Final

Superfund Cleanup Implementation Plan, 2016-2025

Bunker Hill Mining and Metallurgical Complex Superfund Site

U.S. Environmental Protection Agency, Region 10

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Acronyms and Abbreviations

AWQC	ambient water quality criterion/criteria
Basin Commission	Basin Environmental Improvement Project Commission
BCR	Big Creek Repository
BCRA	Big Creek Repository Annex
BEMP	Basin Environmental Monitoring Program
BLM	U.S. Department of the Interior, Bureau of Land Management
BPRP	Basin Property Remediation Program
CCC	Citizens' Coordinating Council
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CIA	central impoundment area
CSM	conceptual site model
CTP	central treatment plant
cy	cubic yard(s)
ECSM	enhanced conceptual site model
EFNM	East Fork of the Ninemile
EMFR	East Mission Flats Repository
EMP	Environmental Monitoring Program
EPA	U.S. Environmental Protection Agency
ESD	Explanation of Significant Differences
FFS	Focused Feasibility Study
GWCS	groundwater collection system
gpm	gallons per minute
HPMP	Historic Properties Management Plan
ICP	Institutional Controls Program
IDAPA	Idaho Administrative Procedures Act
IDCAP	Idaho Fish Consumption Advisory Project
IDEQ	Idaho Department of Environmental Quality
IDFG	Idaho Department of Fish and Game
IDHW	Idaho Department of Health and Welfare
LBCR	Lower Burke Canyon Repository

LLC	Limited Liability Company
LUR	limited use repository
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NHPA	National Historic Preservation Act
NPL	National Priorities List
O&M	operation and maintenance
OU	operable unit
PFT	Project Focus Team
PHD	Panhandle Health District
QA/QC	quality assurance/quality control
RAO	remedial action objective
ROD	record of decision
ROW	right-of-way
SFCDR	South Fork of the Coeur d'Alene River
TCD	typical conceptual design
TLG	Technical Leadership Group
Trust	Successor Coeur d'Alene Custodial and Work Trust
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
WCA	waste consolidation area

SECTION 1

Introduction

In February 2013, the U.S. Environmental Protection Agency (EPA) issued an initial 10-year plan for Superfund cleanup activities anticipated to occur between 2012 and 2022 within the Bunker Hill Mining and Metallurgical Complex Superfund Site (Comprehensive Environmental Response, Compensation and Liability Information System [CERCLIS] identification number IDD048340921) located primarily in northern Idaho (EPA, 2013). The initial Superfund Cleanup Implementation Plan was prepared in conjunction with the *Interim Record of Decision Amendment, Upper Basin of the Coeur d'Alene River, Bunker Hill Mining and Metallurgical Complex Superfund Site* (Upper Basin Interim ROD Amendment; EPA, 2012a). The initial Implementation Plan summarized and discussed cleanup activities included in the Upper Basin Interim ROD Amendment and prior decision documents for the Bunker Hill Mining and Metallurgical Complex Superfund Site (Bunker Hill Superfund Site or Site) for the 10-year time frame from 2012 through 2022.

As part of EPA's implementation planning process—described in greater detail in Section 7—annual updates to the initial Implementation Plan were prepared and issued by EPA in December and January of 2013 and 2015, respectively (EPA, 2013 and 2015a). In addition, EPA's planning process recommends that the Implementation Plan be fully revised at least every 5 years in conjunction with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) required 5-year review process. EPA's *Fourth Five-Year Review Report for the Bunker Hill Superfund Site* was issued in 2015 (Fourth 5-Year Review Report; EPA, 2015b). This revised Implementation Plan, therefore, has been developed to summarize cleanup activities anticipated for a revised 10-year timeframe from 2016 through 2025 and will be referred to in this document as the 2016 10-Year Implementation Plan.

EPA developed a draft version of this final 2016 10-Year Implementation Plan and asked for public comment during a 30-day period from October 14, 2016 through November 14, 2016. Two public comment letters were received, one from the Executive Director of the Basin Environmental Improvement Project Commission (Basin Commission) and the other from the Kootenai Environmental Alliance. The public comment letters are included in Appendix A. The Executive Director's comments were primarily editorial in nature and changes to this plan have been made in response to the suggestions. The Kootenai Environmental Alliance comment letter primarily focuses on whether Lower Basin sediment and hydraulic transport models can track phosphorus particle movement through the Lower Basin and into Lake Coeur d'Alene. Applicable text sections of this plan (Section 7.2.2) have been modified to address the questions raised by the Kootenai Environmental Alliance.

Implementing cleanup actions at the Bunker Hill Superfund Site presents unique challenges given the nature and extent of mining-related contamination, number of remedial actions needed, and the area's size and complexity. For these reasons, while developing the Upper Basin Interim ROD Amendment, EPA began the critical process of planning the

implementation and identifying priority cleanup actions working with the Basin Commission and the Commission's Technical Leadership Group (TLG) and Project Focus Teams (PFTs).[1] In addition to this level of coordination, there are specific aspects of the cleanup and implementation planning that are directly related to the EPA and State of Idaho partnership. One such example is where there is a long-term operation and maintenance (O&M) and match requirement for the State when federal appropriations are used in the cleanup. In these situations, EPA works directly with the Idaho Department of Environmental Quality (IDEQ) outside the Basin Commission process.

The outcome of this ongoing process of implementation planning and identifying priority cleanup actions is documented in this updated 2016 10-Year Implementation Plan, which will guide site-specific cleanup actions from 2016 through 2025 with the objective of ensuring that the actions taken are the most effective in protecting human health and the environment and providing opportunities for substantive input by project stakeholders and community representatives.

Similar to prior implementation planning documents, this 2016 10-Year Implementation Plan will provide a basis for EPA's input into the Basin Commission's future 1- and 5-year work plans. Since the Basin Commission was established in 2002, EPA has annually provided a summary of CERCLA-related activities to the commission, which has then updated its 1-year and 5-year work plans that summarize the CERCLA-related activities to be conducted in the Basin (among other activities). The 1-year work plans establish and maintain the sequencing of activities that are needed to complete the goals and objectives of the 5-year work plan. The Basin Commission 1- and 5-year work plans focus on general areas of work and do not go into site-specific detail; site-specific details are developed through the pre-design, design, and construction phases of cleanup at each site.

Although this 2016 10-Year Implementation Plan focuses on cleanup actions selected in the Upper Basin Interim ROD Amendment, it also identifies the following: (1) additional actions that have been selected by other decision documents for the Bunker Hill Superfund Site and (2) additional studies and pilot projects that EPA plans to conduct at the Site, including several in the Lower Basin. It is important to note that this 2016 10-Year Implementation Plan encompasses the entire Bunker Hill Superfund Site (Operable Units [OUs] 1, 2, and 3 as defined in Section 1.1).

The remainder of this section provides background information on the Bunker Hill Superfund Site, lists the decision documents that prescribe the specific cleanup actions summarized in this 2016 10-Year Implementation Plan, identifies key stakeholders for the Site, presents the 2016 10-Year Implementation Plan purpose and objectives, and describes the Implementation Plan organization.

1.1 Site Name and Location

The Bunker Hill Superfund Site is located primarily in northern Idaho, in the Coeur d'Alene Basin. The Site includes mining-contaminated areas in the Coeur d'Alene River corridor,

[1] The Basin Commission includes federal, state, tribal, and local governmental involvement. EPA anticipates continuing to work as a member of this Commission for implementation of the Selected Remedy and development of the priorities and sequencing of cleanup activities. A list of the key stakeholders for the Bunker Hill Superfund Site is provided in Section 1.3.

adjacent floodplains, downstream water bodies,[2] tributaries, and fill areas, as well as the 21-square-mile Bunker Hill "Box," where historical ore-processing and smelting operations occurred (Figure 1-1). The Site was listed on the National Priorities List (NPL) in 1983 and is assigned CERCLIS identification number IDD048340921. The site is also known as the Coeur d'Alene Basin Cleanup.

EPA has divided the Bunker Hill Superfund Site into three OUs:

- OU 1 includes the populated areas of the Bunker Hill Box.
- OU 2 comprises the nonpopulated areas of the Bunker Hill Box.
- OU 3 includes all areas of the Coeur d'Alene Basin outside the Bunker Hill Box where mining-related contamination is located. OU 3 extends from the Idaho-Montana border into the State of Washington and contains floodplains, populated areas, lakes, rivers, and tributaries. OU 3 includes areas surrounding and including the South Fork of the Coeur d'Alene River (SFCDR) and its tributaries[3], and areas surrounding and including the main stem of the Coeur d'Alene River down to the depositional areas of the Spokane River, which flows from Coeur d'Alene Lake[4] into Washington State.

1.2 Existing Decision Documents for the Site

The original RODs for the three OUs at the Site were issued on the dates indicated below:

- **ROD for OU 1—***EPA Superfund Record of Decision, Bunker Hill Mining and Metallurgical Complex Residential Soils Operable Unit, Shoshone County, Idaho*, August 30, 1991
- **ROD for OU 2—***EPA Superfund Record of Decision, Bunker Hill Mining and Metallurgical Complex, EPA ID: IDD048340921, OU 02, Smelterville, ID*, September 22, 1992
- **ROD for OU 3—***Record of Decision, The Bunker Hill Mining and Metallurgical Complex Operable Unit 3*, September 12, 2002

In addition, ROD Amendments and Explanations of Significant Difference (ESDs) were issued on the following dates:

- **First ROD Amendment for OU 2—***EPA Superfund Record of Decision Amendment: Bunker Hill Mining and Metallurgical Complex, EPA ID: IDD048340921, OU 02, Smelterville, ID*, September 9, 1996
- **Second ROD Amendment for OU 2—***EPA Superfund Record of Decision Amendment: Bunker Hill Mining and Metallurgical Complex, EPA ID: IDD048340921, OU 02, Smelterville, ID*, December 10, 2001
- **First ESD for the OU 2 ROD—***Explanation of Significant Differences for Revised Remedial Actions at the Bunker Hill Superfund Site, Shoshone County, Idaho*, January 1996

[2] Downstream water bodies extend to portions of the Spokane River, located in eastern Washington.

[3] Note that the river corridor portions of the SFCDR and Pine Creek located within the Bunker Hill Box are considered to be part of OU 3.

[4] Coeur d'Alene Lake is being managed by state, Tribal, federal, and local governments outside the Superfund process through revision and implementation of the *Coeur d'Alene Lake Management Plan* (IDEQ and Coeur d'Alene Tribe, 2009).

- **Second ESD for the OU 2 ROD—***Explanation of Significant Differences for Revised Remedial Actions at the Bunker Hill Superfund Site OU 2, Shoshone County, Idaho*, April 1998
- **Upper Basin Interim ROD Amendment—***Interim Record of Decision Amendment, Upper Basin of the Coeur d'Alene River, Bunker Hill Mining and Metallurgical Complex Superfund Site*, August 2012
- **First ESD for the 2012 Upper Basin Interim ROD Amendment—***Explanation of Significant Differences for the Remedy Protection Selected Remedy in the 2012 Interim ROD Amendment; Silver, Slaughterhouse, Blackcloud, McCarthy and Boulder Creeks; Bunker Hill and Metallurgical Complex Superfund Site, EPA ID: IDD048340921*, October 2015

As indicated above, the most recent decision documents for the Bunker Hill Superfund Site are the Upper Basin Interim ROD Amendment and its first ESD for the Upper Basin of the Coeur d'Alene River, which is the main area of historical mining and industrial activities and the primary historical source of downstream metals contamination. The Upper Basin is mostly located in Shoshone County, Idaho, and contains OUs 1 and 2 (in the Bunker Hill Box) and the eastern portion of OU 3 (see Figure 1-1). The 300-square-mile Upper Basin includes areas of mining-related contamination along the SFCDR and its tributaries downstream to the confluence of the South and North Forks of the Coeur d'Alene River. The Selected Remedy for the Upper Basin, which is presented in the Upper Basin Interim ROD Amendment, is an interim remedy that includes actions within the Upper Basin and extending downstream 1 mile from the confluence of the North and South Forks of the Coeur d'Alene River to include the town of Kingston. The Selected Remedy includes remedial actions in portions of OU 1, OU 2, and OU 3. The Upper Basin Interim ROD Amendment also provided a preliminary list of side gulches that may require additional remedial actions to protect the human health barrier containment remedy, with provisions for refining the preliminary list through one or more ESDs. The 2015 ESD (EPA, 2015c) identifies five specific locations within side gulches that warrant Remedy Protection actions along with their appropriate remedial technology and process options (standard engineering practices for stormwater and drainage management).

Substantial progress has been made in implementing the remedies selected in the RODs and other decision documents issued for the three OUs as documented in EPA's Fourth 5-Year Review Report (EPA, 2015b).

1.3 Key Stakeholders

EPA will continue to work with key stakeholders for the Site, State and Tribal partners, and other local jurisdictions when implementing cleanup actions. These entities include, but are not limited to, the following:

- Coeur d'Alene Tribe
- Spokane Tribe
- IDEQ
- Idaho Department of Fish and Game (IDFG)
- Washington State Department of Ecology
- Shoshone County
- Kootenai County

- Benewah County
- U.S. Fish and Wildlife Service (USFWS)
- U.S. Forest Service (USFS)
- U.S. Department of the Interior, Bureau of Land Management (BLM)
- Basin Commission
- Panhandle Health District (PHD)

Several of these entities (the Coeur d'Alene Tribe, BLM, USFWS, USFS, IDFG, and IDEQ) also provide technical experts to the Restoration Partnership, which is committed to working together to develop, adopt, and implement restoration actions using funding sources that have been made available through settlements in the Coeur d'Alene Basin.

As noted previously, the Basin Commission has established the TLG, which serves as an advisory council and consists of federal, state, local, and Tribal representatives with regulatory or land management responsibilities in the Coeur d'Alene Basin that may be affected by remedial actions.

1.4 Purpose and Objectives

This 2016 10-Year Implementation Plan provides an overview of EPA's plan for implementing cleanup actions at the Bunker Hill Superfund Site during the next 10 years (2016 through 2025). For the next several years, the cleanup actions are primarily intended for the Upper Basin, as described in the most recent decision document for the Site (the Upper Basin Interim ROD Amendment [EPA, 2012a]).

Work in the Lower Basin is shifting from collecting data and conducting river hydraulic and sediment transport modelling to prioritizing remediation strategies and conducting pilot studies. Presently, EPA, with input from natural resource agency stakeholders, is currently developing strategy goals and objectives for remedial actions and pilot studies to be implemented in the Lower Basin. As this strategic planning process evolves, additional input will be sought from the Restoration Partnership and the Basin Commission and associated PFTs, TLG, and Citizens' Coordinating Council (CCC). These integrated strategy goals and objectives will provide the framework for developing a Lower Basin Strategic Plan that will guide how the remedial actions already identified in the ROD will be prioritized, implemented, and monitored by EPA. It is EPA's intent that this Lower Basin Strategic Plan will be completed by the end of 2017. This Lower Basin Strategic Plan will be appended to this 2016 10-Year Implementation Plan after public comment and updated and revised as changes occur to the strategy.

This 2016 10-Year Implementation Plan also provides a framework for implementing remedial actions with regard to funding considerations and the different entities involved in the project planning, design, construction, and monitoring phases of the work. The Successor Coeur d'Alene Custodial and Work Trust (the Trust) was established as part of a settlement agreement between the United States and Asarco LLC and its subsidiaries[5] to provide funding for remedial actions in the Coeur d'Alene Basin outside the Bunker Hill Box. The Trust has been actively designing and conducting remedial work in OU 3 since

[5] The case was decided in the United States Bankruptcy Court for the Southern District of Texas, Corpus Christi Division, in 2009.

2011, as directed by EPA. As described throughout this document, EPA will continue to direct the Trust to implement the remedial actions for mine waste-contaminated areas in OU 3,[6] while EPA and IDEQ will work together to implement remedial actions in the Bunker Hill Box (OUs 1 and 2).

This 2016 10-Year Implementation Plan is intended to achieve the following objectives:

- Identify EPA's priority cleanup actions at the Bunker Hill Superfund Site for the next 10 years and provide a strategy for implementing these cleanup actions.
- Provide the basis for EPA's input into the Basin Commission's 1-year and 5-year work plans.
- Describe the process EPA will use to implement cleanup actions in cooperation with stakeholders and partners for the Site, as well as the Trust and other entities.
- Describe existing funding sources and considerations for managing said funds.
- Clarify how stakeholders and partners, local communities, and the public can be involved during the annual implementation planning process.
- Describe how the adaptive management process will be used to evaluate the effectiveness of cleanup actions and modify the implementation and cleanup approaches.

1.5 Plan Organization

The remainder of this 2016 10-Year Implementation Plan is organized as follows:

- **Section 2.0, Identification of Priority Actions,** describes how EPA has identified priority cleanup actions that are expected to be implemented at the Site during the next 10 years**.**
- **Section 3.0, Implementation of Remedies,** provides details of the cleanup actions summarized in Section 2.0, and presents the general approaches and timeframes for implementing these actions.
- **Section 4.0, Implementation Process**, provides an overview of the process for implementing cleanup actions at the Site.
- **Section 5.0, Funding Considerations,** presents considerations for the manner in which EPA will manage the cost of the cleanup.
- **Section 6.0, Community Involvement,** describes the ways in which EPA will continue to gather and consider input from stakeholders and the local community during the implementation of cleanup actions.
- **Section 7.0, Continued Implementation Planning,** describes the continued planning activities that will be conducted to implement the cleanup, including the prioritization

[6] The settlement agreement allows for the Trust to conduct cleanup work only in OU 3.

of cleanup actions using adaptive management and evaluation of the effectiveness of remedial actions.

- **Section 8.0, References,** lists in full the references cited in the sections above.
- **Figures and tables** referenced in Sections 1.0 through 7.0 are provided under separate tabs following Section 8.0.

SECTION 2

Identification of Priority Actions

Cleaning up the Coeur d'Alene Basin will require many years of design and construction, effectiveness monitoring and O&M of in-place remedial actions, and coordination with stakeholders, partners, and the public. Cleanup includes ongoing and future work that must be prioritized and sequenced over a long period. The full scope of the cleanup is described in detail in the Upper Basin Interim ROD Amendment (EPA, 2012a) and other previous decision documents listed in Section 1.2. Implementing the Upper Basin Selected Remedy is expected to take approximately 30 years to implement. Identifying priority cleanup actions is based on the information available at this time and, as discussed in this plan, the priority actions will be updated regularly as new data is collected.

The cleanup work selected for the Upper Basin reflects community involvement throughout the development of the Upper Basin Focused Feasibility Study (FFS; 2012b), Upper Basin Proposed Plan (2010a) and Upper Basin Interim ROD Amendment (2012a). EPA worked closely with the Upper Basin PFT, a group focused on technical issues related to cleanup, in developing the Upper Basin Interim ROD Amendment. The PFT members include Basin Commission representatives, interested citizens and representatives from the State of Idaho, Shoshone County, the BLM, the USFWS, USFS, the Coeur d'Alene and Spokane Tribes, and the State of Washington. Additional stakeholders participated in some of these meetings, including mining industry representatives.

As in the past, establishing priorities for implementing cleanup at the Bunker Hill Superfund Site has incorporated both qualitative and quantitative methods. Qualitative methods include gathering input from stakeholders, partners, and the local community on their concerns and areas of highest need; identifying logistical and financial constraints that will affect the sequencing of the work; and ensuring that the work is consistent with the regulatory requirements that guide EPA.

Quantitative methods include evaluating data from ongoing monitoring programs such as the Basin Environmental Monitoring Program (BEMP) to help evaluate the effectiveness of remedial actions, and using tools such as predictive models (for example, models that estimate the impact of local cleanup actions on water quality) and decision analysis models that help in prioritizing areas for cleanup or making choices among options (for example, where to build or expand repositories for containing contaminated soil). Other factors that are part of this evaluation include the sources of available funding and the identification of projects that provide the greatest value in protection of human health and improvement in water quality for the cost.

EPA's first priority for the Site has consistently been, and will continue to be, focused on actions that protect human health, while actions that protect the environment are required as well. Along these lines, the remedial actions, implementation strategies, and

implementation timeframes presented in this 2016 10-Year Implementation Plan are grouped and discussed as follows:

- Protection of human health in communities
- Protection of human health and the environment outside communities
- Additional supporting activities

For each group, EPA used qualitative and/or quantitative strategies to identify priority cleanup actions for the next 10 years, as described in the following sections. Further descriptions of implementation strategies for these cleanup actions are provided in Section 3.0.

2.1 Protection of Human Health in Communities

EPA's highest priority for the Bunker Hill Superfund Site will always be protecting human health in Upper and Lower Basin communities. These communities include incorporated cities such as Mullan, Wallace, Osburn, Wardner, Kellogg, Smelterville, and Pinehurst, as well as other residential areas (i.e., Silverton, Kingston, Cataldo). In these communities and residential areas during the next 10 years, EPA will focus on completing the following activities and programs:

- The property cleanup program in OU 3 that began in 2002[7] with particular emphasis on high-risk homes where children and pregnant woman reside
- Actions to address roads that may have been damaged by cleanup activities, so that those roads can continue to serve as barriers to underlying contamination
- Actions that protect existing remedies that have already been implemented (these actions are summarized below, and strategies for the anticipated implementation of these actions are presented in Sections 3.1.1 through 3.1.3, respectively)

EPA will conduct these efforts in partnership with IDEQ and the existing Institutional Controls Program (ICP) administered by the PHD,[8] which has been established to help ensure that future construction and maintenance work in the Coeur d'Alene Basin does not result in exposures to contaminated soil or mishandling of contaminated soil wastes. Another important part of implementing actions to protect human health is ensuring that appropriate repositories are available for disposing of contaminated soil; repository development and management priorities are discussed in Section 2.3.

2.1.1 Basin Property Remediation Program

In 2008, EPA and IDEQ certified completion of the OU 1 residential property remediation program conducted under the 1991 ROD for the communities located within the Bunker Hill Box (EPA, 2010). Implementing the Phase I remedies that focused on protecting human health in OU 2 (commercial and public properties in the Box) are also largely complete (EPA, 2010b and 2015b).

[7] The BPRP (discussed in Section 2.1.1) began in 2002 pursuant to the ROD for OU 3 (EPA, 2002).

[8] IDAPA 41.01.01, Rules of PHD 1, is the promulgated rule establishing the ICP. It describes the PHD's authority and the ICP's scope and intent.

The OU 3 property remediation program that began in 2002 is anticipated to be substantially complete in 2019 (as discussed further in Section 3.1.1; Basin Commission, 2011). EPA and IDEQ will continue to focus on completing the ongoing cleanup of residential, commercial, and public right-of-way (ROW) properties in the Upper and Lower Basins through the Basin Property Remediation Program (BPRP). Properties where children (up to 7 years of age) or pregnant women live are the highest priority. Continuing these actions along with monitoring blood-lead levels in children, house dust, private drinking water supplies, and recreational-use areas are needed to meet risk-based goals to protect human health specified in the ROD for OU 3 (EPA, 2002).

2.1.2 Roadway Surface Remediation Strategy

EPA and IDEQ have developed a Roadway Surface Remediation Strategy to address the deterioration of paved roads that are intended to serve as barriers to human exposure, as well as unpaved roads and road shoulders that contain contaminated soil (IDEQ, 2012). Prior to 2012, EPA and IDEQ's cleanup work in communities had initially focused on remediating contaminated residential and commercial properties, common-use areas such as parks and playfields, and a limited number of ROWs including unpaved roads and road shoulders. As property cleanups in the Basin neared completion, EPA and IDEQ began to address public roads in all three OUs to ensure the long-term effectiveness of roads and road shoulders that act as part of the remedies for the Bunker Hill Superfund Site.

The basic elements of the Roadway Surface Remediation Strategy include identifying and approving proposed projects, dispersing EPA funds to local jurisdictions to design and construct the projects, constructing the projects, and documenting the completed work. The local jurisdictions are responsible for planning and constructing the projects and documenting completed work. An additional, but parallel, effort was conducted for the unpaved gravel roads. In this case, the work as performed by EPA and IDEQ.

Paved and unpaved public roads meet the transportation needs within and between the communities in the Bunker Hill Superfund Site and beyond. Responsibility for constructing and maintaining these transportation facilities lies with state and local jurisdictions (EPA and IDEQ are neither road construction nor road maintenance agencies). EPA's and IDEQ's mission at the Site is to reduce exposures to site-related contaminants. By including ROWs in the RODs that have been issued for the Site, EPA has recognized the need for clean roadway surfaces to serve as protective barriers between contaminated materials that lie under these surfaces and people living near and using those roadways. In addition, EPA recognizes that cleanup activities and the associated heavy vehicle traffic within and between communities have likely contributed to the deterioration of some road surfaces. The Roadway Surface Remediation Strategy was developed to protect human health and is designed to provide a mechanism to address on a one-time basis the deterioration of road surfaces resulting from heavy vehicle traffic during remediation activities, to ensure that road surfaces continue to serve as barriers that reduce or eliminate exposures to underlying contamination. As a condition for this one-time repair, local jurisdictions have agreed to continue to maintain roadway surfaces as part of providing basic services to the communities they serve.

The Road Surface Remediation Strategy applies to a specific list of existing public roads located within the administrative boundaries of the ICP. This roads list was generated by

the Silver Valley Transportation Team and its members who represent the jurisdictions of the Cities of Mullan, Wallace, Osburn, Wardner, Kellogg, Smelterville and Pinehurst, as well as Shoshone County and the Eastside Highway District (Kootenai County). Existing private roads located within the ICP Administrative Boundary and these jurisdictions may be addressed as part of the BPRP. New road construction is subject to the requirements of the ICP and is not eligible for funding under this Strategy. The Strategy does not apply to roads that fall under the jurisdiction of BLM, USFS, or the Idaho Transportation Department.

2.1.3 Remedy Protection

The Upper Basin Interim ROD Amendment (EPA, 2012a) and its first ESD (EPA, 2015c) identify actions (referred to as Remedy Protection actions) to protect in-place barriers within the Upper Basin communities (Pinehurst, Smelterville, Kellogg, Wardner, Osburn, Silverton, Wallace, and Mullan) and side gulches outside of communities that may be at risk from tributary flooding. These projects typically include improvements to existing stormwater control systems (e.g., culvert replacements, drainage ditches, channel improvements, diversion structures, bypass systems, and subsurface road drainage systems) and are a high priority for EPA due to their proximity and risks posed to constructed barriers. Similar to the Roadway Surface Remediation Strategy, Remedy Protection work requires logistical planning with the local communities, including private property easement requirements, permitting substantive requirements, and the requirement that the communities take on long-term O&M.

EPA's Fourth 5-Year Review Report (EPA, 2015b) describes the progress made in implementing the Remedy Protection projects. Through the 2015 construction season, the Box (OUs 1 and 2) Remedy Protection projects have been completed and 9 Remedy Protection projects have been completed in the OU 3 communities. Section 3.1.3 describes the ongoing implementation of the remaining Remedy Protection projects, which are anticipated to be complete by 2019.

2.2 Protection of Human Health and the Environment outside Communities

This section describes the priority cleanup actions for the Bunker Hill Superfund Site outside Upper and Lower Basin communities. EPA is prioritizing cleanup actions at OUs 2 and 3 sites that are currently adversely affecting human health and the environment. Over time, other sites may be identified that pose a risk to human health or the environment. As noted in the Upper Basin Interim ROD Amendment, information obtained during cleanup may identify sites where risks to human health or the environment require response actions not selected in the Upper Basin Interim ROD Amendment. In such circumstances, response actions will be selected from the typical conceptual designs presented in the FFS for the Upper Basin (EPA, 2012b) via an Action Memorandum, an ESD, or an appropriate decision document.

The sections below generally describe the Upper and Lower Basins and present the information used by EPA to identify priorities for cleanup during the next 10 years.

2.2.1 Upper Basin

The Upper Basin is the main area of historical mining and industrial activities and the primary source of downstream metals contamination. The Upper Basin is mostly located in Shoshone County, Idaho, and contains OUs 1 and 2 (in the Bunker Hill Box) and the eastern portion of OU 3 (see Figure 1-1). The 300-square-mile Upper Basin includes areas of mining-related contamination along the SFCDR and its tributaries downstream to the confluence of the South and North Forks of the Coeur d'Alene River.

Implementing the Selected Remedy for the Upper Basin will present unique challenges given the nature and extent of mining-related contamination, the number of remedial actions needed, and the size and complexity of the area, as illustrated by figures taken from the Upper Basin Interim ROD Amendment (EPA, 2012a). Figure 2-1 identifies the total number of mine and mill sites in each watershed that are planned to undergo source control actions in the Upper Basin portion of OU 3 per the Selected Remedy. Figure 2-2 identifies the total number of sites planned for water collection and treatment actions in the Upper Basin portion of OU 3 per the Selected Remedy. Figure 2-3 shows the components of the Selected Remedy for OU 2 (in the Bunker Hill Box). In addition to the size and complexity of the work, EPA must consider the different funding mechanisms, and restrictions on those funding mechanisms, for implementing cleanup in OU 2 versus the Upper Basin portion of OU 3.

Consistent with EPA's initial 2013 Implementation Plan, EPA's strategy for prioritizing the cleanup actions at the vast number of sites included in the Selected Remedy for the Upper Basin is based on addressing the most serious human health and ecological risk concerns first. The remedial actions included in the Selected Remedy are primarily focused on collecting and conveying water for treatment at the Central Treatment Plant (CTP) in Kellogg and on excavating and/or containing mining-related contaminants, thereby reducing concentrations of dissolved metals and particulate lead in rivers and streams and direct contact exposures to these contaminants. Such actions will reduce unacceptable risks to humans and the environment.

