

# U.S. Environmental Protection Agency

## Third Five-Year Review Report for Silver Bow Creek/Butte Area Superfund Site

### *Volume 1: Site-Wide Review Summary*

June 2011



*Final*

**Five-Year Review Report**  
**Third Five-Year Review Report**  
**for**  
**Silver Bow Creek/Butte Area Superfund Site**  
**Silver Bow and Deer Lodge Counties, Montana**

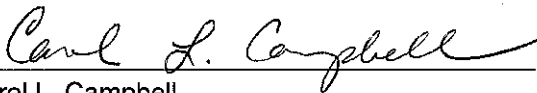
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**PREPARED BY:**

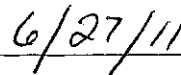
**U.S. Environmental Protection Agency, Region 8**  
**Helena, Montana**

Approved by:

Date:



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REMEDIAL ACTION CONTRACT  
FOR REMEDIAL, ENFORCEMENT OVERSIGHT, AND NON-TIME-  
CRITICAL REMOVAL ACTIVITIES AT SITES OF RELEASE OR  
THREATENED RELEASE OF HAZARDOUS SUBSTANCES  
IN EPA REGION 8

U. S. EPA CONTRACT NO. EP-W-05-049

**FINAL**

Five-Year Review for the  
Silver Bow Creek/Butte Area NPL Site  
Butte, Montana

*Volume 1: Site-Wide Review Summary*

Work Assignment No.: 337-FRFE-0822

June 2011

Prepared for:  
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*Appendix A Community Interviews Summary Report*

*Appendix B ARARs Review Technical Memorandum*

## Acronyms

ARAR	Applicable or Relevant and Appropriate Requirements
BMFOU	Butte Mine Flooding Operable Unit
BMI	benthic macroinvertebrate
BMP	best management practices
BPSOU	Butte Priority Soils Operable Unit
BRES	Butte Reclamation Evaluation System
BSB	Butte-Silver Bow
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Act Information System
CGWA	controlled groundwater area
COC	contaminants of concern
DEQ	Montana Department of Environmental Quality
DNRC	Montana Department of Natural Resources and Conservation
EPA	U.S. Environmental Protection Agency
ESD	Explanation of Significant Differences
HSB	Horseshoe Bend
IC	Institutional Control
ICIP	Institutional Controls Implementation Plan
LAO	Lower Area One
MCL	maximum contaminant level
MR	Montana Resources
O&M	operations and maintenance
OU	Operable Unit
RAO	Remedial Action Objectives
RMAP	Residential Metals Abatement Program
Rocker	Rocker Timber Treating and Framing
ROD	Record of Decision
Site	Silver Bow Creek/Butte Area Superfund Site
SSTOU	Streamside Tailings Operable Unit
TI	technical impracticability
TSS	total suspended solids
µg/L	micrograms per liter
WET	whole effluent toxicity
WSPOUs	Warm Springs Ponds Operable Units
WTP	water treatment plant

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# Executive Summary

The U.S. Environmental Protection Agency (EPA) Region 8 has conducted a five-year review of the response actions implemented at the Silver Bow Creek/Butte Area Superfund Site (Site), Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Information System (CERCLIS) ID: MTD980502777 in Silver Bow and Deer Lodge Counties, Montana. This review covers activities conducted from January 2005 through December 2009. This is the third five-year review for the Site. The first five-year review was conducted in 2000 following construction and shakedown operations at the Warm Springs Ponds Operable Unit (WSPOU).

The purpose of the five-year review is to determine whether the remedies or other response actions in place or under construction within the Site are protective of human health and the environment and otherwise in compliance with the decision documents. The methods, findings, and conclusions of such reviews are documented in five-year review reports. In addition, these reports identify deficiencies found during the review, if any, and identifies recommendations to address them.

The Site is located along the course of Silver Bow Creek between the active mining operations at its headwaters just north of Butte, Montana to approximately 30 miles downstream to its mouth near the town of Warm Springs, Montana, at the beginning of the Clark Fork River. In addition to the impacted floodplain along Silver Bow Creek, the Site also consists of mine-waste impacted areas in and around the city of Butte, Montana, the town of Rocker, Montana, and the WSPOUs. The CERCLIS database lists 13 individual Operable Units (OUs) for the Silver Bow Creek/Butte Area. Several of the original thirteen OUs were removal OUs and, therefore, are addressed under the record of decision (ROD) for one or more of the remedial OUs. The OUs listed in CERCLIS at the Site include:

- 00 Site-wide OU
- 01 Streamside Tailings Operable Unit (SSTOU)
- 02 Area One OU (now part of OU08)
- 03 Berkeley Pit/Mine Flooding Operable Unit (BMFOU)
- 04 Warm Springs Ponds Active Area OU
- 05 Butte Reduction Works Tailings OU (now part of OU08)
- 06 West Camp/Travona Mine OU (previously part of OU03, now part of OU08)
- 07 Rocker Timber Treating and Framing (Rocker) OU
- 08 Butte Priority Soils Operable Unit (BPSOU)

- 09 Clark Fork River/Downstream OU (this OU was transferred to the Milltown Reservoir/Clark Fork River Superfund Site and is no longer part of the Silver Bow Creek/Butte Area Site)
- 10 Butte Residential Soils OU (now part of OU08)
- 11 Lower Area One (LAO) OU (now part of OU08)
- 12 Warm Springs Ponds Inactive Area OU
- 13 West Side Soils OU

Currently, the Site consists of seven active operable units listed below<sup>1</sup>; the first six of these OUs have selected remedies and were included in this third five-year review:

1. Streamside Tailings OU01 – includes the 26-mile, mine-waste impacted Silver Bow Creek floodplain between Butte and the WSPs. This is the second five-year review for this OU.
2. Butte Mine Flooding OU03 – includes contaminated groundwater in the flooded underground mine workings below the city of Butte along with contaminated water in the Berkeley Pit. The West Camp/Travona Mine OU06 was previously part of this OU, but treatment of the West Camp groundwater was transferred to OU08 with the BPSOU ROD. This is the second five-year review for this OU.
3. Butte Priority Soils OU08 – includes impacted soils, mine wastes, and contaminated attic dust located within portions of the city of Butte, along with mining-impacted alluvial groundwater and surface water associated with the historic and current Silver Bow Creek floodplain within the city of Butte. OUs 02, 05, 06, 10, 11 were incorporated into BPSOU with the 2006 ROD. This is the first five-year review for this OU.
4. Rocker Timber Framing and Treating OU07 – includes soils and groundwater contaminated with arsenic from a former timber treating facility. This is the second five-year review for this OU.
5. Warm Springs Ponds Active Area OU04 – includes the portion of the 2,600-acre WSPs that actively treats the entire flow of Silver Bow Creek prior to its confluence with Warm Springs Creek forming the start of the Clark Fork River. It also includes the reconstructed Mill-Willow Bypass. This is the third five-year review for this OU.
6. Warm Springs Ponds Inactive Area OU12 – includes the portion of the 2,600-acre WSPs that is not part of the active treatment of Silver Bow Creek water. This is the third five-year review for this OU.

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<sup>1</sup> These OU descriptions are intended to provide a very brief overview of the scope of each OU and are not intended to be comprehensive descriptions.

7. West Side Soils OU13 – includes the mining-impacted areas in and around the city of Butte that are not included in the BPSOU or the permitted active mining area. This OU is in the forward planning stages with a remedial investigation scheduled for 2013. This OU was not included in the five-year review.

Broadly speaking, the remedies at the Site are to remediate areas impacted by over 100 years of mining and ore processing so that human health and the environment are protected. The remedy components implemented to date include capping and/or removal of mine waste; residential yard cleanups to protect human health; groundwater controls and groundwater treatment; surface water controls (such as ponds, treatment systems, and catch basins); and, the reconstruction of Silver Bow Creek. Each of the OUs being reviewed contains some type of these remedial elements.

The Site is a large, complex CERCLA site with several EPA and state project managers being responsible for certain portions of the Site. Due to the size and complexity of the site, each of these OUs was evaluated individually; these individual review reports are included as subsequent “volumes” in this five-year review report.

The purpose of Volume 1 of the report is to provide an overview of the effectiveness of the selected remedies, as well as provide an assessment summary of the performance of each OU’s selected remedy. Site-wide issues brought up through the community interviews, and the findings of the site-wide applicable and relevant or appropriate requirements (ARARs) review are included in this first volume in Appendices A and B, respectively. In addition, the final appendix in each volume includes a responsiveness summary specific to that OU, to address substantive comments received on the five-year review. The volumes are as follows:

- Volume 1: Executive Summary, including the review of ARARs and the results of the community interviews;
- Volume 2: Streamside Tailings OU – OU01;
- Volume 3: Butte Mine Flooding OU – OU03;
- Volume 4: Warm Springs Ponds Active and Inactive OUs – OU04 and OU12 (the review of these two OUs is combined);
- Volume 5: Rocker Timber Framing and Treating OU – OU07; and,
- Volume 6: Butte Priority Soils OU – OU08.

EPA Region 8 conducted the review with input from the Montana Department of Environmental Quality (DEQ). CDM Federal Programs Corporation (CDM) provided technical support to EPA in preparation of this five-year review under contract EP-W-



05-049 for all OUs except for the SSTOU. CH<sub>2</sub>M Hill supported EPA in preparation of the SSTOU portion of the five-year review.

Overall, removals and remedial actions directed towards achievement of the remedial action objectives, and implementation of the selected remedies at each OU have resulted in tremendous progress towards the protection of human health and the environment of the site. Many of the large source areas or “hotspots” that have posed the greatest threats to human health and environment have been mitigated. During the major cleanup processes, which have been ongoing since the 1990s, much has been learned, and remedy design and implementation has improved. The CERCLA related issues identified in this review are nuanced when compared to the overwhelming issues and risks that were encountered in the 1980s and 1990s when the site was first listed and reclamation activities began. This review has also determined that some of the remaining challenges to the ultimate recovery of Silver Bow Creek include issues that are outside of the jurisdiction of CERCLA.

Protectiveness statements for each OU above are issued in this report. A site-wide protectiveness statement will not be issued until construction of the remedy is complete at all OUs. This review finds that as the remedies are being implemented, short-term and long-term protectiveness will be achieved.

## Five-Year Review Summary Form

### SITE IDENTIFICATION

**Site name:** Silver Bow Creek/Butte NPL Site

**EPA ID:** 0974 **CERCLIS ID #:** MTD980502777

**Region:** 8      **State:** Montana      **City/County:** Silver Bow/Deer Lodge Counties

### SITE STATUS

**NPL status:** ☒ Final ☐ Deleted ☐ Other (specify) \_\_\_\_\_

September 8, 1983

**Remediation status** (choose all that apply): ☒ Under Construction ☒ Operating ☒ Complete

**Multiple OUs?** ☒ YES ☐ NO

**Construction completion date:** Ongoing

Remediation Ongoing

Has Site been put into reuse? ☒ YES ☐ NO

### REVIEW STATUS

**Reviewing agency:** ☒ EPA ☒ State ☐ Tribe ☐ Other Federal Agency \_\_\_\_\_

**Author name:** Roger Hoogerheide

**Author title:** Remedial Project Manager

**Author affiliation:** EPA Region 8

**Review period:** October 2009 – December 2010

**Date(s) of Site inspection:** October 1, 2, 6 and 7, 2009 and November 24, 2009.

**Type of review:** ☒ Statutory

☐ Policy

☐ Post-SARA ☐ Pre-SARA ☐ NPL-Removal only

☐ Non-NPL Remedial Action Site ☐ NPL State/Tribe-lead

☐ Regional Discretion

**Review number:** ☒ 3 (third)

**Triggering action:**

☐ Actual RA Operation of Groundwater ☒ Previous Five-Year Review Report

**Remedial Systems**

☐ Construction Completion

☐ Other (specify) \_\_\_\_\_

**Triggering action date:** September 2005

**Due date (5 years after triggering action date):** September 2010

*(Because of the site complexity and the public comment period, the review was completed after this due date)*

<b>Five-Year Review Summary Form (continued)</b>		
<b>Issues:</b>		
	<b>Affects Protectiveness (Y/N)</b>	
	<b>Current</b>	<b>Future</b>
<b>OU 01 Stream Side Tailings</b>		
1-1. Bare surface soils with salt formation and evidence of recontamination from waste left in place was observed within remediated areas.	Yes	Yes
1-2. Potential exists for recontamination of SSTOU by sources on tributaries.	Yes	Yes
1-3. Institutional Controls (ICs) are not fully and formally implemented.	No	Yes
1-4. Potential exists for recontamination by stormwater from upstream BPSOU until BPSOU remediation is fully in place.	Yes	Yes
1-5. The remedial monitoring network for surface water, instream sediments, groundwater, vadose zone water, soils, and vegetation should be revised to allow a systematic assessment of the performance of the remedy throughout the SSTOU.	No	Yes
1-6. Disturbed areas along stream banks during and after construction are not adequately treated with best management practices (BMPs) to prevent erosion and transport of sediment (possibly with residual metals) into Silver Bow Creek.	Yes	Yes
<b>OU 03 Butte Mine Flooding</b>		
3-1. The Horseshoe Bend (HSB) water treatment plant (WTP) did not meet the final pH effluent standard. Effluent is currently recycled to the Montana Resources (MR) mining operations and does not discharge to Silver Bow Creek.	No	Yes
3-2. Supersaturation of gypsum in the treated effluent causes a high potential for gypsum scaling throughout the WTP and in the effluent pipeline to Silver Bow Creek. Delayed precipitation of gypsum may also cause exceedances of the total suspended solids (TSS) discharge standard. Effluent from the WTP is currently recycled to MR mining operations.	No	Yes
3-3. Stringent pH and effluent turbidity control will be required for the WTP to reliably meet the cadmium discharge standard. Effluent from the WTP is currently recycled to MR mining operations.	No	Yes
3-4. The performance test did not include treatment of Berkeley Pit water, which has significantly higher concentrations of metals and sulfate than HSB water.	No	Yes
3-5. Use of scale inhibitors to control gypsum scaling issues in the treatment system may affect metals removal in the treatment plant. Effluent from the WTP is currently recycled to MR mining operations.	No	Yes
3-6. Whole effluent toxicity (WET) testing has not yet been performed on the HSB WTP effluent. Effluent from the WTP is currently recycled to MR mining operations. Should the effluent fail the WET testing, additional treatment processes may be necessary.	No	Yes.
3-7. The beta-photon procedure used to evaluate the concentration of radio- nuclides in the treatment plant effluent is not practical, given the need to analyze 179 different radionuclides.	No	No

<b>Five-Year Review Summary Form (continued)</b>		
<b>Issues:</b>		
	<b>Affects Protectiveness (Y/N)</b>	
<b>OU 04 and OU 12 Warm Springs Ponds Active and Inactive Areas</b>	<b>Current</b>	<b>Future</b>
4-1. Arsenic standard seasonally exceeded in effluent.	Yes	Yes
4-2. New exposure pathways for wildlife/aquatic life may now be present. These have not yet been evaluated	Unknown	Yes
4-3. A final ROD has not been issued. Final construction of the upstream SSTOU will soon make it possible for a final decision for this OU.	No	No
<b>OU 07 Rocker Timber Treating and Framing</b>		
7-1. Rebounds of arsenic concentrations below the repository are greater than expected in groundwater.	No	Yes
7-2. Atlantic Richfield submitted a technical impracticability (TI) evaluation for a waiver of the arsenic standard in groundwater in 2007.	No	No
7-3. The Town Pump well exceeds the recently-promulgated 10 micrograms per liter (µg/L) drinking water standard for arsenic. While the facility has switched to the community alternative water supply, there is no requirement for the facility to stay on the alternative water supply.	Yes	Yes
7-4. Increasing arsenic concentrations in shallow well RH-44 adjacent to Silver Bow Creek may indicate groundwater impacts to surface water. This is a data gap.	Yes	Yes
7-5. The ¼-mile radius controlled groundwater area may be overly restrictive.	No	No
7-6. The monitoring plan is not ideal for the current phase of the remedy.	No	No
7-7. The new arsenic standard of 10 µg/L is not in a decision document	No	No

<b>Five-Year Review Summary Form (continued)</b>		
<b>Issues:</b>		
	<b>Affects Protectiveness (Y/N)</b>	
<b>OU 08 Butte Priority Soils (includes OUs 02, 05, 06, 10, 11)</b>	<b>Current</b>	<b>Future</b>
8-1. Changes have been made to the Selected Remedy for Solid Media (sampling depths and removal depth)	No	No
8-2. Some corrective actions identified during Butte Reclamation Evaluation System (BRES) monitoring are not taking place in a timely manner. Corrective action work plans are not being developed and sent to EPA for approval before implementation. Corrective actions need to be implemented on an annual basis to maintain cap integrity.	No	Yes
8-3. There are gross exceedances of acute aquatic life standards in Silver Bow Creek during storm events. Copper exceedances of acute aquatic life standards are tens and hundreds of times greater than the standard.	Yes	Yes
8-4. The Butte-Silver Bow (BSB) storm sewer system is aging and contributing to contamination in Silver Bow Creek. Monitoring of storm system point sources from Superfund and non-Superfund sources will be required as BMP's are implemented, to determine where the need exists for additional work on the storm water system.	Yes	Yes
8-5. Interim institutional controls are in place. Specific, key ICs include: (1) earth moving protocols (not in place); (2) storm water ordinance (in place); (3) zoning ordinances (in place); (4) restrictive covenants on caps and other engineered structures (in place); and, (5) controlled groundwater area (in place).	No	Yes
8-6. Ecological monitoring does not track the success of the remedy in attaining the goal of a self-sustaining fishery in Silver Bow Creek.	No	Yes

## Five-Year Review Summary Form (continued)

### Recommendations and Follow-Up Actions:

(Note: Numbering Corresponds with Issue Number)

#### Streamside Tailings Operable Unit (OU 01)

- 1-1. All spots within the remediated areas with little or no vegetation should be inventoried and remediated.
- 1-2. An inventory and evaluation of major tributary gulches with historic mining activity should be performed. Inventory should be field verified and noted for regulatory action, restoration work, or West Side Soils OU evaluation and remediation. Remedial progress by the U.S. Forest Service on the Beal Mountain Heap Leach Pad project should be monitored until complete.
- 1-3. A formal IC Plan needs to be prepared and approved.
- 1-4. Ongoing evaluation and implementation efforts to control upstream stormwater should continue, as is currently required.
- 1-5. Align existing, and design new monitoring station locations to comprehensively monitor remediated media within each subarea. The monitoring network should be designed to accurately assess the performance of the remedy in surface and ground water, as well as vegetation, macroinvertebrates, and fish, and help identify areas not responding as intended so they can be quickly addressed.
- 1-6. Stormwater BMPs should be applied to disturbed areas along reconstructed streambanks during and after final construction activities to prevent erosion and transport of sediment (possibly with residual metals) into Silver Bow Creek. Effective BMPs should be maintained and monitored until streambanks are stabilized by deep rooted vegetation, and robust vegetative cover can be established in the reconstructed floodplain.

#### Butte Mine Flooding Operable Unit (OU 03)

- 3-1. Conduct an additional performance test to investigate solutions to exceedance of the final pH standard prior to the next five-year review.
- 3-2. Conduct an additional performance test to investigate solutions to gypsum supersaturation issues prior to the next five-year review.
- 3-3. Conduct an additional performance test to investigate solutions to ensure reliable cadmium compliance prior to the next five-year review.
- 3-4. Conduct an additional performance test to treat Berkeley Pit water prior to the next five-year review.
- 3-5. Conduct an additional performance test to investigate the effect of scale inhibitors on metals removal prior to the next five-year review.
- 3-6. Perform WET testing on representative effluent prior to the next five-year review.
- 3-7. Determine a more practical approach to analyzing radionuclides to determine compliance with the beta-photon emitter discharge criteria.

## Five-Year Review Summary Form (continued)

### Recommendations and Follow-Up Actions:

(Note: Numbering Corresponds with Issue Number)

#### Warm Springs Ponds Operable Units (OU 04 and OU 12)

- 4-1. Complete arsenic treatment optimization studies, and then determine if meeting Remedial Action Objectives (RAOs) is feasible.
- 4-1. Evaluate contaminant pathways.
- 4-2. Begin forward planning for the final ROD (including data collection efforts, updated risk assessments, and feasibility studies).

#### Rocker Timber Treating and Framing Operable Unit (OU 07)

- 7-1. Evaluate whether additional treatment or a TI waiver is needed. Review the TI waiver petition submitted in 2007.
- 7-2. Evaluate whether additional treatment or a TI waiver is needed. Review the TI waiver petition submitted in 2007.
- 7-3. Follow up to ensure Town Pump continues to use the community water supply and not groundwater
- 7-4. Evaluate the current or potential contribution, if any, of arsenic contamination to Silver Bow Creek from shallow groundwater.
- 7-5. Evaluate the protectiveness and continuation of the ¼-mile radius well ban.
- 7-6. Update the monitoring plan to optimize groundwater sampling.
- 7-7. Write a decision document to update the arsenic standard

#### Butte Priority Soils Operable Unit (OU 08, with OUs 02, 05, 06, 10, and 11 incorporated)

- 8-1. Issue a decision document to acknowledge changes in sampling and removal depths for residential properties.
- 8-2. Develop a program to follow up on BRES-related recommended corrective actions and other operations and maintenance (O&M) for reclaimed areas. Include corrective action tracking, annual work plans, updates to the source area database and an annual audit of the schedule and accomplishments.
- 8-3. Construct new BMPs on the Butte Hill to control runoff. Continue water quality monitoring during storm events to measure progress and long-term trends in storm water quality. Include careful monitoring and coordination with BSB with the storm water conveyance system in this process.
- 8-4. Evaluate and optimize municipal storm water collection system in concert with upgrades to the Superfund collection and treatment system.
- 8-5. Implement an enforceable IC Plan.
- 8-6. Update the monitoring plan to include ecological monitoring.

## Five-Year Review Summary Form (continued)

### Protectiveness Statements:

#### **OU 01 Streamside Tailings:**

The remedy at OU 01 is not protective. Source areas within the OU that can recontaminate the remedy must be identified, evaluated, and mitigated if appropriate. These include salt patches appearing on remediated areas that impede vegetation, and inadequately vegetated stream banks, as well as tributary sources. An IC plan must be developed and approved. Enforceable elements should be added to the IC program to ensure interim protectiveness, and the formal IC program should be approved by DEQ and EPA in coordination with appropriate County and local agencies and organizations. The existing monitoring plan also needs to be revised into a comprehensive groundwater, surface water, sediment, vadose zone, revegetation, macroinvertebrates, and fish monitoring plan to adequately demonstrate protectiveness. The plan also does not provide for maintenance of the remedy.

In-stream cleanup standards have not been met, although substantial progress towards these standards has been made and will likely continue. Environmental exposures continue. To be protective, the remedy must be more completely implemented, data gaps must be filled, enforceable ICs put in place, and the monitoring and maintenance plan updated and implemented.

#### **OU 03 Butte Mine Flooding:**

The remedy at OU 03 is expected to be protective of human health and the environment upon completion, and in the interim, exposure pathways that could cause unacceptable risk are being controlled by water treatment, routing water for re-mining use, land use access controls, and an IC preventing groundwater use. In order to be protective in the long term, water quality issues in the treated effluent will have to be resolved before discharge to Silver Bow Creek becomes necessary.

#### **OU 04 and 12 Warm Springs Ponds:**

The remedy at OUs 04 and 12 is not protective because aquatic life criteria are not met in the Pond discharge. In order to ensure protectiveness, remedy implementation must progress at other OUs upstream. Further, it is unknown if additional human or wildlife exposures are occurring within these OUs.

#### **OU 07 Rocker Timber Treating and Framing:**

The remedy at OU7 is not protective because the Town Pump well exceeds the arsenic MCL of 10 µg/L and was being used for drinking water. Additionally, prolonged use of this well could enlarge the existing plume and otherwise adversely affect remediation of the site. Action to prevent domestic/public use of this well and to prevent extensive pumping is needed to ensure protectiveness.

Further, it is unknown whether site contaminants are reaching Silver Bow Creek.

Other aspects of the remedy currently protect human health and the environment. Land use controls are in place to prevent residential development on the OU and a ban on well use within the Rocker OU is still in place. The Montana Department of Natural Resources and Conservation (DNRC) instituted a controlled groundwater area (CGWA) for the Rocker area and the Rocker residents were provided with an alternate community water system. Existing wells within the CGWA can still be utilized, however well owners have been notified of the potential risks. RAOs were prioritized according to actual or potential use of these groundwater zones. Progress is taking place in lowering the arsenic concentrations in the high quality lower aquifers which are currently used (Tertiary groundwater system) and that have the potential to be used (deep alluvium). A TI waiver is under consideration. Ongoing monitoring, continued implementation of institutional controls, controlling site access, and O&M activities are required to ensure long-term protectiveness.



## Five-Year Review Summary Form (continued)

### Protectiveness Statements:

#### OU 08 Butte Priority Soils:

The remedy at OU 08 is not protective because aquatic life standards are not met in the stream. Environmental exposures continue. Short-term protectiveness is provided for all other potential exposures by the recently enacted CGWA, information/educational ICs, and engineering and access controls of source areas. To ensure protectiveness, remedy implementation must be completed, and municipal storm water contributions to Silver Bow Creek must be abated.

