DRAFT
For Public Review

Former ASARCO East Helena Facility Interim Measures Work Plan—2014

Prepared for

The Montana Environmental Trust Group, LLC
Trustee of the Montana Environmental Custodial Trust

December 2013

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Acronyms and Abbreviations

AOC	Area of Contamination
APSD Area	Acid Plant Sediment Drying Area
ARM	Administrative Rules of Montana
BERA	Baseline Ecological Risk Assessment
bgs	below ground surface
CAMU	Corrective Action Management Unit
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CLOMR	Conditional Letter of Map Revision
CMS	Corrective Measures Study
COPC	constituent of potential concern
CSM	conceptual site model
Custodial Trust	Montana Environmental Custodial Trust
EHECTIC	East Helena Entire Cleanup Team in Coordination
ERM	Environmentally Regulated Material
ESA	Endangered Species Act
ET	evapotranspiration
FEMA	Federal Emergency Management Agency
FSAP	Field Sampling and Analysis Plan
GPR	ground-penetrating radar
HDS	high-density sludge
HEC-RAS	Hydrologic Engineering Centers River Analysis System
ICS	Interim Cover System
ICS 1	Interim Cover System 1 phase proposed to occur in 2014
IM	interim measure
IM Work Plan 2012	Interim Measures Work Plan 2012
IM Work Plan 2013	Interim Measures Work Plan 2013
IM Work Plan 2014	Interim Measures Work Plan 2014
LCCD	Lewis and Clark Conservation District
LOSA	Lower Ore Storage Area
MBTA	Migratory Bird Treaty Act
MCL	maximum contaminant level
MDEQ	Montana Department of Environmental Quality
MDT	Montana Department of Transportation

mg/kg	milligram(s) per kilogram
mg/L	milligram(s) per liter
MPDES	Montana Pollutant Discharge Elimination System
NWE	NorthWestern Energy
PCB	polychlorinated biphenyl
PPC	Prickly Pear Creek
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
SLV	screening-level value
SPHC	South Plant Hydraulic Control
SPLP	Synthetic Precipitation Leaching Procedure
SSL	soil screening level
SWPPP	Stormwater Pollution Prevention Plan
TPA	Tito Park Area
TSCA	Toxic Substances Control Act
UOSA	Upper Ore Storage Area
U.S.	United States
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
WTP	water treatment plant
yd^3	cubic yard(s)

SECTION 1

Introduction

The purpose of this Interim Measures Work Plan 2014 (IM Work Plan 2014) is to provide information to support U.S. Environmental Protection Agency (USEPA) approval of the interim measures (IMs) phases proposed for implementation in 2014 at the East Helena Facility (Facility). This IM Work Plan 2014 focuses on work proposed for 2014 and, as appropriate, provides updates to information that was presented in the Interim Measures Work Plan 2012 (IM Work Plan 2012; CH2M HILL, 2012) and Interim Measures Work Plan 2013 (IM Work Plan 2013; CH2M HILL, 2013a).

Three interrelated, interdependent IMs were proposed in the IM Work Plan 2012, and subsequently conceptually approved by USEPA on August 28, 2012. Components of these IMs performed in 2013 were set forth in IM Work Plan 2013, which was approved by USEPA on January 21, 2013. The primary purpose of the IMs is to reduce the migration of contaminants in groundwater from the operating area of the former ASARCO Smelter (former Smelter site) in order to protect public health and the environment. The three IMs are summarized as follows:

- The South Plant Hydraulic Control IM (SPHC IM) has been proposed to reduce the migration of inorganic contaminants in groundwater by changing the hydrogeologic conditions at the south end of the former Smelter site.
- The Source Removal IM has been proposed to reduce the mass loading of contaminants to groundwater by reducing the volume of soil with high concentrations of inorganic contaminants that are in direct contact with surface water and leaching contaminants to groundwater.
- The Evapotranspiration Cover System IM (ET Cover System IM) is proposed to further reduce the potential for inorganic soil contaminants leaching to groundwater by eliminating or substantially reducing the amount of precipitation that infiltrates through contaminated materials. The ET Cover System IM will also eliminate human and ecological receptor exposure to inorganic-contaminated soil.

Implementation of the three IMs is occurring in phases over a number of years. The following phases were proposed and implemented in 2012 and 2013:

- ET Cover System IM: Phase 1 and Phase 2 demolition of the buildings and infrastructure on the former Smelter site. This work was required to help clear the site in preparation for future construction of the ET Cover System. Phase 1 demolition was completed in July 2013 and Phase 2 demolition was completed in October 2013.
- SPHC IM: Relocation of utilities located on the East Bench, including the City of East Helena water main, the NorthWestern Energy (NWE) distribution line and the CenturyLink communications cable in order to construct the Temporary Bypass for Prickly Pear Creek (PPC) (PPC Temporary Bypass). Construction of the PPC Temporary Bypass was required to route PPC flow around Smelter Dam, thereby dewatering the South Plant area and enabling demolition of Smelter Dam, removal of the Tito Park Area (TPA) (see discussion below), and reconstruct the PPC channel in mostly dry conditions. Construction of the PPC Temporary Bypass began in July 2013 and was completed in October 2013.

The IMs have been designed to be part of the final remedies for the Facility. Their performance will be evaluated as part of the Corrective Measures Study (CMS), and long-term monitoring plans will be designed to evaluate IM performance over time.

The following IM phases are proposed for 2014 and presented herein for USEPA review and approval as well as public review and comment:

- Source Removal IM: Tito Park Area Removal. This work will remove contaminated soil from the TPA, consisting of Tito Park, Upper Ore Storage Area (UOSA), Acid Plant Sediment Drying Area (APSD Area), and Lower Lake, and consolidate this material within the onsite Area of Contamination (AOC), which was approved

by USEPA as part of the IM Work Plan 2012. The earthwork will remove contaminated soil from an area that is susceptible to inundation and erosion due to potential future PPC flooding. In addition, removal of materials from the TPA is necessary to meet the functional needs of the PPC Realignment, support the development of wetland habitat in the PPC floodplain, and reduce the overall footprint of the final ET Cover System. Activities necessary to obtain permits for 2014 implementation of this IM are currently underway, as described further in Section 7.

- ET Cover System IM: Interim Cover System (ICS) Construction. The ICS serves as a required foundation layer for the final ET Cover System. Engineered fill placed for the ICS establishes grade for the ET Cover System and will protectively manage soil and sediment removed from the TPA and East Bench areas consolidated within the AOC. The ICS will be capped with native soil to prevent stormwater from contacting contaminated soil and enable runoff to be shed offsite to perimeter drainages. The ICS will be constructed in two phases, with ICS 1 occurring in 2014 and ICS 2 in 2015 to help balance material haul requirements, and successively reduce the quantity of contaminated "contact" stormwater that is currently collected and treated onsite. This will result in cost savings associated with reduced stormwater treatment. Relocation of the existing NWE 69-kilovolt (kV) power transmission line, demolition of the associated substation, and decommissioning of selected monitoring wells will be coordinated with ICS construction.

Engineering design and permitting required for construction of the PPC Realignment project, including Smelter Dam demolition, was started in 2013 and will continue in 2014. This work will support construction that is intended to begin in 2015 and continue at least through 2016. The work is discussed briefly in Section 7, and will be presented in appropriate detail in future IM Work Plan submittals.

Figure 1-1 shows the work proposed for implementation in 2014.

The Montana Environmental Trust Group, LLC, Trustee of the Montana Environmental Custodial Trust (Custodial Trust), is submitting this IM Work Plan 2014 in compliance with Paragraph 14 of the First Modification to the 1998 Resource Conservation and Recovery Act (RCRA) Consent Decree (First Modification; Dreher et al., 2012). Both the TPA removal and ICS 1 construction are elements of the IMs conceptually approved by USEPA on August 28, 2012, and meet the requirements for IMs specified in Paragraph 15 of the First Modification as follows:

- Removal of contaminated materials in the TPA will minimize the spread of hazardous constituents by reducing the volume of contaminated materials from an area that is susceptible to erosion during high flow events. The TPA removal action will support the implementation of the cleanup management strategy for the Facility and contribute to the performance of long-term remedies at the site.
- Construction of the ICS will minimize the spread of hazardous waste by providing a cover that will prevent erosion and transport of inorganics in stormwater runoff and windblown particulate. ICS construction will also minimize infiltration of precipitation and leaching of contaminants to groundwater. The ICS will contribute to the performance of long-term remedies at the site by protectively managing the consolidated TPA soil and by serving as subgrade for the final ET Cover System.

This IM Work Plan 2014 builds on information presented in IM Work Plans 2012 and 2013, and previous reports and technical memoranda prepared by the Custodial Trust. General background information on site history and conditions is presented in the draft *Phase II RCRA Facility Investigation—East Helena Facility* (draft Phase II RFI; GSI Water Solutions, Inc., 2011), and the Custodial Trust's approach to IMs for the Facility can be found in the IM Work Plans 2012 and 2013. A complete list of references is provided in Section 9 of this IM Work Plan 2014.

The Work Plan is organized into the following sections:

- **Section 1: Introduction**.
- **Section 2: Overview of 2014 Interim Measures Implementation** provides a summary-level description of the IMs proposed for implementation in 2014 and how they fit into the overall IM concept for the former Smelter site.

- **Section 3: Updated Conceptual Site Model** presents an updated conceptual site model (CSM) for the former Smelter site and areas associated with the 2014 IMs already described in the IM Work Plan 2013. This section focuses on Tito Park, UOSA, APSD Area, and Lower Lake, which are the additional areas associated with the 2014 IMs.
- **Section 4: Data Sufficiency** summarizes the existing data used in the development of the work proposed for 2014, determines whether additional data are needed to complete the design, and outlines the activities necessary to obtain additional data if necessary.
- **Section 5: Engineering Design and Construction Information for Proposed 2014 Projects** provides conceptual design information and outlines construction and implementation requirements for TPA removal, ICS construction and related activities, removal of the NWE substation, and relocation of a 69-kV transmission line, all proposed for 2014.
- **Section 6: Remediation Waste Management** describes how hazardous and nonhazardous remediation waste will be managed during 2014 IM implementation to meet the RCRA definitions of both remediation and Corrective Action Management Unit (CAMU)-eligible waste.
- **Section 7: Status of Permitting Activities and Approvals** provides an update on relevant activities associated with permitting and licensing requirements set forth in the IM Work Plans 2012, 2013 and 2014.
- **Section 8: Project Management and Schedule** provides an overview of project management activities and the proposed schedule for IM implementation. Updates to the organizational structure, lines of communication, public participation, deliverables and reporting, and the schedule are described in this section.
- **Section 9: References** contains a bibliography of documents cited in text.

Supporting information is provided in two appendixes. **Appendix A** contains the results of leaching tests performed as part of the draft Phase II RFI. **Appendix B** (pending) contains public comments received on the IM Work Plan 2014 with USEPA responses.

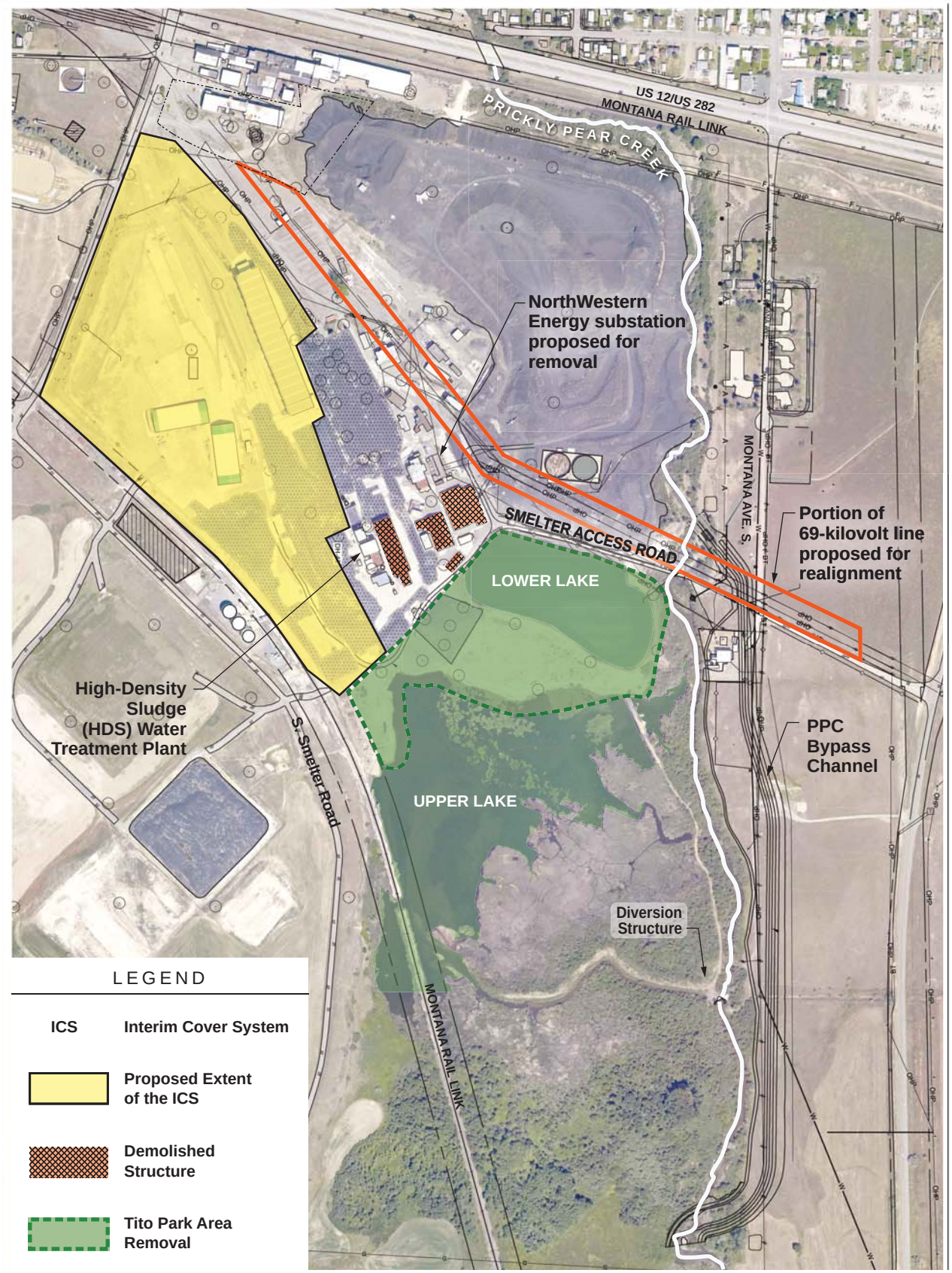


FIGURE 1-1
Interim Measures Components Proposed for Implementation in 2014
Interim Measures Work Plan–2014
East Helena, Montana

SECTION 2

Overview of Proposed 2014 Interim Measures Implementation

This section provides an overview of the IM activities proposed for implementation in 2014. The Source Removal IM proposed for implementation is TPA removal. The ET Cover System IM proposed for implementation is the Phase I ICS installation (ICS 1). A general description of how each phase aligns with the overall IM concept for the former Smelter site is provided in this section. Additional information and engineering details for TPA removal and ICS 1 installation is provided in Section 5.

2.1 Source Removal Interim Measure: Tito Park Area Removal

The TPA removal will excavate soil and sediment from the TPA and consolidate it within the AOC under the ICS and future ET Cover System. Contaminated soil will be removed from the TPA, which is susceptible to future flooding, and will minimize the potential for transport of contaminants by erosion and floodwaters. Consolidating these materials on the former Smelter site will also reduce the areal extent and cost of the ET Cover System.

2.1.1 Objectives

The objectives of the TPA removal are as follows:

1. To meet the Source Control Remedy Performance Standard of reducing, to the extent practicable, the potential for surface water and groundwater to contact soil with COPC concentrations exceeding relevant protection to groundwater standards (i.e., soil screening levels [SSLs; USEPA, 2012] developed to be protective of groundwater MCLs, or background levels based on native Montana soil concentrations [Montana Department of Environmental Quality [MDEQ], 2007], whichever is greater).
2. Meet the proposed surface and creek channel elevations and grading of PPC Realignment and support the development of wetland habitat in the floodplain of the PPC.
3. Provide additional protectiveness for an area susceptible to future flooding:
    - Minimize the potential for contaminated soil to erode from the area from high water levels during future PPC flood events and be transported to downstream locations.
    - Minimize the potential for future contaminant migration by infiltration of water that inundates the area during periodic flooding events.

Overall TPA removal will minimize the risk of contaminant transport in the realigned PPC and provide flexibility in the final design and ultimate performance of the realigned PPC, which is critical to the implementation of the SPHC IM. The SPHC IM is envisioned to be part of the final corrective measures for the Facility aimed at lowering groundwater elevations. Lowered groundwater elevations will reduce the volume of groundwater in contact with contaminated soil, thereby reducing the volume of contaminant loading to groundwater, and reducing further offsite migration of contaminant plumes.

2.1.2 Description

The TPA, as shown in Figure 2-1, is defined to include the following locations:

- Tito Park
- UOSA
- APSD Area
- Lower Lake

Tito Park is an embankment constructed by ASARCO in the southeastern portion of the former Smelter site that separates Upper and Lower Lakes. Based on existing information regarding site operations, the area was used by

ASARCO to stockpile soil and construction debris generated during Smelter operations. ASARCO records indicate that drums were handled and stored, and may have been buried in the eastern end of Tito Park. Tito Park is currently covered with a soil cap that was installed in 2001 following completion of required remedial actions in Lower Lake performed by ASARCO under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA).

The UOSA is an area adjacent to and southwest of Tito Park. The UOSA was used to store ore, smelting byproducts, soil, and other material produced at the Smelter. The UOSA is currently used by the Custodial Trust for equipment and scrap storage.

The APSD Area is located within the northern portion of the UOSA and was used from about 1977 to 1991 to store sludge from the Acid Plant Water Treatment Facility. In 2006, ASARCO enclosed contaminated soil and groundwater in the APSD Area within a slurry wall and placed a temporary geosynthetic cover system over the area.

Lower Lake is a human-made, unlined process wastewater pond constructed by ASARCO to provide water for and accept wastewater releases from historical Smelter operations. Anecdotal information indicates that Lower Lake was first used as a plant water source in 1927. Beginning in 1975, Lower Lake was used to settle solids from the plant process water circuit. Untreated discharges to Lower Lake by ASARCO were discontinued following operational startup of the high-density sludge (HDS) water treatment plant (WTP) in 1994. Lower Lake currently accepts discharge from the HDS WTP outfall in accordance with an existing Montana Pollutant Discharge Elimination System (MPDES) individual permit (MT0030147).

At the request of the Custodial Trust, CH2M HILL evaluated three different grading options for the removal of contaminated soil from the TPA. Based on this evaluation, the Custodial Trust recommended the implementation of the option described herein (Custodial Trust, 2013) to USEPA on June 18, 2013. This option removes the largest quantity of contaminated soils, excavating the entire TPA down to the estimated post-PPC Temporary Bypass groundwater elevation of approximately 3,910 feet above mean sea level and removes up to 2 feet of contaminated sediment in Lower Lake. The excavation quantity was estimated to be approximately 238,000 cubic yards (yd^3). In addition, the evaluation recommended installing a low-permeability berm and riprap along the western and northern edges of the excavation areas (Figure 2-1). USEPA approved the Custodial Trust's recommendation by e-mail communication to the Custodial Trust on July 29, 2013, based on the understanding that additional information would be provided for USEPA, Beneficiary, and public review and approval as part of this IM Work Plan 2014.

TPA removal evaluations completed in mid-2013 also considered the installation of a low-permeability berm along the border between the former Smelter site and the TPA to provide additional protection. Future flood events have the potential to inundate the TPA, saturate shallow soil, and recharge groundwater in the South Plant area. Subsequent flood modeling completed for PPC Temporary Bypass permit applications indicates that implementation of the PPC Realignment project may lower floodwater elevations, thereby reducing the potential for flooding in the TPA and the need for the low-permeability berm. The environmental benefits of this berm will be reviewed during engineering design of the TPA removal.

2.1.3 Technical Evaluations

The final design of the TPA removal will be informed by the following additional technical studies, which will build on the results of the *Tito Park Grading Options Analysis* (CH2M HILL, 2013b):

- A dewatering analysis will be performed to evaluate the potential effect of groundwater on construction activities occurring in the TPA. This analysis will focus on the dewatering needs associated with TPA excavation as well as dewatering needs for the PPC Realignment project.
- A materials balance analysis will be completed to estimate the volume of soil to be excavated from the TPA in order to establish grading requirements for fill in the ICS 1, and ultimately to coordinate with construction grades needed for the final ET Cover System.

