at the time of scoring will need to be refined and improved as more information is developed as to where the contamination has come to be located; this refining step generally comes during the RI/FS [remedial investigation/feasibility study] stage.

The revised HRS (55 FR 51587, December 14, 1990) elaborates on the “come to be located” language, defining “site” as “area(s) where a hazardous substance has been deposited, stored, disposed, or placed, or has otherwise come to be located. Such areas may include multiple sources and may include the area between the sources.”

Until the site investigation process has been completed and a remedial action (if any) selected, the EPA can neither estimate the extent of contamination at the NPL site, nor describe the ultimate dimensions of the site. Even during a remedial action (e.g., the removal of buried waste) the EPA may find that the contamination has spread further than previously estimated, and the site definition may be correspondingly expanded.

While the 19 scored mines presented in the HRS documentation record at proposal represent mines in which EPA is concerned based on existing information, the three drainages contain numerous additional mines and mine-related sources that are possible sources of metal releases. EPA gave notice of this concern on pages 21 -22 (Site Description), and 47-50, 90-91, and 118 (Other Possible Mines and Mine Related Sources) of the HRS documentation record at proposal. Therefore, the Site is the result of the release of hazardous substances and is not bound to only those mine sources scored in the HRS documentation record at proposal.

The 48 locations were identified based on previous analyses completed by the Animas River Stakeholders Group, the U.S. Geological Survey, Colorado Division of Minerals and Geology (now known as Colorado Division of Reclamation, Mining and Safety), Bureau of Land Management, U.S. Forest Service, and the U.S. EPA (Refs. 2; 3; 4; 5; 6; 13; 14; 15; 22; 24; 26; 31; 32; 49; 50; 56). As documented in the HRS documentation record at proposal, this release qualifies for listing on the NPL based on an HRS score for the comingled release from the mining operations in the mining district. In addition, it is also shown in the HRS documentation record at proposal that, where sufficient information is available to adequately evaluate the release from each mine operation or drainage individually, the HRS score is also sufficient to qualify the release from individual mines or drainages for placement on the NPL (see Appendix A of the HRS documentation record at proposal).

In addition, it is reasonable that groundwater contamination has migrated and is currently migrating throughout the BPMD area. However, EPA is not required to score all of the contamination suspected to be part of a site to document that the site qualifies for the NPL. The EPA must balance the need to fully characterize a site with the limited resources available to collect and analyze site data. For this reason, the EPA generally will not score additional pathways upon receiving new data as long as the site still meets the HRS cutoff score. However, any additional data that characterizes site conditions could provide useful information during the remedial investigation (RI).

The HRS is a screening model that uses limited resources to determine whether a site should be placed on the NPL for possible Superfund response. A subsequent stage of the Superfund process, the remedial investigation (RI), characterizes conditions and hazards at the site more comprehensively. The U.S. Court of Appeals for the D.C. Circuit has stated “the NPL is simply a rough list of priorities, assembled quickly and inexpensively to comply with Congress’ mandate for the Agency to take action straightaway” (see *Eagle-Picher II*, 759 F.2d at 932), and “EPA’s decision to reconcile the need for certainty before action with the need for inexpensive, expeditious procedures to identify potentially hazardous sites . . . is reasonable and fully in accord with congressional intent” (see *Eagle-Picher I*, 759 F.2d at 921).

Regarding the Sunnyside Mine and Sunnyside Mine Pool, these areas were listed as other possible mine and mine-related sources in the HRS documentation record at proposal (see pages 48, 49 of the HRS documentation record at proposal). The Sunnyside Mine, located in the headwaters of Eureka Gulch, was the largest mining operation in the area, and operated from 1873 through 1991. The mine workings are known to be connected to multiple features within the area, including American Tunnel and Terry Tunnel (Ref. 6f, pp. 25, 37). The Sunnyside Mine Pool is a pool of underground mine water that has built up behind bulkheads to an elevation of approximately 11,800 ft. above mean sea level. There is known hazardous substance migration from the Sunnyside Mine Pool. The Sunnyside Mine pool is known to contain cadmium, manganese, and zinc as evidenced by the surficial expression of the mine pool at the American Tunnel. The interconnections between the various local mine working and tunnels warrant further detailed characterization at a later stage of the Superfund process to determine the full extent of the Site.

Regarding the Mayflower Tailings, this source area was listed in the other possible mine-related sources in the HRS documentation record at proposal (see page 50 of the HRS documentation record at proposal). The Mayflower Mill Tailings are comprised of four mill tailings repositories. Leachate testing from the tailings in the area indicates high concentrations of cadmium, copper, lead, and zinc. Therefore, this mine may warrant a further detailed characterization at a later stage of the Superfund process to determine the full extent of the Site.

Regarding the Gold King mine, the HRS documentation record at proposal scores the adit discharge and the waste rock piles at this mine as part of the Site (see pages 51-52, 56-57, 62, 69-70, 78, 80, 85, 121, 142-143, Appendix A of the HRS documentation record at proposal). The one-time release of contaminants that occurred on August 5, 2015, was not included in the HRS scoring of the Gold King Mine as the waste rock piles and adit flow were sufficient to score the mine at proposal. As mentioned above, the EPA is not required to score all of the contamination suspected to be part of a site to document that the site qualifies for the NPL. This additional discharge could be considered as part of the HRS evaluation but the inclusion of this discharge would not impact

the scoring of the Gold King Mine, the overall score of the Bonita Peak Mining site, or the scope of the remedial investigation.

These comments results in no change to the HRS score and no change in the decision to place the Site on the NPL.

3.4 Site Description

Comment: SGC and SJLHC commented that the EPA's description of the Site is overly simplified and does not adequately acknowledge poor pre-mining surface water quality, and that some reaches in the Animas headwaters do not support aquatic life.

SGC also commented that the existence of Federal facilities within the Site should be specifically recognized in the listing decision. SGC asserted that Federal ownership or operation occurs or occurred at various locations that most likely contribute as sources of contamination and there is no history or indication that any Federal facility has implemented all appropriate actions or eliminated the need for remedial action.

Response: The site description provided in the HRS documentation record at proposal is sufficiently detailed for the public to identify the Site being scored and for the public to verify the accuracy of the HRS evaluation. The HRS defines a site as an "[a]rea(s) where a hazardous substance has been deposited, stored, disposed, or placed, or has otherwise come to be located. Such areas may include multiple sources and may include the area between sources" (Section 1.1, Definitions, of the HRS (55 FR 51587, December 14, 1990). There is no requirement that specific property areas or land ownership be identified in the site description or at listing. That a release may be on Federal lands does not exclude that release from HRS evaluation.

The HRS documentation record at proposal stated on page 21:

The Bonita Peak Mining District site is located within Headwaters of the Animas River watershed in the San Juan and Silverton calderas which were subject to intensive hardrock mining beginning in the 1870s (Ref. 50, p. 3). The site is the result of the release of hazardous substances, mainly metals, due to the operation and abandonment or discontinued operation of mines (Ref. 6b, p. 6, Figure 1) in the Upper Animas, Cement Creek and Mineral Creek Drainages of the Animas River (Ref. 6a, p. 9). The USGS reported that this history of "[m]ining at large and small mines and excavating at countless prospects have disturbed millions of tons of mineralized rock in the Silverton area and resulted in chemical reactions that release acid and metals to receiving waters in the watershed." (Ref. 6c, p. 5) Mining of the ore bodies in this mining district has resulted in the exposure of the ore in mine shafts and in mine tailings piles to aerobic conditions, which has in turn lead to pH depression and solubilization and mobilization of toxic metals. (Ref. 6a, p. 12-13) Ground water seeping into the mines and snow and rain falling on and running over the mine tailings piles associated with the mines has led to what is commonly referred to as acid mine drainage. (Ref. 6c, p. 5) This drainage flows into and has contaminated the creeks in the three drainages.

The acid mine drainage discharge has been measured to be in the millions of gallons a day and estimated to involve the loading of at least hundreds of pounds of hazardous substances a day, and has resulted in pH depression and increases in dissolved toxic metal concentrations in surface water, including, but not limited to, cadmium, copper, zinc, manganese and aluminum¹ (Ref. 2; 6a, pp 12-13; 13; 14; 15; 56, p. 301). The contaminated surface water from the acid mine drainage extends throughout the drainage basins. This contamination threatens not only human

¹ Aluminum was removed from scoring at promulgation of the BPMD site.

food chain fisheries, wetlands and wildlife habitat, including endangered species habitat, but also has the potential to impact downstream drinking water supplies serving thousands of people.

....

The HRS documentation record at proposal stated on page 22:

The Bonita Peak Mining District site scope is limited to 46 specific mines and two additional study areas where additional characterization is needed to determine whether and what additional actions under CERCLA are appropriate. To address the release of hazardous substances due to the mining operations at these 48 locations within the Bonita Peak Mining District, EPA is evaluating the release for the NPL. These 48 locations were identified based on analysis completed by the Animas River Stakeholders Group, the U.S. Geological Survey, Colorado Division of Minerals and Geology, Bureau of Land Management, U.S. Forest Service and the U.S. EPA (Refs. 2; 3; 4; 5; 6; 13; 14; 15; 22; 24; 26; 31; 32; 49; 50; 56). As is shown in this HRS documentation record, this release qualifies for listing on the NPL based on an HRS score for the comingled release of acid mine drainage from the mining operations in the mining district. In addition, it is also shown in this HRS documentation record that, where sufficient information is available to adequately evaluate the release from each mine operation or drainage individually, the HRS score is also sufficient to qualify the release from individual mines or drainages for placement on the NPL (see Appendix A).

The Bonita Peak Mining District site involves contamination affecting surface water bodies in the San Juan caldera: the upper portion of the Animas River (hereinafter “the Upper Animas River”); the river’s two main tributaries in the Silverton area, Cement Creek and Mineral Creek; and numerous smaller tributaries to all three streams. The headwaters of all these water bodies are located in the high mountain peaks surrounding Silverton, and Cement Creek and Mineral Creek flow into the Animas River at Silverton. For the purposes of this HRS evaluation (and for clarity in the site and pathway definitions), the site is evaluated according to the three drainage areas (i.e., the Upper Animas River, Cement Creek, and Mineral Creek drainages).

...

The site description at proposal provides information on the general location of the Site, the release being scored, the types of sources being scored, other areas of interest in the Site vicinity, and the migration pathway being evaluated. This information is sufficient for the public to evaluate the HRS scoring of the Site. However, the EPA has reviewed the comments raised by commenters regarding the mines scored and the other possible mines and mine-related sources and has revised the site description on pages 21 and 22 to include the following clarifications at promulgation:

- On page 21, the description in the HRS documentation record at promulgation is revised to state: The site is the result of the known or significant release of hazardous substances, mainly metals, due to the operation and abandonment or discontinued operation of mines (Ref. 6b, p. 6, Figure 1) in the Upper Animas, Cement Creek and Mineral Creek Drainages of the Animas River (Ref. 6a, p. 9). EPA has scored 19 specific mines based on information available for an HRS evaluation and has considered for further action 27 other mines and two study areas that information suggests are contributing to the contamination in the watershed.
- On page 22, the following statement has been deleted from the HRS documentation record at promulgation: The Bonita Peak Mining District site scope is limited to 46 specific mines and two additional study areas where additional characterization is needed to determine whether and what additional actions under CERCLA are appropriate.

While these revisions provide clarification in the site description section of the HRS documentation record, the HRS scoring of the sources and release remains unchanged.

Regarding the pre-mining conditions in the watershed and that some reaches in the Animas headwaters do not support aquatic life, further characterization of the Site will be performed at a later stage of the Superfund process. The Site description for HRS purposes focuses on providing information on the HRS evaluation of a release of hazardous substances to the watershed. The fisheries and sensitive environments evaluated as part of the HRS Site score are within the target distance limit (TDL) for the surface water migration pathway at the Site and risk posed to these targets scores sufficient for listing (see pages 149-152, 157-159, and Appendix A of the HRS documentation record at proposal).

These comments result in no change to the HRS score and no change in the decision to place the Site on the NPL.

3.5 Site Aggregation

Comment: SGC stated that “EPA impermissibly aggregates multiple disparate facilities to achieve its proposed Site listing on the NPL.” Citing *Mead Corp. v. Browner*, 100 F.3d 152, 153 (D. D.C. 1996). SGC stated that the Court noted, ‘[t]he factors named in [EPA’s] Aggregation Policy bear only the dimmest relation to any idea of risk.’ Therefore, SGC asserted that EPA has no authority to aggregate multiple facilities where each individual facility does not independently meet the listing criteria. SGC commented that EPA’s aggregation of facilities:

- does not accurately assess the relative degree of risk to human health and the environment posed by individual facilities subject to review;
- untethers the individual facilities from their distinct respective threat, or potential threat, if any, to the public health or welfare, or the environment.

SGC contended that disaggregating the mines would result in a more accurate picture of the mines’ threat, or potential threat, if any, to the public health or welfare, or the environment.

SGC commented that despite the considerable distance separating some facilities or sources, and the varying types of facilities or sources (e.g., pits vs. adits), no aggregation memo or justification was included. Thus, SGC claimed, EPA’s scientific and technical rationale for aggregating sources, or the assumptions EPA made in aggregating sources, cannot be assessed.

Response: The BPMD site is the result of a comingled release of hazardous substances into surface water due to mining and mining-related activities in three converging drainages (Upper Animas River, Cement Creek and Mineral Creek) that converge in the headwaters of the Animas River. The BPMD site is not an aggregation of multiple disparate facilities or non-contiguous releases that would not qualify for placement on the NPL individually; therefore, the Mead decision does not apply to this listing. Further, each of the 19 mines included in scoring in the HRS documentation record at proposal have been independently documented to release hazardous substances directly to this surface water body which achieves an NPL qualifying HRS score of 28.50 or greater (see Appendix A, Mine-Specific and Drainage-Specific Scoring, of the HRS documentation record at proposal). These independent releases comingled as the surface water bodies flow by the mining locations. Therefore, listing is consistent with the intent of CERCLA as it evaluates the overlapping threat posed by the comingled release from the mining activities to human food chain fisheries and sensitive environments in the drainages.

This situation is factually different from that addressed in the Mead Decision. *Mead Corp v. Browner* dealt with the aggregation of separate non-contiguous sites with non-overlapping releases; the court in that case rejected the aggregation of the two sites as one NPL listing “[b]ecause EPA lacks statutory authority to use its Aggregation Policy to list on the NPL a site that would not otherwise qualify” (*Mead Corp. v. Browner*, 100 F.3d 152 (D.C. Cir. 1996)). (Emphasis added). At the “Tennessee Products” site (the site addressed in the Mead decision), EPA had only shown that one of the aggregated sites qualified for the NPL based on the risk documented in a health advisory issued by the Agency for Toxic Substances and Disease Registry (ATSDR). EPA’s rationale for

aggregating the sites in a single listing was based on an aggregation policy using some factors the Court identified as having little relationship to risk. At the BPMD site, the Agency does not rely on the aggregation policy discussed in Mead. The HRS documentation record at proposal presents an HRS site score above 28.50 for the overall listing in the HRS documentation record and also, on pages 161-163 (Appendix A of the HRS documentation record at proposal), for each of the 19 mines scored at the BPMD site. The Mead decision does not apply to this NPL listing decision.

CERCLA Section 105 (a)(8)(B) (as modified by SARA) directs the establishment of the National Priorities List (NPL):

Based upon the criteria set forth in subparagraph (A) of this paragraph, the President shall *list as part of the plan national priorities among the known releases or threatened releases* throughout the United States . . . In assembling or revising the national list, the President shall consider any priorities established by the states. To the extent practicable, [at least four hundred of] the highest priority facilities shall be designated individually and shall be referred to as the “top priority among known response targets” [emphasis added]

In 1986 when reauthorizing CERCLA in SARA, Congress directed EPA to amend the Hazard Ranking System:

Such amendments shall assure, to the maximum extent feasible, that the hazard ranking system accurately assesses the relative degree of risk to human health and the environment posed by sites and facilities subject to review. CERCLA section 105(c)(1).

Section 105(a)(8)(A) of CERCLA, as amended by SARA, requires that the NCP include:

[C]riteria for determining priorities among releases or threatened releases throughout the United States for the purpose of taking remedial action and, to the extent practicable, take into account the potential urgency of such action, for the purpose of taking removal action.

To direct implementation of CERCLA (and SARA), EPA revised the NCP (40 CFR part 300). Section 300.5, Definitions, of the NCP lists the definitions in CERCLA and adds others. It defines the National Priorities List:

National Priorities List (NPL) means the list, compiled by EPA pursuant to CERCLA section 105, of uncontrolled hazardous substance releases that are priorities for long-term remedial evaluation and response.

Hence, the focus of the listing is on the release and the EPA has scored the overall comingled release and the individual releases at 19 mines based on information available for a complete HRS evaluation. The EPA has further considered 29 other mines including two study areas that information suggests are contributing to the contamination in the watershed. However, these other mines and study areas are not scored as part of the HRS site score but identified in the HRS documentation record at proposal as “Other possible Mines and Mine Related Sources” (pages 47-50, 90-91, 118 of the HRS documentation record at proposal).

While each mine scored in the HRS documentation record scored independently for listing, the threat to the surface water pathway is a comingled release of acid mine drainage from the mining operations in the mining district. Further evidence of the comingling of contamination in the watershed can be found in other studies that have been performed in the area. One example includes a USGS professional paper that investigated the environmental effects of historical mining on the Animas River watershed². The findings in this USGS report are

² This professional paper can be found at: <http://pubs.usgs.gov/pp/1651/>

consistent with the HRS evaluation that contamination comingles and contaminant concentrations increase as the contamination travels downstream in the watershed (as it travels past additional mining sites).

These comments result in no change to the HRS score and no change in the decision to place the Site on the NPL.

3.6 Community Involvement/Coordination with States and Tribes

Comment: The Navajo Nation, SGC, La Plata County, Trout Unlimited, NMED, SJLHC, William Simon, Mr. Clark, Mr. Schillaci, and one anonymous commenter requested additional community involvement and coordination with States.

The Navajo Nation commented that it and all other local communities, including those downstream, should be included to participate in the Superfund process. Additionally, it commented that EPA should establish a framework for releasing alerts or notifications to the public.

SJLHC and Trout Unlimited commented that more transparent public involvement and information should occur during the process. The Navajo Nation, La Plata County, and NMED commented that the EPA should strengthen its communication with all impacted Colorado communities and provide accurate information and data reports about the health of the Animas River. SJLHC and Trout Unlimited asserted that EPA should keep stakeholders informed regarding the Site, which has not been done thus far, as stakeholders have a wealth of local historic, geologic, mining, and science-based water quality knowledge in Silverton and Durango that the EPA should utilize. NMED commented that EPA's fate and transport model developed for the Animas and San Juan Watersheds that has purportedly undergone peer review and that can be used to determine current stream quality and sediment conditions has not been made available to the stakeholders and the EPA has excluded the state agencies from the peer review process.

Mr. Simon asserted that ARSG could collaborate with EPA, noting that ASRG has an existing field of concerned stakeholders and mining experts that has been successful in getting water quality standards to meet the goal of the Clean Water Act. Mr. Simon asserted that addressing the contamination in the area would require involvement of all stakeholders, and that EPA should consider engaging several parties in settlement negotiations.

NMED and the Navajo Nation commented that adding the Site to the NPL necessitates the inclusion of parties that are stakeholders that might have previously not been identified as stakeholders. NMED commented that hazardous materials have migrated downstream from the Site into the State of New Mexico for years. NMED stated that residents who live on or near the Animas and San Juan Rivers, farmers and ranchers who use river water, public water supply systems that withdraw water from the rivers or from wells in the alluvial aquifer, and other persons who may be exposed to contaminants from the BPMD Site must be treated by EPA as stakeholders. NMED commented that, to date, EPA has not included downstream groups as stakeholders during discussions about risk-based screening levels and has not provided work plans, permitted information, or data from treatment system to downstream groups for review prior to NPL proposal. NMED asserted that EPA continues to shut out other stakeholders, such as the Navajo Nation, who also should have a voice in any BPMD Superfund process, commenting that no public meeting has been scheduled on Navajo land, sending the message that EPA has no intent to work collaboratively.

NMED and the Navajo Nation commented that EPA must ensure that downstream stakeholders have an active voice and direct involvement in the handling of the BPMD Site and EPA should provide stakeholders downstream from Colorado a seat at the table for the duration of the Superfund process for the BPMD Site. NMED asserted that it is willing to work with EPA and other stakeholders to ensure that oversight of the Superfund process is firmly in place. NMED requested that EPA set up an oversight panel comprised of federal, state, tribal, and local authorities to ensure that the concerns of all impacted, downstream communities are represented in the process. NMED commented that, at a minimum, New Mexico, Utah, the Navajo Nation, and the Southern Ute be given a seat at the table and integrated into the remedial review board. NMED commented that EPA should be required to

communicate with this panel about all decisions related to the potential BPMD Site, and accept direction and guidance from the panel – including all Applicable or Relevant and Appropriate Requirements (ARARs) – before undertaking any actions. NMED asserted that rather than considering the people of New Mexico to have equal input in both the BPMD Superfund process and the GKM response, EPA downgrades the State and its citizens to the level of any commenter from the public whose concerns are passively received. NMED asserted that downstream stakeholders should be involved before it seriously damages the neutrality and objectivity of the Superfund process.

SGC commented that it believes that EPA committing to the reasonable assurances requested by the Town of Silverton Board of Trustees, the San Juan County Board of Commissioners, and the Governor of Colorado should be a prerequisite for the addition of the Site to the NPL. SGC expressed a desire to cooperate with EPA and all other interested parties in achieving an appropriate level of Site remediation. SGC commented that solutions to the Site’s environmental issues require the continued cooperation of interested parties and the facilitation of those efforts that have contributed to past cleanup. SGC asserted that the scope of the communities and stakeholders that have contributed greatly to past Site remediation involvement should not be limited to the typical review and comment on EPA proposals, but rather they should be involved in meaningful involvement through the Superfund process and in the formulation and evaluation of EPA proposals.

SGC commented that listing such a large site on the NPL risks confounding the targeted, prioritized cooperative efforts and collaborative approaches that have contributed to cleanup of the Site. SGC asserted that EPA’s rationale for listing must reflect how listing will promote the successes of the established State regulatory and stakeholder processes. SGC commented that failure to articulate such listing rationale undermines the legitimacy of the listing.

Mr. Schillaci and one anonymous commenter expressed concern over EPA’s involvement in the Site area. One anonymous commenter commented that Silverton does not need EPA involved. Mr. Schillaci commented that if the EPA moves forward with NPL listing, then EPA must involve the community otherwise he could not defend the EPA.

Response: The Superfund program offers numerous opportunities for public participation at NPL sites. To coordinate these efforts, a Community Involvement Plan (CIP) is prepared for each site. The CIP is the “work plan” for community relations activities that EPA will conduct during the entire cleanup process. In developing a CIP, interviews are conducted with state, local and tribal officials, as well as with interested citizens, to learn about community concerns, site conditions, and local history. This information is used to formulate a schedule of activities designed to keep citizens apprised and to keep EPA aware of community concerns.

Region 8 will prepare a BPMD CIP for communities in that region. It will conduct interviews and collect demographic data for Silverton, Durango, San Juan County, La Plata County, the Southern Ute Indian Tribe and the Ute Mountain Ute Tribe. Additionally, Regions 6 and 9 will each prepare a region-specific addendum to the BPMD CIP to ensure outreach to communities in New Mexico and Navajo Nation. As the regions implement their CIPs, Region 8 will continue to share technical information, materials and documents with Regions 6 and 9 staff to support community involvement activities within their respective regions.

Typical community involvement activities that are incorporated in a CIP include:

- Public meetings at which EPA presents a summary of technical information regarding the Site and citizens can ask questions or comment.
- Small, informal public sessions at which EPA representatives are available to citizens.
- Development and distribution of fact sheets to keep citizens up-to-date on site activities.
- Maintenance of a site-specific website.

For BPMD, information repositories will be established in each of the three regions. The information repositories will contain reports, studies, fact sheets, and other documents containing information about the Site. The repositories will be updated continually with new documents and materials.

Community outreach will continue throughout the duration of the remedial process. After the Remedial Investigation/Feasibility Study (RI/FS) is completed and EPA has recommended a preferred cleanup alternative, a Proposed Plan outlining the cleanup alternatives studied and explaining the process for selection of the preferred alternative will be sent to all interested parties. At this time, EPA also begins a public comment period during which citizens are encouraged to submit comments regarding all alternatives. Once the public comment period ends, EPA develops a Responsiveness Summary, which contains EPA responses to public comments. The Responsiveness Summary becomes part of the Record of Decision (ROD), which provides official documentation of the remedy chosen for the Site.

Interim cleanup actions may be taken at the BPMD prior to the development of a ROD. The community will be engaged as decisions about these potential interim cleanup actions are made.

While community engagement is of utmost importance to EPA throughout the cleanup process, these comments result in no change to the HRS score and no change in the decision to place the Site on the NPL.

3.7 Delays Caused by Listing

Comment: Trout Unlimited and Mark Levin expressed concern that adding the Site to the NPL might result in mines being unnecessarily tied up in an NPL designation. Trout Unlimited stated that “[i]f and when identified NPL sites are deemed inappropriate for continued listing, release them.” Mr. Levin asserted that the fear of liability might slow down cleanup efforts.

Response: Consistent with CERCLA and the NCP, the EPA has in place an orderly procedure for identifying and delisting sites where releases of substances addressed under CERCLA have occurred or may occur, placing such sites on the NPL, evaluating the nature and extent of the threats at such sites, responding to those threats, and deleting sites from the NPL. The purpose of the initial two steps is to develop the NPL, which identifies for the States and the public those sites that appear to warrant remedial action (56 FR 35842, July 29, 1991). The evaluation or remedial investigation/feasibility study (RI/FS) phase involves on-site testing to assess the nature and extent of the public health and environmental risks associated with the site and to determine what CERCLA-funded remedial actions, if any, may be appropriate. After a period of public comment, the EPA responds to those threats by issuing a Record of Decision which selects the most appropriate alternative. The selected remedy is implemented during the remedial design/remedial action phase. Finally, the site may be deleted from the NPL when the EPA determines that no further response is appropriate.

Regarding deletion of a site from the NPL, deletion is a separate stage in the Superfund process and that action will be considered at the appropriate time, in accordance with the NCP. The regulations governing deletion of sites from the NPL (40 CFR 300.425(e)) specify that:

EPA shall consult with the state on proposed deletions from the NPL prior to developing the notice of intent to delete. In making a determination to delete a release from the NPL, EPA shall consider, in consultation with the state, whether any of the following criteria has been met:

- (i) Responsible parties or other persons have implemented all appropriate response actions required;
- (ii) All appropriate Fund-financed response under CERCLA has been implemented, and no further response action by responsible parties is appropriate; or
- (iii) The remedial investigation has shown that the release poses no significant threat to public health or the environment and, therefore, taking of remedial measures is not appropriate.

Regarding any perceived delay in cleanup due to liability concerns, the length of time that it takes for remediation at a site does not impact the NPL eligibility of a site. Potentially responsible parties (PRPs) can affect remedy selection, as can any other member of the public, through the public comment process. PRPs may undertake the RI/FS and/or remedial design/remedial action stages under EPA supervision and pursuant to appropriate agreements with governmental authorities (under enforcement authorities of CERCLA or those of other statutes). The listing process does not encumber or preclude PRPs from entering into these agreements. The EPA has entered into such agreements between proposal and promulgation at other sites. Throughout the Superfund process, the EPA is able to work with property owners to resolve any liability concerns (liability is discussed in detail below in section 3.8, Liability, of this support document).

The superfund process allows the agency to include expedited removal actions and interim measures to address more immediate concerns or address portions of the site. Typically a site of this size will be broken out into operable units with remedies selected for portions of the site allowing those portions to be deleted from the NPL in advance of complete site clean-up. Additionally, EPA can work closely with land owners to clarify the status of the investigation/clean up actions at individual parcels and to facilitate land transfers and re-use or redevelopment.

These comments result in no change to the HRS score and no change in the decision to place the Site on the NPL.

3.8 Liability

Comment: SGC, NMED, OSMI, Trout Unlimited, Mr. William Corwin, Mr. Tom Schillaci, Mr. Mark Levin, Mr. William Simon, and three anonymous commenters expressed concern regarding the assignment of liability for the contamination associated with the Site.

SGC stated that the responsibility for the Site's environmental condition rests with numerous parties, historical and present, private and public, and listing must ensure the fair apportionment of responsibility and liability for costs.

NMED, SGC, Mr. Schillaci, and Mr. Simon inquired about the liability associated with discharges from the mines including whether federal agencies could be liable. Mr. Simon commented that the American Tunnel discharges onto BLM land, asserting that this makes BLM the current operator. Mr. Schillaci commented that SGC would claim that SGC has fulfilled all legal obligations identified in the Consent Decree with the State of Colorado. NMED commented that if the Site is ultimately placed on the NPL, EPA's own liability for what happened prior to, during, and after the Gold King Mine release will affect EPA's decisions concerning the cleanup of the upper Animas River Basin. NMED also asserted that the State of Colorado bears responsibility for decades of discharges from the Upper Animas Mining District – both inside and outside of the proposed NPL Site – as well as the August 5, 2015, blowout of the Gold King Mine, and the State of Colorado would also have a conflict of interest.

NMED, Mr. Simon, and two anonymous commenters contended that the EPA and the State of Colorado caused the release at the Gold King Mine, and questioned EPA's objectivity in the listing process. NMED commented that the Site is like no other Superfund site in existence because a major portion of the contamination at the proposed site was directly caused by Colorado's and EPA's conduct at the Gold King Mine. An anonymous commenter asserted that EPA personnel might have planned to discharge the Gold King Mine in August of 2015, and suggested that EPA purposefully let the Gold King Mine waste discharge from the mine. The anonymous commenter stated that EPA has intentionally tried to generate conditions to force the Site being added to the NPL.

Trout Unlimited, Mr. Simon, and Mr. Schillaci expressed concern that current liability laws prevented Good Samaritan actions towards remediation of contamination. Mr. Simon commented that determining various complex scientific and technical issues would exacerbate any legal actions used to determine what entities are responsible for loading to Cement Creek. Mr. Simon commented that for EPA to work collaboratively with other

groups, EPA would need to negotiate to establish that no single entity is liable for the entire Site. An anonymous commenter stated that many contributing sources cannot be assigned responsibility.

OSMI and Mr. Levin commented that the EPA names all current and past owners of mines as PRPs liable for cleanup costs. OSMI further asserted that PRPs would attempt to assert that other companies or individuals are liable, “pitting individuals within the community against each other.” Mr. Levin commented that entities that might be ordered to pay for cleanup could litigate against all other PRPs to recover some portion of the cost for remedial actions for which they are ordered to pay. Mr. Levin asserted that the fear of liability might slow down cleanup efforts.

Mr. Schillaci commented that Kinross needs to acknowledge that the Sunnyside mine pool is the reason water now drains from the Mogul, Red & Bonita, and Gold King #7 level. Mr. Schillaci commented that to date, SGC has not taken responsibility for that unintended consequence and that EPA needs to fully explain who authorized the contractor to use an excavator to open the Gold King Portal. Mr. Simon commented that entities were erroneously being labeled as liable, at least in part, for the contamination present. Mr. Simon asserted that SGC is being blamed for trying to address contamination associated with the mine.

Mr. Corwin and an anonymous commenter submitted comments expressing that funding should be secured based on perceived liability for the Site. An anonymous commenter noted that “those who profited” from the metals mining should pay for remediation rather than taxpayers. Mr. Corwin commented that the water treatment facility to treat the metals loading in the Animas River should be federally funded with proceeds from the mining operations to make up a portion of the costs.

Response: Concerns regarding the assignment of liability for the contamination in the Bonita Peak Mining District are not taken into account by the HRS, and are therefore not relevant to the decision to place the Site on the NPL; nor is liability assigned based on the listing of the Site. As stated in the proposed rule, liability is not considered in evaluating a site under the HRS. The NPL serves primarily as an informational tool for use by the EPA in identifying those sites that appear to present a significant risk to public health or the environment. Listing a site on the NPL does not reflect a judgment on the activities of the current or past owner(s) or operator(s) of a site. It does not require those persons to undertake any action, nor does it assign any liability to any person. This position, stated in the legislative history of CERCLA, has been explained more fully in the Federal Register (48 FR 40674, September 8, 1983, and 53 FR 23988, June 24, 1988). See *Kent County v. EPA*, 963 F.2d 391 (D.C. Cir. 1992).

Regarding the NMED’s comments that EPA is responsible for the Gold King Mine release on August 5, 2015, these issues are not accounted for in the process of proposing and placing a site on the NPL. Evaluating if a site is eligible for proposal to the NPL is based on the technical analysis provided by the Hazard Ranking System.

These comments result in no change to the HRS score and no change in the decision to place the Site on the NPL.

