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# REMEDIAL ACTION WORK PLAN
# MISSOULA WHITE PINE SASH FACILITY

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# Acronyms and Abbreviations

| | |
|---|---|
| % | percent |
| ARM | Administrative Rules of Montana |
| AST | aboveground storage tank |
| bgs | below ground surface |
| BMP | best management practice |
| BRA | Baseline Risk Assessment |
| CAMU | corrective action management unit |
| CDR | conceptual design report |
| CECRA | Comprehensive Environmental Cleanup and Responsibility Act |
| CFR | Code of Federal Regulations |
| City | City of Missoula |
| COC | contaminant of concern |
| COPC | contaminant of potential concern |
| CQC/CA | conceptual construction quality control and quality assurance plan |
| cy | cubic yards |
| DEQ | Montana Department of Environmental Quality |
| DEQ-7 | Montana numeric water quality standards |
| DRO | diesel range organics |
| EPH | extractable petroleum hydrocarbons |
| ERCLs | environmental requirements, criteria, and limitations |
| FDR | final design report |
| FML | flexible membrane liner |
| FSP | field sampling plan |
| $ft^2$/day | square feet per day |
| FTA | former treatment area |
| GRO | gasoline range organics |
| HASP | health and safety plan |
| Huttig | Huttig Building Products, Inc. |
| ISCO | in situ chemical oxidation |
| LEL | lower explosive limit |
| LTM | long-term monitoring |
| LTU | land treatment unit |
| MCL | maximum contaminant level |

| | |
|---|---|
| mg/kg | milligrams per kilogram |
| MNA | monitored natural attenuation |
| MPDES | Montana Pollution Discharge Elimination System |
| MWPS | Missoula White Pine Sash |
| ng/kg | nanograms per kilogram |
| NPDES | National Pollutant Discharge Eliminations System |
| OM&M | operation, maintenance and monitoring |
| ppmv | parts per million/volume |
| PCP | pentachlorophenol |
| PDI | pre-design investigation |
| PM | particulate matter |
| QAPP | quality assurance project plan |
| RAO | remedial action objective |
| RAWP | remedial action work plan |
| RCRA | Resource Conservation and Recovery Act |
| ROD | Record of Decision |
| RSL | regional screening level |
| SAP | sampling and analysis plan |
| SVOC | semi-volatile organic compound |
| SSCL | site-specific cleanup levels |
| SSSL | site-specific screening levels |
| SSLLP | Scott Street, LLP |
| SWPPP | storm water pollution prevention plan |
| TKN | total Kjeldahl nitrogen |
| µmhos/cm | micromhos per centimeter |
| USEPA | United States Environmental Protection Agency |
| UST | underground storage tank |
| VI | vapor intrusion |
| VOC | volatile organic compound |
| VPH | volatile petroleum hydrocarbons |
| WWW | WWW Investments, LLC |

# 1. INTRODUCTION

The Missoula White Pine Sash (MWPS) facility (MWPS Facility) is a state Superfund facility listed on the Montana Comprehensive Environmental Cleanup and Responsibility Act (CECRA) Priorities List. The Montana Department of Environmental Quality (DEQ) developed a Record of Decision (ROD) which presents DEQ's selected remedial action for the MWPS Facility (DEQ 2015). The selected remedy, described in detail in **Section 2** of this document and Part 2, Section 11 of the ROD, is based upon a combination of alternatives related to soil remediation, groundwater remediation, institutional controls, and long-term monitoring.

In addition, as part of the remedial design process for the selected remedy, additional pre-design investigations, treatability studies, bench-scale tests and pilot tests will be completed at the MWPS Facility. These activities are described in detail in **Section 3** of this document and will be completed to fill existing data gaps and optimize effectiveness of remedial components. It is anticipated that completion of the pre-design investigations will optimize the overall remedy and facilitate a phased approach to execution of the program, by allowing interim actions (i.e., excavation of methane/ash/dioxin soils) to be implemented immediately, while separate components are undergoing design/optimization.

## 1.1 Purpose and Content

This remedial action work plan (RAWP) was developed to serve as a roadmap for the remedial design and implementation process at the MWPS Facility. This RAWP provides a conceptual approach to implementing the remedies specified in the ROD and is intended to outline the phasing of remedial design work for efficient use of resources. The RAWP is not intended to contain exhaustive documentation of site conditions, existing data, or potential remedial action implementation alternatives. The RAWP presents a reasonably efficient design and implementation process in a concise, usable manner.

This document is structured to inform the reader about relevant site information and then step the reader through the thought process to effectively implement the remedy specified in the ROD.

- **Section 1** provides the background, history, and setting to give the reader basic knowledge of the MWPS Facility.
- **Section 2** provides the selected remedy, the remedial action objectives (RAOs), and the performance standards specified in the ROD, which will provide the reader with knowledge of what actions are planned for the MWPS Facility and the standards required for effective compliance with applicable laws and regulations.
- **Section 3** lists the remedial action components and provides necessary information for effective implementation of each action. Section 3 is designed to list concerns related to each remedial action and to provide an understanding of how each action may affect other activities at the MWPS Facility.
- **Section 4** provides a list of references for useful documents and documents used in the preparation of this plan.
- **Appendix A** contains a table of environmental requirements, criteria, and limitations (ERCLs) and how they may be addressed by the remedial design and remedial action. **Appendix B** provides a list of agencies and stakeholders affected by future work at the MWPS Facility. The list is intended to assist future remedial actions by identifying affected parties and their contact information prior to preparing the detailed work plan for each action.

## 1.2 Site Location and Description

The Record of Decision issued by the Montana DEQ dated February 18, 2015 provides the following description of the MWPS Facility: The historical operational area of the MWPS Facility is

approximately 43 acres and is located west of Scott Street at the intersection of Scott Street and Stoddard Street on the north side of the Missoula (City), Missoula County, Montana (Township 13 North, Range 19 West, Section 16) (**Figure 1**). The surficial boundaries of the MWPS Facility include the former operational area to the west of Scott Street, extend into the residential area to the east of Scott Street, to the active Montana Rail Link railroad tracks on the south, Rodgers Street and Clawson Manufacturing to the north, and Bulwer Street and Allied Waste Services (now Republic Services) to the west. The actual MWPS Facility boundaries are based on the extent of contamination, and includes one location east of Scott Street. Also, groundwater contamination is known to extend to the east outside of these surficial boundaries, across Scott Street and beneath the adjacent residential area (**Figure 2)**.

### 1.3 Facilities Operational History and Impacts

The MWPS Facility is a former lumber mill and wood treating facility. Historical documents and photos indicate that a lumber mill has been present at the current location of the MWPS Facility since shortly after 1900. Ownership of the mill prior to 1920 is not well documented but the R.L. Polk City Directories from the years 1905 through 1909 list the "Missoula Lumber Co." residing at "Scott and N.P. Tracks." The Polk directories from the years 1911 through 1913 have a listing for "Missoula Lumber Co. (Largey Mill)" at this same address. A map of Missoula dated 1914, on the wall of the Montana Room at the Missoula City Library, shows the "Largey Lumber Co." at the MWPS Facility location. No listings for lumber companies are found in the Polk directories for 1915 through 1919. Beginning in 1922, the Polk directory lists "Missoula White Pine Sash" as occupying this address (Polk, 1905-1922; Envirocon 1998). MWPS Company owned and operated the mill from approximately 1920 to 1971. Huttig Sash and Door Company (now known as Huttig Building Products, Inc.) (Huttig) owned 51% of MWPS since 1920 and acquired the remaining minority interest in 1966 (State of Washington Department of State; Huttig corporate records). In 1968, Crane Co. acquired a majority interest in Huttig Sash and Door Company (Crane Co. Tender Offer Letter dated June 11, 1968). On July 31, 1971, MWPS was merged into Huttig Sash and Door Company (State of Washington Department of State 1971). The MWPS Company was involuntarily dissolved as a Montana corporation in December 1991 (Montana Secretary of State 1991). The mill closed in December 1996 (Envirocon 1998). Crane Co. divested its interest in Huttig in December 1999 (SEC Form 8-K filed December 16, 1999).

In March 1999, Huttig sold property at the MWPS Facility to WWW Investments, LLC (WWW) and Scott Street, LLP (SSLLP), reserving certain rights and easements, and subject to use restrictions (Grant Deed 1999, Grant Deed 1999a). On October 13, 2000, WWW and SSLLP each sold portions of their properties to the City (Grant Deed 2000, Grant Deed 2000a). As part of this transaction, all three parties to the transaction donated one acre each to the City to be used as a park. A site plan showing the current ownership for each portion of the MWPS Facility is shown on **Figure 2**. At this time, SSLLP vacated a railroad easement that formerly extended to the log pond from the south across the City property, and added a rail easement across the extreme west end of the City property (Douglass 2015).

The MWPS mill manufactured precision millwork products, primarily wood window and door components. Beginning in the mid-1930s, selected milled products were treated by dipping in formulations of pentachlorophenol (PCP) that used diesel or mineral spirits as a carrier. In 1987, the MWPS Company replaced the PCP formulations with a non-PCP treating solution (Envirocon 1998).

The first reported dipping system was located north of the MWPS office, located in the southeast portion of the MWPS Facility, from the mid-1930s until approximately 1950. This dipping system included underground diesel storage tanks, an aboveground mixing vat, and an aboveground dip tank that was located in the first dip room. The underground storage tanks (USTs) stored diesel that was pumped from the tanks into the mix vat where solid PCP flakes or granules were added. The

mixture was stirred and heated by steam coils and then pumped into the dip tank. Pieces of wood were then dipped in the dip tank to preserve the surface of the wood until they were painted or stained by the end user (Envirocon 1998). The location of the first dipping system is shown on **Figure 2**.

A replacement system was installed adjacent to the first dip system in approximately 1950 and was used until 1988. This second dipping operation consisted of two 12,000-gallon, aboveground storage tanks (ASTs); an underground, open-top dip tank; and connecting piping. The dip tank was housed in a new cinder block building directly east of the first dip room. The second dip room was taken out of service in 1988, and the building and tank were demolished in 1989. All of the PCP formulations used in the second dip room were delivered premixed and used mineral spirits as a carrier stored initially in the two on-site ASTs (Envirocon 1998).