- Design engineering is scheduled for completion in late 2013. Final construction drawings, specifications, and bid documents will be completed in early 2014 and address the following technical items:
  - TPA excavation
  - Need for a low-permeability berm
  - Need for a run-on diversion berm

2.2 ET Cover System Interim Measure: Interim Cover System 1 Construction

2.2.1 ICS 1 Construction

Implementation of the ET Cover System IM will start in 2014 with construction of ICS 1. The ET Cover System is planned to be a component of the final remedy for the Facility, preventing human and ecological receptors from direct contact with contaminated soils and reducing the leaching of contaminants to groundwater by minimizing the infiltration of precipitation. The ICS will provide a cover to protectively manage soil and sediment excavated from the TPA and consolidated within the AOC, and will function as the ET Cover System foundation layer over a significant portion of the west side of the former Smelter site. See Section 5.2 for additional details on how the ICS relates to the ET Cover System; Figure 5-4 provides a preliminary conceptual cross-section of the ET Cover System and an expanded cross-section of ICS 1. Site preparation for ICS construction started with two phases of demolition at the former Smelter site (completed in 2013). Work to date has removed all buildings and infrastructure within the ICS 1 construction footprint with the exception of monitoring wells and miscellaneous structures used for stormwater management. The existing NWE substation and 69-kV transmission line, which are located on the eastern side of the former Smelter site within the ET Cover System footprint, may be removed in 2014 as part of this IM to prepare for ICS 2 construction in 2015.

2.2.1.1 Objectives

The objectives of ICS 1 are as follows:

- Protectively manage the soil and sediment removed from the TPA and consolidate within the AOC.
- Provide a prepared subgrade on which to build the future final ET Cover System for the former Smelter site.
- Prevent stormwater from coming into direct contact with TPA soil and sediment and enable runoff to be shed to perimeter drainages in accordance with the site stormwater pollution prevention plan (SWPPP). This will reduce the volume of contaminated stormwater that is being collected and treated by the onsite HDS WTP.
- Replace the deteriorating geosynthetic temporary covers placed by ASARCO and provide positive surface grades to minimize infiltration of precipitation and associated leaching of COPCs to groundwater
- Cost-effectively reuse materials from the TPA removal and the 2013 PPC Temporary Bypass excavation.

2.2.1.2 Description

ICS 1 will form the foundation layer, or subgrade, of the ET Cover System on the western portion of the former Smelter site. The ICS will cover the soil and sediment to be removed from the TPA and consolidated within the AOC, protectively managing them during the interim period between excavation and construction of the final layers of the ET Cover System. In addition, utilizing excavated materials from both the PPC Temporary Bypass and the TPA removal will help ensure cost-effective construction of the foundation layer.

ICS 1 will also allow “noncontact” stormwater runoff to be shed to offsite drainage structures. Noncontact stormwater runoff is defined as precipitation that falls on the former Smelter site without coming into contact with soil affected by former Smelter operations. In contrast, “contact” runoff is defined as any stormwater that comes into direct contact with soil affected by former Smelter operations. Stormwater coming off the ICS would therefore be of the same quality as stormwater runoff from native soil in the area, in accordance with the SWPPP. The specific materials to be used as the surface layer of the ICS will be identified as part of the ICS final design, and will be sampled to document that they are of appropriate quality to achieve relevant stormwater quality standards and serve as an interim surface for the cover system.

The proposed minimum and maximum areal extents of ICS 1 are shown in Figure 2-2. The actual coverage extent will be established during detailed design; however, ICS 1 is expected to include, at the minimum, the stormwater basins that drain to the Rodeo Tank containment facility and portions of the adjacent drainage basins.

2.2.1.3 Technical Evaluations

Technical evaluations completed for the final ET Cover System will provide background information needed in the ICS 1 design. Expected final grades for the ET Cover System will be documented in the *ET Cover System 30% Basis of Design Report*, targeted for completion by the end of December 2013.

Additional evaluations are being conducted as part of the CMS and also will build on the results of the ET Cover System preliminary engineering and modeling as well as the TPA engineering activities (e.g., the materials balance) discussed in Section 2.1 above. The following additional evaluations will be completed:

- ICS cover soil borrow source evaluation, to evaluate the physical and chemical properties of native soil from three possible sources for the ICS. The evaluation will include consideration of expected runoff quality from each source, constructability, and cost.
- ICS 1 cover soil design criteria, to define specific properties needed to minimize the potential for wind and stormwater erosion of the cover and direct contact with underlying soil.
- Construction sequencing, to define the logic and order for construction implementation such that materials excavated from the TPA are managed as protectively and efficiently as possible.
- Drainage options analysis, to develop design concepts for runoff management that can accommodate peak flows from the ET Cover System while minimizing runoff contribution from the former Smelter site to adjacent Custodial Trust properties.
- Water management concept plan, to define approaches for stormwater, remediation water, and leachate management during and following IM implementation.
- ICS detailed engineering, to prepare contract documents needed for construction of the ICS. The contract documents will include drawings, construction specifications, and bidding documents.

2.2.2 Substation Removal and 69-kilovolt Transmission Line Relocation

2.2.2.1 Objectives

The objective of this work is to remove utilities that interfere with the location of the ICS and ET Cover System on the former Smelter site. Removal of the existing substation and relocation of the 69-kV transmission line will be completed by NWE.

2.2.2.2 Description

The existing substation is located on the southeastern portion of the former Smelter site north of Lower Lake. The substation provides electrical service to onsite facilities as well as service to NWE customers located east of the former Smelter site. The 69-kV transmission line enters the former Smelter site from the east and crosses to the northwest (Figure 1-1), exiting near American Chemet. The transmission line is supported on wood power poles.

NWE is negotiating with the Custodial Trust to decommission and demolish the substation and to relocate the 69-kV transmission line. This work will remove the transmission line that interferes with the ET Cover System before the construction of the ICS 2 scheduled for 2015 and final ET Cover System currently scheduled for 2016.

Surface soil samples collected around the perimeter of the substation in April 2013 were analyzed for the presence of polychlorinated biphenyls (PCBs) (Hydrometrics, 2013a). PCBs were detected at varying concentrations ranging from 0.019 milligram per kilogram (mg/kg) to 0.11 mg/kg. PCBs detected were Aroclor 1016, 1221, 1232, 1248, 1262, and 1268. While all concentrations are below USEPA's 1 mg/kg cleanup level promulgated under the Toxic Substances Control Act for high-occupancy areas, the presence of PCBs in soil suggests that additional investigation within the substation will be needed to characterize soil for disposal during substation demolition.

2.2.2.3 Technical Evaluations

Preliminary engineering evaluations for substation demolition and 69-kV transmission line relocation will be completed concurrent with detailed design and construction. Engineering evaluations will address:

- Removal and cleanup of the substation. This work will be completed by NWE in coordination with other work needed to deenergize the substation.
- Transmission line relocation evaluation to review and assess options for relocation of the transmission line. The preferred option will be selected jointly by NWE and the Custodial Trust.

2.2.3 Monitoring Well Decommissioning

2.2.3.1 Objectives

The objective of this work is to decommission existing wells that are located within the TPA and determine which wells located within the footprint of the ICS 1 are no longer needed to effectively monitor groundwater quality at the former Smelter site. Wells not needed for future monitoring efforts will be decommissioned and all others will be extended to be functional with the new grades of the ICS 1.

The Custodial Trust is drafting goals for near-term IM performance monitoring, as well as long-term monitoring of final remedies, and evaluating the monitoring well network needed to provide the necessary data. This information, along with recommendations to achieve the performance monitoring goals, will be provided to USEPA for review and approval. This effort is one component of the overall goals and objectives of the groundwater program at the Facility.

2.2.3.2 Description

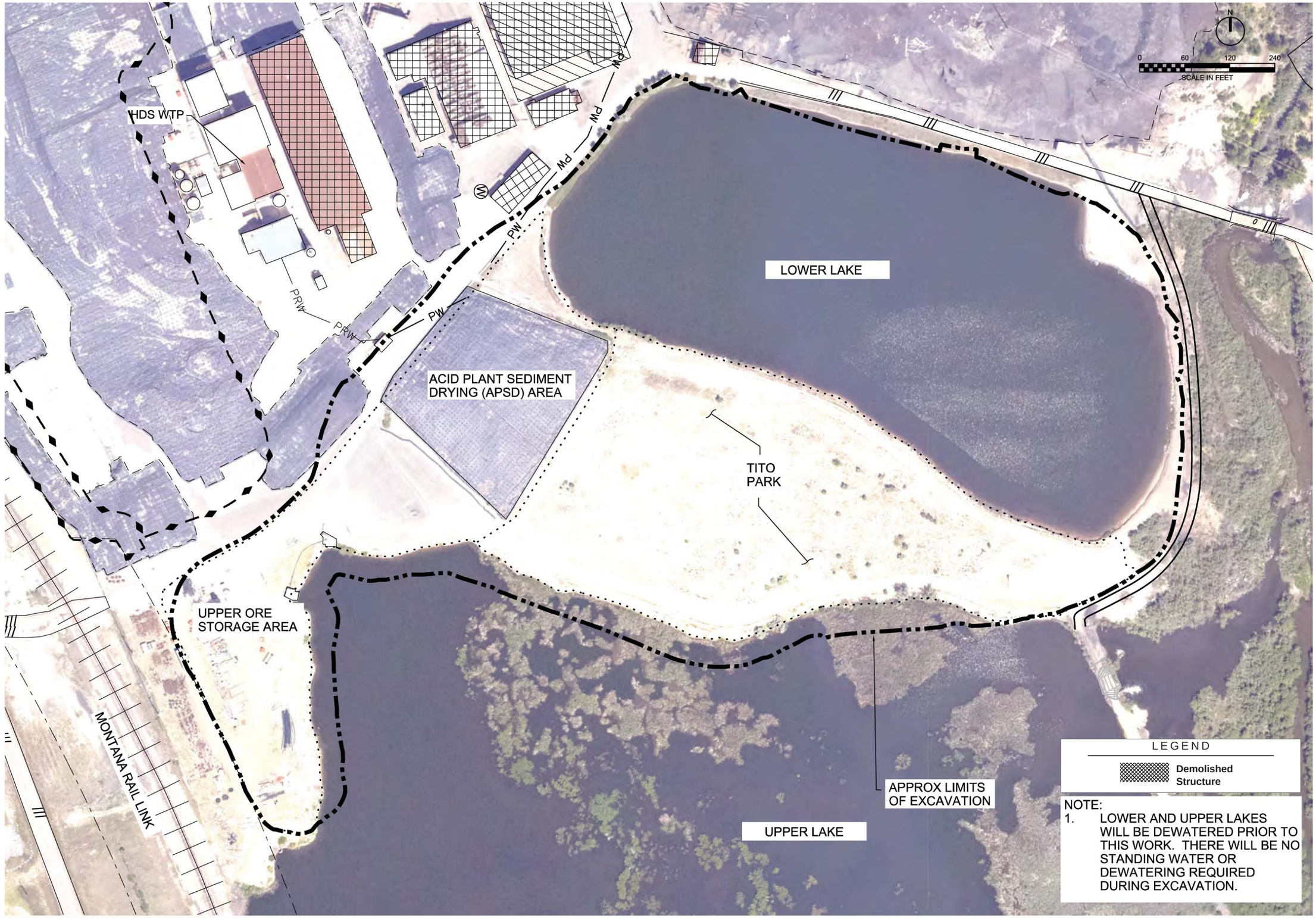
A large number of monitoring wells have been installed over a 30-year period at the former Smelter site for groundwater investigations and monitoring, and for delineation of the nature and extent of groundwater contamination. A number of these wells have not been sampled in years or are no longer needed to provide an effective monitoring network. The wells located in the footprint of the ICS and the ET Cover System will be evaluated for either decommissioning or retrofitting to meet new surface grades. Monitoring wells not required for current and future groundwater monitoring or located in the TPA construction zone will be decommissioned and abandoned. Wells in the ICS/ET Cover System footprint needed for future monitoring will be protected during construction (with elevated well casings to allow access for sampling after ICS construction).

2.2.3.3 Technical Evaluations

A number of technical evaluations will be completed before selecting monitoring wells to be decommissioned. The purpose of the evaluations will be to guide the development of the decommissioning plan and provide recommendations for new monitoring wells to be installed. The following evaluations will be completed:

- Review of historical and current groundwater monitoring data with a focus on groundwater conditions beneath the extent of the ICS 1.
- Remedy performance standards, to be presented in the draft CMS Work Plan, which is scheduled for USEPA review in December 2013. Monitoring goals and objectives will be identified as part of the CMS, to establish criteria for monitoring the expected performance of the IMs implemented at the Facility. As part of this evaluation, a conceptual groundwater monitoring approach will be developed and reviewed with USEPA.
- Monitoring well decommissioning plan, to identify and select proposed monitoring wells for decommissioning. The plan will describe the means and methods for monitoring well decommissioning and the proposed implementation schedule. The plan will also identify existing monitoring wells located within the ICS construction boundary that are proposed for protection and extension through the cover. A detailed design will be developed to meet Montana State requirements for monitoring well extensions.
- Monitoring well construction plan, to identify potential locations and proposed construction details for new monitoring wells that will be installed.

Technical evaluations will be limited to the decommissioning or preservation of monitoring wells in the ICS 1 area. The overall plan and strategy for monitoring the performance of the IMs and their effect on groundwater quality contamination is under development and not intended to be addressed in this IM Work Plan 2014.



PRELIMINARY NOT FOR CONSTRUCTION

NO.	DATE	DSGN	DR	CHK	APVD
0		N. BETTS	R. VILORIA	S. DETHLOFF	J. DEHNER
					APVD
					BY
					NB
					JD

90% INTERNAL REVIEW SUBMITTAL
REVISION

METG
Montana Environmental Trust Group

CH2MHILL
POWER BLOCK BUILDING
7 WEST 6TH AVE. # 519
HELENA, MT 59601-5036
PHONE: (406) 457-5494

FIGURE 2-1
Tito Park Area Removal
Interim Measures Work Plan–2014
East Helena, Montana

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	DECEMBER 2013
PROJ	467300
DWG	G-3
SHEET	3 OF 27

PRELIMINARY - NOT FOR CONSTRUCTION

ES081313034307PDX 467300.35.01.02 Rv2 12-09-13 lh

FIGURE 2-2
Interim Cover System Conceptual Layout
Interim Measures Work Plan–2014
East Helena, Montana

CH2MHILL

METG
Montana Environmental Trust Group

Jay Dehner | JD | PJK | PK

1"=100'

BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

01-05-12
420947
FIGURE 3

Preliminary Concept

FILENAME: SOILREMOVAL FIGURE 3.DWG PLOT DATE: 25-Jul-13 PLOT TIME: 3:44 PM

SECTION 3

Updated Conceptual Site Model

This section provides updates to the former Smelter site CSMs presented in earlier documents (e.g., the IM Work Plan 2012 [CH2M HILL, 2012], the IM Work Plan 2013 [CH2M HILL, 2013a] and the draft Phase II RFI [GSI Water Solutions, Inc., 2011]). CSMs for the former Smelter site and Corrective Measures Study properties are evolving models, and as such will continue to be updated as new information from field activities, ongoing evaluations, and IM construction projects becomes available. This section is not intended to repeat earlier published materials; the IM Work Plan 2013 provides detailed descriptions of the following:

- Section 3.1 – general background information for the former Smelter site, such as location and setting, geology, and hydrogeology
- Section 3.2 – overall CSM for the former Smelter site (relevant to all work activities described in this IM Work Plan 2014)
- Section 3.3 – CSM for the Lower Ore Storage Area (LOSA) and adjacent features (relevant to work activities associated with the Interim Cover [Sections 2.2.1 and 5.2])
- Section 3.4 – CSM for the East Bench (relevant to work activities associated with the relocation of NWE's 69-kV transmission line [Sections 2.2.2 and 5.2])

The following sections focus on areas of the former Smelter site most relevant to the proposed 2014 work. The majority of the information presented below is based on site investigations conducted since 1987, including the following:

- Remedial Investigation of soil conducted in 1987 (CH2M HILL, 1987)
- Remedial Investigation/Feasibility Study conducted in 1990 (Hydrometrics, 1990)
- Current Conditions/Release Assessment conducted in 1998 (Hydrometrics, 1999)
- Investigative sampling conducted in 1999 to evaluate potential IMs and formally documented in the draft Phase II RFI (GSI Water Solutions, Inc., 2011)
- Phase I RFI in 2001 (Asarco Consulting, Inc., 2005)
- Phase II RFI in 2010 (GSI Water Solutions, Inc., 2011)
- Baseline Ecological Risk Assessment (BERA) (Gradient, 2010)

Investigation of Lower Lake sediment was also conducted in conjunction with planning and implementation of dredging activities from 1994 to 1996.

3.1 Updated Conceptual Site Model for Former Smelter Site

This section updates the CSM of the former Smelter site presented in the IM Work Plan 2013 with the results of evaluations of soil contamination performed in 2013 using a three-dimensional model to help visualize subsurface soil conditions. This section also presents updated (June 2013) groundwater plume maps. Figure 3-1 presents a graphical representation of the CSM of the former Smelter site.

The conservative screening-level values (SLVs) used in the draft Phase II RFI have been used as the reference for the preliminary evaluations soil and groundwater quality. With the exception of the USEPA maximum contaminant levels (MCLs) for those contaminants for which there are no DEQ-7 standards, the SLVs used in the Phase II RFI and herein do not reflect media cleanup standards for groundwater.

3.1.1 Soil Contamination

Surface and subsurface soil contamination is significant and widespread throughout the former Smelter site at concentrations that are orders of magnitude higher than levels considered protective of human and ecological receptors. Although some interim measures were implemented by ASARCO (buildings have been demolished, slurry walls were installed to isolate areas of deeper soil contamination, shallow contaminated soil has been excavated, and some areas of residual contamination were covered with temporary geosynthetic liners), exposed surface soil continues to present unacceptable risk for direct contact with human and ecological receptors and stormwater. Leaching of metals from surface and subsurface soil continues to pose a threat to groundwater quality within the former Smelter site.

To better understand the potential distribution and estimated mass of inorganic contaminants in soil, the former Smelter site was modeled three-dimensionally using Mining Visualization System (MVS) software. Soil contaminant distributions were generated using existing soil data. Kriging, an industry-standard geostatistical technique, was used for data interpolation between measured/analyzed soil data points. The MVS model provided graphical illustrations of mass distributions of arsenic and selenium in surface and near-surface soil (Figures 3-2 and 3-3), as well as soil from ground surface to the top of the Tertiary ash/clay layer (which is present at approximately 3,850 to 3,900 feet below ground surface [bgs]) along select cross-sectional lines through the former Smelter site (Figures 3-4 and 3-5).

For the purpose of corrective and interim measures evaluations, the nature and extent of arsenic and selenium are considered to be representative of the nature and extent of all inorganic contaminants for the East Helena Facility. Existing investigations have shown other inorganic contaminants are generally co-located with arsenic and selenium. It should be noted that there is greater certainty in the estimates and information presented for arsenic than selenium because more arsenic than selenium data are available from soil sampling. The results indicate the areas of residual contamination in the vadose zone correspond generally to the location of former smelter operations that have been identified as likely source areas. While the majority of soil contamination resides in shallow soil, significant soil contamination is present in deeper soil above groundwater, and to a lesser extent in contact with groundwater.

As illustrated in Figures 3-2 and 3-3:

- Contaminants are present at concentrations exceeding risk-based screening levels across the former Smelter site.
- The highest concentrations of both arsenic and selenium in soil are found in the central and southern portions of the former Smelter site, in areas associated with historical operations known to have released contaminants to the environment.
- Contaminant concentrations generally decrease with depth below ground surface, particularly in the northwesterly portion of the former Smelter site. Contaminant concentrations at depth are highest in the areas associated with the former process water circuit.

In order to estimate the potential for contaminants to leach from soil to groundwater, leaching tests using two methods: Synthetic Precipitation Leaching Procedure (SPLP) and Sequential Batch Leach, were performed as part of the Phase II RFI (see Appendix A for a copy of the test results presented in the draft Phase II RFI). The leaching test results were compared against arsenic and selenium MCLs, which are the same as the DEQ-7 numeric water quality standards for arsenic and selenium in groundwater (MDEQ, 2012). The SPLP test results indicate great variability in soil samples collected from different areas of the former Smelter site. Fourteen of the twenty soil samples tested leached arsenic at concentrations exceeding the MCL of 0.01 milligram per liter (mg/L). The highest leachable concentrations of arsenic were found in soil samples collected from the former Acid Plant and TPA. In contrast, eleven of the twenty soil samples tested leached selenium at concentrations exceeding the MCL of 0.05 mg/L. The highest leachable concentrations of selenium were found in soil samples collected from the main plant site, along the rail corridors and the former Acid Plant.

3.1.2 Groundwater Contamination

As previously described, arsenic and selenium are the primary COPCs in groundwater. Data also show that the other site-related contaminants (aluminum, antimony, cadmium, lead, manganese, mercury, thallium, vanadium, and zinc) are generally found within the areal extent of the arsenic and selenium plumes. Figures 3-6 and 3-7 show the groundwater concentrations of arsenic and selenium for June 2013. The lateral extent of the arsenic plume continues to be relatively stable or in a state of equilibrium over the past 10 years or more. The areal extent of the selenium plume continues to be evaluated because the period of record for data collection is too short to quantify long-term trends and the current status (for example, stable, advancing, or regressing) of the selenium plume.