3.9 Alternatives to Listing/Defer Listing

Comment: Mr. Stephen Fearn, CMA, OSMI, Mr. Levin, Mr. Wright, Mr. Simon, and one anonymous commenter asserted that alternatives to adding the Site to the NPL are available and urged that the EPA consider these alternatives to placing the Site on the NPL.

CMA, OSMI, Mr. Levin, and an anonymous commenter stated that NPL listing is only one of a spectrum of tools available to EPA for evaluating and performing cleanup actions under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). CMA stated that rather than subject every mine and property to the Superfund process, EPA should consider a watershed approach and use alternative programs such as the State of Colorado’s voluntary cleanup program (VCUP) as appropriate to address those areas of the district that are straight forward and easy to remedy. OSMI commented that stakeholder group efforts in addition to Good Samaritan legislation should be the primary mechanism of remediation to realistic standards. CMA and Mr. Levin

added that once adequate funding is identified and provided, EPA has ample authority under other provisions of CERCLA to handle whatever is needed, in a much faster manner than that required via the NPL process.

Mr. Fearn and Mr. Simon commented that most of the mines considered in the Site could be handled through alternatives to listing on the NPL. Mr. Fearn commented that three scored mines (Vermillion Adit and Waste Rock, Brooklyn Waste Rock Pile, and Bandora Adit and Waste Rock pile) and four unscored mines (Red Cloud and Boston, Ben Butler, Eureka Fluvial Tailings, and Anglo Saxon) would be better addressed by the ARSG than by the EPA. Mr. Simon asserted that most of the mines considered, other than the Mayflower Mill and those in upper Cement Creek, should be dropped, noting that these can be addressed through alternatives to listing on the NPL.

Mr. Wright asserted that funding from EPA should be transferred to USGS and ARSG to allow these groups to determine an appropriate cleanup level based on natural background levels. Mr. Wright commented that USGS and ARSG are the best positioned to establish a not to exceed level based on natural background levels. Mr. Levin stated that “the stakeholders involved...[should] work together as a team to get a bill passed to provide dedicated major federal funding for inactive mine cleanups in the area.”

Mr. Simon commented that there is little evidence present to indicate that EPA can adequately address the Site alone. Mr. Simon commented that one option to address the Site is for EPA to work with SGC, federal land management agencies, CDPHE, and other stakeholders, and suggested working cooperatively instead of expanding resources on legal arguments.

Response: The Agency determined that placing the Site on the NPL is an appropriate approach to address the releases at the Site. As discussed in Section 3.1, Support for Listing and Other Non-Opposition Comments, of this support document, the State of Colorado and local jurisdictions are in agreement with the decision to add the Site to the NPL. Additionally, deferring remediation to Resource Conservation Recovery Act (RCRA) authority is not viable as extraction, beneficiation and certain processing mining wastes are exempted from the hazardous waste regulations in Subtitle C of RCRA. (See 42 U.S.C. §6921 (b)(3)(A)(i)-(iii); also referred to as the 1980 Bevill Amendment.)³

Throughout the Superfund process, EPA will be working closely with the State of Colorado, the Tribes, BLM, USFS and other interested stakeholder groups. Potentially responsible parties (PRPs) or members of the public may affect the remedy selection through the public participation process requirements under Superfund; listing a site on the NPL also does not prevent a PRP or another entity from undertaking voluntary response actions. The EPA makes decisions during all stages of the procedure. PRPs may also undertake the RI/FS and/or remedial design/remedial action stages under EPA supervision and pursuant to appropriate agreements with governmental authorities (under enforcement authorities of CERCLA or those of other statutes). The listing process does not encumber or preclude PRPs from entering into these agreements. Therefore, listing is an appropriate step in the Superfund process at this time and delaying the listing of the Site is not warranted.

These comments result in no change to the HRS score and no change in the decision to place the Site on the NPL.

3.10 Economic Impact

Comment: Colorado Goldfields, Mr. Fearn, Mr. Aaron Brill, Mr. Leo McCormick, Mr. Levin, and one anonymous commenter expressed concern over perceived economic impacts from an NPL designation and remediation efforts. Colorado Goldfields commented that the NPL designation would likely have a terminating effect on the entire Company due to costs required of the company as result of adding the Site to the NPL. Mr.

³ <http://uscode.house.gov/view.xhtml?path=/prelim@title42/chapter82&edition=prelim>;
<https://www.law.cornell.edu/uscode/text/42/6921>; <https://nepis.epa.gov/Adobe/PDF/100019H1.PDF>

Fearn commented that the Frisco Mill/Bagley Tunnel and the Columbus Mine contain important features that draw tourism as part of the mining heritage of San Juan County. These historic and cultural values should be considered in remediation. Mr. Brill urged the EPA to carefully consider the impact of its mitigation efforts in the Bonita Peak Mining District on Silverton Mountain's ongoing business operations. Mr. Brill commented that depending on the design and size of the water treatment facility, this could have a potentially negative impact on a significant portion of the terrain on the east and north side of Silverton Mountain. Mr. McCormick, a property owner with intentions to mine, commented that the Superfund project will severely and adversely affect his rights as a miner and as a citizen of the United States of America, and opposes the listing. Mr. Levin asserted that the long shadow of liability caused by the Site would impair property values and inhibit any future mineral extraction for decades. An anonymous commenter stated that he likes to ride ATVs in the area, but cleaning up "all these sites" will diminish tourism and the towns of Silverton, Ouray, and many others will suffer.

The Navajo Nation commented that the release of contamination from the mines impacts the local agriculture and strained individuals who were forced to expend money on bottled water and other resources that are typically provided by the river. The Navajo Nation commented that perceived economic losses have caused the Site to not be listed in the past, but in reality cleaning up the Site will be a greater economic benefit to the area than not having the Site placed on the NPL.

Response: The effects identified by the commenters are due to the releases of hazardous substances, not the placement of the Site on the NPL. The EPA notes that there are both costs and benefits that can be associated with listing a site on the NPL. Among the benefits are increased health and environmental protection as a result of increased public awareness of potential hazards. In addition to the potential for federally financed remedial actions, the addition of a site to the NPL could accelerate privately financed, voluntary cleanup efforts. As a result of the additional CERCLA remedies, there will be lower human and environmental exposure to metals, and higher quality surface water, ground water, soil, and air. Also, the EPA offers specialized training and job training grants so there are potential of economic benefits of increased jobs related to clean-up.

Potential impacts to existing businesses during remediation are routinely taken into account in developing cleanup plans. Additionally, under Superfund, EPA is required to comply with the substantive portions of all applicable regulations, including those governing cultural resources. The National Historic Preservation Act (NHPA) of 1966 established a process by which federal agencies must incorporate historic resource issues. Section 106 of the Act requires a federal agency with jurisdiction over a federal undertaking to take into account the effects of that undertaking on properties included in or eligible for the National Register of Historic Places. If adverse effects are anticipated, agreement is usually reached on measures that avoid or mitigate the effects. One example where EPA has worked with local stakeholders to preserve historical areas/structures is the [California Gulch Superfund](#) site in Leadville, Colorado.

Further, as discussed in section 3.6, Community Involvement/Coordination with States and Tribes, of this support document, the EPA will develop a CIP and the public will have an opportunity to participate in decisions involving remediation, if any, at a later stage of the Superfund process.

These comments result in no change to the HRS score and no change in the decision to place the Site on the NPL.

3.11 Adequacy of Funding

Comment: SGC, Trout Unlimited, NMED, OSMI, Colorado Goldfields, Mr. Schillaci, Mr. Levin, and Mr. Simon submitted comments questioning whether adequate funding could be secured for the costs associated with Site cleanup.

SGC commented that EPA should provide assurance that adequate funding will be made available because mere listing "does not imply that monies will be expended." SGC stated that EPA's rationale for listing must demonstrate that resources will be efficiently deployed to Site cleanup and failure to articulate such rationale

undermines the legitimacy of the listing. SGC commented that listing such a large site risks increasing the cost of remediation and specifically requested that EPA not redirect resources to issues and actions distinct from Site cleanup. SGC commented that past cooperation, voluntary cleanup, and remedial work at the Site have been diligent, successful, and cost-effective and there is “no indication that such efforts will not continue to be successful, even without listing.”

NMED commented that New Mexico must take action to protect public health and the environment and demands the requisite level of funding to do so. NMED asserted that Superfund Technical Assistance Grants (<https://www.epa.gov/superfund/technical-assistance-grant-tag-program>) be made available to stakeholders in New Mexico. NMED also commented that EPA must fully fund, through Superfund and other programs, as appropriate, state and tribal jurisdictions to conduct independent, comprehensive, and holistic watershed-scale investigations that examine the migration and fate of contaminants released by the Site.

Trout Unlimited commented that permanent funding for the Bonita Peak Mining District must be secured and urged the EPA to use any private funding that may be available, to offset the cost of this project on the American tax payer. Similarly, Mr. Simon commented that adding the Site to the NPL would result in large expenditures and remediation costs at the expense of tax payers and future generations. OSMI also commented that the proposed addition of the Site to the NPL does not guarantee funding for remediation, asserting that the funding will come at a cost to the local community.

Mr. Schillaci commented that EPA's cost recovery efforts to Kinross are further complicated by the fact that some parties are in litigation with the State of New Mexico. Similarly, Mr. Simon commented that EPA would need adequate funding to address damages from the Gold King spill and stated that that SGC withdrew its settlement offer. Mr. Simon asserted that money expended to address the Gold King mine discharge would not be recoverable, as the EPA accepted responsibility. Mr. Levin stated that, even if the Site is added to the NPL, there is no guarantee that adequate funding would be available for the Site in the future.

Colorado Goldfields commented that the Colorado Division of Reclamation, Mining, and Safety (DRMS) holds cash as a warranty for the Goldfield Tailings, which is adequate to address issues associate with the Goldfield Tailings.

Response: Funding for Site cleanup is not a consideration in determining the eligibility of a site for the NPL. CERCLA Section 105(a)(8)(A), as amended, discusses the criteria for determining priorities for responding to releases of hazardous substances and funding is not among the criteria that are considered. Additionally, the identification of a site for the NPL serves the purpose of notifying the public that the EPA believes the site warrants further investigation and future funding is not relevant to this step in the process.

Regarding the commenters' concerns about the impact of the site listing on remedial activities and attendant costs, including whether adequate funding can be secured, the Federal Register Notice (81 FR 20277, April 7, 2016) states that:

Listing a site on the NPL does not itself impose any costs. Costs that arise out of site responses result from future site-specific decisions regarding what actions to take, not directly from the act of placing a site on the NPL.

Therefore, expenditures cited by the commenters and sources of funding for these expenditures are associated with events that generally follow listing the site, not with the listing itself.

These comments result in no change to the HRS score and no change in the decision to place the Site on the NPL.

3.12 HRS Documentation Record Clarifications

Comment: SJLHC and Mr. Clark commented on clarification needed in the HRS documentation record. SJLHC commented that there are factual errors in the information EPA has published regarding “certain properties in the District.” SJLHC stated that the Boston and DeWitt Mines should not be consolidated with the Red Cloud Mine in the Other Possible Mines and Mine Related Sources in the Upper Animas River section of the HRS documentation record. SJLHC also commented that the location for the sample from the Ben Franklin Mine presented in the table of Other Possible Mine and Mine Related Sources in the Upper Animas River is incorrect. SJLHC commented that the historic sample location for DM-32 was above the Ben Franklin Mine, while the 2015 photographic record from the ESAT Sampling Report is presented below the Ben Franklin Mine. SJLHC commented that the 2015 sample location may be appropriate going forward, but it should not be compared with historic results from a different upstream location.

Mr. Clark submitted comments questioning the inclusion of the Little Nation Mine in the proposed Site. Mr. Clark commented that Reference 15 of the HRS documentation record incorrectly lists Little Nation Mine as discharging to the Upper Animas River and stated that the Little Nation Mine has no water discharge. Mr. Clark asserted that the mine described in Reference 15 is the King Solomon mine, which has water discharging into the wetlands. Mr. Clark also commented that the Little Nation and Royal Charter mines are not connected inside the mountain workings to the lower mine.

Response: These clarifications raised by the commenters only pertain to mines that are not scored as part of the Site score and have no impact on the listing decision. The commenters’ clarifications to the Ben Franklin Mine (listed as an Other Possible Mine) in the HRS documentation record at proposal are included in the docket for the Site, and EPA acknowledges these inconsistencies.

Regarding factual errors at “certain properties in the District,” specifically grouping Red Cloud and Boston Mines as one complex, Colorado Division of Minerals, whose report was referenced in the comment, presents the mines as a complex named the “Red Cloud and Boston Mine Complex.” The interconnections between the various local mine working and tunnels warrant further detailed characterization at a later stage of the Superfund process to determine the full extent of the Site.

Regarding the sample location at the Ben Franklin Mine, EPA documented the location of its 2015 sample and will appropriately evaluate historic sample locations associated with previous data collection efforts. EPA also notes the previous stream diversion efforts referenced in the comment.

Regarding the Little Nation Mine, this mine is discussed in the Other Possible Mine and Mine Related Sources section of the HRS documentation record at proposal. EPA did not score any wetlands subject to actual or potential contamination in the HRS scoring of the Site and any clarification that the Little Nation Mine does not drain to a wetland will be investigated further at a later stage of the Superfund process.

These comments result in no change to the HRS score and no change in the decision to place the Site on the NPL.

3.13 Risk to Human Health and the Environment

Comment: OSMI, La Plata County, the City of Farmington, Mr. Fearn and Mr. Simon, and one anonymous commenter questioned whether the Site poses a risk to human health and the environment.

Colorado Goldfields, Mr. Simon, and Mr. Levin commented that only a portion of what is under evaluation at the Site presents any risk. Colorado Goldfields commented that the Goldfields Tailings ponds and mill areas only represent a minor impact on the Animas River. Mr. Simon commented that 48 of the mines serve little purpose, as the real issue is impacts from draining adits in upper Cement Creek and the Mayflower Mill Tailings ponds, which account for metal loading of similar quantity as the area in Cement Creek. Mr. Simon further asserted that

to gain funding, EPA would need to establish a human health risk associated with the Site to ensure the proposed area has a high enough score to compete with other superfund sites. Mr. Simon commented that the only human health risk associated with the area is the Gold King Mine adit collapse.]

Mr. Fearn commented that structural issues on the Mayflower Tailings pile have been corrected and there is no future risk of embankment failures. An anonymous commenter stated that the “Mammoth Tunnel has no known base metal mineralization.”

La Plata County, the City of Farmington, and Colorado Goldfields questioned whether adding the Site to the NPL would result in the risks from the Site being adequately addressed. La Plata County commented that remediation on the approximately 40 mines that are identified in the listing may not adequately address the risk in the Animas watershed. OSMI asserted that the HRS evaluation of the Site does not adequately address the relative risk to public health or the environment. The City of Farmington asserted that the proposed rule does little to protect human health and environment from contamination present in the streambed that is accumulating to dangerous levels.

Response: The HRS documentation record at proposal establishes that the Bonita Peak Mining District site poses sufficient risk to human health or the environment to warrant inclusion on the NPL. However, the actual determinations of site-specific risk that these pose to human health or the environment are determined at a later stage following listing. The NPL is intended primarily to guide EPA in determining which sites warrant further investigation to assess the nature and extent of public health and environmental risks associated with a release of hazardous substances, pollutants or contaminants. See 80 FR 20277 (Proposed Rule, Bonita Peak Mining District, April 7, 2016); see also 55 FR 51532 (Final Rule, Hazard Ranking System, December 14, 1990). CERCLA § 105(a)(8)(a) requires EPA to determine NPL priorities among sites based on the “relative risk or danger to public health or welfare, or the environment.” The criteria EPA applies to determine this relative risk or danger is codified in the HRS, and is the Agency’s primary tool for deriving a site score based on the factors identified in CERCLA. The HRS evaluation and score above 28.50 represents EPA’s determination that the Site may pose a relative risk or danger to human health and the environment and warrants further investigation under CERCLA. As part of the standard Superfund process, once the Site is on the NPL, the investigations performed to date to characterize the Site will be evaluated for completeness, further information will be collected if deemed necessary to adequately characterize the risks posed by the Site, and based on this information, a risk assessment decision will be made determining what, if any, remedial action is necessary to protect human health and the environment.

Regarding La Plata County, OSMI, the City of Farmington, and Colorado Goldfields concerns that listing and subsequent remediation may not address the risks associated with the Site, as noted in section 3.3, Site Boundaries, and 3.7, Delays Caused by Listing, of this support document, the RI/FS phase involves on-site testing to assess the nature and extent of the risks associated with the site and to determine what CERCLA-funded remedial actions, if any, may be appropriate. After a period of public comment, the EPA responds to those threats by issuing a Record of Decision which selects the most appropriate alternative. The selected remedy is implemented during the remedial design/remedial action phase. Thus, at a later stage in the Superfund process following listing, risks are identified and addressed as appropriate. Comments regarding remedy selection and remediation are addressed in section 3.16, Remediation, of this support document.

These comment result in no change to the HRS score and no change in the decision to place the Site on the NPL.

3.14 Data Sufficiency/Data Availability/EPA Bias

Comment: NMED made numerous comments on EPA’s and the State of Colorado’s objectivity at this site and suggested that additional data be included. NMED stated that due to its past interactions with EPA over the Gold King Mine blowout and the post-blowout response, NMED has concerns about EPA’s ability and willingness to administer any Superfund process in an open, objective, and rigorous manner. Similarly, SGC commented that the EPA should incorporate the results of its studies (studies of the area in response to the August 2015 release at the

Gold King Mine's Level 7 Adit) into its listing analysis to better inform the listing decision and more accurately address risks to human health and the environment.

NMED stated that since the fall of 2015, EPA has sought to exert inappropriate control over the methods, scope, and parameters of New Mexico's long-term monitoring program and has effectively eliminated the program. NMED commented that EPA has demonstrated a self-serving bias in monitoring and assessing the impacts and risks from the spill that EPA caused and it would be inappropriate for EPA to control or conduct monitoring in New Mexico while remediating the BPMD site. NMED commented that EPA's own liability for what happened prior to, during, and after the GKM release will affect EPA's decisions concerning the cleanup of the upper Animas River Basin.

NMED commented that EPA must take additional steps in this case to assure all affected parties that all decisions concerning the cleanup of the BPMD Site are well founded in data and made in an open and collaborative manner without concern for EPA's or Colorado's own liability. NMED asserted that EPA needs to ensure that it is presenting consistently honest information to stakeholders and the public, and the Site listing needs to be truthful, accurate, and grounded in good science. EPA has repeatedly asserted that water and sediment in the Animas River have returned to pre-spill conditions. Despite repeated requests by NMED that EPA provide the scientific basis for this assertion, NMED commented that EPA has failed to provide any adequate basis.

NMED stated that EPA has referenced a fate and transport model developed for the Animas and San Juan Watersheds that has purportedly undergone peer review and that can be used to determine current stream quality and sediment conditions; however, NMED stated that this model has not been made available to the stakeholders. Without insight into the model's assumptions and core dataset, it is impossible for states, tribes, and other critical stakeholders to verify the conclusions it produces. Based on these experiences, NMED fears that EPA will employ similarly poor scientific data collection practices and analysis throughout the Superfund process.

Finally, NMED commented that EPA must fully fund, through Superfund and other programs as appropriate, state and tribal jurisdictions to conduct independent, comprehensive and holistic watershed-scale investigations, free of any bias and interference from EPA, that examine the migration and fate of contaminants released by the BPMD Site.

Response: The data used in the HRS evaluation of the Site is sufficient to support the HRS evaluation and the proposed NPL listing and has been made available to the public. NMED has not identified any bias, error or inappropriate use of data in the scoring of the Site.

EPA used appropriate levels of data and investigation in determining the HRS score for the Site consistent with HRS regulation. As explained in the preamble in the Federal Register notice promulgating the present HRS (55 FR 51533, December 14, 1990), Congress, in discussing the substantive standards against which HRS revisions could be assessed, states:

This standard is to be applied within the context of the purpose for the National Priorities List; i.e., identifying for the States and the public those facilities and sites which appear to warrant remedial actions. . . . This standard does not require the Hazard Ranking System to be equivalent to detailed risk assessments, quantitative or qualitative, such as might be performed as part of remedial actions. This standard requires the Hazard Ranking System to rank sites as accurately as the Agency believes is feasible using information from preliminary assessments and site inspections. . . . Meeting this standard does not require long-term monitoring or an accurate determination of the full nature and extent of contamination at sites or the projected level of exposure such as might be done during remedial investigations and feasibility studies. This provision is intended to ensure that the Hazard Ranking System performs with a degree of accuracy appropriate to its role in expeditiously identifying candidates for response actions [H.R. Rep. No. 962, 99th Cong. 2nd Sess. at 199-200 [1986]].

The Courts have supported this position in stating:

The HRS is intended to be a “rough list” of prioritized hazardous sites; a “first step in a process-- nothing more, nothing less” *Eagle Picher Indus. v. EPA*, 759 F.2d 922, 932 (D.C. Cir. 1985) (*Eagle Picher II*). EPA would like to investigate each possible site completely and thoroughly prior to evaluating them for proposal for NPL, but it must reconcile the need for certainty before action with the need for inexpensive, expeditious procedures to identify potentially hazardous sites. The courts have found EPA's approach to solving this conundrum to be “reasonable and fully in accord with Congressional intent.” *Eagle Picher Industries, Inc. v. EPA*, (759 F.2d 905 (D.C. Cir. 1985) *Eagle Picher I*).

NMED comments did not provide substantive reasons why the data used in the HRS evaluation of the Site is suspect or biased. Inasmuch as NMED's comments pertain to potential future remedial activities, remediation is not considered at this stage in the Superfund process (see section 3.16, Remediation, of this support document). Regarding the Gold King Mine, the HRS documentation record at proposal scored the adit discharge and the waste rock piles at the Gold King Mine as part of the Site and appropriately documented the impacts from these sources at the mine. The Agency did not include the August 5th, 2015 release at the Gold King Mine as part of the HRS Site score in the HRS documentation record at proposal as the mine scores above 28.50 using the adit discharge and waste rock piles and qualifies for listing. The additional discharge from the August 5th release could have been included in the evaluation of the Gold King Mine; however, including the data would not impact the listing decision.

Regarding New Mexico's long-term monitoring program, this program and data collected under it does not impact the HRS scoring of the BPMD site. Rather, as stated above, the data used to perform the HRS site evaluation was provided in the HRS package, made available in the public docket, and is sufficient to support the HRS scoring of the Site and its proposal to the NPL.

Regarding the fate and transport model developed for the Animas and San Juan Watersheds, this model is not included in the HRS documentation record at proposal because it was not needed to qualify the Site for placement on the NPL. The HRS documentation record includes all relevant data used to score the Site at proposal and the BPMD site is sufficiently scored based on the data presented. NMED will have opportunity to discuss the result of the model for consideration in further stages of the Superfund process.

These comments result in no change to the HRS score and no change in the decision to place the Site on the NPL.

3.15 Permitted Releases/Discharges

Comment: Colorado Goldfields, Mr. Simon, and Mr. Levin commented that many of the mines under evaluation contain permits for discharges and/or releases that include plans for future monitoring. Mr. Simon commented that the agencies allowed the permits from the Gold King Mine and American Tunnel to lapse and that the BLM does not have a discharge permit. Mr. Levin commented that all of the inactive mines operated under applicable laws during their time in operation. Regarding Howardsville, Colorado – Goldfields Tailings, Colorado Goldfields commented that the current permit includes a plan for monitoring ground water, which would be better to define the source of a historic drainage from the Goldfields Tailings.

Response: Releases and/or discharges that are permitted are eligible for consideration under CERCLA and inclusion in HRS scoring. The fact that the release may have been “Federally-permitted” does not preclude listing. CERCLA Section 105(a)(8)(B) directs the EPA to list on the NPL “releases” of hazardous substances, pollutants, and contaminants according to specific criteria set out in CERCLA Section 105(a)(8)(A). The definition of “release” in CERCLA Section 101(22) exempts certain releases from its scope, but it does not exempt “Federally-permitted releases”; thus, even if discharges occur within the regulatory limits set by those Federal laws

enumerated in CERCLA Section 101(10), so as to constitute “Federally-permitted releases,” the discharges may be considered releases under CERCLA and, if appropriate under the HRS, and placed on the NPL. CERCLA exempts “Federally-permitted releases” only from the notification (Section 103(a) and cost-recovery (107(j)) sections of the statute; such releases remain subject to the other sections of the statute. The absence of a permit for discharge to or from BLM lands does not affect the listing decision.

Comments regarding the impact of remediation and/or monitoring plans within permits on remediation of the Site are addressed in section 3.16, Remediation, of this support document.

Insomuch as the comments infer that agencies issuing permits are liable for releases allowed under a permit, liability is not considered in evaluating a site under the HRS. See section 3.8, Liability, of this support document.

These comments result in no change to the HRS score and no change in the decision to place the Site on the NPL.

3.16 Remediation

Comment: SGC, the Navajo Nation, SJLHC, NMED, OSMI, Colorado Goldfields, Trout Unlimited, La Plata County, Colorado Mining Association, the City of Farmington, Mr. Corwin, Mr. Schillaci, Mr. Brill, and an anonymous commenter submitted comments regarding remedial activities.

The Navajo Nation, SJLHC, NMED, and Mr. Simon commented that several approaches should be considered in evaluating the Site, including:

- Addressing water quality goals strategically by integrating multiple programs.
- Developing separate operable units.
- Collecting one or more contemporaneous background surface-water samples from area unaffected by mining but with the same hydrothermal alteration that is present in mine-impacted areas.
- Sampling before and after the adit drainage contacts the waste rock pile immediately downstream of the adit.
- Considering a watershed/adaptive management approach for the Site.
- Addressing high loading sources through the Superfund process and lower loadings sources through alternative programs.
- Examining the migration and fate of contaminants released by the Site.
- Considering whether anaerobic conditions can be generated to abate acid mine drainage processes.
- Using a lime treatment method to address the mines in the area, although it has drawbacks.

The Navajo Nation commented that best practices should be implemented before conducting remedial actions to ensure that no further releases will occur and they urged that continuous water quality monitoring should occur throughout the Superfund process. The Navajo Nation and SJLHC stated that cultural, ecological and recreational impacts should be evaluated in the remediation analysis and goals.

La Plata County questioned the effectiveness of the remediation of the mines considered. La Plata County commented that remediation on the approximately 40 mines that are identified in the listing may not adequately address the risk in the Animas watershed.

Mr. Brill, Mr. Fearn, and an anonymous commenter asserted that remedial activities could result in increased risks to human health. Mr. Fearn further commented that any remediation at the Eureka Fluvial Tailings mine would actually be more damaging than allowing natural processes to continue to clean the channel since upstream sources have been removed. Mr. Brill commented that there is a need for a cellular tower to be installed to provide adequate communications between the EPA, Silverton Mountain, and any/all users of CR110. Mr. Brill also commented that a plan should be put in place in the remediation of the Site to ensure deterioration of the road does not increase.

The City of Farmington and 36 members of business and organizations expressed concern over the long-term monitoring of the contamination associated with the Site. The City of Farmington asserted that the proposed rule does not present a needed adequate long-term monitoring plan. The City of Farmington also commented that the proposed rule did not present a plan to address contamination in New Mexico or from exposure from events like the August 2015 event.

Mr. Corwin questioned whether future operations would be monitored. Mr. Corwin commented that if mining operations restart, they should be required to pretreat waste at the mine and be assessed fees for ongoing operations.

SJLHC and Mr. Simon expressed concern over the costs associated with remediation. SJLHC asserted that the approach of separating out low and high loading sources would result in a cost-effective approach to addressing properties where an RI/FS may not be needed. Mr. Simon commented that a lime treatment method is an option to address the mines in the area but this method is costly and undesirable.

Trout Unlimited commented that certain standards should be in place for remedial goals, asserting that:

- The primary objective and/or point of compliance should be to meet EPA Aquatic Life Standards at USGS gauging station A72.
- A measure of success for Cement Creek water quality improvements would be to reestablish a trout fishery in the Animas gorge between Silverton and (roughly) the Cascade Creek confluence, and meeting aquatic life standards at A72 would accomplish this.

Trout Unlimited referred to the remediation of other areas as a suggested approach and considerations of improving water quality for aquatic life, noting improvements in water quality in Cement Creek would positively impact the basin and fisheries. Trout Unlimited commented that it supports implementation of a permanent waste water facility for the Gladstone area to treat discharges from Gold King, American Tunnel, Red and Bonita, Mogul, and Silver Ledge discharges to improve water quality. Trout Unlimited commented that the EPA should make the remediation of the Bandora Mine a priority.

OSMI, Colorado Mining Association, and Mr. Wright submitted comments regarding the attainment of specific remedial goals. OSMI commented that the lack of appropriate background sample locations is likely to contribute to unreasonable water quality expectations and cleanup goals. Colorado Mining Association commented that EPA should include assessment of natural background levels that consider mineralization and hydrothermal alteration in its sampling program to ensure remedy selection is based on achievable results. Mr. Wright commented that EPA should establish a cleanup goal equal to natural background of that loading.

Colorado Goldfields and an anonymous commenter asserted that monitoring or remediation of contamination in the area of the Site is ongoing. Colorado Goldfields commented that extensive monitoring data is available from the monitoring of the Goldfields Tailings and commented that it has been monitoring the Goldfield Tailings from 2011-2015 and submitted results to DRMS, which did not identify any problems during this time. An anonymous commenter asserted that most of the mines considered have been subject to cleanup activities over the past 25 years.

The City of Farmington expressed concern regarding the impact of adding the Site to the NPL on the water supply used by the City of Farmington. The City of Farmington commented that EPA should consider the impact of its mitigation efforts and commented that a dedicated pipeline to Lake Nighthorse supplying potable water is crucial. The City of Farmington stated that “[I]anguage to begin a dedicated pipeline feasibility study in the Proposed Rule is timely.

Mr. Simon expressed concern regarding the risk identification and ultimate remediation. Mr. Simon commented that one option is EPA continuing to identify risks and generating a score sufficient for adding the Site to the NPL.

CMA, Trout Unlimited, SJLHC, Mr. Schillaci, Mr. Brill, Mr. Bachman, an anonymous commenter, and 36 members of several business and organizations submitted comments addressing the remediation of the vicinity of the Site. Mr. Schillaci commented that in the absence of Good Samaritan liability protection that would enable third-party watershed groups to clean up some of the draining mines in San Juan County, CO, there is a vacuum that can be filled through CERCLA Removal Actions and Remedial Action. Trout Unlimited and CMA commented that there is a wealth of knowledge and past experiences that can be used in identifying a remedy for the Site. SJLHC and Mr. Brill expressed concern regarding the impact of remediation. SJLHC and Mr. Bill asserted that the significance, either cultural or economic, in the area should be considered in designing a remedy. Thirty-six members of several businesses and organizations commented that the EPA can take practical steps this coming spring (after access to the area is made available by spring snowmelt) to improve the quality of the Animas River. Trout Unlimited, Mr. Simon, and Mr. Schillaci commented that various technologies and approaches for abatement of contamination should be evaluated in the efforts to remediate the Site. An anonymous commenter requested that no further pollution be emitted during cleanup actions. Mr. Bachman suggested the initiation of a snow avalanche inventory concurrent with the proposed assessment and remediation of the Site because the geologic hazard presented by seasonal snow avalanche could have possible impacts on project activities and results. A local resident stated that due to the risk at the Site, remediation must be initiated before responsibility is determined.

Response: Decisions regarding whether remedial actions will occur and which approach to remediation should be employed are not determined at the listing stage of the Superfund process but occur in the remedial stage of the Superfund process. Consistent with CERCLA, the EPA has in place an orderly procedure for identifying sites where releases of substances addressed under CERCLA have occurred or may occur, placing such sites on the NPL, evaluating the nature and extent of the threats at such sites, responding to those threats, and deleting sites from the NPL. The purpose of the initial two steps is to develop the NPL, which identifies for the States and the public those sites that appear to warrant remedial action. The evaluation or remedial investigation/feasibility study (RI/FS) phase involves on-site testing to define the nature and extent of the threat posed by the contamination and to identify alternatives for remedial action, if needed. Also, as stated in Section 3.6, Community Involvement/Coordination with States and Tribes, of this support document, EPA will prepare a Community Involvement Plan (CIP) for the BPMD site. The CIP is the “work plan” for community relations activities that EPA will conduct during the entire cleanup process and community outreach will continue throughout the duration of the remedial process.

Regarding Colorado Goldfields and an anonymous commenter’s assertions that future planned remedial actions were not appropriately considered in evaluating whether the Site merits inclusion on NPL, future actions are not a factor in evaluating whether a site qualifies for the NPL. The EPA makes decisions during all stages of the procedure to add sites to the NPL; however, PRPs may undertake the RI/FS and/or remedial design/remedial action stages under EPA supervision and pursuant to appropriate agreements with governmental authorities (under enforcement authorities of CERCLA or those of other statutes). The listing process does not encumber or preclude PRPs from entering into these agreements. The EPA has entered into such agreements and such an alternative is available to the commenter.