Understanding the unacceptable risks to human health from mine and mill sites has been further evaluated the past two years as part of the Upper Coeur d'Alene Basin mine and mill sites characterization of human health risks (TerraGraphics, 2015a, 2015b, and 2016a). Because more than 1,000 mining-impacted sites are catalogued for the Bunker Hill Superfund Site, approximately 100 of these sites were identified as a potential risk to human health using the following categories. These categories were selected to identify sites with potential human health exposures and to assist with site prioritization:

- Site is located within 200 feet of a residence.
- Site is located between 200 and 1,000 feet of a residence.
- Site intersects a road and/or stream upstream of a residential area.
- Site is upgradient of a residential area.

Following characterization, the sites will be prioritized to identify future remediation needs to address human health exposures and ensure that completed remedies are not recontaminated by migration of contaminants from mine and mill sites. Prioritization is expected to be completed during late 2017.

Dissolved zinc concentrations compared with ambient water quality criteria (AWQC), in the form of an AWQC ratio, are used as a key indicator of surface water quality.[9] As shown in Figures 2-4 and 2-5, respectively, the locations with the highest dissolved zinc AWQC ratios (2002 to 2008) were Ninemile and Canyon Creeks upstream of Wallace (in OU 3), and Government Creek and tributaries to Bunker Creek in the Bunker Hill Box (in OU 2). Based on these data, dissolved zinc AWQC ratios ranged up to 73 in Ninemile Creek, 40 in Canyon Creek, and 85 in the Box. In addition to dissolved zinc, total lead is also used as an indicator of surface water quality. Figure 2-6 shows a map view of total lead concentrations in Upper Basin surface water during high-flow conditions in May 2008.[10] Total lead concentrations upstream of the Box were highest in Canyon Creek and Ninemile Creek (consistent with dissolved zinc). Figures 2-4 through 2-6, which show water quality data through 2008, are from the Upper Basin Interim ROD Amendment (EPA, 2012a). Environmental data continue to be gathered as part of the BEMP (see Section 2.3). The Fourth 5-Year Review Report (EPA, 2015b) summarizes water quality data through 2014 and shows similar data values as those shown in Figure 2-4 through 2-6.

Based on human health risks and the water quality trends in the Upper Basin, EPA is continuing to prioritize actions that address source control and water treatment actions in the East Fork of Ninemile Creek, in Canyon Creek, and in the Box during this next 10-year phase of remedy implementation. As shown in Figure 2-1, the Ninemile and Canyon Creek Watersheds contain the highest density of mine and mill sites and the highest volumes of contaminated waste. Priority actions in these watersheds are discussed in more detail in Section 3.

After most East Fork of Ninemile Creek actions and OU 2 water collection and treatment actions near the Central Impoundment Area (CIA) are implemented, Canyon Creek source control and water collection and treatment actions are anticipated to be initiated. These will include source control actions at areas of high human health risk and actions to address contaminated adit and groundwater that flows into surface water in Woodland Park (an area of Canyon Creek near the confluence with the SFCDR).

Within and among Upper Basin watersheds, EPA will also prioritize implementing the highest risk human health and ecological cleanup actions by considering the potential for recontamination of previously remediated areas. This will typically mean conducting work at sites that are topographically higher in a drainage area first to avoid recontamination from sites above them. This approach will also allow cleanup actions to be completed in coordination with habitat restoration work conducted by the Restoration Partnership.

EPA's implementation strategy for the Upper Basin will continue to use adaptive management principles (described in Sections 4.5 and 7.1), whereby future decision-making incorporates and reacts to new data, conditions, constraints, and/or input from stakeholders and the local community. The strategy will respond to changed and emergent situations or

[9] The AWQC ratio is the concentration of a chemical in surface water divided by the AWQC for that chemical. For example, an AWQC ratio of 10 means the concentration is 10 times greater than the AWQC (the level that is considered to be protective of aquatic life). An AWQC ratio of one or less indicates that the water quality criterion is met. Site-specific AWQC for cadmium, lead, and zinc for ecological protection of the SFCDR watershed were developed by the State of Idaho (IDAPA 58.01.02.284) and have been adopted by EPA. Reference to AWQC in this document refers to these standards.

[10] Total lead concentration data represent the maximum values reporting for samples collected in May 2008 as part of the High-Flow and Low-Flow Surface Water Study (CH2M, 2009a) and the Coeur d'Alene Basin Remedial Action Monitoring Program (CH2M, 2009b).

adjusting projects to coordinate with the federal, tribal, and state natural resource trustees' plans or priorities.

EPA will also continue to work with the Basin Commission and TLG as the cleanup proceeds, to periodically review and discuss data and evaluate the effectiveness of implemented remedial actions, which will help focus and prioritize future cleanup actions. The TLG and Upper Basin PFT were instrumental in refining the actions selected in the Upper Basin Interim ROD Amendment (EPA, 2012a).[11]

2.2.2 Lower Basin

The SFCDR, which flows through the steeper, mountainous terrain of the Upper Basin, merges with the North Fork to form the main stem of Coeur d'Alene River, which flows through the palustrine Lower Basin into Coeur d'Alene Lake. The Lower Basin consists of an approximately 37-mile-long sinuous river channel connected with numerous floodplain lakes, marshes, and wetlands. Approximately 30 square miles of waterfowl habitat are located in the Lower Basin, 80 percent of which contain lead from mining wastes at concentrations acutely toxic to waterfowl; 95 percent of the wetlands have contaminant concentrations above chronic toxicity levels. The river channel contains an estimated 5 to 10 million cubic yards (cy) of contaminated sediments, and those river banks that have not been stabilized and beaches along its length present exposed surfaces of contaminated material at concentrations many times the human health cleanup level. The ROD for OU 3, which includes the Lower Basin, defines preliminary or pilot-scale actions to address this contamination, including excavation and capping in priority wetlands and lakes, removal of contaminated river banks, and dredging in upstream portions of the river (EPA, 2002). Since the ROD for OU 3 was issued, additional data have been collected and EPA's understanding of the nature and extent of contamination in the Lower Basin has continued to evolve.

EPA also continues to develop evaluation tools and pursue data collection and analysis efforts in the Lower Basin to support the future development and evaluation of remedial alternatives. A hydraulic model has been completed and a sediment transport model will be completed in FY16. These tools will help evaluate the impacts and effectiveness of various cleanup options in the Lower Basin.

As described in Section 1.4, EPA, with input from stakeholders, is currently developing a Lower Basin cleanup strategy that will be appended to this 2016 10-Year Implementation Plan after it has received public comment.

[11] The PFT was a subgroup of the Basin Commission primarily composed of representatives from EPA, the State of Idaho, Shoshone and Kootenai Counties, the Coeur d'Alene and Spokane Tribes, the State of Washington, BLM, USFWS, USFS, and interested citizens.

2.3 Strategy to Address Basinwide Recreational Activities

In early 2016, EPA, IDEQ, PHD, and Coeur d'Alene Trust (collectively referred to as the Recreation Sites Team) began developing a strategy to address and manage human health risks from exposure to lead and other metals that can occur during recreational activities throughout the Upper and Lower Coeur d'Alene Basin. The formation of this group evolved during implementation of the BPRP in the Lower Basin. In certain situations, due to recurrent seasonal flooding, other actions were developed to address exposures in lieu of cleanup. These types of actions also had application in other areas where recreation risks occur. A document summarizing the proposed strategy (EPA et al., 2016) has been prepared by the Recreation Sites Team and will be issued in late 2016 for public and stakeholder comments and suggestions. The strategy document will seek input on the following:

- Priority recreational sites, activities, and/or concerns
- Needs for maintained recreation areas to replace highly contaminated areas
- Actions to add to the risk management "toolbox"
- Locations to apply certain actions or ideas for pilot projects
- Recommendations of priority sites and/or concerns to provide to other stakeholders who own or manage recreational properties.

Community outreach and education are important ways to help people manage health risks while recreating in the Basin. A robust outreach and education program has been in place for years and will continue to be implemented and expanded as part of implementing this strategy.

Following review of stakeholder comments and additional data gathering, an implementation plan (or addendum to this 10-Year Implementation Plan) will be prepared to identify initial actions or pilot projects anticipated to start during the summer of 2017. The Coeur d'Alene Tribe will be joining the Recreation Sites Team during development of the implementation plan and will continue to be involved during future planning and implementation.

2.4 Additional Supporting Activities

Throughout the cleanup's duration, EPA will continue with various studies, technical oversight, and ancillary activities necessary to implement a cleanup program of the size and complexity of the Bunker Hill Superfund Site. These additional activities include the following:

- **Repository development, management, and closure—**Existing repositories currently being used to dispose of contaminated soil include those at Big Creek, Big Creek Annex, Page, East Mission Flats, and Lower Burke Canyon. These repositories are used for remedial action wastes and wastes generated from ICP permitted projects. During the next 10 years, as described in Section 3.3.1, the Big Creek Repository (BCR) is planned for closure and additional repository capacity will be developed (BCR and Lower Burke Canyon Repository Annex). To the extent practicable, operating these repositories will use options for waste segregation, reuse, or other approaches to preserve the long-term capacity of these repositories.

- **Limited use repositories—**The need for limited use repositories (LURs) was identified in 2014 when the Paved Roads Program, as described in Section 2.1.3, began generating significant waste volumes of inert asphalt concrete and generally low-level contaminated base materials excavated with the asphalt. To prioritize repository space for more contaminated ICP and remedial action wastes, LURs were sited and developed within OUs 2 and 3 of the Upper Basin in accordance with the LUR policy memorandum (IDEQ and EPA, 2015). The LURs are anticipated to receive waste from the Paved Roads Program until its completion, and then they will be closed in accordance with the LUR policy memo.
- **Environmental monitoring—**The BEMP and project-specific monitoring are ongoing activities that will be used to support the adaptive management process. The BEMP will consolidate all Basinwide environmental monitoring efforts to look at the Upper and Lower Basins more holistically and monitor long-term status and trends, while project-specific monitoring will be used to evaluate the effectiveness of specific remedial actions. This work will include support agency agreements with USFWS, the U.S. Geological Survey, and the Coeur d'Alene Tribe for conducting monitoring activities.
- **Fish Tissue Sampling—**The selected remedy in the OU 3 ROD includes educational resources and health advisories to manage the potential for metals exposure through consumption of fish. During the spring and summer of 2016, fish tissue samples were collected from the South Fork Coeur d'Alene River, Coeur d'Alene River and Chain Lakes, Coeur d'Alene Lake, and Spokane River in Idaho in accordance with the Idaho Fish Consumption Advisory Project (IFCAP) protocol (Idaho Department of Health and Welfare [IDHW], 2013). Sample collection was performed by IDFG, IDEQ, and the Coeur d'Alene Tribe. Fish species were selected based on fish present in each water body, fish harvested for consumption, and fish life histories (IDEQ, 2016). Analytical results are expected in late 2016. During 2017, IFCAP will prepare a health consultation report in coordination with the Coeur d'Alene Tribe. Health advisories for fish consumption will be issued by the IDHW through IFCAP and the Coeur d'Alene Tribe. The current fish consumption guidelines published for Coeur d'Alene Lake and statewide for bass (IDHW, 2016) will be modified or expanded as needed. The goal of IFCAP and the Coeur d'Alene Tribe is to protect the public from adverse health risks associated with consuming contaminated fish.
- **Historic properties documentation and management—**In December 2014, a Historic Properties Management Plan (HPMP; Historical Research Associates, 2014) was developed for the Upper Basin portion of the Site in compliance with EPA's *Superfund CERCLA Compliance with Other Laws Manual: Part 2. Clean Air Act and Other Environmental Statutes and State Requirements* (EPA, 1989). The HPMP documents a process that EPA will implement to achieve the substantive requirements of Section 106 of the National Historic Preservation Act for ongoing and future cleanup efforts being performed under the authority provided to EPA under CERCLA. EPA developed this HPMP to provide appropriate protection of historic properties as allowed under Code of Federal Regulations, Title 36, Section 800.14. EPA is committed to preserving and interpreting historic and culturally significant properties through proper management of such resources. EPA considers the HPMP an essential resource in maintaining staff and

contractor awareness of these properties and ensuring participation in the goals expressed in the HPMP. All entities performing selected remedial actions on the Site, including EPA and their contractors, IDEQ and their contractors, and the Coeur d'Alene Trust and their contractors, are subject to the process outlined in the HPMP. The HPMP summarizes the background of Site cleanup and provides an area of potential effects for the Upper Basin portion of work outlined in the 10-Year Implementation Plan. (Note: the HPMP is subject to change as cleanup areas shift or expand within the larger OU 3 boundaries.) The HPMP also requires that EPA provide an annual summary of how the HPMP was implemented in relation to cultural resources. The annual summary report of HPMP activities will be included in the annual updates to this 10-Year Implementation Plan. Appendix B includes copies of the *Cultural Resource Review Summary* forms for the Remedy Protection projects that began in 2015.

- **Support agency agreements with the State of Idaho—**These agreements will provide oversight, conduct monitoring, and/or implement cleanup actions at the Bunker Hill Superfund Site in coordination with EPA.
- **Community outreach activities and facilitation of meetings—**As noted in Section 6, EPA and IDEQ actively seek meaningful participation of interested and affected members of the community. Using fact sheets, news articles, and posts with new information on the EPA's cleanup website, EPA strives to keep the public informed and involved. EPA also publishes the Basin Bulletin newsletter three times each year and maintains a public Facebook page for the cleanup. EPA collaborates with the Basin Commission, as well. The public is welcome to attend meetings held by the Basin Commission and its subgroups. EPA regularly provides updates about cleanup activities at those meetings. EPA also works with the Basin Commission's CCC and TLG to share information and increase stakeholder involvement.

SECTION 3

Implementation of Remedies

This section provides summaries of and general implementation approaches and timelines for the remedial actions planned to achieve protection of human health in communities, the remedial actions planned to achieve protection of human health and the environment outside communities, and additional supporting activities. Throughout this section, general implementation timeframes are presented in graphical form. These graphics show cleanup designs and actions currently anticipated as being "more certain" or "less certain" based on cleanup priorities and funding considerations. In general, actions planned for the next few years are more certain than actions planned towards the end of the 10-year period. In general, as the cleanup moves forward adjustments in the specific types and locations of work will be made, especially where the goals and approaches of several remedies are best employed together. As discussed in Section 7.0, EPA will update this 2016 10-Year Implementation Plan as necessary to reflect adjustments to the implementation approach.

3.1 Protection of Human Health in Communities

As discussed in Section 2.0, EPA's priority for the Site has consistently been and will continue to be focused on actions that protect human health. During the next 10 years, EPA will focus on completing the following:

- Property cleanup program in OU 3 that began in 1997
- Actions to address roads that may have been damaged by cleanup activities, so that those roads can continue to serve as barriers to underlying contamination (the Roadway Surface Remediation Strategy)
- Actions to protect existing remedies that have already been implemented and may be at risk from stormwater runoff or tributary flooding (Remedy Protection projects).

These actions and general implementation approaches and timeframes are described in Sections 3.1.1 through 3.1.3, respectively.

3.1.1 Basin Property Remediation Program

3.1.1.1 Description of the Work

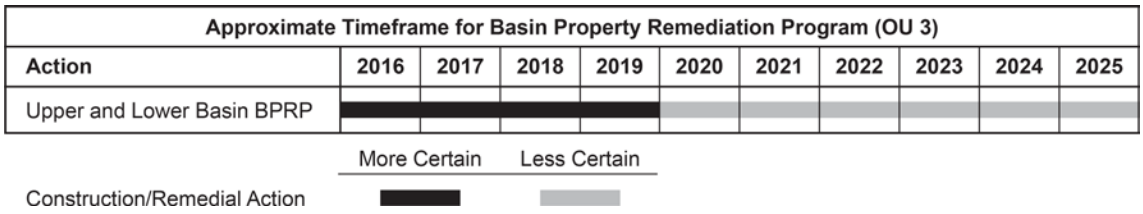
The property cleanup work that remains for OU 3 will be a continuation of the existing BPRP. As with the OU 1 and OU 2 property cleanup programs, residential, commercial (e.g., churches, schools, parks, and businesses), and ROW properties in OU 3 with soil sampling results exceeding action levels for lead or arsenic are being remediated, if landowners provide their consent for the work. When necessary, the remediation involves removing up to 12 inches of contaminated soil and replacing with clean soil and sod or clean gravel or covering the surface with asphalt, forming a clean barrier. Individual properties must be properly managed to prevent clean barriers from becoming recontaminated. As the number of candidate properties dwindles, the number of agreements with property owners to have

their properties sampled, and if necessary remediated, is expected to decline. Therefore, requests for sampling and remediation of qualified properties will be handled by the Trust on a case-by-case basis, and resources will be made available for sampling and/or remediation of qualified properties within a reasonable timeframe based on the timing of the request and available annual budgets.

3.1.1.2 General Implementation Approach and Timeframe

As described in Section 2.1.1, property cleanups in OU 3 are anticipated to be substantially complete in 2019. After that point, the program is expected to continue at a smaller scale, and will focus on smaller projects and addressing potential issues with previously remediated properties. After 2019 the BPRP is expected to be nearing completion (Exhibit 3-1), but when it will be fully implemented is uncertain. This program will continually be evaluated to ensure that it is being effectively and efficiently implemented, and adjustments may be made over time.

EXHIBIT 3-1
Approximate Timeframe for Basin Property Remediation Program for OU 3



3.1.2 Roadway Surface Remediation Strategy

3.1.2.1 Description of the Work

As discussed in Section 2.1.2, the basic elements of the Roadway Surface Remediation Strategy involve identifying and approving proposed projects, dispersing EPA and Trust funds to local jurisdictions to design and construct the projects, constructing the projects, and documenting the completed work.

The work involves sampling unpaved road surfaces, shoulders, and embankments to determine whether metals concentrations exceed cleanup action levels. It is assumed that local entities will continue to maintain transportation infrastructure within their respective jurisdictions, including paved and unpaved roads that serve as barriers to exposure. However, due to the increased wear and tear associated with the residential cleanup activities, one-time remediation funding is being provided to local jurisdictions to help repair the paved roads or road segments in the most deteriorated condition. The Roadway Surface Remediation Strategy developed by EPA and IDEQ provides details of how this work is funded and conducted (IDEQ, 2012).

The Roadway Surface Remediation Strategy began in 2013. As described in the Fourth 5-Year Review Report (EPA, 2015b), approximately 14 miles of the Box (OUs 1 and 2) and 13.5 miles of OU 3 paved roads underlain by contaminated soils were rebuilt, patched, or chip sealed, and approximately 7.25 miles of publicly owned and 2 miles of privately owned gravel roadways have been remediated through 2014. Within OU 3, the remediation of unpaved gravel roadways was completed as designed in 2014. The Roadway Surface

Remediation Strategy continued in 2015 with an additional 10 miles of paved roads remediated.

3.1.2.2 General Implementation Approach and Timeframe

As described above, gravel roads within OU 3 designated for remediation were completed in 2014. The Roadway Surface Remediation Strategy for paved roads continues and is anticipated to be completed in 2019 (Exhibit 3-2), depending on available funding. Roadway surfacing projects are planned for the communities of Pinehurst, Smelterville, Kellogg, Osburn, Wallace, and Mullan and within Shoshone County outside the communities.

EXHIBIT 3-2
Approximate Timeframe for Roadway Surface Remediation Strategy (OUs 1, 2, and 3)

Approximate Timeframe for Roadway Surface Remediation (OUs 1, 2, and 3)										
Actions	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**
OUs 1 and 2: Bunker Hill Box Roads	■	■	■	■						
OU 3: Upper and Lower Basin Roads	■	■	■	■						
	More Certain									
Construction/Remedial Action	■									

3.1.3 Remedy Protection

3.1.3.1 Description of the Work

Remedy protection actions in the Upper Basin include stormwater control actions to protect the existing human health remedies against stormwater runoff, tributary flooding, and heavy rain and snowfall which could cause damage leading to human exposure to underlying contamination. These actions are intended to reduce the potential for erosion and recontamination of existing clean barriers installed within community areas in the Upper Basin (including the Bunker Hill Box). Following are the major components of these actions as defined by the Upper Basin Interim ROD Amendment (EPA, 2012a):

- Specific Remedy Protection actions, such as culvert replacements, channel improvements, diversion structures, and asphalt ditches, identified in the eight primary Upper Basin communities (Pinehurst, Smelterville, Kellogg, and Wardner in OUs 1 and 2; Osburn, Silverton, Wallace, and Mullan in OU 3)
- Identification of generalized Remedy Protection actions that may be needed in side gulches in the Upper Basin (in OUs 1, 2, and 3)[12]

Appendix G (particularly Attachment G-3) in the FFS for the Upper Basin (EPA, 2012b) provides additional details regarding the Remedy Protection projects described in the Upper Basin Interim ROD Amendment (EPA, 2012a).

[12] Side gulches are defined as tributaries of the SFCDR where lower densities of residential populations are located in the Upper Basin and, therefore, fewer of the existing Selected Remedies have been implemented. Section 9.0 of the FFS (EPA, 2012b) provides a list of the Upper Basin side gulches.

The Selected Remedy of the Upper Basin Interim ROD Amendment deferred identification of specific locations within the side gulches and deferred selection of specific stormwater management options to be applied at these locations until more detailed investigation and modeling information was available. EPA and IDEQ completed additional analyses in 2015 to define Remedy Protection projects in five side gulches to the same level of detail as the projects defined for the eight primary communities. EPA documented the selection of site-specific Remedy Protection projects for five side gulch areas in the first ESD to the Upper Basin Interim ROD Amendment (EPA, 2015c). Following are the side gulch Remedy Protection projects added to the Selected Remedy by the ESD:

- Silver Creek, within the community of Page
- Slaughterhouse Gulch Road, near the community of Wardner
- Blackcloud Creek, approximately 2.4 miles north of Interstate 90 on Ninemile Road
- McCarthy Creek, approximately 1.6 miles north of Interstate 90 on Ninemile Road
- Boulder Creek, within the community of Mullan

At this time, Remedy Protection projects focus on the Upper Basin. As previously discussed, Remedy Protection projects aim to reduce the potential for erosion and recontamination of existing clean barriers installed within community areas resulting from stormwater runoff, tributary flooding, and heavy rain and snowfall. Due to the relatively steep topography in the Upper Basin this potential for damage to existing barriers is greater than in the Lower Basin. If Remedy Protection projects are identified for the Lower Basin in the future, these projects will be described in future decision documents.

3.1.3.2 General Implementation Approach and Timeframe

As documented in EPA's Fourth 5-Year Review Report, design and construction of Remedy Protection projects for Upper Basin communities began in 2012 and 2013, respectively.

Figure 3-1 shows the Remedy Protection projects completed in the eight primary Upper Basin community areas and one side gulch area. The Remedy Protection program is complete within the OU 1 communities.

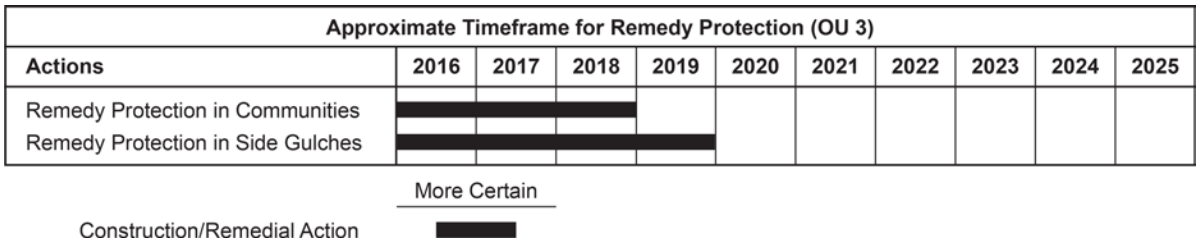
The sequence in which Remedy Protection projects are implemented is based on frequency of flooding and storm events for a watershed, construction impacts to local communities, geographical locations, scopes of work, seasonal construction limitations, funding availability, agreements by local parties to perform long-term maintenance, and private property easement needs. For example, those projects that require fewer private property easement issues to be addressed, and/or are not dependent on seasonal construction were implemented first because the time necessary for design was less. In contrast, Remedy Protection projects that required more comprehensive design, permitting, and/or easement needs required additional time for implementation. Remedy protection projects in the OU 3 communities that remain to be completed include the following:

- Osburn: Rosebud Gulch
- Wallace: Printers Creek
- Mullan: Mill Creek, Tiger Creek, Copper Street

Remaining known side gulch Remedy Protection projects include Boulder Creek within the community of Mullan, Blackcloud Creek outside the City of Wallace, and a portion of Hunt

Gulch near the community of Kingston. An ESD will be issued by EPA to formally select a remedy within Hunt Gulch to address overland flow conditions. These community and side gulch Remedy Protection projects are expected to be completed by the end of the 2018 and 2019 construction seasons, respectively (Exhibit 3-3).

EXHIBIT 3-3
Approximate Timeframe for Remedy Protection (OU 3)



3.2 Protection of Human Health and the Environment outside Communities

As discussed in Section 2.2, EPA continues to prioritize cleanup actions at OU 2 and 3 sites that currently pose the greatest risks to human health and the environment. Based on this approach, in the Upper Basin, EPA will conduct cleanup actions that address source control in Ninemile Creek (Section 3.2.1) and water treatment in the Bunker Hill Box (Section 3.2.2). As these cleanup actions near completion and their effectiveness is monitored, EPA will begin implementing source control and potential water treatment actions in Canyon Creek. In the Lower Basin (Section 3.2.4), EPA is prioritizing pilot studies and pilot projects that can be used to identify appropriate remedial actions to be taken as soon as possible.

3.2.1 Upper Basin: Ninemile Creek Watershed

3.2.1.1 Description of the Work

The Ninemile Creek Watershed has been identified as a priority for cleanup as discussed in Section 2.2.1. The Selected Remedy for the Ninemile Creek Watershed, presented in the Upper Basin Interim ROD Amendment (EPA, 2012a), primarily includes source control remedial actions to address contaminated surface water, soil, sediments, and source materials. Most remedial actions in the Ninemile Creek Watershed will focus on source control versus water treatment and, therefore, can be implemented before active water treatment infrastructure is in place. Following are major components of the remedial actions in the Ninemile Creek Watershed:

- Extensive excavation and consolidation of waste rock, tailings, and floodplain sediments
- Consolidation of excavated materials in a waste consolidation area located in the Ninemile Creek Watershed above the floodplain
- Capping, regrading, and revegetation of tailings and waste rock areas
- Collection and treatment of contaminated adit discharges and seeps either onsite (using semi-passive treatment systems) or at the CTP

- Stream and riparian stabilization actions in conjunction with sediment and floodplain remedial actions

3.2.1.2 General Implementation Approach and Timeframe

Based on principles of adaptive management, using qualitative input from stakeholders and quantitative data (e.g., water quality data; waste types, volumes, and contaminant concentrations; and modeling results), selected source sites within the East Fork of the Ninemile (EFNM) Creek Watershed were identified in the initial 2013 Implementation Plan as the highest priority for initial remedial actions in the Upper Basin. The locations of these prioritized source sites are shown on Figure 3-2; Table 3-1 lists the prioritized sites along with their BLM identification number (BLM Source ID), a general description of the waste type present within the source, and the typical anticipated remedial approach (i.e., typical conceptual design and an estimated quantity). The typical conceptual designs and estimated quantities shown are from the Upper Basin Interim ROD Amendment. Figure 3-2 and Table 3-1 also have been annotated to indicate the EFNM Creek source areas that have been remediated since the 2013 Implementation Plan was issued, including the following:

- Interstate-Callahan Mine/Rock Dumps (BUR053)
- Interstate-Callahan Lower Rock Dumps (BUR160)

In addition to remediating these source sites, a waste consolidation area (WCA) has also been constructed within the EFNM Creek Watershed as described below.

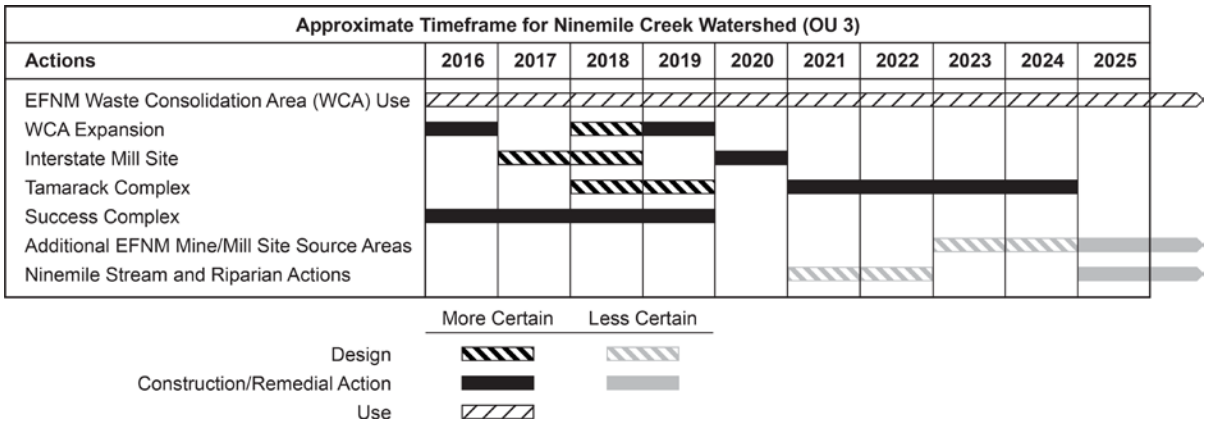
The Selected Remedy of the Upper Basin Interim ROD Amendment also included constructing a WCA within the EFNM Creek Watershed to dispose of waste generated by cleanups conducted in the Watershed. As described in EPA's Fourth 5-Year Review Report (EPA, 2015b), between 2012 and 2014, a WCA was sited, designed, and constructed in the EFNM Creek Watershed approximately 6 miles northeast of Wallace and about 250 feet above EFNM Creek outside of the alluvial valley and in an area that is relatively isolated from groundwater. The WCA was designed to be constructed in phases; the construction of the initial 19 acres of the WCA was completed in 2014 and began receiving waste in 2014 from the Interstate-Callahan removal actions. In 2016, the WCA will be expanded to accommodate waste placement from the remedial action construction of the Success Complex. Upon completion, the WCA is estimated to be about 33 acres in size with a capacity of up to 1.9 million cubic yards (EPA, 2015b). It is anticipated that wastes will be placed in the WCA for at least 10 years, although the timeline is subject to change based on funding and work execution progress in the Ninemile Creek Watershed. The location of the WCA is shown in Figure 3-2.