3.2 Conceptual Site Model for Tito Park Area

This section presents the CSM for the TPA (Tito Park, the UOSA, the APSD Area, and Lower Lake [Figure 3-8]). Tito Park, the UOSA, and the APSD Area are grouped together because of their proximity, and common operational histories, releases, and historical remedial measures. Tito Park is a human-made area of approximately 4.5 acres and consists of primarily barren soil with sparse vegetative cover (grasses) in some areas. The UOSA, located adjacent to and southwest of Tito Park, is approximately 3 acres and primarily was used for equipment staging and storage, as needed. The APSD Area is located on the northern portion of the UOSA. Lower Lake is a human-made pond, formerly used for process water, located adjacent to and north of Tito Park.

3.2.1 Background and Historical Sources of Contamination

3.2.1.1 Tito Park, Upper Ore Storage Area, and Acid Plant Sediment Drying Area

Tito Park historically was used to stockpile soil and construction debris from the former Smelter site operations. Aerial photographs also indicate that ASARCO handled and stored drums for an unknown period of time on the eastern end of Tito Park. Similarly, until the late 1980s, the UOSA was used to store various materials including ore, smelting byproducts, soil stockpiles, and sludge from the Acid Plant Water Treatment Facility (stored in the APSD Area from 1977 to 1991). As part of the Lower Lake remediation project, which was conducted under CERCLA, the concrete pad at the APSD was sealed in preparation for its use as a staging area for Lower Lake sediment handling and treatment equipment. Dredged sediment from Lower Lake was handled in this area from 1994 to 1996, and ultimately transported to the LOSA (see Lower Lake discussion below).

Releases of arsenic and other metals to surface soil, subsurface soil, and groundwater occurred through leaching of metals from ore, concentrates, former Acid Plant process sludge, and other high-concentration materials such as excavated soil and construction debris stockpiled in these areas. Based on results of the 1998 process-water quality evaluation, which showed significantly elevated concentrations of inorganics in the water, the sludge placed in the APSD Area also likely contained elevated levels of arsenic, iron, lead, and sulfate.

With construction of the Ore Storage Building (also referred to as the Concentrate Storage and Handling Building) located near the LOSA in 1989-1990, ore and other process materials were no longer stored and handled at the UOSA and APSD Area. As a result, around 1991, direct loading to soil and groundwater from operational activities was eliminated as a contaminant release pathway in the UOSA and associated APSD Area.

In 2001, as part of remediation work ASARCO conducted under RCRA, all stockpiled soil was removed from Tito Park and placed in the Phase I CAMU 1 cell located offsite to the west of the former Smelter site. Tito Park was then covered with a soil cap. In 2006, the APSD Area was enclosed within a slurry wall and covered by a reinforced polyethylene cap to isolate the remaining metals-affected sludge and soil.

3.2.1.2 Lower Lake

Anecdotal information indicates that Lower Lake was first used as a plant water source beginning in 1927 for cooling water to support the zinc fuming operation. Beginning in 1975, Lower Lake was used to settle solids from the plant process water circuit. Essentially all process water for the plant was drawn from Lower Lake, which functioned as the main holding pond. Process water was used for washdown, moisturizing, and cooling, and eventually was pumped back to Lower Lake.

Releases of arsenic and other metals from Lower Lake to groundwater, soil, and PPC have been identified through multiple site investigations. Seepage of contaminated water through the lakebed and settling of process water solids contributed inorganic contaminants to Lower Lake sediment, the soil beneath the lake, groundwater, and the nearby reach of PPC. Completion of a new acid reclaim facility in 1992 resulted in additional process water being discharged to Lower Lake, and therefore additional contaminant loading to sediment. These releases continued until the startup of the HDS WTP in January 1994. As a result, increases in arsenic concentrations in Lower Lake were noted from 1992 to 1993, followed by a decreasing trend as noted in the lower values reported in 1998.

Changes to the main plant process water circuit began in 1990 with the construction of two 1-million-gallon storage tanks designed to replace Lower Lake. After construction of the storage tanks and the HDS WTP in late 1993, Lower Lake was no longer used to receive process water, although the lake remained a source of makeup water to the plant water system until the Smelter shut down in 2001.

Beginning in 1994 and ending in 1996, settled process sludge and the top 6 inches of the native marsh deposits (collectively referred to as Lower Lake sediment) were dredged from the lake as part of the Operable Unit-1 Record of Decision (USEPA, 1989) for the former Smelter site. The dredged sediment was mechanically dewatered, and the filter cake from the dewatering operation was transported to an interim covered stockpile in the LOSA. A total of approximately 31,000 yd^3 of dewatered Lower Lake sediment was transported to the LOSA, and ultimately disposed of in CAMU 1.

3.2.2 Soil and Sediment Contamination

Data collected in 2010 for and presented in the draft Phase II RFI confirmed that concentrations of metals are still present at concentrations exceeding the risk-based screening values identified in the draft Phase II RFI in surface and near-surface soil in the TPA. The ground surface elevation in the TPA ranges from 3,921 to 3,930 feet above mean sea level, with an approximate average of 3,925 feet above mean sea level. The highest concentrations of metals were generally detected within the upper 5 feet of soil (historical vadose zone), although soil concentrations collected in Tito Park in 2001 and 2010 indicate that concentrations increase from 5 to 10 feet bgs and subsequently decrease from 10 to 15 feet bgs. All samples collected indicate that the lowest soil concentrations are below 15 feet bgs (below approximately 3,910 feet above mean sea level), where the water table is anticipated once the SPHC IM is fully implemented. Although metal (arsenic) concentrations below 15 feet are generally consistent with what is found in naturally occurring native soil in the Helena Valley, the concentrations are still higher than the SLVs protective of groundwater (USEPA SSLs developed to protect groundwater quality from contaminants leaching from soil to groundwater at levels exceeding MCLs).

As shown in Figures 3-2 to 3-5, the soil concentrations detected in the TPA are comparable to other areas of the former Smelter site, such as the former Acid Plant, Speiss Dross area, and the rail corridors near the LOSA. Some of the highest subsurface soil concentrations are noted in the UOSA and APSD Area. The TPA received the majority of the stockpiled materials and the APSD Area received wastes from the former Acid Plant, which contained high levels of metals. Leaching test results of samples collected from the TPA showed levels of leachable arsenic similar to samples collected from the former Acid Plant. Leachable selenium concentrations were similar to those along the rail corridors and at the former Acid Plant.

As part of the BERA, Lower Lake bottom surface (0- to 0.5-foot) sediment samples were collected in 2010. These samples are considered generally representative of current conditions. Concentrations of arsenic, selenium, and several other metals exceeded their risk-based screening levels.

3.2.3 Groundwater Contamination

Over time, metals contamination in soil has leached to groundwater via infiltration of process water and stormwater percolating through contaminated soil. Some metals in soil at or near the pre-SPHC IM water table (around 5 feet bgs) have been leached from the fluctuation of the groundwater table across the affected soil. The affected groundwater then flows northerly under the former Smelter site and further affects groundwater downgradient. However, contaminant concentrations in groundwater from the South Plant area are low compared to other areas, such as the former Acid Plant and LOSA.

Selenium is generally the most mobile of the metals detected at the former Smelter site; however, it is not detected in groundwater beneath the TPA. The original releases of selenium are believed to have occurred downgradient of the TPA. Accordingly, with a few exceptions, only arsenic exceeds the DEQ-7/MCL in wells in the TPA and concentration trends are generally stable. Some of the highest arsenic concentrations are detected within the APSD Area where high concentration sludges from the former Acid Plant were stored.

3.2.4 Conceptual Understanding of Contamination and Contaminant Transport

The CSM for the TPA can be subdivided into land use areas (Tito Park, UOSA and APSD Area, and Lower Lake). The following summarizes the activities and subsequent effects to soil from the land use areas:

- Various process and waste materials were stored in the land use areas, such as ore, smelting byproducts, soil stockpiles, construction debris, and sludges.
- The stored materials affected surface soil through direct contact. The primary contaminants are arsenic, cadmium, and lead. These metals have been detected in soil throughout the area at elevated concentrations, especially within the upper 5 feet of soil. The surface soil concentrations exceed SLVs related to human and ecological health and protection of groundwater. The greatest effects on surficial media are noted in the western portion of the UOSA.
- Through vertical infiltration of water, the subsurface was also affected by the handling and storage of these materials, although to a lesser extent than the surface soil; the concentrations of metals in soil generally decrease with depth. Below 15 feet bgs, concentrations are several orders of magnitude less than surface soil concentrations; however, concentrations exceeding SLVs protective of groundwater for all three metals have been detected below 15 feet bgs.
- Sediment and surface water primarily were affected by the historical use of Lower Lake. During its use for settling of solids, materials with elevated metal concentrations affected lake floor sediment and to some extent surface water. However, the primary effects on surface water are noted before 1993 when process water was circulated through the plant before being returned to Lower Lake.
- Groundwater was contaminated by releases from all of the historical material handling and storage areas and process water activities. As a result of leaching and subsequent infiltration through soil and lake sediment, metals migrated to groundwater. Arsenic is the primary metal that exceeds the DEQ-7/MCL in area groundwater. Cadmium and lead, while detected in soil, have had minimal effect on groundwater in the area. Although leaching test results varied, several samples indicated that arsenic and selenium are leachable from materials stored in the land use areas and from Lower Lake sediment that has since been dredged and removed from Lower Lake.

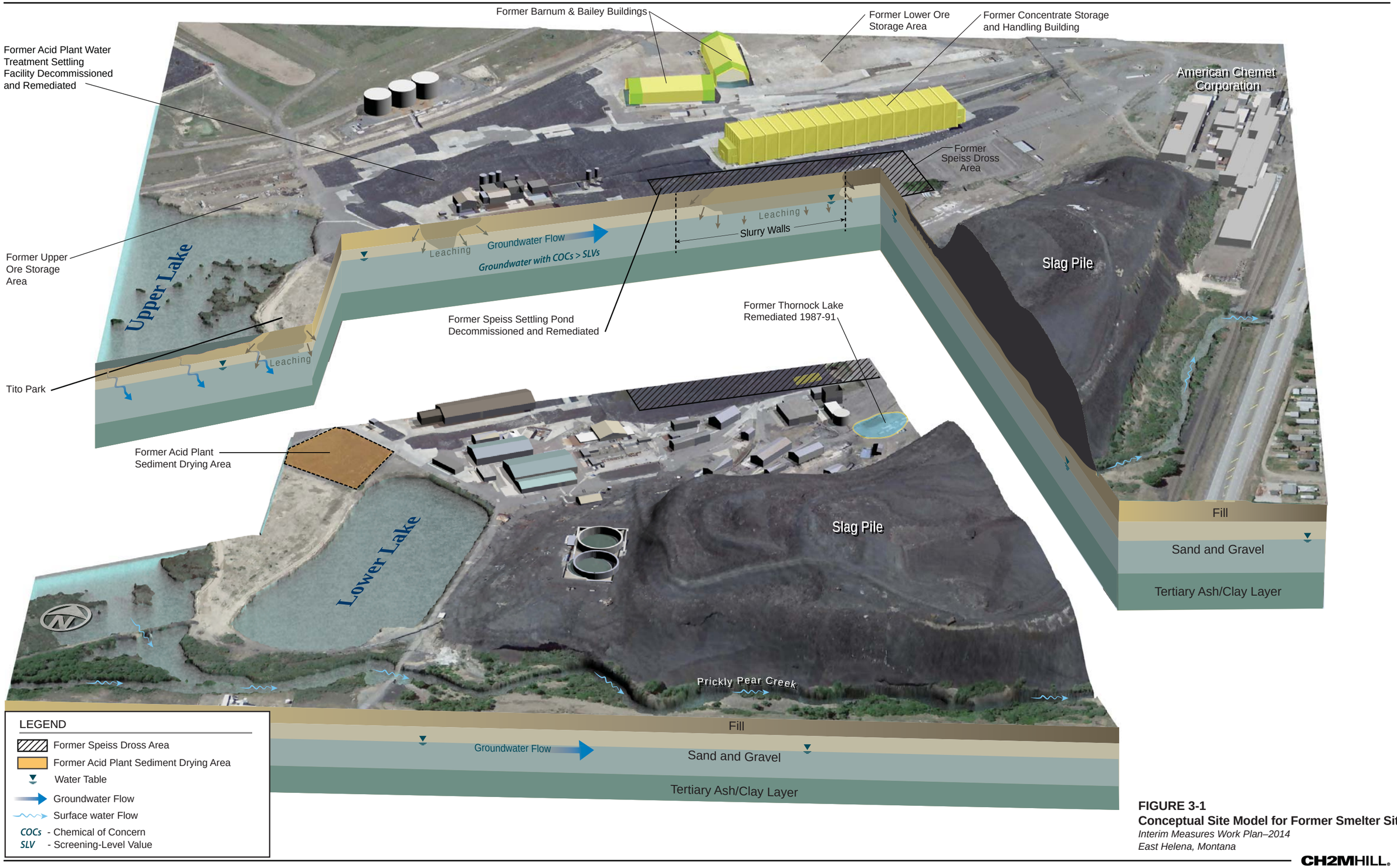


FIGURE 3-1
Conceptual Site Model for Former Smelter Site
Interim Measures Work Plan–2014
East Helena, Montana

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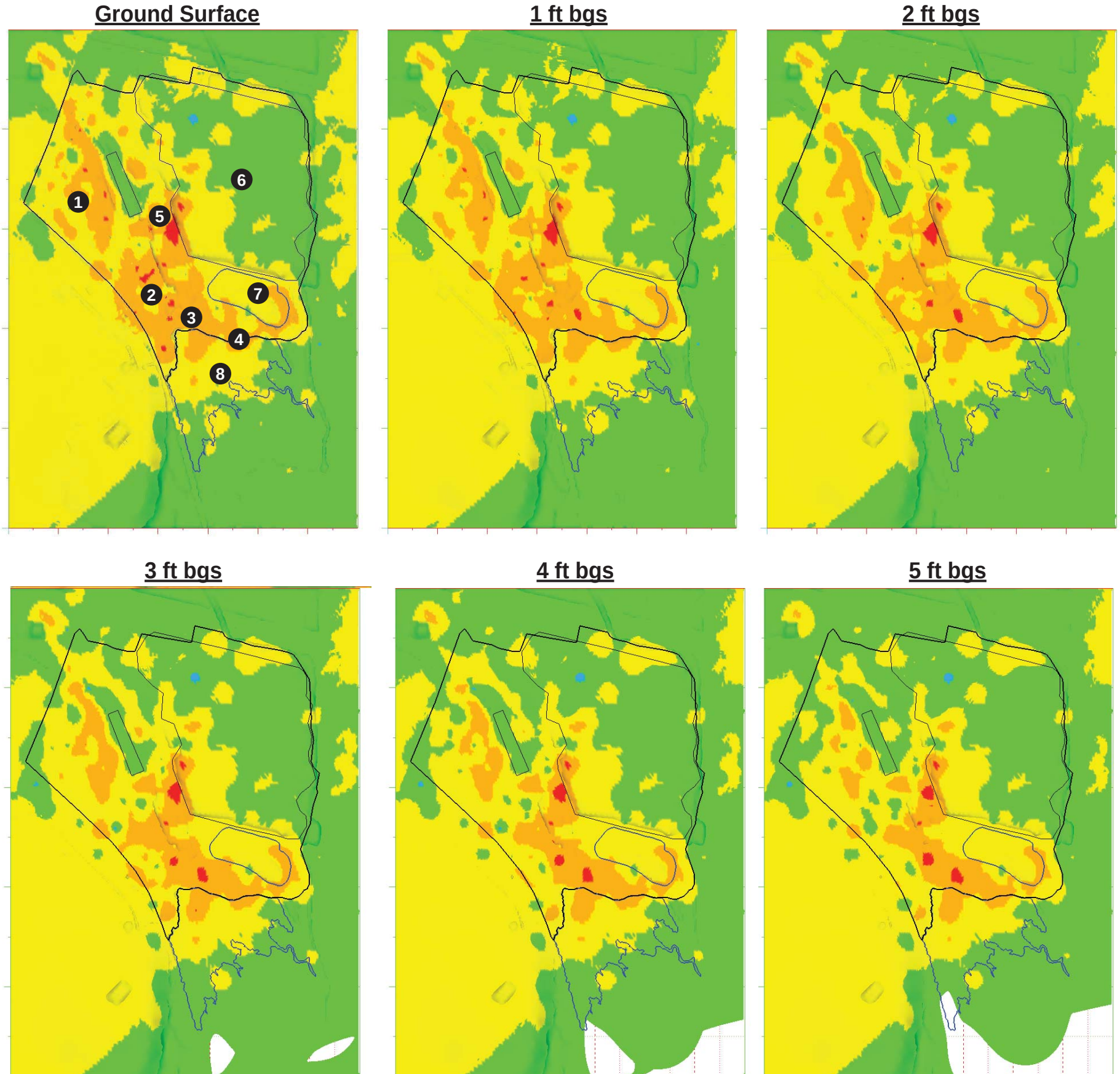


LEGEND

Arsenic Concentrations

- Dark Blue: <0.29 mg/kg
- Light Blue: 0.29 - 2.9 mg/kg
- Green: 2.9 - 40 mg/kg
- Yellow: 40 - 290 mg/kg
- Orange: 290 - 2,900 mg/kg
- Red: >2,900 mg/kg

bgs - below ground surface

ft - foot/feet

mg/kg - milligram per kilogram

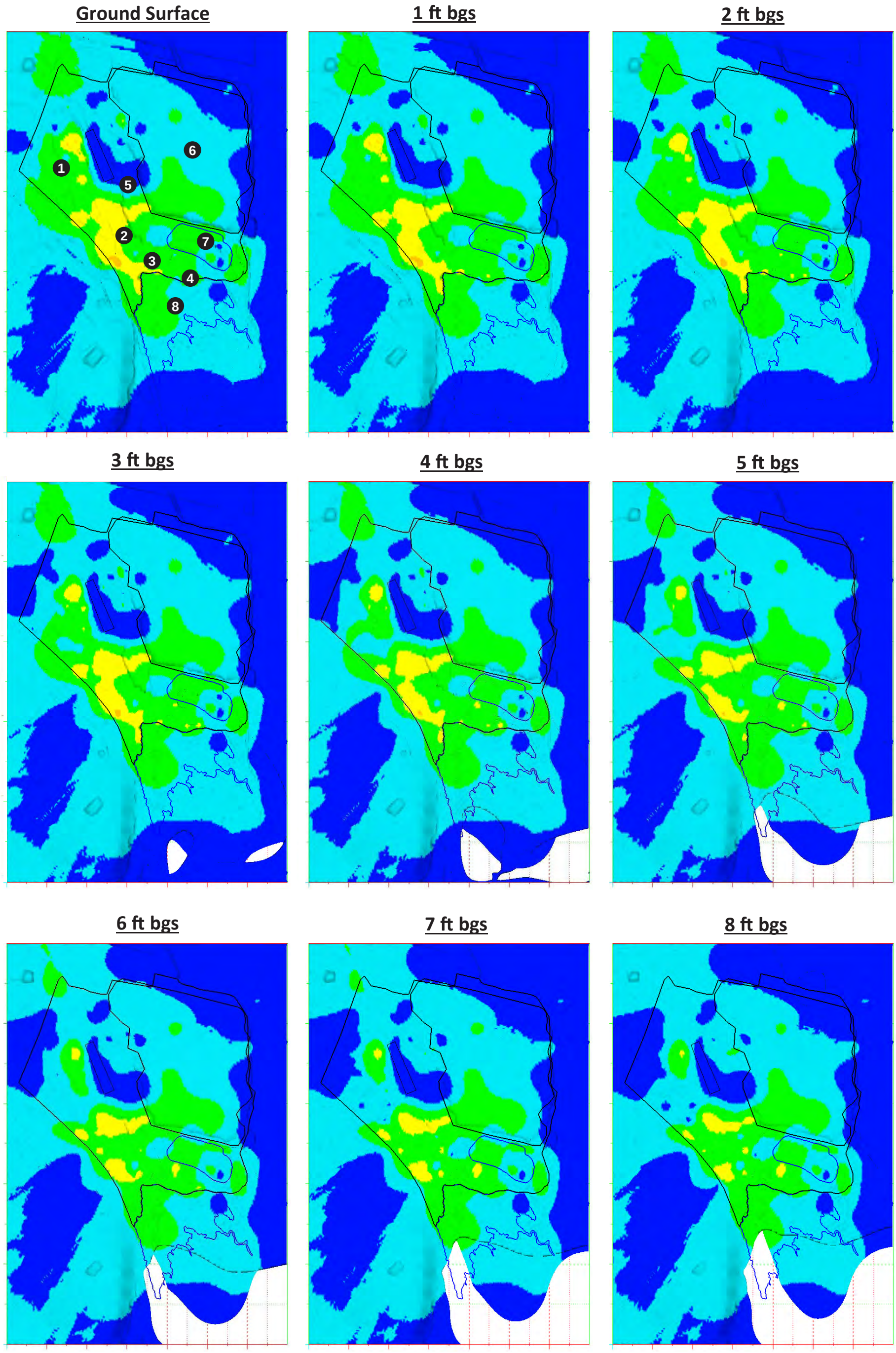
KEY:

1. Former Lower Ore Storage Area
2. Former Acid Plant
3. Acid Plant Sediment Drying Area
4. Tito Park
5. Speiss Dross Area
6. Slag Pile
7. Lower Lake
8. Upper Lake

FIGURE 3-2
Arsenic Contamination,
Ground Surface to Depth of 8 Feet
Interim Measures Work Plan–2014
East Helena, Montana

CH2MHILL

Note: White area of 3-ft bgs to 8-ft bgs figures corresponds to the Tertiary ash/clay layer.