3.17 Consideration of Removal and Reclamation Actions/Current Conditions

Comment: SGC, Colorado Goldfields, Mr. Fearn, and an anonymous commenter commented that aspects of removal actions, reclamation activities, and current conditions were not adequately considered in evaluating the Site.

Colorado Goldfields and an anonymous commenter commented that portions of the Site are in reclamation or have been removed. Colorado Goldfields commented that two of the existing tailings ponds are in reclamation under the current Colorado DRMS permit. An anonymous commenter commented that most of the mines considered have had reclamation projects completed by state and Federal grant monies. Colorado Goldfields commented that in 1997 Sunnyside Gold Corporation removed 84,000 cubic yards of tailings and water quality monitoring before and after the removal indicates that the removal reduced the impact from the tailings.

SGC commented that the remedial actions completed by SGC and other agencies have contributed to considerable Site cleanup. SGC asserted that it has met all regulatory environmental requirements and complied with its permit. SGC commented that the State of Colorado, the ARSG, the BLM, and the U.S. Forest Service have worked to help remediate locations in the Site. SGC also asserted that the HRS evaluation of the Site does not include consideration of historical cooperative and collaborative actions completed.

SGC commented that although NPL listing may advance the additional work needed in the area, there are several considerations, including that:

- SGC has worked cooperatively with Federal and State agencies, stakeholders and other parties to reclaim or remediate multiple locations within the proposed Site, expending in excess of \$15 million.
- SGC has removed tailings and mine waste, capped tailings, addressed discharge and drainage issues, eliminated discharge, installed liners, captured runoff, prevented infiltration, restored streams and wetlands, and conducted studies and analysis. SGC referred to Exhibit 3 of its comment document, docket ID EPA-HQ-OLEM-2016-0152-0054.
- SGC has conducted extensive remedial actions that have appreciably improved water quality and reduced Sunnyside mine drainage.
- SGC immediately began reclamation projects pursuant to an approved Mined Land Reclamation Plan that included bulk-heading to isolate water in the mine.
- Other parties, including ARSG, have been analyzing water quality, searched for remedial methods, and worked to improve water quality in the area.

SGC commented that voluntary cleanup actions have occurred. SGC commented that much remedial work conducted by SGC has been on property not owned, operated, or disturbed by SGC.

SGC commented that it and the Colorado Water Quality Control Division (WQCD) resolved a permitting issue in a May 1996 Consent Decree, which was reviewed by EPA and approved by a Colorado District Court⁴. SGC commented the following regarding its Consent Decree.

- The Consent Decree required SGC to install bulkheads in underground mine workings to reduce or eliminate drainage through the American Tunnel and Terry Tunnel, to operate a water treatment facility near American Tunnel and complete other projects in the area.
- The Consent Decree included that installation of bulkheads in the Sunnyside Mine workings would likely create new seeps and springs as the water table elevation increased behind the bulkheads. WQCD considered this outcome to be consistent with reestablishing the natural pre-mining hydrology, or reaching physical equilibrium, in the area.
- WQCD and the Colorado District Court found that the settlement embodied in the Consent Decree was lawful under the Colorado Water Quality Control Act and WQCD agreed that the Consent Decree conditions had been satisfied.

Colorado Goldfields and Mr. Fearn commented that current conditions were not taken into consideration in evaluating the Site for HRS purposes. Colorado Goldfields commented that Reference 15 of the HRS package is

⁴ See Exhibit 4 of the SGC comment submission for a complete copy of the May 1996 Consent Decree.

not current and does not take into consideration current conditions or remediation work completed. Mr. Fearn commented that some of the information used in evaluating many of the sites did not represent current remediation work.

Mr. Fearn commented that information on many of the sites is incorrect and does not represent remediation work that has been accomplished within the last 15-20 years and therefore does not represent current conditions. For mines that were scored in the HRS documentation record:

- Henrietta Mine Adit – discharge was re-routed around the waste piles.
- Henrietta Waste Rock Pile – Top of the waste rock was covered in geosynthetic clay layer and run-on/run-off controls were installed. Additionally, waste rock was removed from contact with the stream.
- Lark Mine Adit – Drainage was diverted around the mine waste pile and collected.
- Joe and Johns Mine Adit - Drainage was diverted around the mine waste pile and collected.

For mines that were not scored but were listed as other possible sources in the HRS documentation record at proposal, the commenter noted that some have had actions completed on property to minimize the source areas making the estimates of metal loading out of date.

Colorado Goldfields expressed concern over whether adding the Site to the NPL would affect continued reclamation. Colorado Goldfields commented that adding the Goldfields Tailings to the NPL would affect the ability of the operator to continue reclamation.

An anonymous commenter commented that remedial actions have limited the environmental impacts from the Mammoth Tunnel. An anonymous commenter asserted that the Mammoth Tunnel had settling ponds that were funded by grant monies and the water from the Mammoth is entering completely into the ground with no discharge from the property.

Response: The Site has been appropriately evaluated with respect to removal and /or reclamation actions and current site conditions. The removal/reclamation actions and post-removal conditions have been evaluated, and the Site qualifies for listing because not all the risks posed to human health and the environment by the past, and potentially future, releases at the Site have been addressed. These actions neither removed all the hazardous substances from the 19 mines and mine-related sources that were scored as part of the HRS evaluation, nor did they address the releases of those hazardous substances that occurred prior to the actions.

Removal actions are generally considered in an HRS evaluation when documentation clearly demonstrates there is no remaining release or potential for a release that could cause adverse environmental or human health impacts.

As shown in section 4.1.2.1, Likelihood of Release, on pages 141-144 of the HRS documentation record at proposal and defended in section 3.23, Likelihood of Release - Observed Release Direct Observation, of this support document, an observed release by direct observation has been established in surface water for each mine at the Site. The commenters have not claimed that releases to the surface water migration pathway have been totally addressed. Comments regarding actions to contain/maintain/remove-relocate source materials also do not identify that any specific source has been completely removed from the Site; and, none of the mines or sources scored in the HRS documentation record at proposal have been completely contained as defined by the HRS. Accordingly, based on the fact-specific circumstances in this rulemaking, the EPA believes that, consistent with its policy, it is not appropriate to consider the removal/reclamation actions in the scoring of the BPMD site.

Regarding comments on specific sources evaluated in the HRS scoring at the Site, see sections 3.22, Sources, 3.22.1, Source Containment, and 3.22.2, Source Waste Quantity, of this support document. These mines and mine-related sources meet the HRS criteria for a source and will be characterized more fully at a later stage of the Superfund process, and the data referenced by some commenters will be considered at that time.

Regarding mines not scored in the HRS evaluation of the Site but discussed in the Other Possible Mines and Mine Related Sources section of the HRS documentation record at proposal, these mines have no impact on the Site score, but will be further characterized at a later stage of the Superfund process. The other possible mines and mine-related sources are areas EPA is considering for further investigation because information suggests they are contributing to the contamination in the watershed. As noted in section 3.22.3, Other Possible Mines/Sources, of this support document, none of the remedial actions that the commenters allege have occurred at the mines would result in the source containment dropping to zero; therefore, these actions have no impact on their inclusion as other possible mines or mine related sources.

These comments result in no change to the HRS score and no change in the decision to place the Site on the NPL.

3.18 Relative Impact of mines

Comment: Mr. Fearn commented that several of the scored and non-scored mines in the HRS documentation record at proposal have a relatively small, or insignificant, impact on the metals loading in the watershed when compared to the total metals being released. Mr. Fearn commented that mines with a relatively minor impact compared to the major sources of metal loading should be removed from consideration as part of this listing. OSMI commented that the HRS evaluation failed to consider the relative impact of the mines on hazardous substance loading within Cement Creek, Mineral Creek, and the Animas River below the confluence of the three tributaries.

Response: The HRS documentation record at proposal scored actual/quantifiable contamination from each of the uncontained hazardous waste sources and the actual release of hazardous substances to the watershed. At this Site, direct observations of mine waste documented to contain hazardous substances have been established to be entering the surface water from each scored mine. See section 3.24, Likelihood of Release - Observed Release Direct Observation, of this support document for discussion on the documentation of an observe release by direct observation at the Site. The HRS scoring of the surface water migration pathway is documented according to the requirements specified in the HRS and there is no requirement to compare the relative impact of a release at a mine to any other mine or the overall hazardous substance loading at the watershed. Any further evaluation to determine the relative impacts from each mine may be determined at a later stage in the superfund response process.

This comment results in no change to the HRS score and no change in the decision to place the Site on the NPL.

3.19 Lead Benchmark

Comment: NMED and the City of Farmington commented that benchmarks for lead had not been adequately determined.

NMED asserted that lead benchmarks for soil had not been appropriately considered at listing. NMED commented that it is particularly concerned about potential exposure of children to lead-contaminated soil and sediment along the Animas River, and EPA should be equally concerned. NMED stated that samples of Gold King Mine sediment collected in La Plata County demonstrated lead levels of 3,100 milligrams per kilogram (mg/kg) in a residential setting and these levels of lead present imminent risk to human health and the environment. NMED commented that EPA's own emergency response sampling in New Mexico, Utah, and Colorado between August and October 2015 indicates the presence of lead greater than 400 milligrams per kilogram. If the Site is listed, NMED asserted that EPA should use a lead concentration of 500 mg/kg for sediment/soil, the same concentration that it has used as a screening level and cleanup target at other lead contamination sites in New Mexico and Texas.

The City of Farmington asserted that MCLs were not adequately considered for certain metals, particularly lead.

Response: The HRS does not require EPA to evaluate all hazardous substances, pollutants and contaminants and all receptors. Lead was not included in the documentation record for the Site as it was not necessary to determine NPL eligibility. EPA is able to document that this Site is eligible for the NPL based on contaminants other than lead. Regarding soil and sediment benchmarks for lead, specific to HRS evaluation purposes, there are no established benchmarks for lead in soil or sediment; this makes exposure to lead in soils less impactful to the overall site score.

Regarding the consideration of MCLs, EPA is able to document that this Site is eligible for the NPL based on the receptors identified in the documentation record. If drinking water receptors had been included in the Site evaluation, EPA would have compared concentrations to appropriate benchmark levels, such as MCLs. However, there was no need to consider MCLs in this documentation record as there were no drinking water receptors included in the HRS evaluation.

EPA is not precluded from evaluating the threats to human health and environment from any hazardous substance, pollutant or contaminant, including lead, originating from the Site sources as part of the Superfund process. Soil lead levels and cleanup criteria are addressed at a later stage of the Superfund process, the remedial investigation/feasibility study, at which time further on-site testing to assess the nature and extent of the public health and environmental risks associated with the Site and determination of what CERCLA-funded remedial actions, if any, are addressed.

These comments result in no change to the HRS score and no change in the decision to place the Site on the NPL.

3.20 CERCLA Hazardous Substances

Comment: SGC, NMED, and an anonymous commenter submitted comments on the eligibility of hazardous substances that were either included or not included in the HRS documentation record at proposal.

Response: The hazardous substances scored at this site are all substances that can be considered hazardous substances or pollutants or contaminants in the environment. The eligibility of the substances scored at this site has been re-evaluated for inclusion as site-specific pollutants or contaminants. Specific comments regarding the hazardous substances at this site are discussed in detail in the following subsections:

- 3.20.1 Dissolved Aluminum
- 3.20.2 Dissolved Manganese
- 3.20.3 Eligible Hazardous Substances
- 3.20.4 Pollutant/Contaminant - Iron

3.20.1 Dissolved Aluminum

Comment: SGC commented that technical justification is lacking for including dissolved aluminum as a CERCLA hazardous substance. SGC stated there are no Federal or State aquatic life water quality standards for dissolved aluminum; hence, there is no technical justification for it as a hazardous substance.

Response: Aluminum was identified as a hazardous substance in sources and observed releases to surface water at the Site at proposal. Whether a hazardous substance is an HRS-eligible substance is discussed in HRS Section 1.1, *Definitions*. However, EPA is removing aluminum from consideration in the scoring of the BPMD site at promulgation and will consider this contaminant at a later stage of the Superfund process.

HRS Section 1.1, *Definitions*, defines a hazardous substance as:

CERCLA hazardous substances, pollutants, and contaminants as defined in CERCLA sections 101(14) and 101(33), except where otherwise specifically noted in the HRS.

Additionally, as stated in CERCLA Section 101(33), *Pollutants and contaminants*:

The term “pollutant or contaminant” shall include, but not be limited to, any element, substance, compound, or mixture, including disease-causing agents, which after release into the environment and upon exposure, ingestion, inhalation, or assimilation into any organism, either directly from the environment or indirectly by ingestion through food chains, will or may reasonably be anticipated to cause death, disease, behavioral abnormalities, cancer, genetic mutation, physiological malfunctions (including malfunctions in reproduction) or physical deformations, in such organisms or their offspring; except that the term “pollutant or contaminant” shall not include petroleum, including crude oil or any fraction thereof which is not otherwise specifically listed or designated as a hazardous substance under subparagraphs (A) through (F) of paragraph (14) and shall not include natural gas, liquefied natural gas, or synthetic gas of pipeline quality (or mixtures of natural gas and such synthetic gas).

Aluminum has been removed from the scoring components in the HRS Documentation record at promulgation at the BPMD site. Although aluminum was documented in adit drainages and waste piles as a result of mining operations, insufficient information was presented in the HRS documentation record to allow the public to evaluate the threat aluminum poses as a pollutant or contaminant at the Site.

Removing aluminum from the HRS documentation record has no impact on any individual mine waste characteristics or on the overall Site score. Removing aluminum from scoring only impacts those mines that scored the hazardous waste quantity using Tier-A; Tier-A evaluates the hazardous constituent quantity where aluminum was included in this quantity at proposal. Hazardous waste quantities Tiers B, C and D measure only the wastestream, volume, or area, respectively, and do not measure the specific contaminant concentrations in any specific source or mine. Therefore, the Tier-A evaluations of hazardous waste quantity are revised in the HRS documentation record at promulgation to not include aluminum as a hazardous substance. This results in the Grand Mogul Mine, Mogul Mine, Red and Bonita Mine, Gold King Mine, and the American Tunnel adit discharge Tier-A hazardous constituent quantity evaluations to be re-evaluated in the HRS documentation record at promulgation. However, none of these changes to the hazardous waste quantities results in any change to the waste characteristics for the mines, individual mine scores, or to the overall Site score. These comments result in no change in the decision to place the Site on the NPL.

3.20.2 Dissolved Manganese

Comment: SGC commented that technical justification is lacking for including dissolved manganese as a CERCLA hazardous substance. (See: EPA, 2016). SGC stated there are no Federal aquatic life water quality standards for dissolved manganese; hence there is no technical justification for it as a hazardous substance.

Response: Manganese was evaluated as a hazardous substance in sources and observed releases to surface water consistent with the HRS. Whether a hazardous substance is an HRS-eligible substance is discussed in HRS Section 1.1, *Definitions*. There is no requirement that aquatic life water quality standards be established for this substance for it to be an eligible hazardous substance for HRS scoring.

Whether a hazardous substance is an HRS-eligible substance is discussed in Section 1.1, *Definitions*, of the HRS. This section of the HRS defines a hazardous substance as:

CERCLA hazardous substances, pollutants, and contaminants as defined in CERCLA sections 101(14) and 101(33), except where otherwise specifically noted in the HRS.

Regarding hazardous substances, CERCLA section 101(14) defines hazardous substances as follows:

The term “hazardous substance” means (A) any substance designated pursuant to section 311(b)(2)(A) of the Federal Water Pollution Control Act, (B) any element, compound, mixture, solution, or substance designated pursuant to section 102 of this Act, (C) any hazardous waste having the characteristics identified under or listed pursuant to section 3001 of the Solid Waste Disposal Act (but not including any waste the regulation of which under the Solid Waste Disposal Act has been suspended by Act of Congress), (D) any toxic pollutant listed under section 307(a) of the Federal Water Pollution Control Act, (E) any hazardous air pollutant listed under section 112 of the Clean Air Act, and (F) any imminently hazardous chemical substance or mixture with respect to which the Administrator has taken action pursuant to section 7 of the Toxic Substances Control Act. . . .

CERCLA Section 102 (a) states:

SEC.102. (a) The Administrator shall promulgate and revise as may be appropriate, regulations designating as hazardous substances, in addition to those referred to in section 101(14) of this title, such elements, compounds, mixtures, solutions, and substances which, when released into the environment may present substantial danger to the public health or welfare or the environment, and shall promulgate regulations establishing that quantity of any hazardous substance the release of which shall be reported pursuant to section 103 of this title.

Title 40 of the Code of Federal Regulations section 302.4⁵ lists hazardous substances that qualify as hazardous substances under section 102(a) of CERCLA as substances that are identified in the statutes referred to in CERCLA section 101(14). Title 40 of the Code of Federal Regulations section 302.4 lists manganese as a hazardous substance (40 CFR 302.4). This list references section 112 of the Clean Air Act as the designating statutory source that identifies manganese as a hazardous substance. Manganese is an HRS-eligible hazardous substance and can be scored accordingly in an HRS evaluation because it qualifies as a CERCLA hazardous substance pursuant to 40 CFR 302.4.

These comments result in no change to the HRS score and no change in the decision to place the Site on the NPL.

3.20.3 Eligible Hazardous Substances

Comment: SGC commented that the HRS documentation record should explain the basis for scoring the five “hazardous substances” — dissolved aluminum, cadmium, copper, manganese and zinc. NMED stated that during the June 9, 2016, EPA Superfund meeting in Farmington, EPA indicated that lead was not being considered at the Bonita Peak site, based on a purported lack of supporting data. NMED commented that this is very disturbing in that it may indicate an initiative by EPA to disregard lead contamination. NMED asserted that lead is present throughout the BPMD and must be addressed as a constituent of concern. NMED demands that EPA publish all information that explains how it has determined site-specific levels for lead.

Response: The hazardous substances evaluated at the Site were evaluated for scoring consistent with HRS Section 2.2.3, *Identify hazardous substances available to a pathway*, with the exception of aluminum. These hazardous substances were associated with a source with a surface water containment factor value greater than 0 for the watershed and/or met the criteria for an observed release to surface water in the watershed being evaluated. However, as noted above in section 3.21.1, Dissolved Aluminum, of this support document, dissolved aluminum is no longer being evaluated as a hazardous substance at this Site. Addition of other hazardous substances would either not change or raise the HRS site score and it would not alter the listing decision. For listing purposes not all hazardous substances at the Site need be evaluated for scoring.

⁵ 40 CFR 302.4 is available online at: http://www.ecfr.gov/cgi-bin/text-idx?tpl=/ecfrbrowse/Title40/40cfr302_main_02.tpl

HRS Section 2.2.3, *Identify hazardous substances available to a pathway*, states how to evaluate each migration pathway as far as which hazardous substances should be considered available to migrate from the sources at the site to the pathway. HRS Section 2.2.3, *Identify hazardous substances available to a pathway*, states that:

- Surface water migration—overland/flood component.
 - Hazardous substances that meet the criteria for an observed release to surface water in the watershed being evaluated.
 - All hazardous substances associated with a source with a surface water containment factor value greater than 0 for the watershed (see sections 4.1.2.1.2.1.1 and 4.1.2.1.2.2.1).

Cadmium, copper, manganese and zinc were associated with sources in the watershed and each source was documented to have a source containment factor value of greater than zero.

- Pages 30 to 39 of the HRS documentation record at proposal list hazardous substances associated with each source evaluated in the Upper Animas River; aluminum, cadmium, copper, manganese and zinc were associated with each source via sampling results. Page 40 of the HRS documentation record at proposal lists the sources evaluated in the Upper Animas River and the source containment factor value for each. Each source was documented to have a source containment factor value of 10, which meets the HRS Section 2.2.3 criteria that a value of greater than zero be met to allow the source and the hazardous substances associated with it to be considered available to the watershed.
- Pages 62 to 77 of the HRS documentation record at proposal list hazardous substances associated with each source evaluated in Cement Creek; aluminum, cadmium, copper, manganese and/or zinc were associated with each source via sampling results. Pages 78 to 79 list the sources evaluated in Cement Creek and the source containment factor value for each. Each source was documented to have a source containment factor value of 10, which meets the HRS Section 2.2.3 criteria that a value of greater than zero be met to allow the source and the hazardous substances associated with it to be considered available to the watershed.
- Pages 98 to 108 of the HRS documentation record at proposal list hazardous substances associated with each source evaluated in Mineral Creek, and aluminum, cadmium, copper, manganese and zinc were associated with each source via sampling results. Page 109 lists the sources evaluated in Mineral Creek and the source containment factor value for each. Each source was documented to have a source containment factor value of 10, which meets the HRS Section 2.2.3 criteria that a value of greater than zero be met to allow the source and the hazardous substances associated with it to be considered available to the watershed.

EPA notes that aluminum was removed from scoring of BPMD site at promulgation.

Cadmium, copper, manganese, and zinc were also associated with observed releases to the watershed. As documented on pages 141 to 144 of the HRS documentation record at proposal, an observed release by direct observation was documented to the watershed. Page 141 of HRS documentation record at proposal states the following:

Observed release by direct observation is supported by evidence of contaminant-bearing acid mine drainage entering the Upper Animas River watershed from draining mine adits and waste rock piles, as well as observing the presence of waste rock in direct contact with surface water. Section 2.2, Source Characterization for each drainage present all the sources and the hazardous substances associated with each. Adit discharges from multiple sources contain hazardous substances and are known to be entering the watershed, and several waste rock piles are in direct contact with and being eroded by streams. Each PPE is associated with an observed release by

direct observation (i.e., either a draining adit that was observed discharging to a perennial stream, or a waste rock pile that is in direct contact with the stream; see Table SW-1). Based on the results presented in Section 2.2 for each source, the observed releases contain some or all of the following hazardous substances: aluminum, cadmium, copper, manganese, and zinc.

See section 3.23, Likelihood of Release-Observed Release by Direct Observation, of this support document for further discussion.

Cadmium, copper, manganese, and zinc were associated with sources in the watershed, and each source was documented to have a source containment factor value of greater than zero. These four substances were also documented in observed releases to the watershed. Based on the instructions in HRS Section 2.2.3, these four substances are eligible for consideration as being available to migrate to the surface water pathway.

Regarding not including lead in the HRS evaluation, not all hazardous substances at the Site need be evaluated at listing. The HRS is a screening model that uses limited resources to determine whether a site should be placed on the NPL for possible Superfund response. A subsequent stage of the Superfund process, the remedial investigation (RI), characterizes conditions and hazards at the Site more comprehensively. The EPA must balance the need to fully characterize a site with the limited resources available to collect and analyze site data. However, any additional data that characterizes site conditions could provide useful information during the RI. Additionally, the subsequent Superfund remedial investigation and risk assessment will include extensive processes to establish contaminants of concern. See also section 3.19, Lead Benchmarks, of this support document for further discussion.

This comment results in no change to the HRS score and no change in the decision to place the Site on the NPL.

3.20.4 Pollutant/Contaminant - Iron

Comment: An anonymous commenter asserted that iron should be added to the Bonita Peak Mining District list of constituents of concern. The commenter stated that the formation, fate, transport, and remediation of iron oxyhydroxides should be an integral part of the Bonita Peak Superfund investigations. The commenter stated that iron was the cause of the Animas River turning yellow-orange last August and iron oxyhydroxides are neutrally buoyant and can be transported in rivers for many miles and other metals can attach or adsorb to these iron oxyhydroxides thereby transporting iron and toxic heavy metals many miles downstream.

Response: Iron and iron compounds were not evaluated as hazardous substances at the Site, and inclusion of iron and iron compounds in the site evaluation would not change the listing decision. Although the HRS considers CERCLA hazardous substances, pollutants and contaminants, EPA is not required to score all substances or releases.

At this site, iron and iron compounds were not scored or evaluated as pollutant or contaminants. The HRS is a screening model that uses limited resources to determine whether a site should be placed on the NPL for possible Superfund response. A subsequent stage of the Superfund process, the remedial investigation (RI), characterizes conditions and hazards at the Site more comprehensively. The EPA must balance the need to fully characterize a site with the limited resources available to collect and analyze site data. However, any additional data that characterizes site conditions could provide useful information during the RI.

The HRS is intended to be a “rough list” of prioritized hazardous sites; a “first step in a process--nothing more, nothing less.” *Eagle Picher Indus. v. EPA*, 759 F.2d 922, 932 (D.C. Cir. 1985) (Eagle Picher II). The EPA would like to investigate each possible site completely and thoroughly prior to evaluating them for proposal for the NPL, but it must reconcile the need for certainty before action with the need for inexpensive, expeditious procedures to identify potentially hazardous sites. The D.C. Circuit Court of Appeals has found the EPA's approach to solving

this conundrum to be “reasonable and fully in accord with Congressional intent.” Eagle Picher Industries, Inc. v. EPA, (759 F.2d 905 (D.C. Cir. 1985) Eagle Picher I).

3.21 Source Aggregation

Comment: SGC commented that a source aggregation justification memo was not provided as part of the NPL listing.] SGC contended that despite the considerable distance separating some sources and the varying types of sources (e.g., pits vs. adits), no aggregation memo or justification was included. Thus, SGC claimed that EPA's scientific and technical rationale for aggregating sources, or the assumptions EPA made in aggregating sources, cannot be assessed.

Response: For HRS purposes, EPA appropriately characterized some sources at a mine into a single source at that mine. As stated in the HRS documentation record at proposed on pages 26, 27, 54, 55, 59, 92, 93, 97, and 107, some waste rock piles at a mine were treated as one combined source type at that mine because “they are composed of the same types of waste, have the same containment values, affect the same targets, are the same source type, and are found in the same watershed;” or in the case of combined adit discharges, as stated on pages 96 and 106 of the HRS documentation record at proposal, “[t]he four actively flowing mine adits are evaluated as one source because all four adits drain the same mine operations and/or ore body and therefore, can be combined into one source for the purpose of this HRS documentation record.” Because the combined sources have same the source type, are contiguous, have similar waste characteristics and containment, affect similar targets, and are located within the same watershed, they are properly evaluated as a single source. Furthermore, even if each source or adit were scored as an individual source at a mine, this change would not impact the waste characteristics at any mine or the overall HRS site score. Additionally, consistent with the HRS definition of a site, a site can consist of multiple sources and areas between sources. Sources were not combined from separate mines.

HRS Section 1.1, *Definitions*, specifically defines a site as,

Area(s) where a hazardous substance has been deposited, stored, disposed, or placed, or has otherwise come to be located. Such areas may include multiple sources and may include the area between sources.

Whereas HRS Section 1.1, *Definitions*, defines a source as,

Any area where a hazardous substance has been deposited, stored, disposed, or placed, plus those soils that have become contaminated from migration of a hazardous substance.

When considering whether to aggregate similar sources, EPA takes into consideration several factors. First, can the sources be classified as the same source type for the pathway? The answer is yes. As identified in the HRS documentation record at proposed (26, 27, 54, 55, 59, 92, 93, 96, 97, 106 and 107) the combined waste rock pile sources were identified as source type, pile. In the case of combined adit discharges, the combined sources were identified as source type, other (adit).

Second, do the sources affect similar target populations for the pathway? The answer is yes. Each source was associated with a specific drainage and in the HRS documentation record at proposal, the probable point of entry (PPE) to surface water from each source is described in Table SW-1. The locations of the PPEs are used to establish the length of the target distance limit (TDL) and the targets are within the TDL identified. Thus, each combined source would affect the same target populations for HRS purposes. (See Figures 5 to 11 and pages 119 to 123 and 161-163 of the HRS documentation record at proposal; page 2 of Reference 29 of the HRS documentation record at proposal).

Third, do the sources have similar containment for the pathway? The answer is yes. Regarding the waste rock piles, each source received a containment value of 10 based on the evidence that waste rock piles were in direct contact with surface water and/or had no liner or run on/off controls which qualified the source for a containment factor value of 10 in Table 4-2 of the HRS. Regarding the adits, each source was observed discharging to surface water. (See pages 40, 78 and 109 of the HRS documentation record at proposed)

Fourth, do the sources contain substances with similar waste characteristic factor values for that pathway? The answer is yes. Each combined source contained a combination cadmium, copper, manganese, and zinc (pages 33-36, 65-67, 74-75, 105-107 of the HRS documentation record at proposal). In addition, the hazardous waste quantity of each combined source was calculated using the same Tier evaluation. EPA notes that aluminum was removed from scoring of BPMD site at promulgation.

Fifth, are the sources in the same watershed and floodplain? The answer is yes. At this site, each combined source was evaluated for a specific drainage. That is, a combined source was evaluated for either the Upper Animas River, Cement Creek or Mineral Creek and the terminus of each drainage is in the Animas River. (See Figure 11 of the HRS documentation record at proposal).

The HRS documentation record at proposal identified the specific sources at specific mines that were combined into a single source at that mine.

On page 26 of the HRS documentation record at proposal for the Frisco/Bagley Tunnel Waste Rock Pile, the HRS documentation record at proposal states:

The Frisco/Bagley Tunnel waste rock pile source consists of two piles separated by the 4-wheel drive access road. Combined quantity of the waste piles is approximately 20,500 CY. Because these two piles are composed of the same types of waste, have the same containment values, affect the same targets, are the same source type, and are found in the same watershed, they are being addressed as one combined source for HRS scoring purposes. The waste rock piles are comprised of a northern main pile and southern pile by the former mill: these are dominantly country rock from the crosscut adit, but do contain some waste that is pyritic, with sphalerite and some galena and chalcopyrite.

On page 27 of the HRS documentation record at proposal for the Columbus Mine Waste Rock Pile, the HRS documentation record at proposal states:

The waste rock pile source at the Columbus Mine is on two levels. Because these two levels are composed of the same types of waste, have the same containment values, affect the same targets, are the same source type, and are found in the same watershed they are addressed as one combined source for HRS scoring purposes.

On page 54 of the HRS documentation record at proposal for the Grand Mogul Mine Waste Rock Pile, the HRS documentation record at proposal states:

The three mine waste piles are specifically identified as the east, west, and center piles. The three mine waste piles are addressed as one combined source for HRS scoring purposes based upon sharing similar characteristics which include proximity to the mine, a common pile morphology, similarity of mineralogy (abundant sphalerite and galena) and weathering characteristics of the mine waste rock, similar lack of any engineered contaminants, similar lack of containment features (no liners, covers, run-on and runoff controls), similar location along the north bank of Cement Creek (adjacent to one another) and within the same drainage, and similar target populations along Cement Creek

On page 55 of the HRS documentation record at proposal for the Mogul Mine Waste Rock Pile, the HRS documentation record at proposal states:

Because these two piles are composed of the same types of waste, have the same containment values, affect the same targets, are the same source type, and are found in the same watershed they are addressed as one combined source for HRS scoring purposes.

On page 59 of the HRS documentation record at proposal for the Henrietta Mine Waste Rock Pile, the HRS documentation record at proposal states:

Because these two piles are composed of the same types of waste, have the same containment values, affect the same targets, are the same source type, and are found in the same watershed they are addressed as one combined source for HRS scoring purposes.

On page 92 of the HRS documentation record at proposal for the Bandora Mine Adit Discharge, the HRS documentation record at proposal states:

Bandora Mine has been observed to have four flowing adits. The four flowing mine adits are addressed as one combined source for HRS scoring purposes because all four adits drain the same mine operations and/or ore body.

On page 93 of the HRS documentation record at proposal for the Bandora Mine Waste Rock Piles, the HRS documentation record at proposal states:

Bandora Mine contains two main waste piles. The two main waste rock piles associated with Bandora Mine are addressed as one combined source for HRS scoring purposes because the waste piles are from the same mine operations and/or ore body

For the Bandora Mine Adit Discharge, similar statements regarding the combined adit discharges are also provided on pages 96 and 106 of the HRS documentation record at proposal. For the Bandora Mine Waste Rock Piles, similar statements regarding the combined waste pile are also provided on pages 97 and 107 of the HRS documentation record at proposal.

A summary of the combined sources is shown in the following table:

Source	Source Type	Targets Impacted	Source Containment	Hazardous Substances †	Drainage
Frisco/Bagley Tunnel Waste Rock Pile. The Frisco/Bagley Tunnel waste rock pile source consists of two piles separated by the 4-wheel drive access road (pg. 26).	Pile	Animas River #4 (Howardsville) Fishery (pgs. 149, 150, Appendix A). Habitat known to be used by Federal designated threatened species (Canada Lynx) (pgs. 157, 158, Appendix A).	10 (piles are placed in a historic wetland on the gulch) (pg. 40).	Aluminum, Cadmium, Copper, Manganese, Zinc (based on a composite sample from multiple locations) (pgs. 33 and 34).	Upper Animas River (pg. 40).