With the completion of the first phase of the WCA and the two Interstate-Callahan source sites located in the upper portion of the watershed, the following are the next high-priority sites to be remediated within the EFNM during the next 10 years:

- Interstate Millsite (BUR055)
- Tamarack Complex (BUR056, BUR058, BUR170, BUR172, and BUR173)
- Success Complex (OSB044)
- American Mine (OSB048)

Exhibit 3-4 shows the anticipated time line for these source site remediations, as well as timeframes for when the WCA is anticipated to be expanded.

EXHIBIT 3-4
Approximate Timeframe for Ninemile Creek Watershed (OU 3)



3.2.2 Upper Basin: Bunker Hill Box (OU 2)

3.2.2.1 Description of the Work

The Upper Basin Interim ROD Amendment (EPA, 2012a) includes a number of OU 2 Phase II cleanup actions[13] to address ongoing water quality issues. Major components of the Phase II remedial actions for the Bunker Hill Box identified in the Upper Basin Interim ROD Amendment are as follows:

- Actions to reduce the flow of contaminated groundwater entering the SFCDR and Government Creek
- Conveyance of the CTP effluent (i.e., clean, treated water) directly to the SFCDR in a pipeline to prevent recontamination through contact with contaminated subsurface Box soil
- Expansion and upgrade of the CTP to provide treatment of collected water from OU 2, consistently achieve discharge requirements, allow for operation of the CTP in high-density sludge mode, and reduce the volume of waste sludge generated
- Water management actions and/or collection and treatment of contaminated flow from the Reed and Russell Adits

The Selected Remedy's specific remedial actions for the Bunker Hill Box include the following:

- Installing a groundwater interception drain along the northwest end of the CIA

[13] The ROD for OU 2 (EPA, 1992) identified source control actions (referred to as Phase I cleanup actions) for OU 2 and groundwater collection and treatment actions (referred to as Phase II cleanup actions). This Implementation Plan summarizes the Phase II cleanup actions for OU 2, which were further defined in the Upper Basin Interim ROD Amendment and focus on groundwater collection and treatment.

- Conveying the collected water from the groundwater interception drain to the CTP for treatment
- Lining Government Creek and installing a slurry wall (on the upgradient end of the liner) and extraction wells across Government Gulch
- Installing extraction wells across the mouth of Government Gulch and conveying the collected water to the CTP for treatment.
- Upgrading the CTP to increase treatment capacity for an estimated average flow of 3,900 gallons per minute (gpm) of contaminated groundwater from actions listed above
- Conveying treated CTP effluent directly into the SFCDR via a pipeline installed on the east side of the CIA or in a pipe along Bunker Creek
- Constructing a new sludge storage facility for the CTP sized to accommodate sludge generated from OU 2, OU 3, and Bunker Hill mine water
- Conducting phased implementation of the Reed and Russell Adit actions discussed above. The initial phase of this action consists of installing a check dam within the Reed and Russell Adits to redirect acid mine drainage back into the mine and prevent it from flowing out of the adit. If the required water quality criteria are not achieved in the residual Reed and Russell Adit discharge, additional measures will be implemented to collect and convey the acid mine drainage to the CTP for active treatment.[14]

Figure 2-3 shows the remedial actions for the Bunker Hill Box as included in the Upper Basin Interim ROD Amendment.

3.2.2.2 General Implementation Approach and Timeframe

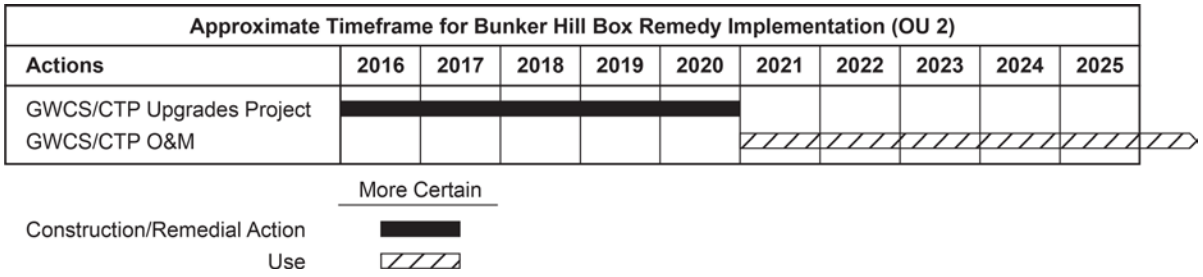
The highest-priority actions for OU 2 are groundwater collection and treatment. These include collecting metals contaminated groundwater from beneath the CIA prior to it entering the SFCDR and conducting upgrades to the CTP to increase its capacity and to achieve more stringent discharge requirements. CTP upgrades also include changing the discharge location from Bunker Creek directly to the SFCDR to avoid recontamination and constructing a new sludge disposal cell on top of the CIA. These groundwater collection and treatment actions are expected to provide the single greatest load reduction of dissolved zinc to surface water out of all the remedial actions identified in the Upper Basin Interim ROD Amendment.

EPA began the design process for the CIA groundwater collection system (GWCS) and the CTP upgrades projects (combined into a single project referred to as the GWCS/CTP Upgrades Project) in the latter part of 2012. During the predesign process for the GWCS a different collection approach (a slurry wall and extraction well system) was shown to be more cost effective than a collector drain (CH2M, 2013). This design change from a drain to a slurry wall/extraction well system has been determined by EPA to be a significant difference to the Selected Remedy. EPA plans to issue a second ESD to the Upper Basin Interim ROD Amendment to document this remedy change.

[14] The Reed and Russell Adits are part of the Bunker Hill Mine, and the implementation of actions at the Reed and Russell Adits may be affected by potential changes in ownership and/or operation of the Bunker Hill Mine.

The U.S. Army Corps of Engineers, working on behalf of EPA, plans to implement the GWCS/CTP Upgrades Project as 4-year design-build-operate project that is anticipated to begin late 2016 and end in 2020 (Exhibit 3-5) and would include 1 year of O&M beyond construction completion. Long-term O&M of the GWCS/CTP would then be administered by the State of Idaho per Memorandum of Agreement. The OU 2 actions for Government Creek are of lower priority because they will provide significantly less reduction in dissolved metals loading to surface water. It is not expected that the Government Gulch actions will be implemented within the next 10 years. The timing of the implementation of actions at the Reed and Russell Adits is being discussed with the Bunker Hill Mine owner.

EXHIBIT 3-5
Approximate Timeframe for Bunker Hill Box Remedy Implementation (OU 2)



3.2.3 Upper Basin: Canyon Creek Watershed

3.2.3.1 Description of the Work

A portion of the Canyon Creek Watershed has also been identified as a priority area for cleanup, as discussed in Section 2.2. The Selected Remedy for the Canyon Creek Watershed, presented in the Upper Basin Interim ROD Amendment (EPA, 2012a), includes source control and water treatment remedial actions to address contaminated surface water, soil, sediments, and source materials. Major components of the remedial actions in the Canyon Creek Watershed include the following:

- Extensive excavation and consolidation of waste rock, tailings, and floodplain sediments.
- Consolidation of excavated materials in WCAs located above the floodplain and/or in regional repositories.
- Capping, regrading, and revegetation of tailings and waste rock areas.
- Collection and treatment of contaminated adit discharges at the CTP.
- Collection and treatment of contaminated groundwater in Woodland Park using a combination of stream liners and groundwater interception drains.
- Stream and riparian stabilization actions in conjunction with sediment and floodplain remedial actions.

3.2.3.2 General Implementation Approach and Timeframe

Based on principles of adaptive management, using qualitative input from stakeholders and quantitative data (e.g., water quality data; waste types, volumes, and contaminant concentrations; and modeling results), source control actions, especially those with human health risk, and water treatment actions in Canyon Creek were identified as the priority for initial remedial actions in this watershed.

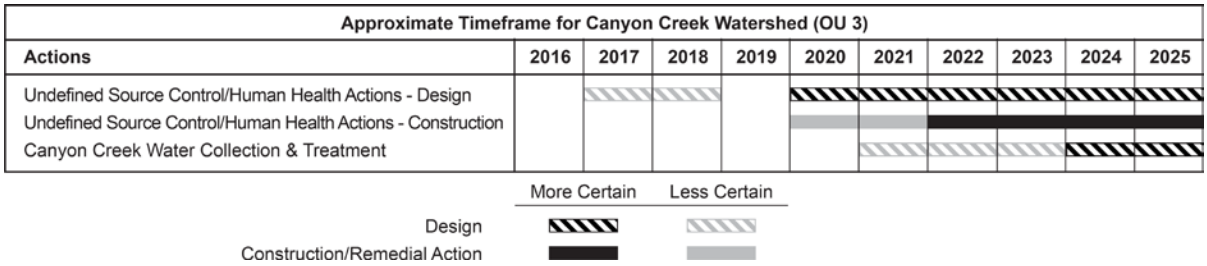
With the completion of human health actions within the communities (e.g., BPRP, Roadway Surface Remediation Strategy, Remedy Protection) and the completion of high-priority source control actions in the Ninemile Creek Watershed, EPA plans to shift source control efforts to Canyon Creek, especially in areas where human health risks are present. EPA anticipates that further identifying and characterizing Canyon Creek human health risk areas would increase in 2017 (Exhibit 3-6), with design and construction anticipated after the completion of the Lower Burke Canyon Repository (LBCR) Annex. EPA, IDEQ, and PHD implemented interim measures in 2016 to provide health education information at popular recreation areas in Canyon Creek.

The Upper Basin Interim ROD Amendment identifies a combination of stream liners and groundwater interception drains for areas of Woodland Park (see Figure 3-3). The Upper Basin Interim ROD Amendment also includes collection and treatment of adit drainages at various mine and mill sites in the Canyon Creek Watershed (see Figure 3-4). Table 3-3 presents the prioritized water treatment actions identified for the Canyon Creek Watershed.

The Upper Basin Interim ROD Amendment identifies treatment of collected surface water and groundwater at the CTP in Kellogg which would require, a pipeline to be constructed from Kellogg to Canyon Creek. The route of the pipeline is conceptual, and easement and access agreements will need to be obtained. In addition, the CTP will need additional upgrades in capacity to treat this additional water from Canyon Creek.

Prior to implementing the water treatment actions in Canyon Creek, EPA will conduct additional studies, modelling, and project feasibility evaluations to ensure that the water collection and treatment approach selected by the Upper Basin Interim ROD Amendment is still appropriate for the site conditions and current understanding of risk and metals loading from the Canyon Creek Watershed to the SFCDR. These additional studies and evaluations could begin as soon as 2017. If cost effective alternate approaches are identified for the collection and treatment of groundwater and adit drainage in the Canyon Creek Watershed, then EPA will evaluate whether the change to the Selected Remedy would require a modification to existing decision documents, and if appropriate, would issue an ESD to document the additional studies and remedy change.

EXHIBIT 3-6
Approximate Timeframe for Canyon Creek Watershed (OU 3)



3.2.4 Lower Basin Studies and Potential Pilot Projects/Remedial Actions

3.2.4.1 Description of the Work

Given the magnitude and complexity of contamination in the Lower Basin, EPA is working with stakeholders on streamlined approaches and pilot studies for remedial actions. There is a desire to move these studies forward to directly reduce the impacts of contamination to human health and the environment and to reduce the ongoing risk of recontamination posed by regular flooding and the transport of contaminated sediment into remediated properties. EPA is also continuing to characterize Lower Basin contaminated sediment transport processes to support effective source-control remedy decisions in the Lower Basin. This work will fill data gaps and help refine the enhanced conceptual site model (ECSM) for the Lower Basin (CH2M HILL, 2010), and will include sediment transport modeling to help guide effective decision-making regarding future remedial actions in the Lower Basin.

Examples of recent streamlined projects include remediation of an eroding riverbank at a campground to reduce human health risks and an ongoing pilot project in Lane Marsh to test thin-layer capping. Several agricultural properties are currently being considered for remediation and conversion to wetland habitat to increase the acreage of clean bird feeding area in the Lower Basin. Source-control remedies in the river channel are expected to be larger and more costly, and they will be evaluated with modeling tools and screening evaluations before pilot testing.

3.2.4.2 General Implementation Approach and Timeframe

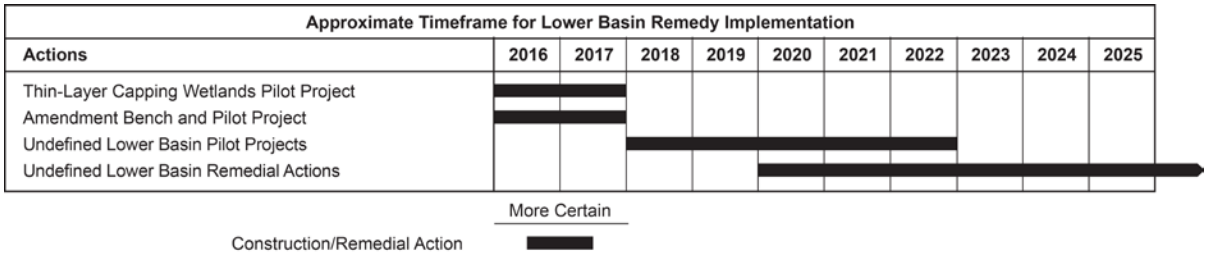
To date, post-ROD data collection and analysis in the Lower Basin have focused on defining the details of contaminant sources related to historical mining practices, pathways, and deposition areas; model development and calibration; and refinement of the ECSM to better characterize contaminant transport, identify effective remedies, and minimize the risk of recontamination. EPA's strategic plan will guide how the remedial actions already identified in the ROD will be prioritized, implemented, and monitored by EPA. Going forward, the general Lower Basin approach consists of the following:

- Synthesizing the data collected to date and conducting preliminary simulations using one and two-dimensional hydraulic, and sediment transport, modeling tools to characterize the system (i.e., evaluate the suspension, transport, and distribution of contaminated sediments during various historical "design" flood events). The one- and two-dimensional hydraulic models have been completed and are in use. The sediment transport model is in final stages of development and is scheduled to be completed by the end of 2016.
- Continuing to opportunistically fill data gaps to adequately understand the sources of contaminated sediments, how they move through the Basin, and where they are deposited.
- Using the sediment transport model and the hydraulic models, evaluate the effectiveness of potential remedial actions. This work will begin in 2016.
- Identifying and evaluating potentially effective remedial actions and the timing, locations, and sequencing of those actions. This work will also begin in 2016.

- Conducting pilot projects to help support evaluation of and/or remedial design for potential future remedial actions.
- Monitoring and assessing contaminant transport in the Lower Basin, including the effectiveness of implemented remedial actions.

Data collection in the Lower Basin is conducted on a targeted basis to fill data gaps as needed and appropriate. Sediment movement occurs primarily during flooding events in the winter and spring, and suspended and depositional sampling is focused on these events. Other studies will seek to better characterize the river channel and banks, and off-channel lake, wetland, and floodplain areas. The scale and complexity of contamination in the Lower Basin requires an iterative approach to data collection and remedial option evaluation. Opportunities to conduct pilot studies are being identified and evaluated, with consideration of potential effectiveness and risks of recontamination. These potential remedies will be considered in the context of the ROD for OU 3 (EPA, 2002) or other appropriate CERCLA decision documents in the future as needed to support planned actions. By 2020, it is expected that work in the Lower Basin will consist of design and development of appropriate CERCLA decision documents if necessary (Exhibit 3-7).

EXHIBIT 3-7
Approximate Timeframe for Lower Basin Remedy Implementation



3.3 Repository Development and Management

Additional activities that will support the cleanup efforts described in Sections 3.1 and 3.2 include continued work to design, construct, operate, and close repositories to contain waste rock, soil, and sediments from cleanup and ICP-regulated activities; continued environmental monitoring; and other ongoing supporting activities. These are discussed in Sections 3.3.1 through 3.3.3.

3.3.1 Repository Development, Management, and Closure

3.3.1.1 Description of the Work

Repository activities have focused on three objectives: (1) continuing operations at the Page, Big Creek, Lower Burke Canyon, and the East Mission Flats Repositories; (2) developing additional repository sites in the Upper Basin to accommodate both cleanup and ICP wastes; and (3) revising and implementing the Waste Management Strategy for the Basin. In addition, innovative methods for waste disposal reduction, such as reuse and the development of LURs and community fill projects, are necessary to prolong the operating life span of the existing repositories. Reducing remedial wastes volumes and using

opportunities to fill developable land with low-level wastes will reduce the level of urgency for developing new repositories in the near future.

Potential repositories have been and will continue to be evaluated using criteria provided in the 2002 OU 3 ROD, which included proximity to cleanup areas, background environmental conditions, site conditions, impacts on groundwater, and other considerations (EPA, 2002). Repositories will require long-term institutional controls and monitoring. Public involvement processes are primary components for the siting of all repositories.

Current and long-term disposal needs were estimated in the *Repository Waste Management and Planning Strategy 2016 Update* (TerraGraphics, 2016b). The Basin repositories currently proposed, operating, or being constructed are discussed below. Figure 3-5 shows the general locations of these repositories.

The BCR is located approximately 4 miles east of Kellogg near the confluence of Big Creek and the SFCDR. The repository was constructed on a former 22-acre tailings impoundment and began receiving waste in 2002. The BCR accepts waste materials from the ICP, BPRP, Remedy Protection Program, and Paved Roads Program. The capacity of the BCR was expanded in 2007 and 2011 to its current estimated capacity of 668,000 cy (TerraGraphics, 2016b). At the completion of the 2015 operating season, the remaining capacity of the BCR was about 14,700 cy. In 2016, the Trust will complete a design for expansion of the BCR that should increase its capacity by approximately 122,000 cy and extend its use through 2021.

In 2015, an area referred to as the BCR Annex (BCRA) was constructed directly west of the BCR to provide an additional waste disposal capacity of about 190,000 cy. It is estimated that the BCRA will be operational through 2023 (TerraGraphics, 2016b).

The LBCR is located within the Canyon Creek Watershed approximately 2.25 miles northeast of Wallace. The 40-acre LBCR site was formerly used for the impoundment of tailings as part of the Star Tailings Impoundment. Design of the repository began in 2012, construction was initiated in 2014, and the repository began receiving waste in 2015. The LBCR is designed to receive up to 1,150,000 cy of mine waste rock and tailings primarily from source control actions throughout the Canyon Creek Watershed (EPA, 2015b). The LBCR can receive waste throughout and beyond the next 10 years and is estimated to reach capacity in 2032 (TerraGraphics, 2016b).

The remediation of the Silver Valley Natural Resource Trustees Repository (a source area within Canyon Creek that is included in the Upper Basin Interim ROD Amendment) provides the opportunity to not only address the source of metals loading to surface water and groundwater, but with its remediation, will also create additional waste consolidation capacity within the Canyon Creek Watershed. Presently, the potential waste consolidation area that would be created is referred to as the LBCR Annex due to its location across Canyon Creek from the LBCR. Design of the remedial action necessary for the Silver Valley Natural Resource Trustees Repository and design of the LBCR Annex are planned for 2016 and 2017, respectively, with construction in 2020 and 2021, respectively. The area is anticipated to be ready to receive waste beginning in 2022. This process will include public review and comment.

The East Mission Flats Repository (EMFR) is located on a 23-acre parcel of land owned by IDEQ and is located in the Lower Basin. The EMFR was constructed and began receiving

waste in 2009. The EMFR accepts waste materials from the ICP, BPRP, and the Paved Roads Program. As of 2015, the remaining capacity of the EMFR was approximately 215,000 cy (TerraGraphics, 2016b). It is anticipated that the EMFR will continue to accept waste through and beyond 2025.

The Page Repository, located within the Bunker Hill Box and currently managed by IDEQ, has been used as the primary repository for waste materials generated during implementation of remedial actions within OU 1. Currently, the Page Repository is the primary location for disposal of OU 1 waste materials generated under ICP permits, Box Roads Program, and Remedy Protection projects. It is likely that some remedial waste from the CIA groundwater interception project will be disposed at the Page Repository. A phased expansion plan for the Page Repository, known as the Westward Expansion, was developed by IDEQ that would increase the capacity of the Page Repository by about 665,000 cy of soil waste (EPA, 2015b). The first cell of the expansion was constructed in 2012, and waste disposal began in 2013. Construction of the second expansion cell began in 2014 and continues in 2016. A second eastward expansion of the Page Repository may also be constructed that could accommodate upwards of 350,000 cy of waste. As designed and conceptualized, the westward and eastward expansions at the Page Repository are anticipated to provide most capacity to meet the OU 1 and OU 2 waste disposal needs for approximately 100 years.

As described in Section 2.3, the need for LURs was identified in 2014 when the Paved Roads Program began generating significant waste volumes of inert asphaltic concrete and generally low-level contaminated base materials excavated with the asphalt. To prioritize repository space for ICP and remedial action wastes that contain higher concentrations of heavy metals, LURs were sited and developed within OUs 2 and 3 of the Upper Basin in accordance with the LUR policy memo (IDEQ and EPA, 2015). The Government Gulch LUR, located in OU 1, began receiving waste in 2015 and, with expansions in capacity, is anticipated to provide waste disposal capacity of more than 150,000 cy and be in service until completion of the Box Roadway Remediation Strategy projects in or about 2019. A second LUR was developed and operated in east Osburn (OU 3) in 2015 and closed that same year. Two additional LURs, one at the Shoshone County Transfer Station and another on the east Zanetti Yard in Osburn, were developed and began operating in 2016. The Shoshone County Transfer Station and Zanetti Yard LURs are anticipated to reach capacity at the end of the 2016 and 2017 construction seasons, respectively. Subsequent to closing the Shoshone County and Zanetti LURs, capacity to accommodate approximately 100,000 cy of roads waste will be necessary to accommodate completion of Basin Roadway Remediation Strategy projects in 2017 through 2019. Closing and capping the OU 1 and OU 3 LURs will be conducted in accordance with the LUR policy memorandum.

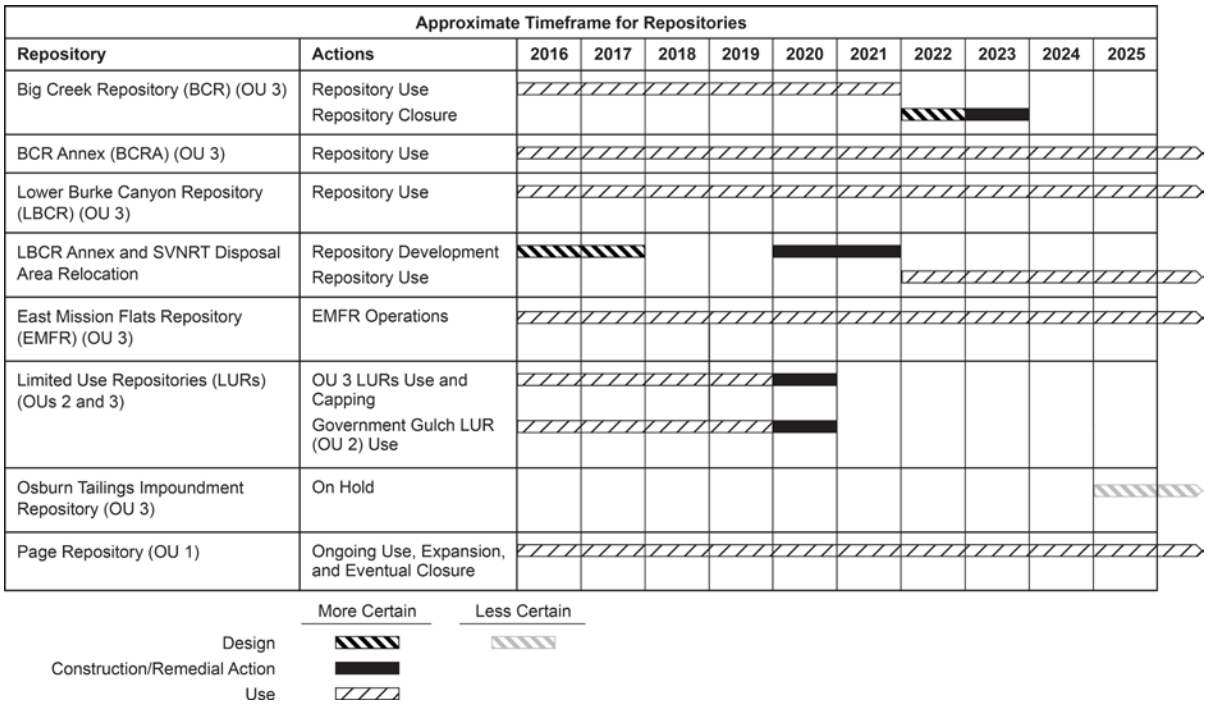
The future Osburn Tailings Impoundment Repository located east of Osburn is currently designed to 30 percent and is "on-hold" until it is determined that additional waste disposal capacity in the Upper Basin is needed.

3.3.1.2 General Implementation Approach and Timeframe

Exhibit 3-8 shows the general timeline for the existing and proposed repository work described above. Continued study of the Lower Basin (discussed in Section 3.2.4) will allow EPA to predict and update repository volume needs in order to support the repository siting

process for the Lower Basin. Subsequent updates to this 2016 10-Year Implementation Plan will identify the scoping and planning for a Lower Basin repository.

EXHIBIT 3-8
Approximate Timeframe for Repositories



3.3.2 Environmental Monitoring

Environmental monitoring conducted as part of the BEMP or on a project-specific basis will continue during the next 10 years. As described in detail in Section 7.2.2, environmental monitoring will be used to inform the adaptive management process, evaluate the effectiveness of cleanup actions, and support statutorily required 5-year reviews of remedy effectiveness and protection of human health and the environment.

3.3.3 Ongoing Supporting Activities

EPA will continue to work with the State of Idaho in accordance with support agency agreements. These agreements will allow the State of Idaho to provide oversight, conduct monitoring, and/or implement cleanup actions at the Bunker Hill Superfund Site in collaboration with EPA.

In addition to collaboration with IDEQ, EPA will continue to conduct community outreach activities as described in detail in Section 6.0. EPA will also continue to facilitate public meetings and open houses as necessary and participate in meetings such as those of the Basin Commission.

3.4 10-Year Implementation Timeframe and Anticipated Major Accomplishments

Figure 3-6 presents an overall view of the anticipated remedial implementation timeframe for actions to protect human health and the environment in communities and outside communities, and to provide support for these actions.

As indicated in Figure 3-6, actions to protect human health, including those associated with the BPRP, the Roadway Surface Remediation Strategy, and Remedy Protection actions both within communities and in side gulches, are expected to be completed within the next 7 years depending on funding availability.

Construction of the GWCS/CTP Upgrades Project in OU 2 is anticipated to be completed within 5 years and turned over to the State of Idaho for long-term O&M, thus mitigating the largest single dissolved zinc load to the SFCDR.

Priority actions along the East Fork of Ninemile Creek, including expansion of the Upper Ninemile Creek WCA, source control actions associated with the Interstate Mill Site, and Tamarack and Success Complexes are expected to be completed within 10 years. Potential source control actions in Canyon Creek associated with human health risks are anticipated to be under investigation, design and construction throughout the next 10 years. Water treatment actions in Canyon Creek will continue to be investigated and perhaps designed in the latter part of this upcoming 10-year time-frame.

It is expected that the BCR will be closed in about 6 years and the BCR Annex would continue to receive waste beyond the next 10 years prior to its closure. The Lower LBCR is projected to have capacity to receive waste beyond the next 10 years, with the LBCR Annex constructed within 6 years and able to receive additional waste beginning in about 2022. The Page Repository in OU 1 and the East Mission Flats Repository in the Lower Basin are both projected to have waste disposal capacity beyond the next 10 years. LURs, used to dispose of low contamination waste from the Paved Roads Program, are anticipated to be closed in about 4 years.

The major accomplishments expected by EPA at the Bunker Hill Superfund Site during the next 10 years include the following:

- Complete the full-scale BPRP implementation and move into a case-by-case approach due to the low numbers of properties remaining for remediation.
- Complete road repairs using the Roadway Surface Remediation Strategy to ensure continued protection of human health in communities.
- Complete Remedy Protection actions.
- Implement CTP upgrades (including new sludge disposal cell and new effluent pipe/outfall to the SFCDR) for the combined OU 2 collected groundwater and Bunker Hill mine water, and construct the CIA groundwater collection system in the Bunker Hill Box.
- Continue to implement high-priority actions along the East Fork of Ninemile Creek.