Releases of arsenic and heavy metal contaminants in alluvial groundwater to Silver Bow Creek have been reduced through a comprehensive groundwater control, capture, and treatment system, such that water quality standards are being met much of the time during base flow conditions. The design of a more effective capture system is very important for completion of the surface water component of the remedy. Storm water continues to be a significant source of contaminant loading to Silver Bow Creek during runoff events, and additional remedial actions are necessary.

The Residential Metals Abatement Program (RMAP) program will continue to obtain access to residential properties within the BPSOU that have not previously been sampled to complete indoor and outdoor assessments (i.e., residential yard soil, indoor and outdoor dust, attic dust, lead-based paint, drinking water, and mercury vapor) and perform clean up actions where necessary. The program anticipates completing these goals by about 2020.

For non-residential areas, engineering and institutional controls effectively isolate identified waste materials, thus preventing human and environmental exposures. Protection of human health is expected to be strengthened as the BRES evaluation and cover maintenance programs are improved and mature, and as the ICIP is fully implemented, tested, and enforced. It is important that follow-up on BRES findings be tracked and implemented.

#### Site-wide:

A site-wide protectiveness statement will not be issued until construction of the remedy is complete at all OUs.

# U.S. Environmental Protection Agency

## **Five-Year Review Report for Silver Bow Creek/Butte Area Superfund Site**

### *Appendix A to Volume 1: Community Interviews*

June 2011

*Final*

REMEDIAL ACTION CONTRACT  
FOR REMEDIAL, ENFORCEMENT OVERSIGHT, AND NON-TIME-  
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## Attachments

*Attachment A: Postcard Sent to Area Residents*

*Attachment B: Interview Questions*

*Attachment C: List of Interviewees*

*Attachment D: List of Recommendations for Additional Interviewees*

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# Acronyms

BNRC	Butte Natural Resource Damage Restoration Council
BPSOU	Butte Priority Soils Operable Unit
BRA	Butte Restoration Alliance
BRES	Butte Reclamation Evaluation System
BSB	Butte Silver Bow
CAG	community advisory group
CDM	CDM Federal Programs Corporation
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFRTAC	Clark Fork River Technical Assistance Committee
CFWEP	Clark Fork River Watershed Education Program
COC	Contaminant of Concern
CTEC	Butte Citizens Technical Environmental Committee
DEQ	Montana Department of Environmental Quality
EPA	U.S. Environmental Protection Agency
FWP	Montana Fish, Wildlife and Parks
FWS	U.S. Fish and Wildlife Service
LAO	Lower Area One
MBMG	Montana Bureau of Mines and Geology
MSD	Metro Storm Drain
NCAT	National Center for Appropriate Technology
NPL	National Priorities List
NRD	Natural Resource Damage
O&M	Operation & Maintenance
OCPA	Opportunity Citizens Protection Association
OU	Operable Unit
PM	Project Manager
PRP	Potentially Responsible Party
PSA	public service announcement
ROD	record of decision
RPM	Remedial Project Manager
SST	Streamside Tailings
TAG	Technical Assistance Grant
WLIP	Waste Left in Place

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# Section 1

## Introduction

The U.S. Environmental Protection Agency (EPA) Region 8 has conducted a five-year review of the response actions implemented at the Silver Bow Creek/Butte Area Superfund Site, Comprehensive Environmental Response, Compensation, and Liability Act Information System (CERCLIS) ID: MTD980502777 in Silver Bow and Deer Lodge Counties, Montana (Site). This review covers activities conducted from January 2005 through December 2009. The interview information summarized here covers all of the Silver Bow Creek/Butte Area Site Operable Units (OUs) and does not provide technical assessment of the responses. Responses to comments relevant to the five-year review are addressed in the five-year review summary reports, and all comments received during the public comment period on the draft Site five-year review reports are addressed in a responsiveness summary at the end of each site-specific report. This is the third five-year review for the Silver Bow Creek/Butte Area National Priorities List (NPL) site.

This section of the report summarizes community involvement and notification; Section 2 summarizes interview responses; and Section 3 provides a summary of recommendations, primarily focusing on the identification of communication goals and steps to achieve those goals.

### 1.1 Community Involvement

EPA's mission is to protect human health and the environment. To achieve that mission, EPA needs to continue to integrate, in a meaningful way, the knowledge and opinions of others into its decision-making processes. Effective public involvement can both improve the content of the agency's decisions and enhance the deliberative process. Public involvement also promotes democracy and civic engagement, and builds public trust in government.

EPA has long been committed to public involvement. The fundamental premise of EPA's Public Involvement Policy (EPA 2003) is that EPA should continue to provide for meaningful public involvement in all its programs, and consistently look for new ways to enhance public input. EPA staff and managers should seek input reflecting all points of view and should carefully consider this input when making decisions. They also should work to ensure that decision-making processes are open and accessible to all interested groups, including those with limited financial and technical resources, English proficiency, and/or past experience participating in environmental decision-making. Such openness to the public increases EPA's credibility and improves the decision-making processes. At the same time, EPA should not accept recommendations or proposals without careful review.

The Public Involvement Policy supplements, but does not amend, existing EPA regulations that prescribe specific public participation requirements applicable to EPA's activities under specific statutes, such as those found at 40 CFR Part 300 National Oil and Hazardous Substance Pollution Contingency Plan (NCP, EPA 2004).



The NCP regulations specify the required level of public participation. Whenever feasible, agency officials should strive to provide increased opportunities for public involvement above and beyond the minimum regulatory requirements.

Superfund is the nation's program to cleanup uncontrolled or abandoned hazardous waste sites. The Superfund law, officially known as the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), was passed by Congress in 1980 and amended in 1986 by the Superfund Amendments and Reauthorization Act (SARA). Superfund has three primary functions:

- It gives EPA the authority to stop releases or potential releases of hazardous substances.
- It enables EPA to compel those responsible for site contamination to pay for cleanup or perform the cleanup.
- It provides funding for cleanup when money from responsible parties is not available.

CERCLA requires EPA, or the state at state-lead sites, to develop and manage community involvement programs at both fund-lead and enforcement-lead sites. At fund-lead sites, cleanup is paid for with Superfund money; at enforcement-lead sites, a potentially responsible party (PRP) pays for or performs cleanup. At either type of site, community involvement remains the responsibility of the EPA.

The CERCLA community involvement effort promotes two-way communication between members of the public and the lead government agency responsible for remedial actions. The overall objectives of CERCLA community involvement are:

- Provide the public the opportunity to express comments on and provide input to technical decisions.
- Inform the public of planned and ongoing actions.
- Identify and resolve conflicts if possible.
- Where applicable, EPA's community involvement activities also address environmental justice issues.

## 1.2 Community Notification

EPA used a number of mechanisms to notify people in the communities within or along the Site of the opportunity for involvement in the five-year review. These activities are described in more detail throughout this report. Below is a brief overview:

- **CTEC Meetings.** EPA made a presentation about the five-year review process at the November 2009 Citizens Technical Environmental Committee (CTEC) meeting.

CTEC is funded under EPA's Technical Assistance Grant (TAG) program. The TAG is the responsible entity for helping the community to interpret technical data, understand site hazards, and become more knowledgeable about the different technologies for cleanup.

- **Postcards.** A postcard was sent to a list of identified interested parties in early January 2010 (Attachment A).
- **Newspaper Advertisements.** Display ads were placed in the local papers (the Montana Standard and the Butte Weekly). The first ad announced the start of the five-year review process and ran in the Montana Standard and Butte Weekly on September 30, 2009. The ads requested public input for the five-year review.
- **CTEC Public Meetings.** EPA and the Montana Department of Environmental Quality (DEQ) were invited guests, available for comment and questions, at three five-year review public meetings hosted by CTEC.
- **Interviewee Recommendations.** The last interview question was to get recommendations from community members for additional interviewees (Attachment D).

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## Section 2

### Interviews

The goal of community interviews is to identify issues that are of concern to the public and may be preventing the remedial action from being protective. Because the Site is so large, complex, and work has been going on for so long, EPA faces special challenges in trying to communicate with the people affected at this Site.

Most of the deficiencies identified as part of the community interview process are addressed in a responsiveness summary attached to each OU-specific report. Some of the issues are outside the scope of a five-year review process or outside the scope of EPA. In such cases, the comments are noted, but will not be addressed by EPA. Whenever possible, contact information has been provided for issues outside of the scope. The five-year review interviews follow guidance specifically described in OSWER No. 9355.7-03B-P.

#### 2.1 Community Interview Process

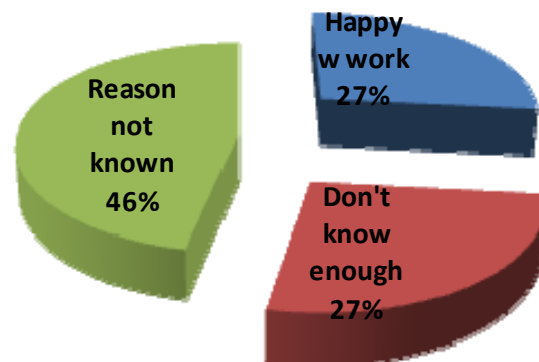
To develop a five-year review that reflects community interests and concerns, EPA depends heavily on information obtained during community interviews. These interviews were conducted between January and March 2010. Almost 100 people were contacted and interviews were conducted with 78 people, well above the typical number of interviews for a

five-year review. Of the people that opted not to interview, almost 30 percent said that they were pleased with the work done to date and did not need to talk about it. Another 27 percent said that they just did not feel knowledgeable enough and sometimes suggested other potential interviewees. A little less than half of the people that did not want to interview did not give a reason.

Interviewees included operations and maintenance (O&M) staff at the Site, local regulatory authorities and response agencies, community interest groups, professors, scientific experts, health care workers, residents, property owners, local and state officials, and businessmen.

The interview team was lead by Roger Hoogerheide, EPA Remedial Project Manager (RPM). The team also included: Daryl Reed, DEQ Project Officer; Angela Frandsen, CDM Project Manager; and Kris Larson, CDM Community Involvement Specialist. Each interviewee was asked ten “generic” questions and was encouraged to elaborate

**Reasons People Did Not Interview**

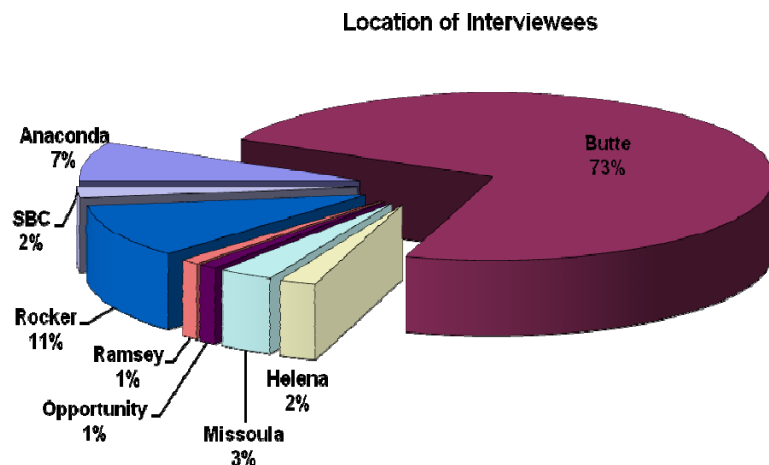


throughout the interview. Interviews took anywhere from 20 minutes to two hours, with the bulk of the interviews taking well over an hour. While the interviews are considered confidential, notes from every interview were shared with the interview team, and the team has worked to ensure that all ideas from the community have been incorporated into this document. This document generally avoids the use of quotes to protect confidentiality. When people are quoted, no interviewee names have been attributed to specific comments. To further protect privacy, most personal information has been removed from the comments.

Some of the interviews were conducted in groups.

For instance, in the case of the Butte Silver Bow Council of Commissioners, the interview team requested a group interview for the convenience of getting together prior to a council meeting. All of the

other group interviews were the interviewee's preference and generally included one or two additional people. The bulk of the interviews (almost 70 percent) were with single individuals.



Most of the interviewees were from Butte, with a smaller percentage from Rocker and Anaconda. A few interviewees were from citizen involvement groups or agencies in Missoula, Helena, or Opportunity. Others were working along Silver Bow Creek in between those towns.

## 2.2 Public Meetings Hosted by CTEC

In addition to the individual and group interviews, three public meetings were hosted by the CTEC for the five-year review. Brief summaries of those meetings are provided below.

### 2.2.1 CTEC Monthly Meeting - November 17, 2009

The preliminary meeting hosted on the five-year review was on November 17, 2009 and was a regularly scheduled CTEC monthly meeting. At that meeting, Roger Hoogerheide gave a 15-minute presentation on the five-year review. Attendees at the meeting were:

- CTEC. Suzzann Nordwick (meeting chair), John Ray, Kriss Douglass, Rick Appleman, and Jim Shive

- **EPA.** Roger Hooderheide and Sara Sparks
- **DEQ.** Joe Griffin
- **CDM.** Angela Frandsen
- **Butte-Silver Bow (BSB).** Tom Malloy
- **TAG.** Steve Ackerlund, Scott Payne, and Ian Magruder
- **Unaffiliated.** Cindy Gaffney, Dori Skrukrud, Dave Williams, and Nick Tucci

### 2.2.2 CTEC Five-Year Review Public Meeting - February 24, 2010

The second meeting hosted by CTEC was a public meeting specifically for the five-year review at the Butte Public Library from 6 to 8 pm on February 24, 2010. EPA and DEQ representatives were invited guests and were available to hear comments from the public. The agenda included a summary of the five-year review and a review of the Butte Priority Soils Operable Unit (BPSOU), Streamside Tailings OU, and Warm Springs Ponds OU. Attendees at this meeting were:

- **EPA.** Roger Hoogerheide, Sara Sparks and Jean Cannada
- **DEQ.** Daryl Reed and Joe Griffin
- **ARCO.** Marci Sheehan
- **CDM.** Angela Frandsen and Kris Larson
- **CTEC.** Suzzann Nordwick, Helen Joyce, John Ray, David Williams, Kriss Douglass, Leland Greb, Elizabeth Erickson, and Janice Hogan
- **Natural Resource Damage (NRD).** Pat Cunneen
- **BSB.** Tom Malloy, Eric Hassler, Dan Powers, and Michele Bay
- **TAG.** Ian Magruder
- **Clark Fork River Watershed Education Program (CFWEP).** Justin Ringsak
- **Other.** Bernard Harrington (Walkerville Mayor)
- **Unaffiliated.** Steve Parker and Mike Machura

### 2.2.3 CTEC Five-Year Review Public Meeting - March 3, 2010

The third and final public meeting hosted by CTEC for the five-year review was held on March 3, 2010 at the Butte Visitor/Chamber of Commerce from 7 to 9 pm. EPA and DEQ representatives invited guests and were available to hear comments from the

public. The agenda included a summary of the five-year review and a review of the BPSOU, SSTOU, and Warm Springs Ponds OU. As part of CTEC's involvement in the five-year review process, a facilitator collected oral and written comments from the public at both meetings. CTEC compiled and summarized the public comments and forwarded to EPA. Attendees at this meeting were:

- **CTEC.** Suzzann Nordwick, Helen Joyce, John Ray, David Williams, Leland Greb, Janice Hogan, Elizabeth Erickson, Jim Shive, Rick Appleman, and Pat Munday
- **EPA.** Julie Dalsoglio and Joe Vranka
- **DEQ.** Daryl Reed and Joe Griffin
- **CDM.** Kris Larson
- **BSB.** Tom Malloy
- **NRD.** Pat Cunneen
- **CFWEP.** Justin Ringsak
- **Other.** Bernard Harrington (Walkerville Mayor) and Pam Haxby-Cote (Senator Tester's Office)
- **Unaffiliated.** Tricia Joyce, Dina A, Marlene O'Donnell, Bill Hill, Keith Ingram, Gere Spear, Rich Penhaligen, Noorjahan Parwana, Barbara Griffin, and Cate Oliver

## 2.3 Community Interview Questions and Responses

People participating in the interviews were told that the interviews were being conducted so EPA could get feedback to determine community interests and to find out which information sources work best for locals. The information gathered would be used to address concerns and to reassess outreach methods that would best fit the needs and wishes of the community.

For ease of reading, comments have been sorted into similar categories (e.g., positive or negative). However, some comments may overlap a category. A summary of the results is shown in Table 2-1. Because this information was derived from conversations with interviewees, rather than from detailed written surveys, the numeric summaries are somewhat subjective and do not represent precise measurements.

**Table 2-1**  
**Summary of Responses to Interview Topics**

Topic	Summary
Familiarity with site	96% Were familiar, many said they were very familiar
Source of Information*	78% Written Materials, 69% Self, 26% TAG or CAG, 6% Teaching, 9% Tours or Field Trips, 91% Agencies or Other Experts, Internet 26%
Concerns about cleanup*	Not quantifiable. Interviewees were most (or in some cases "only") concerned with the places they live and work.
Concerns are heard and addressed	34% Yes, 16% No, 27% Mixed, 3% Neutral, 10% NA (personally involved in site clean-up), 10% Heard but Not Always Addressed
Expectations of cleanup*	96% Protected for Human Health and the Environment, 49% Good for Redevelopment, 39% No Stigma, 9% Used as National Example
Opinion of the work being done	52% Positive, 16% Negative, 23% Mixed, 6% Neutral, 3% NA
Satisfaction with amount of information provided	47% Happy, 38% Want more, 4% Want less, 10% NA (data creators), 1% Mixed
Preferred source of information*	27% Written materials, 15% Meetings, 17% Internet, 5% Library, 14% Other, 36% Combination of All
Anything else*	Comments included: concerns about cancer, review entire basin at once, taking too long, recontamination, inadequate data, educate kids about the site, Butte is treated unfairly, and thank you for listening to the community

*\*Interviewees could provide more than one response to this topic*

The interview team asked each participant a list of 10 questions (Attachment B):

1. Do you know what is being done at the site? What work are you most interested in?
2. Where do you get your information about the site?
3. Do you have any specific concerns about the cleanup? Choices were: Berkeley Pit, Priority Soils, lead abatement in yards/paint, metal-laden attic dust, Rocker, Streamside Tailings, and Warm Springs Ponds.
4. Do you feel concerns you express are heard and addressed?
5. What are your expectations of the cleanup?
6. Do you have an opinion on the work being done at the site?
7. Are you satisfied with the level of information you are receiving and your level of involvement on the work being done at the Silver Bow Creek/Butte Area Site?
8. What is the best way for us to get information to the community about the site? Choices provided were: Letters or fact sheets mailed to your home, newspaper or radio ads for specific events, public meetings (e.g. CTEC), talks to local groups (e.g. Rotary Club), stories in newspaper at significant milestones in the process, regular updates via email, information repository, website, other.
9. Anything else you'd like to add?
10. Anyone else we should interview?



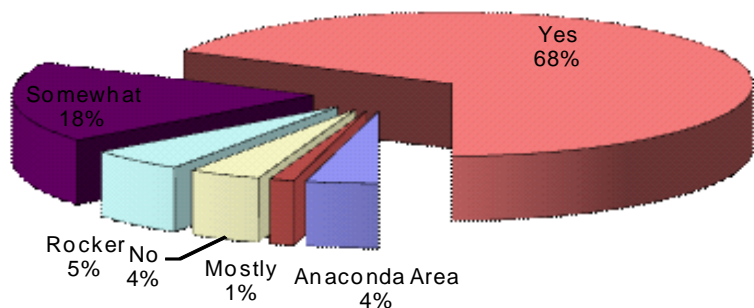
The responses to each of the questions above have been summarized in this section, along with a discussion of how these concerns will be addressed. Some issues are addressed in the five-year review reports summary and others are addressed in the responsiveness summaries.

Every effort has been made to accurately summarize responses from interviews. However, no judgments have been made as to whether or not statements made by interviewees were factual. In many instances, the statements made by interviewees indicated that they did not have an accurate understanding of the issue they were commenting on.

### 2.3.1 Question 1: Do You Know What Is Being Done at the Site? What Work Are You Most Interested In?

Question 1 was asked to determine what people in the community knew about the Site and the problems associated with it. Knowledge of the Site varied from people who had just a passing understanding of the rudiments of the site to people who have worked on the Site for 20 years and have an extensive knowledge of the history and the plans for the future. The Site is large enough that few people have an understanding of all the work that has been done or will be done. However, everyone interviewed was at least somewhat familiar with work in their neighborhood or town. Even the people that said that they had *“No knowledge of the work being done at the site”* were familiar with their neighborhood.

**Do You Know What Is Being Done at the Site?**



For the most part, the responses to the second part of the question (*“What work are you most interested in?”*) fell more appropriately under Question 3 (*“Do you have any specific concerns about the clean up?”*). On multiple occasions, certain issues

were raised by different interviewees without prompting from the interview team, which indicates that there is a level of concern in the community about these issues.

Those concerns are described below:

- **Westside Soils.** EPA has not yet worked on Westside Soils, so the original intention was not to include it in the five-year review. However, many interviewees brought up the topic without prompting, often stating that work should be done in the Westside Soils area because it can affect other projects downstream. People were primarily concerned that Westside Soils was being used for recreation and that there were houses being built in the area. One interviewee noted that signs

intended to keep people out of the area were ineffective, and children riding bikes kick up a lot of dust. Three interviewees mentioned that Bell Smelter was a potential source of copper and that it was a contributing source of contaminants to BPSOU. One resident was concerned that both of his dogs had died of cancer. In response, EPA plans to initiate formal Superfund RI/FS activities for this OU very soon.

- **The Greenway.** More than one third of the respondents mentioned the Greenway, even though none of the interview questions referred to it. For the most part, people were very supportive of it and were impressed with the work done. Several people mentioned the important role that citizens played in this part of the clean-up and how much it engaged the community. A few people mentioned how much they enjoyed an interconnected trail system. They envisioned something like Northern Idaho's Trail of the Coeur d'Alenes. Several people mentioned the importance of native vegetation or a vegetative assembly that was aesthetically pleasing. Many people feel that more vegetation and wildlife will bring more people to recreate in the area. More than one person said that the area's unique cultural heritage should be preserved (e.g., the headframes). One person said that two property owners had not yet granted access or an easement and that, if the property could not be acquired, the remedy would fail. People said that motorized vehicle access should not be allowed, and that long-term maintenance should be part of the remedy. One person noted that the Greenway was proceeding at a "remarkable" pace, and he was impressed with the amount of dirt moved every summer. Only one person had a negative comment and felt that too much money had been spent with too little to show for it. However, he thought it was critically important to community redevelopment.
- **Institutional Controls (ICs).** Most people are not in favor of ICs, and ICs are discussed under many of the individual OUs. The comments from the community referred to in this section are general in nature. Almost anyone that mentioned ICs mentioned their dislike of fences. Many people said something to the effect of, "*the caps are not natural looking.*" A number of people are concerned about long-term O&M. These concerns include the ability to take care of something so complex into perpetuity, that the measures may not be fail-safe, that there could be so many unknowns, and concerns that O&M will become a burden to taxpayers. One person asked, "*If someone doesn't do what they're supposed to do, what is the penalty?*"

### 2.3.2 Question 2: Where Do You Get Your Information about the Site?

Because the Site covers such a large area and the work has been going on for more than 20 years, it can be a challenge to keep the community well-informed about activities and progress. Question 2 asked people where they got their information. Of the people that responded, the most common response was "*meetings.*" Not many people had attended tours or field trips, but those that had, raved about the experience and found it very helpful. Several people said something to the effect of,

*“Friends. That’s the way Butte works. Everyone just kind of talks.”* Some people said that they themselves were a source of information. While some of these people were scientists or other experts working on the site, many said that they obtained their knowledge by walking or driving around the sites and visually observing the work. Unfortunately, this casual process of obtaining and disseminating information often leads to the spread of incorrect information through a large circle of people.

The complete list of sources and the number of times they were mentioned (in parentheses) included:

- **Talking to agencies, ARCO or other experts either informally or at meetings (70).** Agencies include EPA, DEQ and BSB. One quarter of the interviewees mentioned Tom Malloy, of BSB, by name.

- **Written materials (60).** Dozens of people had something positive to say about Pit Watch. People also mentioned newspapers, fact sheets, and “other.”

- **Self (53).** A number of the interviewees were scientists, engineers, teachers or other experts in the community. Some were citizens visually observing work.

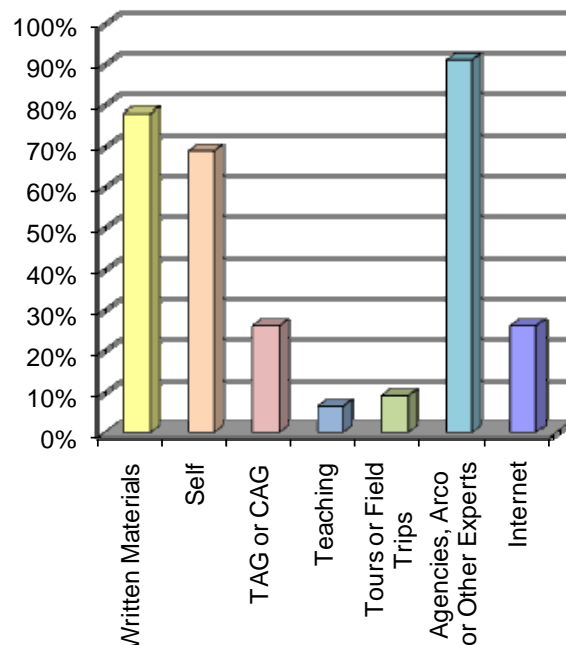
- **Information from TAG or Community Advisory Group (CAG )(20).** These groups include the Arrowhead Foundation, CTEC, Clark Fork River Technical Assistance Committee (CFRTAC), CFWEP, and Opportunity Community Protectiveness Association (OCPA).