Historical interviews and investigations indicate that a pipe ran from above the liquid level in the second open-top dip tank, through the east wall of the dip-tank room, and into a rock well that was located under the west slope of the northern approach to the Scott Street overpass. The top of the rock well was located approximately 5 feet below the grade of the slope, and the bottom was a concrete slab located approximately 12 feet below the top of the rock well. The walls of the well, approximately 4 to 5 feet in diameter, were constructed of round 4- to 6-inch rocks, stacked without mortar. The rock well was filled in with soil in 1996 (Envirocon 1998). The location of the second dipping system, ASTs, and rock well are shown on **Figure 2**.

In 1988, a "new dipping system" was installed approximately 300 feet west of the 1$^{st}$ and 2$^{nd}$ dipping tanks, in the factory building, with the approximate location shown on **Figure 2**. The new dipping system consisted of a double-containment tank and piping, with leak detection and a tank for emergency draining of the treating solution for fire protection. The two ASTs remained in use for storage of the non-PCP treating solution for the new dip tank. The new dipping system was decommissioned in approximately 1997, the ASTs were removed, and the soil beneath the tank was sampled for Gasoline Range Organics (GRO) and Diesel Range Organics (DRO). No contaminants were detected beneath the dip tank, and there was no other evidence that this tank had leaked (Envirocon 1998). Subsequent sampling at the location of the former ASTs indicated PCP, dioxin/furans, and petroleum contamination in soils to a depth of 26 feet below ground surface (bgs) (Douglass 2012).

Prior to 1996, several log, overflow, and drain ponds were present on the northern portion of the Facility (**Figure 3**). Several of the ponds were backfilled in the 1950s and 1960s. The remaining log pond and drain pond were emptied in 1996 and backfilled (Envirocon 1998). In addition, aerial photographs taken between 1967 and 1981 show a teepee burner adjacent to the northern end of the log pond (Envirocon 1998).

Soil and shallower groundwater (19-48 feet bgs) samples taken on site detected hazardous or deleterious substances, including but not limited to PCP, dioxins/furans, petroleum hydrocarbons, metals, and methane (hereinafter, dioxins/furans will be referred to as dioxin). Samples taken of deeper groundwater (greater than 60 feet bgs) in the Missoula Aquifer have detected PCP, dioxin, barium, arsenic, manganese, and petroleum hydrocarbons. Site plans showing the approximate extent of those substances in the soil and groundwater are depicted on **Figures 6**, **7**, **8**, **9a**, **9b**, and **9c**.

The former wood treatment area is fenced with a locked gate, and the northern portion of the former MWPS operational area is fenced on the east and north boundaries. The southern portion of the MWPS Facility was a wood treating area that used chlorophenolic formulations. Resource Conservation and Recovery Act (RCRA)-listed F032 hazardous waste has been identified in this area.

PCP identified on the northern portion of the MWPS Facility does not meet the regulatory definition of a listed hazardous waste and does not carry the F032 listed waste designation.

Currently WWW operates a beverage distributing business (Zip Beverage) on the southeastern portion of the MWPS Facility (**Figure 2**). The City uses the southwestern portion of the MWPS Facility to house and operate City maintenance equipment and shops, and a three-acre area to the east has been developed as a City park. Most of the City property is fenced. The northern portion of the MWPS Facility, owned by SSLLP, is currently vacant. **Figure 2** illustrates current property ownership.

## 1.4 Previous Investigations, Regulatory Involvement, and Interim Actions

Numerous environmental investigations have been conducted on the properties that make up the MWPS Facility. In addition, several interim actions have been conducted. The detailed list of investigations, regulatory involvement, and interim actions for the MWPS facility is presented in the ROD (DEQ 2015).

## 1.5 Geology, Surface Water Hydrology, and Hydrogeology

The topography of the facility is mostly flat with very little change in elevation; the slight changes in elevation that are present are very gradual.

### 1.5.1 Geology

The MWPS Facility is located in the Missoula Valley, a wedge-shaped intermontane basin. The Missoula Valley is bounded to the northeast by the Rattlesnake Hills and to the southeast and southwest by the Sapphire and Bitterroot Mountains, respectively. The mountains and material underlying the valley are composed primarily of metasedimentary rock of the Belt Supergroup. Unconsolidated and semiconsolidated Tertiary fill, up to 2,500 feet in depth, contained in the valley, is overlain by approximately 150 feet of coarse-grained glacial outwash and lake-bed deposits from the Pleistocene glacial period (McMurtrey et al. 1965). Missoula Valley sediment, deposited during the forming and reforming of Glacial Lake Missoula, consists primarily of fine-grained silts and clays. During repeated periods when ice dams melted and the glacial lake drained, coarse-grained gravel and boulders were deposited. Soils at the MWPS Facility consist of gravelly loam that is a deep, excessively drained soil formed in alluvium on alluvial fans and stream terraces (USDA 1995). The MWPS Facility is underlain primarily by non-cohesive, coarse-grained sands and gravels with some silts, cobbles, and clay to a depth of approximately 150 feet.

The unsaturated zone above the Missoula Aquifer at the MWPS Facility is composed of several discontinuous low permeability layers of intermixed silt, clay, and fine sand. A silty clay layer ranging in thickness from three to six feet is present at approximately 30 feet bgs and a silty sand layer is located at about 48 feet bgs (Envirocon 1998). Additional information on the nature of these layers was provided from groundwater investigations (Douglass 2001). These layers can intercept recharge precipitation and create perched water bearing zones. The layers also serve to impede the vertical flow of water beneath the MWPS Facility and from the perched groundwater above the Missoula Aquifer.

### 1.5.2 Surface Water Hydrology

The MWPS Facility is located one-half mile to the north of the Clark Fork River, which generally flows from east to west. Administrative Rules of Montana (ARM) 17.30.607 provides that the Clark Fork River is classified "B-1" for water use. Waters classified as B-1 are to be maintained suitable for drinking, culinary, and food processing purposes, after conventional treatment; bathing, swimming, and recreation; growth and marginal propagation of salmonid fishes and associated aquatic life, waterfowl and furbearers; and agricultural and industrial water supply (ARM 17.30.623). The MWPS Facility is situated outside of the Clark Fork River 100- and 500-year floodplains. It is estimated that the Clark Fork River provides as great as 90 percent (%) of the recharge to the Missoula Aquifer (Cook et al. 2004).

Prior to 1996, several log, overflow, and drain ponds were present on the northern portion of the MWPS Facility (**Figure 3**). Several of the ponds were backfilled in the 1950s and 1960s. The remaining log pond and drain pond were emptied in 1996 and backfilled in January 1999 (Envirocon 1998).

Infiltration storm drains, or dry wells, are present on both the City and WWW properties. These dry wells are not connected to the City storm sewer system, but infiltrate runoff into the ground. The wells capture runoff from paved areas and roofs of buildings that drain to downspouts. The City property, with five dry wells, also includes small, elongated vegetated swales in the parking lot where storm water is allowed to infiltrate or evaporate (CDM 2011). There are 12 dry wells on the WWW property which capture precipitation and allow runoff to infiltrate into the subsurface (WWW 2011). Rainwater that infiltrates into the subsurface likely provides recharge to the perched groundwater.

#### 1.5.3 Hydrology

Groundwater in the unconfined Missoula Aquifer, which is composed of highly permeable coarse-grained sand and gravel, is encountered at approximately 55 to 65 feet bgs beneath the MWPS Facility, depending on the season. The majority of the recharge to the Missoula Aquifer is via infiltration from the Clark Fork River. Regional groundwater direction in the Missoula Aquifer is westward and northwestward, following the Clark Fork River (Envirocon 1998). The portion of the Missoula Aquifer directly beneath the MWPS Facility is relatively stagnant, and the direction of groundwater flow in the immediate vicinity is not clear from water table elevation measurements. A transmissivity estimate was calculated for the Missoula Aquifer of 440,000 square feet per day ($ft^2$/day) based on a pumping test conducted in December 1997 as part of the RI (Envirocon, 1998).

The geology/hydrogeology at the MWPS Facility is complex. The unsaturated zone above the Missoula Aquifer contains several discontinuous silt and clay layers that intercept recharge precipitation and create perched water-bearing zones. An evaluation of this perched system indicates that the perched zones are divided into at least three distinct and separate units based on water-level elevation (Envirocon 1998, Douglass 2002, Douglass 2003a). Although the units do not appear to be directly hydraulically connected, water from upper units appears to provide recharge to the lower units through overflow and spilling from one unit to the next. The lower of the three confining units, at approximately 48 feet bgs, may intersect the Missoula Aquifer during periods of elevated seasonal water fluctuations. **Figure 4** presents a conceptual geologic model of the perched zones.

Class I groundwater (ARM 17.30.1006) is generally suitable for public and private water supplies, culinary and food processing purposes, irrigation, livestock and wildlife watering, and for commercial and industrial purposes with little or no treatment. Class I groundwater has a specific conductance of less than 1,000 micromhos per centimeter (µmhos/cm) at 25 degrees Celsius. Groundwater samples collected during the June 2013 groundwater sampling event indicated that the specific conductance of perched groundwater ranged from 360 µmhos/cm at well B-09S to 1,190 µmhos/cm at well B-02S and the specific conductance of the Missoula Aquifer ranged from 374 µmhos/cm at well WPS-14D to 699 µmhos/cm at well WPS-04D (Douglass 2013). Based on these results, groundwater at the Facility is classified as Class I groundwater.

Industrial wells that could potentially supply drinking water are located within the MWPS Facility, and public water supply wells that supply drinking water are located near the MWPS Facility in the Missoula Aquifer (**Figure 5**) (Douglass 2015).

### 1.6 Structures, Utilities, and Other Obstructions

There are several structures, utilities, and other obstructions present at the MWPS facility that must be considered during implementation of the remedy. Specifically, the following structures are present that must be considered during implementation of the remedy:

- The Scott Street bridge is located near the southern end of the facility and includes the bridge deck, north abutment, associated sidewalks, railings, and north ramp;
- Buildings, fences, driveways, and parking areas present on the WWW property and the City property; and
- The rail yard adjoins the southern boundary of the WWW property adjacent to the former AST area.

