

Evaluation of Mine and Mill Source Sites for Removal from the Forthcoming Upper Basin ROD Amendment

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DATE: March 21, 2012

1.0 Introduction

Alternative 3+(d) in the *Draft Focused Feasibility Study for the Upper Basin of the Coeur d'Alene River, Bunker Hill Mining and Metallurgical Complex Superfund Site* (CH2MHILL, 2011) presented a suite of remedial actions that would constitute a final remedy for surface water and for soil, sediments, and source materials where actions are taken to protect human health and the environment in the Upper Basin. Implementation of Alternative 3+ for the OU 3 portion of Upper Basin presents unique challenges given the magnitude of the environmental problem in the Upper Basin, the number of remedial actions needed to address the problem, the size of the area, and the uncertainty inherent in a site of this size and complexity. To address uncertainty during the management and implementation of the Selected Remedy as presented in the Upper Basin ROD Amendment, EPA identified the use of an adaptive management framework where information and understanding gained at the Site over time will be used to revise and guide the implementation of remedial actions to achieve cleanup goals. Consistent with the adaptive management framework and in response to comments received from stakeholders and the public on the Proposed Plan, EPA has decided to select an interim instead of final remedy in the forthcoming Upper Basin Record of Decision (ROD) Amendment that focuses on addressing mining-related contamination in priority areas where data indicates the greatest risks to human health and the environment are occurring.

This technical memorandum presents the methodology used and results of an evaluation of Upper Basin mine and mill sites identified for remedial action in the Preferred Alternative as presented in the Proposed Plan (Alternative 3+(d) of the FFS) which are of lower priority and thus will not be included in the forthcoming Upper Basin ROD Amendment. The purpose of the evaluation was to identify sites where, based on the operational and remedial history of the site as well as all available information regarding potential risks to human health and the environment resulting from mining-related contamination, EPA has decided not to take action at this time.

2.0 Background

The Proposed Plan (EPA, 2010) presented the Preferred Alternative for a comprehensive remedy for the Upper Basin which addressed historical mining-related contamination. The Preferred Alternative included remedial actions at 345 mine and mill sites¹ located in the Upper Basin that would be required to meet cleanup goals based on available data and predictions of the effectiveness of the cleanup. These mine and mill sites do not include the groundwater treatment actions identified for the Bunker Hill Box, and referred to as OU 2 Alternative (d) in the Proposed Plan. EPA is retaining OU 2 Alternative (d) for inclusion in the Selected Remedy.

Following conclusion of the Proposed Plan comment period, EPA worked with the Upper Basin Project Focus Team (PFT) to categorize mine and mill sites included in the Preferred Alternative based on available analytical data, field observations, historic information, current status, and other site knowledge. This categorization of sites was conducted as a first step towards implementation planning and in response to community and stakeholder comments requesting more description of how the Preferred Alternative would be implemented and where the focus areas would be in the near-term. Mine and mill sites were subsequently categorized into the following categories:

Strong Consensus Sites – Mine and mill sites where available information confirmed substantial risks to human health and the environment from mining-related contamination requiring remedial action.

Active Sites – Mine and mill sites where active industrial and/or commercial activities are currently occurring. At some of these sites, access controls and/or Institutional Controls Program (ICP) protective barriers are in place that prevent or minimize direct contact with source materials. In addition to the presence of in-place measures to reduce direct contact risk, the active mine and mill sites are typically overseen by regulatory agencies outside of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Therefore, regulatory methods both within and outside of CERCLA are available to address the potential release of contaminants that may pose a risk to human health and the environment.

Remediated Sites – Over time, clean up actions have been conducted by EPA, other agencies, and property owners within the Upper Basin. The majority of actions that have been taken at these mine and mill sites focused on human health risks, but where appropriate additional actions were taken to reduce contamination at the sites and the transport of contamination downstream from these sites. Currently, sites where clean up actions have been taken are being monitored to determine their effectiveness towards meeting remedial action objectives. Review of the monitoring results and the protectiveness of these clean up actions are documented in Five-Year Reviews consistent with CERCLA and the 2002 ROD for OU3 (USEPA, 2002). Any potential short-comings of these clean up actions towards achieving remedial action objectives and protection of human health and

¹ The Proposed Plan (EPA, 2010) stated that the Preferred Alternative for OU 3 (Alternative 3+) included 348 mine and mill sites. This total erroneously included three sites in Canyon Creek (WAL007, WAL008, and WAL012) that were in Alternative 4+, but not Alternative 3+. Therefore, the correct number of mine and mill sites in the Preferred Alternative should have been 345.

the environment would be addressed as part of the Five-Year Review process or through the adaptive management process.

Contingent Sites – Mine and mill sites where limited information is available regarding the potential risk to human health and the environment. EPA has worked with stakeholders and the Upper Basin PFT to gather all available information for these sites including a cooperative field effort conducted in 2011 (CH2M HILL, 2011) to gather additional information at some of the sites and potentially remove them from the Selected Remedy to be included in the forthcoming ROD Amendment. The 42 mine and mill sites shown in Table 1 were removed from the Selected Remedy based on the results of the 2011 Focused Characterization Sampling (CH2M HILL, 2012).

In consideration of comments received by the community and stakeholders on the Proposed Plan, EPA is reducing the scope of the Selected Remedy and is not including all of the remedial actions that were presented in the Preferred Alternative in the Proposed Plan. Therefore, the Selected Remedy is not expected to fully address surface water or groundwater contamination at all locations in the Upper Basin. The Preferred Alternative in the Proposed Plan was also not intended to fully address groundwater contamination. The remedial actions included in the Selected Remedy will result in the achievement of cleanup goals for soil and sediments where actions are taken. Thus, the Selected Remedy is an interim remedy for the Upper Basin. However, the Selected Remedy will address many significant sources of contamination in the Upper Basin and will be adequately protective of human health and the environment within the context of its scope.

The reduction in scope of the forthcoming Upper Basin ROD Amendment from a final remedy to an interim remedy resulted in a need to determine which mine and mill sites will be retained in the Selected Remedy and which sites will be removed. Both active facilities (Table 2) and mine and mill sites where clean up actions have been conducted (Table 3) will be removed from the Selected Remedy. As noted above, there are other regulatory approaches that can be used to address future issues at these sites should they occur. In addition, EPA has reviewed mine and mill sites that were previously categorized as contingent sites to determine if additional sites may be removed. Removal of mine and mill sites from the Selected Remedy is based on lines of evidence that suggest that the potential risk to human health and the environment is relatively low. This will allow the Selected Remedy included in the forthcoming interim ROD Amendment to focus on sites with the greatest risk to human health and the environment in the Upper Basin.

3.0 Contingent Mine and Mill Site Evaluation

Mine and mill sites included in the Preferred Alternative presented in the Proposed Plan that were later categorized as contingent sites were evaluated to assess their potential risk to human health and the environment posed by mining-related contamination.

The initial evaluation of mine and mill sites included review of available site-specific contaminant concentration data for each contingent site. If available data indicated that contaminant concentrations were less than 530 milligrams per kilogram (mg/kg) in soil, sediment, and source materials and/or site-specific surface water concentrations were equal to or less than the ambient water quality criteria, the sites were identified for removal from the Selected Remedy. Sites where soil, sediment, or source material lead concentrations

exceeded 530 mg/kg or site-specific surface water contaminant concentrations were greater than the AWQC were retained for inclusion in the Selected Remedy.

Following the evaluation of site-specific data, available human health exposure information regarding the sites was evaluated. Aerial maps and information gathered during field investigations of mine and mill sites (CH2MHILL, 2012) were evaluated to assess the potential risk of exposure to humans by contact with potentially contaminated materials at each site. Information used to evaluate the potential human health exposure risk at each site included the proximity of the site to residences or residential areas, access to the site, recreational use observed at the site during field visits, mine waste types present at the site, and contaminant concentrations measured at the site. Mine and mill sites were then assigned a human health risk level of none, low, moderate, or high based on the human health risk observations identified above. All sites with a human health risk level of high were retained for inclusion in the Selected Remedy as additional data collection and verification will be needed to ensure that these sites do not pose a significant risk to human health.

Mine and mill sites with human health risk levels of none, low, and moderate or with no human health risk information were then evaluated using the following screening criteria:

Erosion – During field investigations in the Upper Basin, evidence of erosion during site visits has been noted by field teams. In addition, information regarding erosion of mine wastes at some sites was provided by review of Idaho Geological Survey (IGS) reports as well as information provided by Upper Basin PFT members based on their personal knowledge. Mine and mill sites where erosion information was available were assigned an erosion description of no erosion, minimal erosion, moderate erosion, or high erosion.

Riparian Acreage – The U.S. Bureau of Land Management (BLM) developed the original estimated areal extent for the mine and mill sites located within the Upper Basin using their late 1990's field reconnaissance notes and aerial maps. In addition, BLM also estimated the areal extent of riparian areas, floodplains, and stream channels in the general vicinity of mine and mill sites in the Upper Basin. As part of planning activities conducted by EPA, BLM overlaid the maps of areal extent of mine and mill sites and riparian areas to provide a rough estimate of the acreage of riparian, floodplain, and stream channel areas that were contained within mine and mill sites in the Upper Basin. The acreage of riparian, floodplain, and stream channel area located within a site was used as an indicator of the relative potential impact that the site may be having on these habitat areas. Sites with no or minimal riparian acreage were given priority for potential removal from the Selected Remedy.

Downstream Water Quality – With the exception of Canyon and Ninemile Creeks and Operable Unit 2, minimal site-specific water quality data is available for the majority of mine and mill sites located in the Upper Basin. For smaller side tributaries to the South Fork Coeur d'Alene River (SFCDR) water quality information is limited to a small number of samples (typically 1 to 5 samples collected between 1997 and 2008) collected at the mouth of the tributary prior to entering the SFCDR. For the purposes of this evaluation, available site-specific and downstream water quality data were evaluated with respect to AWQC to assess the potential impacts that upstream sites may be having on downstream water quality. Sites with downstream AWQC ratios equal to or below 1.0 were given priority for potential removal from the Selected Remedy.

Location Within Watershed – A number of mine and mill sites identified for cleanup in the Preferred Alternative are located in the upper reaches of watersheds and are not in close proximity to riparian, floodplain, or stream channel areas. The location of each site within its respective watershed and available downstream water quality data were evaluated to assess the potential impact of a site on downstream water quality. Sites located in the upper reaches of the watershed with downstream AWQC ratios were given priority for potential removal from the Selected Remedy.

Volume of Waste Material – Initial volumes and types of mine waste materials present at a site were estimated during the development of the Preferred Alternative. Mine and mill sites estimated to have relatively small volumes (typically 200 cubic yards or less) or relatively low-concentration mine wastes (upland waste rock) were identified. The location of these sites within their respective watersheds and downstream water quality data were used to evaluate the potential for risk to human health and the environment from these sources.