- **Internet (18).** Many expressed frustration with EPA’s website and said it was difficult to use unless the user knew precisely what to search for.

- **Tours or field trips (7).** The people who attended these events were very happy with them and wished there were more opportunities.

- **Teaching (5).** Includes information provided for or at college and/or kindergarten through 12th grade.

**Where Do You Get Information about the Site?**



### 2.3.3 Question 3: Do You Have Any Specific Concerns about the Cleanup?

Question 3 focused on finding out people's concerns. A list of the different potential concerns that are currently being addressed was provided to every interviewee. This prompted many specific comments about Berkeley Pit, BPSOU, lead abatement, metals-laden attic dust, Rocker, Streamside Tailings and/or Warm Springs Ponds. Concerns raised by interviewees are identified and comments showing the various viewpoints of community members are presented. A little less than 10 percent of the people interviewed said that they did not have any concerns at all.

It is worth noting that multiple people often mentioned something that was not on this list of seven "key words." Agency representatives and other experts would be expected to have some understanding of the complexities of the site. However, many non-technical local residents brought up issues such as Parrott Tailings, ICs, waste left in place (WLIP), Lower Area One (LAO), groundwater or aquifer contamination, and storm water concerns. While these issues all fall under one of the main categories that were listed as potential concerns, the fact that citizens are talking about them without prompting is an indication of the level of concern in the community. Some additional concerns were not as easily categorized. A summary of the concerns expressed by interviewees, whether they are relevant to the five-year review, and where they will be addressed is provided below for the following categories:

- Berkeley Pit
- Butte Priority Soils
- Lead Abatement in Yards and Paint
- Metals-Laden Attic Dust
- Rocker
- Streamside Tailings
- Warm Springs Ponds

#### 2.3.3.1 Berkeley Pit

There were a number of specific concerns regarding the Berkeley Pit: general comments, Butte Mine Flooding, recontamination downstream, treatment plant, extracting metals, pit fog, and birds. Those comments are summarized below:

- **General comments.** Only a few comments fit into this category. One concern was treatment of the Berkeley Pit into perpetuity. This person felt like there should be better comprehensive clean-up plans in place. Some people mentioned a disaster scenario, such as an earthquake. The primary concerns then would be a treatment plant failure, potential damaged water supply, contamination of the alluvial

aquifer and recontamination downstream. The RI/FS and ROD selection process addressed these issues.

- **Butte Mine Flooding.** Of the people that mentioned Butte Mine Flooding, almost everyone was concerned with the critical water level. A few people wondered why the water in Berkley Pit was not being pumped yet. Several people mentioned that they were concerned that the old mine tunnels have started to fill up with water. They believe that this is affecting building stability and they are also afraid that this water could potentially affect the aquifer. At least one person does not believe that the pumping station will really work. Extensive monitoring is in place to ensure pumping occurs when the critical water level is reached.
- **Recontamination Downstream.** Many people were concerned with recontamination downstream. Comments about recontamination downstream were brought up several times and will be included under the appropriate sub-headings. The comments specifically about potential recontamination from the Berkeley Pit include concerns that the pit walls are not really stable and if the pit fails, it will recontaminate everything downstream. These comments tie into other comments about the order of clean-up efforts, with a number of people feeling that the work has been done out of sequence.
- **Treatment Plant.** There were only a few comments about the treatment plant. People are concerned that when Montana Resources quits operating, the treatment plant might not work, or it might not work into perpetuity, or it might allow the pit to contaminate the shallow groundwater. At least one person wanted testing on Horseshoe Bend. The treatment plant is working well currently, as required by the ROD. It is recommended that EPA conduct a public meeting to let citizens know the status of the treatment plant and how it will function in the long-term.
- **Extract Metals from Berkeley Pit.** One interviewee mentioned extracting metals from the Berkeley Pit. He wondered if someone could use electricity to pull the valuable minerals out and then isolate the arsenic and other contaminants. While only one person mentioned it in the course of these interviews, many people have talked about extracting metals from the pit over the years. It may not be feasible now, but the technology may be better in 20 years. This comment will not be addressed further, because extracting metals from the Berkeley Pit is not an EPA issue under Superfund and is therefore outside the scope of the five-year review.
- **Pit Fog.** A few people mentioned pit fog in the course of the five-year review interviews. The primary concern was that it hadn't been studied. People just did not know if it was going to hurt them driving through it, breathing it, or smelling it. There were also concerns about the fog affecting air and vehicle traffic, as well as property values. Pit fog issues do not involve hazardous substances releases, and are outside the scope of the five-year review and will not be addressed in this report. However, it will be recommended as a subject for further study.

- **Birds.** Only a few people mentioned birds in the course of the interviews, but the issue of birds in and around the Berkeley Pit has come up many times over the years. People are concerned that if the birds land in the pit, they will die. The current mitigation program involves shooting cracker shells near the birds to scare them away from the pit. One person said that there should be some sort of mechanism so the birds cannot land in the pit. Montana Resources is required under the Consent Decree to implement the Waterfowl Mitigation plan and provides a monthly summary report on birds that indicate how many birds are observed, if the birds are living or dead. There are hardcopies available at Montana Tech and at DEQ. This information could be made available electronically if there is real community concern.

### 2.3.3.2 Butte Priority Soils

The BPSOU has several individual issues. The comments from the community were broken into the following categories: general comments, Parrott Tailings, storm water, Metro Storm Drain, odor and dust problems, recontamination downstream, WLIP, and LAO. EPA has noted all of the comments received. However, the BPSOU consent decree negotiations are ongoing between the agencies and the PRPs and specific ways of implementing the selected remedy in the BPSOU are still in the confidential negotiation phase (pursuant to a federal court order) and can only be discussed in general terms. Many of these remedy components for the BPSOU will be up for evaluation in the next five-year review.

- **General Comments.** One person mentioned that there are known reasons for high arsenic concentrations in Butte and suggested that a non-agency representative address issues such as this in public meetings. Another said that the original remedy was based on incomplete data. One person suggested that EPA look at cumulative, synergistic and chronic exposures to other metals besides lead, arsenic and mercury. These issues are addressed in the report and/or the response to comments attached to the report.
- **Metro Storm Drain and the Parrott Tailings.** The Parrott Tailings were not included in the interview questions, but they were brought up by at least half the interviewees - even though many of the interviewees were not from Butte. The Parrott Tailings seem to be one of the largest issues for the BPSOU. Many comments concerned waste left in place, including: the tailings should have been removed, tailings present recontamination issues, and copper has not been addressed as a toxin. There were comments that not enough data had been collected, that new data obtained since the ROD have not been considered, and that the aquifers are not well-characterized. A few people were concerned about the need to treat groundwater into perpetuity, and many people are concerned with redevelopment. Many people said it was inappropriate to use the \$28 million Natural Resource Damage (NRD) fund for clean-up work that should be paid for by the potentially responsible party (PRP).

Almost one third of the respondents mentioned concerns with the MSD. Several interviewees pointed out that when the French drain system is jetted, iron plugs up the holes and the fittings are damaged. Many people are concerned about recontamination of the aquifer and everything downhill. One interviewee said, "The Metro Storm Drain is like a superhighway for contaminants to get to Silver Bow Creek and ruin all the work that was just completed." Several people pointed out that the MSD was once a creek, and should be restored to look like a creek and meet aquatic standards. Many people were concerned with the long-term O&M. One person wanted more monitoring to prove that the MSD can deal with contaminants.

EPA acknowledges the concerns that the community has raised regarding the Parrott Tailings and groundwater in the MSD. Copper is addressed in the BPSOU ROD as a contaminant of concern. The PRPs, with Agency oversight and involvement, have been studying ways to improve the groundwater capture system that was installed in the MSD and improve the design to be more robust. Ongoing Consent Decree negotiations may address these issues.

The five-year review for BPSOU did not include a review of the MSD and Parrott Tailings portion of the remedy because the remedy implementation is ongoing. This system should be evaluated in the next five-year review.

- **Storm water.** About one third of the interviewees listed storm water as a concern. There were concerns about movement of contaminants in storm water, including recontamination of areas downstream (Streamside Tailings OU). There were other concerns about the storm water system: Aging infrastructure was the primary concern brought up by these interviewees. In addition, the cement pipes used to transport storm water were installed in waste, the current system cannot deal with large storm events, and an interdisciplinary team should be used for storm water management. It was also said that storm water is an environmental justice issue and there should be more funding to help fix the infrastructure in poor neighborhoods where there is a lack of consistent curbs, sidewalks, and gutters. A few people mentioned that there needed to be a conventional water treatment plant at LAO to address the contaminated storm water.

EPA, in conjunction with the BPSOU settling defendants, has developed work plans that address stormwater run-on/runoff in source areas. A curb and gutter plan was developed and approved by the EPA and is being implemented. The program includes the installation of curb and gutters at or near source areas. The program began in 2009 and will continue in 2010 and 2011. Additional settling ponds and other storm water best management practices and infrastructure improvements are being implemented and considered.

- **Odor and Dust Problems.** A few interviewees mentioned odor and/or dust problems from the active mine area. This is not a Superfund issue, and it will not be addressed by EPA in this five-year review. Citizens with concerns about odor

and or dust should call DEQ, Hardrock Mine Permitting Section which oversees work at the active mine.

- **Recontamination Downstream.** Many people were concerned with recontamination downstream. There were several comments about this in the interviews. These comments are included under the particular OU or sub-heading when possible. The only comment specifically about potential recontamination from the BPSOU was, *"Why wasn't the Butte portion of the cleanup finished before cleaning the lower portion of the Clark Fork?"* Sequencing issues are addressed in the response to comments.
- **Waste Left In Place (WLIP).** More than half of the people interviewed mentioned WLIP, specifically the capped areas and source areas in Butte. Most people understood the need for WLIP and felt that total removal wasn't practical. One interviewee said, *"It's a risk management based law. There's not a total clean up law."* Concerns about WLIP included fire hazards from grass, permanence, long-term O&M, improper access by vehicles, vegetative diversity, the current use of herbicide, recontamination from erosion, the protection of shallow ground water, redevelopment, and that areas capped under emergency order might not be as thick as they should be. Most people disliked fences. Several people mentioned the need for more testing and one person said, *"The Butte Reclamation Evaluation System (BRES) should be available to the public just as USGS information is available to the public. Someone said in a meeting the other night that half the caps were failing and I know this not to be true, but I want the data to prove it."* This person said that the original soil work was based on arsenic, but they are now seeing more cadmium and copper. One person said that trees at Copper Mountain have been lost and should be replaced. A handful of people wanted total removal, and one said that plowing lime was not a long-term solution. The BPSOU five-year review report identifies the evaluation and maintenance of caps as an issue which must be addressed by EPA.
- **Lower Area One.** Almost half of interviewees were concerned about LAO. The interview team did not ask about it, and yet dozens of people commented on it. Almost all of the interviewees who mentioned LAO were concerned or negative about the work being done there, and most were concerned with the effectiveness of the remedy. Concerns included recontamination from Rocker to Warm Springs Ponds, lack of remedy finalization, ineffectiveness of sludge beds, impacts from Parrott Tailings or Slag Wall Canyon on the lagoons, unproven treatment technology, unknown lagoon capacity, and long-term O&M issues. Many people mentioned the need for testing, and a few people suggested that EPA do 24-hour, once per hour random sampling. One person said he is not seeing macroinvertebrates (an indicator of stream health) and that the leeches, blood worms, and blood midges seen at LAO are highly-tolerant of contaminants. People who felt the remedy is effective pointed out that there are now trout in the creek and wildlife in the area, that the residential metals program and reclamation on the hill had helped to address issues in LAO, and that the treated water was



better than the creek water and that this would improve further over time. The LAO treatment lagoon system is effective in treating contaminated water to stringent standards, and is monitored frequently. EPA needs to provide better information on this topic.

### **2.3.3.3 Lead Abatement in Yards and Paint**

Because the interview team asked specifically about *“lead abatement in yards and paint,”* almost everyone interviewed commented on the program. Almost all of the feedback was very positive. One person pointed out that, *“In the 1990s, the kids had elevated blood lead levels. At the end of the program, there were no kids with elevated blood lead.”* The program has been re-assessed so that now BSB Health Department is working systematically from the top to the bottom of Butte, in addition to accepting referrals. The participation rate has increased. One person that had her yard remediated was very pleased with the process. A handful of the interviewees had negative comments. Concerns included that it is still a voluntary program, that outreach and education aren’t addressed well enough, that anything involving “government” might scare some people off, that sensitive populations (such as low-income, elderly or veterans) might not participate. A recently approved residential cleanup plan continues this successful program and addresses the concerns expressed here.

### **2.3.3.4 Metal-laden Attic Dust**

Metal-laden attic dust from years of smelting was another potential concern that the interview team listed, so many people had comments on it. Several people were concerned that not everyone who should have attic dust removed is getting attic dust removed. Many of these people thought that the program should be better publicized. Some people were concerned that lead was not always the primary contaminant of concern (COC), and there is only testing for lead. Arsenic was listed as an example of a COC used in smelting operations. More than one person mentioned that they would like to see lower acceptable arsenic levels. One person said that she would like to promote hair testing because that shows chronic exposure (vs. blood lead testing which only shows lead that was in the system in the last 7 to 30 days). People would like to see the data available publicly. One person mentioned the need to test for manganese. Another person mentioned that there’s no cleanup unless there’s an identified pathway, but this was not a good long-term solution. These issues are addressed in the response to comments and in the report.

### **2.3.3.5 Rocker**

The majority of the interviewees were from Butte and most did not have much more than a rudimentary knowledge of the work in Rocker. About 11 percent of the interviewees lived in Rocker and the bulk of the comments here come from these people. Concerns included revisiting the controlled groundwater area restrictions which was implemented more than five years ago, potable water, petrochemicals leaking into the groundwater, lack of vegetation in the area. One person noted that the arsenic concentrations aren’t better in the plume, but that the plume is not migrating. One person asked EPA to consider bridge realignment in the course of

other work. One person was concerned that the Town Pump at Rocker discharges all the runoff from the parking lot into a pond, which goes into Silver Bow Creek. This person was concerned that there was no water treatment for the runoff and that Silver Bow Creek would be recontaminated. The Rocker portion of the report addresses the issues here which are within the scope of Superfund.

### 2.3.3.6 Streamside Tailings

Because Streamside Tailings was an area that was specifically asked about during the interviews, almost everyone had a comment. Almost all of the interviewees mentioned that they were very impressed with the work that was done on Silver Bow Creek. There were a few concerns about recontamination, but there were very few negative comments about the work itself. People pointed to examples like the project was on time, under budget, the project manager (PM), Joel Chavez, talked and listened to people, that the project team learned things along the way and implemented changes accordingly, that there were visible improvements in vegetation, wildlife, and fish, and that the project was a good effort for redevelopment and “giving people hope” in the community.

The primary concern with Streamside Tailings is that it would get recontaminated, primarily from storm water runoff. One person noted that the money saved on the project should stay in the area. Several people mentioned the need for ongoing monitoring to ensure that water quality standards are met. One person mentioned the need for more vegetative diversity, particularly trees. One person mentioned that Subarea 4 is not up to the standards of the rest. One person mentioned that it should get more media attention. Many of these issues are addressed in the SSTOU portion of the report.

### 2.3.3.7 Warm Springs Ponds

Warm Springs Ponds was one of the specific areas that the interview team mentioned. There were dozens of comments about Warm Springs Ponds. The comments are broken into groups for ease of reading: contamination (primarily arsenic), recreation and habitat at Warm Springs Ponds, the long-term plan at Warm Springs Ponds.

- **Contamination (primarily arsenic).** Several interviewees mentioned that they were concerned with elevated arsenic levels within and discharged from the Warm Springs Ponds. The two primary concerns are the action level and if the groundwater collection system is adequate. Other concerns include storm water runoff from Butte Hill, long-term O&M, fish declines, contamination of surrounding wells, and monitoring. One person reported that the Mill-Willow Bypass is clean and is working as designed. Another commented that fish kills are caused by the temperature in the ponds, not arsenic. Another person would like to use the Warm Springs Ponds as a monitoring and sampling training program with MT Tech.
- **Recreation.** Almost everyone that mentioned Warm Springs Ponds mentioned the benefits of habitat and recreation. Recreationists make extensive use of the ponds.

Dozens of people mentioned the benefits of recreational use at the ponds including heavy trail use, fishing, waterfowl habitat, spawning grounds for trout, dog training and mitigating the stigma of a Superfund site. One person mentioned that in the Spring when there is high water everywhere else, the ponds can still be used for recreation. People enjoyed the trail system, and many would like to see it connected to the Greenway. Several people wondered if the ponds are safe for human, waterfowl or animal health. One person was concerned about groundwater recharge from the ponds into the Mill-Willow Bypass and potential increased contamination of the ponds. A few people had comments on vegetation, such as using more native plants and grasses. One man wanted to see more fruit-bearing trees in the area. Another person noted that if fences must be used, the fences have to be wildlife-friendly. One person noted that four-wheelers are ruining the vegetation, and that the whole area had been forested at one time. No one was in favor of a dry closure of the ponds, although one person said that the community should reconsider this if it were the only way to protect the area.

- **The Long-term Plan.** Of the people that commented on Warm Springs Ponds, almost all of them were concerned with the long-term plans. Almost everyone that mentioned it was opposed to the rumors of dry closure. Many people use the ponds for recreation and are concerned that there is no final ROD yet. One person noted that the community should not have to manage Warm Springs Ponds into perpetuity. Another person thought that arsenic should be monitored to see where it is and where it is going. Many of these issues are addressed in the Warm Springs Ponds portion of the report. EPA is committed to beginning the Superfund process for a final remedy at the Ponds as soon as upstream contamination controls and incoming water quality levels are more certain.

#### 2.3.3.8 Site-Wide Concerns

- **Silver Bow Creek Water Quality and Biological Monitoring.** Results from the community interviews have indicated that a percentage of residents are concerned that water quality and biological monitoring along the entire length of Silver Bow Creek (and further downstream) is not occurring. In addition, it was noted that the community does not have a solid understanding of the distinction between OUs. The interconnectivity between OUs is an important factor when assessing the impacts to human health and the environment along Silver Bow Creek. Remedial actions upstream can affect the performance of downstream OUs.

To adequately assess the impacts across multiple OUs, an ecological screening study should be considered, which would be an evaluation of the condition of a waterbody using biological surveys and other direct measurements of the resident biota in surface waters. The ecological screening study should be designed as an inexpensive screening tool for determining if a stream is supporting or not supporting a designated aquatic life use. Assessment protocols may include three designated aquatic assemblages (i.e., periphyton, benthic macroinvertebrates, and fish) and habitat assessment. This screening tool would also be important for future assessment of the interconnectivity between OUs and help monitor their

interaction during the remedial actions. However, funding for the Superfund program is tight, and this may not be possible.

- **Butte Municipal Wastewater Treatment Plant.** The wastewater treatment plant effluent is one of the largest issues in the watershed impacting the health and recovery of Silver Bow Creek. Nutrients and heavy metals in the municipal wastewater treatment plant effluent result in conditions that are either anoxic (due to nutrients) or acutely toxic (heavy metals and/or ammonia) to aquatic life. Effluent levels of ammonia and nitrates result in an anoxic zone extending several miles downstream of the discharge point. However, the plant is currently being upgraded to improve nutrient removal. There is some community concern about the plant's capabilities in treating wastewater that may be impacted with metals contamination, possibly as a result of contaminated groundwater infiltration into the sanitary sewer distribution network. Evidence has indicated that discharge from the wastewater treatment plant contains metals, and depending on the flow, can impact water quality, particularly at Station SS-07 (this is discussed further in BPSOU-specific Volume 6 of this five-year review).

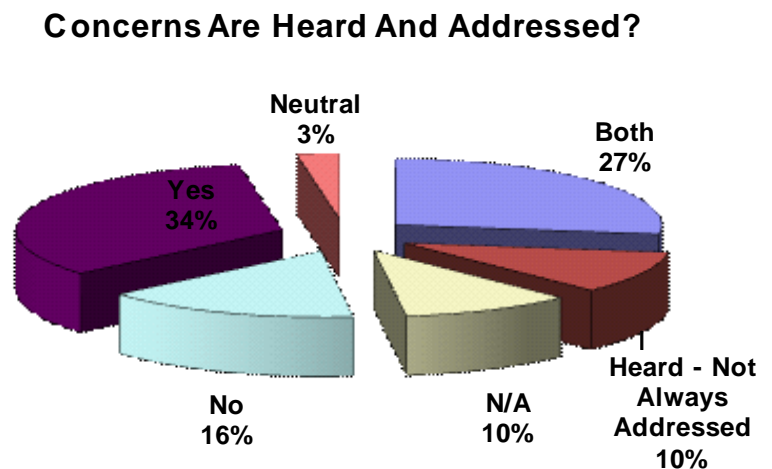
The wastewater treatment plant is regulated by DEQ under the State Clean Water Act. Butte-Silver Bow is currently under order pursuant to the Clean Water Act (Administrative Order on Consent, Docket No. WQ-07-07) to upgrade the WWTP (see Section 6 of Volume 6 on the BPSOU). New effluent limits for total nitrogen, total phosphorous, and chlorine became effective January 1, 2009 and applied to discharges between June 1 through September 30 of each year. The upgrades to the treatment plant were not completed by January 1, 2009. The Order establishes a compliance schedule for BSB to implement the upgrades to the WWTP. Metals levels are expected to be addressed by DEQ in the near future. Again, EPA and BSB County are expecting further improvements to the overall water quality in Silver Bow Creek, based on these important efforts.

- **West Side Soils OU.** Several interviewees expressed concerns about the minimal activity or progress on the West Side Soils OU, which generally encompasses areas surrounding and west of the BPSOU. The concerns were that contaminated material from unreclaimed mine sites located in drainages could wash into Silver Bow Creek during large storm events. Additionally, some people were concerned about human health risks to residents and recreationalists. More homes are being built in the area, some on or near mine waste materials, and more people have been observed walking or riding vehicles on the waste materials. This OU is in the forward planning stages with a remedial investigation scheduled for 2013. EPA is likely to start the process sooner, in response to public comments. This OU was not included in this five-year review.

### 2.3.4 Question 4: Do You Feel the Concerns You Express Are Heard and Addressed?

Question 4 focused on whether people felt that their concerns had been addressed. Most people indicated that their concerns were being addressed to their satisfaction. Of the 19 people that had specific comments about EPA, nine were positive, nine were negative, and one had both positive and negative experiences. A summary of responses is presented below.

- **Concerns Are Addressed (34 percent).** A little more than one third of the interviewees felt that their concerns are addressed adequately. People in this group realized that it sometimes took a while to get concerns addressed, but they were answered. One citizen noted that she had a tremendous amount of support from DEQ and EPA to address concerns for the community. Several people pointed out that community members have to live with the remedy and therefore the community involvement process was critical to the success of the project, actual or perceived. Many people noted that EPA and the other agencies seemed much more available and willing to acknowledge public input than in years past. One person from a group said that he was glad the agencies were finally talking in ways that the community can understand. A few people noted that many citizens bring up issues which cannot be addressed. For example, some issues – while good ideas – are not part of the Superfund process. One person noted that the site is so large and so complicated that the average citizen cannot say too much; that the community needed experts to analyze the situation, discuss alternatives with one another and inform the community of the most prudent way to proceed. Most people in the area were concerned about the consent decree process. There is a great deal of concern about what a consent decree is and what it means to the effected community.



- **Concerns Are Not Addressed (16 percent).** People felt that their concerns were not addressed for a variety of reasons. Some people felt that their comments were simply dismissed. Others felt that the agency representative might sincerely listen and want to help, but that decisions were already made either from higher up in the agency or from the PRP. A few people just thought the process took too much time.

- **Concerns Met with Variable Response (27 percent).** Some people felt their concerns were addressed at times and ignored at other times. A few people mentioned that the process takes time. More than one person noted that the people at EPA were dedicated, but spread very thin. Several people pointed to Silver Bow Creek as a good example of people affecting meaningful change through public participation. Many people mentioned that it was hard to know who was responsible for a particular area when EPA, ARCO, DEQ, and BSB/Anaconda Deer Lodge Counties and others are often all involved on some level.
- **Concerns Are Heard but Not Addressed (10 percent).** Ten percent of the interviewees said that their concerns were heard, but not addressed adequately. At least one interviewee pointed out, that his concerns were addressed, but not in the way he wanted. One person said there did not appear to be a mechanism to ensure that all concerns are addressed. Another person pointed out that concerns must be weighed and measured against things like cost/benefit analysis. The results vary by person - some project managers seem to listen, and some do not.
- **Neutral or Not Applicable (13 percent).** A very small portion of the interviewees either did not have an opinion or did not respond to the question because they are personally involved and are in a position to influence or change decisions. In some cases, people working on the site were not even asked this question. Several of the interviewees were fairly new to the process. They had never verbalized or submitted concerns, but were confident their concerns would be addressed now that they were going to take a more active role. Some of the community residents had simply never tried to express a complaint. One interviewee worked for the county and noted that the relationships between EPA, ARCO, DEQ, and the county made some people question the closeness of some relationships. A few people did, in fact, question these relationships in the course of the interviews.