Operation of the businesses on the WWW property and the City property must be considered during implementation of the remedy. Similarly, use of the City Park and Scott Street by the public must also be considered during implementation of the remedy.

There are also a number of utilities on the MWPS Facility that must be considered during implementation of the remedy. The locations of these utilities will be established during site survey work proposed as pre-design activities (**Section 3.1.2.1**). Specifically, the Yellowstone Pipeline is buried very near and, in some cases, overlapping the southern boundary of the WWW property.

# 2. SELECTED REMEDY, REMEDIAL ACTION OBJECTIVES, AND PERFORMANCE STANDARDS

## 2.1 Selected Remedies

The selected remedy published in the ROD includes excavation and on-site treatment of soils (i.e., to the limits of excavation using conventional excavation and earth-moving equipment, anticipated to be approximately 15-20 feet below grade) containing PCP and other substances; excavation and off-site disposal of dioxin-containing and ash-containing soils; excavation and off-site disposal or recycling of buried wood waste containing methane; and in situ chemical oxidation of soil and groundwater. Land and groundwater use controls and long-term monitoring are also required. DEQ's decision requires that the western portion of the SSLLP property and properties owned by WWW and the City be remediated to commercial/industrial site-specific cleanup levels (SSCLs). The City Park, previously cleaned up, does not require any additional cleanup. The eastern portion of the SSLLP property must be remediated to residential SSCLs. Major components of the selected remedy are summarized in the following sections.

### 2.1.1 Site-Wide Elements

The selected remedy includes long-term monitoring, institutional controls, and engineering controls as site-wide elements.

#### 2.1.1.1 Long-Term Monitoring

The selected remedy includes monitoring site media during remedy construction and long-term operation and maintenance. This plan will be developed during or after remedial design, is subject to DEQ approval, and will include sampling and analysis to:

- confirm the satisfactory performance of the remedy;
- ensure protection of public health, safety, and welfare, and the environment during remedy implementation;
- verify attainment of SSCLs;
- confirm achievement of RAOs; and
- verify compliance with ERCLs.

Monitoring may include sampling some, or all, of the existing monitoring well network that now includes 54 wells or additional wells that may be installed as part of remedial design. Monitoring may also include some or all of the existing nearby irrigation, commercial/industrial, or public water supply wells. The monitoring wells and other wells that will be included in the long-term monitoring

well network will be determined during or after remedial design. DEQ anticipates that, at a minimum, select wells will be monitored semiannually during high and low groundwater elevations for the first five years to monitor concentrations of PCP, semi-volatile organic compounds (SVOCs), dioxin, volatile organic compounds (VOCs), extractable petroleum hydrocarbons (EPH), volatile petroleum hydrocarbons (VPH), and dissolved metals and evaluate the effectiveness of the cleanup. Other analyses may be included to evaluate the effectiveness of chemical oxidation. The monitoring frequency will then be re-evaluated and may be decreased to annually or another frequency that DEQ determines appropriate, until cleanup levels are achieved. Select wells may be monitored for monitored natural attenuation (MNA) parameters (e.g., redox potential, nitrate plus nitrite, ammonia, dissolved oxygen, ferrous or soluble iron, and sulfate) at a frequency determined appropriate by DEQ. Water levels in monitoring wells will also be measured semiannually during high and low groundwater elevations.

Soil vapor monitoring from representative existing and newly installed monitoring points will be conducted to confirm the effectiveness of the soil and groundwater remedies in reducing soil vapor concentrations.

Air monitoring will be conducted, as needed, while implementing the remedy to protect public health, safety, and welfare, as well as the environment. Dust suppression will also be used to ensure that particulate levels do not become elevated. Details of these activities will be developed during remedial design.

#### 2.1.1.2 Institutional Controls

It is anticipated that the following institutional controls will be implemented or maintained:

- Groundwater Use Restrictions: To protect human health and limit potential migration of PCP or other substances through pumping, the selected remedy partially relies on institutional controls in the form of a restrictive covenant or a controlled groundwater area (or both) to prohibit installation of wells, other than those needed for remediation, at the Facility until groundwater is remediated to SSCLs for all contaminants of concern (COCs). Restrictive covenants will be required on the WWW, City, and SSLLP properties to limit the installation of wells and use of the groundwater and a controlled groundwater area could be applied to the entire MWPS Facility. This will ensure that new wells will not induce or redirect impacted groundwater and that no non-remediation wells are installed within or adjacent to the MWPS Facility where City water services exist. On the WWW property, irrigation using groundwater will be prohibited until SSCLs are met (or DEQ otherwise approves it) so that the addition of irrigation water does not disrupt or otherwise change conditions during treatment. These restrictions will remain in effect until DEQ determines they are no longer needed to ensure protection of human health.
- Land Use Restrictions (Restrictive Covenants): The selected remedy includes a requirement that the use of the WWW property, City property (except for the City park), and the western portion of the SSLLP properties be restricted to commercial/industrial use through a restrictive covenant in substantially the same form as the models found in Appendix B of the ROD. Use of the City park property must be restricted to open space use. The design of the land treatment unit (LTU) on the western portion of the SSLLP property, calls for the LTU to be surveyed and the surveyed area must be restricted during the time the LTU is operating. Although use of the WWW, City, and SSLLP properties has been limited through private agreement, DEQ did not approve those restrictions. Therefore, DEQ requires additional restrictive covenants that meet DEQ requirements. These additional institutional controls are intended to help assure that future uses are limited where necessary, depending on the remedial alternatives implemented, and comply with the requirements of CECRA. The placement of restrictive covenants on these properties is authorized in Section 75-10-727, MCA.

2.1.1.3 Engineering Controls

Engineering controls such as fencing will be necessary during remedy implementation, in order to protect the public and workers at on-site businesses from open excavations and heavy equipment, as well as to restrict access. RCRA Corrective Action Management Unit (CAMU)/LTU regulations require fencing, access control (e.g., locking gates), and signage which will be inspected and maintained throughout the duration of soil treatment activities to ensure the integrity of the remedy. These engineering controls will be further detailed during remedial design. Dust monitoring and suppression activities, as appropriate, will also be conducted during remedy implementation and will be included as part of remedial design and implementation.

2.1.2 Soil Remedies

Excavation of contaminated soils, in combination with off-site disposal, ex situ bioremediation, and in situ chemical oxidation (ISCO) are intended to reduce contaminant concentrations to levels that no longer pose a risk for leaching to groundwater. Additionally, these activities will eliminate the direct contact risk 1) to workers in a commercial/industrial scenario for the WWW, City, and western portion of the SSLLP properties; 2) to both workers and residents on the eastern portion of the SSLLP property; and 3) to residents in the existing residential area.

The ROD requires soils containing PCP (co-located with petroleum hydrocarbons or dioxin) to be removed to the limits of excavation using conventional excavation and earth-moving equipment. Details will be finalized during remedial design. Sheet piling with tiebacks may be necessary to excavate deeper soils adjacent to buildings or other structures. The selected remedy also includes ISCO following excavation of surface and subsurface soils in the former treating area, and to address remaining subsurface soil contamination in the former AST area and beneath Scott Street (if not able to be excavated using conventional excavation equipment). In the rock well area, which is at a depth of 12 feet bgs, as much of the contaminated material exceeding SSCLs as can reasonably be excavated using conventional equipment is planned for removal. Soil containing COCs that remain above SSCLs after excavation will be addressed through ISCO.

The various components of the soil portion of the selected remedy are discussed below.

2.1.2.1 Excavation and Off-Site Disposal

The selected remedy includes excavation and off-site disposal at a licensed and permitted disposal facility of an estimated 15,883 cubic yards (cy) of methane-containing soil, 302 cy of ash/metals-contaminated soil, and 4,948 cy of dioxin-contaminated soil that does not contain PCP (**Figure 8**). Excavation and off-site disposal of methane-containing soils and ash/metals-contaminated soils on the northern portion of the MWPS Facility will eliminate future exposure to methane contained in the soil, eliminate the source of the potentially explosive levels of methane, and eliminate the risk associated with the metals contained in the ash leaching to groundwater. The soil will be tested prior to excavation and disposal to determine the appropriate disposal facility. Methane-containing soil (wood waste) may also be recycled at a local composting company if it is determined through sampling not to contain other COCs and is accepted by the composting company. The selected remedy also includes excavation and off-site disposal of dioxin-contaminated soils not comingled with PCP. These soils may be found at a few locations at the MWPS Facility, one residential yard (1028½ Stoddard Street), and three grids on the eastern portion of the SSLLP property that exceed residential SSCLs (**Figure 8**). Prior to excavation, the residential yard will be sampled to confirm that surface soil concentrations exceed SSCLs and soil removal is needed. Finally, this alternative is also identified for an estimated 2,174 cy of soils that meet the SSCLs for all COCs other than dioxin after treatment in the LTU. Excavating these soils as part of the selected remedy is also intended to eliminate the potential for contaminant migration through surface water infiltration (runoff) into dry wells at the MWPS Facility.

2.1.2.2 Excavation and Ex Situ Enhanced Bioremediation

The selected remedy includes excavating an estimated 4,347 cy of PCP-contaminated soil (including soils comingled with petroleum hydrocarbons or dioxin [see **Figures 8**, **9a**, and **9b**]) followed by ex situ bioremediation of this soil in an on-site LTU. The PCP-contaminated soil on the southern portion of the MWPS Facility has been classified as an F032-listed hazardous waste and is banned from land disposal. However, under 40 CFR 264.552, DEQ can designate a CAMU at the Facility where the wastes originated, which allows otherwise land-banned hazardous waste to be treated on-site if PCP is present at concentrations greater than SSCLs. There are no known exceedances of PCP SSCLs on the northern portion of the MWPS Facility but there are exceedances of other COC SSCLs. In addition, as described above, if PCP was detected at concentrations greater than SSCLs on the northern portion of the Facility, that PCP-contaminated soil could either be excavated for off-site disposal, or excavated for ex situ bioremediation in the on-site LTU. Bioremediation is intended to significantly reduce the amount of contamination in soil. The ROD assumed that PCP and petroleum-contaminated soils will be treated within two treatment seasons based on experiences at a similar facility in Montana (AECOM 2009). However, dioxin-contaminated soils may not be effectively treated to SSCLs through bioremediation. If after treatment in the LTU, soils contain dioxin at concentrations exceeding SSCLs, but meet SSCLs for other COCs, those soils will be disposed of off-site at a licensed and permitted disposal facility.