Source	Source Type	Targets Impacted	Source Containment	Hazardous Substances †	Drainage
Columbus Mine Waste Rock Pile. The waste rock pile source at the Columbus Mine is on two levels (pg. 27).	Pile	Animas River #4 (Howardsville) Fishery (pgs. 149, 150, Appendix A). Habitat known to be used by Federal designated threatened species (Canada Lynx) (pgs. 157, 158, Appendix A).	10 (runoff flows directly into the gulch) (pg. 40).	Aluminum, Cadmium, Copper, Manganese, Zinc (based on a composite sample from multiple locations) (pgs. 35 and 36).	Upper Animas River (pg. 40).
Grand Mogul Mine Waste Rock Pile. Three adjacent piles of mine waste from the workings of the Grand Mogul Mine are located on the north side of Cement Creek. The three mine waste piles are specifically identified as the east, west, and center piles (pg. 54).	Pile	Habitat known to be used by Federal designated threatened species (Canada Lynx) (pgs. 157, 158, Appendix A).	10 (no liner or run on/off controls) (pg. 78)	Cadmium, Copper, Manganese, Zinc (pg. 64, 65).	Cement Creek (pg. 78).
Mogul Mine Waste Rock Pile. The Mogul Mine waste rock pile is a two tiered waste rock pile (pg. 55).	Pile	Habitat known to be used by Federal designated threatened species (Canada Lynx) (pgs. 157, 158, Appendix A).	10 (no liner or run on/off controls) (pg. 78).	Cadmium, Copper, Manganese, Zinc (pgs. 66, 67).	Cement Creek (pg. 78).
Henrietta Mine Waste Rock Pile. A large compound waste pile is located at the adits of the 700 and 800 levels. Prospect Gulch divides the pile into two parts (pg. 59).	Pile	Habitat known to be used by Federal designated threatened species (Canada Lynx) (pgs. 157, 158, Appendix A).	10 (no liner or run on/off controls. Visibly in contact with creek (pg. 78).	Cadmium, Copper, Manganese, Zinc (pgs. 74, 75).	Cement Creek (pg. 78).

Source	Source Type	Targets Impacted	Source Containment	Hazardous Substances †	Drainage
Bandora Mine Adit Discharge. Bandora Mine has been observed to have four flowing adits. The four flowing mine adits are addressed as one combined source (pgs. 92, 96, 106).	Other (adit)	South Fork Mineral Creek Fishery (pgs. 149, 150, Appendix A). Habitat known to be used by Federal designated threatened species (Canada Lynx) (pgs. 157, 158, Appendix A).	10 (observed discharging to creek) (pg. 109).	Aluminum, Cadmium, Copper, Manganese, Zinc (pgs. 105, 106).	Mineral Creek (pg. 109).
Bandora Mine Waste Rock Piles. Bandora Mine contains two main waste piles. The two main waste rock piles associated with Bandora Mine are addressed as one combined source for HRS scoring purposes because the waste piles are from the same mine operations and/or ore body (pgs. 93, 97, 107).	Pile	South Fork Mineral Creek Fishery (pgs. 149, 150, Appendix A). Habitat known to be used by Federal designated threatened species (Canada Lynx) (pgs. 157, 158, Appendix A).	10 (no liner or run on/off controls; visibly in contact with creek) (pg. 109).	Aluminum, Cadmium, Copper, Manganese, Zinc (pg. 107).	Mineral Creek (pg. 109).

† EPA notes that aluminum was removed from scoring at promulgation of the BPMD site. (pg. #) or (pgs. #) = (page # of the HRS documentation record at proposal)

The HRS documentation record at proposal provides the rationale when two or more contiguous sources at a mine are combined into a single source at that mine for HRS purposes. No separate aggregation rationale memo is required by the HRS. The statements in the HRS documentation record at proposal identify the sources that are combined into a single source at a mine, and the source and site evaluations reflect that the combined sources have the same source type, same source containment value, same type of hazardous substances (metals), are in the same watershed, and affect the same targets. EPA notes that even if the sources that were combined at specific mines were considered separate as individual sources at those mines, there would be no change in the HRS evaluation of the sources or the individual mine scores or overall Site score.

Regarding SGC's comment on the distance separating some sources and the varying types of sources, the HRS documentation record at proposal focuses on the known or significant release of hazardous substances, mainly metals, due to the operation and abandonment or discontinued operation of mines in the Upper Animas, Cement Creek, and Mineral Creek Drainages of the Animas River. That a site can consist of multiple sources is evident in the HRS definition of site, as provided in HRS Section 1.1., *Definitions*:

Site: Area(s) where a hazardous substance has been deposited, stored, disposed, or placed, or has otherwise come to be located. Such areas may include multiple sources and may include the area between sources.

The HRS evaluation of the BPMD site scored 19 mines all of which individually scored sufficiently for listing. Sources from separate mines were not combined. Further discussion is provided in sections 3.3, Site Boundaries, and 3.5, Site Aggregation, of this support document.

This comment results in no change to the HRS score and no change in the decision to place the Site on the NPL.

3.22 Sources

Comment: Stephen Fearn commented that the sources in the HRS documentation record at proposal were based on old information and that some mines have undergone remediation to re-route or cap adit flow and/or have their waste piles moved, reduced, or capped.

Response: The evaluations of the source mines in the HRS documentation record at proposal were based on the most recent and most reliable data available to EPA on each mine. The EPA has evaluated all of the new information presented by the commenters and determined that none of the new information results in a change to the source characterization at any mine. None of the commenters provided documentation to show that the source evaluations at any mine are incorrect or have definitively changed from what is presented in the HRS documentation record at proposal.

HRS Section 2.2, *Characterize sources*, directs that source characterization include the identification of the following parameters:

Source characterization includes identification of the following:

- Sources (and areas of observed contamination) at the site.
- Hazardous substances associated with these sources (or areas of observed contamination).
- Pathways potentially threatened by these hazardous substances.

HRS Section 2.2.1, *Identify sources*, states how to identify sources at a site. It states that “[f]or the three migration pathways, identify the sources at the site that contain hazardous substances. Identify the migration pathway(s) to which each source applies.”

HRS Section 2.2.2, *Identify hazardous substances associated with a source*, states that hazardous substances identified in a source at the site is considered associated with that source. It states:

For each of the three migration pathways, consider those hazardous substances documented in a source (for example, by sampling, labels, manifests, oral or written statements) to be associated with that source when evaluating each pathway. In some instances, a hazardous substance can be documented as being present at a site (for example, by labels, manifests, oral or written statements), but the specific source(s) containing that hazardous substance cannot be documented. For the three migration pathways, in those instances when the specific source(s) cannot be documented for a hazardous substance, consider the hazardous substance to be present in each source at the site, except sources for which definitive information indicates that the hazardous substance was not or could not be present.

HRS Section 2.2.3, *Identify hazardous substances available to a pathway*, states how to determine if hazardous substances are available to the pathway. For the surface water overland flow component it states:

In evaluating each migration pathway, consider the following hazardous substances available to migrate from the sources at the site to the pathway:

...

- Surface water migration—overland/flood component.
 - Hazardous substances that meet the criteria for an observed release to surface water in the watershed being evaluated.
 - All hazardous substances associated with a source with a surface water containment factor value greater than 0 for the watershed (see sections 4.1.2.1.2.1.1 and 4.1.2.1.2.2.1).

...

- For each migration pathway, in those instances when the specific source(s) containing the hazardous substance cannot be documented, consider that hazardous substance to be available to migrate to the pathway when it can be associated (see section 2.2.2) with at least one source having a containment factor value greater than 0 for that pathway.

The HRS documentation record at proposal identifies the known source areas, documents that hazardous substances are associated with each source, and identifies that the hazardous substances are available to migrate from the sources at the Site. Pages 23 – 118 of the HRS documentation record at proposal describe the sources identified at the Site. The following summary tables, which appear in the HRS documentation record at proposal on the pages indicated below, document the sources identified, hazardous substances and migration route of contamination in each stream reach. Full descriptions of the known source areas, hazardous substances associated with each source, and that the hazardous substances are available to migrate from the sources at the Site are available throughout the source characterization section of the HRS documentation record at proposal beginning on page 23 and ending on page 118.

Upper Animas River:

Source identification table (see pages 23-24 of the HRS documentation record at proposal):

Although there are many possible sources contributing to surface water contamination associated with this site, this portion of the HRS documentation record is focused solely on the Upper Animas River drainage (above Silverton), to make discussion easier. In addition, multiple sources were identified in the Upper Animas River drainage (Figure 2). Each source is detailed in the tables below to include an assigned source number, source name, type, description, location as well as hazardous substances associated with the source, hazardous substances available to a pathway and hazardous waste quantities. A complete source identification for each source in the Upper Animas River drainage follows the tables below:

Source No.	Source Name and Description	Source Type	Location (Figure 2)	Reference
U-1A	Vermillion Mine Adit Discharge. The Vermillion Mine has been observed to have one flowing adit (a horizontal passage leading into a mine for the purposes of access or drainage).	Other (adit)	West Fork/ Placer Gulch latitude N3756'09.1" longitude W10736'0.01" elevation: 12,440 ft	14, pp. 71-72
U-1B	Vermillion Mine Waste Rock Pile. The Vermillion Mine has one waste rock (valueless rock that must be fractured and removed in order to gain access to or upgrade ore) pile.	Pile		14, p. 72
U-2A	Frisco/Bagley Tunnel Adit Discharge. The Frisco/Bagley Tunnel (a passage that goes under the ground, through a hill or mountain, etc.) has one draining adit.	Other (adit)	West Fork/ Placer Gulch latitude N37°55'54.4" longitude W107°34'53.2" elevation: 11,440 ft	14, p. 75
U-2B	Frisco/Bagley Tunnel Waste Rock Piles. The Frisco/Bagley Tunnel has two waste piles.	Pile		14, p. 78
U-3A	Columbus Mine Adit Discharge. The Columbus Mine has been observed to have one flowing adit.	Other (adit)	West Fork/ Placer Gulch	14, pp. 80-82

Source No.	Source Name and Description	Source Type	Location (Figure 2)	Reference
U-3B	Columbus Mine Waste Rock Piles. The Columbus Mine contains two levels of waste rock.	Pile	latitude N3755'59.7" longitude W10734'14.7" elevation: 11,240 ft	14, p. 81
U-4A	Tom Moore Mine Adit Discharge. The Tom Moore Mine has been observed to have one perennially flowing adit.	Other (adit)	Animas River, upgradient from Eureka	14, p. 97-98
U-4B	Tom Moore Mine Waste Rock Pile. The Tom Moore Mine has one waste rock pile.	Pile	latitude N37°53'59.0" longitude W107°33'31.9" elevation: 10,360 ft	14, p. 97
U-5B	Kittimack Tailings Waste Pile. The Kittimack Tailings location has one mill tailings pile (the materials left over after the process of separating the valuable fraction from the uneconomic fraction of an ore).	Pile	Animas River, Eureka to Middleton latitude N37°51'32.2" longitude W107°34'14.1" elevation: 9,740 ft	15, p.128
U-6A	Amy Tunnel of Aspen Mine Adit Discharge. The Amy Tunnel of the Aspen Mine has been observed to have one flowing adit.	Other (adit)	Animas River below Middleton latitude N3749'16.2" longitude W10737'49.8" elevation: 9,760 ft	15, pp. 141-143

Hazardous substances identified (see pages 30-31 of the HRS documentation record at proposal):

2.2.2 HAZARDOUS SUBSTANCES ASSOCIATED WITH THE SOURCE – UPPER ANIMAS RIVER

Source No.	Source Name	Units	Hazardous Substances Associated with a Source ^[†]					Reference	
			<i>Associated Sample ID in Italics</i>						
			Al ^[†]	Cd	Cu	Mn	Zn		
1A	Vermillion Mine Adit Discharge aq.	µg/L	3,079 <i>DM-17</i>	211 <i>DM-17</i>	1,303 <i>DM-17</i>	7,288 <i>DM-17</i>	51,660 <i>DM-17</i>	14, pp. 121, 123, 125, 127	
1B	Vermillion Mine Waste Rock Pile so.	ppb	2,300 <i>#6</i>	84 <i>#6</i>	590 <i>#6</i>	1,400 <i>#6</i>	18,000 <i>#6</i>	14, p. 150-151	
2A	Frisco/ Bagley Mine Adit Discharge aq.	µg/L	135 <i>DM-19</i>	11.2 <i>DM-19</i>	N/A <i>DM-19</i>	7,603 <i>DM-19</i>	3,669 <i>DM-19</i>	14, pp. 121, 123, 125, 127	
2B	Frisco/ Bagley Mine Waste Rock Pile so.	ppb	76 <i>#10</i>	8 <i>#10</i>	38 <i>#10</i>	1,000 <i>#10</i>	2,100 <i>#10</i>	14, p. 150-151	
3A	Columbus Mine Adit Discharge aq.	µg/L	18,870 <i>DM-20</i>	1,037 <i>DM-20</i>	7,707 <i>DM-20</i>	13,610 <i>DM-20</i>	247,800 <i>DM-20</i>	14, pp. 121, 123, 125, 127	

Source No.	Source Name	Units	Hazardous Substances Associated with a Source ^[†]					Reference	
			<i>Associated Sample ID in Italics</i>						
			Al ^[†]	Cd	Cu	Mn	Zn		
3B	Columbus Mine Waste Rock Pile so.	ppb	440 #13	54 #13	660 #13	1.8 #13	10,000 #13	14, p. 150-151	
4A	Tom Moore Mine Adit Discharge aq.	µg/L	N/A DM-22	2.0 DM-22	N/A DM-22	537 DM-22	845 DM-22	14, pp. 121, 123, 125, 127	
4B	Tom Moore Mine Waste Rock Pile so.	ppb	12,000 #33	270 #33	760 #33	34,000 #33	58,000 #33	14, p. 150-151	
5B	Kittimack Tailings Waste Pile so.	ppb	415.9 #13	12.6 #13	1101.6 #13	339.6 #13	2,370.2 #13	15, pp. 228-232	
6A	Amy Tunnel of Aspen Mine Adit Discharge aq.	µg/L	N/A DM64	5.5 DM64	18.8 DM64	14.5 DM64	1,574,000 DM64	15, pp. 187, 190, 193, 199	

Notes: µg/L micrograms per liter
 aq. Aqueous sample, dissolved metals
 N/A Not Associated with the source
 ppb parts per billion
 so. Passive aqueous extract of a solid sample
 [†] EPA notes that aluminum was removed from scoring of BPMD site at promulgation.

Hazardous substance migration table (see page 40 of the HRS documentation record at proposal):

2.2.3 HAZARDOUS SUBSTANCES AVAILABLE TO A PATHWAY – UPPER ANIMAS RIVER

Source No.	Source Name	Source Type	Surface Water Containment Description*	Containment Value	Reference
U-1A	Vermillion Mine Adit Discharge	Other (adit)	Observed discharging to gulch	10	14, pp. 71-75; 55, p. 1
U-1B	Vermillion Mine Waste Rock Pile	Pile	Visibly in contact with wetlands on creek	10	14, pp. 71-75
U-2A	Frisco/Bagley Tunnel Adit Discharge	Other (adit)	Observed discharging to gulch	10	14, pp. 75-79; 55, p.2
U-2B	Frisco/Bagley Tunnel Waste Rock Pile	Pile	Placed in a historic wetland on the gulch	10	14, p. 75-79; 55, p. 2
U-3A	Columbus Mine Adit Discharge	Other (adit)	Observed discharging to pile then gulch	10	14, pp. 81-83; 55, p. 3
U-3B	Columbus Mine Waste Rock Pile	Pile	Runoff flows directly into the gulch	10	14, pp. 81-83; 55, p. 3

U-4A	Tom Moore Mine Adit Discharge	Other (adit)	Observed discharging to river	10	14, pp. 97-98; 55, p. 4
U-4B	Tom Moore Mine Waste Rock Pile	Pile	Directly in contact with the Animas River	10	14, pp. 97-98; 55, p. 4
U-5B	Kittimack Tailings Waste Pile	Pile	No liner, run on/off controls	10	15, p. 129
U-6A	Amy Tunnel of Aspen Mine Adit Discharge	Other (adit)	Observed discharging to river	10	15, p. 143; 55, p. 6

* Only Overland Flow containment has been evaluated.

Cement Creek:

Source identification table (see pages 51-53 of the HRS documentation record at proposal):

Although there are many possible sources contributing to surface water contamination associated with this site, this portion of the HRS documentation record is focused solely on the Cement Creek drainage, to make discussion easier. In addition, multiple sources were identified in the Cement Creek drainage (Figure 3). Each source is detailed in the tables below to include an assigned source number, source name, type, description, location as well as hazardous substances associated with the source, hazardous substances available to a pathway and hazardous waste quantities. A complete source identification for each source in the Cement Creek drainage follows the tables below:

Source No.	Source Name and Description	Source Type	Location (Figure 3)	Reference
C-1A	Grand Mogul Mine Adit Discharge. The Grand Mogul Mine has been observed to have one flowing adit.	Other (adit)	Upper Cement Creek (Ross Basin) latitude N37°54'31 .3" longitude W107°37'41 .9" elevation: 11,800 ft.	Refs. 5, pp. 6, 15; 3, pp. 7-10; 2, pp. 56
C-1B	Grand Mogul Mine Waste Rock Pile. The Grand Mogul Mine contains three discrete waste rock (valueless rock that must be fractured and removed in order to gain access to or upgrade ore) piles all composed of similar waste rock.	Pile		Refs. 3, pp. 7-13; 2, pp. 56-61
C-2A	Mogul Mine Adit Discharge. The Mogul Mine has been observed to have one flowing adit.	Other (adit)	Upper Cement Creek (Ross Basin) latitude N37°54'41.2" longitude W107°38' 19.4" elevation: 11,42 ft	2, pp. 68-69; 4, p. 28
C-2B	Mogul Mine Waste Rock Pile. The Mogul Mine contains one two tiered waste rock pile.	Pile		2, pp. 68-71; 4, pp. 27, 28

Source No.	Source Name and Description	Source Type	Location (Figure 3)	Reference
C-3A	Red and Bonita Mine Adit Discharge. The Red and Bonita Mine has been observed to have one collapsed, flowing adit.	Other (adit)	Upper Cement Creek (Ross Basin)	4, p. 28; 2, pp. 79-81; 11, pp. 8,10
C-3B	Red and Bonita Mine Waste Rock Pile. The Red and Bonita Mine has one waste rock pile.	Pile	latitude N37°53' 51.3" longitude W 107°38' 34.9" elevation: 10,948 ft	4, p. 28; 2, pp. 79-81; 11, pp. 8-9
C-4A	Gold King Mine Adit Discharge. The Gold King Mine has been observed to have one flowing adit.	Other (adit)	Upper Cement Creek (Ross Basin)	4, p.28
C-4B	Gold King Mine Waste Rock Pile. The Gold King Mine has one waste rock pile named The Upper Gold King Mine waste rock pile.	Pile	latitude 37.89493519 longitude -107.6384931 elevation: 11,800 ft	4, p.28; 6e; 48
C-5A	American Tunnel Adit Discharge. The American Tunnel (a passage that goes under the ground, through a hill or mountain, etc.) has been observed to have one flowing adit.	Other (adit)	Upper Cement Creek (Ross Basin) latitude N37°53'39.98" longitude W107°38'25.53" elevation: 11,471 ft	5, p. 7; 8, p. 1, 3; 10, p. 1
C-6A	Natalie/Occidental (Silver Ledge) Mine Adit Discharge. The Natalie/Occidental (also known as [a.k.a.] Silver Ledge, hereafter referred to as Natalie/Occidental Mine) Mine has been observed to have one draining adit (lower).	Other (adit)	South Fork of Cement Creek latitude N37°52'39.1" longitude W107°38'38.6" elevation: 11,000 ft	Ref. 2, p. 94
C-6B	Natalie/Occidental (Silver Ledge) Mine Waste Rock Pile. The Natalie/Occidental Mine has one waste rock pile.	Pile		Ref. 2, pp. 95
C-7A	Henrietta Mine Adit Discharge. The Henrietta Mine has been observed to have one seasonally flowing adit.	Other (adit)	Prospect Gulch	Ref. 2, p. 105, 110
C-7B	Henrietta Mine Waste Rock Pile. The Henrietta Mine has one waste pile which consists of a large compound dump, located at the adits of the 700 and 800 levels.	Pile	latitude N37°53'31.8" longitude W107°40'58.1" elevation: 11,360 ft	Ref. 2, p. 107
C-8A	Lark Mine Adit Discharge. The Lark Mine is now collapsed, but the adit has been observed to still drain a small amount of water.	Other (adit)	Prospect Gulch latitude N37°53'35.9" longitude W107°40'49.6" elevation: 11,320 ft	Ref. 2, p. 111, 113
C-9A	Grand Mogul Mine Seep Discharge. The Grand Mogul Mine has been observed to have one flowing seep.	Other (adit)	Prospect Gulch latitude N37°53'28.6" longitude W107°40'43.4" elevation: 11,200 ft.	Ref. 2, pp. 113-115

Hazardous substances identified (see pages 62-63 of the HRS documentation record at proposal):

2.2.2 HAZARDOUS SUBSTANCES ASSOCIATED WITH THE SOURCE – CEMENT CREEK

Source No.	Source Name	Units	Hazardous Substances Associated with a Source ^[†]					Reference
			<i>Associated sample ID in italics</i>					
			Al ^[†]	Cd	Cu	Mn	Zn	
C-1A	Grand Mogul Mine Adit Discharge aq.	µg/L	13,200 <i>UASW059</i>	105 <i>UASW059</i>	4,690 <i>UASW059</i>	8,740 <i>UASW059</i>	24,900 <i>UASW059</i>	4, pp. 23, 27, 60
C-1B	Grand Mogul Mine Waste Rock Pile ss.	mg/kg	N/A <i>UASO010</i>	40 J <i>UASO010</i>	4,600 J+ <i>UASO010</i>	3,280 <i>UASO011</i>	10,400 J <i>UASO010</i>	4, pp. 24, 27, 62
C-2A	Mogul Mine Adit Discharge aq.	µg/L	3,300 <i>UAAD004</i>	50.9 <i>UAAD004</i>	20.9 <i>UAAD004</i>	29,100 <i>UAAD004</i>	32,700 <i>UAAD004</i>	4, pp. 18, 28, 60
C-2B	Mogul Mine Waste Rock Pile ss.	mg/kg	N/A <i>UASO013</i>	9 J <i>UASO013</i>	285 J+ <i>UASO013</i>	5,570 <i>UASO014</i>	2,580 J <i>UASO013</i>	4, pp. 17, 21, 27, 28, 62
C-3A	Red and Bonita Mine Adit Discharge aq.	µg/L	4,210 <i>CC03C</i>	28.0 <i>CC03C</i>	17.0 <i>CC03C</i>	34,300 <i>CC03C</i>	15,900 <i>CC03C</i>	26, p. 20
C-3B	Red and Bonita Mine Waste Rock Pile ss.	mg/kg	N/A <i>UASO05</i>	35.4 J <i>UASO05</i>	286 J+ <i>UASO05</i>	630 <i>UASO04</i>	11,300 J <i>UASO05</i>	4, pp. 28, 62
C-4A	Gold King Mine Adit Discharge aq.	µg/L	18,300 <i>UAADO02</i>	53 <i>UAADO02</i>	4,210 <i>UAADO02</i>	27,800 <i>UAADO02</i>	18,100 <i>UAADO02</i>	4, pp. 18, 28, 60
C-4B	Gold King Mine Waste Rock Pile ss.	mg/kg	N/A <i>UASO016</i>	1.4 <i>UASO016</i>	67.2 <i>UASO015</i>	171 <i>UASO016</i>	399 <i>UASO016</i>	5, pp. 11, 12
C-5A	American Tunnel Adit Discharge aq.	µg/L	4,990 <i>UAADO01</i>	2.02 <i>UAADO01</i>	N/A <i>UAADO01</i>	41,700 <i>UAADO01</i>	18,100 <i>UAADO01</i>	4, pp. 18, 29, 60
C-6A	Natalie/Occidental (Silver Ledge) Mine Adit Discharge aq.	µg/L	2,877 <i>SO-13</i>	7 <i>SO-13</i>	114 <i>SO-13</i>	2,424 <i>SO-13</i>	1,641 <i>SO-13</i>	2, p. 168, 170, 172
C-6B	Natalie/Occidental Mine (Silver Ledge) Waste Rock Pile so.	ppb	11,100 <i>Site #20</i>	9.5 <i>Site #20</i>	372 <i>Site #20</i>	380 <i>Site #20</i>	1,260 <i>Site #20</i>	2, pp. 185, 187, 189
C-7A	Henrietta Mine Adit Discharge aq.	µg/L	2,238 <i>SO-04</i>	16 <i>SO-04</i>	170 <i>SO-04</i>	106 <i>SO-04</i>	3,136 <i>SO-04</i>	2, pp. 168, 170, 172
C-7B	Henrietta Mine Waste Rock Pile so.	ppb	37,200 <i>Site #10</i>	127 <i>Site #10</i>	18,300 <i>Site #10</i>	2,840 <i>Site #10</i>	19,400 <i>Site #3</i>	2, pp. 185, 187, 189
C-8A	Lark Mine Adit Discharge aq.	µg/L	3,532 <i>SO-02</i>	242 <i>SO-02</i>	12,020 <i>SO-02</i>	164 <i>SO-02</i>	55,110 <i>SO-02</i>	2, p. 168, 170, 172

Source No.	Source Name	Units	Hazardous Substances Associated with a Source ^[†]					Reference
			<i>Associated sample ID in italics</i>					
			Al ^[†]	Cd	Cu	Mn	Zn	
C-9A	Joe and Johns Mine Adit Discharge aq.	µg/L	8,439 <i>SO-06</i>	63 <i>SO-06</i>	1,121 <i>SO-06</i>	130 <i>SO-06</i>	12,080 <i>SO-06</i>	2, p. 168, 170, 172

Notes: µg/L micrograms per liter
 aq. Aqueous sample, dissolved metals
 J The associated value is an estimated quantity, although the presence of the substance is not in doubt.
 J+ The associated value is an estimated quantity and may be biased high, although the presence of the substance is not in doubt.
 mg/kg milligrams per kilogram
 N/A Not Applicable
 ppb parts per billion
 ss. Solid sample
 so. Passive aqueous extract of a solid sample
 [†] EPA notes that aluminum was removed from scoring of BPMD site at promulgation.

Hazardous substance migration table (see pages 78-79 of the HRS documentation record at proposal):

2.2.3 HAZARDOUS SUBSTANCES AVAILABLE TO A PATHWAY – CEMENT CREEK

Source No.	Source Name	Source Type	Surface Water Containment Description*	Containment Value	Reference
C-1A	Grand Mogul Mine Adit Discharge	Other (adit)	Observed discharging to Cement Creek	10	Refs. 5, pp. 6, 15; 3, pp. 7-10; 2, p. 56; 55, p. 7; 12, pp. 1, 3
C-1B	Grand Mogul Mine Waste Rock Pile	Pile	No liner or run on/off controls	10	3, pp. 10-12; 12, pp. 2, 3
C-2A	Mogul Mine Adit Discharge	Other (adit)	Observed discharging to Cement Creek	10	3, 9; 12, pp. 1, 3; 55, p. 8
C-2B	Mogul Mine Waste Rock Pile	Pile	No liner or run on/off controls	10	3, p. 9-10; 12, pp. 2, 3
C-3A	Red and Bonita Mine Adit Discharge	Other (adit)	Observed discharging to Cement Creek	10	12, p. 1, 4; 55, p. 9
C-3B	Red and Bonita Mine Waste Rock Pile	Pile	No liner or run on/off controls	10	12, pp. 1, 2, 4
C-4A	Gold King Mine Adit Discharge	Other (adit)	Observed discharging to Cement Creek	10	12, pp. 2, 4, 5; 55, p. 10
C-4B	Gold King Mine Waste Rock Pile	Pile	No liner or run on/off controls	10	5, pp. 18; 12, pp. 2-5
C-5A	American Tunnel Adit Discharge	Other (adit)	Observed discharging to Cement Creek	10	5, p. 7; 55, p. 11

C-6A	Natalie/Occidental (Silver Ledge) Mine Adit Discharge	Other (adit)	Observed discharging to Cement Creek	10	2, pp. 92, 94; 55, p. 12
C-6B	Natalie/Occidental (Silver Ledge) Mine Waste Rock Pile	Pile	Visibly in contact with creek	10	2, pp. 92, 95; 55, p. 12
C-7A	Henrietta Mine Adit Discharge	Other (adit)	Observed discharging to Prospect Gulch	10	2, pp. 106-107, 110
C-7B	Henrietta Mine Waste Rock Pile	Pile	No liner or run on/off controls. Visibly in contact with creek	10	2, pp. 106, 109, 110; 55, p. 13
C-8A	Lark Mine Adit Discharge	Other (adit)	Observed discharging to Prospect Gulch	10	2, p. 111, 113; 55, p. 14
C-9A	Joe and Johns Mine Adit Discharge	Other (adit)	Observed discharging to Prospect Gulch	10	2, pp. 33, 114-115; 55, p. 15

* Only Overland Flow containment has been evaluated.

Mineral Creek:

Source identification table (see pages 92-93 of the HRS documentation record at proposal):

Although there are many possible sources contributing to surface water contamination associated with this site, this portion of the HRS documentation record is focused solely on the Mineral Creek drainage, to make discussion easier. In addition, multiple sources were identified in the Mineral Creek drainage (Figure 4). Each source is detailed in the tables below to include an assigned source number, source name, type, description, location as well as hazardous substances associated with the source, hazardous substances available to a pathway and hazardous waste quantities. A complete source identification for each source in the Mineral Creek drainage follows the tables below:

Source No.	Source Name and Description	Source Type	Location (Figure 4)	Reference
M-1A	Koehler Tunnel Adit Pool. The Koehler Tunnel (a passage that goes under the ground, through a hill or mountain, etc.) has been observed to have one leaking bulkheaded adit (a horizontal passage leading into a mine for the purposes of access or drainage). The bulkhead was installed in 2003. . The adit drains across soil and flows directly into Mineral Creek.	Other (adit)	Upper Mineral Creek latitude 37.89531 longitude 107.71101 elevation: 11,160 ft	Ref. 6b, p. 29 52, p.1; 39, p. 3-8.
M-2A	Brooklyn Mine Adit Discharge. Brooklyn Mine has been observed to have one flowing adit. The drainage has since been diverted from flowing over the associated mine waste pile and flows directly into Mineral Creek.	Other (adit)	Browns Gulch latitude 37.86083 longitude 107.71468 elevation: 11,310	Refs. 13, pp. 32; 6b, pp. 31, 44; 6c, p. 26; 55, p. 17

M-2B	Brooklyn Mine Waste Rock Pile. Brooklyn Mine contains one waste rock pile.	Pile		Refs. 13, p. 32; 6c, pp. 26; 48; 55, p. 17.
M-3A	Paradise Mine Adit Discharge. Paradise Mine contains four collapsed adits. Although there are four adits at the Paradise Mine, only the adit that is has been observed to be discharging the greatest amount of contaminated water is being evaluated as a source.	Other (adit)	Middle Fork latitude 37.84263 longitude 107.76407 elevation: 10,638 ft	Refs. 13, pp. 47-48; 6b, pp. 31, 46.
M-3B	Paradise Mine Waste Rock Pile. The Paradise Mine waste pile is associated with Paradise Mine Adit 1 (P1) and is referred to as "White Death" (Ref. 13, p. 47).	Pile		Refs. 13, p. 49; 6b, p. 46; 6c, pp. 30-31; 48; 55, p. 18.
M-4A	Bandora Mine Adit Discharge. Bandora Mine has been observed to have four flowing adits. The four flowing mine adits are addressed as one combined source for HRS scoring purposes because all four adits drain the same mine operations and/or ore body.	Other (adit)	South Fork latitude 37.78699 longitude 107.80130 elevation: 10,813 ft	Refs. 13, p. 52; 6b, pp. 35, 44; 48; 55, p. 19.
M-4B	Bandora Mine Waste Rock Piles. Bandora Mine contains two main waste piles. The two main waste rock piles associated with Bandora Mine are addressed as one combined source for HRS scoring purposes because the waste piles are from the same mine operations and/or ore body.	Pile		Refs. 13, p. 50, 55; 6b, p. 44; 48; 55, p. 19.

Hazardous substances identified (see page 98 of the HRS documentation record at promulgation):

2.2.2 HAZARDOUS SUBSTANCES ASSOCIATED WITH THE SOURCE – MINERAL CREEK

Source No.	Source Name	Unit	Hazardous Substances Associated with a Source ^{1, [F]}					See Page
			<i>Associated sample ID in italics</i>					
			Al ^[F]	Cd	Cu	Mn	Zn	
M-1A	Koehler Tunnel Adit Pool aq.	µg/L	71,400 <i>MS81</i>	780 <i>MS81</i>	98,600 <i>MS81</i>	23,700 <i>MS81</i>	228,000 <i>MS81</i>	Ref. 6b, p. 50; 6d, p. 7.
M-2A	Brooklyn Mine Adit Discharge aq.	µg/L	5,500 <i>NAW81</i> 9	38 <i>216/419</i> <i>3-1.306</i>	810 <i>216/4193</i> <i>-1.306</i>	9,400 <i>NAW589</i>	7,300 <i>216/4193</i> <i>-1.306</i>	Ref. 6b, pp. 48, 51; 6d, pp. 2, 8, 9.
M-2B	Brooklyn Mine Waste Rock Pile so.	µg/L	6,900 <i>NAD81</i> 7	30 <i>NAD817</i>	1,300 <i>NAD588</i>	9,100 <i>NAD817</i>	5,400 <i>NAD817</i>	6d, pp. 15-16.
M-3A	Paradise Mine Adit Discharge aq.	µg/L	27,000 <i>NAW87</i> 0	0.4 <i>NAW87</i> 0	13 <i>MS77</i>	6,600 <i>NAW520</i>	660 <i>NAW520</i>	Ref. 6b, p. 52; 6d, pp. 7, 8, 10, 11.