Of the 95 people that the interview team contacted, 19 people made comments specifically about EPA. Some of the first interviews conducted were with people that were very disappointed with the work that EPA was doing and these people were emphatic about their disappointment with the EPA staff. One of the negative comments was said in a public meeting hosted by CTEC. At the end of all the interviews, nine people had negative comments and an equal number of people had positive comments specifically about EPA.

- **Negative Comments about EPA.** About 10 percent of the interviewees had negative comments about EPA. Comments included that the BPSOU RPM was too personally invested in the remedy; that EPA's decisions were driven by money; and that while the agency can do a good job according to their own standards, citizens will see the remedy as ineffective if it does not meet the needs of the community.

- **Positive Comments about EPA.** About 10 percent of the interviewees had positive comments specifically about EPA, all related to BPSOU. Comments included that EPA was very supportive and helpful, that the RPM excelled at maintaining an institutional knowledge of the site, and that one hard-working person does an incredible job of managing a huge site.

### 2.3.5 Question 5: What Are Your Expectations of the Cleanup?

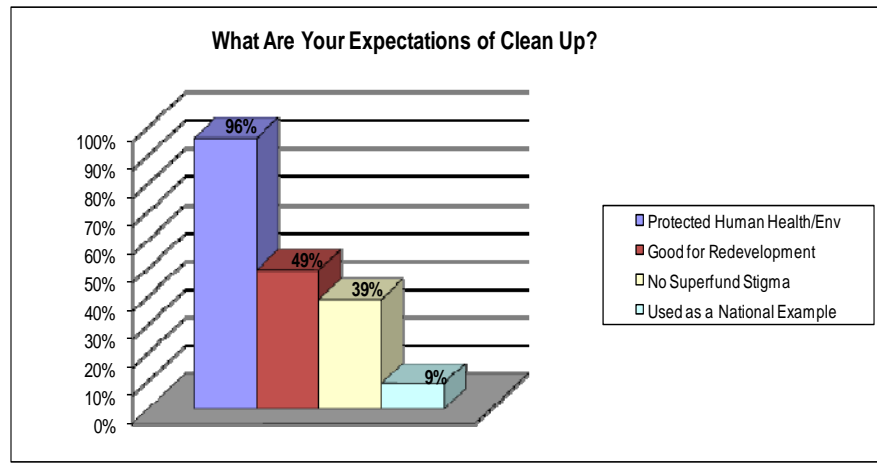
Question 5 was asked to find out what people's expectations were about the project. Almost everyone mentioned that they expected a landscape in which human health and the environment are protected. As part of that protection, many people

mentioned meeting water quality standards.

Many interviewees expressed concern that "clean" was really clean.

These concerns, primarily

about the long-term responsibility for managing WLIP and/or ICs, were addressed previously in this document. Several people mentioned that - beyond protection of human health and the environment, beyond the issues of redevelopment, beyond getting rid of the stigma of a Superfund site - they would like to be left with an environment that is aesthetically pleasing. A small percentage of the people who were interviewed were so disappointed in work to date that they said that they had no expectations of the cleanup.



Community expectations are summarized below by category. The comments will be addressed in a responsiveness summary later this year.

- **Protect Human Health and the Environment (96 percent).** Almost all of the respondents listed this as their top priority. Numerous interviewees mentioned that they hoped that "done" was really done, that projects would not have to be re-done for one reason or another. Concerns included that the Clark Fork River would migrate and pick up contaminants from the floodplain, that there are not enough trout in the Clark Fork River, that there is not enough biodiversity in the upper end of Silver Bow Creek, that children can not play in the portion of Silver Bow Creek in Butte (aka Metro Storm Drain), O&M issues might allow recontamination, and that what is acceptable to regulatory agencies is not acceptable to the public. One person noted that they are seeing more aquatic diversity and macroinvertebrates. This person pointed out that stoneflies are good bioindicators and they are being seen in Silver Bow Creek by Crackerville.

This person also said that where they had once seen macroinvertebrates, they believed that they were not seeing macroinvertebrates recently because of decomposed granitic sand coming into the streambed.

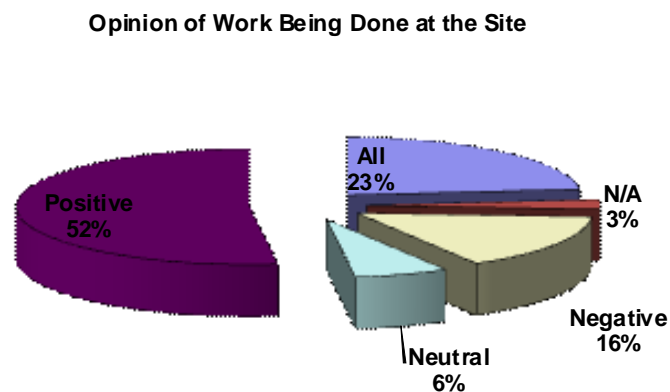
- **Redevelop the Land (49 percent).** Almost half of the respondents listed this as a priority. Many of the interviewees talked about Silver Bow Creek in Butte, the Metro Storm Drain. These people wanted to see a fishable, swimmable river. This is mentioned again here because people perceive this as something that would also help with redevelopment issues. Several people talked about how the public could be encouraged to re-use the land. Suggestions included a marathon along the Greenway, focusing on small areas for redevelopment, new rest areas, and taking advantage of the cultural resources. Several interviewees mentioned that the area does not look inviting, like a safe place to live, or even like other communities in the area. They suggested improvements such as plant diversity on the caps, encouraging businesses to develop land, promoting the great transportation system (railroad, airport, interstate) because that is good for business, and getting rid of fences. Many people said that the cost to mitigate should be the responsibility of the PRP; Taxpayers and/or developers should not be saddled with any mitigation costs. One person noted that money should be used for construction and projects, as opposed to studies and research.
- **Remove the Stigma of Being a Superfund Site (39 percent).** A little less than half of the respondents listed this as a priority. Many people mentioned that the Veterans' Home was rejected in Anaconda because of the Superfund stigma. People felt like it should have been a benefit to locate the home in an area where so much work had been done to remediate the area. Dozens of people mentioned that fencing off areas does not help to encourage growth and economic development. People said that they wanted normalcy; that they wanted outsiders to view these sites as recreational areas and for streams to look like any other Montana stream. These people want the vegetation maintained, fisheries maintained, and the area to be aesthetically pleasing. They want a liveable community. They want to be able to tell people that their community is safe. They do not want to see erosion or remnants of mine waste. One person said, *"The Montana Constitution says that all Montanans have a right to a clean and healthy environment. I want to assure my constituents that they most assuredly have a clean and healthy environment."*
- **Make The Site A "Model Site" (9 percent).** Because the Site is very large and there are many dependencies between the different OUs, it is very complicated. Much of the work being done has never been tried on this sort of a scale. Almost 10 percent of the respondents mentioned that the work done at Site could be a state or national model. Many people mentioned how important community involvement is. One person captured the community sentiments well when he said, *"These goals can be met in a way that is ultimately socially constructive. An engaged community sees that their involvement makes a difference. The agencies come out of this legitimized. We need to find ways to bring in multiple perspectives into the decision*



*making process. This is not a local EPA issue; it's a national issue."* Several people mentioned taking lessons learned from this Superfund site and applying them in other parts of the state or nation. Comments included Streamside Tailings could be a national model, there should be a State Health Fair to share resources, other places could use similar websites to distribute data/information, and restoration is a relatively new field so we should share these new engineering techniques nationally.

### 2.3.6 Question 6: Do You Have an Opinion on the Work Being Done at the Site?

More than half of the people interviewed had a positive opinion on the work being done at the site. About one sixth of the people interviewed had a negative opinion. Almost a quarter of the interviewees could report some positive and some negative experiences. Only a few of the people that the interview team talked to had no opinion, or were so involved with the site that they felt that they should not respond to the question.



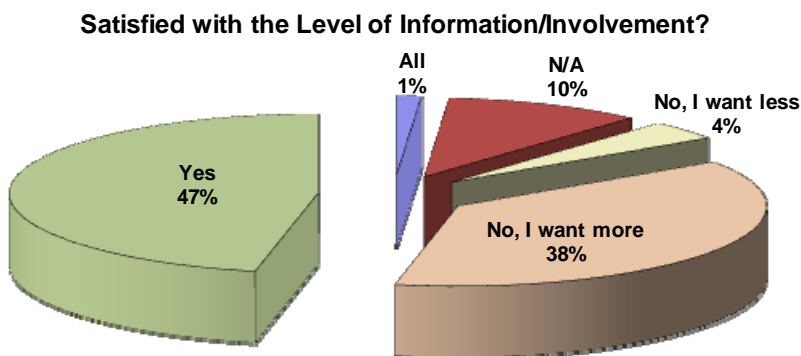
- **Positive Opinion (52 percent).** More than half of the comments about work at the site were positive. Many of the comments were site-specific and are listed under the relevant affected area. Numerous interviewees said something to the effect of, *"Any work done is good work."* Many noted that compared to 10, 15, or 20 years ago, the area is in much better shape. More than half of the interviewees mentioned how pleased they were with the work on Streamside Tailings. While the interview team listed several potential concerns to discuss with people, *"Streamside Tailings"* was not in the list, so the fact that so many people brought it up is of note. Several people mentioned that while tremendous strides had been made, even more could be done to improve the area. Suggestions included adding gardens, walkways, sharing lessons learned, and continuing to employ local workers.
- **Negative Opinion (16 percent).** A small group of interviewees had a negative opinion of work being done on the site. Most of these people were tired of the whole process and did not really say much to the interview team. Their comments were more like, *"What work?"* One comment was that too much money has been spent too slowly. This person pointed out that if it were done more quickly, the money saved could have been used on other projects. Another person believed that the cleanup just was not adequate.

- **Mixed Opinion (23 percent).** Almost a quarter of those interviewed could list some positive and some negative aspects to the work on the site. Most of these comments are incorporated into this report under the site of interest. A comment that represents this mixed opinion from a group interview is, *“DEQ/EPA have shown due diligence to try to complete the remediation to the best of their abilities. I believe the ongoing work is done to the highest standard possible. I don’t think anyone does anything that is less than the best thing possible. It is not perfect. You have to re-evaluate regularly. You’ve heard many comments tonight. You have to take those comments seriously.”*
- **Neutral or N/A Opinion (9 percent).** Only a handful of people did not have an opinion or did not want to express an opinion because they were so intimately involved in the site. Several people expressed the opinion that the agencies and ARCO need to address the social aspect of things. It was a fairly common belief that good technical answers to the problems faced at the site are not necessarily good social solutions and might have little community buy-in. Transparency was a common theme. One interviewee represented the group’s sentiment when he said, *“I don’t know that there’s a right technical answer to that question. How is Superfund working? Is the remedy effective? These are more social questions than technical questions. How do you get the various interests to come together and come to a solution that is agreeable? Then there is litigation - consent decree negotiations add a lot of burden to being able to work more openly and effectively with one another.”*

All of the comments regarding public opinion of work on the site have been noted by EPA. Other than the comment regarding transparency and community buy-in, there is nothing that EPA can address directly. This last comment will be addressed in Section 3 Recommendations and Follow up Actions.

### 2.3.7 Question 7: Are You Satisfied with the Level of Information You Are Receiving and Your Level of Involvement?

The interview team talked to such a large number of people and a wide variety of stakeholders. On one end were the agency and PRP representatives, scientists, engineers and O&M staff who were intimately familiar with the site. At the other extreme were often state and local representatives, community members, and neighbors who are not actively involved on the site, but observe the work in their community on a regular basis. All of the comments about the level of satisfaction with the information and



involvement on the site will be addressed in Section 4 Recommendations and Follow-up Actions of this report.

- **Satisfied with Information/ Involvement 47 percent).** Almost half of the respondents were satisfied with their level of involvement. A common theme was that people did not look at any information until it became relevant to them. Then they might search online, look for written material on the Site, or talk to agency representatives, PRPs, or friends and neighbors about the Site. One person pointed out that while he had access to experts, everyone in the community might not have this kind of access. He said, *"They see stuff, but most of my friends don't have a clue what is going on. Maybe now that I'm more involved, I'll tell them."*
- **Would like More Information/Involvement (38 percent).** Many said they drove by the OUs or heard about work on the site from friends and that they did not fully understand what was going on at the site. However, they would like to keep an eye on things, and keep their friends informed. Several people said the EPA website did not work for them. They suggested putting more documents on the website, making the reports easier to access, avoiding technical language, and allowing the user to drill down from the fact sheet level to the data level. People said that dozens of individuals and organizations took samples and there was not a single place to look for the data. Dozens of people mentioned *Pit Watch* as a great source of information. In one group interview, it was stated that *Pit Watch* was one of the few things that they received without actively searching for information. Many people mentioned a need for more flyers using a lay person's terms and mentioned a variety of delivery mechanisms (mailed to home, emailed, as newspaper insert, left in public places). People stressed the need to keep it simple/interesting. During a group interview and in a few individual interviews as well, people said they would like a neutral, unbiased source for information – they wanted a technical contact that was not working for an agency, the county, or a PRP. More than one person said that the stakeholders needed to do a better job of communicating with one another and that better communication was needed across both OU and agency boundaries.
- **Would like Less Information/Involvement (4 percent).** These comments are almost exclusively from county government employees who are feeling overwhelmed with the amount of information available, citizen action groups, or in some cases scientists that are well-connected to the site. These people said that it was hard to stay on top of everything. These people said that even if they could find time to read the 200-page document, they might not understand it. They relied upon experts to keep them up to speed. People again mentioned how difficult it was to understand what the State was doing, what EPA was doing, what the PRPs were doing, where different responsibilities lie. One person in a group interview suggested a *"Superfund for Dummies,"* to which everyone wholeheartedly agreed. These people emphasized the need for photos and *"cartoons."* They wanted to know what had been done, what had or had not worked, and what was planned.

- **Information/Involvement Is Not Applicable (10 percent).** These people are the data creators, the workers on the ground, the people that have come up with the solutions. Several of these people had ideas about how to most effectively communicate with the public. This comment represents the sentiments of this group, *“The information needs to be up-to-date and easily available to masses. It’s really hard to condense it all down. Basically, we should report what are you working on and what is totally resolved. It’s a large site with a long history. I met a guy this morning that was going off information from 15 years ago. I’m a geek, but the public needs help. In the environmental field, you can have 10,000 well measurements and the only thing people know about is one exceedance. Multiply this by the huge number of square miles and 15 to 25 years of work. Someone has to make sure that the most relevant data is available.”*
- **Desire for Information/Involvement Varies.** Only one person sometimes wanted more information and sometimes wanted less. While this was an isolated opinion, the interviewee had unique and very valuable comments that will be helpful in determining how EPA might best communicate with people in the future. He wanted more monthly meetings between the agencies, the PRPs, the counties and other involved or interested parties. He wanted more peer review. He reiterated what many interviewees have already stated; that is the confusion of knowing where the various OUs are and who is the lead.

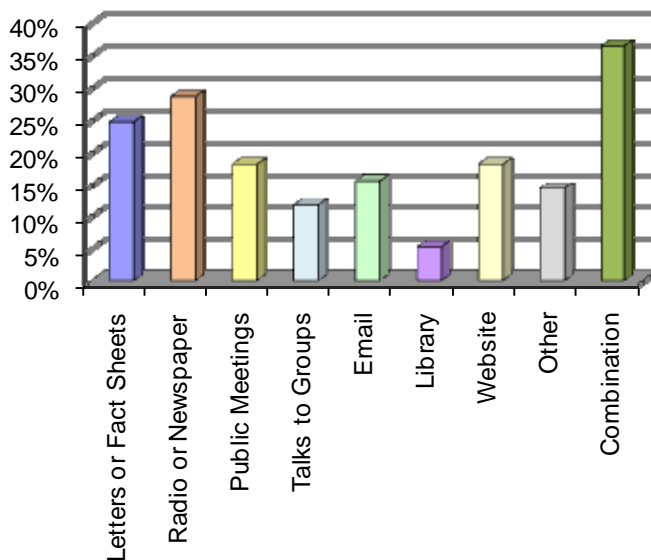
### 2.3.8 Question 8: What is the Best Way for Us to Get Information to the Community?

Again, because the Site covers such a large area, the work at the NPL site has been going on for 20 years, and many people have lived in the area for generations, the interview team opted

to take the opportunity to revisit how best to communicate with residents effected by the remedy. When asked about the best way to communicate with the community, people suggested a variety of options. Most people suggested some sort of combination of all the methods listed. The comments on the best way to provide

information on the site will be addressed in Section 3 Recommendations and Follow-up Actions of this report. However, activities of TAGs and CAGs are outside the

**What is the Best Way to Get Information about the Site?**



scope of the five-year review. The comments from interviewees are summarized by category below.

- **Letters or Fact Sheets (24 percent).** Several interviewees mentioned that the literacy rate in these communities is below average. Often the most contaminated areas are in poorer neighborhoods, and letters or fact sheets, while still necessary, should not be the primary way of communicating with folks. Almost half of the interviewees mentioned the local publication, *Pit Watch*, without being prompted. *Pit Watch* received exclusively positive comments. The thing that most people wanted was something that was easy to read and that was written in layperson's terms. Several people mentioned that *Pit Watch* is not only in a language that anyone can understand, but that children read it at school, bring it home, and often talk about it with their families. One person mentioned that flyers should not just address past jobs. Newsletters or fact sheets should address recently proposed and active jobs as well. A few people mentioned that it was important to coordinate with all parties involved on a site. Newsletters should not highlight just EPA's work, but the work of DEQ and other agencies or entities working on the site.
- **Newspaper or Radio Ads or Stories (30 percent).** These people said that newspaper or radio spots were the most effective single method for reaching the public. A few interviewees specifically mentioned the *Party Line* talk show on KBOW. The interviewees who mentioned the paper thought that people in Butte read the *Montana Standard*. They also thought the *Butte Weekly* is also seen by many people. In Anaconda, people may not buy or read a paper. Interviewees suggested a frequent newspaper column: *Superfund Update*.
- **Public Meetings (18 percent).** Of the people that responded to this question, almost all of them focused on CTEC. In addition to the people that responded to this question, many people that did not respond in this portion of the interview, mentioned CTEC during the course of conversation. Several CTEC members mentioned that funding is a problem. Most of the people that made comments about CTEC, noted that they were hopeful that things at CTEC were improving. One issue identified by several interviewees was that CTEC had a controversial history and has become too political. One interviewee suggested breaking CTEC into two groups, a political action group and an informational group. It was said that CTEC was not known to the community, and that no one attends meetings. There were no suggestions for resolving this issue. Another issue was that environmental justice needs to be addressed. Several people suggested a variety of ways to reach the disenfranchised such as speaking at hot lunch programs, asking YMCA and similar groups for advice, working and speaking in the neighborhoods. A few people mentioned that groups like the Clark Fork Coalition (CFC) and CFRTAC were not really local. These people felt that local people understood the issues better than people from outside the community.

- **Talks to Local Groups (12 percent).** Several people mentioned that a lot of the residents that live in this area were born in this area and/or have a great deal of family in the area. In many cases, there are residents that have lived in the area for generations. *“Talks to local groups”* may have ranked higher than the 12 percent that was counted, as many of the comments spilled over into the *“Other”* or *“Combination”* categories. The take home point is that a great deal of information is relayed by word of mouth. The importance of this category cannot be over-emphasized. This comment best captures the sentiments of these interviewees, *“Get a good, likable person out having face-to-face conversations with community members. Service clubs are always looking for speakers. Get a great speaker at the lunches. Get somebody that knows how to tell a few jokes, that’s really good at speaking in public. It would be the most effective means of transferring information. It’s amazing how many people in Butte grew up in Butte. They know one another, they trust one another. You need someone good at reaching out. It’s a gift. The news would travel.”*
- **Email (16 percent).** A relatively small group said that email was one of the best ways to communicate. There are several organizations and individuals who have extensive email lists to keep citizens apprised of work being done and/or concerns with the site. One interviewee mentioned that some of the citizen-generated email may be more opinion than fact, but residents that do not know any better may believe that they are reading only facts. Email would be a fine way to stay in touch, but should not be the only way. This comment captures the sentiments of the group, *“If it’s electronic, people can share it. For example on the Big Hole Diversion Dam, we just received our 3<sup>rd</sup> newsletter electronically. We’ve been able to nip the rumor mill in bud. This blog said we were going to tear a historic building down but that just wasn’t true.”*
- **Information Repository (5 percent).** The repository is the least used resource for getting information. Many people mentioned that it was an old way of communicating and there are better ways to stay in touch with today’s technology. More importantly, documents are not guaranteed to be in the library or up-to-date. One interviewee suggested checklists to ensure that repositories have and are loaning the most up-to-date information on a site with a 20-year history. A few people mentioned their frustration with documents *“walking off.”*
- **Website (18 percent).** Many people like the idea of a website, but several interviewees mentioned that EPA’s current website is very cumbersome. In fact, anyone that mentioned EPA’s website did not have positive things to say about it. There were many good ideas for improving the website and/or starting a new *“repository”* website. Some of these comments are addressed in other areas of this report as well. They include having one spot to find all data, maintaining current data, and a more intuitive website that started with basics and allowed people to drill down to increasingly complex information.
- **Other Ideas (14 percent).** Many people suggested different and innovative ways to communicate better with the public. Comments included: mimic successful media

transfer (such as elections), hire a facilitator to bring stakeholders together and identify communication barriers, host more events like *“Rally Around the Creek,”* put something in the utility bill, go door-to-door and talk to people, put up a billboard with maps and infographics at the entrance to town (e.g., information about the Greenway), tie into existing phone apps (e.g., point cell phone at Berkeley Pit and get Wikipedia page on the pit), engage children in fun activities like tree planting or collecting bugs, develop PSAs or You-Tube messages, host small focus groups, put before-and-after signs up along the trails, create a community mural, and consider smart growth solutions in the reclamation process. One person suggested exploring outside-the-box ideas to see if they had validity. For example, ask a college classroom to explore a topic, host a *“back of the napkin”* event, or have an internet event similar to Governor Brian Schweitzer’s Montana Accountability Partnership, where the governor asked citizens to send in cost saving ideas and had a prize for the best ideas. Another person said, *“Eyes instantly glaze over when you say Superfund. People don’t have the realization that they could have any influence. You have to allocate enough resources for public involvement. You always get back more than you put into it. You have to change the culture. So people don’t see Superfund as such a negative.”*

- **Other General Comments.** Several people had some good comments about communication in general. Comments included more transparency in community discussions, the need for a good reference librarian that can organize both hardcopy and online information, and people really honor their cultural history (headframes, etc) but may not fully understand the level of contamination at the site. A few suggested more opportunities to visit with people on their time (outside of 8:00 am to 5:00 pm). One citizen said, *“If you can’t cover it in five points or less, I don’t want to hear it.”* Some of the transparency comments were related to the consent decree. Again, it was obvious from many of the comments received from community members that there was widespread misunderstanding of the consent decree and the process of negotiating a consent decree.
- **Combination.** By far, the best way to communicate with people was via a combination of all the communication tools listed above. More than one third of the respondents mentioned using a combination of everything, even though the interview team did not always read the list of ways to get information about the site. Several people noted that a certain segment of the population is going to be apathetic, involved, or critical no matter what EPA does.

### 2.3.9 Question 9: Is There Anything Else You Would Like to Add?

Almost everyone had a few comments at the end of the interview that were not covered under previous questions. These are categorized and described below. All of these comments have been noted by EPA. Some are outside the scope of the five-year review.