2.1.2.3 ISCO of Soil

The selected remedy includes ISCO following excavation of surface and subsurface soils (to the limits of traditional excavation) in the former treating area and to address remaining subsurface soil contamination in the former AST area and beneath Scott Street (**Figures 9a**, **9b**, and **9c**). ISCO consists of adding a chemical oxidant to soil in concentrations that result in the destruction of COCs.

In the former treating area, the selected remedy includes applying a chemical oxidant to the soils while the excavation is open and prior to backfill. The chemical oxidant is intended to target soil between the bottom of the excavation and the perched water table. In the former AST area and beneath Scott Street, the selected remedy includes application of a chemical oxidant to target subsurface soils throughout the soil column down to the perched water table.

While ISCO is expected to be effective in reducing PCP and petroleum-hydrocarbon concentrations to SSCLs, the ability of ISCO to oxidize dioxin is less certain. However, even if ISCO is not capable of reducing dioxin concentrations to SSCLs, data from ISCO bench-scale and field-scale pilot testing at similar facilities in Montana have shown that dioxin concentrations will likely decrease in soil and groundwater (Douglass 2015). It is expected that these reductions in dioxin concentrations, combined with the treatment of PCP-contaminated soils, will reduce concentrations such that there is no longer any leaching to groundwater resulting in exceedances of SSCLs, which will allow a groundwater treatment remedy to be successful.

Multiple application events may be needed to reduce the contaminant concentrations to SSCLs. Timeframes between applications will depend on site-specific data collected during post-application monitoring. Cool-Ox™ was identified by DEQ as the oxidant to be used over others because its byproducts are less undesirable than other oxidants. Given the concern expressed by commenters over oxidation byproducts and considering that the Missoula Aquifer is a sole source aquifer, the ROD requires the use of Cool-Ox™ unless a different oxidant that does not generate undesirable byproducts is identified during remedial design. Pilot testing is planned to optimize system design including, but not limited to, the oxidant, oxidant concentrations, and application method and specifications.

#### 2.1.3 Groundwater Remedies

Removing contaminated soil, in combination with active treatment of the contaminated groundwater, is intended to achieve groundwater SSCLs more quickly than waiting for concentrations to decrease on their own (Douglass 2015).

##### 2.1.3.1 In situ Chemical Oxidation

The selected remedy for groundwater includes ISCO to treat the PCP, dioxin, 2-methylnaphthalene, 1,2,4-trimethylbenzene, and petroleum hydrocarbons in groundwater at the MWPS Facility and in the residential areas to the east (if necessary), as shown on **Figures 6** and **7**. As previously indicated, ISCO is capable of reducing PCP, 1,2,4-trimethylbenzene, and petroleum hydrocarbon concentrations to SSCLs. However, the ability of ISCO to reduce dioxin and metals concentrations to SSCLs is less certain, although it is anticipated to reduce dioxin concentrations in groundwater. If the ISCO treatment is unable to reduce dioxin and metals concentrations to the SSCLs and the plume is not expanding, then continued monitoring for MNA parameters, metals, and dioxin will be conducted to confirm the metals and dioxin concentrations are being reduced to eventually meet the SSCL. MNA parameters will continue to be sampled as part of the long-term monitoring plan.

Cool-Ox™ was the oxidant that was also selected by DEQ for this groundwater remedy component. As noted above, the ROD requires the use of Cool-Ox™ unless a different oxidant that does not generate undesirable byproducts is identified during remedial design. The first injection event will be into perched groundwater wells, starting in the former treating area. After monitoring to evaluate the effectiveness of the injections, the conceptual design assumes a second injection into some of the perched groundwater wells, including the residential area to the east (if necessary). Treatment of perched groundwater is expected to eliminate the continuing source or potential source of contamination to the Missoula Aquifer. However, ISCO may be used to treat the Missoula Aquifer contamination, if needed.

The selected remedy also assumes installation of new wells may be necessary for monitoring and/or injection, to cover areas of the perched groundwater where large distances separate existing wells. It may also be possible to use direct-push methods to directly inject oxidant into the perched groundwater and these methods may be evaluated during remedial design.

Pilot testing is planned to optimize system design and determine the more effective oxidant(s) during remedial design. Optimization may include, but is not limited to, an evaluation of different oxidants, oxidant concentration, injection rate and frequency, and spacing of injection points.

ISCO treatment of groundwater is anticipated to require multiple injection events. Groundwater monitoring is required to determine whether RAOs were achieved and to monitor the Missoula Aquifer.

### 2.2 Remedial Action Objectives

The ROD describes DEQ's selected RAOs. RAOs are general descriptions of what the remediation must accomplish in order to protect public health, safety, and welfare and the environment against unacceptable risk identified in the baseline risk assessment (BRA) and BRA Addendum, consistent with reasonably anticipated land use and beneficial use of groundwater.

#### 2.2.1 Groundwater

The following RAOs are defined for groundwater at the MWPS Facility:

- Meet groundwater SSCLs for COCs in groundwater throughout the MWPS Facility.
- Comply with applicable or relevant state and federal ERCLs for COCs in groundwater.
- Reduce the potential future migration of the contaminated groundwater plume.
- Prevent exposure of humans to COCs in groundwater at concentrations greater than SSCLs.

2.2.2 Soil

The following RAOs are defined for soil at the MWPS Facility:

- Prevent human exposure to COCs in soil at concentrations greater than SSCLs.
- Prevent methane vapors from accumulating beneath future buildings at concentrations that would pose a threat of explosion during or after construction of future buildings.
- Prevent migration of COCs from soil to groundwater that would result in exceedances of SSCLs in groundwater.
- Meet SSCLs for COCs in soil.

2.2.3 Soil Vapor

The following RAOs are defined for soil vapor at the MWPS Facility:

- Reduce the potential for exposure of humans to COCs in soil vapor at concentrations that may pose an inhalation risk.

2.2.4 Indoor Air

The following RAOs are defined for indoor air at the MWPS Facility:

- Prevent human exposure to COCs in indoor air at concentrations greater than SSCLs.

## 2.3 Environmental Requirements, Criteria, and Limitations

ERCLs are applicable or relevant state or federal laws identified by the DEQ in the ROD. The laws are grouped into three categories: contaminant-specific, location-specific, and action-specific.

Contaminant-specific requirements are those that establish an allowable level or concentration of a hazardous or deleterious substance in the environment or which describe a level or method of treatment for a hazardous or deleterious substance.

Location-specific requirements are those that serve as restrictions on the conduct of activities because they are in specific locations (e.g., protected wildlife habitat).

Action-specific requirements are those that are relevant or applicable to implementation of a particular remedy. Action-specific requirements do not in themselves determine the remedy but rather indicate the manner in which the remedy must be implemented. Detailed descriptions of each ERCL and how the remedy will achieve compliance are listed in **Appendix A**.

## 2.4 Remedial Action Performance Standards

Performance standards for the remedial action are established as the cleanup levels in the ROD. Performance standards for groundwater, soil, soil vapor, and indoor air are discussed below.

2.4.1 Groundwater

The Montana numeric water quality standards (DEQ-7) standards are the applicable cleanup levels for groundwater (DEQ 2012). When evaluating public drinking water, using the United States Environmental Protection Agency (USEPA) maximum contaminant levels (MCLs) is appropriate, as those are the federal standards generally applied to drinking water. For COCs without a DEQ-7 standard or MCL available, the BRA addendum evaluated and established SSCLs (CDM 2012). The groundwater SSCLs are provided in **Table 1**.

2.4.2 Soils

DEQ developed SSCLs that are protective of DEQ-7 standards for surface and subsurface soil contaminants that may leach to groundwater at the MWPS Facility and direct contact SSCLs for residents, commercial/industrial workers, and construction workers (CDM 2012). With the exception of the off-site residential property, the City Park, and the eastern portion of the SSLLP property, soil concentrations have been compared to commercial/industrial SSCLs. The off-site residential property

and the eastern portion of the SSLLP property have been compared to residential SSCLs. Through evaluation in the BRA Addendum, it was confirmed that there is no unacceptable risk for recreators on the City Park property; therefore, SSCLs were not calculated (CDM 2012). DEQ has determined the reasonably anticipated future use of the MWPS Facility (with the exception of the City Park, the existing residential area, and the eastern portion of the SSLLP property) as commercial/industrial and cleanup of the Facility must meet those SSCLs.

For the one residential yard in the existing residential area and the eastern portion of the SSLLP property, cleanup must meet residential SSCLs. To ensure protection of human health and the environment, the more protective of the leaching to groundwater SSCLs or the direct contact SSCLs were used for compounds that have both. The COCs for each of these receptors are provided in **Table 2** along with their corresponding SSCLs.

2.4.3 Soil Vapor

The vapor intrusion (VI) investigation confirmed that contaminants of potential concern (COPCs) for the VI pathway are present in deep and shallow soil vapor at concentrations that exceed site-specific screening levels (SSSLs) (CDM 2012). Concentrations of C9-C12 aliphatics were present in elevated concentrations beneath the 5 commercial buildings investigated and 7 of the 10 residential buildings. DEQ required the installation of additional deep soil vapor monitoring points to allow continued evaluation of soil vapor concentrations, as well as to track temporal trends. DEQ calculated SSSLs for inhalation of soil vapor for on-site and off-site construction workers using the same process identified for the indoor air SSCLs in the BRA Addendum (CDM 2012). This process utilized equations developed by USEPA and the DEQ-accepted construction worker assumptions for the amount of time a construction worker is expected to be exposed to contamination (124 days per year for one year). However, upon comparison of the soil vapor data collected from previous investigations, DEQ determined that the shallow soil vapor representative of the construction worker exposure scenario (surface to 10 feet bgs) did not include exceedances of the SSSLs. Although deep soil vapor concentrations exceed SSSLs, on-site and off-site construction workers are not expected to be exposed at this depth. Therefore, DEQ has not retained these SSSLs as SSCLs and has determined that, because the selected treatment alternative will address COC impacts to soil and groundwater and remediation of soil and groundwater will address future concerns regarding potential soil vapor and indoor impacts, SSCLs are not needed for soil vapor.