The screening of mine and mill sites using the above criteria focused on identifying those sites with the lowest potential to present a significant risk to human health and the environment. In general, sites identified for removal from the Selected Remedy exhibited one or all of the following characteristics:

- Limited or no documented erosion of source materials
- No or limited riparian, floodplain, or stream channel areas within the site footprint
- Downstream water quality measurements near or below the AWQC for dissolved zinc
- Located in upstream areas of the watershed
- Exhibit small volumes of relatively low-concentration mine wastes

Table 4 presents the 114 sites that met one or more of the above screening criteria and could therefore be considered for removal from the Selected Remedy. Table 4 presents the sites and the associated lines of evidence that were available to support exclusion of these sites from the Selected Remedy.

4.0 Summary

A total of 145 mine and mill sites originally included in the Alternative 3+ of the Preferred Alternative presented in the Proposed Plan will not be included Selected Remedy in the forthcoming Upper Basin ROD Amendment based on the designation of the mine and mill sites as active facilities (Table 2 – 19 sites), prior clean up actions that have been conducted at sites (Table 3 – 25 sites), and available lines of evidence that suggests minimal potential risks to human health and the environment (Table 1 [2011 Field Investigation] – 42 sites and Table 4 – 114 sites). The location of active, remediated, and contingent sites for removal along with sites retained for inclusion in the Selected Remedy (Table 5) are shown in Figures 1 through 4.

While the mine and mill sites in Tables 1 through 4 are not included in the Selected Remedy, it should not be inferred that they do not pose a risk to human health and the environment.

Additional data, similar to that collected during the 2011 field effort, may need to be collected to ensure that these sites do not pose an unacceptable risk. As cleanup actions proceed in the Upper Basin and more information becomes available either through work in specific areas or through ongoing site characterization efforts, it may be necessary to evaluate some of these sites for inclusion in another remedy decision. In addition, as cleanup proceeds and more information becomes available, sites that have not yet been identified may be discovered that pose a risk to human health and the environment and may need to be included in another remedy decision.

5.0 References

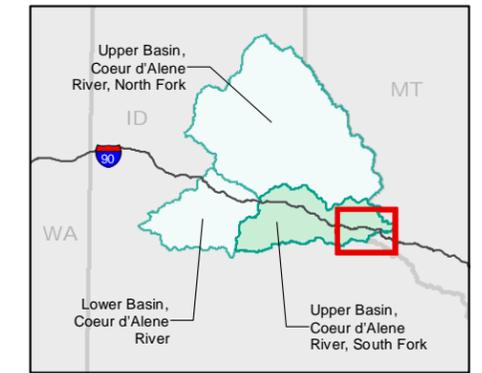
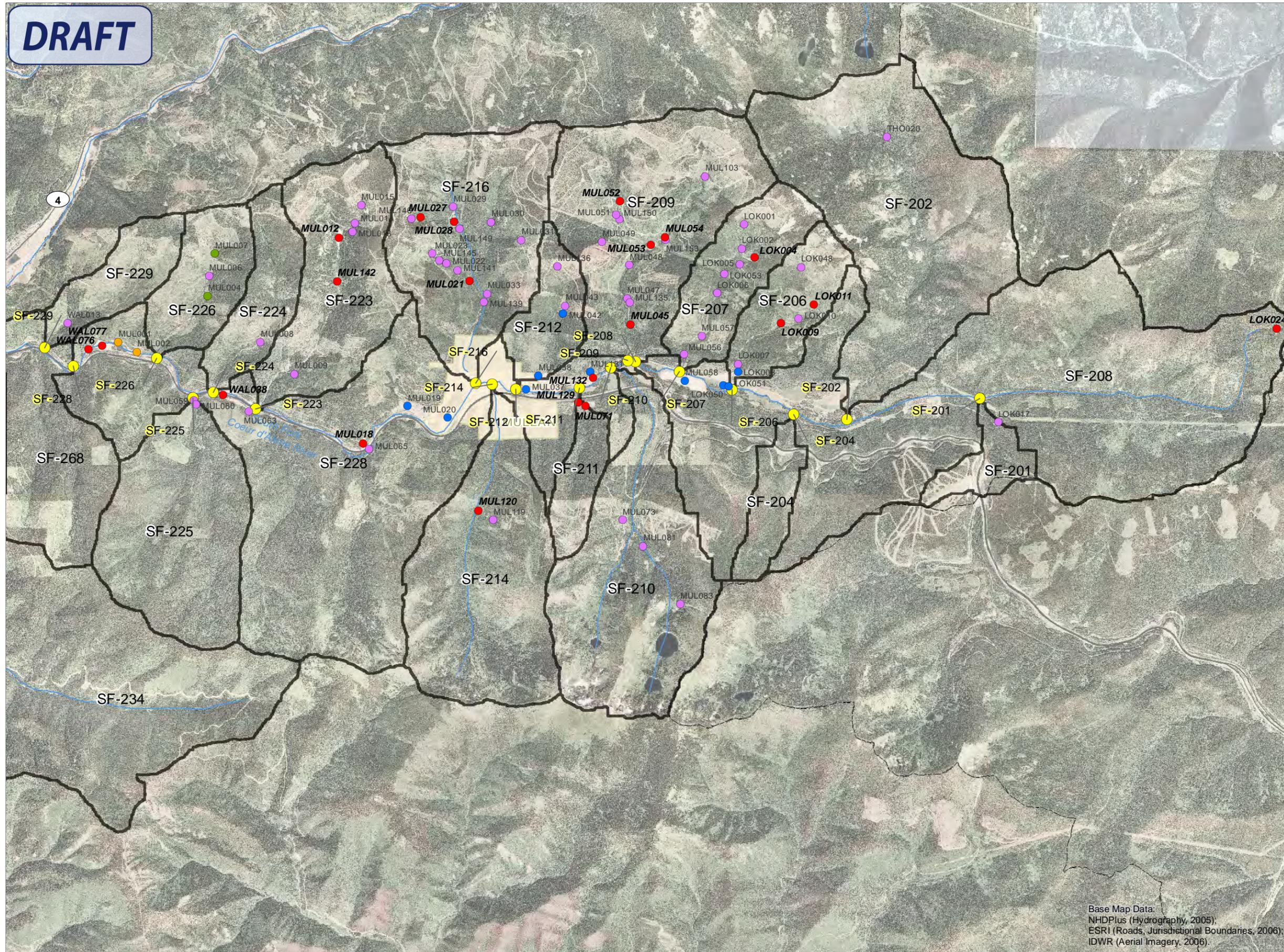
CH2M HILL. March 21, 2012. *Technical Memorandum: Upper Coeur d'Alene Basin 2011 Focused Characterization Sampling; Results from Selected Mine and Mill Sites*. Prepared for U.S. Environmental Protection Agency Region 10.

U. S. Environmental Protection Agency (EPA). September 12, 2002. *Record of Decision, The Bunker Hill Mining and Metallurgical Complex Operable Unit 3*.

U. S. Environmental Protection Agency (EPA). July 12, 2010. *Proposed Plan, Upper Basin of the Coeur d'Alene River, Bunker Hill Mining and Metallurgical Complex Superfund Site*.

Figures

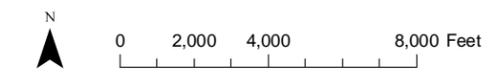
DRAFT



- Active (Removed)
- Likely Low Risk Site (Removed)
- Included in ROD A
- Remediated (Removed)
- Removed 2011 Focused Characterization
- River/Creek
- City Limit
- County Boundary
- Watershed Stations

MUL052 - Sites included in the Remedy

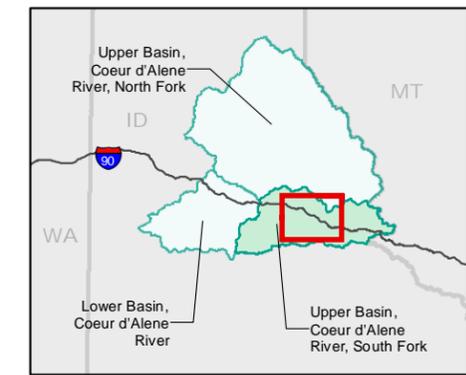
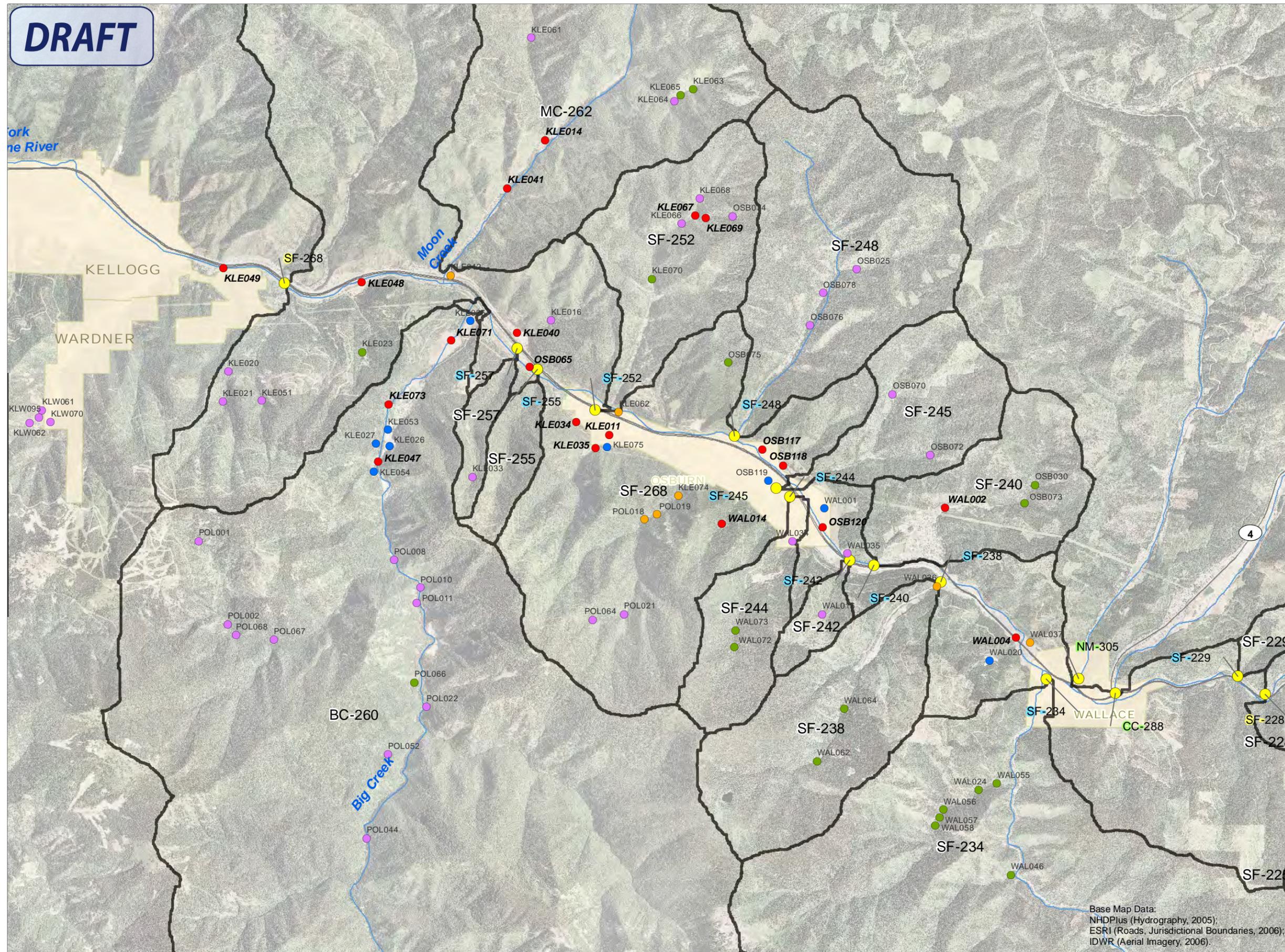
SF-201 ----- 1997 Station ID



Base Map Data:
NHDPlus (Hydrography, 2005);
ESRI (Roads, Jurisdictional Boundaries, 2006);
IDWR (Aerial Imagery, 2006).