- **Concerns about Human Health and Cancer.** Most community members were concerned about the long-term health effects of living in a contaminated area. Cancer, specifically, was mentioned in more than one quarter of the interviews, though there was no shortage of general health concerns. Several interviewees mentioned that friends and family members had died of cancer at a young age. People in Rocker believe there is a higher rate of stomach cancer. These community members wanted to see more studies. A few people mentioned the pig study (in vitro bioavailability of lead from soils). These people also wanted a comprehensive study on the health effects of living in a contaminated area. CTEC wanted to know if the BSB Health Department could expand their testing to include hair samples. One interviewee is looking at mortality rates in Butte. She says that because Butte is a very sedentary community and many people are multi-generational, she can track birth defects and also death certificates.
- **Five-year review Covering the Whole Basin.** Several interviewees mentioned that OU boundary lines made no sense to regular citizens and that the work done on one OU can affect the work done on another OU or NPL Site (i.e., Montana Pole). Almost everyone who mentioned OU boundaries at all, noted that the effects of contamination did not stop at the OU boundary. Several people mentioned that resources, data and lessons learned should be more effectively shared across OU boundaries. A few people mentioned that the synergistic effects of the contaminants should be studied more. Several people mentioned that there should be one five-year review that covers the entire basin from Butte to Missoula.
- **Duration of Clean-up Efforts.** People that mentioned how long it was taking to clean up the site fell on both sides of the fence. Some thought that clean-up was taking too long. Others felt that the time was reasonable after more than one hundred years of mining. The people that were concerned with the length of clean-up mentioned that children need to be considered when making these decisions. A few people were concerned that ARCO would not be around for the duration of clean-up. One person noted that, *"ARCO wants out fast and inexpensively, and the community relies upon the agencies to protect them."* Other people mentioned that the damages took place throughout the 100 years of mining and clean-up wasn't going to happen overnight. One of these people said, *"It's easy to complain, but it really was this huge environmental catastrophe."*
- **Order of Clean-up Efforts.** The issue of recontamination came up in a majority of the interviews. For the purposes of this report, examples related to specific OUs were listed under those OUs. Most of the comments under this section had to do with potential environmental catastrophe (landslides, earthquakes, floods, etc). These people felt that root of the problem was in Butte and if there were a catastrophe, the money and time spent downstream would be wasted. The money and time spent on Milltown Dam was most often cited by these interviewees.
- **Inadequate Data.** There are other areas of this report that address inconsistencies or inadequacies in data collection. Two general comments from CTEC's public



meetings and written comment period as part of the five-year review process: *Does the EPA consider outside data, such as research done on a graduate thesis or research not funded by the EPA (e.g., Missouri Piglet research project)? and Include other studies not just EPA Superfund data. Use a holistic approach.*

- **Educate Children.** Several people mentioned the importance of working with K12 age children and comments can be seen throughout the interview results. A few interviewees mentioned the CFWEP. CFWEP has taken hundreds of school children out in the field to study and sample streams. Many interviewees mentioned that these students are the future stewards of the land, and when they understand or buy into the process, they are ultimately better stewards. Teachers and students have found site tours to be very helpful.
- **Butte Not Treated Fairly.** Several of the people interviewed thought that other areas, including Missoula, received more funding and better treatment. The most common comparison to Butte was Milltown. People that believed Butte was treated unfairly, felt that the community had a higher tolerance level, and did not receive what other communities might have demanded. These people felt that the majority of clean-up dollars should be spent in Butte. A few people said that decisions were not made locally – where the affects of the pollution are. A few people mentioned Butte’s contaminated groundwater. They said that without NRD funding, a small community like Butte could never grow. They were concerned that if there were an environmental catastrophe, Butte would be challenged to have a reliable, clean source of water. One person mentioned that people in mining communities have a misconception of risk. For example, people will plant a garden or let their kids play in a mine waste dump, but this would be unacceptable in a non-mining community.
- **Other Comments.** While these comments may not be specifically addressed by EPA, they are important concerns and are recorded here for consideration by all parties. A few interviewees thought that BSB should get clean-up and/or restoration dollars. This camp thought that BSB Public Works Department was the “boots on the ground” that talked to community members regularly, was the first to get called in the event of something like a burst pipe, and had a vested interest. A few interviewees thought that local government should never get clean-up and/or restoration dollars. This camp believed that inappropriate use of funds was much more limited in EPA/DEQ because there is more oversight in state and national programs. This camp believed that non-locals were still passionately engaged as citizens of Montana. This camp also believed that because BSB was a PRP, it would be difficult to wear two hats and look out for reclamation and remediation.
- **Thank You.** Almost everyone interviewed thanked the team for taking the time to speak with them. Even the people that did not have a positive comment during the interview were thankful for the opportunity to talk. Many people mentioned

that they were grateful that EPA appeared more open to input today than historically.

### **2.3.10 Question 10: Is There Anyone Else We Should Interview?**

When asked if there was anyone else that EPA should contact, almost everybody had at least one suggestion for additional interviewees. The interview team discussed all recommendations and made a concerted effort to talk to people working on the sites as well as citizens affected by the remedy. An attempt was made to contact most of the people that were recommended. If someone was recommended and not interviewed, it was for one of the following reasons: Contacted and the person opted not to participate; Called several times without success; Recommended person was unavailable; or Organization was already well-represented. These names are provided in alphabetical order in Attachment D.

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## Section 3

# Recommendations and Follow-Up Actions

This section provides recommendations, primarily focusing on the identification of communication goals and steps to achieve those goals. The substantive technical issues identified in the community interviews will either be addressed in the five-year summary report or in the responsiveness summaries.

### 3.1 Goals for Improving Communication

Based on the results of the community interviews, it appears that EPA is meeting its statutory obligations for communication at the site. People report that they get information from attending public meetings; reading newsletters; using the EPA (or another) website; contacting someone from the agency with questions; using one of the several information repositories; being a member of or attending the meetings of the several community involvement groups spread throughout the basin; or by participating in the occasional tour.

Although a good effort is being made to communicate with the public, there is room for improvement. Improving communication with the public is especially important given the large and complex site and the duration of the clean-up efforts. To focus the suggested activities, there are three communication goals for the site:

- Meet the community needs for information
- Communicate effectively across OU and agency boundaries
- Share resources and lessons learned

These goals address areas where there may be major opportunities for progress. The goals are attainable, but it will require the long-term commitment of EPA and the other stakeholders to make them wholly successful.

#### 3.1.1 Meet the Community Needs for Information

The most important communication goal at the site is to meet the stakeholders' needs for interaction and communication. Keeping everyone informed and involved will help limit the spread of misinformation or rumors and suspicion about what the EPA may or may not be doing. It is clear that the EPA has made significant efforts in engaging the stakeholders in the past and continues to do so. However, there is always room for improvement. Feedback from the local community indicates that there are areas where small efforts could potentially result in significant gains.

Although half of the people interviewed said they were happy with the level of information they were receiving, it was clear from the overall comments that many stakeholders needed more information. There were many questions asked or statements made repeatedly that indicated the EPA could benefit from adding additional information tools to its communication program. The newsletter that the

EPA currently sends out was appreciated; however, there are a number of ways that the newsletter could be improved.

According to the U.S. Census Bureau, 12 percent of Silver Bow County and 13 percent of Deer Lodge County residents, age 18 to 64, did not have a high school diploma as of the last census. As one interviewee said, *"Nobody really appreciates the level of illiteracy in these communities. 15-20 percent of the people in this community are functional illiterates. That is to say that even if they can read, they don't."* This creates a communication challenge, to be sure, but there a number of ways that this hurdle might be addressed.

Perhaps one of the keys is something that multiple interviewees mentioned. When people were asked where they got information about the site, several people said something to the effect of, *"Friends. That's the way Butte works. Everyone just kind of talks."* The message translates easily to Anaconda, and in fact, more than one Anaconda interviewee mentioned that EPA and the other agencies needed to talk more with the community.

Almost 70 percent of the respondents listed *"Self"* as a primary source of information on the site. Some of these people were scientists or other experts working in the field on the site, but many people who chose *"Self"* as a source of information were residents. These residents may or may not have had any technical background. They gained first-hand knowledge of the site by walking through their neighborhoods and visually observing the work there, often sharing the results of their observations with their friends. Clearly, it would benefit everyone to have more information about work on the sites at their fingertips.

Certainly, one of the largest communication challenges is the duration of the work. Some people have worked on the site for 20 years. Many of the residents not directly working on the site or in a public involvement group studying the site, simply do not pay much attention to the work anymore. At the same time, new residents are coming in to the community or moving back after a long hiatus and have a very rudimentary understanding of the work. To effectively address any topics of interest, the EPA and the other agencies involved will need to employ several delivery methods to try to reach different audiences with varying levels of complexity. For example, if the EPA wanted to educate people about a particular issue, it might involve other agencies and or community interest groups and enlist some or all of the techniques listed in Table 3-1 within a relatively short timeframe.

**Table 3-1**  
**Suggestions for Improving Communication based on Community Feedback**

Step	Status	Suggested Improvement	Cost	Priority
Ask and answer questions	EPA does a good job of answering questions. EPA does not actively solicit questions.	<ul style="list-style-type: none"> <li>Encourage field team to query residents and pass questions on</li> </ul>	<ul style="list-style-type: none"> <li>Low</li> </ul>	<ul style="list-style-type: none"> <li>High</li> </ul>
Continue having public meetings	EPA currently participates in some public meetings.	<ul style="list-style-type: none"> <li>Make more presentations to groups with constituents</li> <li>Query people who come to tables about their concerns or issues and record on flip chart.</li> <li>Advertise in the newsletter, local newspaper, email, and/or postcards</li> </ul>	<ul style="list-style-type: none"> <li>Low</li> <li>Low</li> <li>Med</li> </ul>	<ul style="list-style-type: none"> <li>High</li> <li>High</li> <li>High</li> </ul>
Improve existing outreach materials	"Pit Watch" is well received. EPA "uses too much jargon." EPA website is cumbersome. Reports "walk out" of the repositories.	<ul style="list-style-type: none"> <li>Create "Watch" newsletters for other OUs.</li> <li>Avoid using technical jargon.</li> <li>Use e-mail and regular mail to distribute newsletters.</li> <li>Develop a better website.</li> <li>Make sure repositories have the latest information.</li> </ul>	<ul style="list-style-type: none"> <li>Low</li> <li>Low</li> <li>Low</li> <li>High</li> <li>Med</li> </ul>	<ul style="list-style-type: none"> <li>High</li> <li>High</li> <li>Med</li> <li>High</li> <li>Low</li> </ul>
Reach out to new groups	EPA has recently tried a presentation to a local group with success.	<ul style="list-style-type: none"> <li>Develop relationships with local schools or youth groups.</li> <li>Use EPA personnel to staff a booth at a local event (e.g., a fair).</li> <li>Create a PSA/You Tube clip</li> <li>Make a presentation to a local club or service organization.</li> </ul>	<ul style="list-style-type: none"> <li>Med</li> <li>Med</li> <li>Med</li> <li>Low</li> </ul>	<ul style="list-style-type: none"> <li>High</li> <li>Med</li> <li>High</li> <li>Med</li> </ul>
Develop additional outreach tools	EPA relies primarily on newsletters and meetings.	<ul style="list-style-type: none"> <li>Develop handouts to explain issues of concern.</li> <li>Have a "Superfund Update" box in the newspaper</li> <li>Run a series of Q&amp;A advertisements.</li> <li>Create before/after signs for the Greenway</li> <li>Put information in the water bill/power bill</li> <li>Use billboards to promote work</li> <li>Start an "Adopt a Cap" program.</li> </ul>	<ul style="list-style-type: none"> <li>Med</li> <li>Low</li> <li>Low</li> <li>Med</li> <li>Low</li> <li>Med</li> <li>Low</li> </ul>	<ul style="list-style-type: none"> <li>Med</li> <li>Med</li> <li>Med</li> <li>High</li> <li>High</li> <li>Med</li> <li>High</li> </ul>

The idea is to communicate with as many people as possible at as close to the same time as possible about the same subject in as many ways as possible, so that when people are talking in the community, they have a common knowledge-base and/or enough access to the information to have a good dialogue. There are many different types of learners. While one person may pick up on the information best by studying a map or a graphic, another person may absorb the information more readily by reading, and a third may get the most out of a presentation. If one of the primary methods of communication at the site is "word of mouth," a quarterly communiqué to the residents using as many means as possible is a good way to start community conversations.

This additional outreach does not necessarily have to require a significantly larger amount of time or money, as the various groups already do much of what is outlined above, including announcing meetings in the newsletters, issuing press releases,

providing open house mingling opportunities, and following up on questions asked. Increasing the number and quality of handouts is perhaps the biggest added expenditure, but these handouts can be created over a period of time and should not take more than a few days per handout to create. Increasing exposure by advertising the meetings and using press releases to get necessary information to the public requires minimal time and cost. Giving a similar presentation to several groups does not take many additional resources. If appropriate, asking people who visit each table what their concerns are and writing them on a flip chart is a free and effective way to stimulate conversation and capture concerns.

For people who do not attend meetings, outreach activities to educate them on an issue could include: mailing a map, letter, and/or handout; speaking to local groups; or talking face-to-face during site visits. These methods are relatively inexpensive and can be implemented slowly. The agencies and community groups should not overlook the opportunities for building goodwill and educating future citizens by engaging local youth. Not only is involving a younger audience a positive step for community involvement, but the exercise of writing about the site on a level that children can understand is useful in identifying the essential basics of the site. This is useful in communicating with adults who may not have the time or interest in the site to read detailed information, but who still would like to keep up to date on what is happening.

All outreach techniques need to be implemented repeatedly over an extended period of time using a variety of techniques. Messages need to be stable, easy to understand, and must be repeated again and again. It is human nature to mistakenly believe that explaining something once, or even twice, is sufficient to ensure understanding. In reality, people have many distractions and time demands. As a result, they may not pay attention until they perceive the issue is relevant to them. This is why communication tools such as brochures, handouts, and maps are so useful. When someone finally comes around to wanting to learn more about the site or a particular issue, there is an information piece to put in their hand. Finally, the success of outreach techniques needs to be measured regularly by soliciting feedback as to whether or not the effort was successful.

### **3.1.2 Communicate Effectively across OU and Agency Boundaries**

The second most important goal in improving communication at the site is to increase the level of communication across OU and agency boundaries. Because the Site is so large, there are any number of PRPs, agencies with multiple project officers and project managers, consultants, and other scientists or professionals that may be working or have an interest in the affected area.

At a minimum, there should be a quarterly meeting for each OU with the key players from the various agencies, consulting firms, PRPs and other interested parties. If a regular date were set, such as *"the first Monday of the quarter,"* a person would not have to have attended the previous meeting to know when the next meeting is.

Standing agenda items would be reports from each of the entities on ongoing or planned work in the OU. Notes should be taken to maintain continuity. If an issue may affect another OU, it should be an action item to take forward to the affected party or parties.

It was clear from the community interviews that the bulk of the public, even many people in positions of authority, did not understand OU boundaries. One interviewee fairly early on suggested a “*Basin-wide five-year review*” in the future, not only because of the lack of understanding of OU boundaries, but because the activities on one OU can affect the work on another OU or NPL Site. When the interview team asked other interviewees what they thought of a basin-wide review, there was broad support.

### 3.1.3 Share Resources and Lessons Learned

Several interviewees said something to the effect of “The Site could be a model site.” One of the results of the extensive interviews was a rehash of some of the incredible lessons learned over the last 20 years. One thing that stood out in particular was the lead abatement program in Butte. The fact that in the early 1990s, many Butte area children had elevated blood lead levels (see discussion in Volume 6 on the BPSOU) and now there are no children with elevated blood lead speaks to the program’s success. A similar program is needed in Anaconda and is, or will be needed, by other health departments across the state, and even nationally. Many of the cities and/or counties effected are small and do not have the resources to develop materials. Even larger counties that may have more resources could be wasting time and money to “*re-invent the wheel*,” as one interviewee so eloquently put it.

As a result of the five-year review community interviews, an annual statewide health fair is recommended. There are many resources that could be shared by local health departments, including, but not limited to: public outreach, best practices, forms for tracking information, informational packets, educational materials, and tools for communicating with the public (e.g., such as mapping websites). There are undoubtedly other areas in which resources could be shared, knowledge gained, and overall costs reduced by sharing information and resources. There is clearly a current need for an annual statewide health fair, and lessons learned here may apply to similar venues in the future.

## 3.2 Steps for Attaining Goals

There are a variety of general steps for improving communication related to the site. Many of these steps are currently being taken to one degree or another, but could benefit from some additional improvements. These steps are summarized in Table 3-2 and discussed below. For each step, details are provided for improvements that can be made within the framework of existing outreach programs. Many improvements are very simple and require little extra time or effort, just small changes in behavior or thinking. Others require more effort, but can have a significant payoff (e.g., development of new outreach tools). Finally, some improvements (e.g., reaching out to new groups) are extras that could build valuable relationships, but require more of



a commitment. All of the steps have been ranked on the basis of ease of implementation and priority.

**Table 3-2**  
**Examples of Public Meeting Topics based on Community Feedback**

<b>Subject</b>	<b>Presenter</b>	<b>Overview</b>
<b>What is a Consent Decree ?</b>	EPA	Address issues that are of concern to the community such as why is it taking so long, why is it secret, why does the community not have input, when is it expected to be implemented.
<b>What is the Lead Abatement Program?</b>	BSB Health Department.	How did it start, what has been done, how has it changed, how are people contacted, what areas have been remediated, what is the success rate.
<b>What has happened at Silver Bow Creek?</b>	DEQ	When did the project start, when did the project end, what was learned from the project, how has the flora and fauna changed, what is being done to protect Silver Bow Creek from recontamination?
<b>Why wasn't the Butte Hill cleaned up before any other OU?</b>	EPA	How does the Superfund process work?
<b>What is going on at [Every OU]?</b>	lead agency	When did the project start, what is the timeframe, what is being done currently, what is planned, how is it being monitored, have any errors in the system been discovered and/or addressed.
<b>What is CTEC [other community involvement groups]?</b>	CTEC	What does CTEC do, what resources are available (website, repository, newsletter, etc), when is CTEC open, what events are coming up.
<b>"What is the NRD money?"</b>	NRD	How much money has been awarded, what is the appropriate use of that money, what is inappropriate use of that money, how long does the community have to spend it, who is on the NRD Restoration Council.
<b>What happened at Milltown Dam?</b>	EPA	Why was Milltown cleaned up before other OUs, how much did it cost, where was contaminated material taken, how much contaminated material was removed, what is in place to avoid recontamination.
<b>What is Butte Mine Flooding?</b>	DEQ/MBMG	What is the history, what happens, what systems are in place to ensure contamination is contained.
<b>What is the LAO Treatment Plant?</b>	BSB	How will it work, how many gallons can it treat, how will long-term O&M needs be addressed, what is in place to prevent recontamination downstream.
<b>Who Manages What?</b>	CTEC	What is EPA responsible for, what is DEQ responsible for, what is BSB responsible for, who is the lead, who is the PM or project officer, where are the OUs, what OUs are included in this site.

### **3.2.1 Ask and Answer Questions**

EPA remains committed to providing answers in a timely fashion and regularly answers questions from the community. In addition to answering questions asked, EPA and its contractors should make a point of asking people if they have questions. This outreach can be done during sampling events, at meetings, and in all interactions with the public. People often have questions, but are afraid to ask. As a result, they may assume the worst. They then communicate those fears to their neighbors who have their own fears, and as a result, the concern builds. It is much better to proactively ask questions and to address them, where needed, with the appropriate information. During the course of these interviews, the bulk of the interviewees commented that they appreciated the fact that the EPA was taking an interest in what the community thought. Asking questions is an excellent way to find out what types of information the community wants and how they would like to receive it.

### **3.2.2 Have Focused Public Meetings to Educate the Community**

The interview team listened to several groups with constituents in the Site. It was immediately apparent that these group members were well-connected in the community, talked to constituents almost daily, and did not always have a good understanding of the work being done at the site. Besides educating the individual members of these groups, it's important that these people aren't blindsided when their constituents bring up a contentious issue. Group members will know if issues exist, what attempts are being made to address those issues and who to call for more information. The group members also have an opportunity to get feedback from their constituents and route those concerns to the appropriate party. Presentations with opportunities for questions from a variety of agencies (or other entities) should be made to these groups at least quarterly. These presentations should dovetail with presentations to other groups, fact sheets, Q&A ads in the paper, radio shows, websites, PSAs and/or repository updates if appropriate as mentioned earlier. Topics for such meeting along with suggestions on who should host the meeting are listed in Table 3-3. Tips for improving attendance and productiveness are provided in Table 3-4.

**Table 3-3**

**Suggestions for Improving Attendance and Productivity at Meetings**

<b>When</b>	<b>What</b>
<b>Before</b>	Target different segments of the population, such as: <ul style="list-style-type: none"> <li>■ Groups with constituents such as the Council of Commissioners or the Butte Natural Resource Damage Restoration Council;</li> <li>■ Low income populations, reached via avenues like as a senior citizens lunch, public housing authority, Indian alliance or other similar.</li> <li>■ Local groups such as Rotary, Elks Club, etc.</li> <li>■ Community interest groups such as CTEC, Arrowhead, CFRTAC, etc.</li> <li>■ Students, whether through K-12 classrooms or college-level classes with a specific interest.</li> </ul>
	Announce any public meetings in the EPA newsletter, provide a newspaper ad, mail a postcard
	Send an email and/or issue a press release at least two weeks before the event(s).
	Run a Q&A ad on the topic the week before the meeting and issue a press release announcing the meeting and the topic of discussion.
	Participate in radio talk shows such as "Party Line" on KBOW radio to discuss the topic.
<b>During</b>	Provide a brief presentation and allow time for questions at a broad variety of places
	Give people the opportunity to mingle (open house style) at various tables where they can talk to staff, pick up a variety of handouts, look at posted maps, pick up any kid-related materials, and post questions on flip charts.
	Ask (as well as answer) questions and take notes as others may have similar questions.
<b>After</b>	Send a follow-up fact sheet on the topic out to the mailing list, as well as making the fact sheet available via newspaper insert and in a variety of public places.
	Make a PSA or You Tube clip, if appropriate.
	Update the repositories if applicable.
	Update EPA and all related websites.
	Follow up after the meeting on questions that were asked (post them in the EPA newsletter and on the website, call, or write a letter).

**Table 3-4**  
**Example Messages for Communicating at the Site**

Message	Questions to be Addressed	Purpose
<b>Examples of general messages for everyone</b>		
The EPA is meeting its responsibilities.	<ul style="list-style-type: none"> <li>What is the EPA mandated by the ROD to do at the site?</li> <li>Who can people contact for issues beyond the control of the EPA?</li> </ul>	Focuses people on issues that the EPA has the power to change. Otherwise, the assumption is that the EPA can address every problem (e.g., beautifying the area for economic development).
Environmental issues are well understood.	<ul style="list-style-type: none"> <li>What are the characteristics of [given OU]?</li> <li>What is being done to remediate it?</li> <li>How does the scientific process work?</li> </ul>	Informs and focuses the audience.
The EPA is committed to communicating and values public input.	<ul style="list-style-type: none"> <li>What is the EPA doing to ensure good communication (tools, actions, etc.)?</li> <li>What steps will be taken as a result of the five-year review?</li> <li>Who is the point person for the EPA on communication?</li> </ul>	Actively involve the public and listen to public input.
The EPA is committed to high-quality work.	<ul style="list-style-type: none"> <li>What is done to ensure quality (5-year review, annual remedy performance report, biannual model updates)?</li> <li>What is done to ensure that lessons are learned from any missteps?</li> <li>What is done to ensure the site and risks are well understood?</li> <li>What impact will OUs have on one another?</li> </ul>	Ensure competent solutions and make sure all issues or potential issues are addressed at the site.
Human health and the environment are protected.	<ul style="list-style-type: none"> <li>What are the primary contaminants, exposure pathways, health impacts, and significant concentrations?</li> <li>What would be done if significant concentrations were found?</li> <li>What is being done to ensure that the area is safe?</li> </ul>	Educates the public on potential concerns. Ensures the community that the EPA will alert them to any health issues.
The EPA is responsive to stakeholders.	<ul style="list-style-type: none"> <li>What is the EPA doing to provide information requested on a timely basis?</li> <li>What types of information are provided and when?</li> <li>How are questions tracked to ensure follow-up?</li> </ul>	Communicate information and provide it to the public to the best of its ability and in the most timely manner possible.
<b>Examples of messages specific to a limited audience or a single event</b>		
The EPA cares about specific environmental concerns.	<ul style="list-style-type: none"> <li>What is the EPA doing to address issues on specific properties (e.g., fish kills in ponds, safety of eating wildlife or domestic animals, etc.)?</li> </ul>	Answers concerns of specific property owners and builds trust in the community.
Residents are informed about all aspects of sampling events.	<ul style="list-style-type: none"> <li>When will the next sampling event occur?</li> <li>When are analytical results provided?</li> <li>What do the sample results mean?</li> </ul>	Provides property owners assurance about their property.
Site meetings are for everyone.	<ul style="list-style-type: none"> <li>When and where will the next meetings be held?</li> <li>What's the agenda?</li> <li>Are there any special issues?</li> </ul>	Raises awareness and helps to engage the public.

Presentations to other groups should happen in a similar timeframe, so – to the extent possible – many people in town are talking about the same thing. Often groups that have constituents have regular meetings and agendas do not allow the informal opportunities that other groups may have. For example, the presenter might want to give the same or a similar presentation to Rotary or Elks Club, CTEC (or other community interest groups), and/or students. When it is possible, allow time after the presentation for members of the public to circulate among tables and give people something to talk about when they visit the tables. Asking people who visit each table what their concerns are and writing them on a flip chart is a good way to stimulate conversation and to capture concerns, and it is also free. There may be handouts, magnets, fact sheets or flyers at the tables as well.

The EPA should advertise the meetings beyond including a note in the newsletters. To increase attendance at a relatively low cost, the EPA should continue placing meeting ads and should consider sending out a reminder post card to the mailing list and/or send out an e-mail reminder. If the meetings are held on a regular basis, such reminders might make it easier for people to plan to attend. Any postcards or ads should announce the topic of the meeting, which might attract community members to a meeting they might otherwise not attend. Because a press release is an excellent way to get widespread coverage, the EPA should issue those releases in advance of meetings. EPA should also consider a brief interview with the local newspaper and/or radio on a particular topic. The meeting announcement could be distributed in the form of a special newsletter that highlights *“Here’s what we heard you saying and here’s what we did to address it,”* so people know that their input was valued and acted upon.

### 3.2.3 Improve Existing Outreach Materials

Most people said they approved of the information EPA was sending out. Suggestions for improving existing materials focused on simple changes. To be effective, EPA should be able to tailor its findings for different audiences. Findings should be presented in an extremely simple manner (with figures and drawings) for people who have little experience with environmental work and a fairly low need or interest level. Some suggestions for outreach materials are:

- **Newsletters/Fact Sheets.** Almost half the people interviewed mentioned Pit Watch by name and people said it was popular and well-distributed in the schools, and that their children came home and talked to them about the newsletter. This might be one of the most economical ways to communicate at a site where many of the community members are tired and may not engage in other forms of public outreach. Many people said that newsletters with too much jargon or information are not read. Even words that agency people might think are broadly known such as “ROD” are unacceptable to many members of the community. Most people do not want very detailed information in a newsletter. People suggested that EPA focus on three to five important points about the site. Include a *“By the Numbers”* section which can quickly highlight some facts (how much dirt was removed, how much dirt was brought in, how many yards were tested, etc). If possible, include a

human interest story. People want things that are “interesting” to read and to understand how the work affects them as an individual. Include before and after photos and maps of the site. Include a small text box with “Upcoming Activities.” The newsletters should come out regularly. People suggested that EPA should give people the option of receiving the newsletters by e-mail, as well as in hard copy. Hard copies can be distributed in public places around the community and delivered via newspaper inserts.