M-3B	Paradise Mine Waste Rock Pile so.	µg/L	14,000 NADW5 20	0.09 NAD520	6 NAD520	280 NAF521	20 NAF521	6d, pp. 14, 16–18.
M-4A	Bandora Mine Adit Discharges aq.	µg/L	320 MS4- 712	88 235/418 5- 1.3000	143 MS4-799	8,230 MS4-365	17,400 MS4-799	Ref. 6b, pp. 49; 6d, pp. 2, 3, 5, 6.
M-4B	Bandora Mine Waste Rock Pile so.	µg/L	7.9 NAD39 9	110 NAD399	1,800 NAD399	7,400 NAD399	16,000 NAD399	6d, pp. 12.

Notes: µg/L micrograms per liter
 aq. Aqueous sample, dissolved metals
 so. Passive aqueous extract of solid sample
 † Value presented is the maximum concentration recorded on provided data sets
 [†] EPA notes that aluminum was removed from scoring of BPMD site at promulgation.

Hazardous substance migration table (see page 109 of the HRS documentation record at proposal):

2.2.3 HAZARDOUS SUBSTANCES AVAILABLE TO A PATHWAY – MINERAL CREEK

Source No.	Source Name	Source Type	Surface Water Containment Description*	Containment Value	Reference
M-1A	Koehler Tunnel Adit Pool	Other (adit)	Observed discharging to creek	10	Ref. 13, pp. 9–10, 14; 39, pp. 3–7; 55, p. 16.
M-2A	Brooklyn Mine Adit Discharge	Other (adit)	Observed discharging to creek	10	Ref. 13, p. 32-34; 6c, p. 26-27; 39, pp. 1–2.
M-2B	Brooklyn Mine Waste Rock Pile	Pile	No liner or run on/off controls. Visibly in contact with creek	10	Ref. 13, p. 32-34; 6c, p. 26; 39, pp. 1– 2; 55, p. 17.
M-3A	Paradise Mine Adit Discharge	Other (adit)	Observed discharging to creek	10	Ref. 13, pp. 45, 47, 49; 6c pp. 30–31; 39, pp. 8–9.
M-3B	Paradise Mine Waste Rock Pile	Pile	No liner or run on/off controls. Visibly in contact with creek	10	Ref. 13, pp. 45, 47, 49 ; 6c pp. 30–31; 39, pp. 8–9; 55, p. 18.
M-4A	Bandora Mine Adit Discharge	Other (adit)	Observed discharging to creek	10	Ref. 13, pp. 52–55; 6c, p 27; 39, pp. 11–16.
M-4B	Bandora Mine Waste Rock Pile	Pile	No liner or run on/off controls. Visibly in contact with creek	10	Ref. 13, pp. 53–55; 6c, p 27; 39, p. 10; 55, p. 19.

* Only Overland Flow containment has been evaluated.

The sources at each mine were appropriately evaluated according to the HRS and were based on the most up-to-date, reliable data that could be obtained at the time of proposal. The following subsections address commenters' specific concerns in further detail:

- 3.22.1 Source Containment
- 3.22.2 Source Waste Quantity
- 3.22.3 Other Possible Mines/Sources

3.22.1 Source Containment

Comment: Stephen Fearn commented that some of the mines that are scored in the HRS documentation record at proposal are based on old information and some have since had reclamation or remediation actions that have altered the containment of the sources. Specifically, Mr. Fearn commented on the following mines scored in the HRS documentation record at proposal:

- Henrietta Mine Waste Rock Pile – remediation completed in 2004 added a geosynthetic clay liner on top of the mine waste rock pile and added run-on/run-off controls.
- Lark Mine Adit – discharge has been diverted around the mine waste pile and is being collected for possible treatment.
- Koehler Tunnel Mine Adit – remediation in 2003 completed the installation of an engineered bulkhead approximately 300 feet inside the tunnel. Subsequently, in 2011 the grouting program was completed to further reduce the seepage from the bulkhead.
- Brooklyn Mine Waste Rock Pile – the primary waste rock pile has been removed and placed in a capped repository.

Response: None of the remediation actions that have occurred on the individual mines along the Animas River, Cement Creek, and Mineral Creek result in any of the source containment values changing from 10 to 0 at promulgation. The reclamation or remediation actions at the Lark Mine, Koehler Tunnel, and the Brooklyn Mine all contain evidence of substance migration that has not been mitigated. Assuming the remediation actions at the Henrietta Mine were completed, these actions do not include a functioning leachate collection and removal system. Therefore, all of the sources at the mines remain with non-zero source containment values.

As quoted above, Section 3.22, Sources, of this support document, the HRS states that all hazardous substances associated with a source having a containment value of greater than 0 should be considered available to migrate from the sources at the site.

HRS Section 4.1.2.1.2.1.1, Containment, directs how to assign the source specific containment factor value. It states:

- If one or more sources is located in surface water in the watershed (for example, intact sealed drums in surface water), assign the containment factor a value of 10 for the watershed. Enter this value in table 4–1.
- If none of the sources is located in surface water in the watershed, assign a containment factor value from table 4–2 to each source at the site that can potentially release hazardous substances to the hazardous substance migration path for this watershed. Assign the containment factor value for the watershed as follows:
 - Select the highest containment factor value assigned to those sources that meet the minimum size requirement described below. Assign this highest value as the containment factor value for the watershed. Enter this value in table 4–1.
 - If, for this watershed, no source at the site meets the minimum size requirement, then select the highest containment factor value assigned to the sources at the site eligible to be evaluated

for this watershed and assign it as the containment factor value for the watershed. Enter this value in table 4–1.

A source meets the minimum size requirement if its source hazardous waste quantity value (see section 2.4.2.1.5) is 0.5 or more. Do not include the minimum size requirement in evaluating any other factor of this surface water migration component, except potential to release by flood as specified in section 4.1.2.1.2.2.3.

Table 4–2—Containment Factor Values for Surface Water Migration Pathway

Source	Assigned value
All Sources (Except Surface Impoundments, Land Treatment, Containers, and Tanks)	
Evidence of hazardous substance migration from source area (<i>i.e.</i> , source area includes source and any associated containment structures).	10
No evidence of hazardous substance migration from source area <i>and</i> :	
(a) Neither of the following present: (1) maintained engineered cover, or (2) functioning and maintained run-on control system and runoff management system	10
(b) Any one of the two items in (a) present	9
(c) Any two of the following present: (1) maintained engineered cover, or (2) functioning and maintained run-on control system and runoff management system, or (3) liner with functioning leachate collection and removal system immediately above liner	7
(d) All items in (c) present	5
(e) All items in (c) present, plus no bulk or non-containerized liquids nor materials containing free liquids deposited in source area.	3
No evidence of hazardous substance migration from source area, double liner with functioning leachate collection and removal system above and between liners, <i>and</i> :	
(f) Only one of the following deficiencies present in containment: (1) bulk or noncontainerized liquids or materials containing free liquids deposited in source area, or (2) no or nonfunctioning or nonmaintained run-on control system and runoff management system, or (3) no or nonmaintained engineered cover	3
(g) None of the deficiencies in (f) present.	0
Source area inside or under maintained intact structure that provides protection from precipitation so that neither runoff nor leachate is generated, liquids or materials containing free liquids not deposited in source area, and functioning and maintained runon control present	

As quoted in section 3.22, Sources, of this support document, the HRS documentation record at proposal documented that each scored source at the mines is assigned a source containment factor value of 10. (See tables in section 2.2.3 in the HRS documentation record at proposal for evidence in each stream reach for surface water containment description for each source and the assigned containment value (pages 40, 78-79, 109 of the HRS documentation record at proposal.) The commenter did not challenge how the containment values were assigned at proposal, rather, the commenter only challenged that some remediation actions might have changed some of the containment values at scored mines.

Regarding the Henrietta Mine Waste pile, the EPA is aware that a cover and run on/off controls have been installed at the Site. EPA is not aware of any documentation that a liner and functioning leachate collection and

removal system were installed. Therefore, the containment factor value according to HRS Table 4-2, would be 7 and not 0.

Regarding the Lark Mine adit discharge, remedy actions at the mine of diverting the adit flow around the mine waste pile and collecting it for possible treatment does not change the containment value of the source. The commenter does not indicate that remedy actions have eliminated migration from the source and there is no mention of an engineered cover or run-on and run-off controls. Therefore, the containment value of this source remains as scored at 10.

Regarding the Koehler Tunnel Mine adit, the bulkhead and grouting that has been completed has not completely stopped drainage from the mine. While seepage has been reduced, during an inspection of the mine in October 2015, EPA witnessed drainage from the tunnel draining to a receiving pond that subsequently drains to Mineral Creek. Therefore, these remedial actions have not altered the migration of contamination from the source and there is no impact on the containment value of the source. The containment value for the Koehler Tunnel Mine adit remains at 10.

Regarding the Brooklyn Mine waste rock, the removals mentioned by the commenters have not removed all of the waste rock at the mine. The remaining rock does not have an engineered cover or a maintained and functioning run-on and run-off control system. Therefore, the containment value for the Brooklyn mine remains at a value of 10.

None of the reclamation or remediation actions that have been described by the commenter include both a maintained engineered cover that fully covers a source and a functioning and maintained run-on/run-off control system; therefore, the containment values for the mines, except for the Henrietta Mine Waste pile, remains unchanged at promulgation; for the Henrietta Mine Waste pile, the containment value may be lowered to a value of 7 when considering the previous remediation actions. Thus, all of the mine sources in question would remain above a value of 0; any containment value of >0 results in no change to the site score or HRS evaluation in the HRS documentation record at promulgation.

This comment results in no change to the HRS score and no change in the decision to place the Site on the NPL.

3.22.2 Source Waste Quantity

Comment: Stephen Fearn and SJLHC commented that the waste quantities for the scored sources may not have been accurately measured or may not be representative of current conditions. The SJLHC commented that the flow measurements from the source adits were not adequately described and noted that without accurate measurements it is not possible to quantify the relative loading from each source.

Mr. Fearn commented on specific mines and stated that an engineered bulkhead has been installed in the Koehler Tunnel that has blocked the adit flow and only minor leaking from fractures surrounding the bulkhead remain. Mr. Fearn also commented that based on the pressure exerted on the bulkhead there is approximately 3,000,000 gallons of water behind the bulkhead.

Mr. Fearn commented that the Brooklyn Mine Waste Rock Pile has had a removal and that the primary waste pile is no longer present.

Response: The hazardous waste quantity estimates calculated for each source at the mines were appropriately determined and consistent with the HRS. The adit flows at each of the mines, except for the Vermillion Mine Adit, were all estimated using the lowest documented discharge rates for each adit and only extrapolated the discharge rate for one day unless multiple sampling events occurred. This estimation provides a low-end estimate as these adits have typically been discharging for many years. The one exception to the extrapolation of only a few days is the Vermillion Mine Adit waste quantity; this estimation used the lowest discharge rate, but it was

extrapolated over one full year as the adit is known to have been discharging to the watershed for multiple decades. The remediation actions that the commenters mention do not address the quantity of contamination that has been released or that remains at the mines. The source hazardous waste quantities that were assigned in the HRS documentation record at proposal are consistent with the HRS and are based on the most recent data that was available at proposal. The mines identified as other possible sources will be evaluated to determine if further CERCLA actions are needed.

HRS Section 2.4.2.1, *Source hazardous waste quantity*, explains how a scorer should evaluate the quantity of hazardous substances in a source. It states:

For each of the three migration pathways, assign a source hazardous waste quantity value to each source (including the unallocated source) having a containment factor value greater than 0 for the pathway being evaluated...

...

For all pathways, evaluate source hazardous waste quantity using the following four measures in the following hierarchy:

- Hazardous constituent quantity.
- Hazardous wastestream quantity.
- Volume.
- Area.

HRS Section 2.4.2.1.1, *Hazardous constituent quantity*, states:

Evaluate hazardous constituent quantity for the source (or area of observed contamination) based solely on the mass of CERCLA hazardous substances (as defined in CERCLA section 101(14), as amended) allocated to the source (or area of observed contamination)...

...

Based on this mass, designated as C, assign a value for hazardous constituent quantity as follows:

- For the migration pathways, assign the source a value for hazardous constituent quantity using the Tier A equation of table 2–5.
- For the soil exposure pathway, assign the area of observed contamination a value using the Tier A equation of table 5–2 (section 5.1.2.2).

If the hazardous constituent quantity for the source (or area of observed contamination) is adequately determined (that is, the total mass of all CERCLA hazardous substances in the source and releases from the source [or in the area of observed contamination] is known or is estimated with reasonable confidence), do not evaluate the other three measures discussed below. Instead assign these other three measures a value of 0 for the source (or area of observed contamination) and proceed to section 2.4.2.1.5.

If the hazardous constituent quantity is not adequately determined, assign the source (or area of observed contamination) a value for hazardous constituent quantity based on the available data and proceed to section 2.4.2.1.2.

HRS Section 2.4.2.1.2, *Hazardous wastestream quantity*, states:

Evaluate hazardous wastestream quantity for the source (or area of observed contamination) based on the mass of hazardous wastestreams plus the mass of any additional CERCLA pollutants and contaminants (as defined in CERCLA section 101[33], as amended) that are allocated to the source (or area of observed contamination)...

Based on this mass, designated as W, assign a value for hazardous wastestream quantity as follows:

- For the migration pathways, assign the source a value for hazardous wastestream quantity using the Tier B equation of table 2–5.

...

If the source is the unallocated source or if this condition applies, assign the volume and area measures a value of 0 for the source (or area of observed contamination) and proceed to section 2.4.2.1.5. Otherwise, assign the source (or area of observed contamination) a value for hazardous wastestream quantity based on the available data and proceed to section 2.4.2.1.3.

HRS Section 2.4.2.1.3, *Volume*, states:

Evaluate the volume measure using the volume of the source (or the volume of the area of observed contamination)...

Based on the volume, designated as V, assign a value to the volume measure as follows:

- For the migration pathways, assign the source a value for volume using the appropriate Tier C equation of table 2–5.

...

If the volume of the source (or volume of the area of observed contamination, if applicable) can be determined, do not evaluate the area measure. Instead, assign the area measure a value of 0 and proceed to section 2.4.2.1.5. If the volume cannot be determined (or is not applicable for the soil exposure pathway), assign the source (or area of observed contamination) a value of 0 for the volume measure and proceed to section 2.4.2.1.4.

HRS Section 2.4.2.1.4, *Area*, states:

Evaluate the area measure using the area of the source (or the area of the area of observed contamination). Based on this area, designated as A, assign a value to the area measure as follows:

- For the migration pathways, assign the source a value for area using the appropriate Tier D equation of table 2–5.

HRS section 2.4.2.1.5, *Calculation of source hazardous waste quantity value*, specifies how to assign the hazardous waste quantity value for each source. It states:

Select the highest of the values assigned to the source (or area of observed contamination) for the hazardous constituent quantity, hazardous wastestream quantity, volume, and area measures.

Assign this value as the source hazardous waste quantity value. Do not round to the nearest integer.

The HRS documentation record at proposal presents the estimated source waste quantities for each in accordance with the HRS and documents the calculations for each mine as follows: mines on the Upper Animas River, pages 41-45; mines on Cement Creek, pages 80-88; mines on Mineral Creek, pages 110-116. These calculations evaluate the quantity of hazardous substances in each mine. The following tables from the HRS documentation record at proposal summarize the source hazardous waste quantity evaluations in each stream reach (pages 41-42, 80-82, and 110-112 of the HRS documentation record at proposal):

2.4.2 HAZARDOUS WASTE QUANTITY – UPPER ANIMAS RIVER

Note: the total hazardous constituent quantity for all Sources could not be adequately determined according to the HRS requirements; that is, the total mass of all CERCLA hazardous substances in the sources is not known and cannot be estimated with reasonable confidence (Ref. 1, Section 2.4.2.1.1). There are insufficient historical and current data (manifests, Potentially Responsible Party (PRP) records, State records, permits, waste concentration data, etc.) available to adequately calculate the total or partial mass of all CERCLA hazardous substances in the source and the associated releases from the source. Therefore, there is insufficient information to evaluate the associated releases from the sources to calculate the total hazardous constituent quantity with reasonable confidence. As such, all source evaluations will begin with Tier B.

Source No.	Waste Description ¹	Source Type	Tier	Calculations	HWQ Assigned Value	Reference
U-1A	Vermillion Mine Adit Discharge, 8 gpm	Other (adit)	B	42,048,000 lbs./year /5,000 = 8,409.6	8,409.6	14, p. 72
U-1B	Vermillion Mine Waste Rock Pile, 5,100 CY	Pile	C ²	5,100 CY/2.5 = 2,040	2,040	14, p. 72
U-2A	Frisco/Bagley Tunnel Adit Discharge, 58 gpm	Other (adit)	B	835,200 lbs./day /5,000 = 167.0	167.0	14, p. 79
U-2B	Frisco/Bagley Tunnel Waste Rock Pile, 20,500 CY	Pile	C ²	20,500 CY/2.5 = 8,200	8,200	14, p. 78
U-3A	Columbus Mine Adit Discharge, 1.5 gpm	Other (adit)	B	21,600 lbs./day /5,000 = 4.32	4.32	14, p. 82
U-3B	Columbus Mine Waste Rock Pile, 24,000 CY	Pile	C ²	24,000 CY/2.5 = 9,600	9,600	14, p. 81
U-4A	Tom Moore Mine Adit Discharge, 36 gpm	Other (adit)	B	518,400 lbs./day /5,000 = 103.68	103.68	14, p. 98
U-4B	Tom Moore Mine Waste Rock Pile, 4,000 CY	Pile	C ²	4,000 CY/2.5 = 1,600	1,600	14, p. 97
U-5B	Kittimack Tailings Waste Pile, 23,000 CY	Pile	C ²	23,000 CY/2.5= 9,200	9,200	15, p. 68

U-6A	Amy Tunnel of Aspen Mine Adit Discharge, 190 gpm	Other (adit)	B	2,736,000 lbs./day /5,000 = 547.2	547.2	15, p. 143
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Notes: gpm gallons per minute
 lbs. pounds
 CY cubic yards
 HWQ Hazardous Wastestream Quantity

- ¹ If a range of adit discharge rates were provided in the reference, the lowest discharge rate was used to calculate the hazardous wastestream quantity.
- ² The total hazardous wastestream quantity for Sources U-1B, U-2B, U-3B, U-4B and U-5B could not be adequately determined according to the HRS requirements; that is, the total mass of all hazardous wastestreams and CERCLA pollutants and contaminants in the source is not known and cannot be estimated with reasonable confidence [Ref. 1, pp. 51591 (Section 2.4.2.1.2)]. There are insufficient historical and current data (manifests, PRP records, State records, permits, etc.) available to adequately calculate the total or partial mass of all CERCLA hazardous wastestream and CERCLA pollutants and contaminants in the source and the associated releases from the source. Therefore, there is insufficient information to evaluate the associated releases from the source to calculate the total hazardous wastestream quantity for Sources U-1B, U-2B, U-3B, U-4B and U-5B with reasonable confidence.

2.4.2 HAZARDOUS WASTE QUANTITY – CEMENT CREEK

Note: the total hazardous constituent quantity for all Sources could not be adequately determined according to the HRS requirements; that is, the total mass of all CERCLA hazardous substances in the sources is not known and cannot be estimated with reasonable confidence (Ref. 1, Section 2.4.2.1.1). There are insufficient historical and current data (manifests, PRP records, State records, permits, waste concentration data, etc.) available to adequately calculate the total or partial mass of all CERCLA hazardous substances in most of the sources and the associated releases from said source. Therefore, there is insufficient information to evaluate the associated releases from the sources to calculate the total hazardous constituent quantity with reasonable confidence, except in Sources C-1A, C-2A, C-3A, C-4A and C-5A.

Source No.	Waste Description ^{1,2}	Source Type	Tier	Calculations	HWQ Assigned Value	Reference
C-1A	Grand Mogul Mine Adit Discharge, 39.5 lbs./day, 10 days	Other (adit)	A ^{2,3}	38.17 lbs.	38.17	33, pp. 1, 3
C-1B	Grand Mogul Mine Piles, 26,521 CY	Pile	C ⁴	26,521 CY/2.5 = 10,608.4	10,608.4	3, pp. 11- 13
C-2A	Mogul Mine Adit Discharge, 76 lbs./day, 21 days	Other (adit)	A ^{2,3}	1,008.5 lbs.	1,008.5	33, pp. 1,5
C-2B	Mogul Mine Pile, 41,374.7 CY	Pile	C ⁴	41,374.7 CY/2.5 = 16,549.9	16,549.9	3, pp. 9, 10, 13
C-3A	Red and Bonita Mine Adit Discharge, 198 lbs./day, 23 days	Other (adit)	A ^{2,3}	4,253.5 lbs.	4,253.5	33, pp. 1, 7
C-3B	Red and Bonita Mine Pile, 3,160 CY	Pile	C ⁴	3,160 CY/2.5 = 1,264	1,264	11, p. 9

Source No.	Waste Description ^{1,2}	Source Type	Tier	Calculations	HWQ Assigned Value	Reference
C-4A	Gold King Mine Adit Discharge, 210 lbs./day, 21 days	Other (adit)	A ^{2,3}	4,836.1 lbs.	4,836.1	33, pp. 1, 9
C-4B	Gold King Mine Pile, 142,096 ft ²	Pile	D ^{4,5}	142,096 ft ² /13 = 10,930.4	10,930.4	9, p. 2, 3
C-5A	American Tunnel Discharge 162 lbs./day, 20 days	Other (adit)	A ^{2,3}	2,568.4 lbs	2,568.4	33, pp. 1, 12
C-6A	Natalie/Occidental (Silver Ledge) Mine Adit Discharge, 0.89 cfs	Other (adit)	B	5,696,000 lbs./day /5,000 = 1,139.2	1,139.2	2, p. 148
C-6B	Natalie/Occidental (Silver Ledge) Mine Pile, 6,800 CY	Pile	C ⁴	6,800 CY/2.5 = 2,720	2,720	2, p. 95
C-7A	Henrietta Mine Adit Discharge, 0.101 cfs	Other (adit)	B	646,400 lbs./day /5,000 = 129.28	129.28	2, p. 168
C-7B	Henrietta Mine Pile, 30,000 CY	Pile	C ⁴	30,000 CY/2.5 = 12,000	12,000	2, pp. 107, 108
C-8A	Lark Mine Adit Discharge, 0.012 cfs	Other (adit)	B	76,800 lbs./day /5,000 = 15.36	15.36	2, p. 168
C-9A	Joe and Johns Mine Adit Discharge, 0.034 cfs	Other (adit)	B	217,600 lbs./day /5,000 = 43.52	43.52	2, p. 168

Notes: cfs cubic feet per second
CY cubic yards
ft² square ft
lbs. pounds
HWQ Hazardous Wastestream Quantity

¹ If a range of adit discharge rates were provided in the reference, the lowest discharge rate was used to calculate the hazardous wastestream quantity.

² The adit discharge values reported in lbs./day were calculated by summing the Dissolved Metal Loads (pounds/day) for each analyte and for all samples collected for the sample location as provided in Reference 33.

³ The Tier A estimates are incomplete estimates, as they do not account for the full amount of discharge over time.

⁴ The total hazardous wastestream quantity for Sources C-1B, C-2B, C-3B, C-4B, C-6B and C-7B could not be adequately determined according to the HRS requirements; that is, the total mass of all hazardous wastestreams and CERCLA pollutants and contaminants in the source is not known and cannot be estimated with reasonable confidence [Ref. 1, pp. 51591 (Section 2.4.2.1.2)]. There are insufficient historical and current data (manifests, PRP records, State records, permits, etc.) available to adequately calculate the total or partial mass of all CERCLA hazardous wastestream and CERCLA pollutants and contaminants in the source and the associated releases from the source. Therefore, there is insufficient information to evaluate the associated releases from the source to calculate the total hazardous wastestream quantity for Sources C-1B, C-2B, C-3B, C-6B and C-7B with reasonable confidence.

⁵ The volume measure of this source could not be determined. The volume area measure for this source was assigned a value of 0.

2.4.2 HAZARDOUS WASTE QUANTITY – MINERAL CREEK

Note: the total hazardous constituent quantity for all Sources could not be adequately determined according to the HRS requirements; that is, the total mass of all CERCLA hazardous substances in the sources is not known and cannot be estimated with reasonable confidence (Ref. 13, Section 2.4.2.1.1). There are insufficient historical and current data (manifests, PRP records, State records, permits, waste concentration data, etc.) available to adequately calculate the total or partial mass of all CERCLA hazardous substances in the source and the associated releases from the source. Therefore, there is insufficient information to evaluate the associated releases from the sources to calculate the total hazardous constituent quantity with reasonable confidence. As such, all source evaluations will begin with Tier B.

Source No.	Waste Description ¹	Source Type	Tier	Calculations	HWQ Assigned Value	Reference
M-1A	Koehler Tunnel Adit Pool; 80,000 ft ³	Other (adit)	C ²	2,962.9 /2.5 = 1,185.1	1,185.1	Ref 51.
M-2A	Brooklyn Mine Adit Discharge; measured flowrate:	Other (adit)	B	-	-	Ref. 6b, pp. 48, 51.
	0.045 cfs (Sample 261/4193-1.306) on 7/18/95			287,712 lbs./day /5,000 = 57.54	57.54	
	0.045 cfs (Sample NAW508) on 8/13/98			287,712 lbs./day /5,000 = 57.54	57.54	
	0.045 cfs (Sample NAW589) on 8/18/98			287,712 lbs./day /5,000 = 57.54	57.54	
	0.08 cfs (Sample MS8) on 7/18/99			511,488 lbs./day /5,000 = 102.3	102.3	
	0.045 cfs (Sample NAW817) on 9/1/99			287,712 lbs./day /5,000 = 57.54	57.54	
	-			-	Total = 332.46	
M-2B	Brooklyn Mine Waste Rock Pile; 15,000 m ² of disturbed area	Pile	D ^{2: 3}	161,459 ft ² /13 = 12,419.9	12,419.9	Ref. 6b, p. 44.
M-3A	Paradise Mine Adit Discharge; measured flowrate:	Other (adit)	B	-	-	Ref. 6b, p. 52.
	0.6 cfs (Sample MS77) on 9/28/95			3,836,160 lbs./day /5,000 = 767.23	767.23	
	0.22 cfs (Sample NAW520) on 8/14/98			1,406,592 lbs./day /5,000 = 281.32	281.32	
	0.009 cfs (Sample MS34) on 8/27/98			57,542.4 lbs./day /5,000 = 11.51	11.51	
	0.45 cfs (Sample NAW870) on 9/6/99			2,877,120 lbs./day /5,000 = 575.42	575.42	
	-			-	Total = 1,635.48	
M-3B	Paradise Mine Waste Rock Pile: 700 CY	Pile	C ²	700 CY/2.5 = 280	280	Ref. 6b, p. 46.

Source No.	Waste Description ¹	Source Type	Tier	Calculations	HWQ Assigned Value	Reference
M-4A	Bandora Mine Adit Discharge; measured flowrates:	Other (adit)	B	-	-	Ref. 13, pp. 53; 6b, pp. 49, 53.
	0.071 cfs (Sample 235/4185-1.3000) on 7/19/95			453,945.6 lbs./day /5,000 = 90.79	90.79	
	0.045 cfs (Sample NAW399) on 9/9/97			287,712 lbs./day /5,000 = 57.54	57.54	
	0.056 cfs (Sample NAW648) on 8/23/98			358,041.6 lbs./day /5,000 = 71.61	71.61	
	0.09 cfs (Sample MS4) 10/13/98			575,424 lbs./day /5,000 = 115.08	115.08	
	0.22 cfs (Sample NAW887) on 9/9/99			1,406,592 lbs./day /5,000 = 281.32	281.32	
	-			-	Total = 616.34	
M-4B	Bandora Mine Waste Rock Pile; 5,500 CY total	Pile	C ²	5,500 CY/2.5 = 2,200	2,200	Ref. 13, p. 53; 6b, p. 44, 53.

Notes: () Sample name and date
 cfs cubic ft per second
 CY cubic yards
 ft² square ft
 ft³ cubic ft
 gpm gallons per minute
 HWQ Hazardous Wastestream Quantity
 lbs. pounds
 m² square meters

- ¹ If a range of adit discharge rates were provided in the reference, the lowest discharge rate was used to calculate the hazardous wastestream quantity.
- ² The total hazardous wastestream quantity for Sources M-1A, M-2B, M-3B and M-4B could not be adequately determined according to the HRS requirements; that is, the total mass of all hazardous wastestreams and CERCLA pollutants and contaminants in the source is not known and cannot be estimated with reasonable confidence [Ref. 1, pp. 51591 (Section 2.4.2.1.2)]. There are insufficient historical and current data (manifests, PRP records, State records, permits, etc.) available to adequately calculate the total or partial mass of all CERCLA hazardous wastestream and CERCLA pollutants and contaminants in the source and the associated releases from the source. Therefore, there is insufficient information to evaluate the associated releases from the source to calculate the total hazardous wastestream quantity for Sources M-1A, M-2B, M-3B and M-4B with reasonable confidence.
- ³ The volume measure of this source could not be determined. The volume measure for this source was assigned a value of 0.

Aluminum was removed for scoring of the BPMD site at promulgation and the hazardous waste quantity for Cement Creek was revised as follows at promulgation:

Note: the total hazardous constituent quantity for all Sources could not be adequately determined according to the HRS requirements; that is, the total mass of all CERCLA hazardous substances in the sources is not known and cannot be estimated with reasonable confidence (Ref. 1, Section 2.4.2.1.1). There are insufficient historical and current data (manifests, PRP records, State records, permits, waste concentration data, etc.) available to adequately calculate the total or partial mass of all CERCLA hazardous substances in most of the sources and the associated releases from said source. Therefore, there is insufficient information to evaluate the associated releases from the sources to calculate the total hazardous constituent quantity with reasonable confidence, except in Sources C-1A, C-2A, C-3A, C-4A and C-5A.

Source No.	Waste Description ^{1,2}	Source Type	Tier	Calculations	HWQ Assigned Value	Reference
C-1A	Grand Mogul Mine Adit Discharge, 29.07 lbs., 10 days	Other (adit)	A ^{2,3}	29.07 lbs.	29.07	33, pp. 1, 3
C-1B	Grand Mogul Mine Piles, 26,521 CY	Pile	C ⁴	26,521 CY/2.5 = 10,608.4	10,608.4	3, pp. 11- 13
C-2A	Mogul Mine Adit Discharge, 956.87 lbs., 21 days	Other (adit)	A ^{2,3}	956.87 lbs.	956.87	33, pp. 1,5
C-2B	Mogul Mine Pile, 41,374.7 CY	Pile	C ⁴	41,374.7 CY/2.5 = 16,549.9	16,549.9	3, pp. 9, 10, 13
C-3A	Red and Bonita Mine Adit Discharge, 4,030.72 lbs., 23 days	Other (adit)	A ^{2,3}	4,030.72 lbs.	4,030.72	33, pp. 1, 7
C-3B	Red and Bonita Mine Pile, 3,160 CY	Pile	C ⁴	3,160 CY/2.5 = 1,264	1,264	11, p. 9
C-4A	Gold King Mine Adit Discharge, 3,211.5 lbs., 21 days	Other (adit)	A ^{2,3}	3,211.5 lbs.	3,211.5	33, pp. 1, 9
C-4B	Gold King Mine Pile, 142,096 ft ²	Pile	D ^{4,5}	142,096 ft ² /13 = 10,930.4	10,930.4	9, p. 2, 3
C-5A	American Tunnel Discharge 2,397.89 lbs., 28 days	Other (adit)	A ^{2,3}	2,397.89 lbs	2,397.89	33, pp. 1, 12
C-6A	Natalie/Occidental (Silver Ledge) Mine Adit Discharge, 0.89 cfs	Other (adit)	B	5,696,000 lbs./day /5,000 = 1,139.2	1,139.2	2, p. 148
C-6B	Natalie/Occidental (Silver Ledge) Mine Pile, 6,800 CY	Pile	C ⁴	6,800 CY/2.5 = 2,720	2,720	2, p. 95
C-7A	Henrietta Mine Adit Discharge, 0.101 cfs	Other (adit)	B	646,400 lbs./day /5,000 = 129.28	129.28	2, p. 168
C-7B	Henrietta Mine Pile, 30,000 CY	Pile	C ⁴	30,000 CY/2.5 = 12,000	12,000	2, pp. 107, 108
C-8A	Lark Mine Adit Discharge, 0.012 cfs	Other (adit)	B	76,800 lbs./day /5,000 = 15.36	15.36	2, p. 168
C-9A	Joe and Johns Mine Adit Discharge, 0.034 cfs	Other (adit)	B	217,600 lbs./day /5,000 = 43.52	43.52	2, p. 168

Notes: cfs cubic feet per second

CY cubic yards
 ft² square ft
 lbs. pounds
 HWQ Hazardous Wastestream Quantity

- 1 If a range of adit discharge rates were provided in the reference, the lowest discharge rate was used to calculate the hazardous wastestream quantity.
- 2 The adit discharge values reported in lbs./day were calculated by summing the Dissolved Metal Loads (pounds/day) for each analyte and for all samples collected for the sample location as provided in Reference 33.
- 3 The Tier A estimates are incomplete estimates, as they do not account for the full amount of discharge over time.
- 4 The total hazardous wastestream quantity for Sources C-1B, C-2B, C-3B, C-4B, C-6B and C-7B could not be adequately determined according to the HRS requirements; that is, the total mass of all hazardous wastestreams and CERCLA pollutants and contaminants in the source is not known and cannot be estimated with reasonable confidence [Ref. 1, pp. 51591 (Section 2.4.2.1.2)]. There are insufficient historical and current data (manifests, PRP records, State records, permits, etc.) available to adequately calculate the total or partial mass of all CERCLA hazardous wastestream and CERCLA pollutants and contaminants in the source and the associated releases from the source. Therefore, there is insufficient information to evaluate the associated releases from the source to calculate the total hazardous wastestream quantity for Sources C-1B, C-2B, C-3B, C-6B and C-7B with reasonable confidence.
- 5 The volume measure of this source could not be determined. The volume area measure for this source was assigned a value of 0.