- Begin source control actions in Canyon Creek to address high risk human health concerns and initiate studies and design to address Canyon Creek water collection and treatment actions.
- Prioritize mine and mill sites with human health concerns to identify future remediation needs to address human health exposures.
- Conduct initial actions and pilot projects at Basinwide recreational sites, along with continuing and expanding the outreach and education program to help people manage health risks while recreating in the Coeur d'Alene Basin.
- Carry out program-wide actions within Canyon Creek drainage area to address ongoing human health exposures to lead and other metals.
- Provide a Basinwide fish tissue dataset to IFCAP and the Coeur d'Alene Tribe to determine fish consumption guidelines.
- Conduct Lower Basin pilot projects that will improve the understanding of the Lower Basin and methods to address risks which can then be used to select and implement future remedial actions.

SECTION 4

Implementation Process

This section describes the implementation process at the Site-wide and project-specific levels. This section also focuses on the implementation of cleanup actions and does not account for other activities that are ongoing at the Bunker Hill Superfund Site (e.g., planning for Lower Basin pilot studies, repository siting, and environmental monitoring and reporting). EPA is the lead agency for the Site in partnership with IDEQ and is, therefore, responsible for making decisions regarding the funding and implementation of cleanup actions. As described previously, EPA will collaborate with many entities during the implementation of cleanup actions including IDEQ, the Coeur d'Alene and Spokane Tribes, the Trust, federal agencies (e.g., USFS and USFWS), the State of Washington, and other local entities. EPA will continue to involve the local community in implementation of the cleanup through the existing PFTs and Basin Commission as described in Section 6.0.

The implementation process for the BPRP, Roadway Surface Remediation Strategy, and Remedy Protection projects is well established, and that process will continue until the remedial action projects are completed. As described previously, the full-scale BPRP is anticipated to be complete in 2019, the roadway remediations are scheduled to be complete in 2020, and Remedy Protection projects complete in 2019. For the mine and mill sites in the Upper Basin and Lower Basin pilot and remedial projects, implementation is expected to be conducted using a phased approach.

Table 4-1 summarizes the implementation phases and the typical documentation expected to be developed for each phase. Following are the implementation phases:

- Program planning
- Project planning
- Remedial design
- Remedial action
- Effectiveness assessment and adaptive management

Figure 4-1 illustrates the generalized implementation process, showing how the work will be organized at the Site-wide and project-specific levels. Community involvement is an important part of the process during the project planning and pre-design phases of implementation. An overview of each implementation phase is provided below.

4.1 Program Planning

Overall program planning by EPA is driven by the remedies identified in the decision documents for OUs 1, 2, and 3 and subsequent 5-year reviews for the Bunker Hill Superfund Site. EPA is responsible for selecting which projects will be conducted and in what order. Input from IDEQ and stakeholders is considered, and the selection of projects is guided by the decision documents for the Site, this 2016 10-Year Implementation Plan, and the adaptive management process. EPA will continue to document the selection and sequencing of remedial projects in EPA's 1- and 5-year work plans that are submitted to the Basin Commission.

The Trust, and IDEQ for its designated areas of responsibility, will be responsible for developing the program-wide plans (or master documents) related to pre-design data collection (e.g., health and safety, field sampling, quality assurance, data management, and reporting plans), and design, construction, construction management, construction quality assurance/quality control (QA/QC), post-construction monitoring, and O&M. Trust- or IDEQ-prepared plans and documents associated with these activities will be subject to EPA review and approval.

4.2 Project Planning

The project planning phase consists of work related to the specific projects being implemented on an annual basis. This involves the development of project-specific plans during the pre-design phase (i.e., project-specific Health and Safety, Field Sampling, and Quality Assurance Project Plans). These project-specific plans can be subsets of, or addenda to, the overall program planning master documents. EPA plans to engage the local community for input through the existing Upper and Lower Basin PFT groups, the Basin Commission CCC, and other public involvement activities during this phase of implementation.

4.3 Remedial Design

Remedial design is divided into pre-design and design phases, as shown in Table 4-1. Design of each project will begin with pre-design tasks aimed at addressing data quality objectives and remedial action objectives (RAOs), establishing required pre-design information needs, and developing the general design basis applicable to the project(s).

EPA will take the lead in defining the project-specific objectives and performance standards (consistent with the various decision documents), establishing the initial conceptual design technology approach, identifying historical data available for the site, identifying other considerations such as available site access, and the potential for collaborative work with the Restoration Partnership[15] projects. Project teams will identify key data gaps relative to remedial design and remedial action implementation for the project(s) that will form the basis of the initial work plan for remedial design development. EPA will typically lead cultural resource (National and State Historic Preservation Acts) assessments, Clean Water Act assessments, and Endangered Species Act assessments for the work effort through a Basinwide programmatic approach; however, Basin-specific protocols for conducting these types of assessments have been established with the applicable agencies, such that portions of this work may be transferred to IDEQ or the Trust.

Pre-design data gathering activities will be implemented based on the data gap evaluations, and considering the pre-design elements needed to execute the remedial design and remedial action. As part of the Trust's (or IDEQ's) pre-design data gathering, existing site data will be reviewed, additional investigations will be conducted as needed to support the design and establish baseline conditions, site surveying and mapping will be performed, and property ownership and access will be considered. An initial assessment of waste consolidation and reuse opportunities will also be made by the designated pre-design

[15] As noted in Section 1.3, the Restoration Partnership includes the Coeur d'Alene Tribe, BLM, USFWS, USFS, IDFG, and IDEQ.

entity, as well as of potential waste quantities needing disposal in a regional repository, WCA, or LUR. The findings of the initial assessments will be coordinated with and communicated in a timely manner to the EPA/IDEQ waste disposal team so that the information can be used in the repository planning and management activities. The local community, primarily through the existing Upper and Lower Basin PFT groups and Basin Commission CCC will have an opportunity to be involved during this pre-design phase.

Remedial design will generally be implemented in three phases: preliminary design, intermediate design, and pre-final/final design (Table 4-1). Preliminary design will take the design to approximately 15 to 30 percent complete and will include an initial cost estimate. Intermediate design will further the design to between approximately 30 and 60 percent complete and will refine the cost estimate. Required easements and access agreements will be obtained, and any supplemental site investigations will be conducted. To the extent applicable for a specific site, EPA will coordinate with the NRRT during the design process for restoration components that can enhance the overall goals of the project. The design will be considered final when construction plans and specifications for project bidding have been completed and approved by EPA. An engineer's estimate of the project cost will also be developed. For smaller, more routine projects, the typical three phases of design may be adjusted down to two phases as applicable.

4.4 Remedial Action

The construction phase will consist of the development of bidding,[16] construction, and post-construction documents. The level of effort required for bidding will depend on project complexity as well as the procurement approach being used. While the actual work will vary considerably depending on the project type, the construction phase will need to be programmatically consistent. This includes handling of submittals, contractor questions and change orders, construction safety requirements, and documentation of QC monitoring and QA checks. Post-construction tasks will also need to be programmatically consistent. It is critical that as-built surveys and record documents be developed and that these are similar from project to project in terms of format, level of detail, and completeness. O&M Plans also will be finalized during this phase and incorporated into the program-wide O&M documentation. The duration of the construction phase will depend on the project scope, and may require multiple construction seasons for large projects.

Project-specific monitoring will be conducted to support project design, guide construction activities, and track measures used to contain construction-related contaminant releases. Monitoring will also be performed to document changes during construction and to monitor constructability and implementation issues. Post-construction monitoring will be key to assessing remedy effectiveness and the achievement of RAOs and performance standards, and to demonstrating remedial action completion. The duration of post-construction monitoring will depend on site conditions and the type of action conducted. Documentation will include monitoring design documents and pre- and post-construction summary and impacts assessments. The entity leading and funding the project (i.e., EPA, IDEQ, and/or the Trust) will be responsible for implementing monitoring activities and collecting required

[16] Bidding for the cleanup actions is expected to occur at the completion of the design phase, and bid opportunities will be advertised. The length of the bidding period will be variable depending on the size and complexity of the work. To the extent practicable, this work will be contracted to local businesses and workers.

data. EPA will be responsible for coordinating the interpretation of the data with respect to the achievement of RAOs and performance standards.

O&M will consist of operating and maintaining each project according to its O&M Plan, as well as tracking and reporting O&M costs and site-specific remedial component system performance. Another important aspect will be to assess and document the long-term integrity of the various decision document remedies for OUs 1, 2, and 3. Periodic operations reports will be developed that EPA will use to conduct each CERCLA-required 5-year review of the work conducted at the Bunker Hill Superfund Site. Specific O&M responsibilities will be decided on a project-by-project basis.

4.5 Effectiveness Assessment and Adaptive Management

Assessment of the effectiveness of the remedial actions conducted at the Bunker Hill Superfund Site begins with the evaluation of monitoring data collected prior to and following implementation of the actions. These data are used to update the conceptual site model (CSM) of each watershed, and provide the basis for technical memoranda discussing contaminant containment forecasts and potential refinements to remedial technologies. The overall effectiveness and performance of project-specific remedial actions will be evaluated using the updated CSM as well as implementation tools that are described in Section 7.2.2. Refinement of the implementation tools and evaluation of repository needs will also be documented.

Adaptive management considers uncertainty and monitors and evaluates the effectiveness of remedial actions and cleanup technologies, including progress towards long-term cleanup goals. An adaptive management approach will enable the identification of lessons learned and the enhancement of site understanding to support overall design and implementation improvement in terms of remedy protectiveness, achievement of the overall RAOs for the various decision documents, work efficiency, and cost performance. EPA will be responsible for the overall adaptive management process, which is described in Section 7.0, but will rely on entities performing the work and/or conducting monitoring for input. The remedial action effectiveness assessments and the adaptive management process will be used to provide updates to future implementation plans, also as described in Section 7.0, and to potentially support changes described in future decision documents.

SECTION 5

Funding Considerations

An important consideration affecting implementation planning is the amount and sources of funding available for remedial design, remedial actions, and long-term O&M of the completed actions. EPA recognizes the importance of securing and preserving sufficient resources to implement the Upper Basin Selected Remedy and other cleanup actions throughout the Bunker Hill Superfund Site, including actions in the Lower Basin.

Until about 2011, the federal government's Superfund program (CERCLA), the States of Idaho and Washington, and potentially responsible parties (either through conducting the cleanup themselves or using settlement funds) have collectively funded the majority of the studies and cleanup work conducted at the Site. Beginning in 2011 and as described below, additional potentially responsible parties settlement funds became available and have been used for studies/design and cleanup activities within the Bunker Hill Superfund Site.

At this time, it is uncertain how much of Congressionally-appropriated additional funds will be directed to the Bunker Hill Superfund Site through the federal Superfund program. In addition, EPA is statutorily prohibited from using federal-government-appropriated Superfund dollars to fund or conduct O&M. While federal funding for this site has declined, EPA Region 10 will continue to request additional federal appropriations to supplement the settlement funds received. The currently available sources of funding for ongoing cleanup of the Bunker Hill Superfund Site are discussed below.

5.1 Current Sources and Management of Funding for Cleanup

This section describes two sources of funding currently available to EPA to support the ongoing cleanup at the Bunker Hill Superfund Site and how these funds will be managed.

5.1.1 Current Sources of Funding for Cleanup

In December 2009, as part of the Asarco bankruptcy settlement, funding was secured for Superfund response actions at the Site, including the Bunker Hill Box and the broader Coeur d'Alene Basin. However, most of the settlement monies, about $486 million, can only be used to perform EPA-selected cleanup actions in mining-contaminated areas of OU 3, outside the Bunker Hill Box (OUs 1 and 2). As discussed below, these funds were placed in the Trust and a trustee was appointed to manage the funds. From the bankruptcy settlement, EPA was reimbursed $8 million for human health protection actions that the Agency had completed in the Bunker Hill Box from 2002 to 2005. The $8 million was placed in an EPA-managed special account for the Bunker Hill Superfund Site as described in Section 5.1.2.

In June 2011, a settlement of $263.4 million plus interest was reached between Hecla Mining Company and the United States, the Coeur d'Alene Tribe, and the State of Idaho that resolved legal claims stemming from releases of wastes from Hecla's mining operations. Hecla settlement funds include funds for remediation and restoration of natural resources in

the Coeur d'Alene Basin and can be spent anywhere within the Bunker Hill Superfund Site. Of the $263.4 million, approximately $180 million funds response actions throughout the Site, $17 million was provided to the State of Idaho to fund the ICP and the ICP repository (Page Repository) into perpetuity within OU 1, $52.3 million was provided to the State of Idaho for long-term operations of the upgraded CTP/GWCS Upgrades Project within OU 2, and $65.85 million was paid to the federal, tribal, and state Natural Resource Trustees for use in restoration activities in coordination with cleanup actions.

EPA also received an additional approximately $5.8 million in settlements from *de minimis* parties, mostly smaller mining companies who operated throughout the Coeur d'Alene Basin. These funds are also available to fund response actions anywhere within the Bunker Hill Superfund Site.

5.1.2 Management of Funds

Most of the Asarco bankruptcy settlement funds were placed in the Trust. As stated above, the Trust funds can only be used to conduct cleanup work in mining-contaminated areas of OU 3, outside the Bunker Hill Box. The Trust is managed by a trustee which must manage the funds as defined in the Trust agreement, which was approved by the bankruptcy court. The Trust began actively implementing remedial action work within OU 3 in 2011. In general, the Trust performs work as a limited purpose successor to Asarco, which means that the Trust is "stepping into the shoes of Asarco" when performing response actions at the Bunker Hill Superfund Site. The trustee manages the Trust to maximize value and carry out cleanup actions selected and approved by EPA. EPA provides oversight of the Trust. EPA's decision documents (e.g., RODs, Amendments, ESDs, action memoranda) define the work the Trust performs, that are further clarified in annual work plans prepared by the Trust and approved by EPA. This 2016 10-Year Implementation Plan includes major activities to be conducted by the Trust from 2016 through 2025 within OU 3 of the Bunker Hill Superfund Site.

EPA directly manages the settlement monies from the Hecla settlement and other settling parties in an EPA special account which is dedicated for use at any of the three OUs within the Bunker Hill Superfund Site. EPA's top priority in using the special account funds is to ensure that there is sufficient funding to complete priority remedial actions in OUs 1 and 2 and to provide long-term funding for O&M of future OU 2 actions, EPA oversight of the Trust, and additional studies if necessary.

Through phased implementation planning and the use of adaptive management, EPA carefully considers how to maximize the Trust and the special account funds while moving forward with project priorities. While the settlement funds are significant and remedial progress is being made, the funds represent only a portion of the overall site cleanup needs. The Selected Remedy identified in the Upper Basin Interim ROD Amendment (EPA, 2012a) is an interim remedy and is estimated to cost $635 million (30-year net present value in 2009 dollars). Cleanup of the Lower Basin is expected to cost at least as much as the Upper Basin cleanup and likely more. Therefore, to complete as much cleanup as possible and ensure that the necessary O&M is provided[17], it is imperative that EPA implement the work at a

[17] Currently, EPA anticipates that funding for O&M work conducted by the Trust will be preserved in the Trust and not used for future cleanup actions.

carefully planned and measured pace that will enable the Trust funds to gain interest over time and not be depleted by spending funds too aggressively.

IDEQ manages funds for the long-term operation of the ICP in OUs 1 and 2 from settlement dollars and state appropriations. The ICP costs include ensuring disposal capacity and operating the Page Repository. IDEQ is also funding a portion of the OU 3 ICP and OU 2 O&M with state appropriations. The $52.3 million provided to the State of Idaho for long-term operations of the upgraded CTP/GWCS Upgrades Project within OU 2 have been invested with the Idaho Endowment Fund Invest Board to optimize long-term investment. IDEQ is also responsible for providing 10 percent match for EPA's remedial action expenditures for federally appropriated Superfund dollars (not settlement dollars in EPA special accounts).

5.2 Current Sources of Funding for Restoration

As part of the 2009 Asarco bankruptcy settlement, the federal Natural Resource Trustees (the U.S. Departments of the Interior and Agriculture) received $79.4 million that is separate from the settlement money received by EPA. In addition, as noted above, the federal Natural Resource Trustees (now referred to as the Restoration Partnership) received nearly $66 million as part of the 2011 Hecla settlement.

This settlement money is designated for restoration efforts (separate from cleanup efforts) in the Coeur d'Alene Basin to address the documented natural resource damage resulting from historical mining activities. As noted in Section 1.3, the Restoration Partnership includes the Coeur d'Alene Tribe, USFWS, BLM, USFS, IDFG, and IDEQ. The settlement funds will be used to restore, replace, rehabilitate, or acquire the equivalent of the damaged natural resources. The settlement provides only a portion of the money needed to restore natural resources damaged by mining and the release of hazardous substances in the Basin. The natural resource restoration planning and implementation will be coordinated with EPA's remedial action cleanup plans, and will be documented in subsequent versions of this 2016 10-Year Implementation Plan.

5.3 Anticipated Annual Cleanup Funding Levels

At this time, EPA anticipates near-term funding levels from all sources of approximately $20 to $25 million per year, on average, for cleanup activities, oversight, and studies within the Bunker Hill Superfund Site, with the large majority spent on cleanup activities. This estimated funding level is comparable to historical spending rates and assumes use of both the Trust and EPA special account funding sources for CERCLA-related work. The estimated funding level does not include funds that may be expended by the Restoration Partnership.

As described above, EPA's goal is to manage the spending rate of the Trust such that with interest gained on the invested Trust funds, the Trust will remain a viable source for cleanup funding throughout the Basin for many decades into the future. This approach could result in decisions to modify this 2016 10-Year Implementation Plan and spend fewer Trust cleanup funds in those years when rates of return are low or negative. Conversely, when rates of return on the Trust investments are high, EPA may decide to accelerate cleanup. Although management of funds is a necessary reality, EPA's primary focus will be

on the protection of human health and the environment. As of the end of 2015, the Trust contained $484 million after 5 years of actively conducting remedial work, indicating that the spending strategy for the Trust money is maintaining a long-term source of funding for ongoing remediation within the Basin.

In contrast to the Trust funds, the EPA special account funds are required to be invested in U.S. Department of Treasury funds which yield a lower rate of return. It is expected that the rate of return on the special account funds will be less than 1 percent. Therefore, the spending approach for the special account funds differs somewhat from the approach for the Trust funds. In consideration of monetary inflation and the low-interest rate of return, the special account money is being spent on high-priority remedial actions, primarily in OUs 1 and 2, at a faster rate than the Trust funds. In addition to funding cleanup actions, the special account also covers expenses associated with remedial design, monitoring, and additional studies within the Bunker Hill Box, if necessary, as well as oversight of the Trust. With anticipated expenses for OU 2 priority remedial actions, and setting aside funds for long-term O&M and oversight costs, it is anticipated that the funds in EPA's special account will likely be depleted in 2017 or 2018. After depletion of these dollars, the only source of funding for actions in OU 1 and OU 2 will be from federally appropriated Superfund dollars, which are competed for at the national EPA level.

SECTION 6

Community Involvement

EPA and IDEQ actively seek meaningful participation of interested and affected members of the community. During development of the Upper Basin Interim ROD Amendment (EPA, 2012a), EPA, in coordination with IDEQ, conducted many outreach activities that were intended to provide timely information and opportunities for local community involvement. Public interest in the Basin cleanup is high, and members of the public were actively involved in providing input. EPA Project Managers attend meetings with local organizations, community leaders, and elected officials to provide information, discuss the cleanup progress and encourage involvement in the decision-making process. EPA, in coordination with IDEQ, host public workshops, meetings, open houses, and site tours to provide a range of community involvement opportunities. EPA continues to frequently meet with local organizations, community leaders, and elected officials. EPA also regularly uses the quarterly Basin Commission meetings (and the Basin Commission quarterly meeting minutes) to update the public on EPA's cleanup plans and progress.

EPA also routinely prepares fact sheets, news articles, and other materials, and posts new information on the EPA regional website to help the public stay informed and involved. EPA also publishes the Basin Bulletin newsletter three times each year. Links are provided below:

- EPA Region 10 Bunker Hill Superfund Site website: http://yosemite.epa.gov/r10/cleanup.nsf/sites/bh
- Basin Bulletins: https://yosemite.epa.gov/R10/CLEANUP.NSF/bh/bunker+hill+superfund+site+basin+bulletin
- Data from EPA's Water Quality Exchange/STORET application: http://www.epa.gov/storet/dbtop.html

EPA has also created a ROD Amendment webpage where the public can find fact sheets, technical memoranda, meeting handouts and presentations, community involvement materials, draft documents, and other items related to the Upper Basin Interim ROD Amendment (EPA, 2012a). EPA plans to post additional implementation documents to this webpage: http://yosemite.epa.gov/r10/cleanup.nsf/sites/bh+rod+amendment

Finally, EPA has developed a Facebook page to serve as an online forum and public information resource, giving local people another way to engage with EPA and get current news about the Bunker Hill Superfund Site: http://www.facebook.com/CDAbasin

To encourage community participation in activities related to the Site, EPA has collaborated closely with the Basin Commission since its formation in 2002. The public is welcome to attend meetings held by the Basin Commission and its subgroups. EPA has provided updates about the remedy selection process as well as other cleanup-related activities at

each Basin Commission meeting since October 2008. EPA has also worked with the Basin Commission's CCC and TLG to share information and increase stakeholder involvement.

Links to key citizen groups are provided below (and are also available via the main EPA Region 10 website link provided above):

- Basin Commission:
  - Contact: Terry Harwood, 208-783-2528
  - Website: www.basincommission.com
- CCC
  - Contact: Jerry Boyd, Chair, 509-455-6000
  - Website: www.basincommission.com/CCC.asp

Because of the nature of this 2016 10-Year Implementation Plan, community participation is key, and EPA will once again go beyond regulatory requirements to ensure an inclusive and ongoing public involvement effort.

Each year, upon release of a draft of the revised Implementation Plan and/or an addendum (typically in late summer to early fall), EPA will offer a 30-day informal review opportunity. EPA will solicit and consider suggestions from affected community members and partner organizations. After the informal review period has ended, EPA will issue the revised Implementation Plan or addendum, along with information about how citizen input influenced the latest document. Issuance of full responses to individual comments is not currently anticipated.

EPA will continue to involve the local community in project-specific planning by working closely with the Basin Commission's CCC and the PFTs during implementation of cleanup actions.

EPA will continue to provide regular updates about remedial action implementation through many channels. These will include articles in the agency's Basin Bulletin newsletter, website updates, Facebook updates, local presentations, postal mailings and emails, and media notices. Site documents will be available online and in select libraries.

As the cleanup progresses, the public will have continuing opportunities to provide input on how the cleanup is being implemented. EPA is committed to implementing selected remedial actions through the Basin Commission process. In addition, EPA will follow the National Oil and Hazardous Substances Pollution Contingency Plan (NCP)-mandated public involvement process for all futures remedy decisions. Finally, EPA will continue to conduct 5-year reviews, as required by CERCLA, and the public will be invited to comment on drafts of 5-year review reports. The most recent 5-year review report was completed in 2015 (EPA, 2015b).

SECTION 7

Continued Implementation Planning

Future implementation planning will continue to provide the basis for EPA's input into the Basin Commission's 1- and 5-year work plans. It will be driven, in part, by the adaptive management process and by Trust and EPA special account balances and rates of return. As noted earlier, the Basin Commission work plans focus on general areas of work and do not go into project-specific detail; project-specific information is developed as part of the pre-design process for individual cleanup projects.

This 2016 10-Year Implementation Plan is anticipated to be updated annually with an addendum (at a minimum), and fully revised at least every 5 years in conjunction with the CERCLA-required 5-year review process for the Bunker Hill Superfund Site. Consistent with the adaptive management process, changes to the 2016 10-Year Implementation Plan may be made more frequently than the 5-year review based on information gathered before, during and after implementation of cleanup actions. To provide input to the yearly Basin Commission work plans, EPA will update the anticipated remedial implementation timeframe (Figure 3-6) on an annual basis. The implementation of cleanup actions and the adaptive management process may reveal the need to make changes to the remedies for OU 1, OU 2, and/or OU 3 or future implementation approaches. If necessary, the 2016 10-Year Implementation Plan may be updated or revised more often to reflect such changes. Changes to the remedies may be considered nonsignificant, significant, or fundamental, and EPA will document future changes to remedies or new remedies as appropriate and consistent with CERCLA and the NCP. These documents may include memoranda to the official EPA Site file, ESDs, ROD amendments, and/or action memoranda.

Updates of, and changes to, remedy implementation schedules, priorities, and/or sequencing will be documented through regular updates to this 2016 10-Year Implementation Plan. Such updates or changes will not be considered remedy changes, but may warrant more frequent updates to the 2016 10-Year Implementation Plan. As described in Section 6.0, EPA will involve the local community to provide input on updates to the 2016 10-Year Implementation Plan.

Adaptive management is a critical component of prioritizing and implementing many of the remedial actions at the Site because it is not possible for physical, biological, and chemical conditions to be fully defined and known for this large and complex area. Uncertainty is unavoidable, and the implementation of cleanup actions must be managed taking this uncertainty into account. Adaptive management will play a less crucial role in the implementation of cleanup actions to protect human health within communities because these actions (the BPRP, Roadway Surface Remediation Strategy, and Remedy Protection [drainage control and improvement] projects) have significantly less complexity and uncertainty. Therefore, at this time, discussions of adaptive management focus primarily on cleanup actions to protect human health and the environment outside communities in both the Upper and Lower Basins. The following sections describe continued implementation planning for remedies focused on protection of human health within communities

(Section 7.1) and remedies focused on protection of human health and the environment outside communities (Section 7.2). Remedies within the communities are expected to be largely complete within the next 4 years, while remedies outside communities will require longer timeframes to complete and will be a larger focus in future Implementation Plans and/or addenda.

7.1 Planning for the Implementation of Remedies in Communities

The following sections describe the general strategies to be used for continued planning related to implementation of the BPRP (Section 7.1.1), Roadway Surface Remediation Strategy (Section 7.1.2), and Remedy Protection (Section 7.1.3) in Upper and Lower Basin communities.

7.1.1 Basin Property Remediation Program

The BPRP is well established, and continued planning and prioritization with regard to the BPRP will continue to focus on actions to prevent people (particularly young children and pregnant women) from coming into contact with unhealthy levels of metals. As stated previously in Section 3.1, the BPRP for OU 3 is scheduled to be complete in 2019. EPA and IDEQ continue to monitor house dust concentrations (in vacuum-cleaner bags and dust mats) as residential soil cleanup continues in OU 3. Site-wide blood-lead screening is currently offered annually through the PHD to identify at-risk children and provide feedback on the effectiveness of cleanup efforts. This type of screening will aid in determining whether overall interior dust trends are continuing to decline in communities and whether the occurrences of residences with high lead levels are also declining in response to the implemented remedial actions. Additional monitoring includes visual assessment of remediated properties (including residential barriers and ROWs).

7.1.2 Roadway Surface Remediation Strategy

The OU 3 ROD recognized that roads are barriers to underlying contamination, and the 2010 5-Year Review Report (EPA, 2010b) recommended that a collaborative approach be developed to address roads as a long-term barrier. Beginning in 2011, sampling and remediating publicly owned unpaved gravel roads became a priority, and unpaved gravel roads were categorized according to the entity that owned or maintained it (public or private). Criteria for remediation of publicly owned gravel roads have a maximum removal depth of 6 inches and depends on proximity to residences and traffic use (IDEQ and USEPA, 2013). Alternatively, privately-owned gravel roads are remediated using the same criteria as a residential property (IDEQ, 2014). As described in the Fourth 5-Year Review Report (EPA, 2015b), the unpaved road remediation program was complete in 2014.

As described in Section 3.1.2, the Roadway Surface Remediation Strategy began in 2013 to address the need for paved roads to serve as protective barriers against exposure to or remobilization of underlying contaminants. For this ongoing program, a joint IDEQ/EPA Paved Roads Program Board was established that reviews and approves paved road remediation proposals from the local cities and counties in the Box and Basin. The local road jurisdictions are responsible for implementing the remediation according to approved plans

and following Board guidelines. The jurisdictions are also responsible for O&M of the remediated roads, which will continue to serve as barriers against exposure to or remobilization of underlying contamination. Road shoulders and unpaved roads will be periodically sampled as needed to inform remedy effectiveness evaluations and adaptive management decisions. As described in Section 3.1.2, it is anticipated that the Paved Road Program will be complete in 2019 for OUs 1 and 2 and 2020 for OU 3.

7.1.3 Remedy Protection

Remedy protection projects will continue to be prioritized based on the frequency of flooding and storm events for a watershed, construction impacts to local communities, geographical locations, scopes of work, seasonal construction limitations, permitting considerations, funding availability, agreements by local parties to perform long-term maintenance, and private property easement needs. As noted earlier, those projects that generally require less in terms of design, permitting, and/or easement needs will likely be completed before more complex projects. Ongoing monitoring, including visual assessments of existing remedies, will inform this process.

Prior to the construction of Remedy Protection infrastructure projects, local residents and elected officials engage in a public information or participation process with EPA and IDEQ. Local jurisdictions responsible for infrastructure, along with IDEQ, sign an Interagency Cooperative Agreement. The Interagency Cooperative Agreement requires local governmental entities holding jurisdiction or ownership of the project to assume responsibility for performing and funding ongoing O&M of the project.

As described in Section 3.1.3, the Box Remedy Protection projects identified in the Upper Basin Interim ROD Amendment were completed as of 2015. Remedy protection projects within the communities and in side gulch areas continue to be prioritized with completion of the program estimated in 2019.

7.2 Planning for the Implementation of Remedies outside Communities

The following sections describe the adaptive management process (Section 7.2.1) and tools for evaluating remedial action effectiveness (Section 7.2.2). Both of these will be used to inform continued implementation planning for remedies outside Upper and Lower Basin communities.