LEGEND

Selenium Concentrations

- Dark Blue: <0.26 mg/kg
- Light Blue: 0.26 - 2.6 mg/kg
- Green: 2.6 - 26 mg/kg
- Yellow: 26 - 260 mg/kg
- Orange: 260 - 2,600 mg/kg

Abbreviations:
bgs = below ground surface
ft = foot/feet
mg/kg = milligram per kilogram

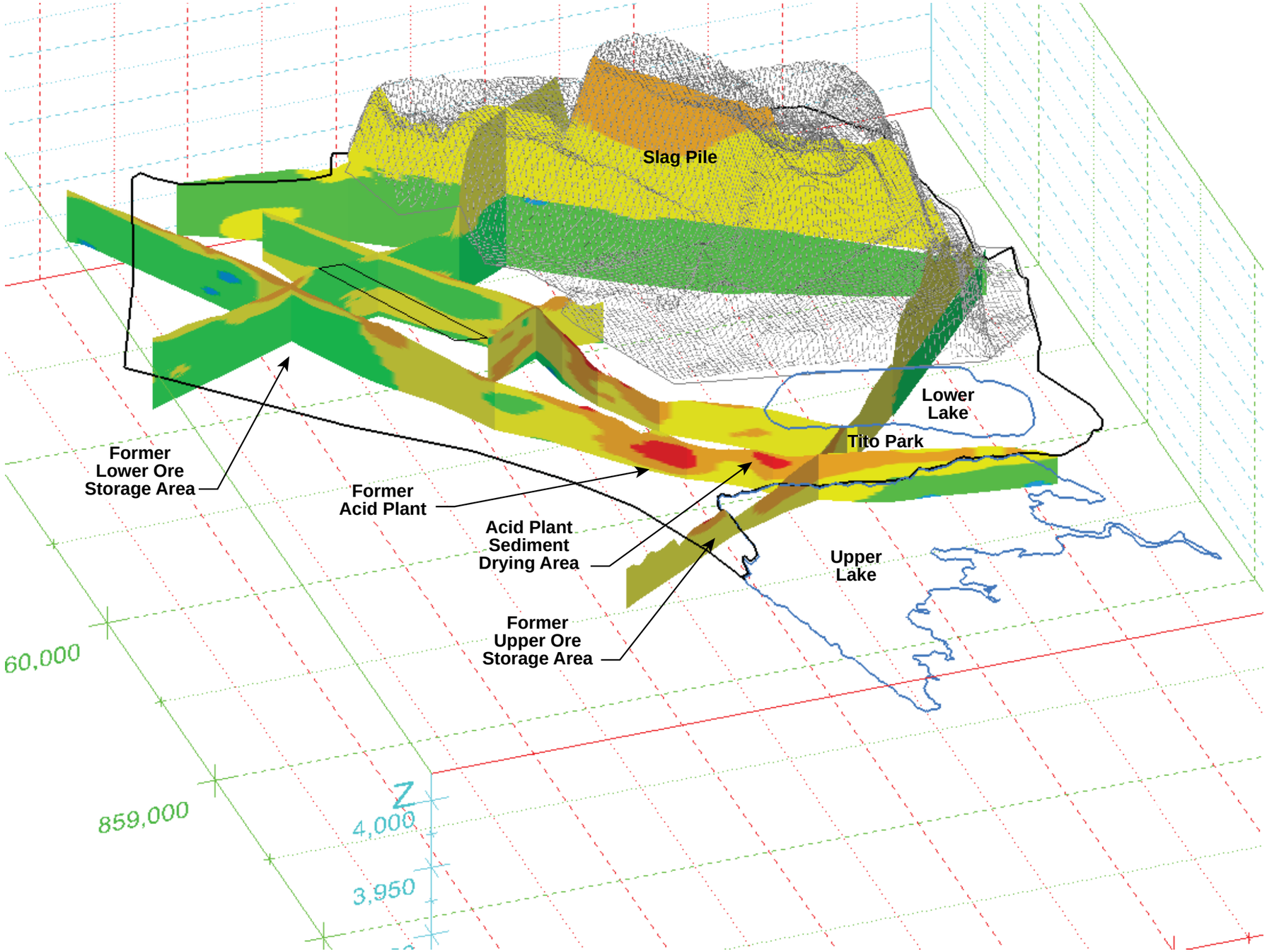
KEY:

1. Former Lower Ore Storage Area
2. Former Acid Plant
3. Acid Plant Sediment Drying Area
4. Tito Park
5. Speiss Dross Area
6. Slag Pile
7. Lower Lake
8. Upper Lake

FIGURE 3-3
Selenium Contamination
Ground Surface to Depth of 8 Feet
Interim Measures Work Plan - 2014
East Helena, Montana

CH2MHILL

Note: White area of 3-ft bgs to 8-ft bgs figures corresponds to the Tertiary ash/clay layer.



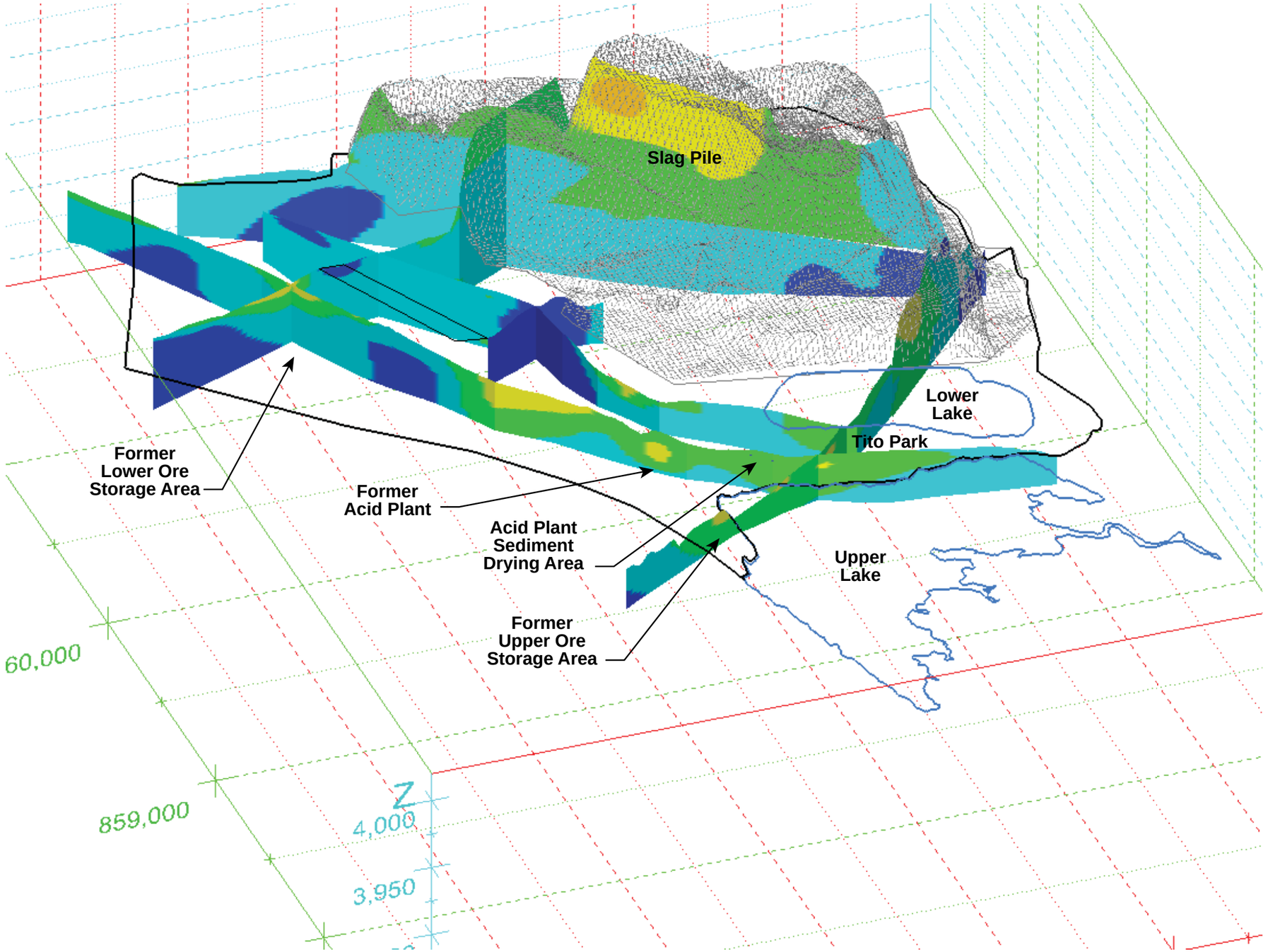
LEGEND

Arsenic Concentrations

- Dark Blue: <0.29 mg/kg
- Light Blue: 0.29 - 2.9 mg/kg
- Green: 2.9 - 40 mg/kg
- Yellow: 40 - 290 mg/kg
- Orange: 290 - 2,900 mg/kg
- Red: >2,900 mg/kg

Abbreviation:
mg/kg = milligrams per kilogram

FIGURE 3-4
Arsenic Contamination in Soil – Surface to Top of Tertiary Ash/Clay Layer
Interim Measures Work Plan–2014
East Helena, Montana



LEGEND

Selenium Concentrations

- Dark Blue: <0.26 mg/kg
- Light Blue: 0.26 - 2.6 mg/kg
- Green: 2.6 - 26 mg/kg
- Yellow: 26 - 260 mg/kg
- Orange: 260 - 2,600 mg/kg

Abbreviation:
mg/kg = milligrams per kilogram

FIGURE 3-5
Selenium Contamination in Soil – Surface to Top of Tertiary Ash/Clay Layer
Interim Measures Work Plan–2014
East Helena, Montana

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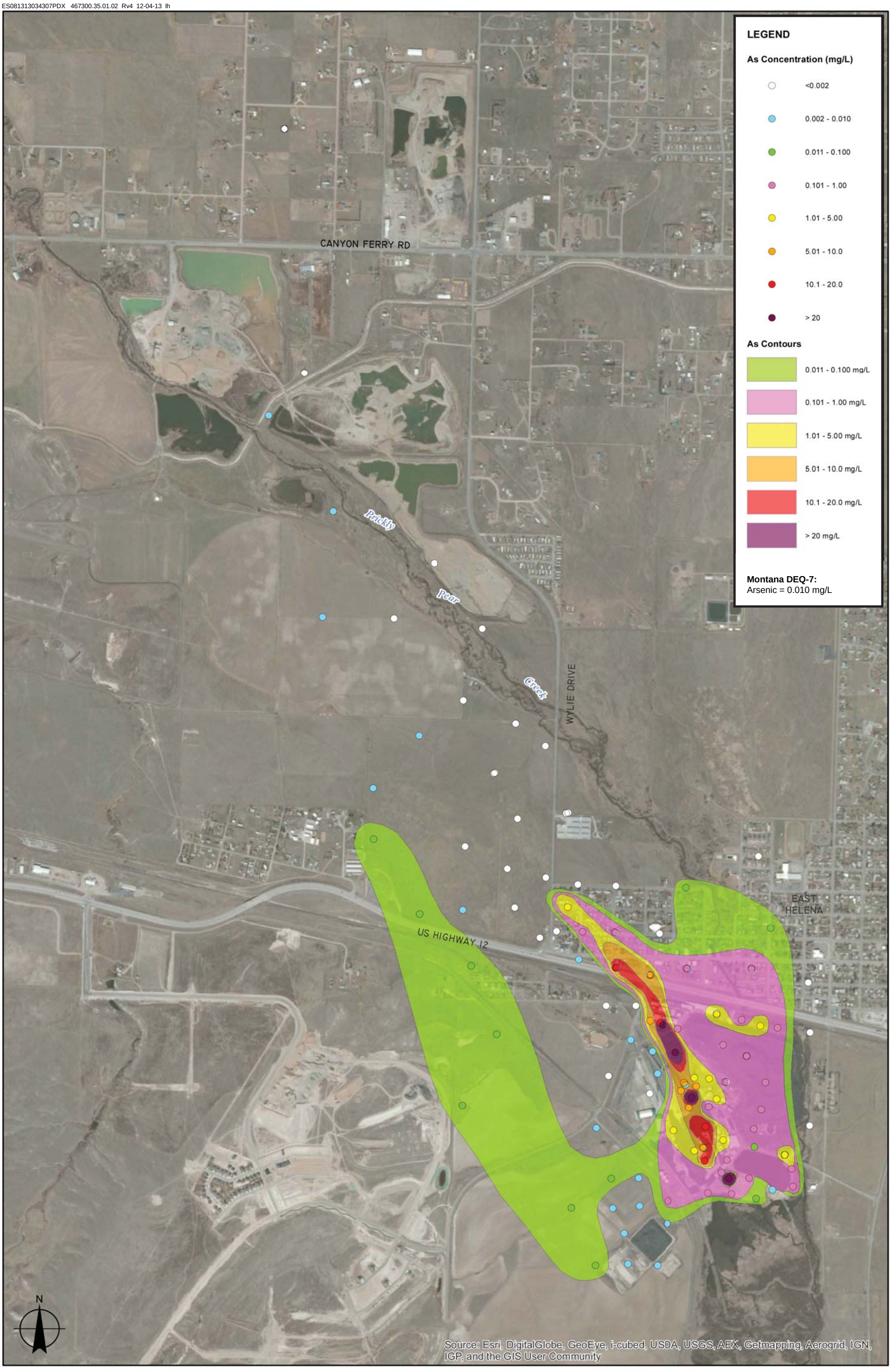

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Hydrometrics, Inc.
Consulting Scientists and Engineers

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Scale in Miles

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Notes:

DEQ-7: The Montana Department of Environmental Quality (DEQ) Circular DEQ-7 *Montana Numeric Water Quality Standards* (October 2012).

mg/L = milligram(s) per liter

FIGURE 3-6
Dissolved Arsenic Concentrations in Groundwater—June 2013
Interim Measures Work Plan–2014
East Helena, Montana

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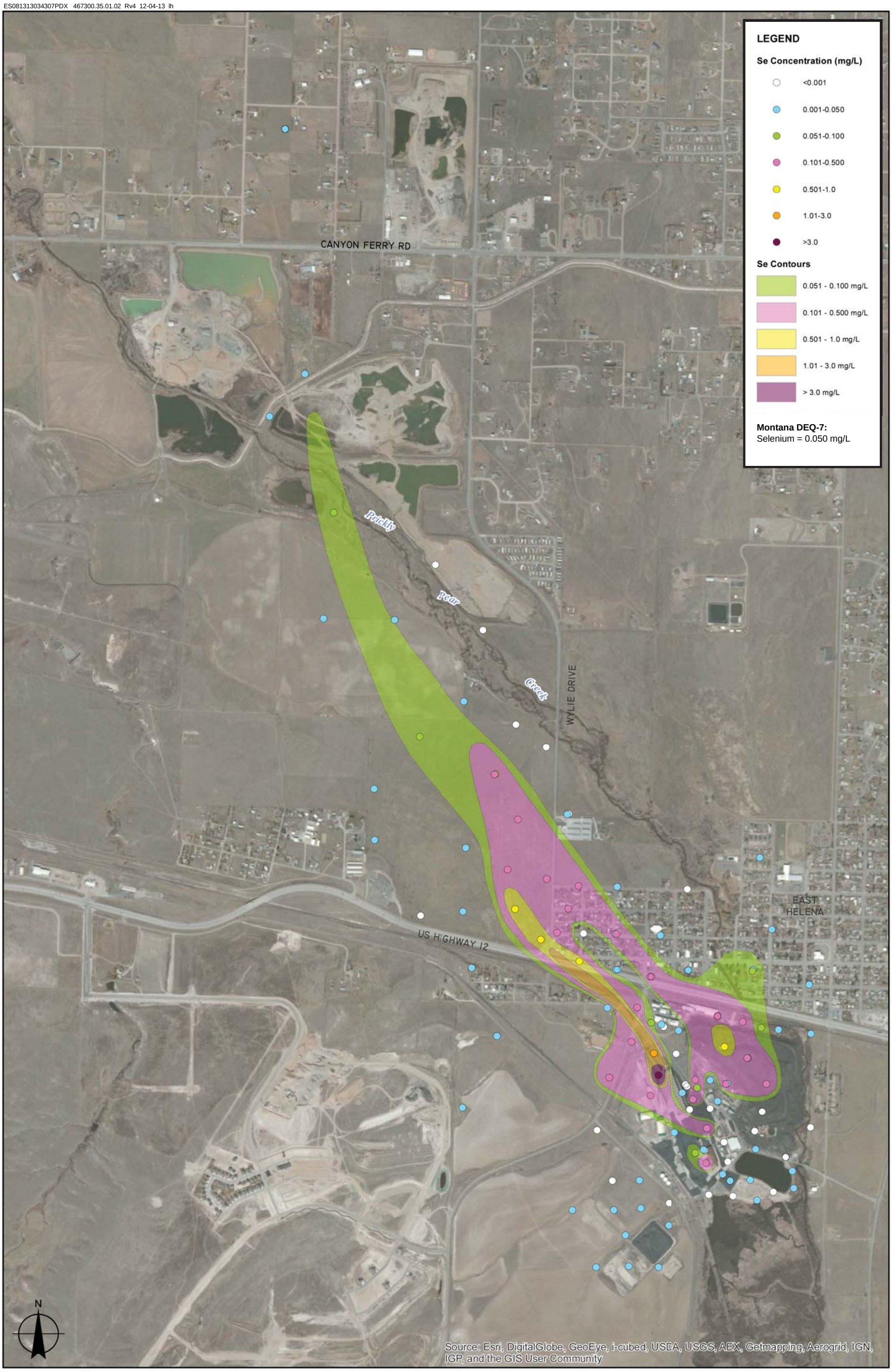

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Consulting Scientists and Engineers

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Scale in Miles

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Notes:

DEQ-7: The Montana Department of Environmental Quality (DEQ) Circular DEQ-7 *Montana Numeric Water Quality Standards* (October 2012).

mg/L = milligram(s) per liter

FIGURE 3-7
Dissolved Selenium Concentrations in Groundwater—June 2013
Interim Measures Work Plan–2014
East Helena, Montana

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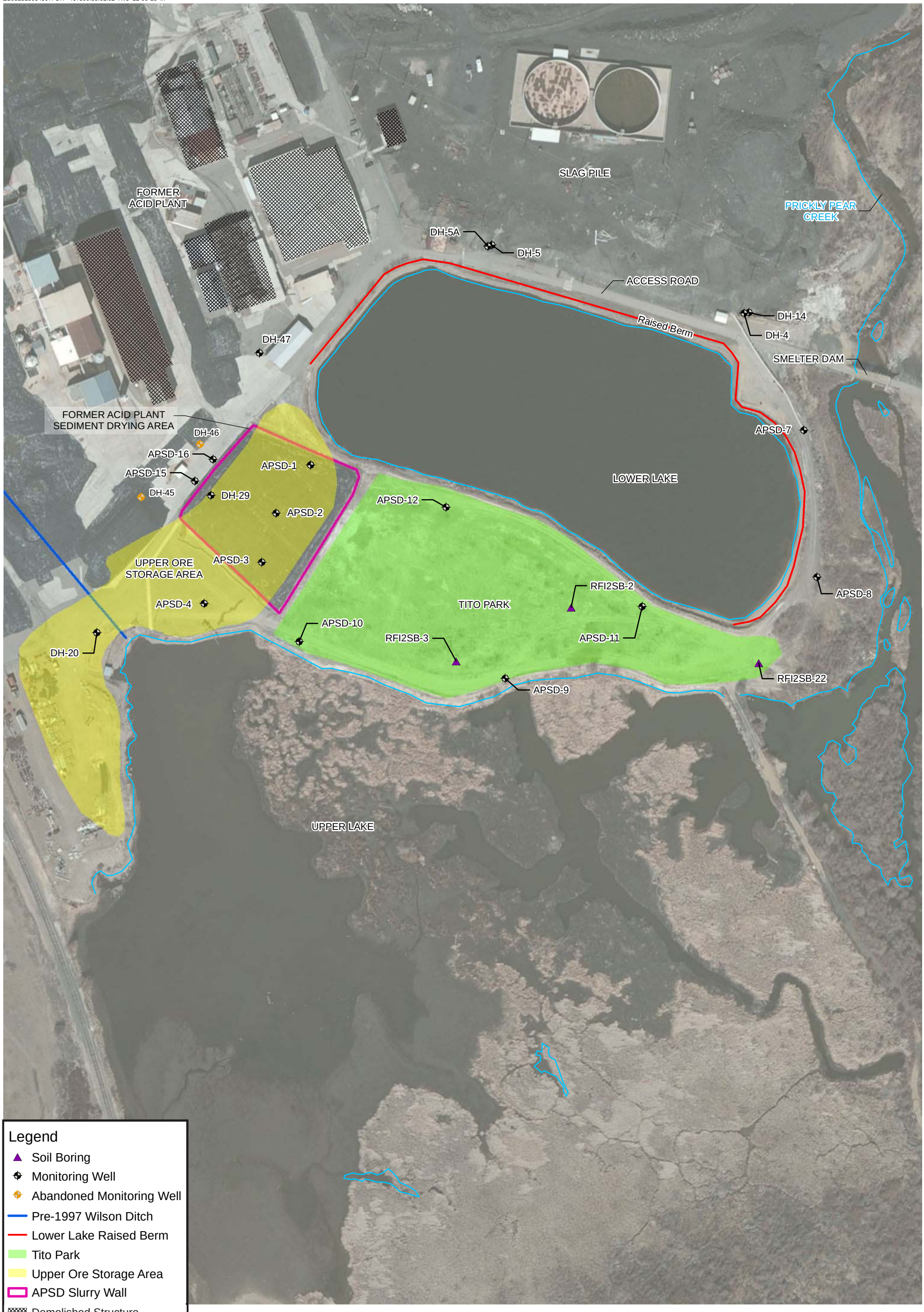

Legend
- Soil Boring
- Monitoring Well
- Abandoned Monitoring Well
- Pre-1997 Wilson Ditch
- Lower Lake Raised Berm
- Tito Park
- Upper Ore Storage Area
- APSD Slurry Wall
- Demolished Structure

Note:
1) APSD - Acid Plant Sediment Drying Area

0 150 300
Scale in Feet

N

FIGURE 3-8
Tito Park Area
Interim Measures Work Plan–2014
East Helena, Montana

CH2MHILL

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Modified from Hydrometrics, Inc., 10/11/2012

SECTION 4

Data Sufficiency

This section discusses the sufficiency of data needed for conceptual development of the IMs and design of the projects proposed for implementation in 2014. Included in this section are a summary of existing data and a list of potential data needs for the 2014 work.