Figure 1
Summary of Sites removed
from the ROD Amendment
in the SFCDR (East) watershed
Evaluation of sites removed from the
Forthcoming ROD Amendment

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- Active (Removed)
- Likely Low Risk Site (Removed)
- Included in ROD A
- Remediated (Removed)
- Removed 2011 Focused Characterization
- River/Creek
- City Limit
- County Boundary
- Watershed Stations

WAL002 - Sites included in the Remedy

Main Stem Station
● SF-268 ----- 2008 Station ID

Minor Tributary Station
● SF-229 ----- 1997 Station ID

Major Tributary Station
● NM-305 ----- 2007 Station ID

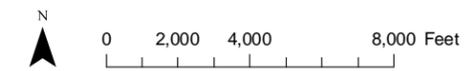
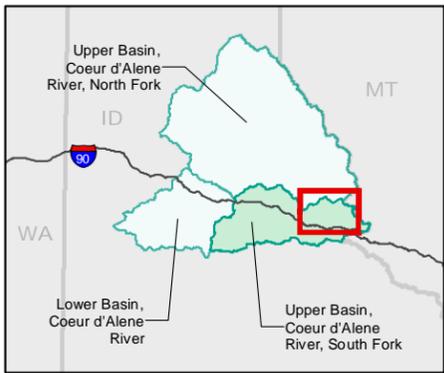
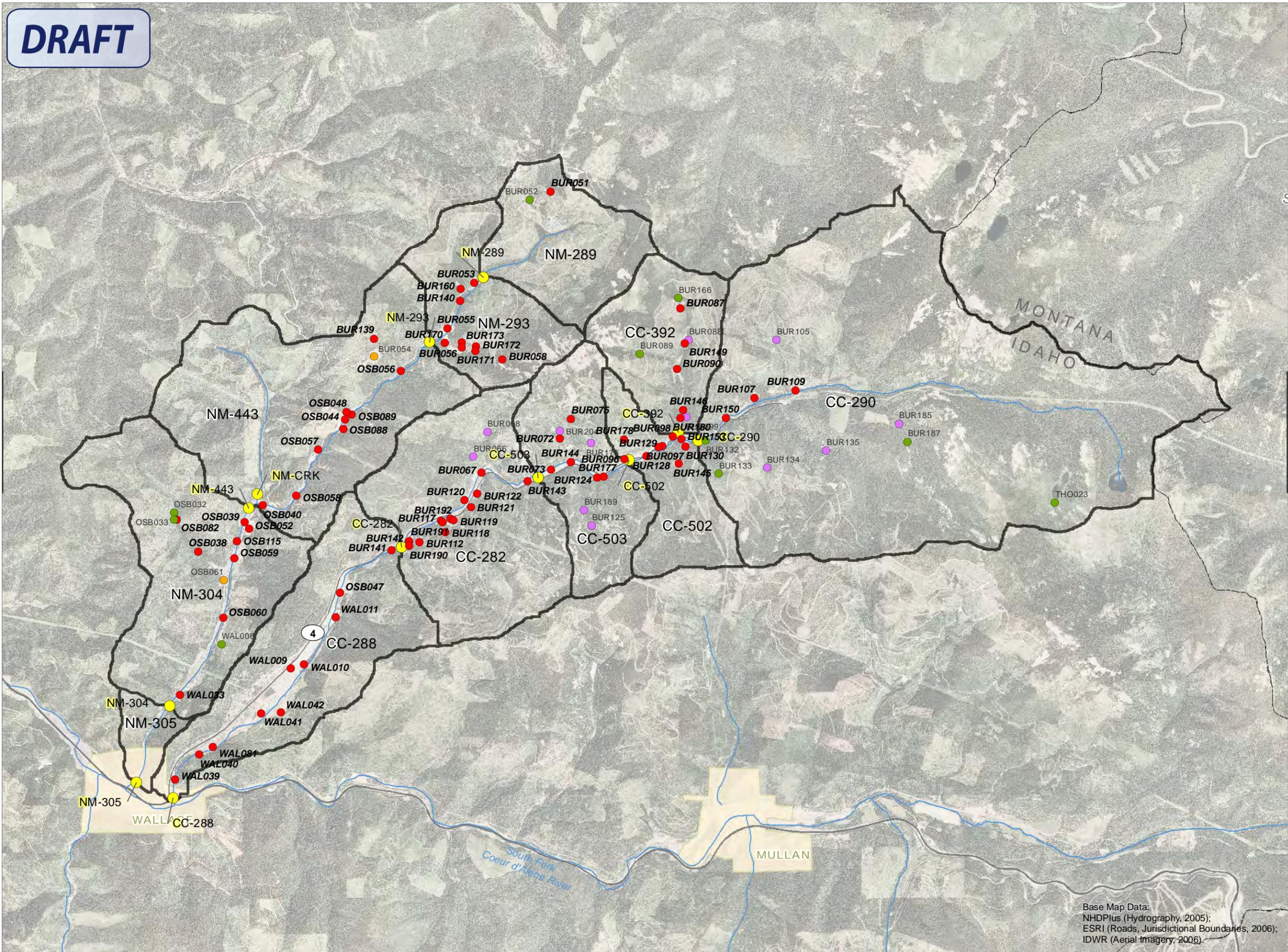


Figure 2
Summary of Sites removed from the ROD Amendment SFCDR (West), Big Creek and Moon Creek Watersheds
Evaluation of sites removed from the Forthcoming ROD Amendment

Base Map Data:
 NHDPlus (Hydrography, 2005);
 ESRI (Roads, Jurisdictional Boundaries, 2006);
 IDWR (Aerial Imagery, 2006).



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- Action Sites**
- Active (Removed)
 - Likely Low Risk Site (Removed)
 - Included in ROD A
 - Remediated (Removed)
 - Removed 2011 Focused Characterization
- River/Creek
- City Limit
- County Boundary
- ▭ Watershed Stations
- BUR705** - Sites included in the Remedy

Main Stem Station
 CC-288 ----- 2008 Station ID

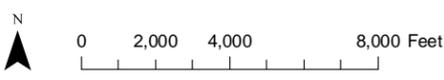
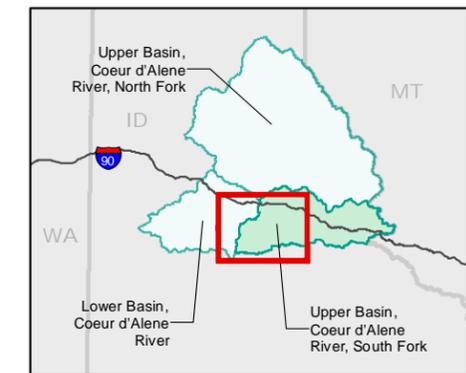
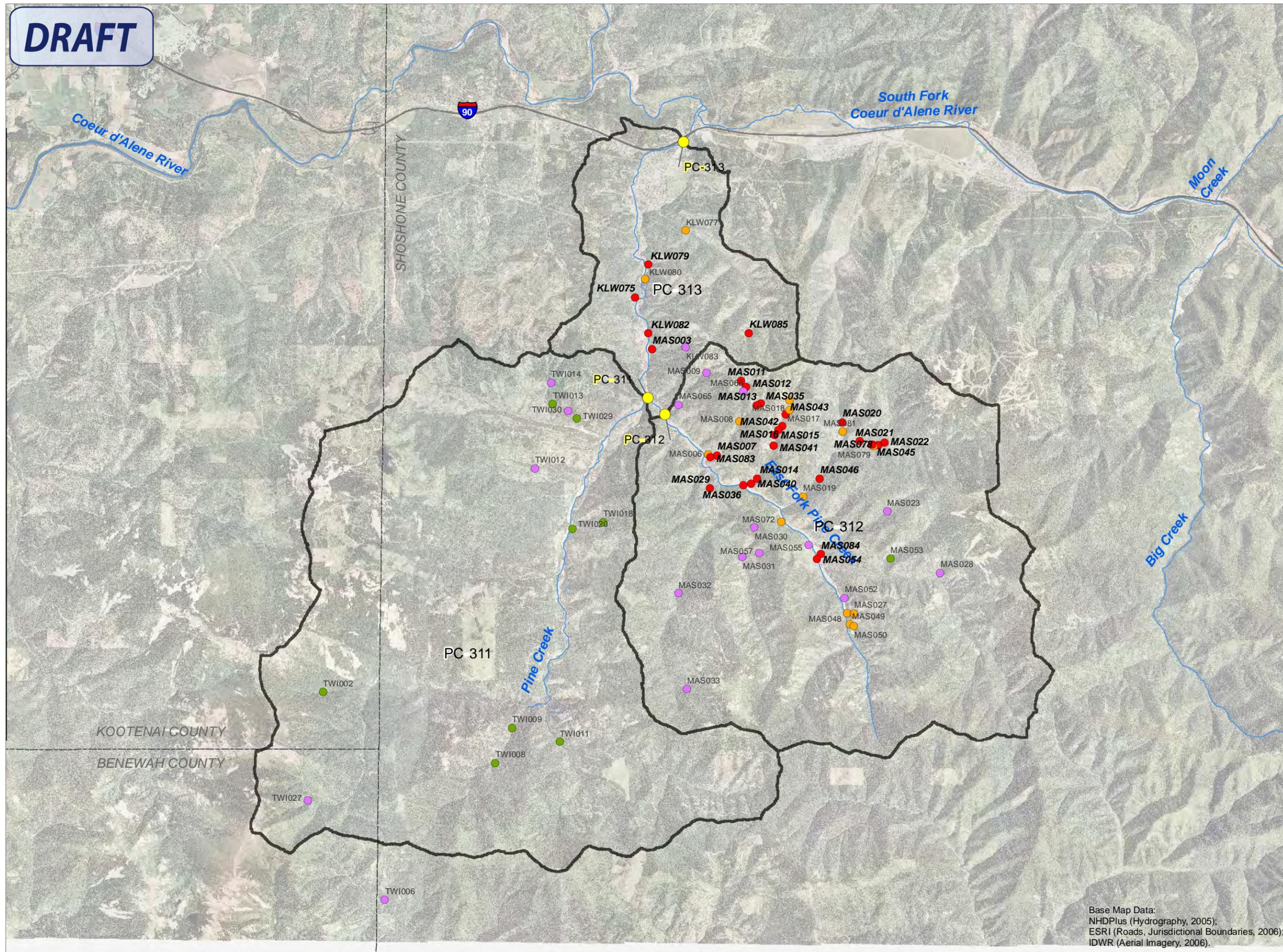


Figure 3
Summary of Sites removed from the ROD Amendment in the Canyon Creek and Ninemile Creek Watersheds
Evaluation of sites removed from the Forthcoming ROD Amendment

Base Map Data:
 NHDPlus (Hydrography, 2005);
 ESRI (Roads, Jurisdictional Boundaries, 2006);
 IDWR (Aerial Imagery, 2006).