7.2.1 Prioritization of Future Remedial Actions Using Adaptive Management

Adaptive management, illustrated in Figure 7-1, is a process wherein decisions are made as part of an ongoing science-based process. A key component of the success of the adaptive management process is refinement of the implementation process and remedial approaches as new information becomes available that clarifies uncertainties regarding the understanding of a site, the effectiveness of the remedial approaches and technologies used, and the responses of environmental receptors to changes in contaminant concentrations, ecological conditions, and habitat. Adaptive management reviews and adjustments, and incorporation of changes into the management objectives, strategies, approaches, and tools used in the implementation process, will be conducted in a timely manner and consistent

with CERCLA-required 5-year reviews. Within the context of the cleanup actions, adaptive management simply means that EPA will implement specific cleanup actions included in the remedies for OUs 1, 2, and 3, monitor the effectiveness of those actions to determine whether cleanup goals are being achieved, and make adjustments to future cleanup actions to benefit from the information gained through the effectiveness monitoring. The intent of the adaptive management process is to guide the collection of valuable information so that the most effective cleanup is achieved for the lowest cost.

7.2.1.1 Prioritization of Remedial Actions

As part of the Upper Basin FFS and development of the Upper Basin Interim ROD Amendment, EPA, with help from stakeholders and community members involved in the Basin Commission's Upper Basin PFT, developed a logical and transparent prioritization process for implementing remedial actions at Upper Basin mine and mill sites. Logically, implementation would begin at the top of watershed drainages and continue downstream to avoid recontamination and the most contaminated Upper Basin watersheds would be addressed first to achieve the greatest remediation value for the funds spent. EPA continues to prioritize remedial actions outside communities at the Bunker Hill Superfund Site using similar processes as more data are gathered and the effectiveness of the initial completed remedial actions are determined. The following specific issues, at a minimum, will be taken into consideration during the prioritization, scheduling, and sequencing of remedial actions:

- **Human health exposure to contaminated mine waste materials**. EPA will continue to place a higher priority on cleaning up sites that present current exposure risk to individuals from contaminated mine wastes, including exposures that may occur from damage to existing remedies. Prioritizing mine and mill sites with risks to human health will be recommended as part of the ongoing Upper Coeur d'Alene Basin Mine and Mill Sites Characterization of Human Health Risks Project, which is expected to be completed during late 2017. Also, a strategy to implement actions to manage human health risks from exposure to lead and other metals that can occur during recreational activities Basinwide is under development and anticipated to start during summer 2017.

- **Potential for recontamination of cleaned areas.** EPA will continue to prioritize the implementation of remedial actions that reduce the potential for recontamination of previously remediated areas to the extent practicable. This typically means conducting work at locations that are topographically higher in a drainage area first, in order to avoid recontamination from locations above them. This approach will make it possible to coordinate habitat restoration work conducted by the Natural Resource Trustees following cleanup actions.

- **Metals loading to surface water, groundwater, and sediments.** EPA will continue to prioritize the implementation of remedial actions at locations based on the potential to add or transport metals, such as lead and zinc, to surface water, groundwater, and sediments.

Additional factors that may be considered prior to the implementation of future remedial actions include, but are not limited to water treatment, waste management, restoration work, construction staging, design needs, and stakeholder and community input.

7.2.1.2 Adaptive Management at the Watershed Level

In general, EPA plans to continue to implement remedial actions outside communities at the Site on a watershed basis, based on evolving CSMs that define the sources and potential pathways for metals contamination at the watershed level. This strategy will provide for efficiency in terms of resource management, logistical coordination, and the ability to monitor effectiveness. As remedial actions are implemented within specific watersheds, EPA will continue to collect data and use the tools described in Section 7.2.2 to assess cleanup technologies and analyze the effectiveness of the actions. The results of these analyses will be documented and will help inform the adaptive management process and prioritization of remedial actions within a specific watershed, while providing for "lessons learned" to be applied during future implementation of actions at other watersheds.

7.2.2 Tools to Assess the Effectiveness of Remedial Actions outside Communities

EPA has multiple tools that will be used to quantitatively assess the effectiveness of implemented remedial actions outside Upper and Lower Basin communities. This effectiveness assessment will inform the adaptive management process. Project–specific monitoring and the ongoing BEMP will provide key data with which to evaluate project- and watershed-specific data along with long-term Basinwide status and trends for surface water, groundwater, sediments, and effects on ecological receptors. Ecological response metrics, specific to the Upper Basin, and effectiveness modeling tools will also be used to evaluate the improvement of environmental quality.

7.2.2.1 Project-Specific Monitoring

Project-specific monitoring for remedial actions outside the Basin communities will include collection and evaluation of pertinent media of concern depending on the particular project site and its location in a watershed (i.e., surface water, groundwater, sediment, and/or biological monitoring data). Key goals of project-specific monitoring are to accomplish the following: (1) evaluate the effectiveness of remedial actions conducted to date, (2) evaluate progress toward the achievement of established cleanup levels, and (3) gain a better understanding of natural processes and data variability. It is anticipated that project-specific monitoring will be expanded to evaluate the effectiveness of individual or groups of cleanup actions within specific areas, as they are implemented. Project-specific monitoring will include evaluating the following:

- Status and trends of dissolved zinc and cadmium concentrations and AWQC ratios in surface water
- Status and trends of particulate lead concentrations and loads to surface water
- Trends in lead concentrations in floodplain soil and sediments, levees, and/or river bed sediments
- Progress toward achieving ROD-specific cleanup levels and RAOs
- Potential unwanted impacts resulting from implementation of the remedies for OUs 1, 2, and 3

- Changes or trends in biological resources (e.g., population diversity, chemical exposure, and bioavailability of metals).

Project-specific monitoring may be initiated in focused areas at an expedited data collection frequency in preparation for remedial design efforts, and may also be adjusted or terminated as actions and data collection objectives are satisfied. Project-specific monitoring data may also be used in conjunction with previous monitoring data and BEMP data (described in the next section). Project-specific monitoring data will be critical for continued implementation planning decisions.

7.2.2.2 Basin Environmental Monitoring Program

In support of the RODs for OU 2 (EPA, 1992) and OU 3 (EPA, 2002 and 2012a), EPA worked with stakeholders at the Bunker Hill Superfund Site to collaboratively develop initial monitoring programs to evaluate the success of the remedies specified for these OUs. The original monitoring programs were initiated for OU 3 and OU 2 in the BEMP (EPA, 2004) and the Environmental Monitoring Plan (EMP; CH2M, 2006), respectively. Beginning in early 2014, EPA initiated an independent third-party optimization review of the Site's BEMP using its Office of Superfund Remediation and Technology Innovation resources. The objective of the review was to provide recommendations to improve the existing monitoring to result in a more efficient and cost effective strategy in consideration of the extent of contamination and diversity of exposure pathways. Recommendations were provided in two broad categories: remedial action performance/effectiveness monitoring and Basinwide monitoring. EPA issued the BEMP optimization review report in January 2016 (EPA, 2016) and is in the process of implementing the report's recommendations.

Following are media of interest for the BEMP:

- **Surface Water**: Dissolved and total metals concentrations, and hardness (calcium and magnesium). The surface water monitoring design emphasizes dissolved cadmium and zinc under a range of flow conditions, and total lead under high-flow conditions as these are the contaminants associated with historical mining practices. Ongoing implementation of the Lake Management Plan by IDEQ and the CDA Tribe has identified the need to monitor phosphorus input into Lake Coeur d'Alene because of its deleterious effect on water quality and potential to release metals from contaminated sediments. Although not a contaminant of concern for the Bunker Hill Site, EPA recognizes the importance of understanding significant sources of phosphorus in the Basin and its implication on the success of the Lake Management Plan. To that end, EPA has taken measures to increase the amount of phosphorus data being gathered in the Basin in addition to efforts already underway by the CDA Tribe, USGS, and IDEQ. These measures include monitoring phosphorus levels in the CTP effluent in response to IDEQ comments related to discharge standards applicable to the CTP; as part of EPA's overall BEMP, USGS will continue monitoring phosphorus in surface water; and EPA is working with IDEQ to include phosphorus analysis of sediment "grab samples" that will be obtained during flood-stage sampling, should flooding occur in the Lower Basin. Phosphorus data previously collected by USGS are reported and discussed in EPA's Fourth Five-Year Review Report (EPA, 2015b). The additional data will provide more recent information on phosphorus levels at various locations in the Basin to inform stakeholders and resource management agencies.

- **Sediments**: Metals concentrations in sediments in river (or stream) and riparian environments in the Upper Basin (particularly in Ninemile Creek, Canyon Creek, Pine Creek, and the SFCDR); metals concentrations in sediments in river (stream), riparian, lake, and wetland environments in the Lower Basin; and metals concentrations in sediments within depositional areas of the Spokane River. The BEMP aims to monitor sediments for long-term trends while soil in source areas may be targeted for action-specific testing and monitoring as appropriate.
- **Groundwater**: Dissolved metals concentrations of the primary chemicals of concern, including arsenic, cadmium, copper, lead, mercury, and zinc.
- **Biological resources**, which generally include:
  - Fish, macroinvertebrates, periphyton (algae, bacteria, microbes, detritus), and aquatic habitat in river (stream) environments
  - Songbirds, small mammals, and vegetation in riparian environments
  - Waterfowl in wetland environments
  - Waterfowl and fish in lake environments

EPA plans to summarize the results of data collected through the BEMP program and provide this information to the community on an annual basis.

7.2.2.3 Ecological Response Metrics for the Upper Basin

EPA, in collaboration with the Restoration Partnership (which consists of the Coeur d'Alene Tribe, BLM, USFWS, USFS, IDFG, and IDEQ as noted previously), has developed ecological response metrics for evaluating remedial progress during the implementation of the Upper Basin Selected Remedy (Stratus Consulting, 2012). Ecological response metrics have been refined in part from the fishery tiers included in the ROD for OU 3 (EPA, 2002), and reflect the current understanding of the river system specific to the Upper Basin. Fishery tiers were developed to provide a relationship between dissolved metals concentrations in surface water and the health of fisheries (i.e., the abundance of fish species, age of fish, fish migration, etc.) in the Upper Basin (CH2M and URS Greiner, 2001).[18]

Measurable ecological response metrics provide EPA with a means to evaluate, predict, and report on environmental improvements associated with remedial actions planned and implemented throughout the Upper Basin. The ecological response metrics are not applicable or relevant and appropriate requirements; therefore, the intent of such ecological response metrics is to provide EPA and interested stakeholders with the following:

- Tools with which to estimate potential environmental and ecological improvements that could result from specific remedial actions.
- Target receptors with which to evaluate environmental recovery.

[18] The Selected Remedy for the Upper Basin is an interim remedy and may not achieve applicable or relevant and appropriate requirements at all locations without additional actions. Although cleanup levels may take a long time to achieve after remediation, it is expected that planned interim remedial actions will result in significant improvements to the ecological health of fisheries in the Upper Basin.

- A means for measuring environmental recovery and progress toward achieving cleanup goals during and after the implementation of watershed-specific remedial actions.

Data collected in the Upper Basin as part of the BEMP will be used to evaluate the ecological response metrics and evaluate Basinwide effectiveness of remedial actions as part of the 5-year review process. EPA will use this information for the adaptive management process and continued implementation planning.

7.2.2.4 Value-Cost Tools to Assist Decision-Making

EPA, in coordination with stakeholder and partners, plans to continue to use cost-value tools to evaluate the prioritization and sequencing of remedial actions. Screening-level estimates of the potential ecological benefits of remedial actions are developed using synoptic data (e.g., surface water quality measurements) between monitoring locations and estimates of the anticipated remedial effectiveness of the cleanup approach being considered (e.g., source removal versus containment/capping). The cost of the remedial approaches being considered is then compared to the anticipated ecological improvement to provide insight into project prioritization and sequencing decisions.

The value-cost tools assist EPA in identifying those sites where the implementation of remedial actions has the highest potential to (1) cost-effectively improve surface water quality for ecological receptors by reducing dissolved metals concentrations, and (2) improve soil and sediment quality for ecological receptors by reducing particulate metals. The assessment of how well each action performs in terms of these criteria will be performed using the projected results of proposed remedies at each site based on existing data. As time goes on, it is expected that better information will be available to refine remedial effectiveness assumptions and costs.

SECTION 8

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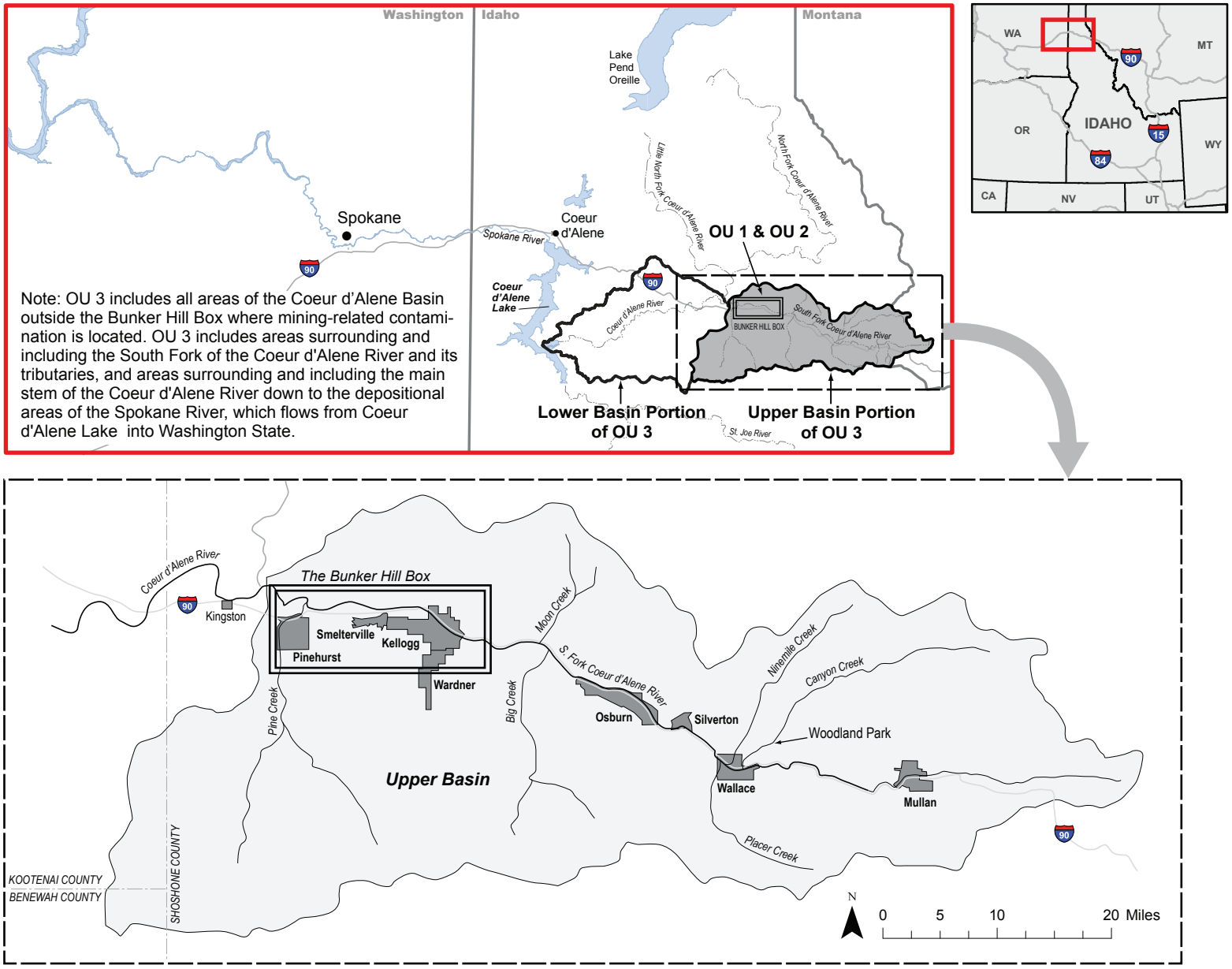
Figures

Vicinity Map of Coeur d'Alene Basin



OU = Operable Unit

Note:
The river corridor portions of the South Fork of the Coeur d'Alene River and Pine Creek located within the Bunker Hill Box are considered to be part of OU 3.

Figure 1-1
Location Map
Superfund Cleanup Implementation Plan, 2016-2025
Bunker Hill Superfund Site

WHAT THIS FIGURE SHOWS

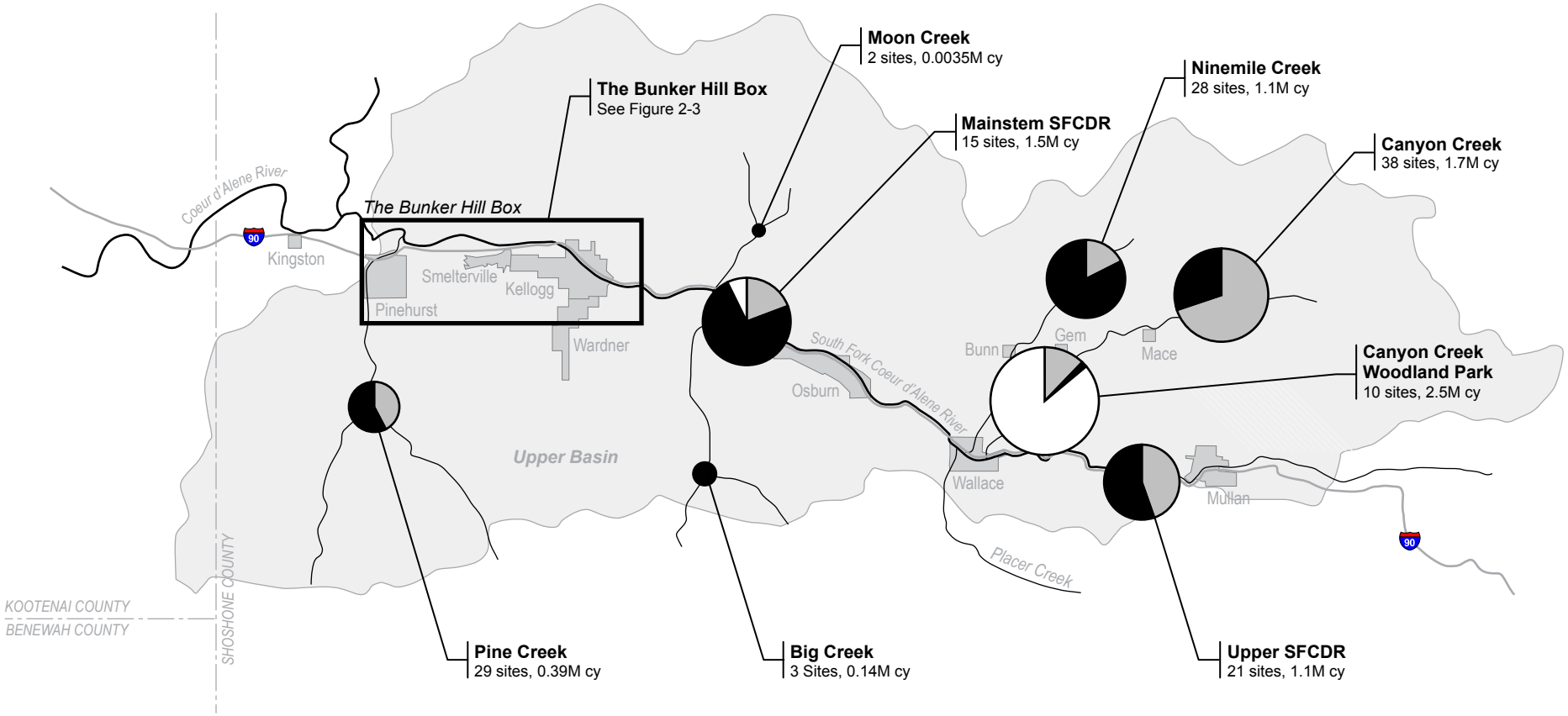
For the main and upper parts of the South Fork Coeur d'Alene River and major creeks, this figure shows the number of individual locations where remedial actions have been planned and the amount of material, such as contaminated tailings, waste rock, and floodplain sediments, that would be cleaned up. The "pie charts" for each portion of the river and creeks show the general breakdown by type of remedial action for the Selected Remedy. The volume (millions of cubic yards [cy]) listed for each watershed includes all material addressed by the Selected Remedy.

The bigger the pie chart, the more contaminated materials are planned to be addressed.

Cap – Includes engineered or soil covers, or regrading and planting.

Excavation – Includes removing materials and either consolidating locally or transporting to a separate repository.

Hydraulic Isolation – Includes preventing contaminated water (seeps, adit drainage, or groundwater) from entering the river and creeks.



Key to Pie Charts

Source Control Actions:

- Cap
- Excavation
- Hydraulic Isolation

Notes:

SFCDR = South Fork Coeur d'Alene River

Some source control actions may not be visible in some pie charts because of their proportionally small size.

N

0 1 2 4 Miles

Figure 2-1
Source Control Actions by Watershed in the Upper Basin Selected Remedy
Superfund Cleanup Implementation Plan, 2016-2025
Bunker Hill Superfund Site

WHAT THIS FIGURE SHOWS

For the main and upper parts of the South Fork Coeur d'Alene River (SFCDR) and major creeks, this figure shows the number of individual locations where water treatment remedial actions have been planned. The "pie charts" for each portion of the river and creeks show the general breakdown by type of water treatment action for the Selected Remedy.

The bigger the pie chart, the larger the flow of contaminated water that will be treated by the Selected Remedy. This figure also shows the approximate location of the water conveyance pipeline to the Central Treatment Plant (CTP) in Kellogg. The size of the arrow represents the approximate amount of flow for the pipeline.

CTP Treatment – Includes collection of groundwater or adit discharge and active water treatment in Kellogg.

Onsite Treatment – Includes collection of groundwater or adit discharge and semi-passive treatment at the source site.

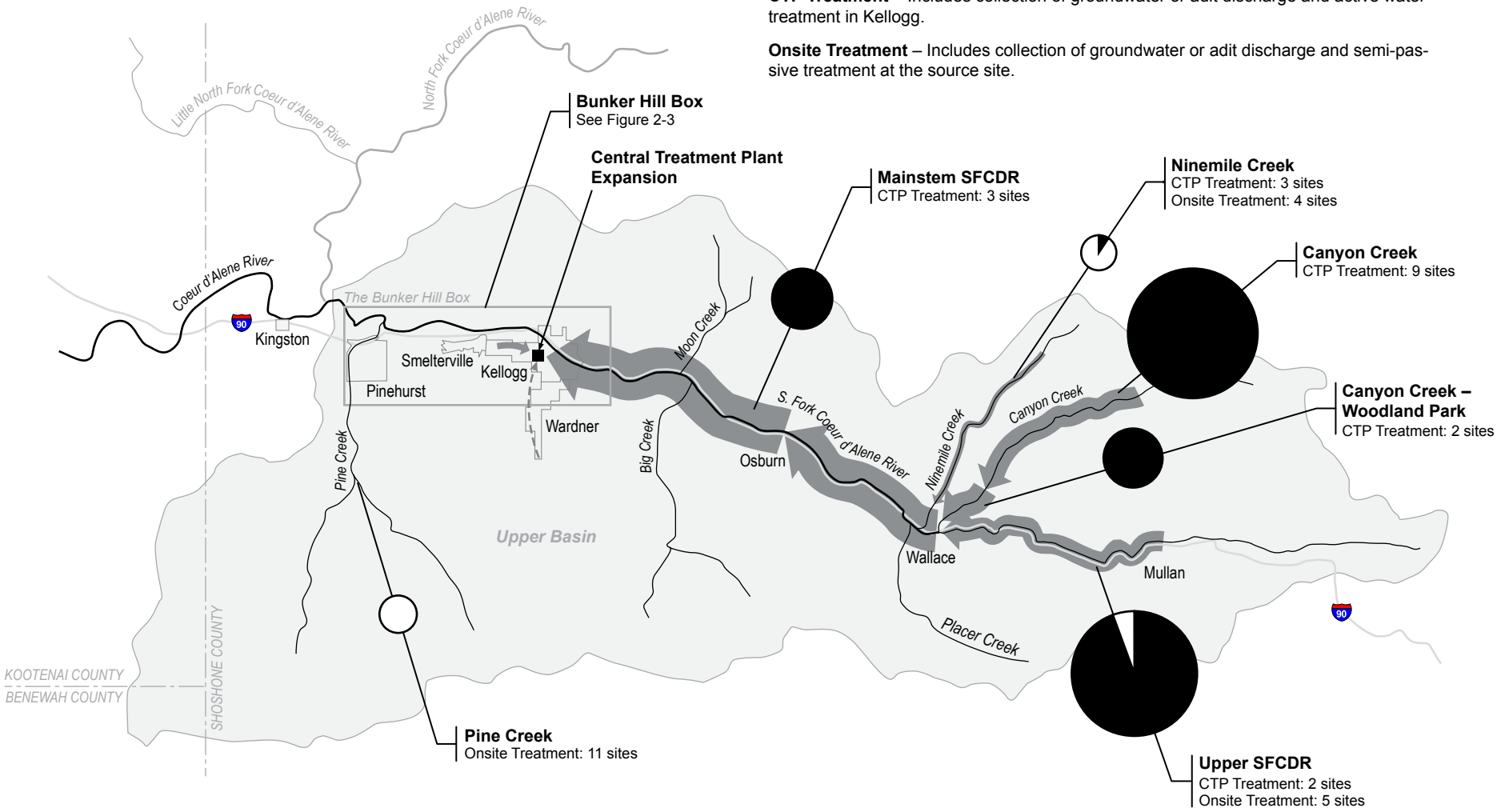
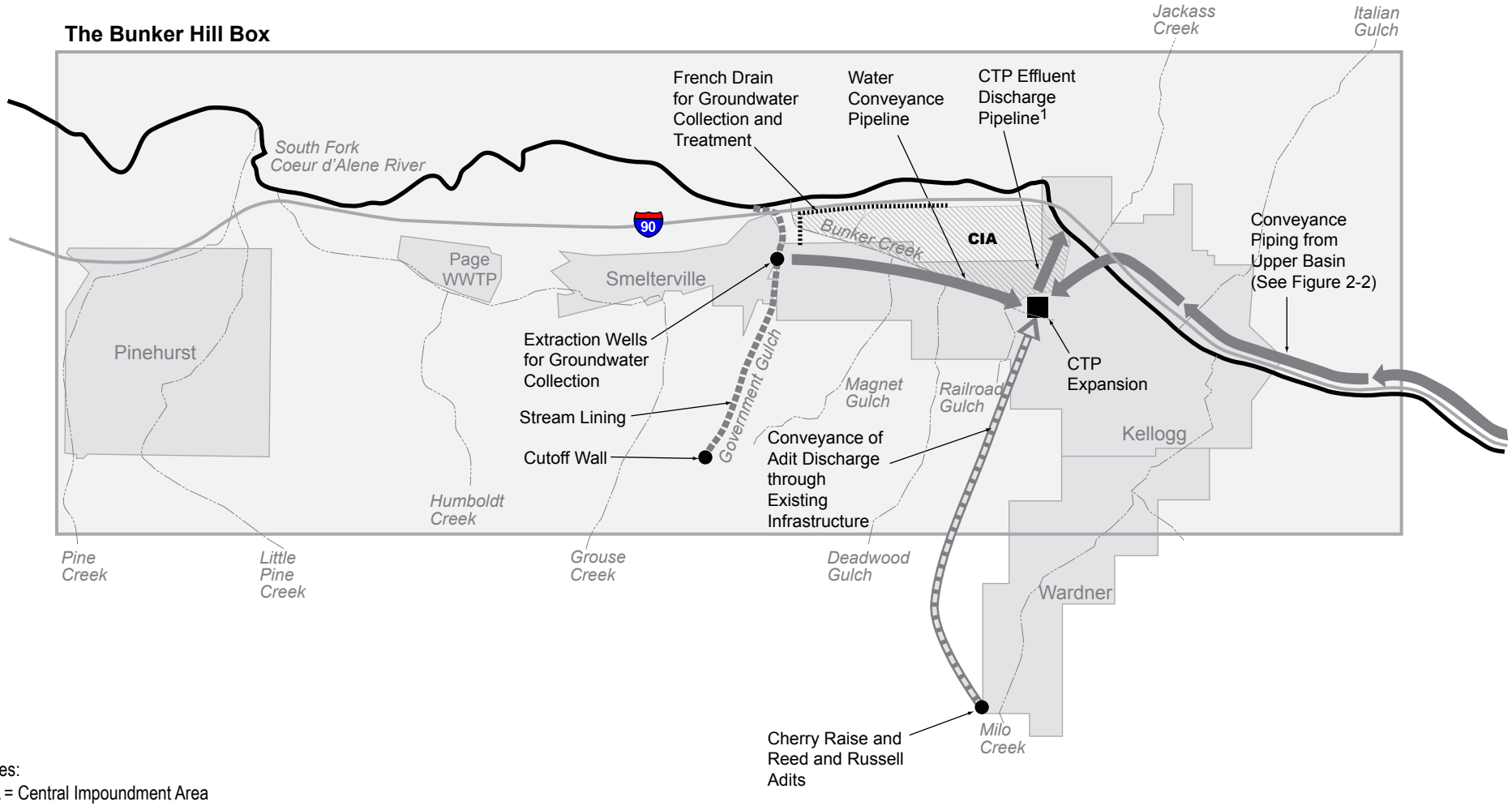


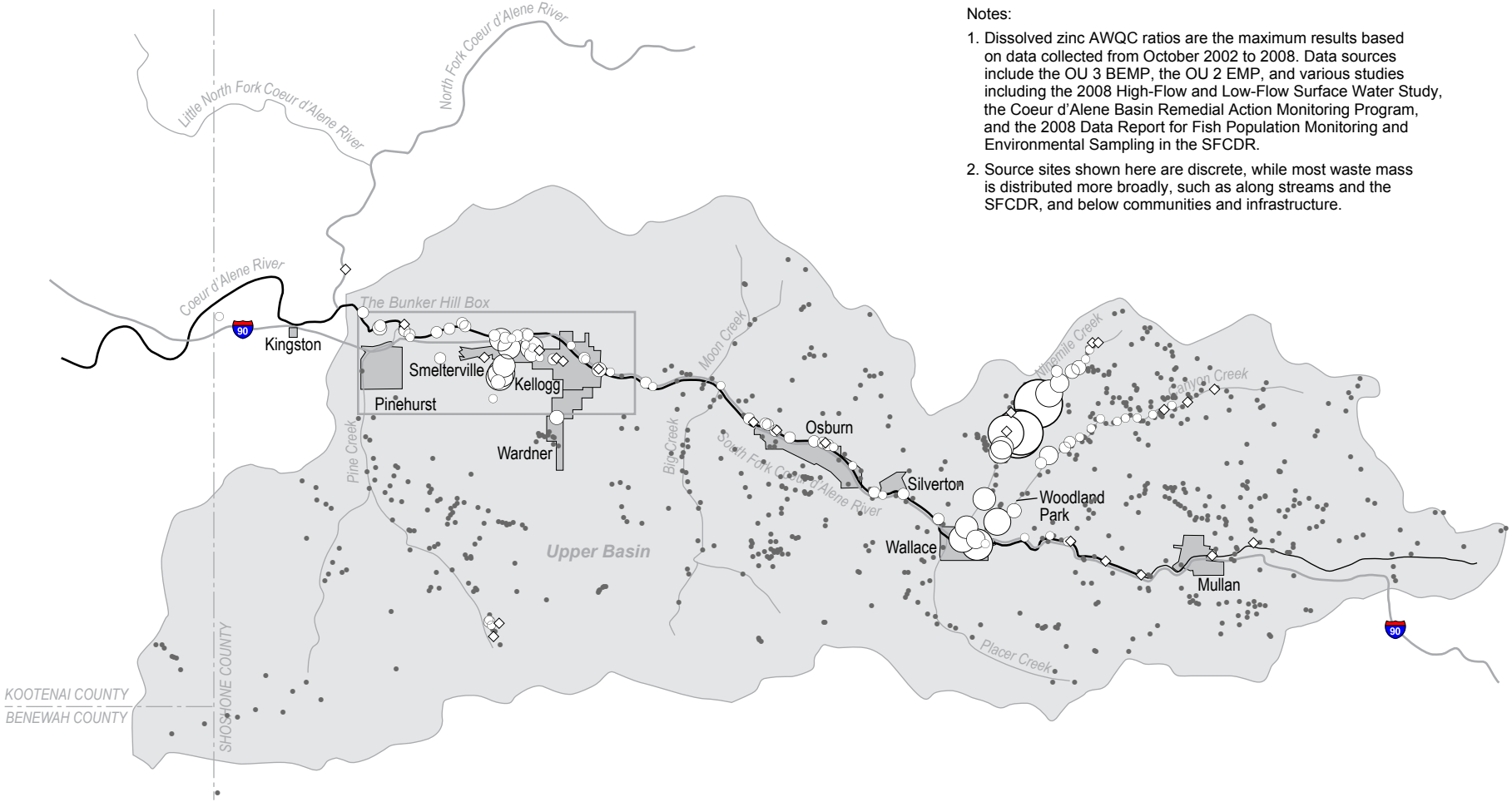
Figure 2-2
Water Collection and Treatment in the Upper Basin Selected Remedy
Superfund Cleanup Implementation Plan, 2016-2025
Bunker Hill Superfund Site



Notes:
CIA = Central Impoundment Area
CTP = Central Treatment Plant

[1] CTP effluent discharge pipeline may be conveyed to the South Fork Coeur D'Alene River (SFCDR) on the east side of the CIA (as pictured above) or along Bunker Creek.