4.1 Summary of Existing Data

A variety of data are needed to evaluate, design, and construct the work described in this IM Work Plan 2014. The current data collection status was originally presented in the IM Work Plan 2012 and updated in the IM Work Plan 2013. Updates relevant to the proposed 2014 work incorporate information collected and completed through the third quarter of 2013. Updates are summarized as follows:

- Hydrogeology—The understanding of groundwater conditions at the former Smelter site and offsite areas is updated based on the results of quarterly and semiannual monitoring by the Custodial Trust, as summarized in the Field Sampling and Analysis Plan (FSAP) (Hydrometrics, 2013b). Available data collected during the 2013 FSAP sampling will be incorporated as appropriate into final IM designs, as will results of the groundwater monitoring to be performed when the PPC Temporary Bypass is in operation (see Section 4.2). Groundwater and surface water sampling will continue under an FSAP for 2014.
- Stream flow— Ongoing. Data are collected for the purposes of PPC Temporary Bypass, TPA removal, and PPC Realignment design needs. Recently collected flow modeling data are summarized in the Conditional Letter of Map Revision (CLOMR) permit application submitted to the Federal Emergency Management Agency (FEMA) for the PPC Temporary Bypass floodplain permit and in the *PPC Realignment Channel Stability Analysis and Engineering Design Report* (Pioneer Technical Services, July 2013).
- Soil chemistry—Completed. Data are summarized in the draft Phase II RFI. Additional test pits were excavated in the former LOSA in the fall of 2012. Soil chemistry data from the test pits were compiled and input into the project environmental database. Available soil chemistry data were recently compiled into a soil contaminant distribution model constructed using MVS software. The MVS model is being used to support an ongoing soil removal evaluation.
- Groundwater chemistry—Ongoing. The draft Phase II RFI summarizes work conducted through 2010. Groundwater monitoring pursuant to the annual FSAP provides updated information on a quarterly basis.
- Stormwater flows, chemistry, and discharge data—Ongoing. Data are available from former Smelter site personnel operating the HDS WTP, data collected as required under the MPDES permit, and stormwater permits.
- Utility types and locations—Completed. Existing utility drawings and underground utility information obtained by the Custodial Trust have been used to identify and locate as many underground utilities as possible.
- Structures—Completed. ASARCO engineering drawings available onsite have been compiled and reviewed as needed for engineering design and construction.
- Borrow sources and geotechnical data—Ongoing. Existing data are summarized in the draft Phase II RFI. Additional test pits were excavated along the East Bench in January 2012 to determine soil types and aggregate sizes to estimate quantities of construction materials. Test pits were also excavated in the Valley View Landfill stockpiles in January 2013 to define soil characteristics for ET Cover System modeling using HYDRUS software. Additional borrow area evaluations may be performed to verify onsite or offsite sources of low-permeability materials for use in the ICS design.
- Environmentally Regulated Material (ERM) Survey—Completed. An ERM Survey was performed during the summer of 2012. The Phase 1 demolition area was surveyed between July 18 and 20, and the remainder

between August 14 and 19. The Phase 2 work summary was completed in October 2013. Data from the ERM survey are summarized in the Demolition Phase 1 and Demolition Phase 2 contract documents.

4.2 Additional Data Requirements for 2014 Work

Additional data requirements for engineering and construction of the work identified in this IM Work Plan 2014 are limited at present. The following data are being developed and will be factored in to the final design and implementation of the 2014 IMs described herein:

- South Plant area groundwater levels before and after implementation of the PPC Temporary Bypass Project—Groundwater levels in the South Plant area are expected to decline substantially following startup of the PPC Temporary Bypass. Groundwater level monitoring will be conducted before and after startup of the PPC Temporary Bypass to document the extent and rate of water level declines. For the purposes of this IM Work Plan 2014, those sets of conditions will be referred to as pre- and post-PPC Temporary Bypass. Actual field results will be compared to projections made using the groundwater numerical flow model. These measurements also provide additional calibration data for continued refinement of the flow model.
- TPA and South Plant area construction dewatering requirements—Pre- and post-PPC Temporary Bypass groundwater levels will be used to support an evaluation of construction dewatering requirements for TPA excavation and future PPC Realignment implementation.
- TPA geophysical survey—Aerial photographs indicate that drums were stored by ASARCO in the past on the eastern end of Tito Park. It is believed that all drums were removed from this area by ASARCO during previous demolition activities. Preliminary results of a ground-penetrating radar (GPR) survey of the TPA conducted in November 2013 have identified areas of anomalies which indicate the potential presence of metal debris. TPA removal plans will include localized excavations to determine the source of the anomalies, and specifications for the safe removal and proper disposal of any materials encountered. If necessary, a contingency to over-pack the drums and dispose of them offsite will be added.
- TPA Lower Lake Sediment Removal—Hand cores will be performed in select areas of Lower Lake to evaluate thickness and consistency of sediment that remains in the lake, and the potential effects of sediment on access and removal activities.
- Substation Soil Chemistry Data Collection—Soil samples collected in 2013 by Hydrometrics along the perimeter of the substation indicate presence of low-level PCB aroclors in the ground surface. Additional surface and subsurface soil samples will be collected by NWE during the planning and engineering design phase for substation decommissioning. Collection of these soil samples will be timed to coincide with deenergizing the facility. The results will be used to determine the extent of required soil excavation to be completed during substation demolition and requirements for disposal of this soil. NWE will be responsible for the testing and final disposition of the soil.
- IM Performance Evaluation—The groundwater flow model was used to predict the performance of the SPHC IM (NewFields, 2013). The flow model simulated changes in hydrologic conditions over time to evaluate the efficacy of the SPHC IM at different operational stages: when the PPC Temporary Bypass is completed, when the PPC Realignment-North section is completed, and when the PPC Realignment is completed in its entirety. Actual groundwater elevation data will be collected at the different stages of operation, and used to refine the flow model.

SECTION 5

Engineering Design and Construction Information for Proposed 2014 Projects

This section summarizes engineering design and construction activities associated with the TPA removal, ICS construction, NWE substation removal and 69-kV transmission line relocation, and monitoring well decommissioning proposed for implementation in 2014. A schedule for task implementation is provided in Section 8.

5.1 Tito Park Area Removal

5.1.1 Key Design Objectives

Key design objectives associated with the TPA removal are summarized as follows:

1. Perform all work in a manner that is protective of human health and the environment, efficient, cost-effective, and in compliance with applicable regulations and permits.
2. In consultation with USFWS, avoid to the extent possible and technically feasible the disturbance of migratory bird nest areas during nesting season.
3. Manage stormwater runoff during construction in accordance with applicable regulations.
4. Remove soil in Tito Park and the UOSA down to the post-PPC Temporary Bypass groundwater table.
5. Design an excavation with geotechnically stable slopes and an excavation bottom.
6. Remove contaminated sediment from Lower Lake.
7. Implement construction “best management practices” to minimize erosion of contaminated soil as it is placed in the ICS 1 subgrade layer.
8. Consider measures to protectively handle soft and potentially wet soil.
9. Consider measures to stabilize or armor the soil left exposed in the excavation bottom and slopes.
10. Provide transportation routes to protectively move excavated soil to consolidation locations.

5.1.2 Design and Construction Features

Contaminated soil will be removed from the TPA in a single excavation event. The design will address requirements to excavate and haul soil for consolidation in the ICS 1 area within the AOC. The design will also consider soil stabilization measures for final configuration of the excavated surface. Elevations and grades needed to provide wetlands and permanent soil stabilization of the excavation area will be evaluated and established as part of the PPC Realignment engineering and design.

Figures 5-1 and 5-2 illustrate the preliminary excavation plan for the TPA removal project. The depth of excavation in Tito Park and the UOSA will be based on the groundwater surface elevation projected for post-PPC Temporary Bypass conditions (expected to be approximately 3,910 feet above mean sea level) (Figure 5-3). Sediment in Lower Lake will be removed until native soil is encountered or up to a maximum depth of 2 feet.

The TPA removal design will consider the need for constructing a low-permeability berm on the side slopes abutting the former Smelter site, which would serve as a wall between this area and the former Smelter Site. The purpose of this berm would be to stabilize the graded area from exposure to a flood event. The berm would serve a different purpose than any berm constructed for the PPC Realignment. Initial hydraulic flow modeling has already been completed to predict the PPC water levels during the 100- and 500-year flood events. These levels will be reviewed and used to determine the potential for floodwaters to recharge groundwater at the former Smelter site.

5.1.3 Construction and Quality Management

Implementation challenges associated with the TPA removal include coordination of haul activities with construction of ICS 1 and protectively removing, handling and consolidating potentially soft and wet sediment from the Lower Lake area. The excavation sequencing and dewatering requirements will be determined during detailed design. The excavation elevation will be measured during construction by ground survey methods. Surface soil samples will be collected after the completion of excavation activities and analyzed for the presence of metals to document environmental conditions remaining following the soil removal.

5.1.3.1 Materials Management

Removal of the TPA to the elevations noted in Section 5.1.2 will require the excavation, transport, and consolidation of approximately 238,000 yd^3 of material considered to be remediation waste. This material will be consolidated within the AOC to form the subgrade of the ICS. As part of final design, evaluations are being conducted to determine whether soil from the APSD Area will be taken to CAMU 2 or consolidated within the AOC. The volume of remediation waste placed in CAMU 2 to date has not reached the unit's design capacity, and as a result additional materials are needed to achieve the final grades identified in the USEPA-approved design of the CAMU's final cover. The APSD Area soil is being considered for placement in the CAMU because concentrations of contaminants in groundwater within the APSD Area are significantly higher than surrounding areas. Therefore, the residual pore water in this soil may contain higher contaminant concentrations and the CAMU's leachate collection system would provide an additional measure of containment.

Native soil will be placed as a cover over the consolidated materials to prevent erosion, windblown dust, and stormwater contact, as discussed in Section 5.2.

Specific materials management procedures for TPA removal will be defined by the selected construction contractor. Soil removal will most likely occur by working the area from east to west and south to north beginning first in Tito Park, then UOSA, and ending in Lower Lake. Because the overall excavation depth in Tito Park could reach 20 feet in places, it is expected that the excavation contractor will work the TPA at different levels and hence may need to construct access ramps between levels for haul vehicle traffic. Drier soil located at higher elevations in the work area may be blended with damp soil expected at lower elevations to improve soil properties for loading and haul. Additional moisture conditioning will be provided by the ICS 1 contractor as necessary for compaction of the engineered fill.

Sediment removal in Lower Lake is planned to proceed from east to west. First, sediment in the eastern portion of the lake bottom will be removed and a soil berm built of newly exposed native materials to separate the east and west parts of the lake. Next, a new, smaller MPDES discharge basin will be constructed in the northeastern corner of Lower Lake and the existing MPDES discharge outfall will be extended to this location. This will enable the MPDES discharge to remain functional during excavation and dewatering of the west half of Lower Lake (see dewatering discussion below). The western portion of the Lower Lake area will be excavated following relocation of the MPDES outfall.

Because the TPA is a fill constructed over many years during operation of the former Smelter, it is possible that material unsuitable for use in ICS 1, such as miscellaneous rubble or organic solid waste, will be identified during excavation. Material unsuitable for use in ICS 1 will be separated at the point of detection and disposed of in accordance with applicable regulations.

Construction dewatering of the TPA excavation footprint is expected to be required as the soil removal advances toward the projected cut limits in each area. Dewatering is required only at the lowest excavation points and for only the duration required to complete work at this elevation. Based on preliminary engineering, construction dewatering will be accomplished by installing a pumping sump at the topographic low in west Lower Lake, and also possibly within the UOSA. A total pumping rate of 50 gallons per minute or less is expected to be adequate to dewater each area. The quality of water pumped from the construction area will be tested and, if required, treated in the HDS WTP prior to discharge in accordance with the approved MPDES discharge permit.

Groundwater contained within the existing APSD Area slurry walls will be pumped down by the Custodial Trust prior to start of TPA removal. Dewatering of the APSD Area will occur at a rate consistent with expected water

level declines that will result from implementation of the PPC Temporary Bypass project. Groundwater pumped from the APSD Area will be stored in existing tanks at the main plant site, periodically batch-treated in HDS WTP, and discharged in accordance with the approved MPDES permit.

Existing groundwater monitoring wells located within the TPA excavation footprint will be decommissioned by the excavation contractor. Monitoring wells APSD 7 and APSD 8 located on the eastern berm of Lower Lake will be protected and retained for future use.

5.1.3.2 Protective Measures During Implementation

Removal of the TPA will include specific requirements to ensure that work is conducted in a manner that is safe and protective of the environment. The design and contract specifications will require measures to safely handle wet material, and to control erosion of contaminated material during TPA excavation and consolidation for ICS 1 construction. Measures will be taken to prevent spillage during transport. Construction will take place in accordance with applicable permits, laws, and regulations. Required construction permits (for example, dust control and stormwater) will be obtained. Traffic routes, laydown and parking areas, and other temporary facilities and controls will be specified. In addition, temporary erosion and sedimentation control plans (including the SWPPP, as discussed under permitting in Section 7.1.4) will be implemented for work areas.

5.1.3.3 Preliminary List of Drawings and Specifications

Because the TPA removal and ICS 1 installation are expected to be completed as a single construction effort, the preliminary lists of drawings and technical specifications for the combined projects are provided together in Tables 5-1 and 5-2, respectively, after Section 5.2, Interim Cover System 1 Construction.

5.2 Interim Cover System 1 Construction

5.2.1 Key Design Objectives

Key design objectives for the ICS 1 construction are summarized as follows:

1. Construct an interim cover that will protect consolidated soil and sediment until the final ET Cover System is constructed.
2. Design the ICS surface and finished grades to enable noncontact runoff to be shed to perimeter drainages.
3. Manage stormwater runoff during construction in accordance with applicable regulations.
4. Perform all work in a manner that is protective of human health and the environment, efficient, cost-effective, and in compliance with applicable regulations.
5. In consultation with USFWS, avoid to the extent possible and technically feasible the disturbance of migratory bird nest areas during nesting season.
6. Incorporate soil consolidated from the TPA into a prepared subgrade on which to build the future ET Cover System.
7. Provide adequate engineered fill capacity to consolidate all of the excavated soil removed from the TPA.
8. Provide a native cover soil layer that prevents direct contact with the consolidated TPA soil, protects the soil from erosion, and minimizes future ET Cover System construction costs.
9. Potentially provide for future construction of a Montana Rail Link spur near the slag pile. This rail spur will be used for future slag recovery load-out operations.

5.2.2 Design and Construction Features

ICS 1 will be constructed over the western portion of the former Smelter site and include, at a minimum, areas that currently drain stormwater runoff to the Rodeo Tank containment facility and portions of the adjacent drainage basins (see Figure 2-2). ICS 1 will be constructed in three layers. The lowest layer in ICS 1 will be consolidated material from the TPA excavation. The middle layer, located directly on top of consolidated TPA soil,

will provide a cover over the soil excavated from the TPA. The top, exposed surface layer will provide erosion control for the cap. Figure 5-4 provides a cross-sectional view of ICS 1 as it is currently planned to be constructed.

The engineered fill layer of ICS 1 will be designed and constructed to provide a subgrade capable of supporting the future ET Cover System. This layer establishes grade and provides the prepared foundation on which to build the future ET Cover System. The engineered fill layer is expected to consist solely of material excavated from the TPA.

The middle layer of ICS 1 is planned to be constructed of 6 to 8 inches of uncontaminated native soil. This layer will serve as a cover for the TPA soil during the time period between construction of ICS 1 and construction of the final ET Cover System, to prevent direct contact with the underlying contamination and enable noncontact stormwater runoff to be directed to perimeter drains. Soil with suitable engineering properties was recently excavated and stockpiled on the East Bench during construction of the PPC Temporary Bypass. This soil is a naturally occurring ash/clay material that was excavated at about 10 feet bgs from a location near the southern end of the PPC Temporary Bypass. While other possible material sources for the middle layer in ICS 1 will be considered, given the suitability, close proximity, and low cost (based on transport only) of the available ash/clay material, the East Bench stockpile is expected to be preferred source of material for construction of the middle layer of ICS 1.

The top layer of ICS 1 will provide erosion protection for the cap and serve as a biobarrier layer for the future ET Cover System. This top layer in ICS 1 is planned to be 6 inches thick and constructed of native 3 inch plus sized rock also recently excavated from the East Bench during construction of the PPC Temporary Bypass. This biobarrier rock will be processed from a large existing stockpile of mixed sand, gravel, and rock located on the East Bench adjacent to the PPC Temporary Bypass.

Construction of ICS 1 will require that existing drainage features at the former Smelter site be removed or repurposed prior to subgrade placement. Drainage modifications will be incidental to ICS 1 construction and specific requirements will be defined during detailed design.

The ditches and swales that will be installed on and around ICS 1 will be designed to convey the volume of runoff expected from ICS 1 or the final ET Cover System, whichever is greater. This approach will reduce overall ET Cover System construction costs by enabling these ditches and swales to be constructed only once. The ditches will be lined to prevent infiltration of runoff near the edges of the ET Cover System. The lining method will be determined during design but will be robust enough to resist puncture and other damage.

5.2.3 Construction and Quality Management

Implementation challenges associated with constructing ICS 1 include coordination of the TPA excavation and haul operations, placement, compaction, and grading of the subgrade materials; management of stormwater runoff collection and treatment during construction; and erosion control during and following construction.

5.2.3.1 Materials Management

Construction of ICS 1 will involve the excavation, transport, and placement of approximately 238,000 yd^3 of contaminated soil from the TPA. For cost effectiveness and construction efficiency, as noted in Section 5.1.3.1, TPA excavation will be sequenced concurrently with ICS 1 construction. Soil excavated from the TPA will be loaded into haul trucks and transported directly to the ICS 1 consolidation location within the AOC where it will be moisture conditioned (if required) and compacted into place. Sequencing construction in this manner will facilitate protective and efficient implementation by minimizing handling activities, stockpiling requirements, and will enable one contractor to complete both projects at the same time.

TPA soil will be consolidated on top of soil with similar types and concentrations of contaminants. The nature and extent of contamination in the TPA has been characterized by numerous site investigations completed in the area, which show contaminant concentrations to be highest near the ground surface and decrease with depth. As a result, an attempt will be made to place the more contaminated layers of TPA soil into the lower and interior lifts of ICS 1. Doing this will bury the highest concentration TPA soil deep within the ICS 1 engineered fill layer, away from the perimeter, and overlay them with progressively less contaminated material.

Construction of the cap and erosion protection layers of ICS 1 will take place after the engineered fill has been brought to grade. The construction contractor will be required to sequence construction of the top two layers of ICS 1 such that all contact runoff is contained onsite and either captured in the existing stormwater collection system (to be treated and discharged through the HDS WTP) or allowed to infiltrate within the construction footprint. Infiltration of contact runoff will be for the shortest possible timeframe needed to allow for safe and cost-efficient construction. As early in the construction sequence as possible, the top layers of ICS 1 will be placed and noncontact runoff directed to perimeter drainages.

5.2.3.2 Protective Measures During Implementation

Construction of ICS 1 will include specific requirements to ensure that work is conducted in a manner that is safe and protective of the environment. The design and contract specifications will require measures to safely handle and control erosion of contaminated material from the TPA during consolidation of this material within the ICS 1. Measures will be taken to prevent spillage during transport. Construction will take place in accordance with applicable permits, laws, and regulations. Required construction permits (for example, dust control and stormwater) will be obtained. Traffic routes, laydown and parking areas, and other temporary facilities and controls will be specified to reduce effects on nearby residences and the environment. In addition, temporary erosion and sedimentation control plans (including the SWPPP, as discussed in Section 7.2) will be implemented for work and material processing areas.