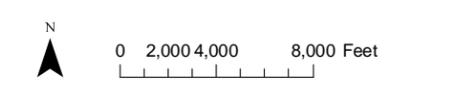
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- Active (Removed)
- Likely Low Risk Site (Removed)
- Included in ROD A
- Remediated (Removed)
- Removed 2011 Focused Characterization
- River/Creek
- ▭ County Boundary
- ▭ City Limit
- ▭ Watershed Stations

BUR705 - Sites included in the Remedy

PC-313 ----- 1997 Station ID



Base Map Data:
NHDPlus (Hydrography, 2005);
ESRI (Roads, Jurisdictional Boundaries, 2006);
IDWR (Aerial Imagery, 2006).

Figure 4
Summary of Sites removed
from the ROD Amendment
in the Pine Creek Watershed
Evaluation of sites removed from the
Forthcoming ROD Amendment

Tables

TABLE 1

Summary of Mine and Mill Sites Not Retained in the Selected Remedy After 2011 Focused Characterization Sampling
Evaluation of Mine and Mill Source Sites for Removal From Forthcoming Upper Basin ROD Amendment, Bunker Hill Superfund Site

BLM Site Number	Source Name	Watershed
POL066	UNNAMED ADIT	Big Creek
BUR089	IDAHO AND EASTERN MINE	Canyon Creek
BUR132	GERTIE MINE	Canyon Creek
BUR133	RUSSEL MINE	Canyon Creek
BUR166	UNNAMED ADIT	Canyon Creek
BUR187	UNNAMED ADIT	Canyon Creek
THO023	UNNAMED ADIT	Canyon Creek
KLE008	MAINE-STANDARD MINE	Moon Creek
KLE063	UNNAMED ADIT	Moon Creek
KLE065	UNNAMED ADITS	Moon Creek
BUR052	LITTLE SUNSET MINE	Ninemile Creek
OSB032	DULUTH MINE BLACKCLOUD CK	Ninemile Creek
OSB033	RUTH MINE	Ninemile Creek
OSB084	BLACKCLOUD CK IMPACTED RIPARIAN	Ninemile Creek
OSB085	BLACKCLOUD CK IMPACTED RIPARIAN	Ninemile Creek
WAL006	NORTHSIDE MINE	Ninemile Creek
MAS053	UNNAMED ADITS	Pine Creek
TWI002	PALISADE MINE LOWER WORKINGS	Pine Creek
TWI008	WEST PINE CREEK DEPOSIT	Pine Creek
TWI009	EQUITABLE PROSPECT	Pine Creek
TWI011	UNNAMED ADIT	Pine Creek
TWI013	BLUEBIRD PROSPECT (HANNIBAL)	Pine Creek
TWI018	UNNAMED PROSPECT	Pine Creek
TWI020	UNNAMED ADIT	Pine Creek
TWI029	UNNAMED ADIT	Pine Creek
KLE023	PIONEER MINES INC. PROPERTY	SFCDR
KLE070	UNNAMED ADIT	SFCDR
MUL004	UNITED LEAD ZINC MINE	SFCDR
MUL007	WONDER MINE	SFCDR
OSB030	SILVERTON PROSPECT UPPER ADIT	SFCDR
OSB073	SILVERTON PROSPECT LOWER ADIT	SFCDR
OSB075	UNNAMED ADIT	SFCDR
WAL024	WAR EAGLE MINE	SFCDR
WAL046	DAY MINES CLAIMS	SFCDR
WAL055	UNNAMED ADIT	SFCDR
WAL056	PEERLESS GROUP (OSCEOLA)	SFCDR
WAL057	PEERLESS GROUP	SFCDR
WAL058	UNNAMED ADIT	SFCDR
WAL062	UNNAMED ADIT	SFCDR
WAL064	UNNAMED ADIT	SFCDR
WAL072	UNNAMED ADIT	SFCDR
WAL073	UNNAMED ADIT	SFCDR

TABLE 2

Active Mine and Mill Sites

Evaluation of Mine and Mill Source Sites for Removal From Forthcoming Upper Basin ROD Amendment, Bunker Hill Superfund Site

BLM site number	Source Name	Watershed
KLE025	Sunshine Tailings Pond No. 2	Big Creek
KLE026	Silver Syndicate	Big Creek
KLE027	North American Mine	Big Creek
KLE053	North American/Silver Syndicate Mine	Big Creek
KLE054	Crescent/Hooper Tunnel	Big Creek
LOK008	Idaho Silver No 2	Daisy Gulch, SF-206
MUL042	Gold Hunter No 5	Deadman Gulch, SF-209
KLE075	Silver Summit Millsite (Polaris)	SFCDR
LOK050	Daisy Gulch Tailings Pond	SFCDR
LOK051	Daisy Gulch Old Landfill	SFCDR
MUL019	Morning No 6	SFCDR
MUL020	Lucky Friday No 3	SFCDR
MUL037	Lucky Friday Tailings Pond No.2	SFCDR
MUL038	Gold Hunter No. 6	SFCDR
MUL058	Lucky Friday Tailings Pond No.1	SFCDR
MUL131	National Millsite	SFCDR
OSB119	Osburn Zanetti Gravel Operation	SFCDR
WAL001	Osburn Tailings Ponds	SFCDR
WAL020	Caladay Mine	SFCDR

Note:

Red font signifies changes made since the 2/29/12 PFT Meeting.

TABLE 3
Remediated Mine and Mill Sites
Evaluation of Mine and Mill Source Sites for Removal From Forthcoming Upper Basin ROD Amendment, Bunker Hill Superfund Site

BLM site number	Source Name	Watershed	Comments and documentation for remedial action
WAL036	Lake Cr Imp Riparian	Lake Creek, SF-238	Identified for remediation by Yards Program 2012-2013
BUR054	Rex No. 2/Sixteen-to-one Mine	Ninemile Creek	Currently monitored under the remedial action effectiveness program. Remedial actions were conducted in 2006 - 2007 and included; removal of on-site debris, re-alignment of Rex-Creek channel and line with rip-rap, consolidation of source materials on-site and cap with clean materials, regrade surface to promote surface water runoff and help new vegetation grow, and build a toe buttress to strengthen the tailings pile.
OSB061	Blackcloud Ck Millsite	Ninemile Creek	Site was largely capped by the yard clean-up program, Currently the capped site is occupied with a residence.
KLW077	General Mine	Pine Creek	Remediated as part of Clean Water Act grant work in Little Pine Creek.
KLW080	Bobby Andersone mine	Pine Creek	Portion of rock dump addressed by road ROW remediation
MAS003	Liberal King Mine and Millsite	Pine Creek	BLM conducted remediation of the portion of this site that is located on Federal land. Site retained in remedy. No work performed on private property portion.
MAS008	Nabob 600 Level (Crystalite)	Pine Creek	BLM conducted remediation consisting of reclaiming/ revegetating the rock dump.
MAS017	Sidney (Denver) 500 Level	Pine Creek	Sidney Mining and the State of Idaho conducted remediation and stabilization on the lower portion of the working along the creek. BLM conducted limited removal of waste material.
MAS018	Denver Mine (Nabob Adit)	Pine Creek	BLM conducted stream work at bottom of site, and installed a cutoff wall to prevent creek from entering Sidney shaft. the waste pile dumps were not included in these remedial actions.
MAS019	Star Antimony Lower Adit	Pine Creek	BLM conducted remedial actions consisting of regrading and revegetation.
MAS027, MAS048, MAS049, MAS050	Constitution Mine and Millsite	Pine Creek	Currently monitored under the remedial action effectiveness program. Remedial actions were conducted in 2006 and included; relocation and consolidation of source materials from the lower segment to the upper segment, stabilization with hydro-seeded and re-vegetated. In addition, surface water controls were installed to control on-site runoff and minimize sediment transport from erosion to East Fork Pine Creek.
MAS072	Unnamed Adit	Pine Creek	BLM conducted rock dump revegetation, and a mine discharge pilot water treatment system, which indicated that adit had high iron and low zinc concentrations.
MAS079	Highland Surprise Lower Rock Dump	Pine Creek	Remedial actions consisting of regrading/ revegetation, and stream armoring were conducted by the BLM.
MAS081	Sidney (Red Cloud) rock dump	Pine Creek	BLM conducted regrading and recontouring and creek realignment.
MAS083 MAS006	Nabob Millsite Tailings Pile	Pine Creek	BLM actions at the millsite primarily consisted with improving mine safety operations, a groundwater drain slurry wall, and capping of tailings.
MAS084	Douglas Minesite Tailings Repository	Pine Creek	BLM EPA conducted tailings removal, and a tailings repository has been completed.
KLE042	Moon Ck Pond At Mouth	SFCDR	Remediated under ICP
KLE062	Osburn Flats USBM Test Plots	SFCDR	Detailed design of the remedial action are complete, and the project has either been conducted recently, or is scheduled in the near future.
KLE074	CDA Mill Site	SFCDR	The CDA Mine and Mill Site were remediated in 2001, and the remedies are functioning as intended by the ROD (5year ROD Review, 2010).
MUL001, MUL002	Golconda Mine and Millsite	SFCDR	Currently monitored under the remedial action effectiveness program. Remedial actions were conducted in 2006 - 2007 and included; design and construction of a water diversion structure to route water through pipes from the site and mine adit (away from existing tailings) and route them to the SFCDR, removal of source materials to an upland area, which was capped and stabilized, and armoring the base of the waste pile along the SFCDR.
POL018	Merger Mine	SFCDR	Work completed by CDA Mines.
POL019	CDA Mne	SFCDR	The CDA Mine and Mill Site were remediated in 2001, and the remedies are functioning as intended by the ROD (5year ROD Review, 2010).
WAL037	Hercules Millsite	SFCDR	Remediated, part of Wallace Yard project.