DEQ will use 25% of the lower explosive limit (LEL; 12,500 parts per million/volume [ppmv]) as the methane level requiring action to be taken to reduce concentrations. Twenty-five percent of the LEL is based on ARM 17.50.1106(1)(a) and (b) that requires the owner or operator of a Class II landfill to ensure that the concentration of methane gas generated by the Facility does not exceed 25% of the LEL for methane.

2.4.4 Indoor Air

The indoor air contaminant concentrations were initially compared to USEPA indoor air regional screening levels (RSLs). The list of indoor air COCs was reduced further by evaluating them against known MWPS Facility contaminants or contaminants identified in soil vapor samples, but not in subslab vapor samples. This approach is consistent with the evaluation of multiple lines of evidence to determine whether VI is occurring. This approach involves evaluating several independent factors that may impact VI, including, but not limited to, analytical data from indoor air, ambient outdoor air, soil vapor, and subslab vapor, building construction, and potential indoor sources (DEQ 2011). Using the identified COCs, DEQ derived residential and commercial SSSLs for the COCs. The derivation employed USEPA residential RSL indoor air risk equations for carcinogenic and non-carcinogenic compounds with DEQ-specific exposure factors (CDM 2012). The more stringent of the carcinogenic or non-carcinogenic screening level was selected as the SSSL for each COC.

As discussed in more detail in the BRA Addendum, given that no additional site-specific data or information was obtained that would change the derived SSSLs, DEQ retained the SSSLs as SSCLs for indoor air for both the residential and commercial worker exposure scenarios (CDM 2012). Although investigation results indicated that the influence of contaminants in soil vapor on indoor air appears to be minimal and does not appear to present a continuous or immediate risk to building occupants, DEQ has included the indoor air SSCLs to assist with verification of successful remediation in the future, should they be needed. **Table 3** provides the SSCLs for each of these scenarios.

# 3. REMEDIAL DESIGN/REMEDIAL ACTION COMPONENTS AND IMPLEMENTATION

The selected remedy for the MWPS Facility is presented in the ROD and summarized in this document (**Section 2**). Implementing the remedy components will include preparing pre-design documents, conducting pre-design investigations, conducting treatability (bench) studies, conducting pilot studies, preparing design documents, and preparing work plans for implementing the remedial actions. Specific components of the design process are discussed in subsequent sections.

## 3.1 Pre-design Investigations, Treatability Studies, and Pilot Studies

Pre-design investigations, bench studies, and pilot studies are often integral components of the remedial design process prior to implementing the remedy. These items are discussed in more detail in the following subsections.

### 3.1.1 Suggested Pre-design Investigation Planning Documents

The following health and safety, quality assurance, and pre-design investigation work plans (PDI work plans) will be submitted to DEQ for review/approval before field activities begin. A summary of the contents of each is provided below.

- Comprehensive Health and Safety Plan (HASP): A comprehensive HASP will be developed prior to initiating field activities. The HASP will be generated in accordance with the Occupational Safety and Health Administration, [OSHA] 29 CFR 1910, and will include provisions for each of the anticipated investigation and remediation activities. The HASP will include a Site Management Plan and a Contingency Plan.
- Quality Assurance Project Plan (QAPP): A QAPP will be individually developed for each portion of the remedial program that requires laboratory analysis. The QAPP will describe the Quality Assurance/Quality Control (QA/QC) procedures to be employed to ensure the integrity and validity of the analytical results from proposed investigation and remediation activities.
- PDI Work Plans: PDI work plans will be submitted for each of the remedy components described in **Section 3.1.2.1** through **3.1.2.7**. Accordingly, the PDI work plans will vary in content and level of detail. As appropriate, these work plans will contain a Sampling and Analysis Plan, and a QAPP.

### 3.1.2 Pre-design Investigation Activities

As part of the remedial design process, additional pre-design investigations are required to a) complete data gaps related to specific areas of the MWPS Facility and management of remediation wastes from these areas, b) optimize the effectiveness of the remedial components (i.e., LTU, ISCO and MNA), and c) design and optimize effective soil treatment and groundwater treatment systems for the MWPS Facility.

Specifically, with respect to data gaps and remedy component design, the ROD states the following for the MWPS Facility:

- Data Gaps
  - While "the data obtained is adequate for DEQ to evaluate and select an appropriate remedy for the MWPS Facility, any data gaps will be evaluated and/or implemented during remedial design." (Part 2, Section 4 of ROD)
  - "The selected remedy includes excavation of PCP-contaminated soils (co-located with petroleum hydrocarbons or dioxin) to the limits of excavation using conventional excavation and earth-moving equipment (actual depth to be determined during remedial design)." (Part 3, Section 2.2 of ROD)
  - "Specifics associated with the design of the excavation and ISCO portions of the remedy will be determined during remedial design and may be different from those used for estimating costs (i.e., specific depths in certain areas, more or different areas targeted with ISCO, multiple injection events for ISCO, etc.)." (Part 3, Section 2.2 of ROD)
  - "Additional data may be collected as part of remedial design to assist in optimizing or refining the selected remedial components." (Part 3, Section 2.2 of ROD)
  - "DEQ may require sampling of this residential yard [1028½ Stoddard Street] during remedial design to obtain accurate dioxin concentrations given the recent demolition activities." (Part 3, Section 2.2 of ROD)
  - "Since the former process area is adjacent to the TFR [Total Fluids Recovery] building, and contaminated soils remain in the former process area, sampling will be necessary during remedial design to determine if demolition of the TFR building is necessary." (Part 3, Section 2.2 of ROD)
  - "Details regarding the location, depth, and volume of soil to be excavated will be more thoroughly described in the remediation plan design documents." (Part 3, Section 2.2 of ROD)
  - "it may be possible to sample this well [the Dickens and Defoe well] as part of remedial design" (Part 3, Section 2.2 of ROD)
- LTU
  - "Treatability testing to optimize enhanced bioremediation may be needed during remedial design." (Part 2, Section 9.1.3 of ROD)
  - "Treatability studies to optimize soil treatment in the LTU to determine site-specific treatment timeframes and to optimize system design may occur as part of remedial design if necessary." (Part 3, Section 2.2 of ROD)
  - "Bench scale testing or pilot testing may be conducted during remedial design to optimize [the LTU] system design. Optimization may include, but is not limited to, determining appropriate amendments, the rate and frequency of adding amendments, and calculating treatment time frames" (Part 2, Section 11.1 of ROD)
- ISCO
  - Concerns regarding generation of byproducts of oxidation "can be addressed during remedial design." (Part 2, Section 9.1.9 of ROD)
  - "Pilot testing may be conducted to optimize [ISCO] system design and determine the most effective oxidant(s) during remedial design. Optimization may include, but is not limited to, an evaluation of different oxidants, oxidant concentration, injection rate and frequency, and spacing of injection points." (Part 2, Section 11.2.3 of ROD)
  - The feasibility of using "direct push methods to directly inject oxidant into the perched groundwater […] may be evaluated during remedial design." (Part 2, Section 11.2.3 of ROD)
- "Pilot tests and/or treatability studies will be conducted to optimize the selected technologies during remedial design, as appropriate." (Part 2, Section 11.1 of ROD)

In addition, a biotreatability bench study and ISCO bench/pilot study were previously performed at the MWPS Facility. While these studies provided useful information, they did not however generate all the required data to complete the remedial design. The biotreatability bench study was conducted to further evaluate specific areas identified during a preliminary bench-scale evaluation completed in 2001. The results of this study are presented in the Final Bench-Scale Biotreatability Study Report (Douglass 2003), which indicates that there is an indigenous PCP-degrading microbial population and that aeration is necessary to promote degradation. The ISCO pilot study determined that ISCO may be able to effectively treat COCs in the vadose zone and groundwater beneath the former treating area. The details of the ISCO pilot study are provided in the Final In-Situ Chemical Oxidation Pilot Test Report (Douglass 2008). A separate bench study for ISCO was presented in the Chemical Oxidation Bench-Scale Treatability Report (Douglass 2009), which indicated reduction of PCP using Cool-Ox™.

Therefore, the following pre-design investigation activities are proposed, which are discussed in further detail in **Sections 3.1.2.2** through **3.1.2.7**:

- Site Features (site survey, etc.)
- Supplemental Investigation/Delineation of the Former Treatment Area
- Waste Characterization of Soil Requiring Off-Site Disposal
- Characterization of Soil for On-Site Reuse
- Geotechnical Investigation
- Ex Situ Biotreatability/Bioaugmentation Study
- Supplemental In-Situ Chemical Oxidation Study

Prior to implementation of these pre-design investigation activities, PDI work plans will be submitted for DEQ review. Upon completion of each pre-design investigation activity, a PDI Report that presents the findings and recommendations will be submitted to DEQ, as applicable and noted below.

#### 3.1.2.1 Site Features

Certain site information needs to be compiled to support the remedy design. A detailed site survey is necessary to establish site topography, location and types of site features and existing ground cover. The survey will also map existing subsurface and aboveground utilities as well as easements.

In addition, site-specific historical meteorological data will be reviewed, if necessary, to optimize the remedy design (e.g., determining operating procedures for the LTU). The historical data to be compiled includes, but is not limited to, temperature, precipitation, and wind velocity and direction.

Lastly, available infrastructure and resources that may be used or incorporated as part of the remedy implementation will be defined. These include sources of water, reagents and materials. Regarding the latter, the physical properties of materials (e.g., gradation, permeability, modified proctor curve) that could be imported as excavation backfill or to construct the LTU will be defined.