The source hazardous waste quantities for each mine were estimated according to the HRS. The HWQ associated with each mine adit was calculated using recorded flow rates on discrete sampling dates and the flow rate was extrapolated for only the individual days that the flow was recorded. The adits from these mines have been flowing for many years, and thus the estimation provided in the HRS documentation record at proposal is a low-end estimation based on individual points in time in the history of flow from the adits. References 2, 3, 6b, 11, 13, 14, 15 and 33 of the HRS documentation record at proposal contain information on flow rate methodologies and/or entities performing the sampling used to evaluate the BPMD site. EPA notes that sampling was performed by various entities and complete SOPs were not provided. However, sufficient detailed information on the flow rate sampling is provided in the references of the HRS documentation record at proposal. (See pages 11-17 of Reference 2; page 8 of Reference 3; pages 13, 14, 48-50 of Reference 6b; page 10 of Reference 11; page 2 of Reference 13; pages 14 to 16 of Reference 14; pages 16 to 24 of Reference 15; and page 1 of Reference 33 of the HRS documentation record at proposal and at promulgation.). The Agency notes that the commenters did not challenge that historical releases of contamination occurred from the adits or the historical presence of tailings piles at each scored mine.

Regarding the commenter's statement that the Koehler Tunnel adit has undergone remediation actions to block the adit flow and reduce the hazardous waste quantity, the Koehler Tunnel adit source hazardous waste quantity was based on the volume of water behind the bulkhead that is seeping out. As quoted above, the Koehler Tunnel was estimated at proposal to have 80,000 ft³ of wastewater in a pool behind the bulkhead that is not fully contained; the hazardous waste quantity is not based on the quantity of seepage that is occurring from the bulkhead (its source containment factor value is >0 as explained in section 3.23.1, Source Containment, of this support document). The commenter stated that based on the pressure of water behind the bulkhead, 3 million gallons of water are estimated to be contained behind the bulkhead. However, using this estimate would only increase the source hazardous waste quantity as 3 million gallons equates to more than 400,000 ft³ of wastewater compared to the estimate in the HRS documentation record at proposal of 80,000 ft³. Therefore, the source hazardous waste quantity estimate for the Koehler Tunnel Mine adit in the HRS documentation record at proposal is sufficient to score the source.

Regarding the Brooklyn Mine waste rock source hazardous waste quantity, no documentation or alternative source hazardous waste quantity estimations have been provided by the commenter. While some removal actions may have occurred, it appears that the removal actions as described by the commenters did not address all three piles of contamination and some mine tailings exist at the Site. Because no values have been provided, the source hazardous waste quantity cannot be confirmed. However, even if a value of undetermined but greater than zero based on the presence of other waste rock piles were applied to the Brooklyn Mine waste rock source, there would be no impact on the HRS score for the individual mine or for the overall HRS site score, as a reduced waste characteristics factor value of 320 (from 1,000) would result in the same surface water overland/flood migration component score of 60.00 at proposal.

These comments result in no change to the HRS score and no change in the decision to place the Site on the NPL.

3.22.3 Other Possible Mines/Sources

Comment: Stephen Fearn and Colorado Goldfields commented that some of the unscored mines in the HRS documentation record at proposal are fully contained and should not be considered in the proposed listing.

Colorado Goldfields commented that the Goldfields Tailings ponds are not in communication with the Animas River. Mr. Fearn commented that some of the mines have had remedial actions completed to contain the sources and mitigate contamination. Specifically, Mr. Fearn commented that:

- Pride of the West Mine has had its open “stopes” covered.
- Goldfields Tailings has two existing tailings ponds that are in reclamation phase.
- Mammoth Tunnel has had settling ponds created to reduce loading.
- Silver Ledge Mine has had residual mine waste from the creek channel and moved to an on-site repository with run-on/run-off controls to manage storm water.
- Longfellow Mine has had the waste pile consolidated and capped.

Response: All of the “Other Possible Mines and Mine Related Sources” in the HRS documentation record at proposal were included to inform the public that these mines and related sources could also be contributing to the release in the watershed and that EPA will be investigating these as part of further efforts. The other possible mines that are listed in the sources section of the HRS documentation record at proposal are not included as part of the HRS site score. While these other mines are not included in the scoring of the Site, these mines are associated with hazardous substances (unchallenged by the commenters) and have containment values greater than zero and therefore meet the HRS definition of a source and could be contributing to the release to the watershed.

HRS Section 1.1, *Definitions*, defines a source as “any area where a hazardous substance has been deposited, stored, disposed, or placed, plus those soils that have become contamination from migration of a hazardous substance.”

HRS Section 2.2.3, Identify hazardous substances available to a pathway, describes how to evaluate the eligibility of sources and hazardous substances within the source. It states, in relevant part, to consider substances available to the pathway if:

- Surface water migration—overland/flood component.

...

–All hazardous substances associated with a source with a surface water containment factor value greater than 0 for the watershed (see sections 4.1.2.1.2.1.1 and 4.1.2.1.2.2.1).

HRS Table 4-2 directs how to assign the containment factor values for the surface water pathway (see section 3.23.1, Source Containment, of this support document).

The other possible mines and sources included in the HRS documentation record at proposal all contain hazardous substances that were unchallenged by the commenters. All of the mines that were included as other possible mines contain sources of contamination that are either source types of piles (tailings piles) or source type other (adit flow, pools, etc.) and both source types are included in the HRS Table 4-2 (see section 3.23.1, Source Containment, of this support document). The HRS does not require that unscored sources/mines document contaminant migration from the unscored source, only that the unscored sources/mines contain non-zero containment values to make the hazardous substances available to the pathway.

Regarding the commenters' statements that the Goldfields Tailings pile ponds are in reclamation and do not appear to be in connection with the Animas River, as mentioned above, there is no requirement that migration from the ponds be actively occurring at the Site, only that the containment of the tailings piles and ponds have containment values of greater than zero. Neither the EPA nor the commenters identified that any maintained engineered cover or a functioning run-on run-off system were present at the Goldfields Tailings pile mining site. Therefore, according to HRS Table 4-2, a containment factor value of 10 would be assigned and the unscored mine remains eligible as an other possible mine and related source.

Regarding the Pride of the West Mine, while documentation has not been provided to show that the tailings piles have been covered, even if the tailings piles have a maintained engineered cover there is no mention of a functioning run-on/run-off control system at the unscored mine. Therefore, even if the tailings piles were considered covered, HRS Table 4-2 would assign a containment value of 9 for this unscored mine and it would remain eligible as an other possible mine and related source.

Regarding the Mammoth Tunnel, a reduction of contaminant loading does not eliminate migration of the contamination. Therefore, HRS Table 4-2 would assign a containment value of 10 for this unscored mine and it would remain eligible as an other possible mine and related source.

Regarding the Silver Ledge Mine, while documentation has not been provided to show that contamination was removed from the stream and that the on-site repository contains run-on/run-off controls, even if these actions and controls are assumed to be completed, the repository does not contain a maintained engineered cover. Therefore, HRS Table 4-2 would assign a containment value of 9 for this unscored mine and it would remain eligible as an other possible mine and related source.

Regarding the Longfellow Mine, while documentation has not been provided to show that the tailings piles have been covered, even if the tailings piles have a maintained engineered cover, there is no mention of a functioning run-on/run-off control system at the unscored mine. Therefore, even if the tailings piles were consolidated and capped, HRS Table 4-2 would assign a containment value of 9 for this unscored mine and it would remain eligible as an other possible mine and related source.

None of the mines that are listed in the sources section of the HRS documentation record at proposal as "Other Possible Mines and Mine Related Sources" were included in the scoring of the Site and their inclusion or removal from this list has no impact on the HRS Site score. However, since all of the mines that the commenters mentioned as being contained are in fact not contained for HRS purposes, it is appropriate to include them as other possible mines that may be investigated at a later stage in the Superfund process.

These comments result in no change to the HRS score and no change in the decision to place the Site on the NPL.

3.23 Likelihood of Release - Observed Release Direct Observation

Comment: SGC commented that EPA's observed release to surface water relied on either an adit that was observed discharging to a stream, or a waste rock pile that was in direct contact with a stream, whereas the USGS risk assessment relied on chemical concentrations and evaluations of the aquatic community (benthic invertebrates and fish) within the watershed.

Stephen Fearn commented that at the Henrietta Mine, the waste rock was removed from being in contact with the stream.

Response: EPA correctly established observed releases by direct observation of cadmium, copper, manganese, and zinc to the Animas River, Cement Creek, and Mineral Creek. The establishment of the releases of cadmium, copper, manganese, and zinc by direct observation meet the HRS requirements and support the likelihood of release value of 550 as scored. The HRS contains no requirement that an observed release be documented to be causing immediate harm to human health or the environment. The possible effect of a release on receptors is considered in assigning the target category value for the site

The HRS provides that an observed release can be established either by chemical analysis or by direct observation. For the surface water migration pathway, HRS Section 4.1.2.1.1, *Observed release*, states the following for documenting an observed release:

Establish an observed release to surface water for a watershed by demonstrating that the site has released a hazardous substance to the surface water in the watershed. Base this demonstration on **either:** [emphasis added]

- Direct Observation
 - A material that contains one or more hazardous substances has been seen entering surface water through migration or is known to have entered surface water through direct deposition, or
 - A source area has been flooded at a time that hazardous substances were present, and one or more hazardous substances were in contact with the flood waters, or
 - When evidence supports the inference of a release of a material that contains one or more hazardous substances by the site to surface water, demonstrated adverse effects associated with that release may also be used to establish an observed release.

...

If an observed release can be established for a watershed, assign an observe release value of 550 to that watershed....

The first of the criteria listed to establish an observed release by direct observation -- a material that contains one or more hazardous substances has been seen entering surface water through migration or is known to have entered surface water through direct deposition -- has been satisfied in the HRS documentation record, which states the following on pages 141-144 of the HRS documentation record at proposal:

Observed release by direct observation is supported by evidence of contaminant-bearing acid mine drainage entering the Upper Animas River watershed from draining mine adits and waste rock piles, as well as observing the presence of waste rock in direct contact with surface water. Section 2.2, Source Characterization for each drainage present all the sources and the hazardous substances associated with each. Adit discharges from multiple sources contain hazardous substances and are known to be entering the watershed, and several waste rock piles are in direct contact with and being eroded by streams. Each PPE is associated with an observed release by

direct observation (i.e., either a draining adit that was observed discharging to a perennial stream, or a waste rock pile that is in direct contact with the stream; see Table SW-1). Based on the results presented in Section 2.2 for each source, the observed releases contain some or all of the following hazardous substances: aluminum⁶, cadmium, copper, manganese, and zinc.

TABLE SW-5. Observed Release by Direct Observation			
PPE Designation	Stream Name	Evidence^[†]	References
PPE-U-1A	West Fork Animas River (California Gulch)	The Vermillion Mine Adit Discharge (Source U-1A), which has pH of 3.1 to 3.7 and contains aluminum, cadmium, copper, manganese, and zinc (sample DM-17), enters West Fork Animas River at PPE-U-1A.	Refs. 14, pp. 12, 71-73, 121, 123, 125, 127; 19, pp. 5, 114; 55, p.1
PPE-U-2A	West Fork Animas River (California Gulch)	The Frisco/Bagley Tunnel Adit Discharge (Source U-2A), which contains cadmium, manganese, and zinc (sample DM-19), enters West Fork Animas River at PPE-U-2A	Refs. 14, pp. 12, 75-79, 121, 123, 125, 127, 150, 151; 19, pp. 5, 113; 55, p. 2; 49, pp. 132-133
PPE-U-2B	West Fork Animas River (California Gulch)	The Frisco/Bagley Tunnel Waste Rock Pile (Source U-2B), which contains aluminum, cadmium, copper, manganese, and zinc (sample #10), is in contact with West Fork Animas River at PPE-U-2B.	
PPE-U-3	West Fork Animas River (California Gulch)	The Columbus Mine Adit Discharge (Source U-3A), which contains aluminum, cadmium, copper, manganese, and zinc (sample DM-20), enters West Fork Animas River at PPE-U-3. The Columbus Mine Waste Rock Pile (Source U-3B) contains aluminum, cadmium, copper, manganese, and zinc (sample #13). Leachate from the pile enters the stream at the same PPE.	Refs. 14, pp. 12, 80-82, 121, 123, 125, 127, 150, 151; 19, pp. 5, 39, 113; 55, p. 3
PPE-U-4	Animas River	The Tom Moore Mine Adit Discharge (Source U-4A), which contains cadmium, manganese, and zinc (sample DM-22), enters Animas River at PPE-U-4. The Tom Moore Mine Waste Rock Pile (Source U-4B) contains aluminum, cadmium, copper, manganese, and zinc (sample #33). Leachate from the pile enters the stream at the same PPE.	Refs. 14, pp. 12, 97-98, 121, 123, 125, 127; 55, p. 4
PPE-U-5	Animas River	The Kittimack Tailings Waste Pile (Source U-5B) contains aluminum, cadmium, copper, manganese, and zinc (sample #13). Erosion into Animas River at PPE-U-5 occurs when the tailings area becomes saturated in spring.	Ref. 15, pp. 26, 128-129, 229-232; 55, p. 5
PPE-U-6	Animas River	The Amy Tunnel of Aspen Mine Adit Discharge (Source U-6A), which contains cadmium, copper, manganese, and zinc (sample DM64), enters Animas River at PPE-U-6.	Refs. 15, pp. 20, 141-143, 187-199; 55, p. 6

⁶ EPA notes that aluminum was removed from scoring of the BPMD site at promulgation.

TABLE SW-5. Observed Release by Direct Observation			
PPE Designation	Stream Name	Evidence^[†]	References
PPE-C-1	Cement Creek	The Grand Mogul Mine Adit Discharge (Source C-1A), which contains aluminum, cadmium, copper, manganese, and zinc (sample UASW059), enters Cement Creek at PPE-C1, where a rust-colored stain has been observed on stream rocks at the PPE. The adit discharge emanates from the Grand Mogul Mine Waste Rock Pile (Source C-1B), which contains cadmium, copper, manganese, and zinc (samples UASO010 and UASO011).	Refs. 3, pp. 41-44; 4, pp. 18, 22-24, 27, 60, 62; 5, pp. 6, 15; 12, pp. 1-3; 55, p.7
PPE-C-2	Cement Creek	The Mogul Mine Adit Discharge (Source C-2A), which contains aluminum, cadmium, copper, manganese, and zinc (sample UAAD004), enters Cement Creek at PPE-C-2.	Refs. 2, p. 18; 3, pp. 9-10, 32, 37; 4, pp. 18, 22-24, 27-28, 60, 62; 12, pp. 1-3; 55; p. 8
PPE-C-3	Cement Creek	The Red and Bonita Mine Adit Discharge (Source C-3A), which contains aluminum, cadmium, manganese, and zinc (sample CC03C), enters Cement Creek at PPE-C-3.	Refs. 2, p. 18; 4, pp. 18-19, 27-28, 55, 62; 11, pp. 8-10, 40-41; 12, pp. 1, 2, 4, 5; 26, pp. 20; 55, p. 9
PPE-C-4A	North Fork Cement Creek	The Gold King Mine Adit Discharge (Source C-4A), which contains aluminum, cadmium, copper, manganese, and zinc (sample UAAD002), enters Cement Creek at PPE-C-4A.	Refs. 2, p. 18; 4, pp. 18-19, 27-28, 60, 62; 5, pp. 11, 12, 18-19; 12, pp. 1, 2, 4, 5; 55, p. 10; 50, p. 163
PPE-C-4B	North Fork Cement Creek	The Gold King Mine Waste Rock Pile (Source C-4B) contains cadmium, copper, manganese, and zinc (samples UASO015 and UASO016). North Fork Cement Creek actively erodes the pile at PPE-C-4B.	
PPE-C-5	Cement Creek	The American Tunnel Adit Discharge (Source C-5A), which contains aluminum, cadmium, manganese, and zinc (sample UAAD001), enters Cement Creek at PPE-C-5.	Refs. 4, pp. 18-19, 27-29, 60; 55, p. 11
PPE-C-6A	South Fork Cement Creek/Silver Ledge	The Natalie/Occidental Mine Adit Discharge (Source C-6A), which contains aluminum, cadmium, copper, manganese, and zinc (sample SO-13), enters South Fork Cement Creek at PPE-C-6A.	Refs. 2, pp. 18, 92, 94-96, 167-169, 171, 185, 187, 189; 55, p. 12; 50, p. 161
PPE-C-6B	South Fork Cement Creek	The Natalie/Occidental Mine Waste Rock Pile (Source C-6B) contains cadmium, copper, manganese, and zinc (sample Site #20). South Fork Cement Creek runs through and erodes the toe of the pile at PPE-C-6B.	
PPE-C-7A	Prospect Gulch	The Henrietta Mine Adit Discharge (Source C-7A), which contains aluminum, cadmium, copper, manganese, and zinc (sample SO-04), enters Prospect Gulch at PPE-C-7A.	Refs. 2, pp. 19, 105-111, 168, 170, 172, 185, 187, 189; 55, p. 13; 50, p. 153
PPE-C-7B	Prospect Gulch	The Henrietta Mine Waste Rock Pile (Source C-7B) contains cadmium, copper, manganese, and zinc (samples Site #3 and Site #10). The pile is being eroded at the toe by the stream (Prospect Gulch) at PPE-C-7B.	

TABLE SW-5. Observed Release by Direct Observation			
PPE Designation	Stream Name	Evidence^[†]	References
PPE-C-8	Prospect Gulch	The Lark Mine Adit Discharge (Source C-8A), which contains aluminum, cadmium, copper, manganese, and zinc (sample SO-02), enters Prospect Gulch at PPE-C-8.	Refs. 2, pp. 106, 111-113, 168, 170,172; 55, p. 14
PPE-C-9	Prospect Gulch	The Joe and Johns Mine Adit Discharge (Source C-9A), which contains aluminum, cadmium, copper, manganese, and zinc (sample SO-06), enters Prospect Gulch at PPE-C-9.	Refs. 2, pp. 33, 113-115, 168, 170,172; 55, p. 15
PPE-M-1	Mineral Creek	Discharge from the Koehler Tunnel Adit Pool (Source M-1A), which contains aluminum, cadmium, copper, manganese, and zinc (sample MS81), enters Mineral Creek at PPE-M-1.	Refs. 6b, pp. 45, 50; 6d, p. 7; 13, pp. 7-22; 39, pp. 3-8; 55, p. 16
PPE-M-2A	Browns Gulch	The Brooklyn Mine Adit Discharge (Source M-2A), which contains aluminum, cadmium, copper, manganese, and zinc (samples 216/4193-1.306 and several others; see Section 2.2.2-Mineral Creek for full list), enters Browns Gulch at PPE-M-2A. On its way to the PPE, the adit discharge becomes more acidic and metals concentrations increase when it flows over the Brooklyn Mine Waste Rock Pile (Source M-2B), which contains leachable aluminum, cadmium, copper, manganese, and zinc (leach test samples NAD588, NAD817, NAD818, and NAT501).	Refs. 6b, pp. 44, 48, 51; 6c, pp. 26-27; 6d, pp. 2, 8-9, 15, 16, 18; 13, pp. 31-35; 39, pp. 1-2; 55, p. 17
PPE-M-3A	Middle Fork Mineral Creek	The Paradise Mine Adit Discharge (Source M-3A), which contains aluminum, cadmium, copper, manganese, and zinc (sample MS77 and others; see Section 2.2.2-Mineral Creek for full list), enters Middle Fork Mineral Creek at PPE-M-3A.	Refs. 6b, pp. 46, 52; 6c pp. 30-31; 6d, pp. 6-7, 10, 12-14, 16, 17; 13, pp. 45, 47-52; 39, pp. 8-9; 55, p. 18
PPE-M-3B	Middle Fork Mineral Creek	The Paradise Mine Waste Rock Pile (Source M-3B), which contains aluminum, cadmium, copper, manganese, and zinc (leach test samples NAD520, NADW520, NAF520, and NAF521), is in direct contact with Middle Fork Mineral Creek at the same PPE as Source M-3A.	
PPE-M-4	South Fork Mineral Creek	The Bandora Mine Adit Discharge (Source M-4A), which contains aluminum, cadmium, copper, manganese, and zinc (sample 235/4185-1.300 and several others; see Section 2.2.2-Mineral Creek for full list), enters South Fork Mineral Creek at PPE-M4.	Refs. 6b, pp. 35, 44, 49, 53; 6c, p. 27; 6d, pp. 2, 5-6, 12, 15; 13, pp. 52-57; 39, pp. 10-16; 55, p. 19

Note: PPE Probable Point of Entry

[†] EPA notes that aluminum was removed from scoring of the BPMD site at promulgation.

Observed Release by Chemical Analysis

Observed release by chemical analysis is not scored for the BPMD site.

Hazardous Substances Released:

Aluminum⁷
Cadmium
Copper
Manganese
Zinc

The HRS documentation record at promulgation lists cadmium, copper, manganese and zinc releases as adit discharge or waste piles containing these hazardous substances that are in direct contact to surface water. In establishing an observed release to the surface water migration pathway, the HRS does not require that a release of hazardous substance is ongoing, it only requires that a “site has released a hazardous substance.” Further, there is no requirement that aquatic organisms must be evaluated to establish an observed release by chemical analysis and the HRS evaluation of the BPMD site did not even score an observed release by chemical analysis.

EPA documented observed releases by direct observation in the HRS documentation record at proposal and at promulgation and an observed release factor value of 550 was assigned to the watershed at proposal and at promulgation for each mine scored and the overall site score.

Regarding Mr. Fearn’s comment that the waste rock at Henrietta Mine was removed from being in contact with the stream, historical release can be considered for observed release by direct observation. The HRS does not require that releases are current or ongoing, only that a material that contains one or more hazardous substances has been seen entering surface water through migration or is known to have entered surface water through direct deposition. See section 3.17, Consideration of Removal and Reclamation Actions/Current Conditions, of this support document for discussion of removal activity at the Site

These comments result in no change to the HRS score and no change in the decision to place the Site on the NPL.

3.24 Likelihood of Release - Observed Release by Chemical Analysis

Comment: SGC, NMED, the Colorado Mining Association, OSMI, SJLHC, Mr. Simon, and Mr. Wright all commented on sampling data that they alleged should have been used to properly evaluate an observed release by chemical analysis but were not used in the HRS scoring of the Site.

SGC, SJLHC, and the Colorado Mining Association commented that EPA did not consider appropriate background levels given the natural landscape is highly mineralized at the Site. SGC and Mr. Wright commented that acid mine drainage discharge is impacted both by drainage from inactive mines and by weathering of mineralized bedrock, and any perceived threat disregards pre-mining and background water quality issues. Mr. Simon and Mr. Wright commented that the portion of the metal loading that is natural and existed prior to mining is complex to differentiate.

SGC and SJLHC commented that EPA ignored USGS data when developing its estimates of background metals concentrations in the surface waters of the Site. It explained that the USGS data reflects the unique geology of the upper Animas River basin. SGC asserted that the maximum background surface water concentrations from the USGS data are orders of magnitude greater than those relied upon by EPA in its HRS documentation record. SGC commented that EPA overestimated anthropogenic water quality impacts in the upper Animas River basin and asserted that an observed release by chemical analysis would not be established at the Site if these highest background sample levels were used.

⁷ EPA notes that aluminum was removed from scoring of the BPMD site at promulgation

OSMI commented that insufficient locations had been sampled to determine background conditions and asserted that additional background sampling locations should be added to determine an appropriate background level.

SGC commented that EPA is unclear in its definition of “elevated” concentrations. It asserted that using USGS data, only 6 of 209 “elevated” surface water concentrations listed in Table SW-3 of the HRS documentation record exceed the maximum background concentrations developed by the USGS.

Response: The HRS documentation record at proposal appropriately establishes observed releases from each mine by direct observation and assigned a value of 550 to the likelihood of release; it is not required that observed releases by chemical analysis be established to assign the 550 value. Therefore, the EPA was not required to establish background levels or show significant increases in the hazardous substance levels as these are only required when documenting observed releases by chemical analysis.

HRS Section 4.1.2.1.1, Observed release, states that an observed release to surface water for a watershed can be established based on either direct observation or chemical analysis. Specifically, it states:

Establish an observed release to surface water for a watershed by demonstrating that the site has released a hazardous substance to the surface water in the watershed. Base this demonstration on **either:** [emphasis added]

- Direct observation:
...
- Chemical analysis:
...

If an observed release can be established for a watershed, assign an observed release factor value of 550 to that watershed, enter this value in Table 4-1, and proceed to section 4.1.2.1.3.

As quoted in section 3.23, Likelihood of Release – Observed Release by Direct Observation, of this support document, observed releases by direct observation are appropriately established at each scored mine in the HRS documentation record at proposal. Page 144 of the HRS documentation record at proposal states that an “observed release by chemical analysis is not scored for the BPMD site.”

The HRS does not require that an observed release by chemical analysis be evaluated to establish a likelihood of release value of 550 at a site. In this case, sufficient data was available to appropriately score observed releases by direct observation for each scored mine; an observed release by chemical analysis was not evaluated in the HRS documentation record at proposal at this Site.

While an observed release by chemical analysis is not required and was not scored at Site, chemical analysis data were included in the HRS documentation record at proposal to demonstrate that extensive metals contamination is present throughout the watershed. Because no observed releases by chemical analysis were established, the background samples at the Site are only used to show that “elevated” concentrations of metals are present at and around the abandoned mines. Similarly, because an observed release by chemical analysis is not being scored, there is no requirement for demonstrating that downstream samples of hazardous substance concentrations be elevated above concentration of the background levels

These comments result in no change to the HRS score and no change in the decision to place the Site on the NPL.

3.25 Surface Water Pathway: Drinking Water Threat

Comment: SGC, Mr. Leo M. McCormick, and an anonymous commenter raised concerns about the evaluation of the drinking water threat. SGC commented that EPA does not adequately acknowledge poor pre-mining surface water quality and has not taken this into consideration in scoring the Site. SGC commented that background water quality in portions of the Animas River Watershed, some stream reaches of Cement Creek, and mainstem Mineral Creek has always been poor, and some reaches likely have never been fit to drink.

Mr. Leo M. McCormick and an anonymous commenter both stated that there have never been any good studies on the effects of the water and they are not aware of people dying prematurely or becoming ill because of the effects of this water. The anonymous commenter added that metal loading and mineralization of the water are being used as a justification for the listing.

Response: The drinking water threat was not scored as part of the surface water pathway – overland flow component of the HRS evaluation of this site. Therefore, there were no targets identified or scored as being subject to a drinking water threat in the HRS documentation record at proposal. The HRS contains no requirement that all threats of the surface water pathway be evaluated in the HRS documentation record. Because there were no drinking water threats identified within the TDL for this Site or evaluated at the Site, page 4 of the HRS documentation record at proposal documents that both the drinking water threat targets and the drinking water threat score are evaluated as “NS” or “Not Scored.”

These comments result in no change to the HRS score and no change in the decision to place the Site on the NPL.

3.26 Surface Water Pathway: Human Food Chain Threat

Comment: SGC commented that the surface water pathway human food chain threat was inappropriately evaluated in the HRS documentation record at proposal. SGC commented that improper hazardous substances were selected to score the waste characteristics in each drainage system and that EPA has calculated a human food chain threat target factor category value with little if any specific information regarding the fishery. SGC commented that pre-mining conditions did not necessarily support aquatic life and that listing the Site on the NPL primarily based on human consumption of fish is questionable.

Response: As shown in the following subsections of this support document, the human food chain threat of the surface water pathway has been evaluated according to the HRS; both the waste characteristics and targets were calculated according to the requirements of the HRS. The HRS documentation record at proposal and at promulgation used the appropriate hazardous substance to score each mine and pathway and appropriately evaluated the fisheries present at the Site.

HRS Section 4.1.3.2.1.4, *Calculation of toxicity/persistence/bioaccumulation factor value*, directs how scorers should evaluate hazardous substances to assign the appropriate toxicity/persistence/bioaccumulation factor value. It states:

Assign each hazardous substance a toxicity/persistence factor value from table 4–12, based on the values assigned to the hazardous substance for the toxicity and persistence factors. Then assign each hazardous substance a toxicity/persistence/bioaccumulation factor value from table 4–16, based on the values assigned for the toxicity/persistence and bioaccumulation potential factors. Use the hazardous substance with the highest toxicity/persistence/bioaccumulation factor value for the watershed to assign the value to this factor. Enter this value in table 4–1.

The HRS documentation record at proposal and at promulgation assigns the toxicity/persistence/bioaccumulation factor values based on the hazardous substances associated with the sources; page 145 at proposal states how the factor value was assigned:

4.1.3.2.1 Toxicity/Persistence/Bioaccumulation

The toxicity/persistence/bioaccumulation factor values are based on the hazardous substances associated with the sources (see Section 2.2 Source Characterization for each drainage).

Hazardous Substance*	Source No.**	Toxicity Factor Value***	Persistence Factor Value**** (River)	Bioaccumulation Factor Value (Fresh)	Toxicity/Persistence/Bioaccumulation Factor Value	Reference
Aluminum ^[†]	OR and all sources	1,000	1.0	50	5 x 10 ⁴	Ref. 16, p. 1
Cadmium	OR and all sources	10,000	1.0	50,000	5 x 10⁸	Ref. 16, p. 3
Copper	OR and all sources	100	1.0	50,000	5 x 10 ⁶	Ref. 16, p. 4
Manganese	OR and all sources	10,000	1.0	500	5 x 10 ⁶	Ref. 16, p. 5
Zinc	OR and all sources	10	1.0	500	5 X 10 ³	Ref. 16, p. 6

OR Observed Release by Direct Observation

* As shown in Sections 2.2.2 for each drainage.

** As shown in Sections 2.2.3 for each drainage.

*** Toxicity values assigned are based on the predominant surface water category of fresh water.

**** Persistence values assigned are based on the predominant surface water body category "River."

[†] EPA notes that aluminum was removed from scoring of the BPMD site at promulgation].

Cadmium has the highest toxicity/persistence/bioaccumulation factor value (5 x 10⁸) for this watershed [Ref. 1, Table 4-16; Ref. 16, pp. 1-6]. Cadmium was selected to assign the value to this factor [Ref. 1, Section 4.1.3.2.1.4].

Toxicity/Persistence/Bioaccumulation Factor Value: 5 x 10⁸

Similarly, for the individual mine scores calculated in Appendix A of the HRS documentation record at proposal, for the Toxicity/Persistence/Bioaccumulation factor value, it refers the reader to section 4.1.3.2.1 of the HRS documentation record at proposal. (See Appendix A of the HRS documentation record at proposal and at promulgation). The Toxicity/Persistence/Bioaccumulation factor value for each individual mine is the same as cited above from page 145 of the HRS documentation record at proposal. Therefore, cadmium is the substance with the highest toxicity/persistence/bioaccumulation factor value at each individual mine at proposal and at promulgation.

Regarding the commenters' concerns that a fishery was appropriately identified as a target, HRS Section 4.1.3.3, *Human food chain threat-targets*, states:

Evaluate two target factors for each watershed: food chain individual and population. For both factors, determine whether the target fisheries are subject to actual or potential human food chain contamination.