Notes:
MAS003 retained in remedy. Portion of site on private property has not been addressed
MAS083 retained in remedy. No actions have been taken at the millsite, mine and rockdumps, materials readily accessible to humans
MAS084 retained in remedy. No actions have been taken at the millsite, mine and rockdumps, materials readily accessible to humans
Red font signifies changes made since the 2/29/12 PFT Meeting.

TABLE 4

Contingent Mine and Mill Sites for Removal From Selected Remedy

Evaluation of Mine and Mill Source Sites for Removal From Forthcoming Upper Basin ROD Amendment, Bunker Hill Superfund Site

BLM Site Number	Source Name	Watershed	Low Human Health Exposure Criteria ¹	Low Erosion Potential Criteria ²	Riparian Acreage	Minimal Riparian Acreage Criteria ³	AWQC at Down stream Segment	Downstream Water Quality Criteria ⁴	Upland Area of Watershed Criteria ⁵	Waste Volume (cy)	Small Waste Volume Criteria ⁶	Site Specific Data indicates minimal risk ⁷	Notes
POL001	Sunshine Consolidated Rockford Group	Big Creek	--	--	0	X	0.060	X	X	8,160		X	Waste pile sample indicated low levels of cadmium (1.5 mg/kg). Water quality data from adit, indicates that the discharge is below the AWQC. Site has no riparian acreage, AWQC exceedance ratio for dissolved zinc is less than 1.0 downstream, and is located high up in the watershed.
POL002	Silver Dale & Big Hill Mine	Big Creek	--	--	0.68	X	0.060	X	X	1,700			Site is located in the communities of Big Creek and Sunshine drinking water source areas. Site contains 0.68 acres of riparian habitat, and AWQC exceedance ratio for dissolved zinc is less than 1.0 downstream.
POL008	Globe Mine	Big Creek	--	--	0.34	X	0.060	X		8,160			Limited riparian habitat (0.34 acres) and AWQC exceedance ratio for dissolved zinc is less than 1.0 downstream.
POL010	Western Star Mine	Big Creek	--	--	0.19	X	0.060	X		4,560			Limited riparian area (0.19 acres), and AWQC exceedance ratio for dissolved zinc is less than 1.0 downstream.
POL011	Wolfson Mine	Big Creek	--	--	0.13	X	0.060	X	X	3,120			Limited riparian area (0.13 acres), and AWQC exceedance ratio for dissolved zinc is less than 1.0 downstream. In addition, site is located far up in the watershed.
POL022	First National Mine	Big Creek	--	--	0.85	X	0.060	X	X	4,600		X	Idaho Geologic Survey collected waste dump and adit samples (arsenic 210 mg/kg, cadmium 2.2 mg/kg, and copper 26 mg/kg). Adit discharge was below AWQC. Site has limited riparian area (0.85 acres), and AWQC exceedance ratio for dissolved zinc is less than 1.0 downstream.
POL044	Unnamed Prospect	Big Creek	--	--	0.30	X	0.060	X	X	200	X		Limited riparian area (0.30 acres), low waste volume (200 cy), and AWQC exceedance ratio for dissolved zinc is less than 1.0 downstream. In addition, site is located far up in the watershed.
POL052	Lucky Boy Mine	Big Creek	--	--	0.14	X	0.060	X		4,600		X	Idaho Geologic Survey sampled the waste dump. Lead concentrations were low (120 mg/kg). Limited riparian area (0.14 acres), and AWQC exceedance ratio for dissolved zinc is less than 1.0 downstream.
POL067	Unnamed Adit	Big Creek	--	--	0	X	0.060	X		0	X	X	Remedial Action TCD has a passive treatment component. The adit discharge has low dissolved zinc concentrations (<0.01 mg/L). Site has no riparian area, low waste volume, and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0.
POL068	Unnamed Adit	Big Creek	--	--	0.20	X	0.060	X	X	200	X		Limited riparian area (0.20 acres), low waste volume (200 cy), and AWQC exceedance ratio for dissolved zinc is less than 1.0 downstream. In addition, site is located far up in the watershed.
BUR066	Moonlight Mine	Canyon Creek	X	X	0.30	X	10.2			7,000			Site has low risk of human exposure, no observed erosion potential, and limited riparian areas (0.3 acres).
BUR068	Headlight Mine	Canyon Creek	X	X	0	X	10.2		X	12,000			Site has no risk of human exposure, moderate erosion potential, no riparian area, and is located high up in the watershed.
BUR105	Oom Paul No. 2	Canyon Creek	X	X	0.27	X	0.110	X	X	6,500			Site has a low risk of human exposure, no observed erosion potential, minimal riparian area (0.27 acres), is located high up in the watershed, and the downstream dissolved zinc AWQC exceedance ratio is less than 1.0.
BUR125	Midway Summit Mine	Canyon Creek	--	--	0		3.06		X	8,000			Site has no riparian acreage, and is located high up in the watershed.
BUR134	Alcides Prospect & Imperial Mine	Canyon Creek	--	--	0	X	0.110	X	X	14,400			Site contains no riparian area, is located high up in the watershed, and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0.
BUR135	Sonora Mine	Canyon Creek	--	--	0.58	X	0.110	X		200	X		Site has a small waste volume (200 cy), limited riparian area (0.58 acres), is located high up in the watershed, and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0.
BUR176	Unnamed Adit	Canyon Creek	--	--	0.56	X	3.06			200	X		Site has a small waste volume (200 cy), and limited riparian area (0.56 acres).
BUR185	West Mammoth Mine	Canyon Creek	--	--	0.31	X	0.110	X	X	200	X		Site has a small waste volume (200 cy), limited riparian area (0.31 acres), is located high up in the watershed, and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0.
BUR189	Duluth Mine Canyon Ck	Canyon Creek	--	--	0	X	3.06		X	200	X		Site has a small waste volume (200 cy), no riparian area, is located high up in the watershed.
BUR204	Unnamed Rock Dump	Canyon Creek	--	--	0.19	X	3.06		X	200	X		Site has a small waste volume (200 cy), limited riparian area (0.19 acres), and is located high up in the watershed.
BUR088	Ajax No. 2	Canyon Creek Tributary (Gorge Gulch)	--	--	0	X	1.54	X		0			Proposed remedial action includes an active treatment component, although no water quality data from the adit discharge is available. The site has no riparian area, and downstream AWQC exceedance ratio for dissolved zinc is less than 1.6.
BUR099	Benton Mine	Canyon Creek Tributary (Gorge Gulch)	--	--	0	X	1.54	X		0			Proposed remedial action includes an active treatment component, although no water quality data from the adit discharge is available. The site has no riparian area, and downstream AWQC exceedance ratio for dissolved zinc is less than 1.6.
KLE061	Unnamed Tunnel	Moon Creek	--	--	0.10	X	1.35	X		200	X		Site has a small waste volume (200 cy), limited riparian area (0.1 acres), and downstream AWQC exceedance ratio for dissolved zinc is less than 1.5.
KLE064	Unnamed Adit	Moon Creek	--	--	0.10	X	1.35	X	X	200	X		Site has a small waste volume (200 cy), limited riparian area (0.1 acres), and downstream AWQC exceedance ratio for dissolved zinc is less than 1.5.
KLW077	General Mine	Pine Creek	--	--	0.4	X	1.68		X	11,040			Site has limited riparian area (0.40 acres), and is located high up in the watershed.
KLW083	Liberal King Part of Tunnel No 2	Pine Creek	--	--	0.58		1.68		X	13,920			Site has limited riparian area (0.58 acres), is located high up in the watershed.
MAS009	Shetland Mining Co/Nabob Silver-Lead	Pine Creek	--	--	0.31	X	5.75		X	7,440			Site has limited riparian area (0.31 acres), and is located high up in the watershed.
MAS023	Blue Eagle Mine	Pine Creek	--	--	0.35		5.75		X	1000			Site has limited riparian area (0.35 acres), and is located high up in the watershed.
MAS028	Lon Cheney Group	Pine Creek	--	--	0.45	X	5.75		X	10,800			Site has limited riparian area (0.45 acres), is located high up in the watershed.
MAS029	Big It Mine	Pine Creek	--	--	0.22	X	5.75		X	700	X		Site has limited riparian area (0.22 acres), and is located high up in the watershed.
MAS030	Trapper Creek Silver	Pine Creek	--	--	0.28	X	5.75		X	6,720			Site has limited riparian area (0.28 acres), and is located high up in the watershed.
MAS031	Trapper Mining & Smelting	Pine Creek	--	--	0.18	X	5.75		X	4,320			Site has limited riparian area (0.18 acres), and is located high up in the watershed.
MAS032	L&J Prospect	Pine Creek	--	--	0.27	X	5.75		X	80	X		Site has limited riparian area (0.27 acres), low waste volume (80 cy), and is located high up in the watershed.
MAS033	CDA Premiere	Pine Creek	--	--	0.20	X	5.75		X	4,800			Site has limited riparian area (0.20 acres), and is located high up in the watershed.
MAS052	Owl/Fred Mine	Pine Creek	--	--	0.22	X	5.75		X	5,280			Site has limited riparian area (0.22 acres), and is located high up in the watershed.
MAS055	Unnamed Adit	Pine Creek	--	--	0	X	5.75		X	200	X		Site has no riparian area, has a small waste volume (200 cy), and is located high up in the watershed.
MAS057	Unnamed Adit	Pine Creek	--	--	0.17	X	5.75		X	200	X		Site has a small waste volume (200 cy), limited riparian area (0.17 acres), and is located high up in the watershed.
MAS065	Unnamed Prospect	Pine Creek	--	--	0.20	X	5.75		X	200	X		Site has a small waste volume (200 cy), limited riparian area (0.20 acres), and is located high up in the watershed.
MAS068	Unnamed Adit	Pine Creek	--	--	0.16	X	5.75		X	200	X		Site has a small waste volume (200 cy) and limited riparian area (0.16 acres).