- **Website.** The EPA website should be updated regularly. One suggestion was to create a website in which the user could “drill down.” Start at the “Superfund for Dummies” level and allow the user to go to more and more detailed information. Several people requested a single source for accessing all data. Many entities collect data, and with proper use statements, those data could be compiled on one website. It is important to ensure that the most up-to-date information is on the website. More than one interviewee reported finding very outdated information. The website should have a contact section where someone could submit a tip, question, or complaint - similar to the State of Montana’s idea website, a “suggestion box” specifically for creative remediation ideas.
- **Library repositories.** The repositories were the least mentioned way of getting information, but they are still used by some people and there is still a need for them. There are a number of limitations to using the repositories: limited hours, reports that “walk off,” and out-of-date information.
- **Tours.** Only a few people mentioned that they had been on a site tour, but the people that had taken tours raved about the experience. While it can be a challenge to get people “excited” about work that has been going on for 20 years, there are a few momentous events that can inspire people to participate, especially when making a concerted effort to educate as many people as possible in the community about a particular topic, as described above. Currently, for example, a tour of Silver Bow Creek with agency leads is likely to get people involved because many people in the community are talking about it at this time. Tours are another opportunity for the face-to-face contact with community members. The tours could also be an opportunity to involve a local science teacher and some students.

### 3.2.4 Reach Out to New Groups

Although all of the residents have an interest in the site, most citizens have too many other obligations to be able to attend all of the meetings or read all of the information they have received. Several people mentioned that they stay informed, sometimes exclusively, by talking with their friends and neighbors. Because of this, EPA should consider making an effort to have a stronger presence in the community. Significant benefits can be achieved by reaching out to groups of adults and youngsters who would not otherwise have participated in site events. Methods of reaching out to these people are described below:

- **Have a Booth at an Annual Event.** *“Rally at the Creek”* was a very successful community event. EPA should consider having a presence (e.g., a booth with handouts) at local events, such as the fairs or rodeos. Such events are a great place to hand out brochures, shake hands, and talk about the site with people who would not normally attend a public meeting. Attending these events presents an opportunity for EPA to develop relationships and remain a recognizable, friendly face to more people in the community, which makes it more likely that people will come to EPA with questions or concerns in the future. Most of the materials that would be needed for these types of events would be those that have already been prepared.
- **Present a Talk at Local Clubs and Service Organizations.** EPA could give presentations to community groups in the area (e.g., Rotary, Elks, garden clubs, or homeowner groups). One of the concerns that several interviewees brought forward were environmental justice issues. One interviewee suggested, *“How do we better reach these disadvantaged individuals? It’s easy to criticize, but very hard to accomplish. I think you could try the Senior Citizens Belmont Hot Lunch, Public Housing Authority – information on doors or hold a meeting within the housing authority, Indian Alliance – Ask them how do we reach them?”* To address these concerns, EPA might also work with organizations such as YMCA, WIC, and church groups. These presentations are a good way of identifying middle-ground people who may not already be involved in the process. These folks can help explain the facts to their neighbors. The materials that would be needed for these events would be those that have already been prepared for meetings or other visits.
- **Develop a Relationship with a School and/or Youth Group.** Because this site is likely to be active for the foreseeable future, EPA should consider involving younger people in the process. By getting kids to be aware of the site, EPA would be educating the entire family. Local citizens have a strong, generational connection to their property. Raising awareness in kids can not only help move information to the family, but it can be beneficial in getting kids to take ownership in the area. A child that helped to plant trees in 4<sup>th</sup> grade isn’t as likely to tear up the area on his ATV as a teenager. EPA could consider making an annual presentation at a school or group such as the FFA or 4-H. Team members could take a science class on a field trip to see how sampling is done. Kids could take turns wearing gloves and writing down the notes, and they could look at a printout of lab results. EPA could have a contest to design an informational poster about the site. EPA should use the site to ignite the kids’ interest in science and government. Such an annual event could build goodwill and would also be an enjoyable experience for everyone.
- **Create a public service announcement (PSA) or You Tube Clip.** Many people mentioned being absolutely overwhelmed by the amount of information available. After 20 years of work, there is a very broad mix of knowledge in the community. Some people could write a book about the site, while others may have very limited knowledge of the site. Even the most well-educated, often do not have the

time or desire to read all the materials, attend meetings, or put much more effort into the site. A number of people said something to the effect of “*show me pictures.*” An occasional 30- or 90-second video clip could reach a broad audience quickly.

### 3.2.5 Develop Additional Outreach Tools

The best communications results are achieved by using a variety of tools to provide the same message in several formats. Sample messages that could be applicable to the Site are presented in Table 4-4. This practice of overlapping greatly increases the odds that the message will be heard, understood, and retained. Considering how deluged the average person is with responsibilities and information, chances are great that a large percentage of the audience may be entirely unaware of the first or even second attempts at communication. This section provides a brief description of some additional tools, none of these which are particularly expensive. Most of the tools use information that has already been gathered for other purposes and they can be implemented one at a time to see if there is a favorable response.

- **Handouts.** Handouts are great tools at meetings. It is possible to create a series of handouts that will have a long shelf life and do much to improve relations in the community. Titles of these handouts could include: Critical Water Level, EPA’s Role at the Site, Why and How EPA Collects Samples, Understanding the Various OUs, Understanding Site Risk, Recurring Activities at the Site, and Frequently Asked Questions. Preparation of these handouts would require only a moderate investment of time and money. Some of the handouts already exist and only need to be updated. Most of the material that would be needed for the handouts already exists. That material would just have to be edited down to fit the message and the audience. Copies should be made on an as-needed basis and would be very inexpensive. With a moderate increase in the budget, it would be possible to have a series of very engaging and informative pieces.
- **Superfund Update Box and Q&A Ads.** A “*Superfund Update*” box on the fact sheet and/or in the local paper is a simple tool that can be used to provide answers to questions that have been asked of EPA during the previous few months and to provide updates. It can also be used to dovetail with quarterly presentations. Also, a regular series of Q&A display ads in the local newspaper, as EPA has done in Libby, could be very effective. The ads could run for two weeks prior to a quarterly presentation. Each ad could present and answer a single question about the site. Having regular ads would help establish a presence and would provide a way for the EPA to answer questions. An annual compilation of the Q&A ads could also be made into a useful handout. The cost of creating the ad would be minimal and the cost of placing the ad would depend on which newspaper was used. Each ad should have a contact number on the bottom. At present, it is almost impossible for the average citizen to know who to call. EPA has multiple Project Officers responsible for different sites; DEQ has the lead on other sites and also has multiple Project Officers; the County has O&M responsibilities on some sites.



- **Greenway Signs.** Children have been born and become adults since work has begun on the site. Some people that grew up in area, left home, and are now returning after a 20-year hiatus. Signs along the Greenway with before and after pictures would help demonstrate what has happened in the area. Signs along the Greenway are a good way to reach and educate people who may not have an interest in participating in other forms of community outreach. Most people walk around their own neighborhoods or at least talk to somebody who has, so this is an effective way of reaching people that may not be reached in any other way.
- **Postcards and/or Utility Bill Inserts.** These are great tools for getting a relatively simple message to a targeted audience. Postcards are quite effective at providing updates on construction activities in a particular town or neighborhood. Postcards are also useful for announcing upcoming meetings and providing a very brief description of the material to be covered. The postcards are inexpensive and can be printed on colored card stock using the in-house office printer. Postcards can generally be made up in less than a day, particularly at sites with a small mailing list, such as Anaconda, Opportunity and Rucker.
- **“Adopt a Cap.”** Similar to the “*Adopt a Highway*” program, the “*Adopt a Cap*” program could help local neighborhoods and interest groups beautify sections of town. Gallatin Valley Land Trust has a similar “Adopt a Trail” program that has been implemented with wide success. Many interviewees expressed an interest in redevelopment, and several people commented on the uninviting nature of the caps. School groups are already monitoring some of the caps; it would not be much of a leap to adopt one or two. Local redevelopment groups may also have an interest, as well as citizens that live in neighborhoods with capped waste. It is also an opportunity for education; what kind of vegetation works well on the caps and what is appropriate for an aesthetically pleasing long-term solution in the community.
- **Try the Community Suggestions.** As reported in Section 2, the community had interesting suggestions for improving communication. These methods might or might not improve communication, but they appear to be relatively inexpensive and could be an effective way to show that EPA is listening. Some of them have already been addressed above, others include: go door-to-door and talk to people, put up a billboard with maps and infographics at the entrance to town, tie into existing phone apps (e.g., point phone at Berkeley Pit and get a Wikipedia page on the pit), host small focus groups, create a community mural, consider smart growth solutions in the reclamation process, ask a college classroom to explore a topic, host a “*back of the napkin*” event, or have an internet event similar to the governor’s Montana Accountability Partnership, where citizens were asked to send in cost saving ideas.

## Section 4

# References

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EPA, 2003, Office of Policy, Economics and Innovation, *EPA's Public Involvement Policy*, U.S. EPA, May 2003

EPA, 2004, EPA activities under 40 CFR Part 300 as they relate to the 1990 revision of the Federal regulation that guides Superfund (National Oil and Hazardous Substances Pollution Contingency Plan)  
[www.epa.gov/publicinvolvement/pdf/part25.pdf](http://www.epa.gov/publicinvolvement/pdf/part25.pdf)

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## Attachment A: Postcard Sent to Area Residents

The U.S. Environmental Protection Agency (EPA) and Montana Department of Environmental Quality (DEQ) will be conducting a five-year review of the response actions for cleanup work at the Silver Bow Creek/Butte Area Superfund Site, to be consistent with CERCLA 121(c). The review assesses the effectiveness of the various response actions to date. Part of the process is to interview key people involved with the site. You have been identified as someone who might be interested in sharing your knowledge and concerns regarding the process. We would like to schedule an interview with you in the next few weeks, and will be calling you soon.

The emphasis of the review is on the site's six most active Operable Units(OUs):

- Butte Mine Flooding
- Butte Priority Soils
- Rocker Timber Framing and Treatment Plant
- Streamside Tailings
- Warm Springs Ponds – Active Area
- Warm Springs Ponds – Inactive Area

EPA and DEQ welcome public comments regarding work done at any of the OUs. Comments will be appended to the final five-year review document. People are also welcome to provide written comments throughout the five-year review process. Send comments to:

Roger Hoogerheide  
EPA Review Coordinator  
10 West 15th Street, Suite 3200  
Helena, MT 59626

Daryl Reed  
Superfund Project Manager  
P.O. Box 200901  
Helena, MT 59620-0901



Roger Hoogerheide  
EPA Review Coordinator  
10 West 15th Street, Suite 3200  
Helena, MT 59626

<Interviewee Address Block>



## Attachment B: Interview Questions

## **Silver Bow Creek/Butte Area**

### **Five Year Review**

### **Interview Questions**

1. Do you know what is being done at the site? What work are you most interested in?
2. Where do you get your information about the site?
3. Do you have any specific concerns about the cleanup?
  - a. Berkeley Pit
  - b. Priority Soils
  - c. lead Abatement in yards/paint
  - d. Metal-laden attic dust from years of smelting
  - e. Rocker
  - f. Streamside Tailings
  - g. Warm Springs Ponds
4. Do you feel concerns you express are heard and addressed?
5. What are your expectations of the cleanup?
6. Do you have an opinion on the work being done at the site?
7. Are you satisfied with the level of information you are receiving and your level of involvement on the work being done at the Silver Bow Creek/Butte Area Site?
  - a. Yes
  - b. No, I would like less
  - c. No, I would like more
8. What is the best way for us to get information to the community about the site?
  - a. Letters or fact sheets mailed to your home
  - b. Newspaper or radio ads for specific events
  - c. Public meetings (e.g. CTEC)
  - d. Talks to local groups (e.g. Rotary Club)
  - e. Stories in newspaper at significant milestones in the process
  - f. Regular updates via email
  - g. Library Repository
  - h. Website
  - i. Other?
9. Anything else you'd like to add?
10. Anyone else we should interview?

## Attachment C: List of Interviewees



No	NAME	Position / Affiliation
1	Steve Ackerlund	CTEC Technical Advisor
2	Robin Anderson	Ramsey School Teacher
3	Rick Appleman	MT Tech Professor/Environmental Engineering
4	Brad Archibald	Pioneer Technical
5	John J. Ayers	Rocker Landowner
6	Paul Babb	BSB Chief Executive
7	Stacie Barry	Masters in Environmental Engineering
8	Michelle Bay	BSB Public Health
9	Bob Benson	Clark Fork River Technical Assistance Committee (CFRTAC)
10	Linda Best	Deer Lodge Co Health Dept.
11	Don Booth	BP/ARCO-EMC2
12	Chris Brick	Clark Fork Coalition
13	Bill Callaghan	Butte High School Science Teacher
14	Larry Curran	Butte Local Development Corporation
15	Fritz Daily	Former Montana Legislator
16	Tad Dale	Montana Resources
17	Connie Daniels	Anaconda-Deer Lodge Co Planning Director
18	Dan Dennehy	BSB Director of Public Works
19	Tina Donovan	Trec
20	Kriss Douglass	Citizens Technical Environmental Committee (CTEC)
21	Ted Duaine	MBMG/Hydrogeologist
22	Colleen Elliott	Clark Fork Watershed Education Program (CFWEP)
23	Elizabeth Erickson	Butte Nat. Res. Damage Restoration Council (BNRC)
24	Bruce Evans	BSB Wastewater Treatment Plant
25	Bud Eveland	Rocker Water and Sewer Board
26	Dan Foley	BSB Council of Commissioners
27	Jo Foley	Concerned Citizen
28	Wally Frasz	BSB Council of Commissioners
29	Mark Gollinger	BNRC
30	Glen Granger	BSB Council of Commissioners
31	Leland Greb	Concerned Citizen
32	Dave Grifis	Pioneer Technical – LAO
33	Rebecca Guay	Chief Executive Deer Lodge County

<b>No</b>	<b>NAME</b>	<b>Position / Affiliation</b>
34	Kathy Hadley	ED of National Center for Appropriate Technology (NCAT)
35	Wayne Hadley	Former FWP Fisheries Biologist - Warm Springs Ponds
36	Ristene Hall	BSB Council of Commissioners
37	Tom Harpole	Concerned Citizen
38	Bernie Harrington	Mayor of Walkerville
39	Dan Harrington	Former State Senator
40	Eric Hassler	BSB Health Department
41	Brad Hollamon	Pioneer Technical – LAO
42	Keith Ingram	Concerned Citizen
43	Jim Kambich	MT Economic Revitalization & Development Inst. (MERDI)
44	Jim Keane	State Senator
45	Kevin Jr. Kenneally	Townpump Owner
46	Tom Kenneally	Townpump Owner
47	Jim Kuipers	Kuipers and Associates, LLC
48	Mike Kustudia	Clark Fork River Technical Assistance Committee (CFRTAC)
49	Donna Larson	Concerned Citizen - Work done on property/Butte
50	Rick Larson	BSB Operations Manager for Utilities Division
51	Joe Lee	VP of BSB Council of Commissioners
52	Ruth Lee	BNRC
53	Tom Malloy	BSB Planning/Community Development
54	Dave McCarthy	copper Environmental
55	John McKee	BNRC
56	John Metesh	MT Tech Professor/Hydrogeologist
57	Albert Mognoni	Rocker Landowner
58	Mark Moodry	BSB Council of Commissioners
59	John Morgan	BSB Council of Commissioners
60	Tom Morrill	Rocker Water and Sewer Board
61	E. (Pat) Munday	MT Tech Professor
62	Suzzann Nordwick	Citizens Technical Environmental Committee (CTEC)
63	George Niland	Opportunity Citizens Protection Association (OCPA)
64	Chad Okrusch	BNRC
65	Charlie O'Leary	BSB Council of Commissioners
66	Bill Olsen	Former USFWS - Warm Springs Ponds area
67	Dave Palmer	BSB Council of Commissioners

No	NAME	Position / Affiliation
68	Ray Palmer	Rocker Landowner
69	John Pantano	Spherion (ARCO consultant)
70	Noorjahan Parwana	Concerned Citizen/Soil Scientist
71	Scott Payne	CTEC Technical Advisor - Kirk Environmental
72	Don Peoples	MERDI
73	Dan Powers	BSB Environmental Health Director
74	Rich Proddgers	Plant Ecologist on Silver Bow Creek
75	John Ray	MT Tech Professor
76	Jade Richter	Rocker Water and Sewer Board
77	Justin Ringsak	Clark Fork Watershed Education Program (CFWEP)
78	Emmett Riordan	BNRC
79	Pat Sampson	Pioneer Technical
80	Tony Schoonen	Concerned Citizen – Warm Springs Ponds
81	Dave Schultz	Former BSB Public Works/Engineer
82	Terry Schultz	BSB Council of Commissioners
83	Jon Sesso	MT House of Representatives/BSB Planning Director
84	Cindi Shaw	BSB Council of Commissioners
85	Marci Sheehan	BP ARCO
86	Mike Sheehy	BSB Council of Commissioners
87	Dori Skrukrud	BSB Greenway/Trail Rep
88	Dave Smith	Burlington Northern Santa Fe Railroad Environmental Engineer
89	Lawrence (Lorry) Thomas	Warm Springs Ponds Sportsman Group
90	Dan Ueland	Private Land Owner
91	Don Ueland	Private Land Owner
92	Josh Vincent	WET and Trout Unlimited
93	Matt Vincent	Clark Fork Watershed Education Program (CFWEP)
94	Gene and Mary Wohlman	Concerned Citizen - Work done near property/Butte
95	Carol Wold	Concerned Citizen
<p>Gray indicates that the person was contacted, but opted not to participate. In more than half of the cases, the person indicated that they did not want to be interviewed either because they were satisfied with the work done to date or they did not feel knowledgeable enough about the Silver Bow Creek/Butte Area Site to participate.</p>		

Attachment D: List of Recommendations for  
Additional Interviewees

No	Recommendation	Position / Affiliation of Recommendation
1	Ed Amberg	Montana State Hospital – Warm Springs
2	Rick Appleman	MT Tech Professor/Environmental Engineering
3	Arrowhead	Anaconda TAG
4	Paul Babb	BSB Chief Executive
5	Darryl Barton	Warm Springs Ponds
6	Len Ballek	Herrera Environmental, Missoula
7	Stacie Barry	National Center for Appropriate Technology (NCAT)
8	Glenn Bodish	Executive Director for BSB Arts Foundation
9	Tom Bowler	MT Bureau of Mines & Geology (MBMG) Treatment Plant
10	Chris Brick	Clark Fork Coalition, Ponds and Discharge
11	Dan Charon	Host of “Party Line” on KBOW Radio
12	Pat Cunneen	NRD Environmental Science Specialist
13	Larry Curran	Butte Local Development Corporation
14	Fritz Daily	Former Montana Legislator
15	Connie Daniels	Anaconda-Deer Lodge Co Planning Director
16	Ron Davis	KBOW Radio
17	Ed Deal	Director MBMG
18	Dan Dennehy	BSB Director of Public Works
19	Rick Douglass	MT Tech
20	Ted Duaine	MBMG/Hydrogeologist
21	Dave Dziak	FWP, Missoula
22	Phyllis Egen	Former BSB Board of Health
23	Jerry Earhart	Ramsey Association
24	Colleen Elliott	Clark Fork Watershed Education Program (CFWEP)
25	Elizabeth Erickson	Citizens Technical Education Committee (CTEC)
26	Bruce Evans	BSB Public Works Metro Sewer Plant
27	George Everett	Butte Restoration Alliance (BRA)
28	Bruce Farley	Trout Unlimited
29	Dan Foley	BSB Commissioner
30	Bob & Jo Foley	Concerned Citizens – work done near their house
31	Steve Gallus	Senator Montana Legislature / Outfitter in the Big Hole
32	Kumrar Ganesan	MT Tech Professor/Environmental Engineering
33	Rosie Garvey	Principal of Ramsey School
34	Frank Gilmore	Chancellor MT Tech, Chemical Engineer
35	Mark Gollinger	Construction Eng.
36	Tyler Grant	Missoula, Running for Congress
37	Eileen Ann Greb	Saint James Hospital
38	Leland Greb	Concerned Citizen
39	Joe Griffin	Department of Environmental Quality (DEQ)
40	Rebecca Guay	Chief Executive Deer Lodge County

No	Recommendation	Position / Affiliation of Recommendation
41	Wayne Hadley	Former FWP Fisheries Biologist - Warm Springs Ponds area
42	Kathy Hadley	Executive Director of NCAT
43	Kathy Hammond	Concerned Citizen
44	Ron Hankin	Former Public Works
45	Dan Harrington	State Senator
46	Bernie Harrington	Mayor of Walkerville
47	Eric Hassler	BSB Health Department
48	Brian Holland	Attorney
49	Judy Jacobson	Former BSB Chief Executive
50	Nick Jaynes	Formerly MSE
51	Elizabeth Jeffery	Concerned Citizen
52	Eileen Joyce	BSB County Attorney
53	Helen Joyce	BRA Environmental Committee
54	Jim Kambich	MT Economic Revitalization & Development Inst. (MERDI)
55	Jim Keane	State Senator
56	Jim Kuipers	Kuipers and Associates, LLC
57	Mike Kustudia	Executive Director of CF TAG
58	Rick Larson	BSB Operations Manager for Utilities Division
59	Ruth Lee	Community Head Start
60	Duane Logan	Pioneer
61	Huey Long	Warm Springs Ponds
62	Jack Lynch	Former BSB Chief Executive
63	Mollie Maffei	BSB Deputy County Attorney
64	Tom Malloy	BSB Planning/Community Development
65	Milo Manning	Anaconda, Greenway
66	Sister Mary Jo	Saint's Ann Parish
67	Rob McCullough	MBMG
68	Angela McGrath	Parent Teacher Association
69	Ian McGruder	Warm Springs Ponds
70	John McKee	Aleph Energy
71	Marv Miller	MBMG Hydrogeologist
72	Barbara Miller	Low Income Housing
73	Mark Moodry	BSB Council of Commissioners
74	Serge Myers	OCPA – Warm Springs Ponds
75	George Niland	OCPA – Warm Springs Ponds
76	Suzzann Nordwick	Citizens Environmental Technical Committee (CTEC)
77	Joni O'Neill	Parent Teacher Association
78	Chad Okrusch	MT Tech Professor
79	Bill Olsen	Former USFWS - Warm Springs Ponds area
80	Dave Palmer	BSB Commissioner
81	Noorjahan Parwana	Concerned Citizen/Soil Scientist

No	Recommendation	Position / Affiliation of Recommendation
82	Don Peoples	MERDI
83	Ed Peretti	Veterinarian, worked with Board of Health
84	Mark Peterson	DEQ Environmental Engineer
85	Holly Peterson	Environmental Engineering Professor at MT Tech
86	Peterson	Owner of Ranch by Fairmont
87	Dan Powers	BSB Environmental Health Director
88	Rich Progers	Plant Ecologist, Silver Bow Creek
89	John Ray	MT Tech Professor
90	Rudy & Ann Richter	Concerned Citizens
91	Emmet Riordan	NorthWestern Energy
92	(Woman) Robinson	Opportunity Ponds
93	Pat Sampson	Pioneer Technical
94	Tony Schoonan	Ramsey, Warm Springs Ponds Sportsman
95	Dave Schultz	Public Works
96	Joe Schumaker	NY Life Insurance
97	Jon Sesso	MT House of Representatives/BSB Planning Director
98	Mike Sheehy	BSB Council of Commissioners
99	Jim Shive	CTEC
100	Dori Skrukud	BSB Greenway/Trail Rep
101	Andrea or Don Stierle	Chemistry/Geochemistry Dept of MT Tech
102	Lawrence Thomas	Warm Springs Ponds Sportsman Group
103	Todd Trigsted	ARCO & EPA employee
104	Uelands	Ranchers, have stockyards, also have water right
105	Josh Vincent	Trout Unlimited
106	Dave Williams	BRA Environmental Committee
107	Pat Williams	Former U.S. House of Representatives from Butte
108	Gene & Mary Wohlman	Work done on property/Butte
<p>An attempt was made to contact most of the people that were recommended. If someone was recommended and not interviewed, it was for one of the following reasons: Contacted and the person opted not to participate; Called several times without success; Recommended person was unavailable; or Organization was already well-represented.</p>		

# U.S. Environmental Protection Agency

## **Final ARARs Review Technical Memorandum**

### **Third 5-Year Review Report for Silver Bow Creek/Butte Area Superfund Site**

#### *Appendix B to Volume 1: Site-Wide Summary Report*

June 2011



REMEDIAL ACTION CONTRACT  
FOR REMEDIAL, ENFORCEMENT OVERSIGHT, AND NON-TIME-  
CRITICAL REMOVAL ACTIVITIES AT SITES OF RELEASE OR  
THREATENED RELEASE OF HAZARDOUS SUBSTANCES  
IN EPA REGION 8

U. S. EPA CONTRACT NO. EP-W-05-049

FINAL

APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARS)

REVIEW TECHNICAL MEMORANDUM

FOR THE FIVE-YEAR REVIEW

Silver Bow Creek/Butte Area NPL Site  
Butte, Montana

Work Assignment No.: 337-FRFE-0822

June 2011

Prepared for:  
U. S. ENVIRONMENTAL PROTECTION AGENCY  
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Table 2	Summary of Water Quality Standards and Changes, Silver Bow Creek/Butte Area NPL Site

## Acronyms

ARAR	applicable or relevant and appropriate requirement
BMP	best management practice
BPSOU	Butte Priority Soils Operable Unit
BRES	Butte Reclamation Evaluation System
BSBC	Butte-Silver Bow County
CD	consent decree
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
cfs	cubic feet per second
CWL	critical water level
cy	cubic yard
DEQ	Montana Department of Environmental Quality
EPA	United States Environmental Protection Agency
ESD	explanation of significant differences
IC	institutional control
LAO	Lower Area One
MCE	maximum credible earthquake
mg/kg	milligrams per kilogram
MSD	Metro Storm Drain
NCP	National Contingency Plan
NPL	National Priorities List
NTU	nephelometric turbidity units
OU	operable unit
PMF	probable maximum flood
ppm	parts per million
PRP	potentially responsible party
ROD	record of decision
Site	Butte/Silver Bow Creek National Priorities List site
SST OU	Streamside Tailings Operable Unit
TBC	to be considered
TI	technical impracticability (zone)

# Section 1

## Introduction

This technical memorandum summarizes the evaluation of the applicable or relevant and appropriate requirements (ARARs) conducted as part of the 5-year review for the Butte/Silver Bow Creek National Priorities List (NPL) site (Site). This work is being done for Work Assignment No. 337-FRFE-0822 under U.S. Environmental Protection Agency (EPA) Contract No. EP-W-05-49. The five-year review for the Site includes the following operable units (OUs):

- Warm Springs Ponds Active (OU 4) and Inactive (OU 12) operable units
- Rocker (OU 7)
- Butte Mine Flooding (OU 3)
- Streamside Tailings (OU 1)
- Butte Priority Soils (OU 8)

### 1.1 ARARs Review Overview and Background

The purpose of the ARARs review is to determine whether regulations, laws, or criteria identified in the decision documents for the various OUs at the Site have been updated or changed, and whether these changes alter the protectiveness of the selected remedy for the Site. The ARARs reviewed during this process were established in the record of decision (ROD) for each OU. Changes to the Warm Springs Pond Active OU 4 ARARs were also identified in an explanation of significant differences (ESD).