Consider a fishery (or portion of a fishery) within the target distance limit of the watershed to be subject to actual human food chain contamination if any of the following apply:

- A hazardous substance having a bioaccumulation potential factor value of 500 or greater is present either in an observed release by direct observation to the watershed or in a surface water or sediment sample from the watershed at a level that meets the criteria for an observed release to

the watershed from the site, and at least a portion of the fishery is within the boundaries of the observed release (that is, it is located either at the point of direct observation or at or between the probable point of entry and the most distant sampling point establishing the observed release).

...

When a fishery (or portion of a fishery) is subject to actual food chain contamination, determine the part of the fishery subject to Level I concentrations and the part subject to Level II concentrations. If the actual food chain contamination is based on direct observation, evaluate it using Level II concentrations.

The HRS documentation record at proposal and at promulgation identifies two fisheries that are present within the TDL at the Site. Page 149 of the HRS documentation record at proposal states:

4.1.3.3 Human Food Chain Threat - Targets

As shown in Figures 8 and 10, there are two specific fisheries identified within the TDL for the site: Animas River #4 (Howardsville), a reach of the river between Cunningham Creek and Minnie Gulch, and South Fork Mineral Creek (SF Mineral Creek) [Ref. 42, pp. 25-28; 43, pp. 20-22; 44, pp. 1-2]. According to Colorado Parks and Wildlife (CPW), people consume some of the fish that are caught in these reaches [Ref. 44, pp. 1-2]. Although fishing is common in the affected fisheries, CPW does not conduct formal angler surveys and does not record or estimate harvest [Ref. 44, p. 1]. As shown in Figure 8, the observed release at PPE-U-5 affects the Animas River #4 (Howardsville) fishery in the Upper Animas River drainage. As shown in Figure 10, the observed release at PPE-M-4 affects the South Fork Mineral Creek fishery in the Mineral Creek drainage. Based on the observed releases by direct observation, both fisheries are subject to Level II concentrations [Ref. 1, Sections 2.5 and 4.1.3.3].

...

Samples for Observed Release/Level I/Level II Concentrations

As described in **Section 4.1.2.1.1**, the observed releases are documented by direct observation; no stream sample data are considered for evaluation of Level I/Level II concentrations. The fisheries where there is an observed release by direct observation are considered as being subject to Level II concentrations [Ref. 1, Sections 2.5 and 4.1.3.3]. The following hazardous substances are associated with the observed releases into both fisheries:

Hazardous Substance:	Aluminum ⁸
Bioaccumulation Potential:	50
Hazardous Substance:	Cadmium
Bioaccumulation Potential:	50,000
Hazardous Substance:	Copper
Bioaccumulation Potential:	50,000
Hazardous Substance:	Manganese
Bioaccumulation Potential:	500

⁸ EPA notes that aluminum was removed from scoring of the BPMD site at promulgation.

Hazardous Substance: Zinc
Bioaccumulation Potential: 500

References: See Table SW-6.

The hazardous substances and the fisheries in the Animas River and Mineral Creek were appropriately evaluated in the HRS documentation record at proposal and at promulgation. Following the HRS, the highest scoring hazardous substance was used for the watershed to evaluate the waste characteristics. Similarly, two fisheries were appropriately identified at the Site where fish were known to be caught for human consumption. Please see the following subsections for more specific comments regarding the waste characteristics and the targets scored in the HRS documentation record at proposal:

- 3.26.1 Waste Characteristics - Toxicity/ Persistence/Bioaccumulation
- 3.26.2 Targets

3.26.1 Waste Characteristics - Toxicity/Persistence/Bioaccumulation

Comment: SGC commented that EPA chose to use cadmium, the highest scoring substance for assigning the toxicity/persistence/bioaccumulation factor value, but should have used more technically defensible values specific to each drainage to more accurately reflect any threat, or potential threat, if any, to the public health or welfare or the environment. SGC stated that the more appropriate calculations of waste characteristics for the human food chain threat would have been to use zinc for the Upper Animas drainage basin and aluminum for both the Cement Creek and Mineral Creek drainage basins.

SGC commented that cadmium concentrations reported by EPA on Table SW-3 in the HRS documentation record at proposal were elevated only in surface water samples collected in the uppermost reach of the Upper Animas River drainage in California Gulch, Placer Gulch, and the West Fork of the Animas River, and in the uppermost reach of Cement Creek. SGC commented that cadmium concentrations were not elevated farther downstream in the Upper Animas River or Cement Creek, and were not elevated in surface water samples collected in Mineral Creek. SGC added that the ecological risks to aquatic biota in the Animas River watershed were evaluated by the USGS (Besser, Finger, and Church, 2007), which it claimed concluded that dissolved cadmium occurs at much lower concentrations than zinc or copper and does not pose a risk to brook trout. Therefore, claimed SGC, “cadmium is not representative of the Upper Animas River watershed and its toxicity/persistence/bioaccumulation factor should not be used as a default value for HRS scoring.”

SGC commented that both manganese and copper were more widespread contaminants than cadmium and would result in a lower human food chain threat score for the surface water overland/flood migration component of the surface water pathway. SGC also commented that both aluminum and zinc concentrations are elevated in the uppermost reach of the Upper Animas River and aluminum is elevated in the mainstem of Cement Creek. SGC commented that, “[u]sing the [toxicity/persistence/bioaccumulation] value for aluminum in Cement Creek and Mineral Creek would be entirely appropriate as a representative constituent and would significantly reduce the human food chain threat score for the surface water overland/flood migration component of the surface water pathway.” SGC commented that using the toxicity/persistence/bioaccumulation value for zinc in the Upper Animas River “rather than cadmium-again a more representative metal-would significantly reduce the human food chain threat score for the surface water overland/flood migration component of the surface water pathway.”

SGC summarized that the toxicity/persistence/bioaccumulation values should be 5×10^3 considering zinc for the Upper Animas River, and 5×10^4 considering aluminum for Cement Creek and Mineral Creek.

Response: The HRS documentation record at proposal properly uses cadmium as the substance with the highest scoring toxicity/persistence/bioaccumulation factor value for evaluating the waste characteristics component of

the human food chain threat for all three drainages. The HRS specifically instructs to select the substance, either associated with a source or in an observed release, with the highest toxicity/mobility/bioaccumulation factor value for the human food chain threat when evaluating these factor values. At this site, cadmium was associated with sources and releases to the three drainages and had the highest toxicity/persistence/bioaccumulation factor value.

In addition, for the human food chain threat component of the surface water migration pathway, the toxicity of each substance was assigned according to the instructions of HRS, which directs to consider “human toxicity” parameters. The toxicity of cadmium, copper, manganese, and zinc were correctly considered when evaluating the human food chain threat toxicity component of the waste characteristics for the watershed. Further, while unchallenged by the commenters, the HRS accounts for the threat to humans by also considering the persistence of the hazardous substance in surface water and the potential for it to bioaccumulate in human food chain organisms. All three factors (toxicity, persistence, and bioaccumulation) contribute to the calculation of the waste characteristics component when selecting the substance that potentially poses the greatest hazard at the Site.

The highest scoring substance (cadmium) was correctly considered. HRS Section 4.1.3.2.1, *Toxicity/persistence/bioaccumulation*, and its subpart HRS Section 4.1.3.2.1.4, *Calculation of toxicity/persistence/bioaccumulation factor value*, as well as HRS Section 2.4.1, *Selection of substance potentially posing greatest hazard*, were followed when selecting the hazardous substance to be used for calculating the toxicity/persistence/bioaccumulation factor value for the watershed.

HRS Section 2.4.1 *Selection of substance potentially posing greatest hazard*, states:

For all pathways (and threats), select the hazardous substance potentially posing the greatest hazard for the pathway (or threat) and use that substance in evaluating the waste characteristics category of the pathway (or threat). For the three migration pathways (and threats), base the selection of this hazardous substance on the toxicity factor value for the substance, combined with its mobility, persistence, and/ or bioaccumulation (or ecosystem bioaccumulation) potential factor values, as applicable to the migration pathway (or threat). For the soil exposure pathway, base the selection on the toxicity factor alone.

HRS Section 4.1.3.2.1, *Toxicity/persistence/ bioaccumulation*, states:

Evaluate **all** those hazardous substances eligible to be evaluated for toxicity/persistence in the drinking water threat for the watershed (see section 4.1.2.2). [Emphasis added]

As instructed in HRS Section 4.1.3.2.1, HRS Section 4.1.2.2, *Drinking water threat-waste characteristics*, was considered; it states in part:

Evaluate only those hazardous substances that are available to migrate from the sources at the site to surface water in the watershed via the overland/flood hazardous substance migration path for the watershed (see section 4.1.1.1). Such hazardous substances include:

- Hazardous substances **that meet the criteria for an observed release to surface water in the watershed**. [Emphasis added]
- All hazardous **substances associated with a source that has a surface water containment factor value greater than 0 for the watershed** (see sections 2.2.2, 2.2.3, 4.1.2.1.2.1.1, and 4.1.2.1.2.2.1). [Emphasis added]

In evaluating the assigned toxicity/persistence/bioaccumulation factor value for the human food chain threat, HRS Section 4.1.3.2.1.4, *Calculation of toxicity/persistence/bioaccumulation factor value*, was considered and it states:

Assign each hazardous substance a toxicity/persistence factor value from Table 4-12, based on the values assigned to the hazardous substance for the toxicity and persistence factors. Then

assign each hazardous substance a toxicity/persistence/ bioaccumulation factor value from Table 4-16, based on the values assigned for the toxicity/persistence and bioaccumulation potential factors. **Use the hazardous substance with the highest toxicity/persistence/bioaccumulation factor value for the watershed** to assign the value to this factor. Enter this value in Table 4-1. [Emphasis added]

Pages 40, 78, 79 and 109 of the HRS documentation record at proposal and at promulgation list the source containment values for the sources scored. Each source was assigned a source containment value of greater than zero, and, hence, the hazardous substances associated with each source are eligible for migration to surface water. The hazardous substances available to migrate from the sources at the Site to surface water are cadmium, copper, manganese, and zinc, and each substance is eligible for evaluation in the toxicity/persistence/bioaccumulation components of the waste characteristics for the Site. EPA notes that aluminum was removed from scoring of the BPMD site at promulgation.

As quoted in section 3.23, Likelihood of Release - Observed Release by Direct Observation, of this support document, pages 141-144 of the HRS documentation record at proposal list the hazardous substances documented to meet an observed release to the watershed, and each substance is eligible for evaluation in the toxicity/persistence/bioaccumulation components of waste characteristics. These substances are cadmium, copper, manganese and zinc, and they are associated with each drainage watershed (Upper Animas, Cement Creek, and Mineral Creek). EPA notes that aluminum was removed from scoring of the BPMD site at promulgation.

As quoted in section 3.26, Surface Water Pathway: Human Food Chain Threat, of this support document, Table SW-6 in the HRS documentation record at proposal presents the toxicity/persistence/bioaccumulation value assigned to hazardous substances scored and documents that cadmium is the highest scoring substance at 5×10^8 . Page 145 states:

Cadmium has the highest toxicity/persistence/bioaccumulation factor value (5×10^8) for this watershed [Ref. 1, Table 4-16; Ref. 16, pp. 1-6]. Cadmium was selected to assign the value to this factor [Ref. 1, Section 4.1.3.2.1.4].

Toxicity/Persistence/Bioaccumulation Factor Value: 5×10^8

The toxicity/persistence/bioaccumulation factor value for the human food chain threat was correctly applied using the value calculated for cadmium as it had the highest value. The HRS requires the highest scoring hazardous substance documented in a source available to the watershed or documented in an observed release be selected for the toxicity/persistence/bioaccumulation factor value component of the waste characteristics for the watershed.

Regarding the toxicity of cadmium, copper, manganese and zinc, the toxicity of each substance is assigned a value consistent with the requirements of the HRS. For the human food chain threat component of the surface water migration pathway, the toxicity of each substance is assigned according to the instructions of HRS 2.4, *Waste characteristics*; HRS Section 2.4.1, *Selection of substance potentially posing greatest hazard*; HRS Section 2.4.1.1, *Toxicity factor*; and HRS Section 4.1.3.2.1.1, *Toxicity*, which directs to consider “human toxicity” parameters. EPA notes that aluminum was removed from scoring of the BPMD site at promulgation. HRS Section 2.4, *Waste characteristics*, states:

The waste characteristics factor category includes the following factors: hazardous waste quantity, Toxicity, and as appropriate to the pathway or threat being evaluated, mobility, persistence, and/or bioaccumulation (or ecosystem bioaccumulation) potential.

HRS Section 2.4.1, *Selection of substance potentially posing greatest hazard*, states:

For all pathways (and threats), select the hazardous substance potentially posing the greatest hazard for the pathway (or threat) and use that substance in evaluating the waste characteristics category of the pathway (or threat). For the three migration pathways (and threats), base the selection of this hazardous substance on the toxicity factor value for the substance, combined with its mobility, persistence, and/or bioaccumulation (or ecosystem bioaccumulation) potential factor values, as applicable to the migration pathway (or threat). For the soil exposure pathway, base the selection on the toxicity factor alone.

Evaluation of the toxicity factor is specified in section 2.4.1.1. Use and evaluation of the mobility, persistence, and/or bioaccumulation (or ecosystem bioaccumulation) potential factors vary by pathway (or threat) and are specified under the appropriate pathway (or threat] section. Section 2.4.1.2 identifies the specific factors that are combined with toxicity in evaluating each pathway (or threat).

HRS Section 4.1.3.2.1.1, *Toxicity*, of the human food chain threat states:

Assign a toxicity factor value to each hazardous substance as specified in section 2.4.1.1.

HRS Section 2.4.1.1, *Toxicity factor*, states:

Evaluate toxicity for those hazardous substances at the site that are available to the pathway being scored. For all pathways and threats, except the surface water environmental threat, evaluate human toxicity as specified below. For the surface water environmental threat, evaluate ecosystem toxicity as specified in section 4.1.4.2.1.1. [Emphasis added].

Establish human toxicity factor values based on quantitative dose-response parameters for the following three types of toxicity: [Emphasis added].

- Cancer--Use slope factors (also referred to as cancer potency factors] combined with weight-of-evidence ratings for carcinogenicity. If a slope factor is not available for a substance, use its ED₁₀ value to estimate a slope factor as follows....
- Noncancer toxicological responses of chronic exposure--use reference dose (RRD) values.
- Noncancer toxicological responses of acute exposure--use acute toxicity parameters, such as the LD₅₀.

The HRS documentation record at proposal and at promulgation calculates a human toxicity factor value of 10,000 for cadmium based on an inhalation RfD of 2.5×10^{-6} mg/kg/day and an ED₁₀ of 1.7×10^{-2} mg/kg/day with a corresponding weight of evidence of B1, which when either is applied to HRS Table 2-4, *Toxicity Factor Evaluation*, results in a human toxicity assigned value of 10,000 (see page 145 of HRS documentation record at proposal and Reference 16 of the HRS documentation record at proposal).

The HRS documentation record at proposal and at promulgation calculates a human toxicity factor value of 100 for copper based on an oral RfD of 4.0×10^{-2} mg/kg/day, which when applied to HRS Table 2-4, *Toxicity Factor Evaluation*, results in a human toxicity assigned value of 100 (see page 145 of HRS documentation record at proposal and Reference 16 of the HRS documentation record at proposal).

The HRS documentation record at proposal and at promulgation calculates a human toxicity factor value of 10,000 for manganese based on an inhalation RfD of 1.2×10^{-5} mg/kg/day, which when applied to HRS Table 2-4, *Toxicity Factor Evaluation*, results in a human toxicity assigned value of 10,000 (see page 145 of HRS documentation record at proposal and Reference 16 of the HRS documentation record at proposal).

The HRS documentation record at proposal and at promulgation calculates a human toxicity factor value of 10 for zinc based on an oral RfD of 3.0×10^{-1} mg/kg/day, which when applied to HRS Table 2-4, *Toxicity Factor Evaluation*, results in a human toxicity assigned value of 10 (see page 145 of HRS documentation record at proposal and Reference 16 of the HRS documentation record at proposal).

Regarding threat to aquatic biota including the brook trout, the toxicity factor for the human food chain threat component of the surface water pathway is assigned based on a “human toxicity” parameter. The HRS considers the threat is to humans eating potentially contaminated human food chain organisms and, therefore, the toxicity factor value is assigned according to the directions of HRS Section 2.4.1.1, quoted above. Hence, the toxicity of cadmium, copper, manganese, and zinc was correctly considered when evaluating the human food chain threat toxicity component of the waste characteristics for the watershed. SGC is confusing the human food chain threat toxicity with the ecosystem toxicity. The commenters did not challenge the persistence and bioaccumulation potential of the hazardous substances.

These comments result in no change to the HRS score and no change in the decision to place the Site on the NPL.

3.26.2 Targets

Comment: SGC commented that pre-mining conditions did not necessarily support aquatic life and that background data and the presence/absence of fisheries was not scored appropriately.

Response: The fisheries scored in the HRS documentation record at proposal are appropriately identified at proposal as being located within the TDL for the combined site and for the TDL for the Vermillion Mine, Frisco/Bagley Tunnel, Columbus Mine, Tom Moore Mine, Kittimack Tailings and Bandora Mine. These fisheries were also appropriately identified to contain a hazardous substance with a bioaccumulation factor of 500 or greater. As quoted in section 3.27, Surface Water Pathway: Human Food Chain Threat, of this support document, the HRS documentation record evaluates the fishery in accordance with the HRS and determines that two fisheries are present. The following subsections address commenters’ specific issues regarding the human food chain threat targets:

- 3.26.2.1 Background/Historical Conditions
- 3.26.2.2 Fishery Not Threatened
- 3.26.2.3 Human Food Chain Individual and Population Scores

3.26.2.1 Background/Historical Conditions

Comment: SGC submitted comments that could be interpreted as questioning the presence of human food chain fisheries. SGC commented that EPA does not adequately acknowledge poor pre-mining surface water quality and that some reaches in the Animas headwaters, in Cement Creek, and mainstream Mineral Creek do not support aquatic life. SGC commented that the human food chain threat in the HRS documentation record is not based on the quality of the aquatic communities or fishery itself where it noted that the conditions in the rivers are severely impacted by naturally occurring sources of metals and acidity that have not been accounted for. SGC explained that even in streams less affected by high background levels of acid and metals, the high altitude of the watershed led to relatively poorly developed aquatic communities.

Response: Two fisheries are identified in the HRS documentation record at proposal and are appropriately evaluated using direct observations of contamination in the fisheries and evaluated according to the HRS. The fisheries in the Upper Animas River were evaluated as being contaminated based on the presence of an observed release by direct observation to the fishery from Kittimack tailings. The fishery in South Fork Mineral Creek was evaluated as being contaminated based on the presence of an observed release by direct observation to the fishery from the Bandora mine. As quoted in section 3.26, Surface Water Pathway: Human Food Chain Threat, of this support document, the HRS documentation record at proposal identified that a hazardous substance (cadmium)

having a bioaccumulation potential factor value of 500 or greater was directly observed to be present in the Animas River and Mineral Creek within a documented fishery. Figures 8, 10 and 11 of the HRS documentation record at proposal all show that the documented fisheries are located in areas where either a mine adit discharge or a mine waste pile has been directly observed to be in contact with the river.

Regarding the quality of the fisheries prior to mining in the area or regarding the altitude of the rivers, the quality of the aquatic communities, or fisheries, is not considered at the NPL listing stage of the Superfund process. Evidence presented in the HRS documentation record at proposal shows that aquatic life (a fishery) is currently supported in these designated areas of the stream reach and that fish caught in these areas are consumed by humans (see References 42, 43 and 44 of the HRS documentation record at proposal for documentation of human consumption). While other aquatic organisms of the aquatic community can be sampled and evaluated as part of the HRS evaluation, this sampling was not included in the scoring of the Site as it would only be used to document Level I concentrations of contamination; the Site, as scored at proposal, evaluated only Level II contamination (unchallenged by commenters) as direct observations of contamination were documented in the fisheries. Therefore, regardless of the pre-mining surface water conditions, two fisheries are appropriately identified in the HRS documentation record at proposal consistent with the HRS.

These comments result in no change to the HRS score and no change in the decision to place the Site on the NPL.

3.26.2.2 Fishery Not Threatened

Comment: SGC commented that the human food chain threat is based on observed releases rather than the quality of the fisheries. It added that although the benthic invertebrate community is slightly impaired, the USGS risk assessment showed that the water quality in the EPA-identified “fisheries” in the Animas River at Howardsville and in South Fork Mineral Creek is good and the fish population in these areas is stable. Mr. Fearn commented that there is a fishery located just downstream of the Bandora Mine on Mineral Creek, and he stated that since the fishery is “fine,” the mine must not be significantly impacting the drainage basin.

Response: The human food chain threat evaluated in the HRS documentation record at proposal is based on the presence of two fisheries that are located in the TDL for the combined site and in the TDL for the Vermillion Mine, Frisco/Bagley Tunnel, Columbus Mine, Tom Moore Mine, Kittimack Tailings, and Bandora Mine. This evaluation is also based on the direct observation of contamination that is present within the fisheries. As quoted in section 3.26, Surface Water Pathway: Human Food Chain Threat, of this support document, the evaluation of these fisheries is consistent with HRS Section 4.1.3.3, *Human food chain threat targets*. The HRS does not require that the quality of the fisheries be evaluated or that any risk assessment be completed on the risk posed to the fisheries as part of an HRS evaluation. The identification of the presence of a fishery does not mean that there are no adverse impacts from the mines to the fisheries, and the level of impairment is not considered in the HRS evaluation.

Regarding the commenters’ specific concerns about the risk posed by the mine releases to the fisheries, please see section 3.13, Risk to Human Health and the Environment, of this support document for a complete discussion of risk to human health and the environment at this Site.

This comment results in no change to the HRS score and no change in the decision to place the Site on the NPL.

3.26.2.3 Human Food Chain Individual and Population Scores

Comment: SGC commented that there are no surveys documenting human consumption of fish from either the Animas River at Howardsville or the South Fork of Mineral Creek. (White 2014, 2015, 2016). SGC commented that fishing in these areas would only occur during the warmer months of the year and would most commonly take place on a recreational basis by individuals visiting the area.

SGC stated that there is no documentation that individuals rely on the two Site fisheries for subsistence living and any consumption of fish from these areas would occur very infrequently and almost certainly not at levels that would result in actual risks to people. SGC contended that use of the human food chain threat based on fish consumption demonstrates the extent to which EPA has “strained the HRS scoring system in an effort to put the Site on the NPL.”

SGC commented that the technical basis for listing the Site on the NPL primarily on human consumption of fish (or even of a single fish) from limited fishing areas is suspect. It asserted that there is little if any technical justification for EPA's estimate of the human food chain production of the Upper Animas River watershed as "up to 100 pounds per year."

Response: Both the human food chain individual and the human food chain population values were appropriately assigned for the surface water migration pathway, for each individual mine as well as for each stream reach in the HRS documentation record at proposal. Official fish surveys were completed on the scored fisheries, and a Colorado Parks and Wildlife expert stated that human consumption of fish from these fisheries occurs. Therefore, two fisheries and the documentation of human consumption of the fish are appropriately identified in the HRS documentation record.

HRS Section 4.1.3.3.1, *Food chain individual*, states how to assign the food chain individual factor value based on the fisheries that are present at a site. It states:

Evaluate the food chain individual factor based on the fisheries (or portions of fisheries) within the target distance limit for the watershed. Assign this factor a value as follows:

- If any fishery (or portion of a fishery) is subject to Level I concentrations, assign a value of 50.
- If not, but if any fishery (or portion of a fishery) is subject to Level II concentrations, assign a value of 45.
- If not, but if there is an observed release of a hazardous substance having a bioaccumulation potential factor value of 500 or greater to surface water in the watershed and there is a fishery (or portion of a fishery) present anywhere within the target distance limit, assign a value of 20.

HRS Section 4.1.3.3.2, *Population*, explains how to evaluate the population factor for the watershed. It states:

Evaluate the population factor for the watershed based on three factors: Level I concentrations, Level II concentrations, and potential human food chain contamination. Determine which factor applies for a fishery (or portion of a fishery) as specified in section 4.1.3.3.

HRS Section 4.1.3.3.2.2, *Level II concentrations*, provides the explanation for assigning the human food chain population value. (Only Level II concentrations were evaluated at this site). It states:

Determine those fisheries (or portions of fisheries) within the watershed that are subject to Level II concentrations. Do not include any fisheries (or portions of fisheries) already counted under the Level I concentrations factor.

Assign each fishery (or portion of a fishery) a value for human food chain population from table 4–18, based on the estimated human food production for the fishery. Estimate the human food chain production for the fishery as specified in section 4.1.3.3.2.1.

Sum the human food chain population value for each fishery (and portion of a fishery). If this sum is less than 1, do not round it to the nearest integer; if 1 or more, round to the nearest integer. Assign the resulting value as the Level II concentrations factor value. Enter this value in table 4-1.

Table 4-18—Human Food Chain Population Values ^a

Human food chain production (pounds per year)	Assigned human food chain population value
0	0
Greater than 0 to 100	0.03
Greater than 100 to 1,000	0.3
Greater than 1,000 to 10,000	3
Greater than 10,000 to 100,000	31
Greater than 100,000 to 1,000,000	310
Greater than 10 ⁶ to 10 ⁷	3,100
Greater than 10 ⁷ to 10 ⁸	31,000
Greater than 10 ⁸ to 10 ⁹	310,000
Greater than 10 ⁹	3,100,000

^a Do not round to nearest integer.

Section 4.1.3.3.1, Food Chain Individual, of the HRS documentation record at proposal explains the rationale for assigning the food chain individual factor value for the combined site, the Kittimack Tailings and the Bandora Mine; page 150 states:

The fisheries in Upper Animas River and South Fork Mineral Creek are considered as being subject to Level II concentrations [Ref. 1, Section 4.1.3.3.2.2] based on the presence of an observed release by direct observation to the fisheries from Kittimack tailings and Bandora mine respectively. Therefore, a food chain individual factor value of 45 is assigned [Ref. 1, Section 4.1.3.3.1].

Food Chain Individual Factor Value: 45

Page 150 of the HRS documentation record at proposal also discusses the population that was scored. There were no fisheries identified as being subject to Level I concentrations, therefore, only Level II concentrations were identified. It states on page 150:

Based on the observed releases by direct observation, both fisheries are subject to Level II concentrations [Ref. 1, Sections 2.5 and 4.1.3.3]. According to CPW, people consume some of the fish that are caught in the Animas River #4 (Howardsville) and South Fork Mineral Creek fisheries [Ref. 42, pp. 25-28; 43, pp. 20-22; 44, pp. 1-2]. Although fishing is common in the affected fisheries, CPW does not conduct formal angler surveys and does not record or estimate harvest [Ref. 44, p. 1]. Based on these considerations, the human food chain production for each fishery is considered to be greater than 0 to 100 pounds per year and a human food chain population value of 0.03 is assigned to each fishery [Ref. 1, Table 4-18].

Similarly, for the individual mine scores calculated in Appendix A of the HRS documentation record at proposal, for the food chain individual factor value, it refers the reader to HRS Section 4.1.3.3.1 as stated in Footnote 3 in Appendix A (see Appendix A of the HRS documentation record at proposal and at promulgation). HRS Section 4.1.3.3.1, *Food chain individual*, as cited above, instructs to assign a value of 20 to the food chain individual factor value if there is an observed release of a hazardous substance having a bioaccumulation potential factor value of 500 or greater to surface water in the watershed and there is a fishery (or portion of a fishery) present

anywhere within the target distance limit. In Appendix A of the HRS documentation record at proposal, a food chain individual factor of 20 was assigned to the Vermillion Mine, Frisco/Bagley Tunnel, Columbus Mine, and Tom Moore Mine because the Upper Animas River fishery is within their TDL. See also Figure 11 of the HRS documentation record at proposal and at promulgation.

The Colorado Parks and Wildlife department completed official fish surveys on the Animas River at Howardsville and the south fork of Mineral Creek that document the presence of fisheries at these locations in the river. These fishery surveys are presented in HRS documentation record as References 42 and 43. Regarding surveys on the human consumption of fish from these fisheries scored at this site, the HRS does not require that any formal survey of human consumption be completed. However, the aquatic biologist that completed the survey of the fisheries for the Colorado Parks and Wildlife department confirmed that fish from these fisheries are consumed by humans and the fish are part of the human food chain (See Reference 44 of the HRS documentation record at proposal).

As documented in section 3.26.2.1, Background/Historical Conditions, of this support document, an observed release by direct observation was appropriately documented in the fisheries at this site (and unchallenged by the commenters); therefore, Level II concentrations were evaluated for the human food chain threat. As quoted above in this section, the HRS directs that any fishery subject to Level II concentrations of contamination be assigned a food chain individual factor value of 45. Therefore, the food chain individual factor value was appropriately evaluated in the HRS documentation record at proposal.

Similarly, in assigning the population value to the human food chain, the HRS directs that fisheries be assigned a value from HRS Table 4-18 based on the estimated human food chain production. As a Colorado Parks and Wildlife aquatic biologist expert confirmed that fish are consumed by humans⁹, HRS Table 4-18 directs that a human food chain population value of 0.03 be assigned. Therefore, the HRS documentation record at proposal correctly assigns a food chain population factor value of 0.03 for each fishery subject to Level II concentrations.

In scoring each mine individually, the human food chain individual and population factor values were also appropriately assigned in the HRS documentation record at proposal. Appendix A of the HRS documentation record at proposal contains the scoring of each individual mine. All mines upgradient of the documented fisheries, where the fisheries are located within the TDL of the mine (the Vermillion Mine, Frisco/Bagley Tunnel, Columbus Mine and the Tom Moore mine), received a food chain individual factor value of 20 and a dilution weighted potential population of 0.00003 consistent with the HRS. The two mines located in the fisheries (Kittimack Tailings and Bandora Mine) are scored consistent with Level II contamination outlined in this section and all downgradient mines received a human food chain threat score of 0. The commenters did not specifically challenge the scoring of the food chain threat individual or population for individual mines.

In scoring the individual stream reaches, the human food chain individual and population factor values were appropriately assigned in the HRS documentation record at proposal. Appendix A of the HRS documentation record at proposal contains the scoring of each stream reach. Both Animas River and Mineral Creek contain documented fisheries and are scored consistent with the Level II contamination outlined in this section. Cement Creek does not contain a documented fishery and is assigned a human food chain threat score of 0. The commenters did not specifically challenge the scoring of the food chain threat individual or population for the individual stream reaches.

Regarding the commenters statements that the fisheries are not used for subsistence living and that they would likely only be used during warmer months, there is no HRS requirement to document fishing for subsistence

⁹ The Colorado Parks and Wildlife expert in Reference 44 of the HRS documentation record at proposal confirmed that some fish are consumed by humans (greater than zero pounds per year), but was not able to confirm that more than 100 pounds of fish are consumed from the fisheries in a year.

living or to document that fishing occurs throughout the entire year. As quoted in section 3.26, Surface Water Pathway: Human Food Chain Threat, of this support document, the HRS only requires that a fishery with an observed release be present that contains a hazardous substance containing a BCF of 500 or greater and that fishing for human consumption occurs.

These comments result in no change to the HRS score and no change in the decision to place the Site on the NPL.

3.27 Surface Water Pathway: Environmental Threat

Comment: SGC commented that the surface water pathway environmental threat has been inappropriately evaluated in the HRS documentation record at proposal. SGC commented that improper hazardous substances were selected to score the waste characteristics in each drainage system and that the lynx was incorrectly identified as a target at the Site.

Response: As shown in the following subsections of this support document, the environmental threat of the surface water pathway has been evaluated according to the HRS; both the waste characteristics and targets were calculated according to the requirements of the HRS. The HRS documentation record at proposal and at promulgation used the appropriate hazardous substance to score each mine and pathway and also appropriately evaluated the sensitive environment present at the Site and at each mine.

HRS Section 4.1.4.2.1.4, *Calculation of ecosystem toxicity/persistence/bioaccumulation factor value*, directs that all hazardous substances be evaluated for their ecosystem toxicity/persistence/bioaccumulation factor values and that the highest scoring hazardous substance for the watershed be selected. It states:

Assign each hazardous substance an ecosystem toxicity/persistence factor value from table 4–20, based on the values assigned to the hazardous substance for the ecosystem toxicity and persistence factors. Then assign each hazardous substance an ecosystem toxicity/persistence/bioaccumulation factor value from table 4–21, based on the values assigned for the ecosystem toxicity/persistence and ecosystem bioaccumulation potential factors. Select the hazardous substance with the highest ecosystem toxicity/persistence/bioaccumulation factor value for the watershed and use it to assign the value to this factor. Enter this value in table 4–1.

The HRS documentation record at proposal and at promulgation assigns the ecosystem toxicity/persistence/bioaccumulation factor values based on the hazardous substances associated with the sources. Page 153 of the HRS documentation record at proposal states how the factor value was assigned:

4.1.4.2.1 Ecosystem Toxicity/Persistence/Bioaccumulation

The ecosystem toxicity/persistence/bioaccumulation factor values are based on the hazardous substances associated with the sources (see **Section 2.2 Source Characterization** for each drainage).