TABLE 4

Contingent Mine and Mill Sites for Removal From Selected Remedy

Evaluation of Mine and Mill Source Sites for Removal From Forthcoming Upper Basin ROD Amendment, Bunker Hill Superfund Site

BLM Site Number	Source Name	Watershed	Low Human Health Exposure Criteria ¹	Low Erosion Potential Criteria ²	Riparian Acreage	Minimal Riparian Acreage Criteria ³	AWQC at Down stream Segment	Downstream Water Quality Criteria ⁴	Upland Area of Watershed Criteria ⁵	Waste Volume (cy)	Small Waste Volume Criteria ⁶	Site Specific Data indicates minimal risk ⁷	Notes
TWI006	Manhattan Mine	Pine Creek	--	--	0	X	0.0657	X		4,800			Site has no riparian area, and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0.
TWI012	KC Prospect	Pine Creek	--	--	0.16	X	0.0657	X		3,840			Site has limited riparian area (0.16 acres), and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0.
TWI014	Great Dunkard Mine	Pine Creek	--	--	0.25	X	0.0657	X	X	6,000			Site has limited riparian area (0.25 acres), is located high up in the watershed, and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0.
TWI027	Unnamed Prospect	Pine Creek	--	--	0	X	0.0657	X		200	X		Site has no riparian area, low waste volume (200 cy), and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0.
TWI030	Unnamed Adit	Pine Creek	--	--	0	X	0.0657	X		200	X		Site has no riparian area, low waste volume (200 cy), and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0.
KLE016	Syndicate Mining	SFCDR	--	--	0.62	X	8.70			200	X		Site has a small waste volume (200 cy) and limited riparian area (0.62 acres).
KLE020	New Hilarity Mine	SFCDR	--	--	0	X	8.70		X	36,000			Site has no riparian area and is located far up in the watershed.
KLE021	Alhambra Mine	SFCDR	--	--	0	X	8.70		X	200	X		Site has no riparian area and is located far up in the watershed.
KLE051	Florence Mine	SFCDR	--	--	0	X	8.70		X	200	X		Site has no riparian area and is located far up in the watershed.
MUL063	Gem State Mine	SFCDR	X	X	0	X	1.41			5,040			Site has moderate risk for human exposure, no observed erosion potential, and no riparian area.
MUL065	Moe Mine	SFCDR	X	X	0	X	1.41			7,440			Site has moderate risk for human exposure, no observed erosion potential, and no riparian area.
POL021	Eclipse Mine	SFCDR	--	--	0.66	X	8.70		X	200	X		Site has a small waste volume (200 cy), limited riparian area (0.66 acres), and is located far up in the watershed.
POL064	Unnamed Adit	SFCDR	--	--	0	X	8.70		X	200	X		Site has small waste volume (200 cy), no riparian area, and is located far up in the watershed.
WAL035	Osburn Rockpit Along I-90	SFCDR	X	X	4.79		8.70			140,000			The rock pit was not a developed mineral site, there is no risk of human exposure, and there is low potential for erosion.
WAL016	Argentine Mine	SFCDR Tributary (Argentine Gulch, SF-242)	--	--	0.48	X	0.128	X		200	X		Site has a small waste volume (200 cy), limited riparian area (0.48 acres), and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0.
MUL119	Unnamed Adit	SFCDR Tributary (Boulder Creek, SF-214)	--	--	0.28	X	0.0767	X		200	X		Site has a small waste volume (200 cy), limited riparian area (0.28 acres), and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0.
LOK007	Butte & CDA (Idaho Silver)	SFCDR Tributary (Daisy Gulch, SF-206)	--	--	0.27	X	0.0310	X		6,480			Idaho Geologic Survey data review indicates that the mineral production of the mine was uncertain. Site has limited riparian area (0.27 acres), and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0.
LOK010	Hash House Mine	SFCDR Tributary (Daisy Gulch, SF-206)	--	--	0.27	X	0.0310	X		3,360			Processing of the mine rock was not done at this site and was done primarily at the bottom of the gulch. Site has limited riparian area (0.27 acres).
LOK048	Snowstorm Apex	SFCDR Tributary (Daisy Gulch, SF-206)	X	X	0.27	X	0.0310	X		6,480			Mine was primarily a copper ore producer, processing did not occur onsite, and was done at LOK008. Site has low human health exposure, moderate erosion potential, limited riparian area (0.27 acres), and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0.
MUL047	Lottie L. Mine	SFCDR Tributary (Deadman Gulch, SF-209)	X	X	0.23	X	0.0181	X		5,520			Site has low risk of human exposure, no observed erosion potential, limited riparian area (0.23 acres), and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0.
MUL048	Alma Mine	SFCDR Tributary (Deadman Gulch, SF-209)	X	X	0.68	X	0.0181	X		21,360			Site has low risk of human exposure, moderate erosion potential, limited riparian area (0.68 acres), and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0.
MUL049	Copper Plate Mine	SFCDR Tributary (Deadman Gulch, SF-209)	--	--	0.30	X	0.0181	X		7,200			Site has limited riparian area (0.30 acres), and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0.
MUL051	Pilot Mine	SFCDR Tributary (Deadman Gulch, SF-209)	X	X	0.65	X	0.0181	X		28,800			Site has low risk of human exposure, moderate erosion potential, limited riparian area (0.65 acres), and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0.
MUL103	Missoula Mine	SFCDR Tributary (Deadman Gulch, SF-209)	X		0	X	0.0181	X		6,300			Site has low risk of human exposure, no riparian area, and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0.
MUL135	Unnamed Adit	SFCDR Tributary (Deadman Gulch, SF-209)	--	--	0.18	X	0.0181	X		200	X		Site has limited riparian area (0.18 acres), low waste volume (20 cy), and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0.
MUL150	Deadman Gulch Imp Riparian	SFCDR Tributary (Deadman Gulch, SF-209)	--	--	3.02	X	0.0181	X		15,100			Site has limited riparian area (3.02 acres), and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0.
MUL153	Deadman Gulch Imp Riparian	SFCDR Tributary (Deadman Gulch, SF-209)	--	--	1.52	X	0.0181	X		7,600			Site has limited riparian area (1.52 acres), and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0.
WAL013	Granada Mine	SFCDR Tributary (Dexter Gulch, SF-229)	X	X	0.34	X	0.204	X		8,160			Site has low risk of human exposure, no observed erosion potential, limited riparian area (0.34 acres), and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0.
LOK001	Lucky Calumet No 1	SFCDR Tributary (Gentle Annie Gulch, SF-207)	--	--	0	X	0.108	X		30,960			Idaho Geologic Survey data review indicates that mine was primarily used for copper ore production. In addition, site has no riparian area, and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0.
LOK002	Lucky Calumet No 2	SFCDR Tributary (Gentle Annie Gulch, SF-207)	--	--	0.95	X	0.108	X		30,480			Site has limited riparian area (0.95 acres), and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0.
LOK005	Lucky Boy No 2	SFCDR Tributary (Gentle Annie Gulch, SF-207)	--	--	0.18	X	0.108	X		4,320			Site has limited riparian area (0.18 acres), and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0.
LOK006	Lucky Boy No 1	SFCDR Tributary (Gentle Annie Gulch, SF-207)	X	X	0.17	X	0.108	X		6,240			Site has low risk of human exposure, no observed erosion potential, limited riparian area (0.17 acres), and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0.
LOK053	Unnamed Adit	SFCDR Tributary (Gentle Annie Gulch, SF-207)	--	--	0.31	X	0.108	X		200	X		Site has a small waste volume (200 cy), limited riparian area (0.31 acres), and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0.
MUL056	Coughlin Mine	SFCDR Tributary (Gentle Annie Gulch, SF-207)	--	--	0	X	0.108	X		8,400			Site has no riparian area, and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0.
MUL057	Butte & CDA Mine	SFCDR Tributary (Gentle Annie Gulch, SF-207)	--	--	0	X	0.108	X		18,960			Site has no riparian area, and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0.
MUL043	Silver Reef Mine	SFCDR Tributary (Gold Hunter Gulch, SF-212)	--	--	0.63	X	0.0646	X		17,520			Site has limited riparian area (0.63 acres), and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0.
MUL136	Unnamed Adit	SFCDR Tributary (Gold Hunter Gulch, SF-212)	--	--	0	X	0.0646	X		200	X		Site has no riparian area, low waste volume (200 cy), and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0.

TABLE 4

Contingent Mine and Mill Sites for Removal From Selected Remedy

Evaluation of Mine and Mill Source Sites for Removal From Forthcoming Upper Basin ROD Amendment, Bunker Hill Superfund Site