Section 121(d) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) requires that onsite remedial actions attain or waive federal environmental ARARs, or more stringent state environmental ARARs, upon completion of the remedial action. The preamble to the National Contingency Plan (NCP) states that remedy selection, including ARAR identification, will not be re-evaluated unless new or modified requirements call into question the protectiveness of the selected remedy.

Response actions under CERCLA are exempted by law from the need to obtain federal, state, or local permits for any activities conducted completely on site. However, response actions must still meet the substantive requirements of regulations that are specified in the Site ARARs unless waived.

### 1.2 ARARs Review Guidance (EPA 2001)

The purpose of the ARARs review is to evaluate whether changes or updates to the laws, regulations, and criteria identified in the RODs will affect the protectiveness of

the selected remedy. Cleanup levels or actions may be based on ARARs as opposed to site-specific risk-based values.

In the NCP, the regulations require ARARs to be kept the same as of the date of the ROD and not reopen remedy selection decisions contained in RODs (i.e., ARARs are normally frozen at the time of ROD signature) unless a new or modified requirement calls into question the protectiveness of the selected remedy. 55 FR 8757 (March 8, 1990). The NCP preamble states that “a policy of freezing ARARs at the time of ROD signing will not sacrifice protection of human health and the environment because the remedy will be reviewed for protectiveness every 5 years, considering new or modified requirements at that point, or more frequently, if there is reason to believe that the remedy is no longer protective of health and environment.” 55 FR 8758 (March 8, 1990). The preamble also states that a remedy would not necessarily need to be modified solely to attain a newly promulgated or modified requirement, but that “newly promulgated or modified requirements contribute to [the] evaluation of protectiveness.” 55 FR 8758 (March 8, 1990).

Generally, the ARARs review will consider changes in standards that were identified as ARARs in the ROD, newly promulgated standards for chemicals of potential concern, and to be considered documents (TBCs) identified in the ROD that bear on the protectiveness of the remedy.

The purpose of this memorandum is to summarize the ARARs for the OUs included in the 5-year review, and any changes to the ARARs since the time of the last five-year review. Evaluation of the effects of these changes on the protectiveness of the remedy for each OU will be included in the full 5-year review report.

## Section 2

# Selected Remedy Summaries

### 2.1 Location and Setting

The Site begins around the City of Butte, Montana. The urban center of “Uptown” Butte, Montana, is located on the Butte Hill, which is widely referred to as the “Richest Hill on Earth”. The Butte Hill lies just west of the Continental Divide at the head of Silver Bow Creek and the Clark Fork River watershed. Historically, metal mines and ore processing facilities on the Butte Hill produced globally significant quantities of copper, lead, zinc, molybdenum, gold, and silver. Throughout much of the 20th century, the Butte Mining District was the largest producer of copper in North America. Large scale mining in Butte as well as the operation of silver mills and copper and zinc concentrators/smelters has resulted in the generation of tremendous volumes of mining-related waste including waste rock, mill tailings, slag, and aerial smelter emissions. Historically, Silver Bow Creek was used to impound smelter tailings and to convey wastes out of Butte. Mining wastes carried from Butte have impacted water quality throughout the entire length of Silver Bow Creek and the upper Clark Fork River between Butte and Missoula, Montana. The Silver Bow Creek/Butte Area Superfund Site includes the urban uptown part of the City of Butte (the Butte Hill), the underground mines beneath the Butte Hill, the Berkeley Pit, the mining area associated with the historic Berkeley Pit operation and the active Continental Pit operation, the entire reach of Silver Bow Creek between Butte and Warm Springs, Montana, and the Warm Springs treatment ponds. The Site encompasses approximately 85 square miles.

Summaries of the ROD and/or consent decree (CD) requirements are provided in the following sections for each OU. Table 1 accompanies this text and presents a summary of the ARARs for the OUs.

### 2.2 Warm Springs Ponds Active and Inactive OUs

Table 1 presents the summary of ARARs for each of the OUs, as presented in the Active Unit ROD (EPA 1990) and ESD (EPA 1991), and the Inactive Area ROD (EPA 1992). A summary of the selected remedy from the RODs for these OUs is presented below:

#### 2.2.1 Active Area OU

- Allow the ponds to remain in place; Ponds 3 and 2 will continue to function as treatment ponds until upstream sources of contamination are cleaned up and standards can be met without treatment.
- Raise and strengthen all pond berms according to specified criteria, which will protect against dam failure in the event of major earthquakes or floods, and increase the storage capacity of Pond 3 to receive and treat flows up to the 100-year flood.

- Construct new inlet and hydraulic structures to prevent debris from plugging the Pond 3 inlet and to safely route flows in excess of the 100-year flood around the ponds.
- Comprehensively upgrade the treatment capability of Ponds 2 and 3 to fully treat all flows up to 3,300 cubic feet per second (cfs) (100-year peak discharge) and construct spillways for routing excess flood water into the bypass channel.
- Remove remaining tailings and contaminated soils from the Mill-Willow Bypass, consolidate them over existing dry tailings and contaminated soils within the Pond 1 and Pond 3 berms, and provide adequate cover material which will be revegetated.
- Reconstruct the Mill-Willow Bypass channel and armor the north-south berms of all ponds to safely route flows up to 70,000 cfs (one half of the estimated probable maximum flood[PMF]).
- Flood (wet-close) all dry portions of Pond 2.
- Establish surface and ground water quality monitoring systems and perform all other activities necessary to ensure compliance with all ARARs.
- Implement institutional controls (ICs) to prevent future residential development, to prevent swimming, and to prevent consumption of fish by humans.
- Defer, for not more than one year after the effective date of the ROD, decisions concerning the remediation of contaminated soils, tailings, and groundwater in the area below Pond 1, pending evaluation of various wet- and dry-closure alternatives and public review.

### **2.2.2 Inactive Area OU**

- Remove all tailings and contaminated soils from the adjacent portion of the bypass channel and from the area below Pond 1 not planned for wet-closure. Consolidate the wastes over existing dry tailings within the western portion of Pond 1.
- Modify, or enlarge if necessary, the adjacent portion of the bypass channel to safely route flood flows up to 70,000 cfs, which is one-half the estimated PMF for the combined flows of Silver Bow, Willow, and Mill Creeks. Soils and gravels that have copper concentrations below 500 milligrams per kilogram (mg/kg) and meet geotechnical requirements will be used for raising and strengthening the existing berms and constructing new berms.
- Raise, strengthen, and armor with soil cement the north-south aspect of the Pond 1 berm. In accordance with specified state safety standards for high hazard dams and for the protection of human health and the environment, the reconstructed berm must withstand the estimated maximum credible earthquake (MCE) for this area.

In addition, the reinforced berm must be constructed to withstand flood flows up to 70,000 cfs (0.5 PMF) in the enlarged bypass channel.

- Stabilize the east-west aspect of the Pond 1 berm. The reconstructed berm must withstand a MCE for this area, thus protecting against the movement of contained pond bottom sediments or tailings into the uncontaminated or wet-closed areas below Pond 1 in accordance with specified state dam safety standards, and for the protection of human health and the environment.
- Extend and armor the north-south aspect of the Pond 1 berm approximately 2,400 feet in a north-northeasterly direction. This extended berm will be constructed to provide MCE protection and the ability to withstand one-half the estimated PMF (70,000 cfs) in the adjacent bypass channel.
- Relocate the lowermost portion of the bypass channel and convert the present channel into a groundwater interception trench. The relatively straight reach of the bypass channel, from the apex of the existing Pond 1 berm to the historic Silver Bow Creek channel, will be relocated north of the extended berm. The entire reach of the bypass channel that is adjacent to the inactive area will be reconstructed, reclaimed, and restored to a more natural, meandering condition. Other excavated areas will be reclaimed and restored to their natural condition.
- The converted groundwater interception trench will be deepened and pumps will be installed to allow for a pump-back system. Intercepted water that fails to meet specified standards will be pumped back to the active area for treatment. Monitoring wells and surface water quality monitoring stations will be placed at strategic locations.
- Construct wet-closure berms to enclose the submerged and partially submerged tailings and contaminated soils. Within the eastern portion of Pond 1 and along the historic Silver Bow Creek channel below Pond 1, these smaller berms will create a series of cells, which when flooded will vary in depth from a minimum of 1 foot to a maximum of 6 feet.
- Chemically fix (immobilize) the tailings and contaminated soils, now enclosed by smaller berms, by incorporating lime and lime slurry onto or into them.
- Flood the wet-closure cells with water adjusted to a pH greater than 8.5 and maintain proper water surface elevations in the wet-closure cells.
- Cover the dry tailings and contaminated soils within the western portion of Pond 1 with 2 inches of limestone, 12 inches of fill, and 6 inches of a suitable soil cap. This dry-closed area will be contoured to control runoff and seeded with native vegetation.
- Construct a runoff interception system along the east side of the inactive area. This system will prevent floods originating in the eastern hills from entering the wet-



closure cells. It will be designed to intercept one-half of the PMF, which is estimated to be 8,500 cfs at its peak. A collection system or other engineered solution will be constructed to prevent excessive sediments from entering the Clark Fork River immediately below.

- Install toe drains along the armored berms and construct a collection manifold for both the active and inactive areas. The water collected will be pumped to the active area for treatment if it exceeds final point discharge standards specified in Attachment 5 to the Warm Springs Ponds Active Area unilateral administrative order.
- Implement long-term ecological monitoring. By means of an unbiased set of measurements, this monitoring effort will concentrate on the effects of biological systems living in contact with metals in the water and substrate of ponds and wetlands environments. The results will validate or invalidate the decision to chemically fix, wet-close and contain in place the exposed and submerged tailings and contaminated soils.
- Implement ICs to prevent residential development, swimming, domestic well construction, and disruption of dry-closure caps.

## 2.3 Rocker Operable Unit

Table 1 presents the summary of ARARs for the Rocker OU, as presented in the ROD (EPA 1995b). A summary of the selected remedy from the ROD is presented below:

- Excavate and treat arsenic-contaminated soils above 1,000 parts per million (ppm).
- Dispose of treated soils in an onsite repository.
- Cover arsenic-contaminated soils ranging from 380 ppm to 1,000 ppm remaining on site with 18 inches of clean soil and revegetate.
- Treat contaminated groundwater and rely on natural attenuation to achieve cleanup standards.
- Construct an expanded capacity water supply system for the community.
- Monitor and demonstrate that the requirements of the ROD have been met. Return the groundwater resource to the community and provide operation and maintenance of the repository and soil covers.
- Implement ICs to ensure non-residential use of the OU and prevent domestic groundwater use until cleanup is achieved.

## 2.4 Butte Mine Flooding Operable Unit

Table 1 presents the summary of ARARs for the Butte Mine Flooding OU, as presented in the ROD (EPA 1994). A summary of the selected remedy from the ROD is presented below:

- Intercept and treat all surface water from the Horseshoe Bend area using a high density lime precipitation treatment system. Recycle the treated water back into the Montana Resources mining operations or discharge into Silver Bow Creek.
- Keep the water level in the Berkeley Pit system below the critical water level (CWL) (5,410 feet) through pumping, treatment, and discharge to Silver Bow Creek (or use for some other beneficial uses).
- Track the elevations and quality of water inflows into the Berkeley Pit and West Camp systems against the CWL for both the Berkeley Pit and the West Camp. Update this information annually and use in models of the Berkeley Pit and West Camp to provide EPA and Montana Department of Environmental Quality (DEQ) with a projected date at which the CWLs will be met. The effectiveness of this monitoring plan is reviewed every 3 years by EPA and DEQ.
- Produce a focused feasibility study 24 months before mine closure or before the Berkeley Pit reaches the CWL. At that time, EPA will evaluate information about all existing and emerging technologies to select a final treatment technology for the Berkeley Pit water prior to discharge of this water into Silver Bow Creek. This treatment technology will treat the Berkeley Pit water to Montana and other pertinent water quality standards.
- Institute a long-term, comprehensive monitoring program.
- Implement an IC program to restrict use of contaminated groundwater (the Butte Alluvial and Bedrock Controlled Groundwater Area was established in 2009, which combines the Mine Flooding and Priority Soils OUs aquifers into one administrative unit – BSBC 2009) has been established.
- Create and implement a public education program to inform the public on the progress of the Mine Flooding project.

The ESD (USEPA 2002) modifies the selected remedy ROD in the following ways:

- It adds more stringent contaminant requirements for the water discharge from the treatment plant. The cadmium standard was the most important standard made more stringent by the ESD because of a post-ROD change in water quality standards by the State of Montana.
- It acknowledges DEQ's primary responsibility for the active mine area and the Yankee Doodle Tailings Pond and EPA's responsibility for the sludge repository.

- It acknowledges EPA's prior decision to send West Camp contaminated water into the Butte Priority Soils Operable Unit (BPSOU) as long as it can be handled effectively there.
- It notes that a full feasibility-study-level examination of different treatment options for the mine flooding water is no longer required.
- It allows stormwater from uptown Butte to be diverted to the Berkeley Pit and sludge from the Horseshoe Bend treatment plant to go to Berkeley Pit.

## 2.5 Streamside Tailings Operable Unit

Table 1 presents the summary of ARARs for the Streamside Tailings OU (SST OU), as presented in the ROD (EPA 1995a). A summary of the selected remedy from the ROD is presented below:

- Remove tailings/impacted soils from the floodplain where (a) they are saturated by groundwater, (b) in-place treatment would not be effective due to thickness of tailings or lack of buffer material between the tailings and groundwater, or (3) treated tailings/impacted soils could be eroded into Silver Bow Creek. Place excavated tailings/impacted soils in mine waste relocation repositories outside of the floodplain or transport to the Opportunity Ponds disposal area.
- Remove fine-grained in-stream sediments from depositional areas and place in repositories with excavated tailings/impacted soils. After removal of contaminated in-stream sediments, reconstruct the channel bed and streambank.
- Excavate, treat, and/or cap all contaminated railroad materials that pose a risk to human health or the environment. Placed excavated railroad materials in the repositories.
- No separate remedial action is planned for groundwater or surface water. Remedial activities for SST OU tailings/impacted soils and for sources of contaminants upstream or off site under other cleanup actions are expected to reduce contaminant releases to groundwater and surface water with the goal of ultimately attaining state water quality standards.
- The ROD called for an ICs program which will be coordinated through a joint effort of the Butte-Silver Bow and Anaconda-Deer Lodge local governments.

The ESD presented the following nine changes from the remedy described in the ROD (DEQ 1998):

- An increase in the volume of tailings/impacted soil in the SST OU.
- Modifications to the alignment of Silver Bow Creek and the channel profile (i.e., elevation profile).

- Use of a temporary stream diversion during and after construction to facilitate dewatering and excavation of near-stream tailings and to enhance floodplain and streambank revegetation efforts.
- Changes in the criteria for instream sediment removal as a result of other design changes.
- Modifications to the mine waste relocation repository design.
- The inclusion of sediment basins to contain contaminated overland flow run-on from offsite mine waste sources.
- Elimination of treatment wetlands as the end land use in Subarea 1.
- Changes in the estimated schedule to implement the SST OU remedy.
- An increase in the estimated cost of the SST OU remedy.

## 2.6 Butte Priority Soils Operable Unit

Table 1 presents the summary of ARARs for the BPSOU, as presented in the ROD (EPA 2006). A summary of the selected remedy from the ROD is presented below:

The selected remedy includes components to address contaminated solid media (mine waste, soil, and residential soil and dust), surface water (base flow and stormwater runoff), and alluvial groundwater. The selected remedy for these media is summarized in the subsections that follow.

### 2.6.1 Solid Media

**Residential Contamination.** EPA's action levels for residential, commercial/industrial, and recreational soils and dust are:

Contaminant of Concern	Exposure Scenario	Concentration
<b>Lead</b>	Residential	1,200 mg/kg
	Non-residential	2,300 mg/kg
<b>Arsenic</b>	Residential	250 mg/kg
	Commercial	500 mg/kg
	Recreational	1,000 mg/kg
<b>Mercury</b>	Residential	147 mg/kg
	Residential (vapor)	0.43 micrograms per cubic meter

The selected remedy requires residential areas above these action levels, in yards or in indoor dust in living spaces, be remediated if a pathway exists. The selected remedy calls for a Residential Metals Abatement Program similar to the current Lead

Intervention and Abatement Program administered by the Butte-Silver Bow County (BSBC) Health Department. The Residential Metals Abatement Program will expand the current Lead Intervention and Abatement Program to include arsenic and mercury. The expansion of this program in the selected remedy requires that all residential properties within the BPSOU must be sampled, assessed, and abated if action levels are exceeded, within a reasonable time frame, for arsenic, lead, and mercury. Abatement includes cleaning up yard soils, indoor dust, and attic dust. Abatement can be done through the existing program and can be integrated with the established comprehensive abatement components of the existing program.

**Non-Residential Contamination.** Contaminated solid media located in non-residential areas at the BPSOU site include waste rock piles, smelter wastes, milling wastes, and contaminated soils. Solid media in non-residential areas including commercial areas, open areas, non-active mining areas, etc. may exceed action levels. These areas may also pose a threat to the environment as a result of stormwater runoff. For example, runoff from these areas is a source of copper and zinc loading to receiving waters. Contaminated solid media shall be addressed through a combination of source removal, capping, and land reclamation.

Reclaimed areas, including cover soil caps, must achieve the performance standards described by EPA in the Butte Reclamation Evaluation System (BRES), which is attached to the ROD as Appendix E. The BRES is a site-specific tool to evaluate the stability, integrity, and degree of human and environmental protectiveness afforded by EPA-sanctioned response actions or other past reclamation action initiated on lands impacted by mining within the OU. The information obtained from the evaluation will be used to assure that completed response actions both past and future are effective, are meeting established performance standards, and are maintained to protect human health and the environment.

The BPSOU ROD then provides more specific direction regarding remediation of different categories of contaminated solid media and specific source areas. Those details will not be summarized here.

## **2.6.2 Groundwater**

Under the selected remedy, buried and partially saturated wastes in the Metro Storm Drain (MSD) and Lower Area One (LAO) areas will be left in place with appropriate groundwater monitoring and ICs. This will provide a continued understanding of the extent of groundwater contamination and long-term protection of human health and surface water resources. The contaminated alluvial groundwater in the MSD and in LAO will be captured and routed to a lime treatment facility for treatment and discharge to Silver Bow Creek. The groundwater collection and treatment system has and will significantly reduce the loading of metals to Silver Bow Creek. The groundwater remedy will provide the level of protection of Silver Bow Creek needed to achieve remedial action objectives during non-wet weather (base flow) conditions.

Under the selected remedy, groundwater captured in the interception and collection systems at LAO and MSD will be combined with contaminated base flow from Missoula Gulch and the groundwater from the West Camp bedrock system of the Mine Flooding OU for combined treatment in the Butte Treatment Lagoons (a lime treatment facility) and discharged to Silver Bow Creek. The treatment facility will be evaluated and possibly re-designed or modified during remedial design. If monitoring data demonstrate that the existing system is not effectively capturing the contaminated groundwater, contaminated groundwater is leaving the site, or the system is not otherwise effective, additional groundwater capture systems and/or extraction wells will be implemented to ensure full effectiveness of the system.

The ROD waived groundwater quality ARARs for the alluvial aquifer at BPSOU. A controlled groundwater area (the Butte Alluvial and Bedrock Controlled Groundwater Area – BSBC 2009) has been established to prevent domestic use of this water and to prevent any well development that would exacerbate or spread existing contamination.

### 2.6.3 Surface Water

The selected remedy for surface water is directed at achieving the primary objectives of returning Silver Bow Creek to its beneficial uses and protecting downstream receptors from releases of contamination from BPSOU. The selected remedy for surface water consists of the following components:

1. The Surface Water Management Program, which utilizes best management practices (BMPs) to address contaminated storm water runoff and improve storm water quality. The BMPs that will be implemented include, but are not limited to, source controls including waste removal, engineered sediment controls, curb and gutters, subsurface drains, detention/retention basins, and routing storm flows away from receiving waters.
2. Excavation and removal to a repository of contaminated sediments from the stream bed, banks, and adjacent floodplain along Blacktail Creek and Silver Bow Creek, from just above the confluence of Blacktail Creek and MSD to the beginning of the reconstructed Silver Bow Creek floodplain at LAO. Following removal of the instream sediments, further evaluation of surface water quality in this area will be conducted. If groundwater inflow is found to adversely affect surface water quality, additional hydraulic controls and groundwater capture shall be implemented.
3. Capturing and treating storm water runoff up to a specified maximum storm event, if BMPs implemented under the Surface Water Management Program do not achieve the goal of meeting surface water standards in Silver Bow Creek, Grove Gulch, and Blacktail Creek during storm water events.

4. Hydraulic control, capture, and treatment of contaminated groundwater to prevent its discharge to Silver Bow Creek surface water (as described above for groundwater).
5. Instream flow augmentation as appropriate. Flow augmentation will not be considered until the major remedial components described in this ROD are designed and implemented.

## 2.6.4 Institutional Controls

The selected remedy includes the following minimum ICs:

1. A controlled groundwater area will be established in the alluvial aquifer technical impracticability (TI) zone to prevent domestic use of contaminated water, exacerbation or spreading of existing contamination, or release of highly contaminated groundwater to surface water resources through irrigation.
2. County zoning and permit requirements will be implemented to ensure that capped waste areas, discrete areas of waste left in place, and other control measures such as storm water controls are not disturbed, mismanaged, or inappropriately developed and that waste taken from these areas is disposed of at the Butte Mine Waste Repository or, if identified as a hazardous waste, at a Resource Conservation and Recovery Act C facility. These controls and permits are best implemented with adequate funding for appropriate redevelopment and re-use of affected sites.
3. Notices will be placed with property deeds for all areas where wastes were capped and left in place or where engineered controls were constructed or other discrete wastes were left in place. The deed notices will notify current and subsequent landowners of the presence of these wastes or engineered controls and ensure that these wastes are not disturbed. In addition, fencing and signs may be required to ensure the integrity of caps and engineered controls.
4. Where private landowners require fencing or use posting for legitimate reasons relating to the prevention of remedy disruption, the selected remedy requires the installation of these fences or signs.

## 2.6.5 Operations and Maintenance

The selected remedy requires the development of long-term and integrated comprehensive monitoring and operation and maintenance plans for all aspects of the selected remedy.

## Section 3

### Changes to ARARs

Table 2 summarizes changes to water quality standards identified as ARARs. The most significant change noted during this review was a lowering of the arsenic human health-based standard for arsenic in surface water and groundwater under the State of Montana water quality standards (Circular DEQ-7, published in 2008). This lowering of the arsenic standard brings the state human health-based standards in line with the federal maximum contaminant limit (MCL) for arsenic. This change in water quality standards applies to all OUs included in this Five-Year Review.