Figure 2-3
Bunker Hill Box Remedial Actions in the Selected Remedy
Superfund Cleanup Implementation Plan, 2016-2025
Bunker Hill Superfund Site



Notes:

1. Dissolved zinc AWQC ratios are the maximum results based on data collected from October 2002 to 2008. Data sources include the OU 3 BEMP, the OU 2 EMP, and various studies including the 2008 High-Flow and Low-Flow Surface Water Study, the Coeur d'Alene Basin Remedial Action Monitoring Program, and the 2008 Data Report for Fish Population Monitoring and Environmental Sampling in the SFCDR.
2. Source sites shown here are discrete, while most waste mass is distributed more broadly, such as along streams and the SFCDR, and below communities and infrastructure.

AWQC Ratios

Representative Values

- ◇ < 1
- ○ 5
- ◯ 20
- ◯ 50
- ◯ 75

AWQC = Ambient Water Quality Criteria
BEMP = Basin Environmental Monitoring Program
EMP = Environmental Monitoring Program
OU = Operable Unit
SFCDR = South Fork Coeur d'Alene River

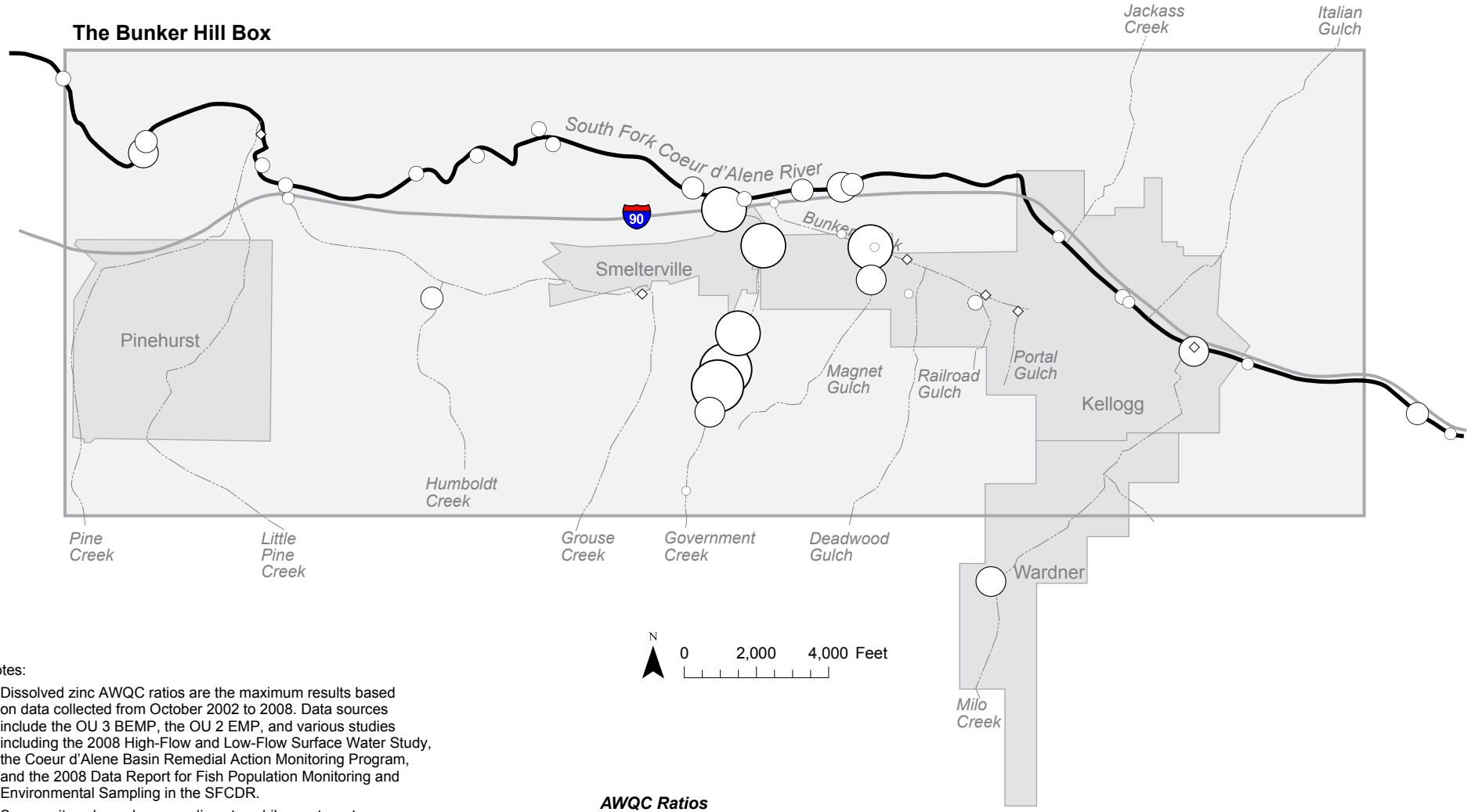
• Source Site

N

0 1 2 4 Miles

Figure 2-4
Maximum Zinc AWQC Ratios in Upper Basin Surface Water, 2002 to 2008
Superfund Cleanup Implementation Plan, 2016-2025
Bunker Hill Superfund Site

EPA



Notes:

1. Dissolved zinc AWQC ratios are the maximum results based on data collected from October 2002 to 2008. Data sources include the OU 3 BEMP, the OU 2 EMP, and various studies including the 2008 High-Flow and Low-Flow Surface Water Study, the Coeur d'Alene Basin Remedial Action Monitoring Program, and the 2008 Data Report for Fish Population Monitoring and Environmental Sampling in the SFCDR.
2. Source sites shown here are discrete, while most waste mass is distributed more broadly, such as along streams and the SFCDR, and below communities and infrastructure.

AWQC = Ambient Water Quality Criteria
BEMP = Basin Environmental Monitoring Program
EMP = Environmental Monitoring Program
OU = Operable Unit
SFCDR = South Fork Coeur d'Alene River

Figure 2-5
Maximum Zinc AWQC Ratios in Bunker Hill Box Surface Water, 2002 to 2008
Superfund Cleanup Implementation Plan, 2016-2025
Bunker Hill Superfund Site

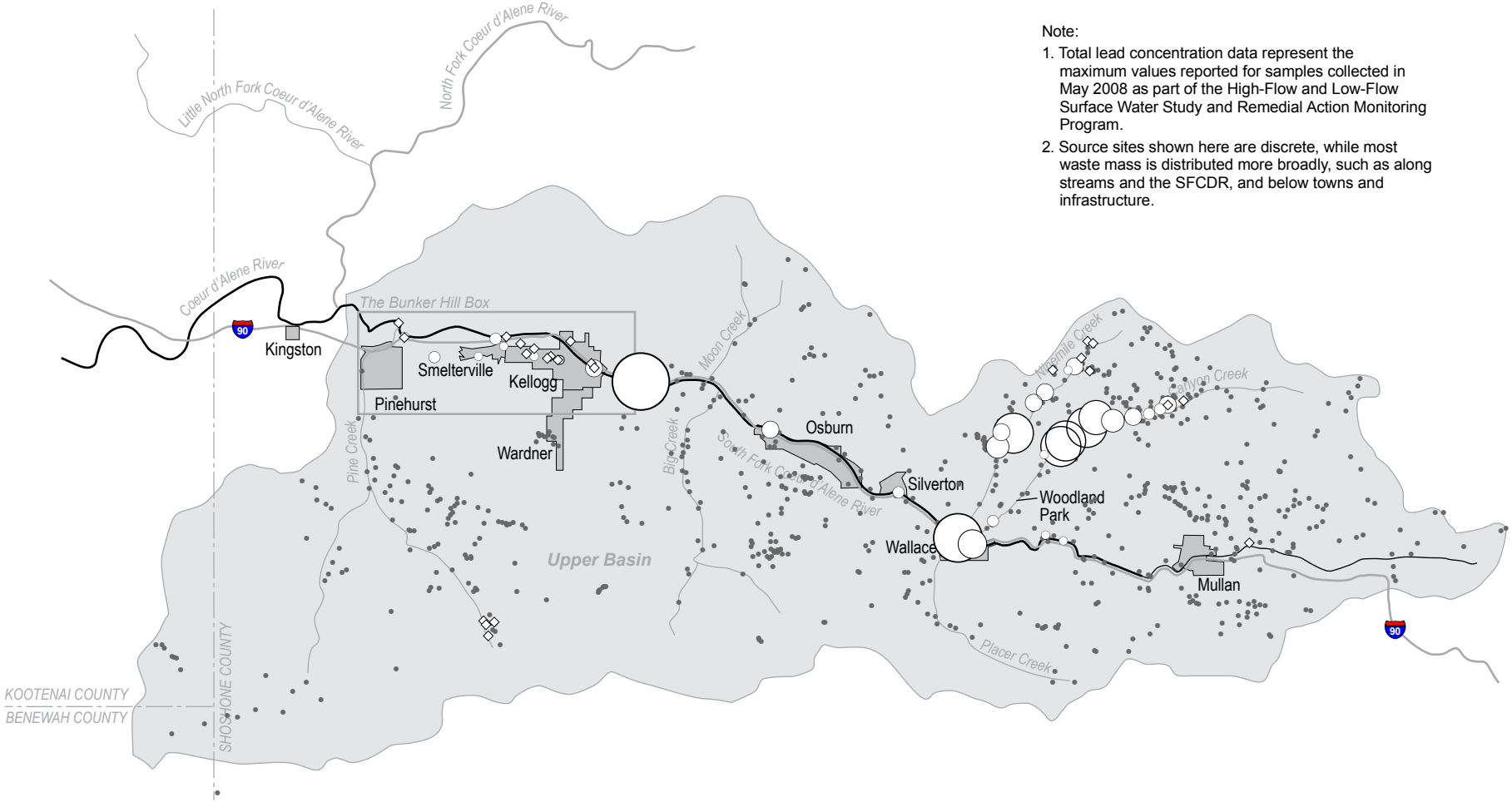


Figure 2-6
Total Lead Concentrations in Upper Basin Surface Water, May 2008
Superfund Cleanup Implementation Plan, 2016-2025
Bunker Hill Superfund Site

EPA

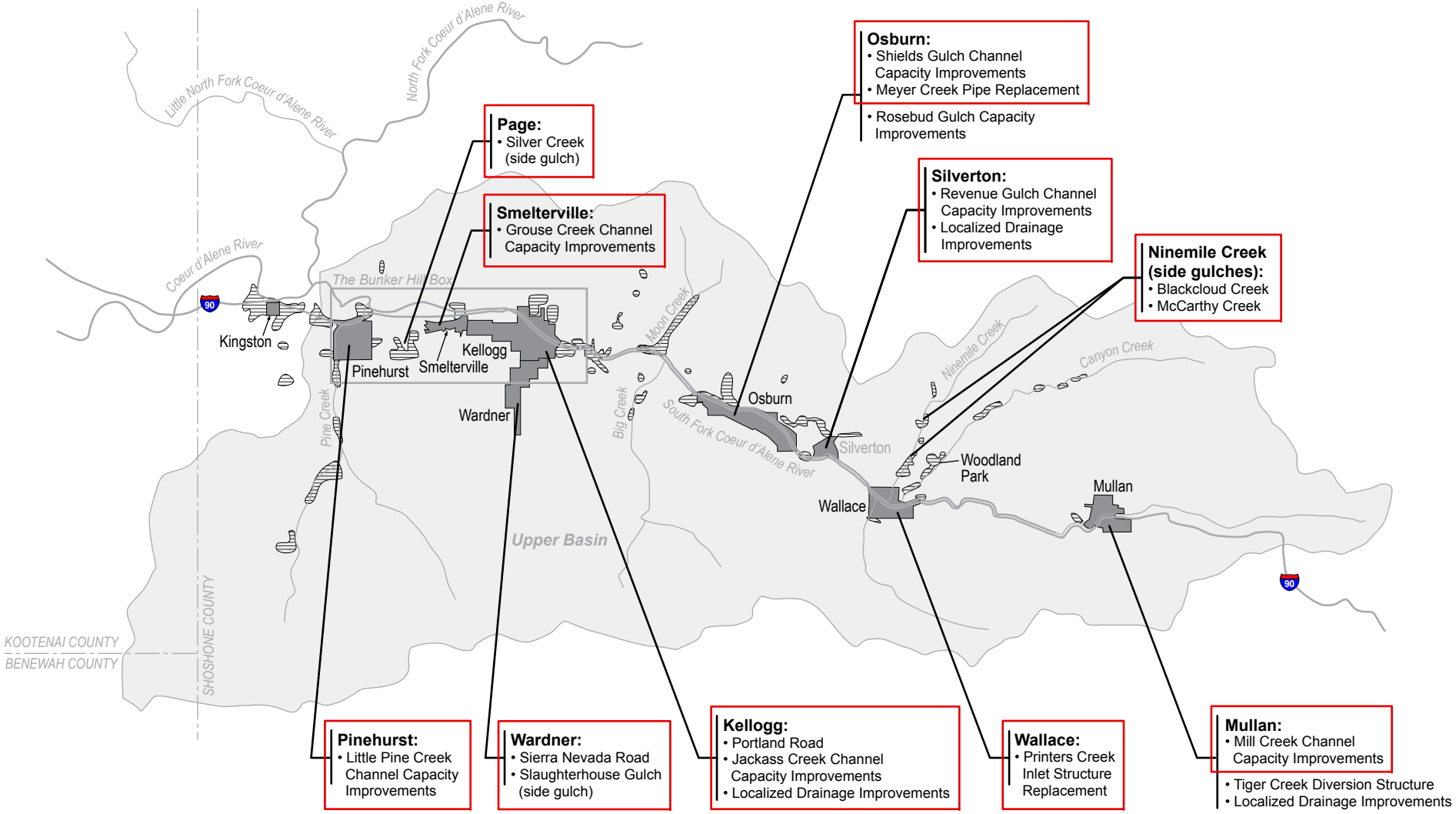
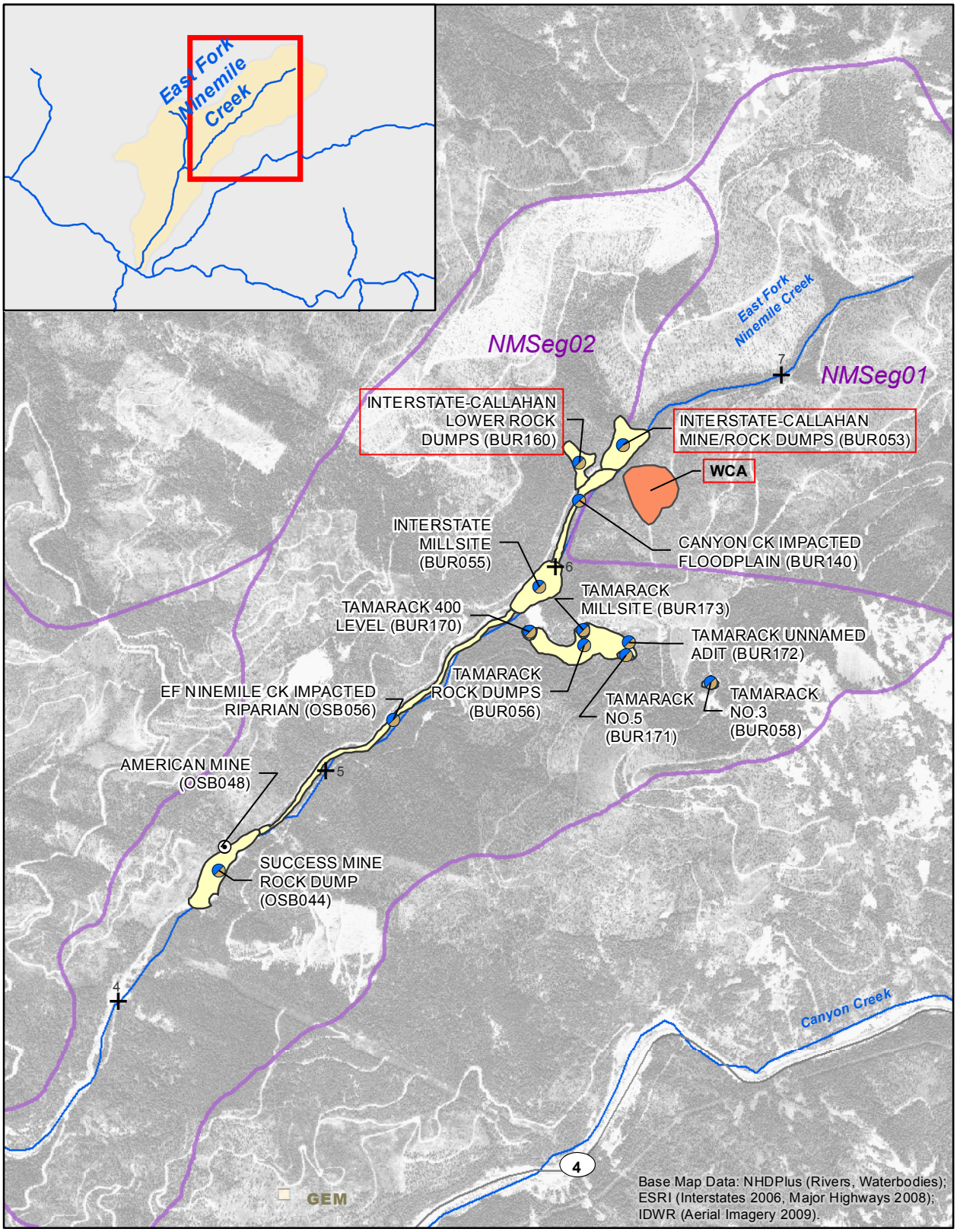
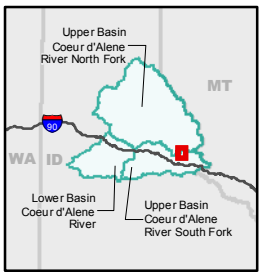


Figure 3-1
Remedy Protection Actions
Superfund Cleanup Implementation Plan, 2016-2025
Bunker Hill Superfund Site





Remedial Action Type

- Excavation/Waste Consolidation Area
- Regrade/Reconsolidate/Revegetate
- Upper Ninemile Creek Waste Consolidation Area (WCA)
- INTERSTATE MILLSITE *(Site Name)* (BUR055) *(Site ID)*

4 River Mile

River/Creek

Watershed Segment

Mine and Mill Site Boundary

Completed Actions Through 2015

Note: Stream and riparian actions will be implemented along the East Fork of Ninemile Creek in locations where sediment removal cleanup actions are conducted.

0 0.25 0.5 Miles

N

Figure 3-2
Prioritized Remedial Actions, East Fork Ninemile Creek Watershed
Superfund Cleanup Implementation Plan, 2016-2025
Bunker Hill Superfund Site

EPA

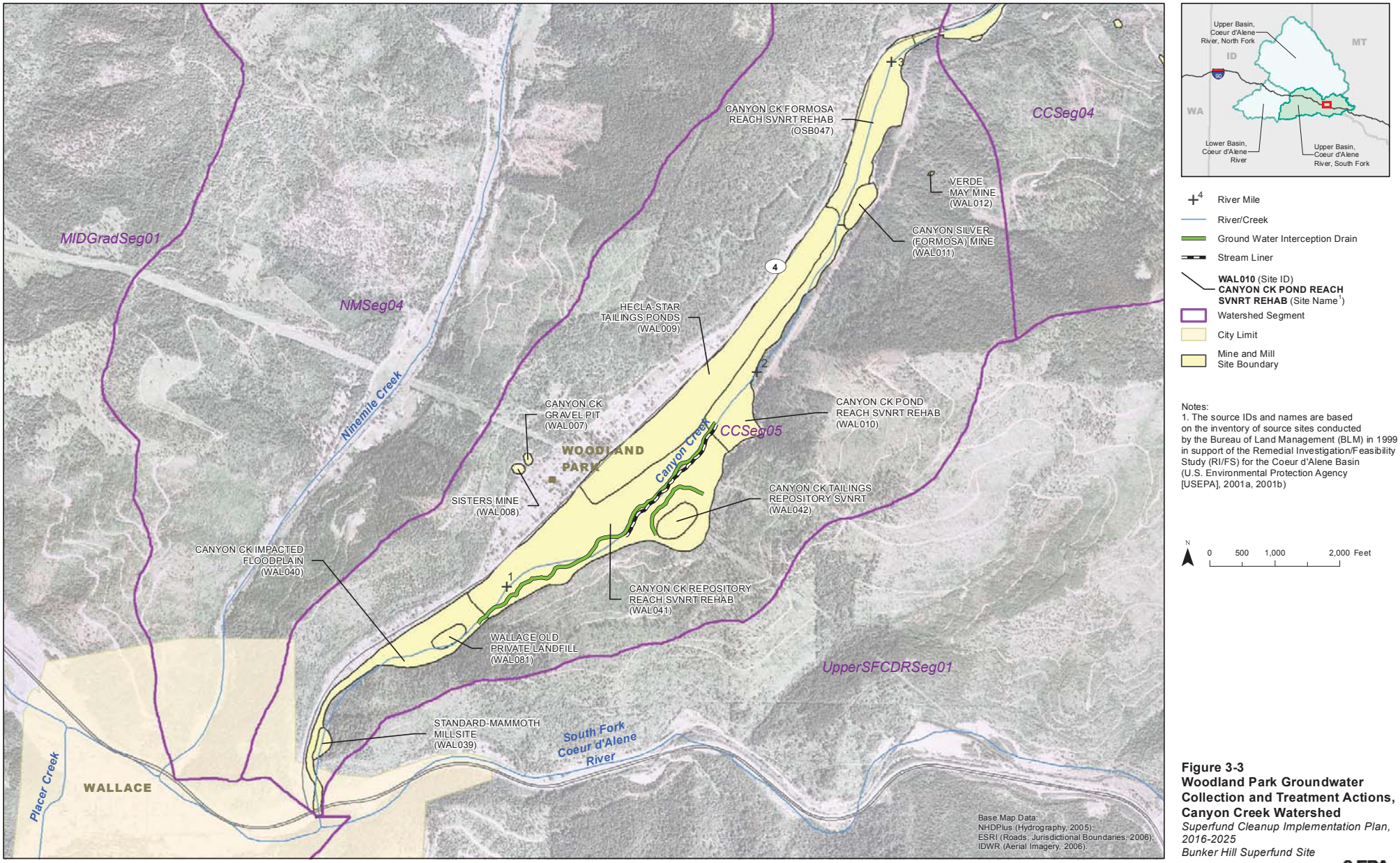


Figure 3-3
Woodland Park Groundwater Collection and Treatment Actions, Canyon Creek Watershed
Superfund Cleanup Implementation Plan, 2016-2025
Bunker Hill Superfund Site