BLM Site Number	Source Name	Watershed	Low Human Health Exposure Criteria ¹	Low Erosion Potential Criteria ²	Riparian Acreage	Minimal Riparian Acreage Criteria ³	AWQC at Down stream Segment	Downstream Water Quality Criteria ⁴	Upland Area of Watershed Criteria ⁵	Waste Volume (cy)	Small Waste Volume Criteria ⁶	Site Specific Data indicates minimal risk ⁷	Notes
MUL009	Silver Shaft	SFCDR Tributary (Grouse Gulch, SF-223)	--	--	0	X	11.4			6,000			Site has no riparian area.
MUL013	We Like Mine	SFCDR Tributary (Grouse Gulch, SF-223)	--	--	0	X	11.4			12,720			Site has no riparian area. BLM performed rock stabilization of rock dump and water treatment pilot.
MUL014	Grouse Mine	SFCDR Tributary (Grouse Gulch, SF-223)	--	--	0.33	X	11.4			7,920		X	Adit water quality data indicates that the dissolved zinc concentration is low (0.84 mg/L). The selected remedial action contains an active treatment component. Site has limited riparian area (0.33 acres).
MUL015	West Star Mine	SFCDR Tributary (Grouse Gulch, SF-223)	--	--	0	X	11.4			23,000			Site has no riparian area.
THO020	Bullfrog Mine	SFCDR Tributary (Little North Fork, SF-202)	--	--	0	X	0.102	X		6,960			Site has no riparian area, and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0.
MUL022	Sunshine Premiere	SFCDR Tributary (Mill Creek, SF-216)	X	X	0.32	X	0.0231	X		8,400			Site has no human health exposure, moderate erosion potential, limited riparian area (0.32 acres), and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0.
MUL023	Fanny Gremm Mine	SFCDR Tributary (Mill Creek, SF-216)			0	X	0.0231	X		31,200			Site has no riparian area, and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0.
MUL029	North Franklin Mine	SFCDR Tributary (Mill Creek, SF-216)	X	X	0.63	X	0.0231	X		20,400			Site has moderate human health exposure potential, moderate erosion potential, limited riparian area (0.63 acres), and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0.
MUL030	Wall Street Mine	SFCDR Tributary (Mill Creek, SF-216)	X		0	X	0.0231	X		8,640			Site has no human health exposure, no riparian area, and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0.
MUL031	Cincinnati Mine	SFCDR Tributary (Mill Creek, SF-216)	X	X	0	X	0.0231	X		8,160			Site has no human health exposure, no observed erosion potential, no riparian area, and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0.
MUL033	American Commander No 2	SFCDR Tributary (Mill Creek, SF-216)	X	X	0.46		0.0231	X		15,840			Site has low human health exposure potential, moderate erosion potential, and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0.
MUL139	Unnamed Adit	SFCDR Tributary (Mill Creek, SF-216)	--	--	0.24	X	0.0231	X		200	X		Site has small waste volume (200 cy), limited riparian area (0.24 acres), and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0.
MUL141	Mill Ck Imp Riparian No 3	SFCDR Tributary (Mill Creek, SF-216)	--	--	1.93	X	0.0231	X		9,650			Site has limited riparian area (1.93 acres), and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0.
MUL145	Mill Ck Imp Riparian No 2	SFCDR Tributary (Mill Creek, SF-216)	--	--	0	X	0.0231	X		4,200			Site has no riparian area, and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0.
MUL146	Morning No. 3	SFCDR Tributary (Mill Creek, SF-216)	--	--	0	X	0.0231	X		31,440			Site has no riparian area, and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0.
MUL149	Mill Creek Impacted Riparian No. 1	SFCDR Tributary (Mill Creek, SF-216)	--	--	1.13	X	0.0231	X		5,650			Site has limited riparian area (1.13 acres), and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0.
OSB070	Silverore-Inspiration Mine	SFCDR Tributary (Nichols Gulch, SF-245)	--	--	1.3	X	0.132	X		31,000			Site has limited riparian area (1.3 acres), and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0.
OSB072	Western Union Upper Adit	SFCDR Tributary (Nichols Gulch, SF-245)	X		0.23	X	0.132	X		200	X		Site has low human health exposure potential, limited riparian area (0.23 acres), and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0.
MUL085	Vienna Intl Mine	SFCDR Tributary (Placer Creek, SF-234)	X	X	0.37	X	0.0335	X		200	X		Site has low human health exposure potential, moderate erosion potential, limited riparian area (0.37 acres), low waste volume (200 cy), and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0.
MUL086	Wibberding-Golden Slipper	SFCDR Tributary (Placer Creek, SF-234)	X	X	0	X	0.0335	X		30,000			Site has no human health exposure potential, no observed erosion potential, no riparian area, and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0.
MUL059	Rock Creek Mine Rock Dump	SFCDR Tributary (Rock Creek, SF-225)	X	X	0.94	X	1.41	X		22,560			Site has moderate human exposure potential, moderate erosion potential, limited riparian area (0.94 acres), and downstream AWQC exceedance ratio is less than 1.5.
MUL060	Rock Creek Mine	SFCDR Tributary (Rock Creek, SF-225)	--	--	0.21	X	0.0359	X		5,040			Site has limited riparian area (0.21 acres), and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0.
MUL008	Alice Mine	SFCDR Tributary (Ruddy Gulch, SF-224)		X	1.1	X	0.0445	X		33,000		X	IGS waste samples are available indicating that this site is not a risk. In addition the site has low erosion potential, far up in the watershed, limited riparian area (1.1 acres), and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0.
WAL034	Shields Gulch Imp Riparian	SFCDR Tributary (Shields Gulch, SF-244)	--	--	6.08	X	0.0201	X		78,000			Site has limited riparian area (6.08 acres), and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0.
KLE066	Rhode Island No 1 & 2 & assoc adits	SFCDR Tributary (Terror Gulch, SF-252)	--	--	0.38	X	0.224	X		200	X		Site has small waste volume (200 cy), and limited riparian area (0.38 acres) and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0.
KLE068	St Joe No 2	SFCDR Tributary (Terror Gulch, SF-252)	--	--	0.21	X	0.224	X		14,000		X	Idaho Geologic Survey sampled the waste dump. Lead concentrations ranged from 84 - 390 mg/kg. In addition, the site has limited riparian area (0.21 acres), and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0.
OSB074	St. Joe No. 1	SFCDR Tributary (Terror Gulch, SF-252)	--	--	0	X	0.224	X		0	X		Remedial action contains passive treatment, and the site has low waste volume. Location of adit is potentially in the St. Joe river watershed.
MUL006	Square Deal Mine	SFCDR Tributary (Trowbridge Gulch, SF-226)	--	--	0.13	X	0.109	X		17,520			Site has limited riparian area (0.13 acres), and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0.
OSB076	Unnamed Adit (May Claim)	SFCDR Tributary (Twomile Creek, SF-248)	--	--	0.18	X	0.067	X		200	X		Site has limited riparian area (0.18 acres), low waste volume (200 cy), and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0.
OSB078	Unnamed Adit (Hardscrabble Claim)	SFCDR Tributary (Twomile Creek, SF-248)	X	X	0.08	X	0.067	X		200	X		Site has moderate potential for human exposure, moderate erosion potential, limited riparian area (0.08 acres), low waste volume (200 cy), and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0.
LOK017	Beacon Light	SFCDR Tributary (Unknown, SF-201)		X	0	X	0.178	X		31,000			Site has high human access, no observed potential for erosion, no riparian area, and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0. In addition, the IGS exploration Wallace Museum indicates that this mine was an ore producer.
MUL073	Atlas Mine (Carbonate Hill)	SFCDR Tributary (Willow Creek, SF-210)	--	--	0	X	0.0490	X		560	X	X	Idaho Geologic Survey data indicates that the waste pile is primarily an asbestos pile. Site has no riparian area, and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0.
MUL081	Reindeer Queen Mine	SFCDR Tributary (Willow Creek, SF-210)	X	X	0.76	X	0.0490	X		8,000		X	Site has moderate human exposure potential, moderate erosion potential, limited riparian acreage (0.76 acres), and IGS -waste dump samples indicate minimal risk.
MUL083	Copper Queen Mine	SFCDR Tributary (Willow Creek, SF-210)	X	X	0.64	X	0.0490	X		15,360			Idaho Geologic Survey data indicates that this mine was an extensively developed copper mine. Site has low human health exposure potential, no observed erosion potential, and limited riparian area (0.64 acres), and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0.
OSB025	Capitol Silver Lead No 3	SFCDR Tributary (Twomile Creek)	X	X	0.5	X	0.067	X		12,000			Site has low human health exposure potential, no observed erosion potential, limited riparian area (0.5 acres), and downstream AWQC exceedance ratio for dissolved zinc is less than 1.0.

TABLE 4

Contingent Mine and Mill Sites for Removal From Selected Remedy

Evaluation of Mine and Mill Source Sites for Removal From Forthcoming Upper Basin ROD Amendment, Bunker Hill Superfund Site

BLM Site Number	Source Name	Watershed	Low Human Health Exposure Criteria ¹	Low Erosion Potential Criteria ²	Riparian Acreage	Minimal Riparian Acreage Criteria ³	AWQC at Down stream Segment	Downstream Water Quality Criteria ⁴	Upland Area of Watershed Criteria ⁵	Waste Volume (cy)	Small Waste Volume Criteria ⁶	Site Specific Data indicates minimal risk ⁷	Notes
KLE033	Polaris Mine	SFCDR Tributary (Unknown, SF-257)	--	--	1.6	X	0.05	X	X	25,000			Site has limited riparian acreage (1.6 acres), is located far up in the watershed, and downstream AWQC exceedence ratio for dissolved zinc is less than 1.0.
KLW061	BH No. 2	SFCDR	--	--						333,120			Additional site characterization is needed to determine risk posed to human health and the environment. If, upon further analysis, actions are determined to be warranted, they could be implemented through the existing ROD for OU 2.
KLW062	Bluebird Mine and Guy Cave Area	SFCDR	--	--						51,120			Additional site characterization is needed to determine risk posed to human health and the environment. If, upon further analysis, actions are determined to be warranted, they could be implemented through the existing ROD for OU 2.
KLW070	Milo Creek Impacted Riparian No. 1	SFCDR	--	--						9,350			Additional site characterization is needed to determine risk posed to human health and the environment. If, upon further analysis, actions are determined to be warranted, they could be implemented through the existing ROD for OU 2.
KLW095	Phil Sheridan Mine	SFCDR	--	--						19,680			Additional site characterization is needed to determine risk posed to human health and the environment. If, upon further analysis, actions are determined to be warranted, they could be implemented through the existing ROD for OU 2.

Notes:

-- Site was not evaluated for human health exposure or erosion potential

1 Human Health Exposure Criteria – An “X” indicates that the results of analyzing GIS coverages and information gathered during field investigations of mine and mill sites (CH2MHILL, 2011) that human health risk observations were available were assigned a human health risk level of none, low, or moderate.

2 Erosion Potential Criteria – An “X” indicates that erosion potential, determined during field investigations in the Upper Basin, was observed to have no erosion potential, minimal erosion potential, or moderate erosion potential

3 Riparian Acreage Criteria– An “X” indicates that there is minimal riparian area associated with the site.

4 Downstream Water Quality Criteria – An “X” indicates that site-specific water quality data (specifically the dissolved zinc AWQC exceedence ratio) indicates that downstream water quality data do not appear to be impacted by upstream sites. The AWQC exceedence ratio was calculated using the 1997 low flow dataset for the SFCDR, Big Creek, Moon Creek, and Pine Creek

5 Location Within Watershed – An “X” , indicates that the site is located in the upper reaches of watershed outside of riparian, floodplain, or stream channel areas in the upper reaches of their watersheds

6 Volume of Waste Material – An “X” indicates that the initial volumes and types of mine waste materials present at a site were estimated during the development of the preferred alternative. Sites estimated to have relatively small volumes (typically 200 cubic yards or less) or relatively low-concentration mine wastes (upland waste rock) were identified

7 Additional Site-Specific Information – An “X” indicates that, contaminant concentrations, site-specific water quality data, and information from field visits were available for sites and that the data was used to evaluate the potential risk to human health and the environment from the site

TABLE 5

Mine and Mill Sites Retained in the Selected Remedy

Evaluation of Mine and Mill Source Sites for Removal From Forthcoming Upper Basin ROD Amendment, Bunker Hill Superfund

BLM Site Number	Source Name	Watershed
KLE047	BIG CK IMPACTED RIPARIAN: NO. 1	Big Creek
KLE071	BIG CK IMPACTED RIPARIAN: NO. 3	Big Creek
KLE073	BIG CK IMPACTED RIPARIAN: NO. 2	Big Creek
BUR067	TAMARACK NO.7 (1200 LEVEL)	Canyon Creek
BUR072	STANDARD-MAMMOTH NO.4	Canyon Creek
BUR073	STANDARD-MAMMOTH CAMPBELL ADIT	Canyon Creek
BUR075	SHERMAN 1000 LEVEL (OREANO ADIT)	Canyon Creek
BUR087	HERCULES NO. 3	Canyon Creek
BUR090	HERCULES NO. 4	Canyon Creek
BUR094	SHERMAN 600 LEVEL	Canyon Creek
BUR096	ANCHOR MINE	Canyon Creek
BUR097	HIDDEN TREASURE MINE	Canyon Creek
BUR098	HERCULES NO. 5	Canyon Creek
BUR107	AJAX NO.3	Canyon Creek
BUR109	OOM PAUL NO. 1	Canyon Creek
BUR112	GEM NO.2	Canyon Creek
BUR117	FRISCO MILLSITE	Canyon Creek
BUR118	FRISCO NO.2 & NO.1	Canyon Creek
BUR119	BLACK BEAR NO.4	Canyon Creek
BUR120	SILVER MOON MINE	Canyon Creek
BUR121	BLACK BEAR FRACTION	Canyon Creek
BUR122	FLYNN MINE	Canyon Creek
BUR124	OMAHA MINE	Canyon Creek
BUR128	HECLA-STAR MINE & MILLSITE COMPLEX	Canyon Creek
BUR129	TIGER-POORMAN MINE	Canyon Creek
BUR130	MARSH MINE	Canyon Creek
BUR141	CANYON CK IMPACTED FLOODPLAIN	Canyon Creek
BUR142	GEM MILLSITE	Canyon Creek
BUR143	CANYON CK IMPACTED RIPARIAN	Canyon Creek
BUR144	STANDARD-MAMMOTH LOADING AREA	Canyon Creek
BUR145	ONEILL GULCH UNNAMED ROCK DUMP	Canyon Creek
BUR146	GORGE GULCH IMPACTED RIPARIAN	Canyon Creek
BUR149	AJAX NO.2 ADJACENT ROCK DUMP	Canyon Creek
BUR150	CANYON CK GARBAGE DUMP	Canyon Creek
BUR153	CANYON CK IMPACTED FLOODPLAIN (CCSeg02 & CCSeg04)	Canyon Creek
BUR177	JOE MATT MINE	Canyon Creek
BUR178	WEST HECLA MINE	Canyon Creek
BUR180	STANLEY MINE	Canyon Creek
BUR190	GEM NO.3	Canyon Creek
BUR191	FRISCO NO.3	Canyon Creek