In December 2009, EPA published a final rule aimed at reducing pollution from construction and development sites (EPA 2009, 2010). Effective February 2010, the rule imposes an enforceable numeric turbidity limit of 280 nephelometric turbidity units (NTU) on storm water discharges from large construction and development sites. The final rule requires permittees to collect samples of storm water discharges and to comply with the numeric turbidity limitation. For construction activity that disturbs 20 or more acres of land at one time, the rule is phased in over 18 months (by August 1, 2011). For construction disturbances greater than 10 acres, the rule is phased in over 4 years (by February 2, 2014). The rule includes non-contiguous land disturbances that take place at the same time and are part of a larger common plan of development or sale. This change applies to all OUs included in this Five-Year Review.

In addition to the standards identified above, several ARARs have been modified or repealed since the time of the ROD. However, these changes are not anticipated to have significant impacts on remedy protectiveness.



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## Section 4

# References

BSBC 2009. Petition for A Butte Alluvial and Bedrock Controlled Groundwater Area. Prepared for the Montana Department of Natural Resources and Conservation on behalf of Butte-Silver Bow County. Prepared by Water & Environmental Technologies, Butte, Montana. December, 2009.

U.S. Environmental Protection Agency (EPA). 1990. Record of Decision, Warm Springs Ponds Operable Unit, Silver Bow Creek/Butte Area National Priorities List (NPL) Site, Butte, Montana. U.S. Environmental Protection Agency, Montana Office. September 28, 1990.

\_\_\_\_\_. 1991. Explanation of Significant Differences for the Warm Springs Ponds Operable Unit, Silver Bow Creek/Butte Area NPL Site, Butte, Montana. U.S. Environmental Protection Agency, Montana Office. June 24, 1991.

\_\_\_\_\_. 1992. Record of Decision, Warm Springs Ponds Inactive Area Operable Unit, Silver Bow Creek/Butte Area NPL Site, Butte, Montana. U.S. Environmental Protection Agency, Montana Office. June 30, 1992.

\_\_\_\_\_. 1994. Record of Decision, Butte Mine Flooding Operable Unit, Silver Bow Creek/Butte Area NPL Site, Butte, Montana. U.S. Environmental Protection Agency, Montana Office. September 29, 1994.

\_\_\_\_\_. 1995a. Record of Decision, Streamside Tailings Operable Unit, Silver Bow Creek/Butte Area NPL Site, Butte, Montana. U.S. Environmental Protection Agency, Montana Office. November 29, 1995.

\_\_\_\_\_. 1995b. Record of Decision, Rocker Timber Framing and Treatment Plant Operable Unit, Silver Bow Creek/Butte Area NPL Site, Butte, Montana. U.S. Environmental Protection Agency, Montana Office. December 22, 1995.

\_\_\_\_\_. 1998. Explanation of Significant Differences for the Streamside Tailings Operable Unit, Silver Bow Creek/Butte Area NPL Site, Butte, Montana. U.S. Environmental Protection Agency, Montana Office. August 2002.

\_\_\_\_\_. 2001. Comprehensive Five-Year Review Guidance. OSWER No. 9355.7-03B-P. June.

\_\_\_\_\_. 2002. Explanation of Significant Differences for the Butte Mine Flooding Operable Unit, Silver Bow Creek/Butte Area NPL Site, Butte, Montana. U.S. Environmental Protection Agency, Montana Office. March 2002.

*Section 4*  
*References*

\_\_\_\_\_. 2006. Record of Decision, Butte Priority Soils Operable Unit, Silver Bow Creek/Butte Area NPL Site, Butte, Montana. U.S. Environmental Protection Agency, Montana Office. September, 2006.

\_\_\_\_\_. 2009. Fact Sheet, Final Rule: Effluent Guidelines for Discharges from the Construction and Development Industry. U.S. Environmental Protection Agency. EPA 821-F-09-004. November, 2009.

\_\_\_\_\_. 2010. Fact Sheet, Correction Notice: Effluent Guidelines for Discharges from the Construction and Development Industry. U.S. Environmental Protection Agency. EPA 821-F-10-001. March, 2010.

Table 1  
Summary of Applicable or Relevant and Appropriate Requirements (ARARs)  
Silver Bow Creek/Butte Area NPL Site

Citation (Current)	Citation (ROD)	Title	Type (Contaminant, Location, or Action-Specific)	OU						Comments
				Warm Springs Ponds - Active OU 4	Warm Springs Ponds - Inactive OU 12	Rocker OU 7	Butte Mine Flooding OU 3	Streamside Tailings OU 1	Butte Priority Soils OU 8	
Federal ARARs										
Groundwater										
40 CFR § 141		Safe Drinking Water Act (SDWA) - Maximum Contaminant Levels (MCLs) and non-zero Maximum Contaminant Level Goals (MCLGs)	Contaminant	R&A - Waiver for Mercury and Arsenic	R&A - Waiver for Mercury and Arsenic	R&A	R&A (Outside of TI Waiver Area)	R&A	R&A (Outside of TI Waiver Area)	
40 CFR § 264, Subpart F		Resource Conservation and Recovery Act - Releases from Solid Waste Management Units	Contaminant	R&A	R&A	R&A				
Air										
40 CFR § 50.12		Clean Air Act - National Primary and Secondary Air Quality Standards for Lead	Contaminant	A	A		A			Standard is 1.5 micrograms per cubic meter (ug/m <sup>3</sup> ) (90-day average)
40 CFR § 50.6		Clean Air Act - National Primary and Secondary Air Quality Standards for PM10	Contaminant	A	A		A			Standard is 150 ug/m <sup>3</sup> (24-hour average), 50 ug/m <sup>3</sup> (annual average)
Surface Water		Montana has promulgated surface water quality standards								
40 CFR § 122 and 125		National Pollutant Discharge Elimination System (NPDES) Stormwater Regulations - General Conditions and Industrial Conditions	Contaminant						A	
29 CFR §§ 1910.1000, 1910.1018(c), and 1910.1025(c),		Occupational Safety and Health Requirements	Contaminant	A						
16 USC §§ 661 et seq		Fish and Wildlife Coordination Act	Location	A	A	A	A	A	A	
16 USC §§ 1531-1543; 50 CFR § 402		Endangered Species Act	Location	A	A	A	A	A	A	
16 USC § 470; 36 CFR § 800		National Historic Preservation Act	Location	A	A	A	A	A	A	
16 USC § 469		Archaeological and Historical Preservation Act	Location	A	A	A	A	A	A	
36 CFR § 62.6		Historic Sites, Buildings, and Antiquities Act	Location			A	A	A	A	
16 USC §§ 703 et seq.		Migratory Bird Treaty Act	Location			A	A	A	A	
17 USC §§ 668 et seq.		Bald Eagle Protection Act	Location			A	A	A	A	
25 USC § 3001			Location						A	
43 CFR §§10.1 - 10.17		Native American Grave Protection and Repatriation Act								
40 CFR § 264.18 (a) and (b)		Resource Conservation and Recovery Act (RCRA) (Requirements for Siting Repositories)	Location	A	A	A - Treatment R&A - Re-Disposal	A	R&A	R&A	
Executive Order 11,988		Floodplain Management Order	Location	A	A	A	A	A	A	
Executive Order 11,990		Protection of Wetlands Order	Location	A	A	A	A	A	A	
40 CFR 230		Section 404(b)(1) guidelines for Specifications of Disposal Sites for Dredged Material	Location			A		A		
40 CFR § 257.3		Criteria for Classification of Solid Waste Disposal Facilities and Practices	Action			A	A	A	A	
40 CFR § 258, Subparts B, C, D, E, and F		Criteria for Municipal Solid Waste Landfills	Action				A			
40 CFR § 50.12		Clean Air Act - National Primary and Secondary Air Quality Standards for Lead	Action			A	A	A	A	Standard is 1.5 ug/m <sup>3</sup> (90-day average)
40 CFR § 50.6		Clean Air Act - National Primary and Secondary Air Quality Standards for PM10	Action			A	A	A	A	Standard is 150 ug/m <sup>3</sup> (24-hour average), 50 ug/m <sup>3</sup> (annual average)
40 CFR §§ 61.145 and 150		National Emission Standards for Hazardous Air Pollutants - Asbestos Demolition and Waste Disposal	Action			A				
30 CFR § 816		Permanent Program Performance Standards - Surface Mining Activities	Action	R&A	R&A	R&A		R&A	R&A	
30 CFR § 784		Underground Mining Permit Applications - Minimum Requirements for Operating and Reclamation Plan	Action			R&A		R&A	R&A	
40 CFR § 230		Section 404(b)(1) guidelines for Specifications of Disposal Sites for Dredged Material	Action	A	A	A		A	A	

Notes:  
A - Applicable  
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				Warm Springs Ponds - Active OU 4	Warm Springs Ponds - Inactive OU 12	Rocker OU 7	Butte Mine Flooding OU 3	Streamside Tailings OU 1	Butte Priority Soils OU 8	
40 CFR § 231		Section 404(C) Procedures	Action	A	A					
33 CFR §§ 323 and 330		Permits for Discharges of Dredged or Fill Material into Waters of the U.S.; National Permit Program	Action	A	A					
40 CFR §121, 122, and 125		Clean Water Act - General Conditions and Industrial Activity Conditions	Action	A		A		A	A	40 CFR § 450 promulgated December 2009. Effective February 1, 2010, the New Source Performance Standards include a numeric limit for turbidity of 280 NTU for discharge from construction activity disturbances (phased in over 18 months for 20+ acres, or 4 years for 10+ acres)
40 CFR § 440		Ore Mining and Dressing Point Sources	Action				A	A		
40 CFR § 440.104		Effluent Limits under New Source Performance Standards	Action	A			A			
40 CFR § 144		Underground Injection Control	Action			A	A	A	A	
		RCRA								
40 CFR §264.97		Groundwater Monitoring Requirements (Only contaminants in the ROD monitored)	Action	R&A	A					
40 CFR § 264.111		Closure Performance Standards	Action	R&A	A					
40 CFR § 264.116 and .119;		Requirements for Notice and Deed Restrictions	Action	R&A	R&A	R&A	R&A	R&A	R&A	
40 CFR 264.228(a)(2)(i);		Dewatering of Wastes Prior to Disposal								
40 CFR 264.228(a)(2)(iii)(B), (C) and (D) and .251(C), (D), and (		Run-on and Run-off Controls								
40 CFR §§ 257.3-1(a), 257.3-2 through 257.3-4		Classification Criteria for Solid Waste Disposal Facilities	Action	R&A	A					
40 CFR § 262		Standards Applicable to Generators of Hazardous Waste	Action			A				
40 CFR § 263		Standards Applicable to Transporters of Hazardous Waste	Action			A	A	A	A	
40 CFR §§ 264.170 - 178		RCRA - Use and Management of Containers	Action			A				
40 CFR § 264.221 (f), (g), and (h)		RCRA - Design and Operating Requirements for Surface Impoundments	Action	R&A	A					
40 CFR § 264.226		RCRA - Design and Operating Requirements for Surface Impoundments - Monitoring and Inspection	Action	R&A						
40 CFR §§ 264.600-603		RCRA - Miscellaneous Treatment, Storage, and Disposal Units	Action			A				
40 CFR §§ 265.400-406		RCRA - Chemical, Physical, and Biological Treatment	Action			A				
40 CFR §§ 264.250 - 259		RCRA - Waste Piles	Action			A				
29 CFR § 1926 20 CFR §§ 1910.120 and 1910.132		Occupational Safety and Health Administration Worker Protection	Action	A						
State ARARs										
Surface Water										
MCA §§ 75-5-101 et seq.		Montana Water Quality Act								
ARM 17.30.607(1)	ARM 16.20.604(1)	Silver Bow Creek (Mainstem) from Blacktail Creek to Warm Springs Creek is classified "I" for water use Clark Fork River from Warm Springs Creek to Cottonwood Creek is classified "C-2" Other waters within the Clark Fork Drainage are classified "B-1"	Contaminant	A (Arsenic and Mercury Waiver)	A	A	A	A	A	
ARM 17.30.627	ARM 16.20.622	"C-2" Classification Standards	Contaminant	A	A					
ARM 17.30.623		"B-1" Classification Standards	Contaminant		A				A	
ARM 17.30.628	ARM 16.20.623	"I" Classification Standards	Contaminant			A	A	A	A	
ARM 17.30.637	ARM 16.20.633	General Prohibitions on Discharges	Contaminant				A	A	A	

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ARM 17.30.705		Non-Degradation of Surface Water Quality	Contaminant						A	
ARM 17.30.1203	ARM 16.20.925	Incorporation of 40 CFR 125 standards for technology-based treatment requirements in MPDES permits	Contaminant			A	A	A	A	
ARM 17.30.1342 - 1344		MPDES Permit Requirements	Contaminant						A	
ARM 17.30.601; §ARM 17.30.1101 et seq.; ARM 17.30.1301		MDEQ General Stormwater Permits	Contaminant						A	
MCA §§ 75-5-605		Prohibition on Causing Surface Water or Groundwater Pollution	Contaminant			A	A	A	A	
Groundwater										
MCA § 85-2-505		Groundwater Act - Construction and Maintenance of Groundwater Monitoring Wells	Contaminant	A						
ARM 17.30.1006 (REVISED IN 2006)	ARM 16.20.1002; ARM 16.20.1003	Classification of Groundwater into Classes I through IV Based on Beneficial Uses, and Establish Standards (standards not applicable within TI Waiver area)	Contaminant		A	A	A	A	A	
ARM 17.30.1011	ARM 16.20.1011	Non-Degradation of Groundwater Quality	Contaminant	A	A		A	A	A	
Air										
ARM 17.8.222	ARM 16.8.815	Federally-Approved State Implementation Plan (SIP) of Lead Air Quality Standards	Contaminant	A	A	A	A	A	A	Standard is 1.5 ug/m <sup>3</sup> (90-day average)
ARM 17.8.223	ARM 16.8.821	Federally-Approved State Implementation Plan (SIP) of PM-10 Air Quality Standards	Contaminant	A	A	A	A	A	A	Standard is 150 ug/m <sup>3</sup> (24-hour average), 50 ug/m <sup>3</sup> (annual average)
ARM 17.8.604	ARM 16.8.1302	Open Burning Prohibitions	Contaminant		A					
ARM 17.8.308 (1) and (2)	ARM 16.8.1401 (1) and (2)	Control of Airborne Particulate Matter	Contaminant		A					
ARM 17.8.220	ARM 16.8.818	Standard for Settled Particulate Matter	Contaminant	A	A					Standard is 10 grams per square meter (g/m <sup>2</sup> )
ARM 17.8.308 (3)	ARM 16.8.1401 (4)	Particulate Control Requirements Within Non-Attainment Areas	Contaminant	A	A					
ARM 17.8.308 (4)	ARM 16.8.1401 (3)	Road Dust Suppression	Contaminant	A						
ARM 17.8.304	ARM 16.8.1404	Visible Air Contaminants	Contaminant		A					
REPEALED	ARM 16.8.1427	Odor Control	Contaminant		A					
ARM 17.24.761		Air Resources Protection - Fugitive Dust	Contaminant		A					
17.74.102	ARM 16.42.102	Occupational Safety and Health - Arsenic and Lead Exposure Limits	Contaminant	R&A						
MCA §§ 75-10-201 et seq. §ARM 16.14.505	ARM 16.14.505	Solid Waste Management Regulations	Location		A	A	A	A	A	
MCA §§ 75-7-101 et seq. §MCA § ARM 36.2.404	ARM 36.2.404	Natural Streambed and Land Preservation Act	Location		A			A	A	
MCA § 75-7-102		Natural Streambed and Land Preservation Act - Soil Erosion and Sedimentation	Location	A						
MCA §§ 76-5-401 et seq.		Floodplain and Floodway Management Act	Location	A	A	A				
ARM 36.15.601, 602, and 701		Allowed Uses Within Floodway	Location			A		A	A	
ARM 36.15.604		Minimum Criteria for Permits	Location			A			A	
ARM 36.15.605 and 703		Prohibited Uses Within Floodway	Location			A		A	A	
ARM 36.15.606		Permits for Flood Control Works	Location	R&A	A					
ARM 36.15.801		Allowed Uses Where Floodway Not Designated - Wildlife Management and Natural Areas	Location	A						
ARM 36.15.216		Applicable Considerations in Use of a Floodway	Location			A		A	A	
ARM 36.15.601(2), 603, 606, 701(3)(c), 701(3)(d), 702(1), 702(2)		Specific Obstructions or Uses	Location			A		A	A	
ARM 17.54.702	ARM 16.44.702	Standards and Requirements for Permitted Facilities - REPEALED	Location	R&A						
MCA § 85-2-505		Groundwater Act - Construction and Maintenance of Groundwater Monitoring Wells	Action		A	A	A	A		
ARM 17.30.1011	ARM 16.20.1011	Non-Degradation of Groundwater Quality	Action			A			A	
MCA § 75-5-602		Water Quality Act - Discharges to publically owned treatment works	Action				A			

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MCA § 75-5-605		Water Quality Act - Prohibition on Pollution							A	
ARM 17.30.601; 2ARM 17.30.1101 et seq.; ARM 17.30.1301		MDEQ General Stormwater Permits	Action						A	
ARM 17.30.637	ARM 16.20.633	General Prohibitions on Discharges	Action	A						
ARM 17.30.641	ARM 16.20.635	Water Quality Sampling Methods	Action				A			
ARM 17.30.646	ARM 16.20.642	Bioassays - Tolerance Concentrations	Action				A			
ARM 17.30.705		Non-Degradation of Surface Water Quality	Action						A	
ARM 17.30.715		Criteria for Non-Significant Changes in Water Quality	Action						A	
ARM 17.30.1342 - 1344		MPDES Permit Requirements	Action						A	
ARM 17.38.101(3)	ARM 16.20.401(3)	Public Water Supply - Construction Standards	Action				A	A		
ARM 17.30.1101 et seq.	ARM 16.20.6012 et seq., ARM 16.20.1301 et seq., ARM 16.20.1314	Water Quality Act - Stormwater Discharges and General Permits	Action			A				
17.30.1322 and 1345	ARM 16.20.1310 and 1321	Best Management Practices and Monitoring	Action	A						
MCA §§ 75-2-101 et seq.		Montana Clean Air Act	Action				A	A		
ARM 17.8.214	ARM 16.8.814	Hydrogen Sulfide Ambient Air Standard	Action				A	A		Standard 0.05 ppm, not to exceed more than once per year
ARM 17.8.222	ARM 16.8.815	Lead Ambient Air Standard	Action				A	A		Standard is 1.5 ug/m <sup>3</sup> (90-day average)
ARM 17.8.223	ARM 16.8.821	PM-10 Ambient Air Quality Standard	Action				A	A		Standard is 150 ug/m <sup>3</sup> (24-hour average), 50 ug/m <sup>3</sup> (annual average)
ARM 17.8.604	ARM 16.8.1302	Open Burning Prohibitions	Action				A	A	A	
ARM 17.8.308 (1) and (2)	ARM 16.8.1401 (1) and (2)	Control of Airborne Particulate Matter	Action			A	A	A	A	
ARM 17.8.220	ARM 16.8.818	Standard for Settled Particulate Matter	Action			A	A	A		Standard is 10 g/m <sup>2</sup>
ARM 17.8.308 (4)	ARM 16.8.1401 (4)	Particulate Control Requirements Within Non-Attainment Areas	Action			A	A	A		
ARM 17.8.304	ARM 16.8.1404	Visible Air Contaminants	Action			A				
REPEALED	ARM 16.8.1427	Odor Control				A	A	A		
ARM 17.24.761		Air Resources Protection - Fugitive Dust	Action	R&A	A	A	A	A	R&A	
ARM 17.8.715	ARM 16.8.1103	Emission Control Requirements - BACT and LAER	Action			A				
ARM 17.8.204	ARM 16.8.807	Ambient Air Monitoring Methods	Action				A			
ARM 17.8.206	ARM 16.8.809	Ambient Air Sampling, Data collection, Recording Methods	Action				A			
MCA §§ 75-10-201 et seq.2ARM	ARM 16.14.500 et seq.	Solid Waste Management Act	Action				A			
MCA § 75-10-214		Solid Waste Disposal on Private Property	Action	A						
ARM 17.50.504	ARM 16.14.504	Disposal Facility Classifications	Action				A			
ARM 17.50.505	ARM 16.14.505	Standards for Solid Waste Management Facilities	Action	R&A		A	A	A	A	
ARM 17.50.506	ARM 16.14.506	Design Criteria for Landfills	Action			A	A		A	
ARM 17.50.510 and 511	ARM 16.14.520 and 521	General and Specific Operation and Maintenance Requirements	Action			A	A		A	
ARM 17.50.523	ARM 16.14.523	Transportation of Solid Waste	Action	R&A		A	A	A	A	
ARM 17.50.530 and 531	ARM 16.14.530 and 531	Closure and Post-Closure Care for Landfills	Action			A	A		A	
ARM 17.54.702	ARM 16.44.702	Standards and Requirements for Facilities - Hazardous Waste Management - REPEALED	Action	R&A	A					
ARM 17.54.701-703	ARM 16.44.701-703	Standards and Requirements for Facilities - Hazardous Waste Management - REPEALED	Action							
MCA §§ 85-15-101 et seq.		Montana Dam Safety Act	Action				A			
ARM 36.14.202		Dam Construction	Action	A			A			
ARM 36.14.501		High-Hazard Dam Criteria	Action	A	A		A			
ARM 36.14.502		High-Hazard Dam Inflow Flood Design	Action	A	A		A			
MCA §§ 82-4-201 et seq.		Montana Strip and Underground Mine Reclamation Act								
ARM 17.24.631	ARM 26.4.631	Mine Reclamation - General Hydrology Requirements	Action	R&A	R&A	R&A		R&A	R&A	

Notes:  
A - Applicable  
R&A - Relevant and Appropriate

Table 1  
Summary of Applicable or Relevant and Appropriate Requirements (ARARs)  
Silver Bow Creek/Butte Area NPL Site

Citation (Current)	Citation (ROD)	Title	Type (Contaminant, Location, or Action-Specific)	OU						Comments
				Warm Springs Ponds - Active OU 4	Warm Springs Ponds - Inactive OU 12	Rocker OU 7	Butte Mine Flooding OU 3	Streamside Tailings OU 1	Butte Priority Soils OU 8	
ARM 17.24.633	ARM 26.4.633	Mine Reclamation - Water Quality Performance Standards	Action	R&A		R&A		R&A	R&A	
ARM 17.24.634	ARM 26.4.634	Reclamation of Drainage Basins	Action	R&A	R&A	R&A		R&A		
ARM 17.24.635 - 637	ARM 26.4.635 - 637	Temporary and Permanent Diversions	Action	R&A	R&A			R&A	R&A	
ARM 17.24.638	ARM 26.4.638	Sediment Control Measures	Action	R&A	R&A	R&A		R&A	R&A	
ARM 17.24.639		Sedimentation Pond Requirements	Action						R&A	
ARM 17.24.640	ARM 26.4.640	Discharge from Sedimentation Ponds	Action		R&A	R&A		R&A	R&A	
ARM 17.24.641	ARM 26.4.641	Acid- and Toxic-Forming Spoils	Action			R&A			R&A	
ARM 17.24.643		Groundwater Protection	Action						R&A	
ARM 17.24.644	ARM 26.4.644	Protection of Groundwater Resource	Action	R&A	R&A					
ARM 17.24.645		Groundwater Monitoring	Action						R&A	
ARM 17.24.646		Surface Water Monitoring	Action						R&A	
ARM 17.24.501 and 501A	ARM 26.4.501 and 501A	Backfilling and Grading Requirements	Action	R&A	R&A	R&A		R&A	R&A	
ARM 17.24.505		Burial of Acid- and Toxic-Forming Materials	Action	R&A					R&A	
ARM 17.24.514	ARM 26.4.514	Contouring - REPEALED				R&A		R&A		
ARM 17.24.519	ARM 26.4.519	Settlement Monitoring	Action			R&A		R&A	R&A	
ARM 17.24.702	ARM 26.4.702	Redistribution and Stockpiling of Soil	Action			R&A		R&A	R&A	
ARM 17.24.703	ARM 26.4.703	Materials Other Than Soil	Action	R&A		R&A		R&A	R&A	
ARM 17.24.711	ARM 26.4.711	Establishment of Vegetation	Action	R&A		R&A		R&A	R&A	
ARM 17.24.713	ARM 26.4.713	Seeding and Planting	Action	R&A		R&A		R&A	R&A	
ARM 17.24.714	ARM 26.4.714	Soil Stabilization	Action	R&A		R&A		R&A	R&A	
ARM 17.24.716	ARM 26.4.716	Revegetation	Action	R&A		R&A		R&A	R&A	
ARM 17.24.717	ARM 26.4.717	Planting of Trees and Shrubs	Action					R&A	R&A	
ARM 17.24.718	ARM 26.4.718	Soil Amendments	Action	R&A		R&A		R&A	R&A	
ARM 17.24.719		Livestock Grazing - REPEALED	Action	R&A						
ARM 17.24.721		Eradication of Rills and Gullies	Action	R&A					R&A	
ARM 17.24.723		Monitoring - Vegetation, Soils, Wildlife	Action						R&A	
ARM 17.24.724		Revegetation Success Criteria	Action	R&A					R&A	
ARM 17.24.726		Vegetation Measurements	Action	R&A					R&A	
ARM 17.24.728	ARM 26.4.728	Composition of Vegetation - REPEALED	Action	R&A		R&A		R&A	R&A	
ARM 17.24.733		Measurement for Trees, Shrubs - REPEALED	Action						R&A	
ARM 17.24.751	ARM 26.4.751	Protection and Enhancement of Fish, Wildlife, and Related Environmental Values	Action	R&A		R&A				

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