These activities will be described, as appropriate, in relevant PDI work plans which will be submitted to DEQ prior to implementation.

#### 3.1.2.2 Supplemental Investigation/Delineation of the Former Treatment Area

PCP concentrations in soil have been documented above the applicable SSCLs within the former treatment area (FTA) of the MWPS Facility (**Figure 8**). However, additional sampling of the FTA is needed to further define the nature and extent of COCs, as described below:

1. Additional soil sampling for PCP is needed as the lateral extent of PCP impacts has not yet been fully delineated to below SSCLs (i.e., <0.27 milligrams per kilogram [mg/kg] in subsurface [>2’] soils).

2. Additional soil sampling for PCP is needed to identify current conditions.
3. Additional soil sampling for other COCs (i.e., dioxin, metals, and petroleum compounds) may also be conducted to verify the nature and extent of impacts above SSCLs and to identify current conditions .
4. Additional PCP groundwater sampling is needed to better delineate and characterize the contaminant plume for ISCO design purposes.

Therefore, investigation of the FTA is proposed to 1) accurately define the area subject to excavation, 2) properly size the construction of the LTU, and 3) better understand the distribution of PCP at depth requiring in situ treatment. A focused PDI work plan which will include soil sampling locations, field screening methods and measurements, sampling methods, and proposed laboratory analyses will be developed for this investigation and submitted to DEQ.

3.1.2.3 Waste Characterization of Soil Requiring Off-Site Disposal

All soil proposed for excavation and off-site reuse and/or off-site disposal (e.g., FTA, methane-impacted soil and ash-impacted soil) needs to be characterized for waste disposal parameters such that the soil meets the criteria of the receiving facility. If the methane-impacted soil does not contain any COCs above SSCLs, this soil may be further evaluated for offsite reuse at a composting facility. In order to avoid stockpiling soil on-site, and instead perform as much "live-loading" into trucks as possible, in situ testing of soil at the site is proposed. A focused PDI work plan which will include soil sampling locations, field screening methods and measurements, sampling methods, and proposed laboratory analyses will be developed for this characterization effort and submitted to DEQ.

During remedial implementation, confirmatory soil sampling will also be performed upon completion of excavation to verify that COCs in soil remaining in place are below SSCLs.

3.1.2.4 Characterization of Soil for On-Site Reuse

Although not included in the ROD, soil proposed to be excavated from the southeastern portion of the SSLLP property and 1028½ Stoddard Street may be evaluated for excavation and onsite reuse as backfill on the western portion of the SSLLP property. However, this soil will first be characterized for all COCs. Any soil proposed for reuse as backfill will meet the leaching to groundwater based SSCLs for all COCs. Additionally, analytical data for all COCs will be compared to the commercial/industrial SSCLs for surface soil and subsurface soil. If the excavated soil does not meet commercial/industrial SSCLs for surface soil, institutional controls would have to be placed on the proposed backfill area to restrict depth of excavations so that soil placed in the excavation does not get moved to the surface. The option of using excavated soil onsite as backfill was not evaluated by Huttig and therefore was not considered in the ROD. Therefore, DEQ has informed Huttig that before such an option would be made available to Huttig, DEQ would evaluate a revision to the ROD, which would likely be in the form of an Explanation of Significant Differences, and would include a public comment period.

In addition, soil from the southeastern portion of the SSLLP property and 1028½ Stoddard Street will be evaluated for organic material and structural suitability (Proctor). If any COCs are detected above SSCLs indicating the soil is not suitable for on-site reuse, additional sampling for waste disposal parameters will likely be necessary to facilitate off-site disposal for a portion, or all, of the soil from the southeastern portion of the SSLLP property and 1028½ Stoddard Street.

If the soil from southeastern portion of the SSLLP property and 1028½ Stoddard Street a) contains no exceedances of the applicable SSCLs (as described above), b) does not contain excessive organic material, and c) is structurally suitable, this soil may be considered for on-site reuse as backfill. Specifically, following removal of the methane-impacted soil from the western portion of the SSLLP

property, the soil from the southeastern portion of the SSLLP property and 1028½ Stoddard Street would be backfilled into the excavation.

In order to avoid stockpiling soil on site, and instead perform as much "live-loading" into trucks as possible, in-situ testing of soil at the site is proposed. A focused PDI work plan which will include soil sampling locations, field screening methods and measurements, sampling methods, and proposed laboratory analyses will be developed for this characterization effort and submitted to DEQ.

During remedial implementation, confirmatory soil sampling will also be performed upon completion of excavation from the southeastern portion of the SSLLP property and 1028½ Stoddard Street to verify that COCs in soil remaining in place are below SSCLs.

3.1.2.5 Geotechnical Investigation

Excavations may be necessary along Scott Street and an existing building structure in the FTA. In order to protect these structures, sheeting and/or shoring systems may be required. As such, a geotechnical investigation of the subsurface materials along the anticipated limits of excavation will be required. It is anticipated that soil borings will be advanced to a depth of approximately 40 feet (i.e., 25 feet below the depth of excavation) and that representative disturbed and undisturbed samples will be collected for geotechnical laboratory testing. It is anticipated that the geotechnical testing would include, at least, grain size distribution, moisture content, bulk density, and unconsolidated-undrained shear strength.

In addition, geotechnical samples will be collected from the area where the LTU is proposed to establish the physical properties of materials (e.g., gradation, permeability, modified proctor curve) to evaluate their suitability for use to construct the anticipated berms of the LTU.

A focused PDI work plan which will include soil sampling locations, field screening methods and measurements, sampling methods, and proposed laboratory analyses will be developed for this investigation and submitted to DEQ.

3.1.2.6 Ex Situ Biotreatability/Bioaugmentation Study

To optimize the ex situ enhanced bioremediation component of the LTU, samples of the soils to be treated need to be collected. Initially, the physical properties of these materials (e.g., soil type and texture, soil moisture content, soil organic matter content, total organic carbon, cation exchange capacity, water-holding capacity, permeability) as well as the soil's nutrient content (total Kjeldahl nitrogen [TKN], ammonia, nitrate, total phosphorous), and pH will be established. In addition, samples will be evaluated for the presence of key microbial groups and enzymes responsible for biodegradation of MWPS Facility COCs. This baseline testing will be used to determine whether amendments are required to enhance natural bioremediation processes.

Bench-scale tests will be performed to evaluate the proposed ex situ bioremediation. Specifically, amendments (e.g. nutrients), water and oxygen (atmospheric air) will be mixed into the PCP- and hydrocarbon-impacted soil replicating the anticipated operation of the LTU. The bench-scale testing will include appropriate controls to monitor the effectiveness of the treatment. These will include sampling and analysis of key parameters (e.g., pH, nitrate, phosphate, COCs, key microbial group counts, moisture content) at specified time frames. In addition, bench-scale testing may also be performed to evaluate the potential of using bioaugmentation to accelerate the biodegradation of PCP- and dioxin-impacted soil. Collectively, the data gathered as part of this study will be used to (a) optimize the types, rate, and frequency of amendment addition; (b) estimate remedial time frames; and (c) define a monitoring plan that will be used to evaluate the effectiveness of the treatment system.

A focused PDI work plan which will include soil sampling locations, field screening methods and measurements, sampling methods, and proposed laboratory analyses will be developed for this bench-scale biotreatability/bioaugmentation study and submitted to DEQ.

3.1.2.7 Supplemental In Situ Chemical Oxidation Study

The selected remedy at the MWPS Facility includes ISCO using Cool-Ox™ unless a different oxidant that does not generate undesirable by-products is identified during remedial design. In order to provide data for full-scale remedial design, as well as to better verify and quantify the effectiveness of ISCO for the MWPS Facility, a phased approach will be used for implementation of the ISCO remedy. First, a bench-scale treatability study will be performed at a laboratory under a controlled environment. Then, a pilot study will be conducted within the source area at the MWPS Facility. Upon completion of the pilot study, recommendations will be provided to DEQ regarding full-scale implementation of the optimized ISCO remedy.

Prior to conducting ISCO bench testing, available pre-design investigation data will be reviewed to calculate the mass of adsorbed (saturated and unsaturated) and dissolved-phase contaminants within the target treatment area(s) as well as the theoretical stoichiometric demand of oxidants required to reduce the mass of contaminants to the extent practicable. It is anticipated that additional borings will be required to collect soil and groundwater samples to better delineate and characterize the contaminant plume. Typical sampling data required for evaluation of chemical oxidation technologies for soil and groundwater specific to COCs present at the MWPS Facility will be analyzed, as summarized in **Table 4**. It is anticipated that the sampling for this PDI will be completed as part of the activities described in **Section 3.1.2.2**.

As part of previous studies at the MWPS Facility, bench-scale and pilot scale studies were conducted using permanganate. Although the bench-scale study indicated that permanganate could be effective in rapidly oxidizing PCP in both soil and groundwater, the pilot study demonstrated an increase in concentrations of VPH fractions and metals in the perched groundwater (Douglass, 2009). Given the presence of petroleum hydrocarbons as a co-contaminant, permanganate will not be further evaluated. In addition, a follow-up bench scale study was performed using Cool-Ox™ and activated persulfate or Klozur™; however, there were several problems (e.g., the untreated control experienced as much reduction in PCP and dioxin/furan concentration as the treated soil) and the bench scale test results were inconclusive (Douglass, 2009). Therefore, as discussed below, Huttig recommends that a bench scale test be performed using several oxidants, including Cool-Ox™.

Once the mass of contaminants and theoretical stoichiometric demand of oxidant have been estimated, bench-scale laboratory treatability testing will be performed to quantify treatment parameters. If an alternative oxidant to Cool-Ox™ is identified which meets DEQ requirements, it may also be tested at this time, with DEQ approval. The following oxidants are currently under consideration for bench-testing:

- Cool-Ox™;
- Alkaline and hydrogen peroxide activated sodium persulfate;
- Modified Fenton's Reagent (i.e., catalyzed hydrogen peroxide) with iron as a catalyst and chelating agent; and
- Hydrogen Peroxide with stabilizers (e.g., citrate and phosphate) and natural iron as catalyst.