Only uncontaminated native materials will be used in construction of the top layer of ICS 1. Quality criteria for selection of these materials are described in Section 5.2.2. Based on preliminary review of available characterization data, it is anticipated that the East Bench materials discussed above for use in the ICS 1 cap will meet these quality criteria.

5.2.4 Preliminary List of Drawings and Specifications

A single set of contract documents for excavation of the TPA and construction of ICS 1 will likely be issued. Table 5-1 contains a preliminary list of drawings to be prepared during design of the TPA removal and ICS 1.

TABLE 5-1
Preliminary Drawing List for Tito Park Area Removal and Interim Cover System 1 Design

Sheet Number	Drawing Number	Drawing Title	Drawing Description
1	G-1	Title, Location and Vicinity Map, Index to Drawings	See drawing title
2	G-2	Legends, Abbreviations, and General Notes	See drawing title
3	G-3	Overall Site Plan	Overall work areas, traffic routes, laydown areas, borrow areas
4	C-1	TPA Excavation Plan 1	Existing and excavation grade for approximately 1/2 of excavation
5	C-2	TPA Excavation Plan 2	Existing and excavation grade for approximately 1/2 of excavation
6	C-3	TPA Finish Grading Plan	Finish grade for area
7	C-4	TPA Sections	Section view of existing, excavation, and finish grade
8	C-5	TPA Details	Armoring, slope stabilization, and berms
9	C-6	ICS 1 Demolition Plan	Subgrade preparation
10	C-7	ICS 1 Overall Grading Plan	Existing and finish grade for entire cover
11	C-8	ICS 1 Finish Grading Plan 1	Existing and finish grade for approximately 1/2 of cover
12	C-9	ICS 1 Finish Grading Plan 2	Existing and finish grade for approximately 1/2 of cover
13	C-10	ICS 1 Sections	Section view of existing and finish grade
14	C-11	ICS 1 Civil Details	Cover system, typical road sections, special slopes
15	C-12	ICS 1 Drainage Plan	DWG C-7 with drainage overlay
16	C-13	ICS 1 Piping Plan	Close-up plan of Rodeo Tank and associated piping

TABLE 5-1
Preliminary Drawing List for Tito Park Area Removal and Interim Cover System 1 Design

Sheet Number	Drawing Number	Drawing Title	Drawing Description
17	C-14	ICS 1 Piping Sections and Details	Detailed drawings of pipes and pipe demo
18	EC-1	ICS 1 Temporary Erosion Control and Stormwater Plan	Short-term erosion control/stormwater measures for construction
19	EC-2	ICS 1 Soil Stabilization Plan	Longer-term erosion control/stormwater measures post-construction
20	EC-3	ICS 1 Erosion, Stormwater, and Stabilization Details	Ditches, ditch lining, waddles/bales, sediment fences, etc.

Table 5-2 contains a preliminary list of technical specifications to be prepared during design of the TPA removal and ICS 1.

TABLE 5-2
Preliminary Technical Specifications List for Tito Park Area Removal and Interim Cover System 1 Design

Section Number	Section Title
01 11 00	Summary of Work
01 29 00	Payment Procedures
01 31 13	Project Coordination
01 31 19	Project Meetings
01 32 00	Construction Progress Documentation
01 33 00	Submittal Procedures
01 42 13	Abbreviations and Acronyms
01 45 16.13	Contractor Quality Control
01 50 00	Temporary Facilities and Controls
01 57 13	Temporary Erosion and Sediment Control
01 61 00	Common Product Requirements (if needed)
01 77 00	Closeout Procedures
02 41 00	Demolition
31 10 00	Site Clearing
31 23 13	Subgrade Preparation
31 23 16	Excavation
31 23 19.01	Dewatering
31 23 23	Fill and Backfill
31 32 00	Soil Stabilization
32 11 23	Aggregate Base Courses
31 32 19	Geotextile (if needed)
31 37 00	Rip Rap (if needed)
33 05 01	Conveyance Piping General
33 05 13	Manholes (if needed)
33 41 01	Storm Drain and Sanitary Sewer Drainage Piping
33 47 13.01	High-Density Polyethylene and Low-Density Polyethylene Liner (if needed for ditch lining)

5.3 Substation Removal and 69-kV Transmission Line Relocation

5.3.1 Key Design Objectives

Key design objectives for removal of the NWE substation and relocation of the 69-kV transmission line are summarized as follows:

1. Perform all work in a manner that is protective of human health and the environment, efficient, cost-effective, and in compliance with applicable regulations.
2. In consultation with USFWS, avoid to the extent possible and technically feasible the disturbance of migratory bird nest areas during nesting season.
3. Manage stormwater runoff during construction in accordance with applicable regulations.
4. Remove electrical utilities from the former Smelter site that would prevent and/or interfere with construction of the future ET Cover System.
5. Provide NWE adequate means of accessing the relocated transmission line to complete all needed long-term maintenance activities.
6. If present, remove contaminated soil from the substation as required for compliance with applicable state and federal regulations. Note that NWE will be responsible for all activities related to removal and proper disposal of the substation.
7. Provide for temporary power supply to HDS WTP and other onsite buildings until they are demolished.

5.3.2 Design and Construction Features

Specific design and construction features associated with substation demolition and transmission line relocation are not currently available. Design criteria and construction features will be provided by NWE by early 2014.

5.3.3 Construction and Quality Management

Construction and quality management requirements associated with substation demolition and transmission line relocation are not currently available. Information related to construction and quality management will be provided by NWE by early 2014.

5.4 Monitoring Well Decommissioning

5.4.1 Key Design Objectives

Key design objectives for monitoring well decommissioning are summarized as follows:

1. Perform all work in a manner that is protective of human health and the environment, efficient, cost-effective, and in compliance with applicable regulations.
2. Decommission monitoring wells that are not needed within the ICS 1 footprint. Identify monitoring wells to be retained, protect them during construction, and extend the casings through the ICS 1 surface.

5.4.2 Design and Construction Features

Monitoring wells completed at the former Smelter site are constructed of 2- or 4-inch-diameter schedule 40 polyvinyl chloride casing and screen. Each monitoring well uses a silica sand pack around each screen and the borehole annulus is sealed with a bentonite grout from the top of the filter pack to the ground surface.

Monitoring wells at the former Smelter site will be decommissioned in accordance with the *Borehole Abandonment Plan for the Former Asarco East Helena Facility* (Hydrometrics, 2010). Decommissioning procedures will be in accordance with the Administrative Rules of Montana (ARM) 36.21.810.

The general monitoring well decommissioning procedures are as follows:

1. Remove all equipment from the monitoring well.
2. For monitoring wells less than 20 feet deep, fill the borehole with the specified sealing material while removing the casing. Keep the level of sealing material just below the bottom of the casing at all times to prevent sloughing.
3. For monitoring wells greater than 20 feet deep, do not attempt to remove the casing. Fill the well casing with the specified sealing material starting at the bottom and working upward.
4. In both cases, seal borings to within 3 feet of the ground surface. Fill the upper 3 feet with native soil.

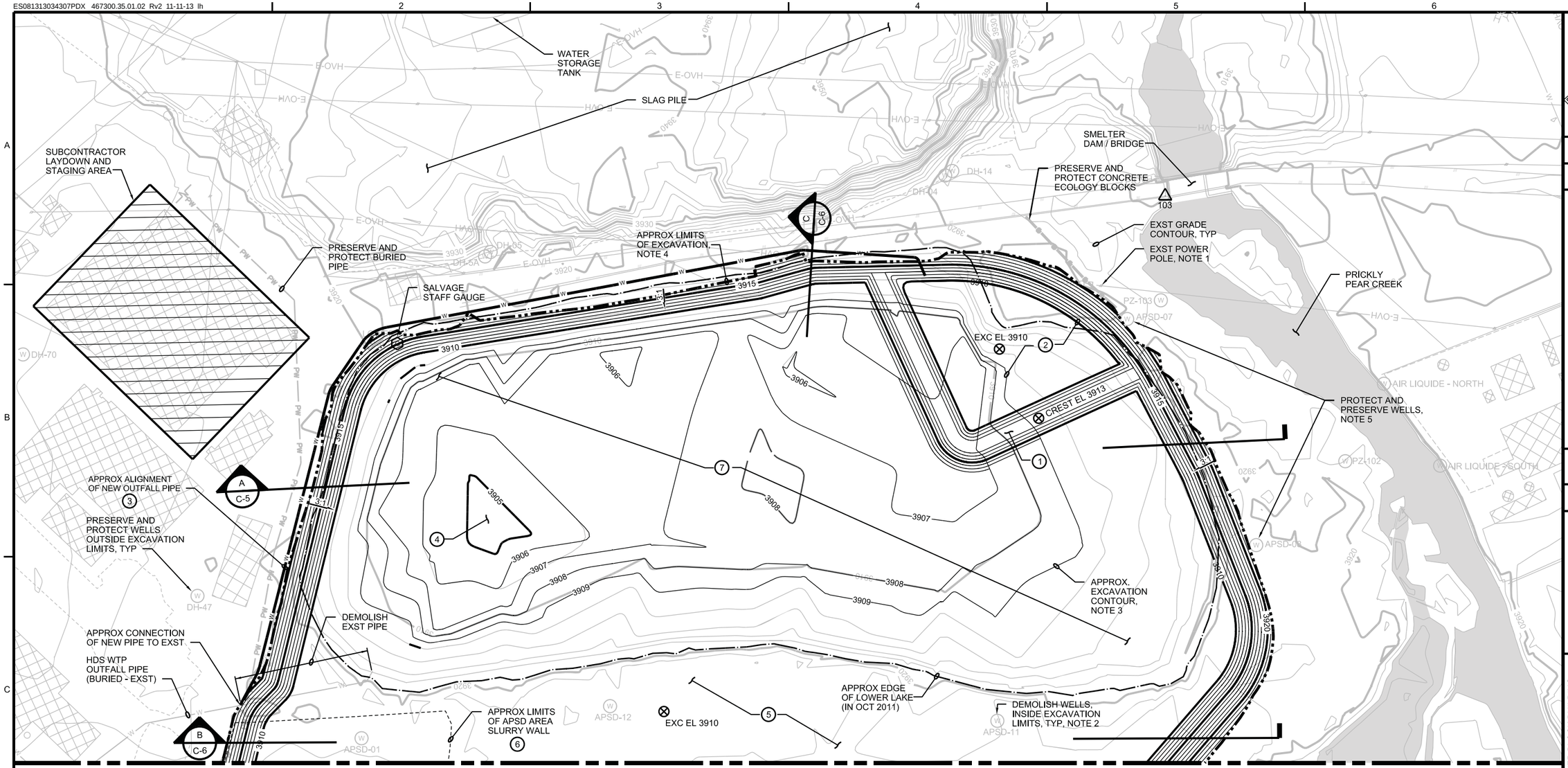
Sealing materials are specified in 36.21.810 and include concrete slurry, cement bentonite slurry, and bentonite pellets or chips.

5.4.3 Construction and Quality Management

In accordance with the *Borehole Abandonment Plan for the Former Asarco East Helena Facility* (Hydrometrics, 2010), proper steps will be taken to ensure that the following occurs:

- All subsurface boreholes requiring abandonment are abandoned in a manner that effectively and permanently prohibits the movement of water (vertically and horizontally) within the abandoned borehole.
- Proper information is recorded for all abandoned boreholes, including borehole location, depth, and date and means of abandonment.

Materials will be sealed with special precautions to guard against bridging or uneven placement of sealing material within the borehole. Proper grout placement procedures will be followed during decommissioning activities. Procedures may vary but generally consist of using a proper slurry mix that is free of clumps, using a tremie pipe to direct the sealing material to the proper depth, filling from the bottom to the top of the borehole, and applying the proper grout volume for the borehole diameter. If bridging does occur during borehole abandonment, the bridge will be removed before continuing abandonment procedures. A borehole abandonment documentation form will be completed for each monitoring well that is decommissioned.



CONSTRUCTION SEQUENCE NOTES (COMPLETE IN NUMERICAL ORDER):

1. BUILD SEPARATION BERM IN NE CORNER OF LL. EXCAVATE SEDIMENT AND PREPARE SUBGRADE WITHIN BERM FOOTPRINT. DEWATER AS NEEDED AND SPECIFIED. (1 / C-5)
2. EXCAVATE SEDIMENT WITHIN BERMED PORTION OF LL BY EXCAVATING TO FIRST ENCOUNTER WITH NATIVE SOIL. THE FIRST ENCOUNTER WILL BE DETERMINED IN THE FIELD SOLELY BY THE CONTRACTOR AND BASED ON VISUAL SOIL IDENTIFICATION. DEWATER AS NEEDED AND SPECIFIED.
3. MOVE DISCHARGE POINT OF HDS WTP OUTFALL PIPE INTO NORTHEASTERN PORTION OF LOWER LAKE BY WELDING ADDITIONAL PIPE LENGTHS ONTO EXISTING PIPE. PROVIDE NEW HDPE PIPE THAT MATCHES EXISTING. PROVIDE FITTINGS, SWEEPS, AND BENDS AS NEEDED TO INSTALL PIPE. COORDINATE EXACT ALIGNMENT AND INVERT ELEVATION IN FIELD WITH CONTRACTOR. (2 / C-10)
4. PROVIDE A DEWATERING SUMP IN LOWEST POINT OF LL AND BEGIN DEWATERING LL. SUMP BOTTOM EL WILL BE 3903. DEWATER AS SPECIFIED.
5. REMOVE USOA AND TPA TO ELEVATIONS SHOWN. PROVIDE DRAINAGE TRENCHES AND POSSIBLY ADDITIONAL SUMPS TO DRAIN WATER TO THE DEWATERING SUMP. PROVIDE TRENCHES BEFORE EXCAVATION REACHES EL 3912. DEWATER AS SPECIFIED.
6. REMOVE APSD AREA CONCURRENT WITH UOSA AND TPA. REFER TO SPECIFICATIONS FOR ASPD-SPECIFIC REQUIREMENTS.
7. REMOVE SEDIMENT FROM THE REST OF LL BY EXCAVATING TO CRITERIA DEFINED ABOVE. PROVIDE DRAINAGE TRENCHES IN LL AS NEEDED. DEWATER AS NEEDED AND SPECIFIED.

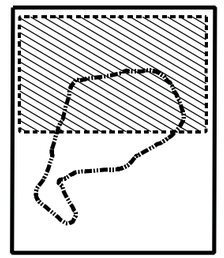
NOTE:
FINISH GRADE CONTOUR INTERVAL = 1 FOOT
EXST GRADE CONTOUR INTERVAL = 2 FEET

NOTES:

1. COORDINATE WITH CONTRACTOR AND OWNER AS SPECIFIED FOR DEMOLITION BY OTHERS.
2. DEMOLISH WELLS INSIDE EXCAVATION LIMITS AS SPECIFIED.
3. ACTUAL EXCAVATION SURFACE MAY BE IN PROXIMITY TO GROUNDWATER AND SOFT SUBGRADE SOILS ARE EXPECTED, ESPECIALLY IN LOWER LAKE. REFER TO SPECIFICATIONS FOR EXCAVATION REQUIREMENTS.
4. SEE TABLE FOR EXCAVATION CONTROL POINTS (TO BE ADDED AT 90%). SURVEY AND STAKE LIMIT BEFORE STARTING EXCAVATION. COORDINATE WITH CONTRACTOR TO SET EXACT LIMIT IN FIELD.
5. PROVIDE 12 FOOT WIDE GRAVEL ACCESS ROAD BETWEEN SMELTER DAM, WELLS, AND BERM BREACH.

N

0 50 100 150
SCALE IN FEET



KEY MAP

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DATE	REVISION	CHK	APVD
0	10/22/13	60% EXTERNAL REVIEW SUBMITTAL	S. DETHLOFF	J. DEHNER

DR R. VILORIA
DSGN P. KRYCH
BY NB
APVD JD

METG
Montana Environmental Trust Group

Former ASARCO Smelter Site
East Helena, Montana
Montana Environmental Trust Group
East Helena, Montana

CH2MHILL
POWER BLOCK BUILDING
7 WEST 6TH AVE, # 519
HELENA, MT 59601-5036
PHONE: (406) 457-5494

FIGURE 5-1
Tito Park Area Excavation Plan - North
Interim Measures Work Plan–2014
East Helena, Montana

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	OCTOBER 2013
PROJ	467300
DWG	C-1
SHEET	4 OF 10

PRELIMINARY - NOT FOR CONSTRUCTION

FILENAME: P034C001D_467300.dgn PLOT DATE: 2013\10\22 PLOT TIME: 9:22:00 AM

MATCHLINE SEE DWG C-1

HDS WTP OUTFALL PIPE (BURIED - EXST)

PRESERVE AND PROTECT WELLS OUTSIDE EXCAVATION LIMITS, TYP

PRESERVE AND PROTECT BURIED PIPE

PRESERVE AND PROTECT METER HOUSE AND SUMP

APPROX. LIMITS OF ICS

APPROX. LIMITS OF APSD AREA SLURRY WALL

6

SALVAGE STAFF GAUGE

DEMOLISH TRUCK FILL STATION

DEMOLISH PUMP HOUSE

5

EXC EL 3910

PONDED WATER, NOTE 7 ON DWG G-3

DEMOLISH WILSON DITCH INTAKE STRUCTURE, NOTES, 2 AND 7

APPROX. RAILROAD ROW LIMIT, NOTE 3

DEMOLISH WELLS INSIDE EXCAVATION LIMITS, TYP, NOTE 8

APPROXIMATE EXCAVATION CONTOUR, TYP, NOTE 4

APPROX LIMITS OF EXCAVATION, NOTE 6

C-6

EXST DRAINAGE DITCH, NOTE 9

UPPER LAKE

PRESERVE AND PROTECT EXST EMBANKMENT AND ROAD

REMOVE 30" DIA REGULATOR PIPE, NOTES, 2 AND 5

FILL BERM BREACH, NOTE 5

1 / C-5

SALVAGE STAFF GAUGE

PRICKLY PEAR CREEK

EXST GRADE CONTOUR, TYP

NOTES:

1. REFER TO DWG C-1 FOR KEYED CONSTRUCTION SEQUENCE NOTES.
2. VERIFY ELEVATIONS AND CONFIGURATION OF STRUCTURES.
3. SURVEY AND STAKE ROW ALONG EXCAVATION LIMIT BEFORE STARTING WORK. DO NOT ENTER ROW. PRESERVE AND PROTECT ROW AND ASSOCIATED INFRASTRACTURE.
4. ACTUAL EXCAVATION SURFACE MAY BE IN PROXIMITY TO GROUNDWATER AND SOFT SUBGRADE SOILS ARE EXPECTED, ESPECIALLY IN LOWER LAKE. REFER TO SPECIFICATIONS FOR EXCAVATION REQUIREMENTS.
5. REMOVE RIPRAP, BENCH SLOPES AS REQUIRED, AND PROVIDE COMPACTED EARTHFILL. MATCH ELEVATION OF ADJACENT BERM CREST. BACKFILL THE EXCAVATION CREATED BY REMOVING THE PIPE WITH EARTHFILL. REUSE RIPRAP FOR SLOPE ARMORING.
6. SEE TABLE FOR EXCAVATION CONTROL POINTS (TO BE ADDED AT 90%). SURVEY AND STAKE LIMIT BEFORE STARTING EXCAVATION. COORDINATE WITH CONTRACTOR TO SET EXACT LIMIT IN FIELD.
7. EXCAVATE FROM END OF PIPE TO ROW, CUT AT ROW, AND REMOVE PIPE AND INLET STRUCTURE. FILL END OF PIPE LEFT IN PLACE WITH 10 FEET OF CONCRETE. BURY BELOW FINISH GRADE. COORDINATE DEMOLITION WITH CONTRACTOR TO MEET MRL REQUIREMENTS.
8. DEMOLISH WELLS INSIDE EXCAVATION LIMITS AS SPECIFIED.
9. LOCATION SHOWN IS APPROXIMATE. RELOCATE DITCH AS NECESSARY TO DEWATER AND EXCAVATE.