TABLE SW-10. Ecotoxicity/Persistence/Bioaccumulation, Environmental Threat						
Hazardous Substance*	Source No.**	Ecotoxicity Factor Value***	Persistence Factor Value**** (River)	Ecosystem Bioaccumulation Factor Value (Env./Fresh)	Ecotoxicity/Persistence/Bioaccumulation Factor Value	Ref.
Aluminum ^[†]	OR and all sources	100	1.0	50,000	5 x 10 ⁶	Ref. 16, p. 1
Cadmium	OR and all sources	10,000	1.0	50,000	5 x 10⁸	Ref. 16, p. 3
Copper	OR and all sources	1,000	1.0	50,000	5 x 10 ⁷	Ref. 16, p. 4
Manganese	OR and all sources	100	1.0	50,000	5 x 10 ⁶	Ref. 16, p. 5
Zinc	OR and all sources	10	1.0	50,000	5 X 10 ⁵	Ref. 16, p. 6

OR Observed Release by Direct Observation

* As shown in source section 2.2.2 for each drainage.

** As shown in source section 2.2.3 for each drainage.

*** Ecotoxicity values assigned are based on the predominant surface water category of fresh water.

**** Persistence values assigned are based on the predominant surface water body category “River.”

[†] EPA notes that aluminum was removed from scoring of the BPMD site at promulgation.

Cadmium has the highest ecosystem toxicity/persistence/bioaccumulation factor value (5 x 10⁸) for this watershed [Ref. 1, Table 4-21; Ref. 16, pp. 1-6]. Cadmium was selected to assign the value to this factor [Ref. 1, Section 4.1.4.2.1.4].

Ecosystem Toxicity/Persistence/Bioaccumulation Factor Value: 5 x 10⁸

Similarly, for the individual mine scores calculated in Appendix A of the HRS documentation record at proposal, for the Ecotoxicity/Persistence/Bioaccumulation factor value, it refers the reader to section 4.1.4.2.1 of the HRS documentation record at proposal (See Appendix A of the HRS documentation record at proposal and at promulgation). The Ecotoxicity/Persistence/Bioaccumulation factor value for each individual mine is the same as cited above from page 153 of the HRS documentation record at proposal. Therefore, cadmium is also the substance with the highest Ecotoxicity/Persistence/Bioaccumulation factor value at each individual mine at proposal and at promulgation.

Regarding the lynx being identified as a target, HRS Section 4.1.4.3.1, *Sensitive environments*, directs how to identify sensitive environment targets in the watershed. It states:

Evaluate sensitive environments along the hazardous substance migration path for the watershed based on three factors: Level I concentrations, Level II concentrations, and potential contamination.

Determine which factor applies to each sensitive environment as specified in section 4.1.2.3, except: use ecological-based benchmarks (Table 4–22) rather than health-based benchmarks (Table 3–10) in determining the level of contamination from samples. In determining the level of actual contamination, use a point of direct observation anywhere within the sensitive environment or samples (that is, surface water, benthic, or sediment samples) taken anywhere within or beyond the sensitive environment (or anywhere adjacent to or beyond the sensitive environment if it is contiguous to the migration path).

The Site scores observed releases by direct observation at each mine and HRS Section 2.5, *Targets*, directs that “[f]or observed releases based on direction observation, assign Level II to targets as specified in sections 3, 4, and 6.” Thus, sensitive environment targets are evaluated as subject to Level II contamination.

HRS Section 4.1.4.3.1.2, *Level II concentrations*, states:

Assign value(s) from table 4–23 to each sensitive environment subject to Level II concentrations. Do not include sensitive environments already counted for table 4–23 under the Level I concentrations factor for this watershed.

For those sensitive environments that are wetlands, assign an additional value from table 4–24. In assigning a value from table 4–24, include only those portions of wetlands located along the hazardous substance migration path in the area of Level II concentrations, as specified in section 4.1.4.3.1.1.

HRS Table 4-23 provides the sensitive environment rating values that are to be applied to each type of sensitive environment.

Table 4–23—Sensitive Environments Rating Values

Sensitive environment	Assigned value
Critical habitat ^a for Federal designated endangered or threatened species	100
Marine Sanctuary	
National Park	
Designated Federal Wilderness Area	
Areas identified under Coastal Zone Management Act ^b	
Sensitive areas identified under National Estuary Program ^c or Near Coastal Waters Program ^d	
Critical areas identified under the Clean Lakes Program ^e	
National Monument ^f	
National Seashore Recreational Area	
National Lakeshore Recreational Area	
Habitat known to be used by Federal designated or proposed endangered or threatened species	
National Preserve	
National or State Wildlife Refuge	
Unit of Coastal Barrier Resources System	
Coastal Barrier (undeveloped)	
Federal land designated for protection of natural ecosystems	
Administratively Proposed Federal Wilderness Area	
Spawning areas critical ^g for the maintenance of fish/shellfish species within river, lake, or coastal tidal waters	
Migratory pathways and feeding areas critical for maintenance of anadromous fish species within river reaches or areas in lakes or coastal tidal waters in which the fish spend extended periods of time	
Terrestrial areas utilized for breeding by large or dense aggregations of animals ^h	
National river reach designated as Recreational	50
Habitat known to be used by State designated endangered or threatened species	
Habitat known to be used by species under review as to its Federal endangered or threatened status	
Coastal Barrier (partially developed)	
Federal designated Scenic or Wild River	25
State land designated for wildlife or game management	
State designated Scenic or Wild River	

Sensitive environment	Assigned value
State designated Natural Areas	
Particular areas, relatively small in size, important to maintenance of unique biotic communities	
State designated areas for protection or maintenance of aquatic life ¹	5

^a Critical habitat as defined in 50 CFR 424.02.

^b Areas identified in State Coastal Zone Management plans as requiring protection because of ecological value.

^c National Estuary Program study areas (subareas within estuaries) identified in Comprehensive Conservation and Management Plans as requiring protection because they support critical life stages of key estuarine species (Section 320 of Clean Water Act, as amended).

^d Near Coastal Waters as defined in Sections 104(b)(3), 304(1), 319, and 320 of Clean Water Act, as amended.

^e Clean Lakes Program critical areas (subareas within lakes, or in some cases entire small lakes) identified by State Clean Lake Plans as critical habitat (Section 314 of Clean Water Act, as amended).

^f Use only for air migration pathway.

^g Limit to areas described as being used for intense or concentrated spawning by a given species.

^h For the air migration pathway, limit to terrestrial vertebrate species. For the surface water migration pathway, limit to terrestrial vertebrate species with aquatic or semiaquatic foraging habits.

¹ Areas designated under Section 305(a) of Clean Water Act, as amended.

The HRS documentation record at proposal and at promulgation appropriately evaluates the ecosystem toxicity/persistence/ bioaccumulation factor value according to the HRS and correctly identifies the lynx as subject to Level II contamination. The following subsections provide more specific responses to commenters concerns regarding the sensitive environments scored in the HRS documentation record at proposal:

- 3.27.1 Waste Characteristics – Ecosystem Toxicity/Persistence/Bioaccumulation
- 3.27.2 Targets

3.27.1 Waste Characteristics – Ecosystem Toxicity/Persistence/Bioaccumulation

Comment: SGC stated that EPA chose to use cadmium, the highest scoring substance for toxicity/persistence/bioaccumulation factor value, but should have used more technically defensible values specific to each drainage to more accurately reflect any threat, or potential threat, if any, to the public health or welfare, or the environment.

SGC commented that instead of using cadmium toxicity for calculation of waste characteristics, the scoring should have evaluated zinc for the Upper Animas drainage basin (and the respective ecosystem toxicity/persistence/bioaccumulation factor values) and aluminum for both the Cement Creek and Mineral Creek drainage basins (and the respective ecosystem toxicity/persistence/bioaccumulation factor values) for calculation of waste characteristics for the environmental threat. SGC summarized that the ecosystem toxicity/persistence/bioaccumulation values should be 5×10^3 considering zinc for the Upper Animas River, and 5×10^6 considering aluminum for Cement Creek and Mineral Creek.

SGC commented that using its recommended ecosystem toxicity/persistence/bioaccumulation factor value for aluminum for mines in the Cement Creek drainage would significantly reduce the environmental threat score and would reduce the mine-specific HRS score for the Red and Bonita Mine, American Tunnel, Natalie/Occidental Mine, Lark Mine, and Joe and Johns Mine to 25.0, which is below the site score required for NPL listing.

Response: The HRS documentation record at proposal properly evaluates and uses cadmium as the substance with the highest scoring ecosystem toxicity/persistence/bioaccumulation factor value for evaluating the waste characteristics component of the environmental threat for all three drainages. The HRS specifically instructs to select the substance with the highest scoring ecosystem toxicity/mobility/bioaccumulation when evaluating that factor value. At this site, cadmium was associated with sources and release to the three drainages and had the highest ecosystem toxicity/persistence/bioaccumulation factor value.

In addition, the appropriate ecosystem toxicity of each substance was assigned according to the instructions of HRS which directs to consider ecosystem toxicity parameters. The ecosystem toxicities of cadmium, copper, manganese, and zinc were correctly considered when evaluating the environmental threat ecosystem toxicity component of the waste characteristics for the three drainages. Further, the HRS accounts for the threat to the ecosystem by also considering the persistence of the hazardous substance in surface water and the potential for each substance to bioaccumulate in environmental organisms (the persistence and bioaccumulation values were unchallenged by the commenters). All three of these factors (ecosystem toxicity, persistence, and ecosystem bioaccumulation) contribute to the calculation of the waste characteristics component when selecting the substance that potentially poses the greatest hazard at the Site.

The highest scoring substance (cadmium) was correctly considered in the HRS evaluation. HRS Section 4.1.4.2, *Environmental threat waste characteristics*, and its subparts HRS 4.1.4.2.1, *Ecosystem toxicity/persistence/bioaccumulation*, HRS Section 4.1.4.2.1.1, *Ecosystem toxicity*, and HRS Section 4.1.4.2.1.4, *Calculation of ecosystem toxicity/persistence/bioaccumulation factor value*, as well as HRS Section 2.4.1, *Selection of substance potentially posing greatest hazard*, were considered when selecting the hazardous substance to be used for calculating the ecosystem toxicity/persistence/bioaccumulation factor value for the watershed.

HRS Section 2.4.1 *Selection of substance potentially posing greatest hazard*, states:

For all pathways (and threats), select the hazardous substance potentially posing the greatest hazard for the pathway (or threat) and use that substance in evaluating the waste characteristics category of the pathway (or threat). For the three migration pathways (and threats), base the selection of this hazardous substance on the toxicity factor value for the substance, combined with its mobility, persistence, and/or bioaccumulation (or ecosystem bioaccumulation) potential factor values, as applicable to the migration pathway (or threat). For the soil exposure pathway, base the selection on the toxicity factor alone.

HRS 4.1.4.2.1, *Ecosystem toxicity/persistence/bioaccumulation*, states:

Evaluate **all** those hazardous substances eligible to be evaluated for toxicity/persistence in the drinking water threat for the watershed (see section 4.1.2.2). [Emphasis added].

As instructed in HRS Section 4.1.4.2.1, HRS Section 4.1.2.2, *Drinking water threat-waste characteristics*, was considered. It states in part:

Evaluate only those hazardous substances that are available to migrate from the sources at the site to surface water in the watershed via the overland/flood hazardous substance migration path for the watershed (see section 4.1.1.1). Such hazardous substances include:

- Hazardous substances **that meet the criteria for an observed release to surface water in the watershed**. [Emphasis added]
- All hazardous **substances associated with a source that has a surface water containment factor value greater than 0 for the watershed** (see sections 2.2.2, 2.2.3, 4.1.2.1.2.1.1, and 4.1.2.1.2.2.1). [Emphasis added]

In evaluating the assigned ecosystem toxicity/persistence/bioaccumulation factor value for the environmental threat, HRS Section 4.1.4.2.1.4, *Calculation of ecosystem toxicity/persistence/bioaccumulation factor value*, was considered. It states:

Assign each hazardous substance an ecosystem toxicity/persistence factor value from Table 4-20, based on the values assigned to the hazardous substance for the ecosystem toxicity and

persistence factors. Then assign each hazardous substance an ecosystem toxicity/persistence/bioaccumulation factor value from Table 4-21, based on the values assigned for the ecosystem toxicity/persistence and ecosystem bioaccumulation potential factors. **Select the hazardous substance with the highest ecosystem toxicity/persistence/bioaccumulation factor value for the watershed** and use it to assign the value to this factor. Enter this value in Table 4-1. [Emphasis added]

Pages 40, 78, and 109 the HRS documentation record at proposal list the source containment values for the sources scored. Each source was assigned a source containment value of greater than zero and, hence, the hazardous substances associated with each source are eligible for migration to surface water. The hazardous substances available to migrate from the sources at the Site to surface water are cadmium, copper, manganese, and zinc, and each substance is eligible for evaluation in the toxicity/persistence/bioaccumulation components of the waste characteristics for the Site. EPA notes that aluminum was removed from scoring of the BPMD site at promulgation.

As quoted in section 3.23, Likelihood of Release - Observed Release by Direct Observation, of this support document, pages 141-144 of the HRS documentation record at proposal list the hazardous substances documented to meet an observed release to the watershed, and each substance is eligible for evaluation in the ecotoxicity/persistence/bioaccumulation component of waste characteristics. These substances are cadmium, copper, manganese, and zinc, and they are associated with each drainage watershed (Upper Animas, Cement Creek, and Mineral Creek). EPA notes that aluminum was removed from scoring of the BPMD site at promulgation.

As quoted in section 3.27, Surface Water Pathway: Environmental Threat, of this support document, Table SW-10 in the HRS documentation record at proposal presents the ecosystem toxicity/persistence/bioaccumulation value assigned to hazardous substances scored and documents that cadmium is the highest scoring substance at 5×10^8 . Page 153 of the HRS documentation record at proposal and at promulgation states:

Cadmium has the highest ecosystem toxicity/persistence/bioaccumulation factor value (5×10^8) for this watershed [Ref. 1, Table 4-21; Ref. 16, pp. 1-6]. Cadmium was selected to assign the value to this factor [Ref. 1, Section 4.1.4.2.1.4].

Ecosystem Toxicity/Persistence/Bioaccumulation Factor Value: 5×10^8

The ecosystem toxicity/persistence/bioaccumulation factor value for the watershed was correctly applied using the value calculated for cadmium as it has the highest combined value of 5×10^8 . The HRS requires the highest scoring hazardous substance documented in a source available to the watershed or documented in an observed release to be selected for the ecosystem toxicity/persistence/bioaccumulation factor value component of the waste characteristics for the watershed.

Regarding SGC's comment that the data presented in Table SW-3 in the HRS documentation record at proposal show cadmium is elevated only in surface water samples collected in the uppermost reach of the Upper Animas River drainage in California Gulch, Placer Gulch, and in the West Fork of the Animas River, and in the uppermost reach of Cement Creek, the HRS documentation record at proposal did not rely on the data in Table SW-3 to document an observed release to the watershed at the Site. Instead, as shown on pages 141-144 of the HRS documentation record at proposal and promulgation, cadmium, copper, manganese, and zinc are documented to be associated with sources at the Site and meet an observed release to the watershed and, hence, each substance is eligible for evaluation in the ecosystem toxicity/persistence/bioaccumulation component of waste characteristics. EPA notes that aluminum was removed from scoring of the BPMD site at promulgation.

Regarding the ecosystem toxicity of cadmium, copper, manganese, and zinc, the ecosystem toxicity of each substance was assigned a value consistent with the requirements of the HRS. For the environmental threat

component of the surface water migration pathway, the ecosystem toxicity of each substance was assigned according to the instructions of HRS 2.4, *Waste characteristics*, HRS Section 2.4.1, *Selection of substance potentially posing greatest hazard*, HRS Section 4.1.4.2.1.1, *Ecosystem toxicity*. EPA notes that aluminum was removed from scoring of the BPMD site at promulgation.

HRS Section 2.4, *Waste characteristics*, states:

The waste characteristics factor category includes the following factors: hazardous waste quantity. Toxicity, and as appropriate to the pathway or threat being evaluated, mobility, persistence, and/or bioaccumulation (or ecosystem bioaccumulation) potential.

HRS Section 2.4.1, *Selection of substance potentially posing greatest hazard*, states:

For all pathways (and threats), select the hazardous substance potentially posing the greatest hazard for the pathway (or threat) and use that substance in evaluating the waste characteristics category of the pathway (or threat). For the three migration pathways (and threats), base the selection of this hazardous substance on the toxicity factor value for the substance, combined with its mobility, persistence, and/or bioaccumulation (or ecosystem bioaccumulation) potential factor values, as applicable to the migration pathway (or threat). For the soil exposure pathway, base the selection on the toxicity factor alone.

Evaluation of the toxicity factor is specified in section 2.4.1.1. Use and evaluation of the mobility, persistence, and/or bioaccumulation (or ecosystem bioaccumulation) potential factors vary by pathway (or threat) and are specified under the appropriate pathway (or threat] section. Section 2.4.1.2 identifies the specific factors that are combined with toxicity in evaluating each pathway (or threat).

HRS Section 4.1.3.2.1.1, *Toxicity*, of the human food chain threat states:

Assign a toxicity factor value to each hazardous substance as specified in section 2.4.1.1.

HRS Section 2.4.1.1, *Toxicity factor*, states:

Evaluate toxicity for those hazardous substances at the site that are available to the pathway being scored. For all pathways and threats, except the surface water environmental threat, evaluate human toxicity as specified below. **For the surface water environmental threat, evaluate ecosystem toxicity as specified in section 4.1.4.2.1.1.** [Emphasis added].

HRS Section 4.1.4.2.1.1, *Ecosystem toxicity*, states:

Assign an ecosystem toxicity factor value from Table 4-19 to each hazardous substance on the basis of the following data hierarchy:

- EPA chronic Ambient Water Quality Criterion (AWQC) for the substance.
- EPA chronic Ambient Aquatic Life Advisory Concentrations (AALAC) for the substance.
- EPA acute AWQC for the substance.
- EPA acute AALAC for the substance.
- Lowest LC₅₀ value for the substance.

The HRS documentation record at proposal and at promulgation utilizes an ecosystem toxicity factor value of 10,000 for cadmium based on a freshwater chronic Criteria Continuous Concentration (CCC) of $2.5 \times 10^{-1} \mu\text{g/L}$, which when applied to HRS Table 4-19, *Ecosystem Toxicity Factor Values*, results in an ecosystem toxicity

assigned value of 10,000 (see page 153 of HRS documentation record at proposal and Reference 16 of the HRS documentation record at proposal).

The HRS documentation record at proposal and at promulgation utilizes an ecosystem toxicity factor value of 1,000 for copper based on a freshwater chronic CCC of 1.4 µg/L, which when applied to HRS Table 4-19, *Ecosystem Toxicity Factor Values*, results in an ecosystem toxicity assigned value of 1,000 (see page 153 of HRS documentation record at proposal and Reference 16 of the HRS documentation record at proposal).

The HRS documentation record at proposal and at promulgation utilizes an ecosystem toxicity factor value of 100 for manganese based on a freshwater LC₅₀ 3.8 x 10³ µg/L, which when applied to HRS Table 4-19, *Ecosystem Toxicity Factor Values*, results in an ecosystem toxicity assigned value of 100 (see page 153 of HRS documentation record at proposal and Reference 16 of the HRS documentation record at proposal).

The HRS documentation record at proposal and at promulgation utilizes an ecosystem toxicity factor value of 10 for zinc based on a freshwater chronic CCC of 1.2 x 10² µg/L, which when applied to HRS Table 4-19, *Ecosystem Toxicity Factor Values*, results in an ecosystem toxicity assigned value of 10 (see page 153 of HRS documentation record at proposal and Reference 16 of the HRS documentation record at proposal).

The ecosystem toxicity factor for the environmental threat component of the surface water pathway is assigned based on ecosystem toxicity parameters. The HRS considers the threat is to ecosystem aquatic organisms and, therefore, the ecosystem toxicity factor value is assigned as directed in HRS Section 4.1.4.2.1.1.4, *Ecosystem toxicity*. Hence, the toxicities of cadmium, copper, manganese, and zinc were correctly considered when evaluating environmental threat toxicity component of the waste characteristics for the watershed. EPA notes that aluminum was removed from scoring of the BPMD site at promulgation.

These comments result in no change to the HRS score and no change in the decision to place the Site on the NPL.

3.27.2 Targets

Comment: SGC commented that there is no empirical evidence that the lynx should have been designated as a target at the Site. SGC commented that anthropogenic factors have not impacted the lynx and it should not be designated as a target.

Response: The HRS documentation record at proposal properly evaluates the Canada Lynx habitat for scoring as a target in the environmental threat of the overland flood migration component of the surface water migration pathway. The habitat known to be used by the federally threatened Canada Lynx is appropriately identified and is an eligible sensitive environment for HRS scoring of the combined site and each individual mine scored at the Site. HRS Section 4.1.4.3.1, *Sensitive environments*, directs how to identify sensitive environments; it states:

Evaluate sensitive environments along the hazardous substance migration path for the watershed based on three factors: Level I concentrations, Level II concentrations, and potential contamination.

Determine which factor applies to each sensitive environment as specified in section 4.1.2.3, except: use ecological-based benchmarks (Table 4–22) rather than health-based benchmarks (Table 3–10) in determining the level of contamination from samples. In determining the level of actual contamination, use a point of direct observation anywhere within the sensitive environment or samples (that is, surface water, benthic, or sediment samples) taken anywhere within or beyond the sensitive environment (or anywhere adjacent to or beyond the sensitive environment if it is contiguous to the migration path).

In evaluating Level II concentrations, HRS Section 4.1.4.3.1.2, *Level II concentrations*, states:

Assign value(s) from table 4–23 to each sensitive environment subject to Level II concentrations. Do not include sensitive environments already counted for table 4–23 under the Level I concentrations factor for this watershed.

HRS Table 4-23 states in relevant part:

Table 4–23—Sensitive Environments Rating Values

Sensitive environment	Assigned value
...	...
Habitat known to be used by Federal designated or proposed endangered or threatened species	75
...	...

In evaluating surface water migration pathway environmental threat targets, page 157 of the HRS documentation record at proposal and at promulgation states:

As shown in Figures 8 through 11, the available documentation indicates that all of the documented observed releases by direct observation except for that for the Vermillion mine are associated with PPEs into all three drainages, and are located within habitat known to be used by the Canada Lynx, a Federal designated threatened species [Ref. 29, pp. 1-2; 30, pp. 1, 6; 45, p. 1]. The habitat extends throughout the Upper Animas River, Cement Creek, and Mineral Creek drainages. Based on these considerations, Canada Lynx habitat is considered to be subject to actual contamination in all three drainages [Ref. 1, Section 4.1.4.3.1].

....

As described in Section 4.1.2.1.1, the observed releases are documented by direct observation; there are no sample data to consider for evaluation of Level I/Level II concentrations. Therefore, the sensitive environments within the zone of contamination for the Bonita Peak Mining District site (i.e., Canada Lynx habitat areas located where observed release by direct observation is documented) are considered as being subject to Level II concentrations [Ref. 1, Sections 2.5].

...

4.1.4.3.1.1 Level I Concentrations

There are no sensitive environments or wetlands subject to Level I concentrations; therefore, the Level I concentrations factor value is 0 [Ref. 1, Section 4.1.4.3.1.1].

Level I Concentrations Factor Value: 0

4.1.4.3.1.2 Level II Concentrations

Sensitive Environments

TABLE SW-12. Level II Concentrations – Sensitive Environments			
Sensitive Environment	Distance from PPE¹	References	Sensitive Environment Rating Value
Habitat known to be used by Federal designated threatened	0 mile	Figures 8-11; 29, pp. 1-2; 30, pp. 1, 6; 45, p. 1	75

All mines, except Vermillion Mine, that score sensitive environments as part of their individual HRS score (see Appendix A of the HRS documentation record at proposal) establish observed releases by direct observation that are located within habitat that is known to be used by the Canada Lynx. Because observed releases are established by direct observation, consistent with HRS Section 4.1.1.2, *Target distance limit*, Level II contamination is evaluated for the sensitive environment. Therefore, the Canada Lynx habitat is appropriately assigned a sensitive environment rating value of 75, in accordance with HRS sections 4.1.4.3.1 and 4.1.4.3.1.2 and HRS Table 4-23.

Regarding the scoring of sensitive environments for the Vermillion Mine, in Appendix A of the HRS documentation record at proposal, this mine is assigned a sensitive environments factor value of 0.75 because the Canada Lynx habitat is evaluated as subject to potential contamination as it is within the TDL for this mine but is not subject to Level I or Level II contamination. Footnote 7 in Appendix A of the HRS documentation record at proposal refers the reader to HRS Section 4.1.4.3.1.4, *Potential contamination*, which directs the scorer to assign values to sensitive environments from Table 4-23, assign sensitive environment that are wetlands values from Table 4-24, sum all values, divide the sum by 10 and assign this value as the potential contamination factor value. As shown above, HRS Table 4-23 assigns the Canada Lynx habitat a value of 75. Although wetlands are subject to potential contamination, they were not evaluated in the scoring of the combined site or the individual mines (see page 158 of the HRS documentation record at proposal). Because the Canada Lynx is subject to potential contamination, the value of 75 assigned to this sensitive environment is divided by 10 when scoring the Vermillion Mine site. Therefore, for the Vermillion Mine, a sensitive environments factor value of 0.75 was assigned as shown in Appendix A of the HRS documentation record at proposal and at promulgation.

Further comments regarding specific aspects of the assignment of the sensitive environment rating value for the Canada Lynx are addressed below in the following subsections:

- 3.27.2.1 Documentation of Canada Lynx/No Empirical Evidence
- 3.27.2.2 Canada Lynx Not Threatened

3.27.2.1 Documentation of Canada Lynx/No Empirical Evidence

Comment: SGC commented that the HRS documentation record merely notes the existence of lynx habitat, with no assessment of any actual or threatened risk to any sensitive environment or to the lynx. SGC contended that the HRS documentation record cites observed releases as a categorical justification of threat, but does not present empirical evidence of a vector between the observation and lynx.

Response: The HRS documentation record at proposal sufficiently documents the presence of habitat known to be used by the Canada Lynx to meet the HRS requirements for assigning a sensitive environments rating value. There is no requirement that the HRS provide a detailed risk assessment of the impact the releases at the Site and individual mines scored has on the Canada lynx.

As quoted in Section 3.27.2, Targets, of this support document, in evaluating whether a sensitive environment is eligible for scoring as a target in the environmental threat of the surface water migration pathway, HRS section 4.1.4.3.1 states:

Evaluate sensitive environments along the hazardous substance migration path for the watershed based on three factors: Level I concentrations, Level II concentrations, and potential contamination.

Also, as mentioned in Section 3.27.2, Targets, of this support document, observed releases are established by direct observations at each mine scoring sensitive environments making them subject for Level II contamination according to HRS Section 4.1.1.2, *Target distance limit*. Therefore, HRS Section 4.1.4.3.1.2 instructs a scorer to:

Assign value(s) from table 4–23 to each sensitive environment subject to Level II concentrations.

HRS Table 4-23 instructs a scorer to assign a 75 for a sensitive environment that is a critical habitat for Federal designated endangered or threatened species.

In establishing the eligibility of the Canada Lynx habitat for scoring at the Site, the HRS documentation record at proposal states on page 157:

As shown in Figures 8 through 11, the available documentation indicates that all of the documented observed releases by direct observation except for that for the Vermillion mine are associated with PPEs into all three drainages, and are located within habitat known to be used by the Canada Lynx, a Federal designated threatened species [Ref. 29, pp. 1-2; 30, pp. 1, 6; 45, p. 1].

As quoted in Section 3.27.2, Targets, of this support document, based on the presence of a Federal designated threatened species habitat in an area of documented Level II concentrations (i.e., the PPE for all observed releases by direct observation except the Vermillion Mine), the HRS documentation record at proposal assigns a sensitive environment rating value of 75 per HRS Table 4-23.

For the Vermillion Mine, Appendix A of the HRS documentation record at proposal assigned a sensitive environments value of 0.75 to this mine based on the presence of the Canada Lynx habitat being subject to potential contamination. (See section 3.7.2.2, Targets, of this support document.)

Regarding SGC's concerns about the evidence of the habitat of the Canada Lynx in the contaminated area, References 29, 30 and 45 of the HRS documentation record at proposal support the presence and eligibility of the Canada Lynx. The Canada Lynx Habitat Use in Colorado Map on page 2 of Reference 29 to the HRS documentation record at proposal indicates a high presence of the Canada Lynx in the area of the Site. Page 1 of Reference 45 to the HRS documentation record at proposal states that "all areas mapped [in Reference 29] as suitable Lynx habitat are indeed being used by Canada Lynx, a Federal designated threatened species." Pages 1-8 of Reference 30 support that the Canada Lynx maintains a federally designated threatened status. Therefore, the HRS documentation record at proposal and at promulgation establishes the eligibility of the Canada Lynx for scoring at the Site and sufficiently documents the presence of the Canada Lynx at the applicable PPEs to assign a sensitive environment rating value from HRS Table 4-23.

These comments result in no change to the HRS score and no change in the decision to place the Site on the NPL.

3.27.2.2 Canada Lynx Not Threatened

Comment: SGC commented that background levels for the surface water are elevated for metals, and there is no indication that any differential between the background and any anthropogenic increase in metals levels has any impact on lynx. SGC stated that the information upon which EPA relied demonstrates that the reintroduction of lynx in Colorado has been successful in spite of the observed releases cited in the HRS documentation record. See HRS documentation record Reference 29 (2014 CPW publication), which states that “the reintroduction program established lynx as a self-sustaining population in Colorado.” SGC contended that without any justification of actual or threatened risk to lynx, the sensitive environment scoring is untenable.

Response: The HRS documentation record at proposal properly documents actual contamination sufficient to score the Canada Lynx habitat as subject to Level II concentrations in accordance with the HRS for all mines scored except for the Vermillion Mine score which evaluated the Canada Lynx habitat as subject to potential contamination. As quoted in Section 3.27.2, Targets, of this support document, the Canada Lynx was properly identified as a sensitive environment that, due to direct observations of contamination, is subject to Level II contamination. Thus, according to HRS Table 4-23, a value of 75 is appropriately assigned to the sensitive environment.

As quoted in section 3.27.2, Targets, of this support document, page 157 of the HRS documentation record at proposal discusses the eligibility of the Canada Lynx habitat for scoring at the Site. It states:

As shown in Figures 8 through 11, the available documentation indicates that all of the documented observed releases by direct observation except for that for the Vermillion mine are associated with PPEs into all three drainages, and are located within habitat known to be used by the Canada Lynx, a Federal designated threatened species [Ref. 29, pp. 1-2; 30, pp. 1, 6; 45, p. 1].

...

4.1.4.3.1.2 Level II Concentrations

Sensitive Environments

Sensitive Environment	Distance from PPE¹	References	Sensitive Environment Rating Value
Habitat known to be used by Federal designated threatened	0 mile	Figures 8-11; 29, pp. 1-2; 30, pp. 1, 6; 45, p. 1	75

By documenting the presence of the Canada Lynx at the PPEs in the HRS documentation record at proposal where actual contamination is scored (i.e., at observed release by direct observation locations), the HRS evaluation of the Site meets the HRS requirements to assign a sensitive environment rating value for the critical habitat known to be used by the federally threatened or endangered Canada Lynx. This assignment of a sensitive environments rating value in the HRS evaluation based on Level II concentrations represents the determination that a risk is posed to the habitat of the Canada Lynx for HRS evaluation purposes. The eligibility of the Canada Lynx habitat is discussed in detail in Section 3.27.2.1, Documentation of Canada Lynx/No Empirical Evidence, of this support document.

For the Vermillion Mine, Appendix A of the HRS documentation record at proposal assigned a sensitive environments value of 0.75 to this mine based on the presence of the habitat of the Canada Lynx habitat being subject to potential contamination. (See section 3.7.2.2, Targets, of this support document.)

Regarding SGC's concern that the success of the reintroduction of the Canada Lynx demonstrates that the Canada Lynx is not at risk, the success of the reintroduction of the Canada Lynx in Colorado does not preclude the habitat known to be used by the Canada Lynx from being eligible. The above discussion explains that the HRS procedures were followed in establishing that the Canada Lynx habitat was subject to actual contamination for HRS scoring purposes and an HRS-eligible sensitive environment. Therefore, whether or not the reintroduction of the Canada Lynx is successful is not a factor in scoring the habitat of the Canada Lynx as a sensitive environment.

These comments result in no change to the HRS score and no change in the decision to place the Site on the NPL.

4. Conclusion

The original HRS score for this site was 50.00. Based on the above responses to public comments, the score remains unchanged at 50.00 and each of the individual mines included in the scoring at the Site remain unchanged at or above 28.50. The final scores for the Bonita Peak Mining District site are:

Ground Water: NS
Surface Water: 100.00
Soil Exposure: NS
Air Pathway: NS
HRS Score: 50.00