TABLE 5

Mine and Mill Sites Retained in the Selected Remedy

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BLM Site Number	Source Name	Watershed
BUR192	BLACK BEAR MILLSITE	Canyon Creek
OSB047	CANYON CK FORMOSA REACH SVNRT REHAB	Canyon Creek
WAL009	HECLA-STAR TAILINGS PONDS	Canyon Creek
WAL010	CANYON CK POND REACH SVNRT REHAB	Canyon Creek
WAL011	CANYON SILVER (FORMOSA) MINE	Canyon Creek
WAL039	STANDARD-MAMMOTH MILLSITE	Canyon Creek
WAL040	CANYON CK IMPACTED FLOODPLAIN	Canyon Creek
WAL041	CANYON CK REPOSITORY REACH SVNRT REHAB	Canyon Creek
WAL042	CANYON CK TAILINGS REPOSITORY SVNRT	Canyon Creek
WAL081	WALLACE OLD PRIVATE LANDFILL	Canyon Creek
KLE014	ROYAL ANNE MINE	Moon Creek
KLE041	MOON CK IMPACTED RIPARIAN	Moon Creek
BUR051	SUNSET MINE	Ninemile Creek
BUR053	INTERSTATE-CALLAHAN MINE/ROCK DUMPS	Ninemile Creek
BUR055	INTERSTATE MILLSITE	Ninemile Creek
BUR056	TAMARACK ROCK DUMPS	Ninemile Creek
BUR058	TAMARACK NO.3	Ninemile Creek
BUR139	REX NO.1	Ninemile Creek
BUR140	NINEMILE CREEK IMPACTED FLOODPLAIN	Ninemile Creek
BUR160	INTERSTATE-CALLAHAN LOWER ROCK DUMPS	Ninemile Creek
BUR170	TAMARACK 400 LEVEL	Ninemile Creek
BUR171	TAMARACK NO.5	Ninemile Creek
BUR172	TAMARACK UNNAMED ADIT	Ninemile Creek
BUR173	TAMARACK MILLSITE	Ninemile Creek
OSB038	CALIFORNIA NO.4	Ninemile Creek
OSB039	DAYROCK MINE	Ninemile Creek
OSB040	EF NINEMILE CK HECLA REHAB	Ninemile Creek
OSB044	SUCCESS MINE ROCK DUMP	Ninemile Creek
OSB048	AMERICAN MINE	Ninemile Creek
OSB052	DAYROCK MINE TLGS PILE/SVNRT REPOSITORY	Ninemile Creek
OSB056	EF NINEMILE CK IMPACTED RIPARIAN	Ninemile Creek
OSB057	EF NINEMILE CK IMPACTED RIPARIAN	Ninemile Creek
OSB058	EF NINEMILE CK SVNRT REHAB	Ninemile Creek
OSB059	NINEMILE CK BELOW DAYROCK MINE	Ninemile Creek
OSB060	NINEMILE CK SVNRT REHAB NEAR BLACKCLD	Ninemile Creek
OSB082	MONARCH MINE BLACKCLOUD CK	Ninemile Creek
OSB088	ALAMEDA MINE	Ninemile Creek
OSB089	SUCCESS NO.3	Ninemile Creek
OSB115	OPTION MINE	Ninemile Creek
WAL033	NINEMILE CK POTENTIAL TAILINGS DEPOSIT	Ninemile Creek
KLW075	MATCHLESS MINE	Pine Creek

TABLE 5

Mine and Mill Sites Retained in the Selected Remedy

Evaluation of Mine and Mill Source Sites for Removal From Forthcoming Upper Basin ROD Amendment, Bunker Hill Superfund

BLM Site Number	Source Name	Watershed
KLW079	GOLD EAGLE MINING CO.	Pine Creek
KLW082	CARBONATE MINE: NO. 2	Pine Creek
KLW085	CARBONATE MINE: NO. 1	Pine Creek
MAS003	LIBERAL KING MINE & MILLSITE	Pine Creek
MAS007	NABOB 1300 LEVEL	Pine Creek
MAS011	IDAHO PROSPECT: NO. 2	Pine Creek
MAS012	LYNCH-PINE CREEK MINE	Pine Creek
MAS013	NABOB 600 LEVEL (300 Level)	Pine Creek
MAS014	HILARITY MINE	Pine Creek
MAS015	LITTLE PITTSBURG MINE: NO. 2	Pine Creek
MAS016	LITTLE PITTSBURG MINE: NO. 1	Pine Creek
MAS020	SIDNEY (RED CLOUD) MINE/MILLSITE	Pine Creek
MAS021	NEVADA-STEWART MINE	Pine Creek
MAS022	SURPRISE MINE & UPPER ROCK DUMP	Pine Creek
MAS025	DOUGLAS MINE & MILLSITE	Pine Creek
MAS029	BIG IT MINE	Pine Creek
MAS035	NABOB 600 LEVEL SHAFT	Pine Creek
MAS036	DENVER CK TAILINGS PILE	Pine Creek
MAS040	DENVER CK IMPACTED RIPARIAN: NO. 2	Pine Creek
MAS041	DENVER CK IMPACTED RIPARIAN: NO. 3	Pine Creek
MAS042	DENVER CK IMPACTED RIPARIAN: NO. 4	Pine Creek
MAS043	DENVER CK IMPACTED RIPARIAN: NO. 1	Pine Creek
MAS045	HIGHLAND CK IMPACTED RIPARIAN	Pine Creek
MAS046	HIGHLAND & RED CLOUD CK IMPACTED RIPAR	Pine Creek
MAS054	MARMION OR SF FRACTION	Pine Creek
MAS078	HIGHLAND-SURPRISE MINE & MILLSITE	Pine Creek
MAS083	NABOB MILLSITE	Pine Creek
MAS084	DOUGLAS MINESITE TAILINGS REPOSITORY	Pine Creek
KLE011 ^a	SILVER CRESCENT TAILINGS	SFCDR
KLE034	SILVER DOLLAR MINE	SFCDR
KLE035	SILVER SUMMIT MINE	SFCDR
KLE040	SF CDA RIVER IMPACTED FLOODPLAIN: NO. 5	SFCDR
KLE048	SF CDA RIVER SVNRT REHAB	SFCDR
KLE049	SF CDA RIVER IMPACTED RIPARIAN (MidGradSeg01 & MidGradSeg02)	SFCDR
KLE067	ST. JOE NO.4	SFCDR
KLE069	ST. JOE NO.3	SFCDR
LOK004	SNOWSHOE NO. 2	SFCDR
LOK009	SNOWSTORM NO. 4	SFCDR
LOK011	SNOWSTORM NO. 3	SFCDR
LOK024	SILVER CABLE MINE	SFCDR

TABLE 5

Mine and Mill Sites Retained in the Selected Remedy

Evaluation of Mine and Mill Source Sites for Removal From Forthcoming Upper Basin ROD Amendment, Bunker Hill Superfund

BLM Site Number	Source Name	Watershed
MUL012	STAR 1200 LEVEL	SFCDR
MUL018	MULLAN METALS MINE	SFCDR
MUL021	INDEPENDENCE MINE	SFCDR
MUL027	MORNING NO.4	SFCDR
MUL028	MORNING NO.5	SFCDR
MUL045	HOMESTAKE MINE	SFCDR
MUL052	COPPER KING MINE	SFCDR
MUL053	NATIONAL MINE	SFCDR
MUL054	UNNAMED ADIT	SFCDR
MUL071	ATLAS MINE	SFCDR
MUL120	BANNER MINE NO. 02	SFCDR
MUL129	ATLAS MINE ROCK DUMP	SFCDR
MUL132	NATIONAL MILLSITE ADJACENT TAILINGS	SFCDR
MUL142	GROUSE GULCH IMPACTED RIPARIAN	SFCDR
OSB065	SF CDA RIVER IMPACTED FLOODPLAIN: NO. 3	SFCDR
OSB117	OSBURN ZANETTI STOCKPILED TAILINGS	SFCDR
OSB118	OSBURN NORTH TAILINGS AREA	SFCDR
OSB120	SF CDA RIVER IMPACTED FLOODPLAIN: NO. 4	SFCDR
WAL002	WESTERN UNION LOWER ADIT	SFCDR
WAL004	SF CDA RIVER RAILROAD YARDS & IMP FLDP	SFCDR
WAL014	ST. ELMO MINE	SFCDR
WAL038	SF CDA RIVER IMPACTED FLOODPLAIN: NO. 1	SFCDR
WAL076	MARY D CLAIM WORKINGS	SFCDR
WAL077	GOLCONDA TAILINGS	SFCDR

Notes:

^a (The KLE011 source area is actually the Silver Summit Tailings Pond. It is believed that the names were mistakenly switched within the BLM GIS database. For consistency, we have not revised the BLM naming convention.)

This table presents the mine and mill sites retained in the remedy. There are 5 specific actions that are included within the Remedy that are not specifically mine and mill sites, including: Woodland Park Option C, and 4 Box actions (Box-01, Box-02, Box-03, Box-04).

MAS029 retained in remedy. Located along Trapper Creek, pile is being actively eroded by Trapper Creek.

KLW077 moved to remediated category. Action performed as part of Little Pine Creek CWA grant work.

MAS003 retained in remedy. Portion of site on private property has not been addressed.

MAS083 retained in remedy. No actions have been taken at the millsite, mine and rockdumps, materials readily

MAS084 retained in remedy. No actions have been taken at the millsite, mine and rockdumps, materials readily accessible to humans.

Red font signifies changes made since the 2/29/12 PFT Meeting.