NOTE:
FINISH GRADE CONTOUR INTERVAL = 1 FOOT
EXST GRADE CONTOUR INTERVAL = 2 FEET

N

0 50 100 150
SCALE IN FEET

KEY MAP

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DATE	DSGN	DR	CHK	APVD
0	10/22/13	P. KRYCH	R. VILORIA	S. DETHLOFF	J. DEHNER

60% EXTERNAL REVIEW SUBMITTAL

REVISION	BY	APVD
	NB	JD

METG
Montana Environmental Trust Group

Former ASARCO Smelter Site
East Helena, Montana
Montana Environmental Trust Group
East Helena, Montana

POWER BLOCK BUILDING
7 WEST 6TH AVE. # 519
HELENA, MT 59601-5036
PHONE: (406) 457-5494

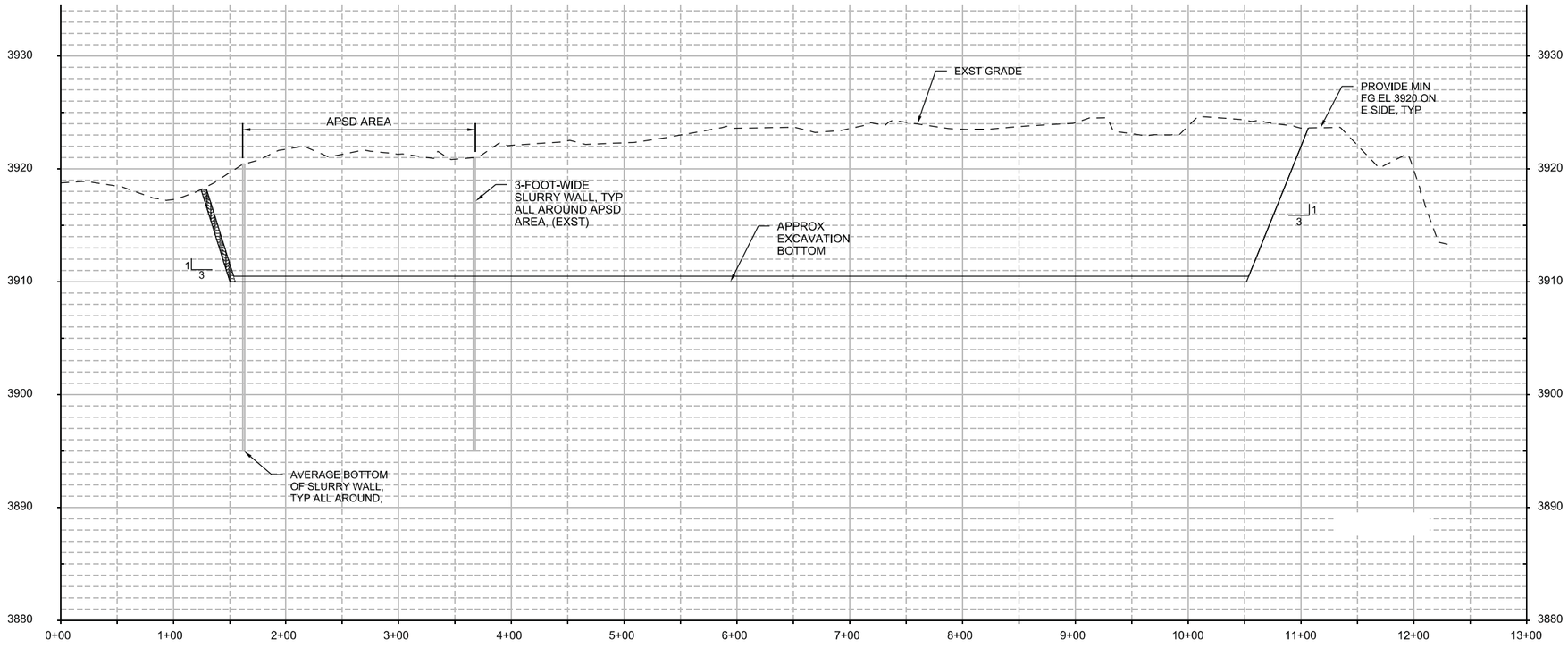
CH2MHILL

FIGURE 5-2
Tito Park Area Excavation Plan - South
Interim Measures Work Plan–2014
East Helena, Montana

PRELIMINARY - NOT FOR CONSTRUCTION

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	OCTOBER 2013
PROJ	467300
DWG	C-2
SHEET	5 OF 10



B SECTION - TITO PARK
H 1"=60'
V 1"=6'

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DATE			
0		DSGN	DR	CHK	APVD
		P. KRYCH	R. VILORIA	S. DETHLOFF	J. DEHNER
				NB	JD
				BY	APVD

90% INTERNAL REVIEW SUBMITTAL
REVISION

PRELIMINARY - NOT FOR CONSTRUCTION

METG
Montana Environmental Training Group

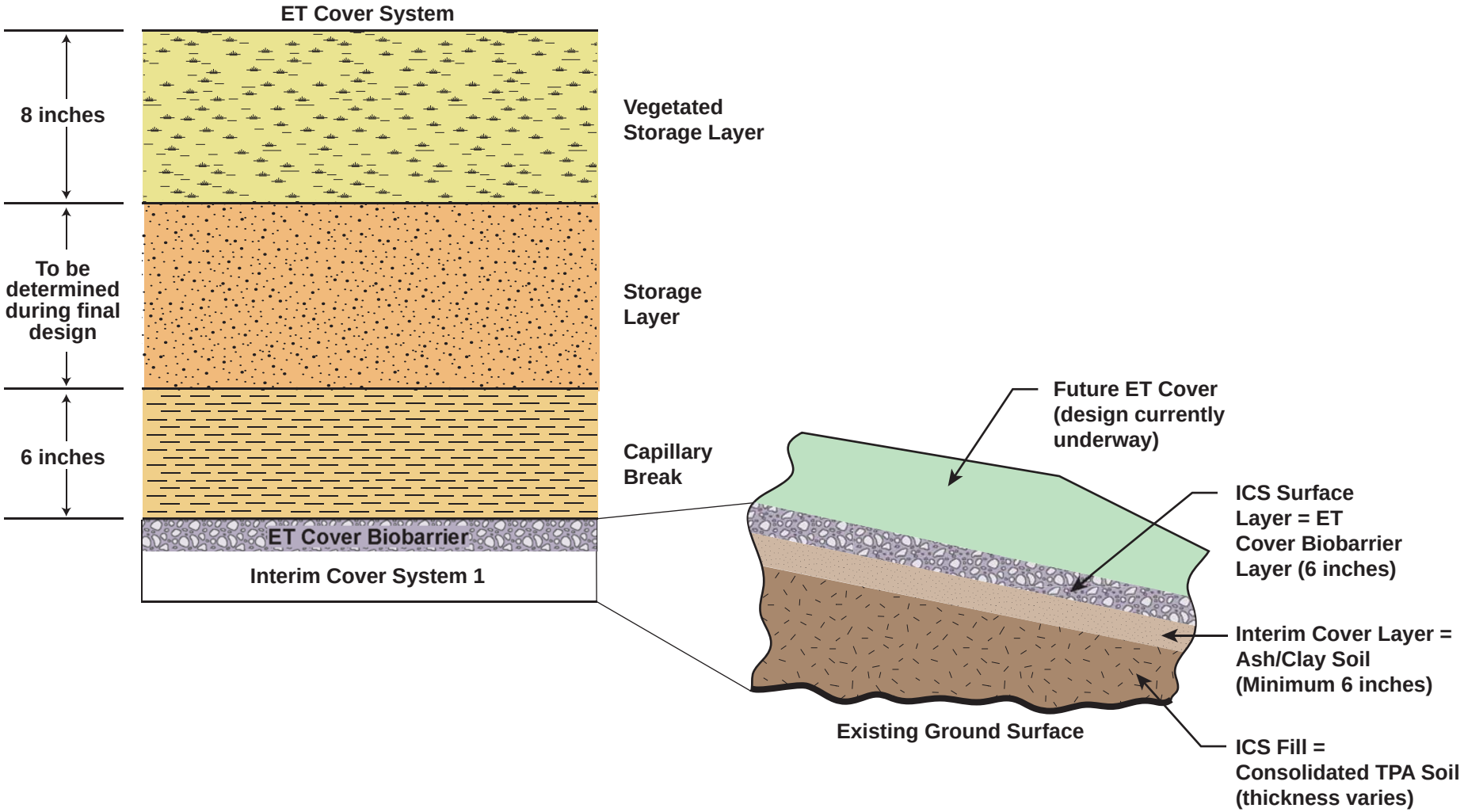
CH2MHILL
POWER BLOCK BUILDING
7 WEST 6TH AVE. # 519
HELENA, MT 59601-5036
PHONE: (406) 457-5494

FIGURE 5-3
Tito Park Area Cross-Section
Interim Measures Work Plan–2014
East Helena, Montana

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	DECEMBER 2013
PROJ	467300
DWG	C-6
SHEET	9 OF 27

FILENAME: IMWP-SECTION_467300.dgn PLOT DATE: 2013\12\09 PLOT TIME: 10:50:22 AM



Notes:

The biobarrier is part of the ET Cover System and will be installed during ICS 1 construction.

All the layer thicknesses for the ET Cover System are estimated based on preliminary engineering and may change during final design.

ET = Evapotranspiration

ICS = Interim Cover System

FIGURE 5-4
ET Cover System and Interim Cover System 1 Cross-Section
Interim Measures Work Plan–2014
East Helena, Montana

SECTION 6

Remediation Waste Management

This section describes the proposed approach for managing remediation waste associated with implementation of the proposed 2014 IM elements.

6.1 Use of the Area of Contamination

The description and rationale for the AOC at the East Helena Facility was approved by USEPA in their conditional approval of the IM Work Plan 2012, dated August 28, 2012. All 2014 IM activities will be conducted within the AOC boundary. As shown in Figure 6-1, the AOC covers Parcels 16 and 19 (the former Smelter site operating area); the area of Parcel 15 containing CAMUs 1 and 2, portions of Tito Park, Lower Lake, and Upper Lake; the portion of Parcel 8 west of State Highway 18; and Parcels 10, 11, 12, 17, 18, and 23. The ability to consolidate hazardous remediation waste within the designated AOC will allow interim and final remedial measures to be conducted in a protective, efficient, sustainable and cost-effective manner, and will also reserve CAMU capacity for the management and treatment (if needed) of other hazardous remediation waste that clearly should be segregated from site soil.

The IM Work Plan 2012 also described the intended use of onsite CAMUs to manage remediation waste, consistent with practices at the Facility since the late 1990s. CAMUs 1 and 2 were constructed by ASARCO on Parcel 15 and the southwestern corner of Parcel 19. CAMU 1 has been closed and the remaining capacity in CAMU 2 will continue to be used to manage remediation waste and debris from operations and IM activities (including demolition) that are deemed unsuitable for salvage and recycling. Evaluations are currently underway to determine if soil removed from the APSD Area will be placed in CAMU 2.

6.2 Remediation Waste Management in 2014

The remediation waste expected to be associated with implementation of the 2014 IM components is summarized in Table 6-1 and described briefly in the following paragraphs. Detailed work plans, as appropriate, for each of the components described will be prepared during final design, or will be required submittals as part of the construction contract(s).

TABLE 6-1
Interim Measures Remediation Waste Management

IM Component	Remediation Waste	Disposition
Tito Park Area Removal	Soil	Consolidate within AOC.
	APSD Area soil and groundwater	Consolidate soil within AOC or place in CAMU 2. Collect and treat APSD Area groundwater in the onsite HDS WTP. Discharge treated water per MPDES permit (MT0030147)
	Construction and decontamination water	Collect and treat in the onsite HDS WTP. Discharge treated water per MPDES permit (MT0030147).
	Tito Park Area construction dewatering	Test water and, if required, collect and treat in the onsite HDS WTP. Discharge treated water per MPDES permit (MT0030147). If treatment is not required, discharge in accordance with Best Management Practices or a Construction General Dewatering Permit (if required).
	Debris	Depending on type and characteristics, consolidate within AOC, place in CAMU 2, or dispose of in accordance with applicable regulations.
Interim Cover System 1 Construction	PPE and decontamination waste	Place in CAMU 2 heavily soiled PPE and solid decontamination waste.
Removal of Substation and Relocation of 69-	TSCA and non-TSCA PCB waste	If encountered, NorthWestern Energy will transport PCB materials to an appropriately permitted offsite disposal facility.

TABLE 6-1
Interim Measures Remediation Waste Management

IM Component	Remediation Waste	Disposition
kilovolt Line		
Monitoring Well Decommissioning	Debris[a]	Evaluate decommissioning debris for placement in CAMU 2 or consolidation onsite.

Note:

[a] Debris is expected to consist of well screens, casings, and concrete.

Abbreviations:
AOC = Area of Contamination
APSD Area = Acid Plant Sediment Drying Area
CAMU = Corrective Action Management Unit
HDS WTP = high-density sludge water treatment plant
MPDES = Montana Pollutant Discharge Elimination System
PCB = polychlorinated biphenyl
PPE = personal protective equipment
TSCA = Toxic Substances Control Act

6.2.1 Tito Park Area Removal

The TPA soil removal activity is estimated to require the excavation of more than 238,000 yd^3 of soil. All excavated material is considered remediation waste and may be consolidated within the AOC boundary. Appropriately detailed soil and remediation waste management plans will be prepared as part of final design for the IMs. The plans may include testing if necessary to determine the appropriate management of excavated material.

Final design plans include physical screening to be conducted during excavation in order to separate out debris that may not be suitable for use in the ICS. Debris that is unsuitable for the ICS will be disposed of in CAMU 2.

Limited sampling and analyses will be conducted post-excavation to document the quality of soil left in place following the removal action. The surfaces created during removal (anticipate completion in the fourth quarter of 2014) are planned to be regraded during future PPC Realignment and wetlands construction (anticipate completion in the fourth quarter of 2016). This final exposure surface will meet media cleanup standards protective of direct contact for human and ecological receptors. In the interim period, access by trespassers to the TPA will be restricted, and the surfaces created will be on average less contaminated than current site conditions. Protocols for stockpiling, transportation, and dust suppression to minimize potential contaminant migration during construction will be specified during detailed design.

6.2.2 Interim Cover System Construction

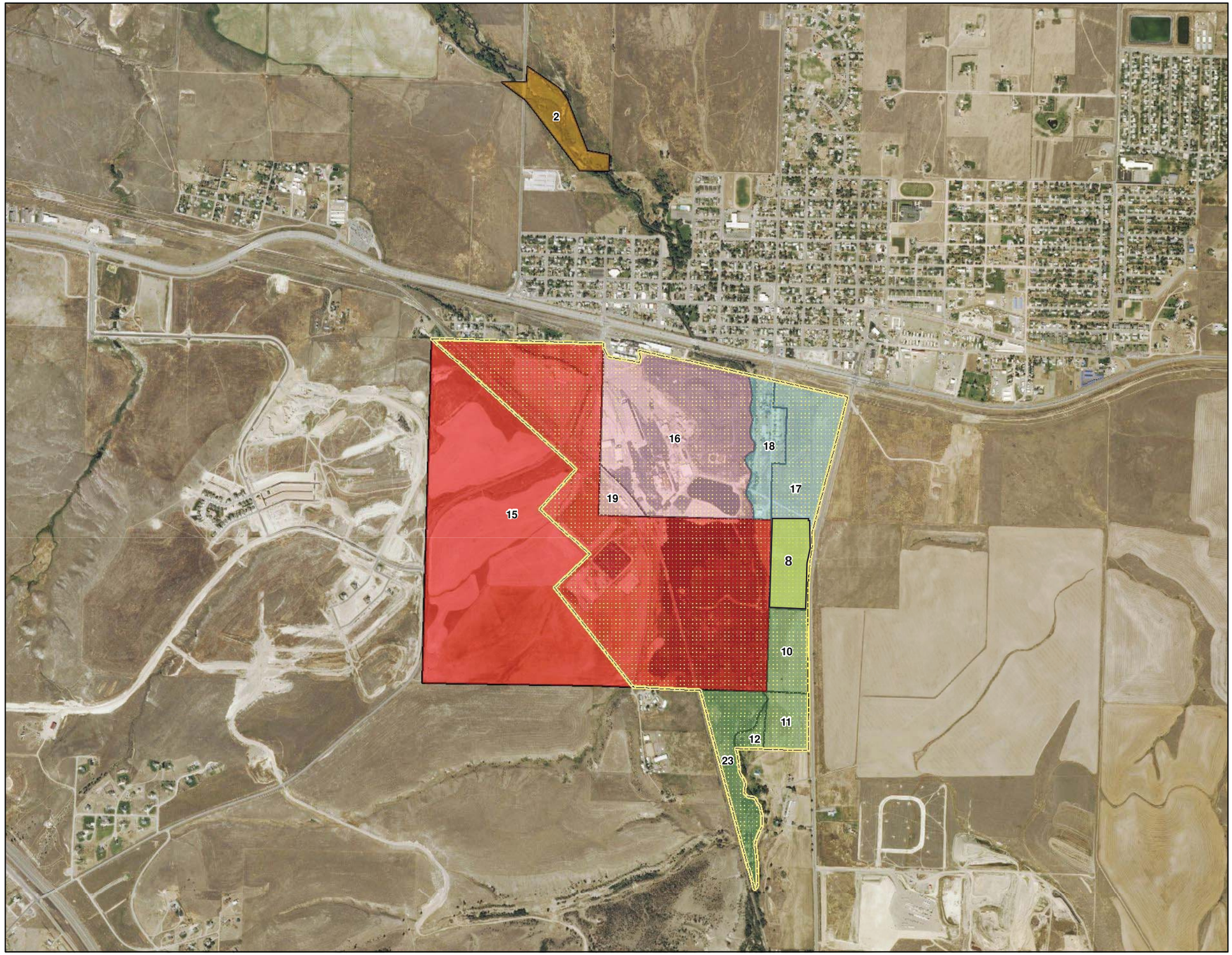
No remediation waste is expected to be generated during construction of the ICS, with the exception of personal protective equipment and decontamination waste.

6.2.3 Substation Removal and Transmission Line Relocation

NWE will be conducting the work associated with removing the substation and relocating the 69-kV transmission line. Any remediation waste management associated with this work will be handled by NWE.

6.2.4 Monitoring Well Decommissioning

For monitoring wells less than 20 feet deep, well casing and screens will be pulled. Any decommissioning debris will be evaluated for placement within CAMU 2.



VICINITY MAP

LEGEND

- Portion of Parcel 2 near Prickly Pear Creek
- Portion of Parcel 8 West of State Highway 518
- Parcel 15
- Parcels 16 and 19
- Parcels 17 and 18
- Parcels 10, 11, 12, and 23
- Area of Contamination Boundary

N

0 750 1,500
Feet

FIGURE 6-1
Area of Contamination Boundary
Interim Measures Work Plan–2014
East Helena, Montana

CH2MHILL

SECTION 7

Status of Permitting Activities and Approvals

This section provides an update to the federal, state, and local permit and licensing measures outlined in the IM Work Plans 2012 and 2013, and discusses the permits under evaluation for 2014.

7.1 Past Permitting and Authorization Activities

7.1.1 Joint Application and Conditional Letter of Map Revision

The Joint Application for Proposed Work in Montana's Streams, Wetlands, Floodplains, and Other Water Bodies (Joint Application) is used to simultaneously apply for several different water resource permits from multiple permitting agencies. In September 2012, Joint Application No. 1 for the PPC Temporary Bypass project was submitted to the City of Helena, the U.S. Army Corps of Engineers (USACE), the MDEQ, and the Lewis and Clark Conservation District (LCCD). This work was conducted concurrently with the submittal of the CLOMR No. 1 for the PPC Temporary Bypass.

The CLOMR No. 1 approval was received in December 2012, and all other agency approvals under Joint Application No. 1 (including the 404, 318, 310, and City of East Helena Floodplain Permit) were received by February 2013.

7.1.2 Montana Dam Safety Act

In May 2013, the Dam Safety Office of the Montana Department of Natural Resources and Conservation issued a determination that Smelter Dam does not impound at least 50 acre-feet of water. Therefore, a downstream hazard evaluation will not need to be performed, an operating permit will not be required, and a demolition permit will not need to be obtained for removal of the dam.

7.1.3 National Emissions Standards for Hazardous Air Pollutants (NESHAP) Compliance

In compliance with Montana Administrative Rules, Title 17, Chapter 74, Subchapters 3 and 4, NESHAP notifications were submitted for Demolition Phase 1 and 2 activities in 2013. Acknowledgements were received from MDEQ for Demolition Phase 1 originally on April 8, 2013, and subsequently (as related to project revisions) on June 12 and July 11, 2013. Acknowledgements were received from MDEQ for Demolition Phase 2 on June 25, 2013 (with no follow-on revisions).

7.1.4 Stormwater Pollution Prevention Plan

The former Smelter site is permitted to discharge stormwater associated with industrial activities to waters of the United States pursuant to Montana General Discharge Permit for Stormwater MTR000072. The former Smelter site has no ongoing industrial operations and is undergoing active remediation pursuant to the USEPA Corrective Action Program under RCRA. In accordance with permit requirements, stormwater management at the site is accomplished in accordance with an approved Stormwater Pollution Prevention Plan (SWPPP). The original SWPPP was prepared by ASARCO when the facility was operated as a primary lead smelter. However, there have been no smelting operations at the plant site since April 2001. An updated SWPPP, representing current site conditions, was prepared for the Custodial Trust by Hydrometrics and submitted to MDEQ on July 31, 2013. A copy of the SWPPP is maintained on site at all times.

7.1.5 Endangered Species Act Compliance

Endangered Species Act (ESA) compliance must be demonstrated for any federal permit approval that may be necessary during the course of IM implementation. A technical memorandum entitled *Montana Environmental Trust Group Endangered Species Act Compliance* (CH2M HILL, 2013c) was issued to the U.S. Fish and Wildlife Service (USFWS) on September 5, 2012. USFWS concurrence that the project complies with the ESA was received by CH2M HILL for the Custodial Trust on September 19, 2012.

7.1.6 General Permit for Construction Dewatering

Construction of the PPC Temporary Bypass channel required construction dewatering. Water was pumped from the work area into sediment ponds, from which the water either percolated into the ground or flowed over a weir and into PPC. A General Permit for Construction Dewatering was applied for and approved by MDEQ. This work was completed in October 2013.