The following are the specific goals of the ISCO bench testing:

- to measure soil oxidant demand/oxidant persistence for alkaline and hydrogen peroxide activated persulfate;

- to assess effect of treatment on COCs for each oxidant;
- to evaluate the effect of each oxidant on secondary water quality parameters and production of potential byproducts (e.g., metals);
- to evaluate the site soils to attenuate the metals to background or baseline conditions;
- to estimate parameters for pilot-scale and full-scale implementation such as oxidant concentrations, etc.;
- to measure the longevity of Cool-Ox™, catalyzed hydrogen peroxide and hydrogen peroxide with stabilizers in the presence of site soil;
- to determine whether hydrogen peroxide should be applied as a single high dose or as multiple low doses; and
- to assess the ability of soil to buffer changes in pH associated with the use of activated persulfate and Cool-Ox™.

The amount of oxidant required is a function of not only the dissolved contaminant levels, but also the absorbed contaminants, dissolved- and solid-phase reduced minerals, and naturally occurring organic materials. Therefore, total oxidant demand testing will be required to ensure successful chemical oxidation implementation. The ISCO bench testing will also be used to evaluate the potential for metals mobilization.

A focused PDI work plan which will include soil sampling locations, field screening methods and measurements, sampling methods, and proposed laboratory analyses will be developed for ISCO bench testing and submitted to DEQ.

Based on the results of the ISCO bench testing, a pilot study may be conducted to evaluate application of ISCO in the proposed treatment areas and to gather data (e.g., radius of influence, volume of oxidant required, attenuation of COCs achieved) for full-scale design and implementation of ISCO remediation at the MWPS Facility. It is anticipated that a focused PDI work plan for the ISCO pilot study will be submitted to DEQ that would, at a minimum, include the following information:

- The horizontal and vertical extents of the target treatment area(s)
- Description of the delivery system and application method(s)
- The proposed oxidant/treatment reagent and anticipated volume required
- The expected time duration and application schedule.

### 3.2 Remedial Design

Remedial design is required to efficiently and effectively implement the final remedy at the MWPS Facility. The remedial design will be prepared upon completion of the pre-design activities based on the results of the pre-design activities described above. Based on the ROD and existing information, the remedial design is expected to include the following:

a) Excavation and off-site disposal of surface and subsurface soils exceeding SSCLs for COCs other than PCP throughout the MWPS Facility, excluding the FTA
b) Excavation and ex situ enhanced bioremediation in an on-site LTU for surface and subsurface PCP-impacted soil exceeding SSCLs in the FTA (as much as can be reasonably excavated using standard excavation equipment)
c) ISCO of deep PCP-impacted soils in the FTA (below the depths that can reasonably be reached using standard excavation equipment)
d) ISCO of groundwater impacted with PCP, 2-methylnaphthalene, petroleum hydrocarbons, 1,2,4-trimethylbenzene, and dioxin exceeding SSCLs
e) Institutional controls (e.g., land use and groundwater use restrictions) as part of implementation of the remedy
f) Engineering controls (e.g., fencing, dust suppression) during implementation of the remedy

g) Long-term monitoring (including groundwater, soil vapor and air monitoring) to evaluate the effectiveness of the remedy, to determine when SSCLs are achieved, and to ensure the ongoing protection of public health, safety and welfare and of the environment. If the ISCO treatment is unable to reduce dioxin and metals concentrations to the SSCLs and the plume is not expanding, then continued monitoring for MNA parameters, metals, and dioxin will be conducted to confirm the metals and dioxin concentrations are being reduced to eventually meet SSCLs.

### 3.2.1 Remedial Design Components

A brief discussion of the required design considerations for each of the remedial components is provided below.

#### 3.2.1.1 Excavation and Off-site Disposal (Soil and Ash)

Design for excavation and off-site disposal will require determination of total volumes to be removed, final off-site disposal location, characterization required for disposal, determination of feasibility of recycling of methane-producing soil (if feasible), transport procedures and a tentative schedule for excavation. Lastly, sloping/shoring/benching of excavation walls (if necessary) will be addressed in the FTA.

#### 3.2.1.2 LTU Design (Soil)

The ROD provides for construction of an LTU within a CAMU on the western portion of the SSLLP property (approximate location provided on **Figure 10**) to treat approximately 4,400 cubic yards of impacted soil from the FTA. As required by the ROD, the CAMU will be designed in accordance with 40 CFR 264.552(e)(3)(i) to include a composite liner (i.e., a flexible membrane liner (FML) with a thickness of at least 30-mil overlying, unless the FML is high density polyethylene (HDPE) in which case the thickness must be at least 60 mil thick, and two feet of compacted soil with a hydraulic conductivity of no more than $1x10^{-7}$cm/s) and a leachate collection system that will maintain less than 30 centimeters of leachate over the liner. The LTU may also include a surface irrigation system. Based on the PDI results, the LTU will be sized to accommodate the anticipated excavation volume. The MWPS Facility topography will be used to create a grading plan for the base of the LTU. If the geotechnical PDI results indicate that MWPS Facility soils are suitable for construction of the berms of the LTU, these will be incorporated into the design. Otherwise, the LTU will be designed with specified fill to be imported. The design of the LTU will also consider soil erosion and sediment control measures and the sequence of construction to ensure the LTU is constructed before impacted materials are excavated. Leachate will be collected and stored for either recirculation into the LTU or off-site disposal, depending on the properties of the leachate and the irrigation needs.

Remediation within the LTU will consist of land farming, which involves enhanced bioremediation of PCP-, dioxin-, and petroleum hydrocarbon-impacted soils. Land farming involves promoting aerobic biodegradation of the COCs to sustain aerobic conditions within the LTU. Aerobic conditions will be promoted by either turning over the soil (i.e., tilling) so that the soil can be exposed to the air on a routine basis or by installing a perforated piping network within the soils to be treated. The piping network will be used to inject air and/or nutrients. Nutrient amendments can be also applied to the LTU via a spray irrigation system. The selected method to promote aerobic conditions, irrigate soils, and add nutrients will be defined based on the results of the pre-design activities.

Once treated, soils that meet SSCLs for all COCs (other than dioxin) will be excavated for disposal off-site[1]. The LTU design will include a construction plan and a decommissioning plan.

[1] It is possible that a Contained-In Determination could be sought for soil that exceeds Leaching to Groundwater SSCL for PCP but is lower than Universal Treatment Standards and the Direct Contact SSCL for PCP assuming no other COCs exceed SSCLs.

3.2.1.3 In Situ Chemical Oxidation Design (Soil and Groundwater)

ISCO was selected in the ROD for treatment of the deeper subsurface soil, perched groundwater, and, if necessary, deeper groundwater contained in the Missoula Aquifer. The ISCO remedy design will be completed based on the results of the pre-design investigations, bench-scale treatability study and pilot study. The design will define the dosages, the anticipated number of applications, the delivery method, and the application techniques based on the oxidant(s) selected. Oxidant management, handling, mixing, and storage procedures and requirements will also be defined as part of the ISCO design. It is anticipated that aqueous-phase applications will be used to deliver oxidant to the subsurface; however, if an installed system is to be used instead, the components of such system will be defined in the ISCO design.

3.2.1.4 Performance Monitoring (Soil and Groundwater)

Soil monitoring will be performed in the LTU to establish the effectiveness of the LTU to biodegrade the COCs and to optimize the treatment system as environmental conditions change. It is anticipated that the following parameters will be monitored:

- Moisture content via gravimetric method, soil moisture blocks, or other appropriate method
- Oxygen level by soil respirometry (e.g., EAR-800S or similar technique)
- pH
- Nutrient levels (e.g., TOC, TKN, ammonia, total phosphorous)
- COC concentrations
- Key microbial populations or enzymes (genes) responsible for biodegrading site COCs (if necessary - i.e., in the event that degradation rates within the LTU are not meeting design criteria)

Based on the monitoring results, the following options may be used to adjust the conditions within the LTU:

- Low moisture content: adjust via irrigation or spraying system.
- Low oxygen levels in soil: increase aeration by more frequent tilling or increase the air injection rate.
- Low pH: adjust pH to be near neutral via limestone, agricultural lime, sodium hydroxide or similar amendment.
- Low nutrient levels: amend with limiting nutrient (e.g., nitrogen and phosphorous, ammonium diphosphate, urea).
- Low microbial populations or non-detect key microbial populations: consider bioaugmentation based on bench-scale testing results.

Similarly, soil and groundwater monitoring will be performed in the ISCO treated areas to establish the effectiveness of the treatment process and define whether additional applications or other actions are warranted. The specific parameters to be monitored will be defined based on the type of oxidant used and will be described in the work plan for this remedy component.

## 3.3 Remedy Design Reports, Plans, and Specifications

The design investigation results will be evaluated and analyzed, and the information will be compiled into a series of reports and plans as discussed below.

3.3.1 Suggested Remedial Design Documents

The completed remedial design will be a series of engineering reports, documents, specifications, and drawings that detail the steps to be taken during remedial action activities to meet the goals established in the ROD. The documents discussed below are anticipated to complete the remedial design at the MWPS Facility.

3.3.1.1 Remedial Design Investigation Report(s)

Remedial design investigation report(s) will include remedial design investigation results as discussed in **Section 3.1.2**. Each report will include the results of the investigations conducted, including bench and/or pilot studies. These results will assist in rectifying data gaps, to further refine the site conceptual model and establish preliminary designs for each remedy component.

3.3.1.2 Conceptual Design Report

It is intended that design of the proposed remedial activities to be conducted at the site will be provided in a single document. The conceptual design report (CDR) (approximately 30% complete) typically presents the conceptual design criteria and includes conceptual plans, a conceptual construction quality control and quality assurance plan (CQC/QA Plan) for all the remedial components, and a conceptual remedial action schedule. The CDR is intended to allow DEQ to provide comments to ensure that the design meets the objectives of the ROD.