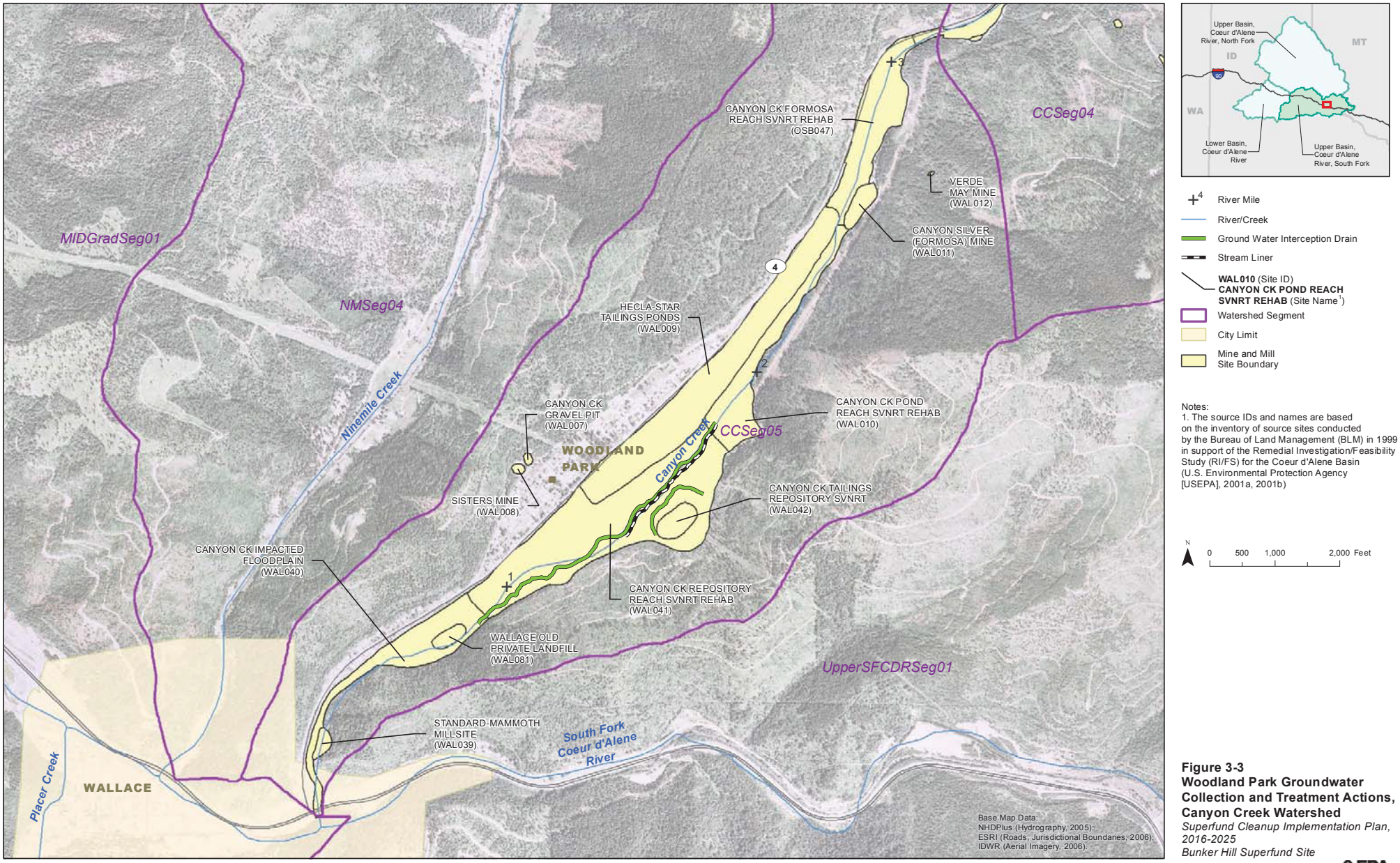
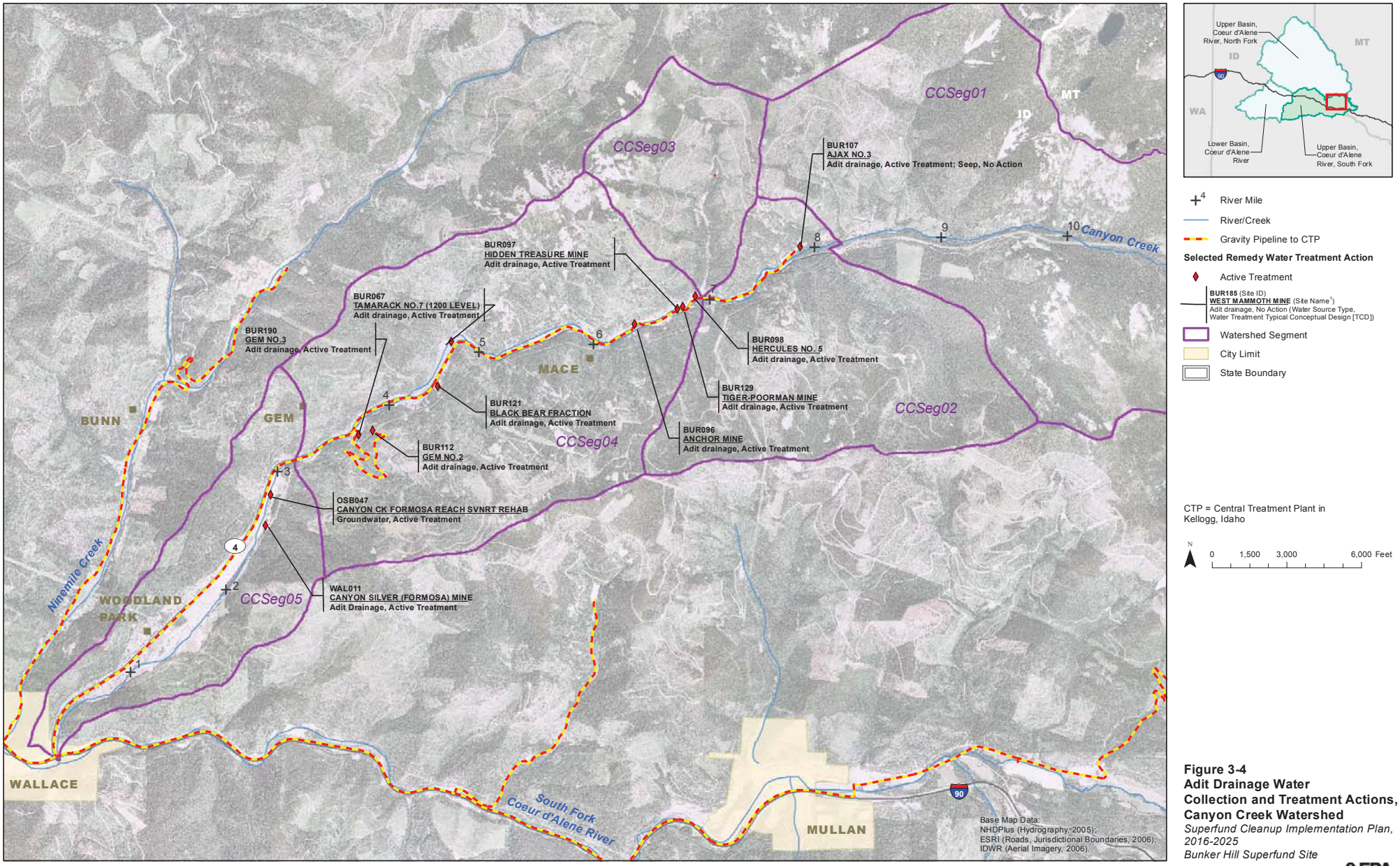


Figure 3-3
Woodland Park Groundwater Collection and Treatment Actions, Canyon Creek Watershed
Superfund Cleanup Implementation Plan, 2016-2025
Bunker Hill Superfund Site



4 River Mile

River/Creek

Gravity Pipeline to CTP

Selected Remedy Water Treatment Action

Active Treatment

BUR185 (Site ID)
WEST MAMMOTH MINE (Site Name[1])
Adit drainage, No Action (Water Source Type, Water Treatment Typical Conceptual Design [TCD])

Watershed Segment

City Limit

State Boundary

CTP = Central Treatment Plant in Kellogg, Idaho

N 0 1,500 3,000 6,000 Feet

Figure 3-4
Adit Drainage Water Collection and Treatment Actions, Canyon Creek Watershed
Superfund Cleanup Implementation Plan, 2016-2025
Bunker Hill Superfund Site

EPA

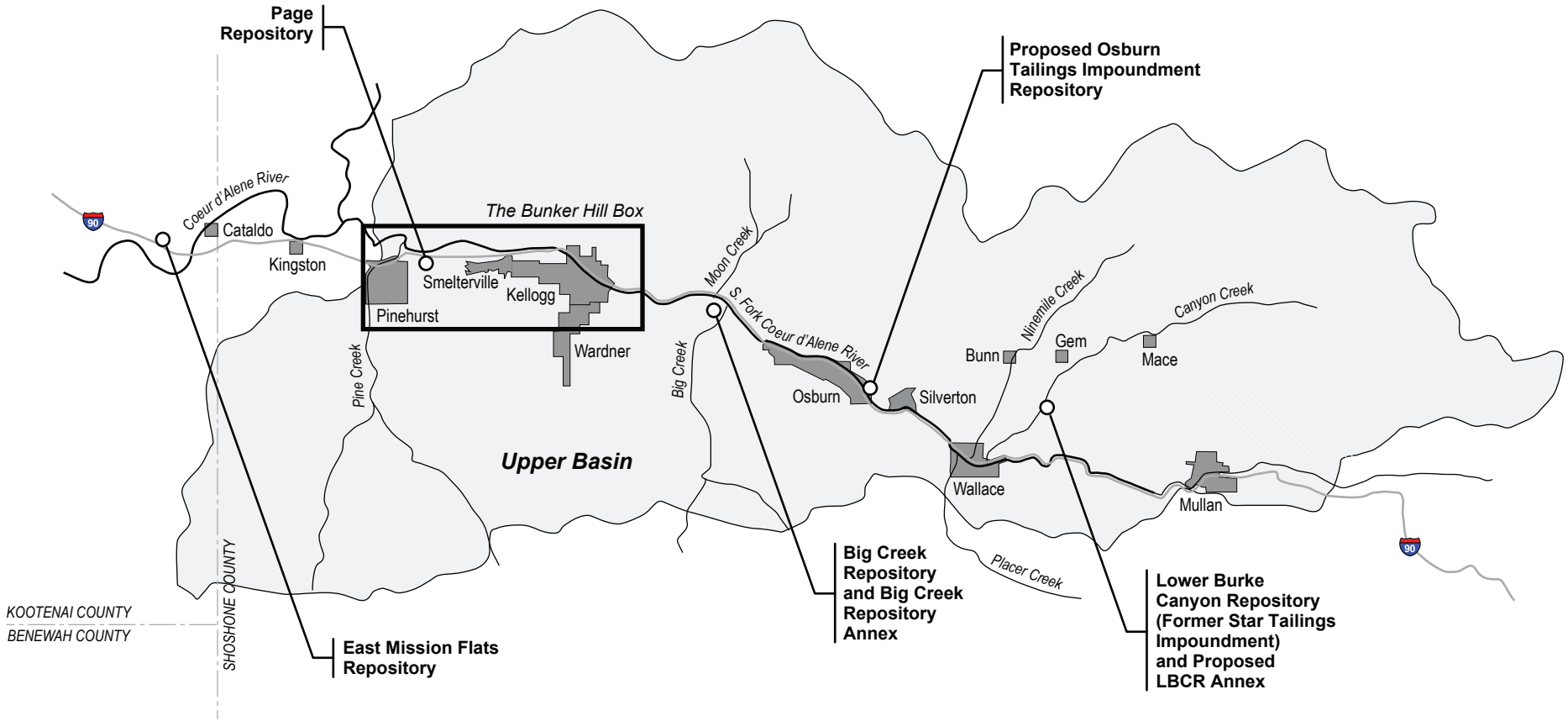


Figure 3-5
Current and Proposed Repository Locations
Superfund Cleanup Implementation Plan, 2016-2025
Bunker Hill Superfund Site

ACTIVITY/LOCATION	ACTIONS	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Protection of Human Health in Communities											
Basin Property Remediation Program (OU 3)	Upper and Lower Basin BPRP[1]										
Roadway Surface Remediation (OUs 1, 2, and 3)	OUs 1 and 2: Bunker Hill Box Roads										
	OU 3: Upper and Lower Basin Roads										
Remedy Protection (OU 3)	Remedy Protection in Communities										
	Remedy Protection in Side Gulches										
Protection of Human Health and the Environment Outside Communities											
Bunker Hill Box Remedy Implementation (OU 2)	GWCS/CTP Upgrades Project[2]										
	GWCS/CTP O&M										
Ninemile Creek Watershed (OU 3)	EFNM Waste Consolidation Area (WCA) Use										
	WCA Expansion										
	Interstate Mill Site										
	Tamarack Complex										
	Success Complex										
	Additional EFNM Mine/Mill Site Source Areas										
	Ninemile Stream and Riparian Actions										
Canyon Creek Watershed (OU 3)	Potential Source Control/Human Health Actions - Design										
	Potential Source Control/Human Health Actions - Construction										
	Canyon Creek Water Collection & Treatment										
Lower Basin Remedy Implementation	Thin-Layer Capping Wetlands Pilot Project										
	Amendment Bench and Pilot Project										
	Undefined Lower Basin Pilot Projects										
	Undefined Lower Basin Remedial Actions										
Repository Development and Management (OUs 1, 2, and 3)											
Big Creek Repository (BCR) (OU 3)	Repository Use										
	Repository Closure										
BCR Annex (BCRA) (OU 3)	Repository Use										
	Repository Closure										
Lower Burke Canyon Repository (LBCR) (OU 3)	Repository Use										
LBCR Annex and SVNRT Disposal Area Relocation	Repository Development										
	Repository Use										
East Mission Flats Repository (EMFR) (OU 3)	EMFR Operations										
Limited Use Repositories (LURs) (OUs 2 and 3)	OU 3 LURs: Use and Capping										
	Government Gulch LUR (OU 2): Use and Capping										
Osburn Tailings Impoundment Repository (OU 3)	On Hold										
Page Repository (OU 1)	Ongoing Use, Expansion, and Eventual Closure										

Notes:

BPRP = Basin Property Remediation Program
CIA = Central Impoundment Area
CTP = Central Treatment Plant
EFNM = East Fork Ninemile Creek
GWCS = Groundwater Collection System
LBCR = Lower Burke Canyon Repository
O&M = Operations and Maintenance
OU = Operable Unit
SVNRT = Silver Valley Natural Resources Trustees
= Action expected to continue beyond 10 years

	More Certain	Less Certain
Design		
Construction/ Remedial Action		
Use		

Note: "More Certain" and "Less Certain" designations are included to help show that uncertainty surrounding the timeframe for most actions may be on the order of a year or more.

[1] Upper and Lower Basin BPRP: Additional properties may be remediated beyond the anticipated substantial completion year of 2018 as needed based on site-specific data and conditions.

[2] GWCS/CTP Upgrades Project includes CIA GWCS, CTP upgrades, new CTP sludge disposal cell, new CTP discharge pipeline and outfall.

IMPORTANT NOTES REGARDING INTERPRETATION OF THIS FIGURE

1. The timeframes shown on this figure are approximate and subject to change based on many factors including implementation logistics and funding considerations.
2. The effectiveness of the remedial actions, as determined through monitoring, is also uncertain, but will become better understood over time. The effectiveness of the remedial actions will impact overall remediation timeframes.
3. As would be expected, actions planned for the next year are more certain than actions planned towards the end of the 10-year period.

Figure 3-6
Anticipated Remedial Implementation Timeframe
Superfund Cleanup Implementation Plan, 2016-2025
Bunker Hill Superfund Site

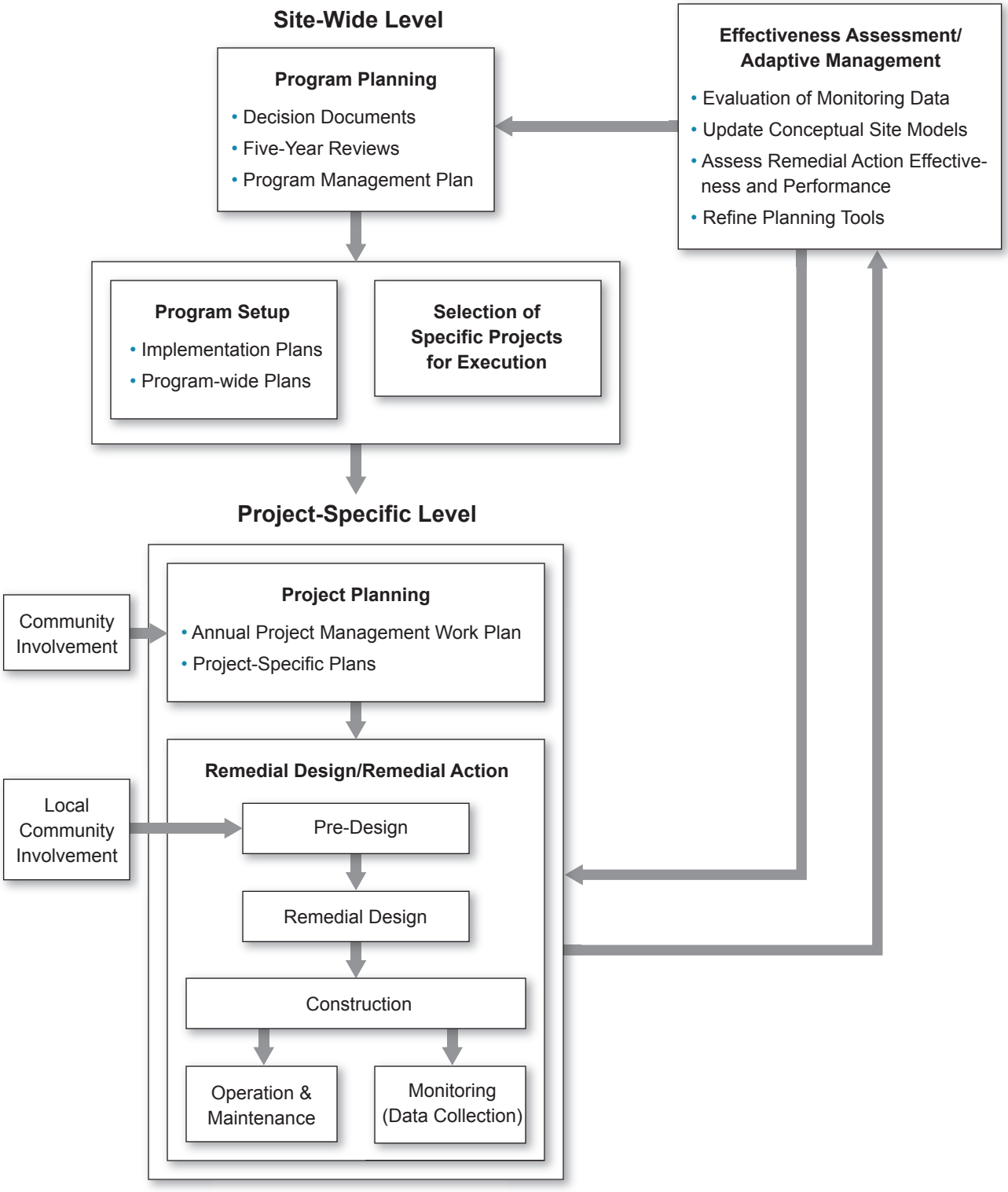
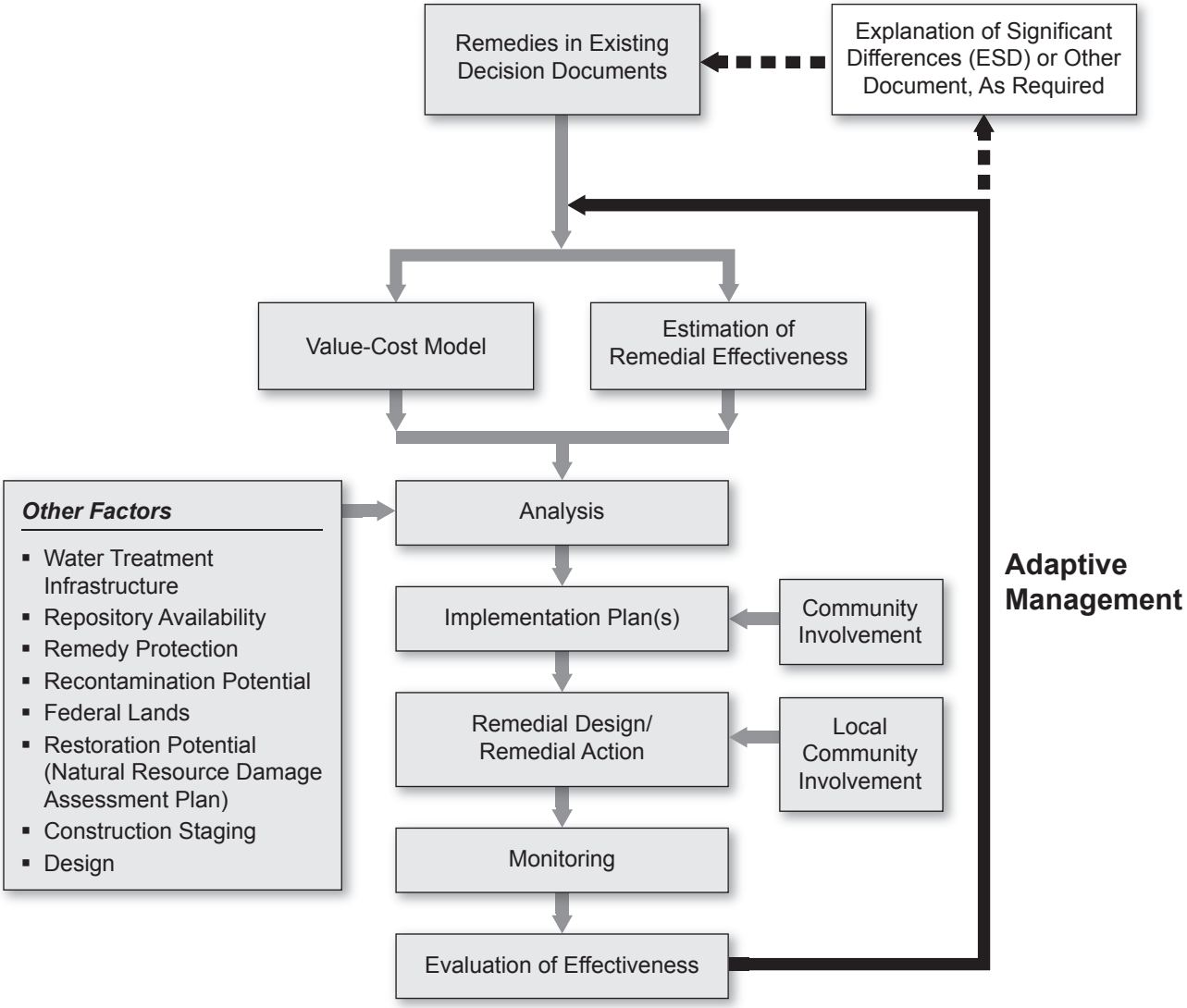


Figure 4-1
Generalized Implementation Process
Superfund Cleanup Implementation Plan, 2016-2025
Bunker Hill Superfund Site



Notes:

The Implementation Plan will be routinely updated in collaboration with the Basin Commission Project Focus Teams (PFTs) and other stakeholders.

The adaptive management process will primarily be used for remedial actions that focus on protection of human health and the environment outside communities.

Figure 7-1
Adaptive Management Process
Superfund Cleanup Implementation Plan, 2016-2025
Bunker Hill Superfund Site

Tables

TABLE 3-1
Prioritized Remedial Actions: East Fork Ninemile Creek Watershed

Segment ID	Source Type Description	Source ID	Source Name	Trait Description (Waste Types)	TCD	TCD Description	Quantity	Units
NMSeg01	Mine and Mill Sites	BUR053	INTERSTATE-CALLAHAN MINE/ROCK DUMPS REMEDIAL ACTION COMPLETED 2015	Upland Waste Rock (Erosion Potential)	C01	Excavation	111,500	CY
					C07	Waste Consolidation Area Above Flood Level	111,500	CY
					HAUL-2	Haul to Repository	151,201	CY-MI
		BUR140	NINEMILE CREEK IMPACTED FLOODPLAIN	Floodplain Sediments	C01b	Excavation (60% dry/40% wet)	10,000	CY
					C07	Waste Consolidation Area Above Flood Level	10,000	CY
					HAUL-2	Haul to Repository	11,648	CY-MI
		BUR160	INTERSTATE-CALLAHAN LOWER ROCK DUMPS REMEDIAL ACTION COMPLETED 2015	Upland Waste Rock (Erosion Potential)	C01	Excavation	74,100	CY
					C07	Waste Consolidation Area Above Flood Level	74,100	CY
					HAUL-2	Haul to Repository	92,695	CY-MI
	Stream and Riparian Stabilization Actions	NM01-1	Headwaters of East Fork Ninemile Creek to Interstate Mill site	BioReach General Characteristics	BSBR-AVG	Bank Stabilization via Revetments - Average Cost	4,011	LF
					CD-AVG	Current Deflector - Average Cost	48.00	EA
					CD-SED	Current Deflector, Sediment Traps	5.00	EA
					FP/RP-AVG	Floodplain and Riparian Zone Replanting - Average Cost	200,531	SF
					VBS-AVG	Vegetative Bank Stabilization - Average Cost	4,011	LF
NMSeg02	Mine and Mill Sites	BUR055	INTERSTATE MILLSITE	Floodplain Sediments	C01b	Excavation (60% dry/40% wet)	30,700	CY
					C07	Waste Consolidation Area Above Flood Level	30,700	CY
					HAUL-2	Haul to Repository	26,746	CY-MI
				Upland Tailings	C01	Excavation	78,200	CY
					C07	Waste Consolidation Area Above Flood Level	78,200	CY
					HAUL-2	Haul to Repository	68,129	CY-MI
		BUR056	TAMARACK ROCK DUMPS	Upland Waste Rock (Potential Intermixed Tailings)	C01	Excavation	253,600	CY
					C07	Waste Consolidation Area Above Flood Level	253,600	CY
					HAUL-2	Haul to Repository	85,494	CY-MI
		BUR058	TAMARACK NO. 3	Upland Waste Rock	C01	Excavation	13,500	CY
					C07	Waste Consolidation Area Above Flood Level	13,500	CY
					HAUL-2	Haul to Repository	32,881	CY-MI
				Adit Drainage	C10	Adit Drainage Collection	1	LS
					WT02	Onsite Semi-Passive Treatment Using Lime Addition	89.8	GPM

TABLE 3-1
Prioritized Remedial Actions: East Fork Ninemile Creek Watershed

Segment ID	Source Type Description	Source ID	Source Name	Trait Description (Waste Types)	TCD	TCD Description	Quantity	Units
NMSeg02	Mine and Mill Sites	BUR170	TAMARACK 400 LEVEL	Upland Waste Rock (Potential Intermixed Tailings)	C01	Excavation	17,700	CY
					C07	Waste Consolidation Area Above Flood Level	17,700	CY
					HAUL-2	Haul to Repository	2,749	CY-MI
				Adit Drainage	C10	Adit Drainage Collection	1	LS
					WT02	Onsite Semi-Passive Treatment Using Lime Addition	74.5	GPM
		BUR171	TAMARACK NO. 5	Upland Waste Rock (Potential Intermixed Tailings)	C01	Excavation	6,500	CY
					C07	Waste Consolidation Area Above Flood Level	6,500	CY
					HAUL-2	Haul to Repository	2,831	CY-MI
				Adit Drainage	C10	Adit Drainage Collection	1	LS
					WT02	Onsite Semi-Passive Treatment Using Lime Addition	27.4	GPM
		BUR172	TAMARACK UNNAMED ADIT	Upland Waste Rock	C01	Excavation	4,300	CY
					C07	Waste Consolidation Area Above Flood Level	4,300	CY
					HAUL-2	Haul to Repository	2,052	CY-MI
		BUR173	TAMARACK MILLSITE	Upland Tailings	C01	Excavation	5,200	CY
					C07	Waste Consolidation Area Above Flood Level	5,200	CY
					HAUL-2	Haul to Repository	2,117	CY-MI
		OSB044	SUCCESS MINE ROCK DUMP	Upland Tailings (Jig Tailings)	C01	Excavation	155,100	CY
					C07	Waste Consolidation Area Above Flood Level	155,100	CY
					HAUL-2	Haul to Repository	86,950	CY-MI
				Upland Waste Rock	C01	Excavation	7,300	CY
					C07	Waste Consolidation Area Above Flood Level	7,300	CY
					HAUL-2	Haul to Repository	4,092	CY-MI
				Floodplain Sediments	C01b	Excavation (60% dry/40% wet)	4,300	CY
					C07	Waste Consolidation Area Above Flood Level	4,300	CY
					HAUL-2	Haul to Repository	2,411	CY-MI
		OSB048	AMERICAN MINE	Upland Waste Rock	C02a	Regrade/Consolidate/Revegetate	0.15	AC
		OSB056	EF NINEMILE CK IMPACTED RIPARIAN	Floodplain Sediments	C01b	Excavation (60% dry/40% wet)	1,600	CY
					C07	Waste Consolidation Area Above Flood Level	1,600	CY
					HAUL-2	Haul to Repository	1,342	CY-MI

TABLE 3-1
Prioritized Remedial Actions: East Fork Ninemile Creek Watershed

Segment ID	Source Type Description	Source ID	Source Name	Trait Description (Waste Types)	TCD	TCD Description	Quantity	Units
NMSeg02	Stream and Riparian Stabilization Actions	NM02-1	Interstate Mill site on East Fork to mainstem Ninemile Creek	BioReach General Characteristics	BSBR-AVG	Bank Stabilization via Revetments - Average Cost	7,553	LF
					CD-AVG	Current Deflector - Average Cost	90	EA
					CD-SED	Current Deflector, Sediment Traps	10	EA
					FP/RP-AVG	Floodplain and Riparian Replanting - Average Cost	377,656	SF
					OFFCH-AVG	Off-Channel Hydrologic Feature - Average Cost	347	SY
					VBS-AVG	Vegetative Bank Stabilization - Average Cost	7,553	LF

Notes
AC acres
CY cubic yard(s)
CY-MI cubic yards per mile
EA each
GPM gallons per minute
ID identification
LF linear foot or feet
LS lump sum
SF square foot or feet
SY square yard(s)
TCD typical conceptual design

It is important to note that TCDs are only conceptual designs, and the constructed remedies at specific source sites may differ from the TCDs based on future site- and waste-specific characterization assessments and other pre-design activities.

TABLE 3-2
Bunker Hill Box Remedial Actions

Action	TCD	TCD Description	Quantity	Units
CIA Groundwater Drain	C15c	French Drain	1,150	LF
	C15d	French Drain	4,225	LF
	Pressure-Pipe-3	Pressurized Pipeline	7,000	LF
	PUMP-4	Pump Station	1	EA
	WT01	Centralized HDS Treatment at CTP	4,399	GPM
CTP Direct Discharge Pipeline	Pressure-Pipe-3	Pressurized Pipeline	2,500	LF
Government Gulch	C11d	Hydraulic Isolation Using Slurry Wall	275	LF
	C14b	Stream Lining	11,000	LF
	Pressure-Pipe-1	Pressurized Pipeline	1,500	LF
Lower Government Gulch	C17c	Extraction Well	5	EA
Reed/Russell Adits Water Collection and Treatment	C10	Adit Drainage Collection	2	LS
	C20	Check Dam	2	LS
	Pressure-Pipe-1	Pressurized Pipeline	2,000	LF
	Pressure-Pipe-4	Pressurized Pipeline	1,000	LF
	PUMP-1	Pump Station	1	EA
Upper Government Gulch	C17b	Extraction Well	2	EA

Notes
CIA Central Impoundment Area
CTP Central Treatment Plant
EA each
GPM gallons per minute
HDS high-density sludge
ID identification
LF linear foot
LS lump sum
TCD typical conceptual design

It is important to note that TCDs are only conceptual designs, and the constructed remedies at specific source sites may differ from the TCDs based on future site- and waste-specific characterization assessments and other pre-design activities.