7.2 Anticipated 2014 Permitting and Authorization Activities

The following permits and authorizations are necessary for execution of the proposed 2014 site activities, including the placement of the ICS, removal of the NWE substation and relocation of the 69-kV line, and soil removal in the TPA.

7.2.1 Joint Application (U.S. Army Corps of Engineers 404, Montana Department of Environmental Quality 318, and Lewis and Clark Conservation District 310 Permits)

Joint Application No. 1 was submitted to USACE in September 2012 to address work necessary to install the PPC Temporary Bypass and did not include the proposed soil removal actions for the TPA. However, the proposed TPA actions will not disturb additional wetlands beyond those identified in Joint Application No. 1. Therefore, a request will be made to USACE, MDEQ, and the LCCD to provide an administrative authorization of the actions as an amendment to Joint Application No. 1. A technical memorandum summarizing the proposed activities, with figures illustrating the work, is planned for submittal to these agencies as part of the authorization process. Preliminary communications conducted with the USACE have indicated that this permitting approach for the TPA is likely to be acceptable.

7.2.2 Floodplain Development Permit

Because the excavation in Tito Park will alter the location and elevation of the regulatory floodplain to a greater degree than was shown in CLOMR No. 1, an updated Floodplain Development Permit will need to be obtained from the City of East Helena. Additional Hydrologic Engineering Centers River Analysis System (HEC-RAS) modeling, reflecting the removal of Tito Park, will be performed and submitted to FEMA for their PPC project file. A request will be made to FEMA for a written letter of concurrence that the TPA source removal project is consistent with the CLOMR issued for the PPC Temporary Bypass (Case No. 12-08-0919R, December 4, 2012), and that it meets the minimum requirements of the National Flood Insurance Program. The concurrence letter from FEMA will provide the basis for subsequent TPA source removal authorization amendments to the existing PPC Temporary Bypass 404, 318, and 310 permits (by USACE, MDEQ, and LCCD as discussed in 7.2.1 above) and an updated Floodplain Development Permit from the City of East Helena. It is not anticipated that the City or FEMA will require preparation of an additional CLOMR for the updated permit. As part of the permit process, and prior to issuing the updated permit, the City of East Helena will solicit public comments on the application for a 15-day period.

7.2.3 Montana Pollutant Discharge Elimination System Construction Dewatering Permit MTG070000

The purpose of the MPDES Construction Dewatering General Permit is to regulate the construction dewatering discharges from dewatering cofferdams, excavations, or trenches where sediment-laden infiltration of groundwater or surface water may be discharged to a state surface water. Construction dewatering discharges are subject to effluent limitations, monitoring requirements, and other conditions. Effluent characteristics (water quality data less than 1 year old) must be provided as part of the application for coverage under this permit.

7.2.4 Montana Pollutant Discharge Elimination System Construction Activity Stormwater General Permit MTR100000

Construction activity that results in the “disturbance” of equal to or greater than 1 acre of total land area necessitates coverage from this permit. Obtaining coverage under this permit would require preparation of a Notice of Intent and a SWPPP.

7.2.5 Montana Department of Transportation Permits

Any work done within the Montana Department of Transportation (MDT) right-of-way will require the appropriate permit. MDT will be contacted to secure all required permits in advance of starting construction activities.

7.2.6 Montana Pollutant Discharge Elimination System Permits

The goal of the MPDES program is to control point source discharges of wastewater such that water quality in the receiving streams is protected. The Custodial Trust holds the following two MPDES permits: (1) an individual permit (MT0030147) that provides authorization to discharge treated effluent from the HDS WTP to an outfall in Lower Lake, and (2) authorization under the General Permit for Stormwater Discharges associated with industrial activity (MTR000072).

7.2.6.1 Evaluation of MPDES Individual Permit MT0030147

The Custodial Trust currently holds an MPDES Minor Industrial Individual Permit No: MT0030147 for authorization to discharge under the MPDES program. This individual permit regulates wastewater discharges from point sources that do not fall under the guidelines of General Permits. Individual permits undergo a more rigorous process and address specific conditions of the facility or activity. This permit allows for the discharge of treated effluent from the HDS WTP to an outfall located on Lower Lake. The current permit is valid until July 31, 2015.

Modifications to this permit would be necessary if the outfall location is moved to a new receiving water because of the dewatering and excavation activities that are planned for implementation in Lower Lake. As part of the more rigorous nature of the individual permit, a public comment process would be required to change the outfall location to a new receiving water.

At present, engineering concepts developed for TPA excavation activities do not involve moving the MPDES discharge to a new receiving water. The current plan is to extend the existing 4-inch HDPE outfall pipe less than 500 feet to the east and discharge to small portion of Lower Lake retained to support IM implementation. Engineering drawings will be prepared that depict the proposed modifications to Lower Lake and the outfall pipe. The proposed modifications will be reviewed with MDEQ to confirm that these changes have no effect on the current MPDES individual permit. The Custodial Trust will note to MDEQ that the changes are needed on a temporary basis only until the HDS WTP is decommissioned. HDS WTP decommissioning is anticipated to occur in mid-2015.

7.2.6.2 Modification of MPDES General Permit for Stormwater Discharges (MTR000072)

The Custodial Trust currently holds an MPDES General Permit for Stormwater Discharges. Because the site is undergoing active remediation under RCRA, the SWPPP (submitted to MDEQ in July 2013 as discussed in Section 7.1.4 above) will be kept up-to-date to reflect current conditions on the site. Also in accordance with the SWPPP, updates will not be submitted to MDEQ unless specifically requested.

7.2.7 Stormwater Pollution Prevention Plan

As discussed above in Section 7.1.4, stormwater management at the site is accomplished in accordance with an approved SWPPP. An updated SWPPP representing current site conditions was prepared and submitted to MDEQ on July 31, 2013. A copy of the SWPPP is maintained onsite at all times.

7.2.8 Migratory Bird Treaty Act

The Custodial Trust will continue to coordinate and consult with USFWS and USEPA regarding deterrence activities aimed at minimizing non-compliance with the Migratory Bird Treaty Act (MBTA) associated with all IMs.

SECTION 8

Project Management and Schedule

This section provides an overview of project management activities and the proposed schedule for 2014 IM implementation. Organization and lines of communication, public participation, documentation and reporting, and the preliminary schedule are described.

The Custodial Trust will manage all IM activities as part of the responsibilities and obligations set forth in the Settlement Agreement and First Modification to the 1998 Consent Decree. The Custodial Trust will communicate relevant information about the IM task plans, results, and progress to USEPA, as Lead Agency, as well as to the federal and state beneficiaries of the Custodial Trust. Communication will occur on a frequent and timely basis, to review progress on the IMs, to solicit input from the beneficiaries, and to ensure that the beneficiaries are kept well informed of activities onsite.

8.1 Organization and Lines of Communication

The Custodial Trust will procure the services of consultants and contractors to implement the IMs as efficiently and cost-effectively as possible. Figure 8-1 shows the current overall Project Organization Chart and the lines of communication. Table 8-1 identifies the anticipated consultant leads for IM design and construction.

TABLE 8-1
Interim Measure Consultant Leads

Name	Lead Contact	Description of Role
CH2M HILL	Jay Dehner: 509-979-5733	Project management and overall engineering design and construction lead for former Smelter site interim measures
Morrison Maierle Inc.	Mark Brooke: 406-495-3469	Engineering design support and floodplain modeling
Pioneer Technical Services	Joel Gerhart: 406-490-2530	Prickly Pear Creek Realignment design and permitting, including natural resources, stream geomorphology, and engineering design
Hydrometrics	Bob Anderson: 406-443-4150	Hydrogeology and engineering design
Applied Geomorphology	Karin Boyd: 406-587-6352	Stream geomorphology
NewFields	Cam Stringer: 406-549-8270	Groundwater flow and contaminant transport modeling
Confluence	Jim Lovell: 406-585-9500	Stream geomorphology

8.2 Public Participation

Public involvement is a critical part of the overall cleanup process for the former Smelter site. General communication with the public will continue to follow the *Draft Community Relations Plan, Former ASARCO Smelter Facility, East Helena, Montana* prepared by the Custodial Trust (2010), as well as the requirements of the First Modification to the 1998 Consent Decree. In 2013, the Custodial Trust held the following meetings and workshops:

- A meeting of the East Helena Entire Cleanup Team in Coordination (EHECTIC) was held in April 2013 to provide project stakeholders and the community information on the PPC Realignment design.
- A workshop was held in October 2013 to provide the community an update on the PPC Realignment design.
- An informational meeting will be held in December 2013 to provide the community with an overview of the 2014 IM work described herein.

In addition, the Custodial Trust holds meetings with the EHECTIC group to provide information to key local stakeholders and attends the East Helena City Council meetings. The Custodial Trust's website: http://www.mtenvironmentaltrust.org/east-helena contains links to news on cleanup progress, design

documents, meeting materials, and future meeting dates. A video of the PPC Realignment project is available for viewing.

8.3 Documentation and Reporting

The following IM documentation is under development:

- Contract scopes of work and schedules
- Engineering technical reports and memoranda
- Modeling results (including PPC flow, ET Cover System, and groundwater flow)
- Permit application packages
- Detailed engineering designs (plans and specifications)
- Construction contract packages (drawings and specifications)
- Operation and maintenance plans
- Record drawings and contract close-out documents

Core plans that have been developed for the Facility will be incorporated by reference, or amended as appropriate, to ensure that IM activities follow relevant protocols and methods. Core plans include the following:

- Health and Safety Plan for the East Helena former Smelter site
- Quality Assurance/Quality Control Plan
- Sampling and Analyses Plans

IM progress will be summarized in the monthly progress reports.

8.4 Preliminary Interim Measure Implementation Schedule

Table 8-2 summarizes key dates for the proposed 2014 IM implementation and provides schedule updates for the work proposed and approved in the IM Work Plans 2012 and 2013. The schedule is considered a living document and will be revised on a regular basis as needed to reflect planned implementation requirements for each IM. The preliminary schedule was developed in coordination with other ongoing work being conducted by the Custodial Trust pursuant to the First Modification. The schedule for these activities is subject to refinement as input is received from the Custodial Trust, beneficiaries, and other stakeholders.

TABLE 8-2
Summary of Proposed 2014 Implementation Schedule

East Helena Facility Planning and Construction Activities	Start	End
2014 Interim Measures Work Plan		
Public Comment Period	December 2013	January 2014
U.S. Environmental Protection Agency Approval		February 2014
Tito Park Area Removal		
Bidding and Award	February 2014	April 2014
Construction	May 2014	October 2014
Interim Cover System 1 Construction		
Bidding and Award	February 2014	April 2014
Construction	May 2014	October 2014
NorthWestern Energy Substation Removal and 69-kV Line Relocation		
Bidding and Award	March 2014	May 2014
Construction	May 2014	August 2014
Monitoring Well Decommissioning		
Bidding and Award	March 2014	June 2014
Construction	June 2014	September 2014

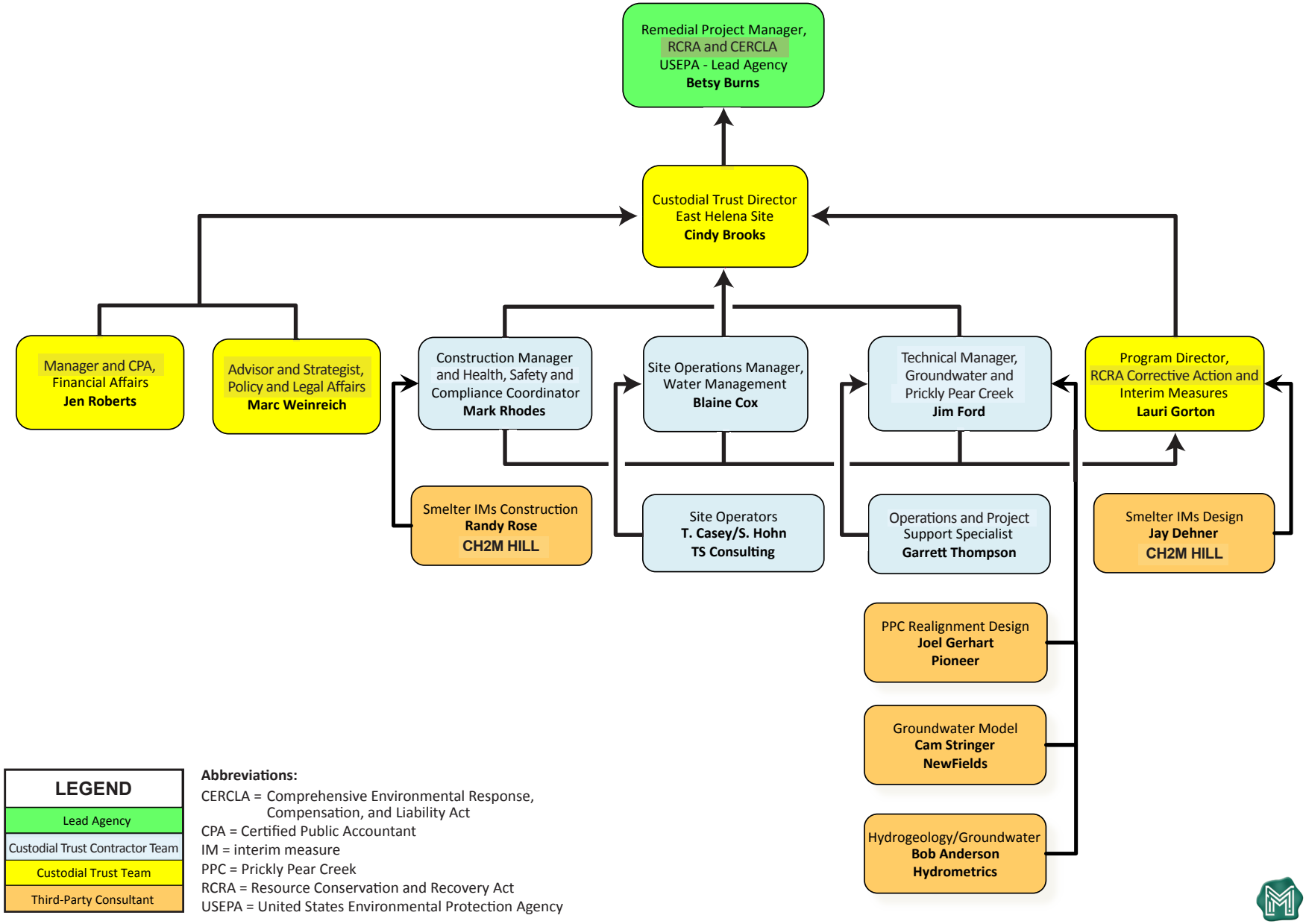


FIGURE 8-1
Project Organization and Lines of Communication
Interim Measures Work Plan–2014
East Helena, Montana

SECTION 9

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Appendix A
Leaching Test Results

Table 6-12. Synthetic Precipitation Leaching Procedure (SPLP) Results

Phase II RFI Report, East Helena Facility

				Total Concentration (mg/kg)		SPLP Concentration (mg/L)	
Sample Location	**Facility Area**	**Depth (ft bgs)**	**Field ID#**	**As**	**Se**	**As**	**Se**
Soil Boring/Monitoring Well Locations							
RFI2SB-3	Tito Park	5-7	AEH-1009-149-SL	2850	8	2.4	0.025
RFI2SB-6	Monier Flue	2.5-5	AEH-1008-567-SL	1460	106	0.002	0.120
RFI2SB-9	Rail Corridor	0-2.5*	AEH-1008-573-SL, -574-SL	1170-1240	151-281	0.026	0.14
RFI2SB-15	Zinc Plant	0-0.5	AEH-1008-659-SL	3350	662	<0.001	0.061
RFI2SB-15	Zinc Plant	0.5-2.5	AEH-1008-660-SL	556	74	0.001	0.01
RFI2SB-15	Zinc Plant	15-17	AEH-1008-664-SL	583	<5	0.017	<0.001
RFI2SB-18	Acid Plant	0.5-2.5	AEH-1008-624-SL	3270	30	2	0.051
RFI2SB-18	Acid Plant	0.5-6.5*	AEH-1008-624-SL, -625-SL, -626-SL	3270-11600	30-126	0.110	0.053
RFI2SB-22	Tito Park	0-5*	AEH-1009-134-SL, -135-SL, -136-SL	78-280	1.4-29.2	0.02	0.03
DH-72	Acid Plant	0-5*	AEH-1008-858-SL, -859-SL, -860-SL	436-816	4.4-19.5	0.042	0.026
DH-74	Slag Pile	0-2	AEH-1008-838-SL	814	97	0.077	0.059
DH-74	Slag Pile	40-42	AEH-1008-842-SL	1210	209	0.130	0.400
DH-76	Slag Pile	5-12*	AEH-1008-767-SL, -768-SL	570-864	267-325	0.009	0.13
DH-76	Slag Pile	55-62*	AEH-1008-778-SL, -780-SL	1715-3060	25-57	0.099	0.036
Surface Soil Locations*							
RC-SS7	Rail Corridor	0-0.5	AEH-1008-131-SL	5100	754	0.009	0.11
RC-SS7	Rail Corridor	2.5-5	AEH-1008-133-SL	588	96	0.021	0.490
RC-SS5	Rail Corridor	0-0.5	AEH-1008-118-SL	6150	569	0.016	0.027
RC-SS5	Rail Corridor	0.5-2.5	AEH-1008-119-SL	1170	75	0.020	0.340
UOS-SS8	Tito Park	2.5-5	AEH-1008-104-SL	799	64	0.007	0.022
UOS-SS14	Tito Park	2.5-5	AEH-1008-111-SL	1680	160	0.017	0.013

Notes:

*Denotes sample composited for SPLP analysis from individual grabs collected over indicated depth; for these samples, total concentration ranges are shown for analysis of total arsenic and selenium conducted on individual samples.

**Samples were added to SPLP testing program after reviewing initial results; therefore, these represent supplemental samples not included in Table 2-3-1.

Table obtained from Hydrometrics, Inc.: Section 2 Tables.xlsx/2-3-2

Table 6-13. Sequential Batch Leach Results

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					Sequential Batch Leach Test Number and Leachate Arsenic Concentration (mg/L)							
Sample Location	**Facility Area**	**Depth (ft bgs)**	**Field ID#**	**As Tot (mg/kg)**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Arsenic Results												
RFI2SB-1	Tito Park	2.5-5	AEH-1008-585-SL	235	0.19	0.13	0.096	0.088	0.066	0.069	0.066	0.063
RFI2SB-3	Tito Park	10-12	AEH-1009-150-SL	471	0.57	0.87	1	0.77	0.33	0.33	0.3	0.29
RFI2SB-6	Monier Flue	2.5-5	AEH-1008-567-SL	1460	0.029	0.022	0.021	0.086	0.005	0.007	0.008	0.01
RFI2SB-8	Rail Corridor	40-41	AEH-1008-510-SL	124	0.088	0.083	0.081	0.018	0.11	0.1	0.092	0.095
RFI2SB-16	Parking Lot	25-32*	AEH-1009-108-SL, -109-SL	154-184	0.33	0.22	0.12	0.096	0.14	0.14	0.12	0.11
RFI2SB-16	Parking Lot	40-42	AEH-1009-112-SL	403	2.8	1.3	0.92	0.65	0.76	0.51	0.4	0.33
RFI2SB-18	Acid Plant	10-16.5*	AEH-1008-627-SL, -628-SL	1260-1710	1.1	0.77	0.62	0.5	0.56	0.51	0.46	0.43
RFI2SB-21	Downgradient	30-52*	AEH-1009-123-SL through -127-SL	64-275	0.31	0.25	0.22	0.19	0.24	0.22	0.2	0.19
RFI2SB-22	Tito Park	15-17	AEH-1009-141-SL	121	0.043	0.019	0.012	0.012	0.012	0.093	0.024	0.022

					Sequential Batch Leach Test Number and Leachate Selenium Concentration (mg/L)							
Sample Location	**Facility Area**	**Depth (ft bgs)**	**Field ID#**	**Se Tot (mg/kg)**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Selenium Results												
RFI2SB-3	Tito Park	10-12	AEH-1009-150-SL	13	0.014	0.013	0.012	0.01	0.012	0.008	0.007	0.006
RFI2SB-6	Monier Flue	2.5-5	AEH-1008-567-SL	106	0.28	0.11	0.069	<0.001	0.068	0.042	0.04	0.04
RFI2SB-18	Acid Plant	10-16.5*	AEH-1008-627-SL, -628-SL	76-94	0.21	0.18	0.15	0.13	0.19	0.16	0.15	0.13

Notes:

*Denotes sample composited for sequential batch leach analysis from individual grabs collected over indicated depth; for these samples, total concentration ranges are shown for analysis of total arsenic and selenium conducted on individual samples.

Sequential batch leach tests consisted of consecutive SPLP-type extractions conducted on a single soil sample using Upper Lake water as extractant.

Table obtained from Hydrometrics, Inc.: Section 2 Tables.xlsx/2-3-3

Appendix B
Public Comments Received on the 2014 Interim Measures Work Plan with U.S. Environmental Protection Agency Response (*Pending*)