TABLE 3-3
Prioritized Remedial Actions: Water Treatment Actions, Canyon Creek Watershed

Segment ID	Source Type Description	Source ID	Source Name	Trait Description (Waste Types)	TCD	TCD Description	Quantity	Units
CCSeg02	Mine and Mill Sites	BUR107	AJAX NO. 3	Adit Drainage	C10	Adit Drainage Collection	1	LS
					WT01	Centralized HDS Treatment at CTP	89.8	GPM
	Water Treatment Pipelines	PIPING_8	BUR107 to Int G	Adit Drainage	PIPE-1	Gravity Pipeline-6"	4,597	LF
CCSeg03	Water Treatment Pipelines	PIPING_10		Adit Drainage	PIPE-1	Gravity Pipeline-6"	227	LF
		PIPING_10.25		Combined Waters	PIPE-1	Gravity Pipeline-6"	1,135	LF
		PIPING_10.5		Combined Waters	PIPE-1	Gravity Pipeline-6"	265	LF
		PIPING_9		Adit Drainage	PIPE-1	Gravity Pipeline-6"	4,599	LF
CCSeg04	Mine and Mill Sites	BUR067	TAMARACK NO. 7 (1200 LEVEL)	Adit Drainage	C10	Adit Drainage Collection	1	LS
					WT01	Centralized HDS Treatment at CTP	1,414	GPM
		BUR096	ANCHOR MINE	Adit Drainage	C10	Adit Drainage Collection	1	LS
					WT01	Centralized HDS Treatment at CTP	7.27	GPM
		BUR097	HIDDEN TREASURE MINE	Adit Drainage	C10	Adit Drainage Collection	1	LS
					WT01	Centralized HDS Treatment at CTP	1,293	GPM
		BUR098	HERCULES NO. 5	Adit Drainage	C10	Adit Drainage Collection	1	LS
					WT01	Centralized HDS Treatment at CTP	1,346	GPM
		BUR112	GEM NO. 2	Adit Drainage	C10	Adit Drainage Collection	1	LS
					WT01	Centralized HDS Treatment at CTP	89.8	GPM
		BUR121	BLACK BEAR FRACTION	Adit Drainage	C10	Adit Drainage Collection	1	LS
					WT01	Centralized HDS Treatment at CTP	1,014	GPM
		BUR129	TIGER-POORMAN MINE	Adit Drainage	C10	Adit Drainage Collection	1	LS
					WT01	Centralized HDS Treatment at CTP	89.8	GPM
		BUR190	GEM NO. 3	Adit Drainage	C10	Adit Drainage Collection	1	LS
					WT01	Centralized HDS Treatment at CTP	449	GPM
CCSeg04	Water Treatment Pipelines	PIPING_11		Adit Drainage	PIPE-3	Gravity Pipeline-24"	137	LF
		PIPING_11.5		Combined Waters	PIPE-3	Gravity Pipeline-24"	717	LF
		PIPING_12.5		Combined Waters	PIPE-3	Gravity Pipeline-24"	236	LF
		PIPING_13.5		Combined Waters	PIPE-3	Gravity Pipeline-24"	753	LF
		PIPING_14.5		Combined Waters	PIPE-3	Gravity Pipeline-24"	1,152	LF
		PIPING_15.5		Combined Waters	PIPE-3	Gravity Pipeline-24"	8,216	LF
		PIPING_16.5		Combined Waters	PIPE-3	Gravity Pipeline-24"	1,731	LF

TABLE 3-3
Prioritized Remedial Actions: Water Treatment Actions, Canyon Creek Watershed

Segment ID	Source Type Description	Source ID	Source Name	Trait Description (Waste Types)	TCD	TCD Description	Quantity	Units
		PIPING_17		Adit Drainage	PIPE-2	Gravity Pipeline-12"	129	LF
		PIPING_17.5		Combined Waters	PIPE-3	Gravity Pipeline-24"	4,212	LF
		PIPING_18		Adit Drainage	PIPE-1	Gravity Pipeline-6"	7,076	LF
		PIPING_19.25		Combined Waters	PIPE-2	Gravity Pipeline-12"	499	LF
		PIPING_19.5		Combined Waters	PIPE-4	Gravity Pipeline-36"	4,431	LF
CCSeg05	Mine and Mill Sites	WAL011	CANYON SILVER (FORMOSA) MINE	Adit Drainage	C10	Adit Drainage Collection	1	LS
					WT01	Centralized HDS Treatment at CTP	89.8	GPM
		WP-OPTIONC	WOODLAND PARK OPTION C	Floodplain Sediments	C14b	Stream Lining	2,700	LF
					C15b	French Drain	7,800	LF
				Groundwater	WT01	Centralized HDS Treatment at CTP	673	GPM
	Water Treatment Pipelines	PIPING_20.5		Combined Waters	PIPE-4	Gravity Pipeline-36"	4,014	LF
		PIPING_20.6		Combined Waters	PIPE-4	Gravity Pipeline-36"	604	LF
		PIPING_20.7		Combined Waters	PIPE-4	Gravity Pipeline-36"	2,759	LF
		PIPING_20.8		Combined Waters	PIPE-4	Gravity Pipeline-36"	6,719	LF

Notes:
CTP Central Treatment Plant
GPM gallons per minute
HDS high-density sludge
ID identification
LF lineal foot
LS lump sum
TCD typical conceptual design

It is important to note that TCDs are only conceptual designs, and the constructed remedies at specific source sites may differ from the TCDs based on future site- and waste-specific characterization assessments and other pre-design activities.

TABLE 3-4
Prioritized Remedial Actions: Star Complex and Adjacent Sites, Canyon Creek Watershed
Remedial Action Implementation Plan, 2012-2022, Bunker Hill Superfund Site

Segment ID	Source Type Description	Source ID	Source Name	Trait Description (Waste Types)	TCD	TCD Description	Quantity	Units
CCSeg04	Mine and Mill Sites	BUR097	HIDDEN TREASURE MINE	Upland Waste Rock	C02a	Regrade/Consolidate/Revegetate	0.87	AC
				Adit Drainage	C10	Adit Drainage Collection	1	LS
					WT01	Centralized HDS Treatment at CTP	1,293	GPM
		BUR098	HERCULES NO. 5	Upland Waste Rock (Potential Intermixed Tailings)	C01	Excavation	55,000	CY
					C07	Waste Consolidation Area Above Flood Level	55,000	CY
				Adit Drainage	C10	Adit Drainage Collection	1	LS
					WT01	Centralized HDS Treatment at CTP	1,346	GPM
		BUR128	HECLA-STAR MINE & MILL SITE COMPLEX	Upland Tailings	C01	Excavation	43,400	CY
					C07	Waste Consolidation Area Above Flood Level	43,400	CY
				Building & Structures	HH-3	Millsite Decontamination	1	EA
		BUR129	TIGER-POORMAN MINE	Upland Tailings	C01	Excavation	5,250	CY
					C07	Waste Consolidation Area Above Flood Level	5,250	CY
				Adit Drainage	C10	Adit Drainage Collection	1	LS
					WT01	Centralized HDS Treatment at CTP	89.8	GPM

Notes:
AC acre(s)
CTP Central Treatment Plant
CY cubic yard(s)
EA each
GPM gallons per minute
HDS high-density sludge
ID identification
LS lump sum
TCD typical conceptual design

It is important to note that TCDs are only conceptual designs, and the constructed remedies at specific source sites may differ from the TCDs based on future site- and waste-specific characterization assessments and other pre-design activities.

TABLE 4-1
Implementation Phases and Typical Documentation

Program Planning and Setup	Project Planning	Remedial Design	Remedial Action	Effectiveness Assessment/Adaptive Management
Program Management Plan	Annual Project Management Work Plan	Pre-Design	Construction	Monitoring Data Evaluation and CSM Model Updates
Implementation Plans	Project-Specific Plans	Design Work Plan	Bidding Documents	Updated CSM TM
Program-wide Plans	Health and Safety Plan	Design Phase	Construction Documents	Update Contaminant Containment Forecast TM
Health and Safety Plan	Field Sampling Plan	Preliminary Design Submittal	Post-Construction Documents	Refined Remedial Technologies Summary TM
Field Sampling Program Plan	Quality Assurance Project Plan	Intermediate Design Submittal	Monitoring	Assessment of Remedial Action Effectiveness and Performance
Quality Assurance Plan		Pref-Final and Final Design Submittals	Design Documents	Effectiveness and Performance of Remedial Actions TM
Data Management Program Plan			Pre- and Post-Construction Data Summary and Impacts Assessments	Refinement of Implementation Planning Tools
Reporting Program Plan			Operations and Maintenance (O&M)	Implementation Tool Update Summary TM
Contractor Procurement Plan			O&M Plans	Evaluation of Repository Needs TM
Community Relations Plan			O&M Reports	Implementation Plan Update TM
Recordkeeping Program Plan				

Notes:
CSM conceptual site model
O&M operations and maintenance
TM technical memorandum

Appendix A
Implementation Plan Public Comments

Terry Harwood, Executive Director of the Basin Environmental Improvement Project Commission, Comments on draft Superfund Cleanup Implementation Plan 2016-2025

- Section 1.4 – Was the Lower Basin PFT involved in preparation of the Lower Basin Strategic Plan and was the BEIPC invited to any meetings concerning the preparation in accordance with the BEIPC MOA?
- Section 2 – Identification of priority actions. Upper Basin PFT includes BEIPC representation, if it doesn't we are violating the BEIPC MOA.
- Section 2.1.2 – Should something be said about the unpaved road surface restoration program? That work was not performed by the local road jurisdictions, but the EPA and IDEQ.
- Section 2.3 – Why wasn't the Recreation Sites Team formed as a PFT under the TLG or CCC? If the Upper Basin PFT was so successful, why wasn't this team a PFT as well to ensure adequate public input?
- Page 2-10 – Community outreach activities: are these activities required to be coordinated through the BEIPC as is stated in MOA section VB Public Comment? Currently, they tend to not be coordinated through that process.
- Section 3 – Implementation of Remedies; "actions are based on EPA priorities"; what about BEIPC or community priorities and will this be a violation of the intent of the BEIPC MOA? [This exact same sentence was used in the original 2013 Implementation Plan. Suggest modifying to address Terry's comment.]
- Section 3.1.1.2 – This should not just include high risk and high priority properties. Are we going to refuse to remediate the property of a senior citizen if they request sampling and remediation? Some of these type folks have stated concerns to me about this approach. What about Environmental Justice issues?
- Section 3.1.3 – Remedy Protection; Hunt Gulch is not included in the listing of side gulch projects. It was added in an ESD.
  [Not included in ESD, but perhaps is part of another gulch? Need Anne Mc input]
- 7.1.2 – May want to indicate that the public unpaved roads program was completed in 2014.
- Figure 2-3 – indicates a French drain for collection at the CIA. Should it be changed to the current plans of the cut off wall and extraction wells?
- Figure 3-1 – shows Printers Creek in Wallace completed, not so!
- Figure 4-1 – Project Planning and Predesign Phase, community involvement, good!
- There should be community involvement after the construction phase as well so folks can see the results of the effort!
- Table 3-1 – May want to indicate that material will be hauled to WCA for work in E. Fk. Ninemile, not to a repository as stated.
- General comment on adit and other collection of discharges and piping to CTP. I don't think any of this work will happen because of the prohibitive cost and inability to get the needed access agreements for construction of the line unless EPA is willing to use its CERCLA authority differently as in the past.

November 9, 2016

Environmental Protection Agency Region 10
Bill Adams
1200 Sixth Avenue, Suite 900, ECL-122
Seattle, WA 98101

RE: Coeur d'Alene Basin 2016 10-year Implementation Plan Draft

Kootenai Environmental Alliance (KEA) is the oldest non-profit conservation organization in Idaho. It is our mission to conserve, protect and restore the environment with particular emphasis on the Coeur d'Alene Basin and the Idaho Panhandle. Our members live, work and play in the Coeur d'Alene Basin and have an active interest in the cleanup activities.

The EPA Region 10 draft 2016 10-year Implementation Plan spells out general plans for doing Superfund cleanup work in the Coeur d'Alene Basin over the next decade. The plan mostly specifies remediation actions in the Upper Basin which are greatly needed to reduce contributions of heavy metals into the Coeur d'Alene River system and protect human health.

Aside from a few small pilot projects, activity in the Lower Basin has largely been focused on evaluation and data collection. Section 3.2.4 of the draft plan, pages 3-11 and 3-12, concerns Lower Basin studies and Potential Project/Remedial Actions. Flooding, flood events, sediment transport and models are mentioned in 3.2.4.2. Does either the sediment model, or the hydraulic models described in Section 3.2.4 have the capability to model the transport of phosphorus particles through the Coeur d'Alene River Basin when flooding events occur in the Basin? If one or more models have this capability, has this data been acquired in previous flooding events?

If none of the models have this capability, the final plan should indicate whether there are any other tools currently being used to calculate the transport of phosphorus particles in the Basin during flooding events? If there are no tools currently available, the final plan should include a discussion as to how the issue of phosphorus transport through the Basin and into Coeur d'Alene Lake will be addressed in the next 10 years.

At the Our Gem Symposium in March 2016, the Coeur d'Alene Lake Management team presented trends in data collected since 2003 (some as far back as 1998) in Lake Coeur d'Alene. The data showed consistent increases of phosphorus in the Lake, as well as, consistent decreases in summer Dissolved Oxygen levels in the hypolimnion and close to sediments in sites C1, C4. These conditions combined with the amount of heavy metals contained in the sediments are cause for concern because metals can be released from sediments at low dissolved oxygen levels.

Thus, while monitoring of heavy metals is primary in this cleanup effort, phosphorus levels must also be managed to maintain the integrity of Lake Coeur d'Alene and its beneficial uses.

Thank you for your consideration of our comments regarding the proposed plan.

Looking Forward,

Adrienne Cronebaugh

Adrienne Cronebaugh
Executive Director

Kootenai Environmental Alliance
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Appendix B
Historic Properties Management Plan—Project-Specific Cultural Resource Review Summary Information

APPENDIX B

Historic Properties Management Plan—Project-Specific Cultural Resource Review Summary Information

In 2015 construction began, and in some cases was completed, on the Remedy Protection projects listed below. Before field work, the U.S. Environmental Protection Agency (EPA) took steps to comply with the 2014 *Bunker Hill Mining and Metallurgical Complex Superfund Site Historic Properties Management Plan* (HPMP; Historical Research Associates, 2014) to meet its obligations under the National Historic Preservation Act (NHPA). This appendix includes copies of the cultural resource review summary forms for the Remedy Protection projects listed below; other documentation required by the HPMP and NHPA have been provided directly to the State Historic Preservation Officer and the Tribal Historic Preservation Officer, if appropriate:

- Jackass Creek Remedy Protection project in Kellogg
- McCarthy Creek Remedy Protection project outside of Wallace
- Mill Road Remedy Protection project in Mullan
- Revenue Creek Remedy Protection project in the community of Silverton
- Silver Creek Remedy Protection project in the community of Page
- Slaughterhouse Creek Remedy Protection project in Wardner
- South Second Street Remedy Protection project in Mullan

Bunker Hill Superfund Site
Cultural Resource Review Summary

Project: Jackass Creek, Kellogg, Idaho
Project Manager: Anne McCauley
Date of Review: 8-15-16

1) Brief Description of Project: The Jackass Creek project consists of:

- Replacing and undersized corrugated metal pipe culvert with a larger concrete box concrete.
- Approximately 440 linear feet of stream channel work to increase its capacity.
- Installation of an inlet structure that will consist of a sediment weir, debris rack, and retaining wall.
- Installation of approximately 516 linear feet of storm drain pipe to convey excess Jackass Creek flow underground, past the Shoshone Medical Center hospital.
- Installation of two storm drain manholes.

Since replacing the existing culvert network under hospital property was not feasible due to its proximity to the hospital building, a system was designed to bypass overflow that will be installed under the adjacent street, Jacobs Gulch Road, before discharging back into the channel downstream of the constriction.

2) Are all the activities associated with the project exempt? If yes, please summarize the activities and the information you used to determine that the project is exempt. After documenting below, you do not need to continue past this step. If no, please continue on to step 3.

No – a small amount of excavation to increase the Creek capacity and to accommodate the new bypass pipe may be conducted in previously undisturbed areas.

3) What is the land ownership for your project? If it is anything other than private, please review the appropriate appendices of the HPMP to determine what coordination may be necessary and document it here.

Parcels on which construction will take place are owned by a combination of School District #391, West Shoshone Hospital District, and City of Kellogg.

Project Manager Review:
4) Do your project activities occur only in areas of **previous** and **documented** disturbance? If yes, please summarize the information you used to determine the location and extent of previous disturbance. After documenting below, you do not need to continue past this step.

No.

If activities occur in previously undisturbed areas, please continue on to step 5.

5) If your activities are not exempt and in previously undisturbed areas, please refer to Figure 5-1 of the HPMP and the Historic and Pre-contact Probability maps in Appendix E – Predictive Model Maps and follow the procedures outlined in Section 5.2.5 of the HPMP. Please note, if you reach this step you will need to coordinate with SHPO/THPO.

   An *Archaeological and Historic Survey Report* was completed for the Jackass Creek project area by, or under the supervision of, Dr. Robert L. Sappington, U of I, on April 21, 2015.

Bunker Hill Superfund Site
Cultural Resource Review Summary

Project: **McCarthy Creek, Shoshone County, Idaho**
Project Manager: **Anne McCauley**
Date of Review: **7-7-15**

1) Brief Description of Project: The McCarthy Creek project consists of:
   - Replacement of an existing 3-foot diameter culvert under Ninemile Road with a 4-foot diameter culvert of the same length and alignment,
   - Replacement of an existing wood retaining wall with an interlocking concrete block wall, and
   - Deepening of the shallow channel by one foot for a length of 160 feet.

   No channel or ground disturbing work will be conducted with the exception of that necessary to replace the existing culvert and retaining wall and to deepen the existing channel by one foot.

2) Are all the activities associated with the project exempt? If yes, please summarize the activities and the information you used to determine that the project is exempt. After documenting below, you do not need to continue past this step. If no, please continue on to step 3. Yes. The McCarthy Creek project consists of replacement of an existing culvert with a 1-foot diameter larger culvert within known horizontal and vertical limits of previous disturbance under Ninemile Road, dimensionally comparable retaining wall replacement, and channel deepening within the limits of previous remediation activities. Areas of channel and ground disturbance will coincide with what would have been necessary for installation of the existing culvert, retaining wall, and 1-foot clean human health barrier installed by the Basin Property Remediation Program, and will therefore occur in previously disturbed areas.

3) What is the land ownership for your project? If it is anything other than private, please review the appropriate appendices of the HPMP to determine what coordination may be necessary and document it here.

Project Manager Review:
4) Do your project activities occur only in areas of **previous** and **documented** disturbance? If yes, please summarize the information you used to determine the location and extent of previous disturbance. After documenting below, you do not need to continue past this step.

If activities occur in previously undisturbed areas, please continue on to step 5.

5) If your activities are not exempt and in previously undisturbed areas, please refer to Figure 5-1 of the HPMP and the Historic and Pre-contact Probability maps in Appendix E – Predictive Model Maps and follow the procedures outlined in Section 5.2.5 of the HPMP. Please note, if you reach this step you will need to coordinate with SHPO/THPO.

Bunker Hill Superfund Site
Cultural Resource Review Summary

Project: **Mill Road, Mullan, Idaho**
Project Manager: **Anne McCauley**
Date of Review: **8-15-16**

1) Brief Description of Project: The Mill Road Remedy Protection project consists of:

- Installation of approximately 2,100 feet of 12 to 36 inch diameter storm drain pipe.
- Installation of approximately 1,800 feet of curb and gutter and valley gutter along Mill Road.
- Installation of nine manholes.
- Installation of twenty-two catch basins along the storm drain alignment to collect surface runoff from the residential area, including several areas of riprap inlet armoring.
- Installation of one 12 inch culvert, including riprap inlet and outlet armoring.
- Installation of approximately 2,000 feet of 4 inch sock drain installed at the edge of the rock cap under Mill Road and along a portion of Daisy Loop.
- Installation of an outfall to the South Fork Coeur d'Alene River, including riprap armoring.

2) Are all the activities associated with the project exempt? If yes, please summarize the activities and the information you used to determine that the project is exempt. After documenting below, you do not need to continue past this step. If no, please continue on to step 3.

Yes. The Mill Road project consists of installing a culvert with inlet and a stormwater collection system and outfall within limits of previous disturbance. Areas of ground disturbance will coincide with what would have been necessary for installation of existing utilities and with a heavily disturbed area adjacent to the US Silver's Morning Shop and the Trail of the Coeur d'Alenes (a former railroad track). Information used to make this determination includes field visits, utility locates, land survey, and discussions with local utility representatives and City of Mullan Streets Foreman.

Although ground disturbing activities are expected to occur in previously disturbed areas, the historic Fairmount Cemetary is located adjacent to a portion of Mill Road to be excavated. For this reason, a *Cultural Resources Inventory* report and a *Cultural Field Response Plan* were completed for the project.

3) What is the land ownership for your project? If it is anything other than private, please review the appropriate appendices of the HPMP to determine what coordination may be necessary and document it here.

Parcels on which construction will take place are owned by a combination of private residents, City of Mullan, Idaho Transportation Department, Idaho Dept of Parks and Recreation, and Shoshone Tree Farms.

Project Manager Review:
4) Do your project activities occur only in areas of **previous** and **documented** disturbance? If yes, please summarize the information you used to determine the location and extent of previous disturbance. After documenting below, you do not need to continue past this step.

See 2), above.

If activities occur in previously undisturbed areas, please continue on to step 5.

5) If your activities are not exempt and in previously undisturbed areas, please refer to Figure 5-1 of the HPMP and the Historic and Pre-contact Probability maps in Appendix E – Predictive Model Maps and follow the procedures outlined in Section 5.2.5 of the HPMP. Please note, if you reach this step you will need to coordinate with SHPO/THPO.

A *Cultural Resources Inventory* report and a *Cultural Field Response Plan* were completed for the Mill Road project area by Historical Research Associates, Inc. in April 2015.

Bunker Hill Superfund Site
Cultural Resource Review Summary

Project: Revenue Gulch, Silverton, Idaho
Project Manager: Anne McCauley
Date of Review: 8-15-16

1) Brief Description of Project: The Revenue Gulch Remedy Protection project consists of:

- Installation of five concrete box culverts spanning Revenue Gulch creek.
- Installation of five storm drain catch basins to route storm water to the storm drain pipes.
- Installation of 23 storm drain manholes.
- Installation of a diversion structure to divert high flows from Revenue Gulch creek to the new storm drain system.
- Installation of approximately 1,950-feet of new curb and gutter to convey surface runoff water to catch basins.
- Installation of riprap erosion control for channel protection in a portion of Revenue Gulch through the town of Silverton.
- Installation of riprap erosion control for storm sewer outlet protection of the storm drain.
- Installation of riprap erosion control for inlet and outlet protection at each of the culverts in Revenue Gulch creek.

2) Are all the activities associated with the project exempt? If yes, please summarize the activities and the information you used to determine that the project is exempt. After documenting below, you do not need to continue past this step. If no, please continue on to step 3.

No – some portion of the excavation necessary to install replacement culverts and to install the new subsurface drain pipes may be conducted in previously undisturbed areas.

3) What is the land ownership for your project? If it is anything other than private, please review the appropriate appendices of the HPMP to determine what coordination may be necessary and document it here.

Parcels on which construction will take place are owned by a combination of private residents, Shoshone County, and a small business.

Project Manager Review:
4) Do your project activities occur only in areas of **previous** and **documented** disturbance? If yes, please summarize the information you used to determine the location and extent of previous disturbance. After documenting below, you do not need to continue past this step.

No.

If activities occur in previously undisturbed areas, please continue on to step 5.

5) If your activities are not exempt and in previously undisturbed areas, please refer to Figure 5-1 of the HPMP and the Historic and Pre-contact Probability maps in Appendix E – Predictive Model Maps and follow the procedures outlined in Section 5.2.5 of the HPMP. Please note, if you reach this step you will need to coordinate with SHPO/THPO.

A *Cultural Resources Inventory* report was completed for the Revenue Gulch project area by Historical Research Associates, Inc. during April 2015.

Bunker Hill Superfund Site
Cultural Resource Review Summary

Project: Silver Creek, Page, Shoshone County, Idaho
Project Manager: Anne McCauley
Date of Review: 4-24-15

1) Brief Description of Project: Silver Creek is a small project estimated at the 90% design phase to cost approximately $13,000. The project involves replacing a damaged 48-inch diameter by 40-foot long CMP culvert with a new culvert of the same material and size at the same location and alignment within Silver Creek. No channel or ground disturbing work will be conducted with the exception of that necessary to remove the existing culvert and install the new culvert.

2) Are all the activities associated with the project exempt? If yes, please summarize the activities and the information you used to determine that the project is exempt. After documenting below, you do not need to continue past this step. If no, please continue on to step 3. Yes. The Silver Creek project consists solely of in-kind culvert replacement within known horizontal and vertical limits of previous disturbance. Area(s) of channel and ground disturbance will coincide with what would have been necessary for installation of the existing culvert and will therefore occur in previously disturbed areas.

3) What is the land ownership for your project? If it is anything other than private, please review the appropriate appendices of the HPMP to determine what coordination may be necessary and document it here.

Project Manager Review:
4) Do your project activities occur only in areas of **previous** and **documented** disturbance? If yes, please summarize the information you used to determine the location and extent of previous disturbance. After documenting below, you do not need to continue past this step.

If activities occur in previously undisturbed areas, please continue on to step 5.

5) If your activities are not exempt and in previously undisturbed areas, please refer to Figure 5-1 of the HPMP and the Historic and Pre-contact Probability maps in Appendix E – Predictive Model Maps and follow the procedures outlined in Section 5.2.5 of the HPMP. Please note, if you reach this step you will need to coordinate with SHPO/THPO.

Bunker Hill Superfund Site
Cultural Resource Review Summary

Project: Slaughterhouse Gulch, Wardner, Shoshone County, Idaho
Project Manager: Anne McCauley
Date of Review: 4-24-15

1) Brief Description of Project: Slaughterhouse Gulch is a small predominately road construction project estimated at the 90% design phase to cost approximately $11,000. The project involves construction of:

- Two 40-feet long rolling dips within the existing Slaughterhouse Gulch roadway,
- Two road shoulder rock chutes to direct water from the rolling dips to Slaughterhouse Creek, and
- Armoring of two 20-feet bank sections of Slaughterhouse Creek with riprap.

A minimal amount of shallow excavation will be required to install these features.

2) Are all the activities associated with the project exempt? If yes, please summarize the activities and the information you used to determine that the project is exempt. After documenting below, you do not need to continue past this step. If no, please continue on to step 3. Yes. The Slaughterhouse Gulch project consists of surficial drainage features constructed within an existing roadway corridor. Subsurface disturbance of the corridor would have resulted during initial construction of the road and road shoulder. A minimal amount of shallow excavation (generally one foot or less) will be required to install project features.

3) What is the land ownership for your project? If it is anything other than private, please review the appropriate appendices of the HPMP to determine what coordination may be necessary and document it here.

Project Manager Review:
4) Do your project activities occur only in areas of **previous** and **documented** disturbance? If yes, please summarize the information you used to determine the location and extent of previous disturbance. After documenting below, you do not need to continue past this step.

If activities occur in previously undisturbed areas, please continue on to step 5.

5) If your activities are not exempt and in previously undisturbed areas, please refer to Figure 5-1 of the HPMP and the Historic and Pre-contact Probability maps in Appendix E – Predictive Model Maps and follow the procedures outlined in Section 5.2.5 of the HPMP. Please note, if you reach this step you will need to coordinate with SHPO/THPO.

Bunker Hill Superfund Site
Cultural Resource Review Summary

Project: South 2nd Street, Mullan, Idaho
Project Manager: Anne McCauley
Date of Review: 8-15-16

1) Brief Description of Project: The South 2nd Street Remedy Protection project consists of:

- Installation of approximately 784 feet of 18- to 30-inch diameter storm drain pipe from S. 2nd Street to Mill Creek.
- Installation of three manholes.
- Installation of two catch basins to collect surface runoff from 2nd Street.
- Installation of a 12 foot wide by 5.5 foot tall concrete box culvert with wing walls, including riprap inlet and outlet armoring.
- Installation of an outfall in one of the concrete box culvert wing walls with riprap armoring.

2) Are all the activities associated with the project exempt? If yes, please summarize the activities and the information you used to determine that the project is exempt. After documenting below, you do not need to continue past this step. If no, please continue on to step 3.

No – some portion of the excavation necessary to install the new subsurface storm drain pipe may be conducted in previously undisturbed areas.

3) What is the land ownership for your project? If it is anything other than private, please review the appropriate appendices of the HPMP to determine what coordination may be necessary and document it here.

Parcels on which construction will take place are owned by a combination of Idaho Department of Parks and Recreation and the City of Mullan.

Project Manager Review:
4) Do your project activities occur only in areas of **previous** and **documented** disturbance? If yes, please summarize the information you used to determine the location and extent of previous disturbance. After documenting below, you do not need to continue past this step.

No.

If activities occur in previously undisturbed areas, please continue on to step 5.

5) If your activities are not exempt and in previously undisturbed areas, please refer to Figure 5-1 of the HPMP and the Historic and Pre-contact Probability maps in Appendix E – Predictive Model Maps and follow the procedures outlined in Section 5.2.5 of the HPMP. Please note, if you reach this step you will need to coordinate with SHPO/THPO.

A *Cultural Resources Inventory* report was completed for the South 2nd Street project area by Historical Research Associates, Inc. during April 2015.