3.3.1.3 Preliminary Design Report

The preliminary design report (PDR) (approximately 50% complete): (a) expands on the CDR incorporating revisions based on review comments; (b) presents the design criteria, basis of design, and best management practices (BMPs); and (c) includes preliminary plans, a list of technical specifications, preliminary CQC/QA Plan for all the remedial components, preliminary remedial action schedule, and a preliminary operation, maintenance and monitoring (OM&M) Plan. In addition, to facilitate DEQ review and allow simultaneous implementation of various remedy components, the PDR will include applicable remedial action work plans detailed in **Section 3.3.2**. The PDR is intended to allow DEQ to provide comments and incorporate potential major revisions prior to finalizing the design. Upon incorporating revisions, the PDR will be used for permitting purposes.

3.3.1.4 Final Design Report

The final design report (FDR) (100% complete): (a) expands on the PDR incorporating revisions based on review comments; (b) includes detailed plans and technical specifications, and final versions of the CQC/QA Plan, remedial action schedule and OM&M Plan; and (c) provides an engineer's cost estimate for the implementation of the remedy. The FDR will include copies of permits and access agreements, where applicable. As with the CDR and PDR, it is intended that design of the proposed remedial activities to be conducted at the site will be provided in a single document. Upon DEQ approval of the FDR, it will be used for contractor procurement purposes, and subsequently for remedial implementation.

3.3.2 Remedial Action Work Plans

The remedial action work plans are specific, detailed plans that outline each individual aspect of the designed remedy. Each work plan also includes general project issues such as health and safety, utility clearance, site security, land surveying, and coordinating with existing site operations. Each work plan will include a table explaining compliance with the applicable ERCLs for that activity. Based on the information gathered during the remedial design phase, the following implementation work plans may be required as part of the remedial action. Additional implementation work plans may also be required as the remedial action is implemented. As applicable, the remedial work plans will be attached to the FDR such that the DEQ can review/approve this all at once.

3.3.2.1 Soil Remedy Work Plans

Soil remedy work plans may be combined into one document or developed individually for ease of phased implementation. Soil remedy work plans may include the following:

- Soil Excavation Work Plan: It is anticipated that the soil excavation work plan will include items such as excavation procedures, limits of soil to be excavated, segregation procedures for soils with different contaminants (if necessary), ambient air monitoring, dust control, destination of excavated soil (i.e., disposal, LTU, recycling, etc.), transportation procedures including haul

routes, personnel and equipment decontamination, confirmation sampling procedures and frequency, utility location and protection, and sloping/shoring/benching of excavation walls (if necessary). The work plan will also include procedures to properly abandon monitoring wells within the excavation area.

- LTU Construction Work Plan: The LTU construction work plan will include information on backfilling, compacting, and grading the excavation where the LTU will be placed. It will include details on the liner installation, leachate collection system installation, berms, irrigation system installation (if necessary), access road(s), fencing, soil placement in the LTU, and other construction details. It will also include details on testing the integrity of the liner system and discuss compliance with RCRA requirements for the LTU.

- Monitoring Well Installation Work Plan: Monitoring wells will likely be installed following soil remedy implementation, as some existing monitoring wells will likely be abandoned as they will conflict with the excavation. Monitoring wells may also be installed as part of the ISCO remedy for groundwater. The monitoring well installation work plan will include descriptions of the monitoring well construction details, locations, drilling methods, soil sampling (if necessary), and completion details.

- ISCO Work Plan: The ISCO work plan will include information on the oxidant(s) selected, application method(s), application areas and rates, mixing instructions, and application intervals. The delivery system and other details will be included in the work plan. The work plan will include information on monitoring during the applications and conditions that would necessitate additional application events, if necessary. The work plan will include contingency plans for drilling problems, application problems, and other problems.

- Long-Term Monitoring Work Plan: The long-term monitoring plan will include details on the monitoring well network, sampling parameters, sampling frequency, monitoring of institutional controls, inspections of the LTU, and operational procedures for the LTU. The LTU procedures will include information on determining adequate remediation of each lift of soil, sampling parameters and procedure, tilling procedures, nutrient and water application, leachate management, and dust and odor control.

### 3.4 Remedy Implementation

Once each portion of the overall remedy has been fully planned, approved, and scheduled, work will begin. During the remedy implementation, care will be taken to properly communicate proposed activities to stakeholders, plan further necessary actions, and comply will ERCLs. These components are described in more detail in the following subsections.

In order to optimize the scheduling of remediation at the MWPS Facility, some components of the remedy (i.e., excavation of methane/dioxin/ash soils) will be phased sooner than other components (i.e., ISCO and LTU) that require additional planning or approval. A preliminary remedial design/remedial action schedule is presented as **Figure 11**. This schedule shows activities that may be performed concurrently, as well as activities that must be completed before other activities may begin. Since many components of the remedies are related or take place in the same or nearby locations, it is important to adequately plan the implementation of the remedies in advance, to avoid unnecessary costs and delay of remediation. This schedule may be modified as additional information is obtained during the data collection activities described in this work plan.

3.4.1 Institutional Controls Implementation

The selected remedy partially relies on the placement of DEQ-approved restrictive covenants on some of the properties that make up the MWPS Facility to limit the future use of portions of the WWW property, City property, and western portion of the SSLLP properties to commercial/industrial and to limit the use of the City Park to recreational. (These restrictive covenants are not needed on the existing residential property east of Scott Street or on the eastern portion of the SSLLP property). Groundwater use will be regulated in these restrictive covenants or a controlled groundwater area (or both) to prohibit installation of non-remediation wells at the Facility until SSCLs for groundwater are met. On the WWW property, irrigation will be prohibited until SSCLs are met (or DEQ otherwise approves it) to ensure that the addition of irrigation water does not disrupt or otherwise change conditions during treatment. Part of the western portion of the SSLLP property will also have use restrictions for a short time to allow treatment of soils in an LTU and may have restrictions if soil from the east side of the SSLLP property is re-used for backfill in this area. These restrictive covenants will be in effect until DEQ determines they are no longer needed to ensure protection of public health, safety, or welfare or the environment.

3.4.2 Remedial Action Communications and Progress Reports

Communication between DEQ, Huttig, consultants/contractors performing the remedies, the public, and other affected parties will be important. It is anticipated that the following are types of communication will be planned for and described in a Communications Plan that will be submitted to DEQ for approval:

- Communication with DEQ: Huttig will communicate with DEQ to ensure remedial actions meet the requirements of CECRA and the ROD.
- Meetings with Affected Parties: Meetings with affected parties (e.g., landowners, operators, utilities) should be scheduled in advance of the remedial action. Communication with these parties will likely make the remedial action easier and reduce conflicts with the affected parties. Huttig will coordinate communication regarding remediation activities with affected landowners/lessees (as defined in **Section 3.4.3.1**), utilities (as defined in **Section 3.4.3.2**), the local government (as defined in **Section 3.4.3.3**), as well as other interested parties (as described in **Section 3.4.3.4**).
- Progress Reports: While actively implementing components of the overall remedy (i.e., when remedial work is being completed at the MWPS Facility), weekly status memos should be submitted by the construction contractor or oversight consultant to Huttig and DEQ. The weekly memos should summarize the components of the remedy completed during the previous week. Monthly reports should be submitted by the construction contractor or oversight consultant to Huttig and DEQ throughout remedial design and remedial action. The monthly reports should include a summary of the activities during the previous month, problems encountered and solutions, budget status, and anticipated activities for the next month.
- Long-Term Monitoring Reports: Reports should be prepared by the consultant responsible for LTM. The frequency will depend on the monitoring frequency and quantity of data and a schedule approved by DEQ. The reports will contain the data collected during the report period, analysis of the data, progress of LTU operations, and recommendations.
- Communication with the Public: DEQ will keep the public informed about MWPS Facility activities as necessary.

3.4.3 Remedial Action Coordination

Once the RAWP is approved, a flow chart depicting tasks associated with remedial actions, and a general timeframe for coordination tasks to be performed, will be prepared. Coordination with interested parties, affected landowners/lessees, and local governments will be critical to the success

of the remedial action, and has the potential to reduce project costs through increased efficiencies. Discussion of the coordination required with each group is included in the following sections.

3.4.3.1 Affected Landowners/Lessees

Affected landowners west of Scott Street include the City of Missoula, WWW, and SSLLP, as shown on **Figure 2**. WWW leases portions of their property; current lessees will be identified and updated by WWW. The owner of 1028½ Stoddard Street will be affected and it is possible that other private landowners east of Scott Street could be affected by the remedy; however, which additional lots, if any, will not be known until the remedial design is complete. Each of these entities may be affected in some way by the remedial action. Huttig will minimize disruptions to the residents and ongoing businesses to the extent practical.

Currently WWW operates a beverage distributing business on the southern portion of the MWPS Facility. The City uses the central portion of the MWPS Facility to house and operate City maintenance equipment and workshops, and a three-acre area on the eastern portion of the MWPS Facility is currently used as a City park. The vacant northern portion of the MWPS Facility is owned by SSLLP. All three landowners and any affected lessees on the WWW property will be notified prior to implementing on-site work activities that affect their respective properties.

3.4.3.2 Affected Utilities

A Mountain Water Company (MWC) water supply line crosses the FTA, but MWC is not sure of its exact location. Huttig has had preliminary discussions with MWC about the best method for locating this line prior to sampling and remediation. Huttig and MWC will coordinate the location and, if necessary, the removal, replacement, and/or relocation of this line, the details of which will be included in the appropriate work plans. Other utility locations will be determined during the detailed site survey proposed above in **Section 3.1.2.1**.

3.4.3.3 Local Governments

Coordination is anticipated with the Missoula City-County Health Department and the City Engineer (traffic and utilities). Each of these parties will likely have interest in ongoing remedial actions. Huttig will send draft versions of all work plans and reports electronically in pdf version and a hard copy of all final work plans and reports directly to the Missoula City-County Health Department concurrently with its submittals to DEQ.

3.4.3.4 Other Interested Parties

Other interested parties include the North-Missoula Community Development Corporation, home owners and nearby residents who live on Scott Street and surrounding neighborhoods, emergency response services, and other businesses in the area that may be affected by remedial activities.

3.4.4 Remedial Action Monitoring

3.4.4.1 Air Monitoring

Air monitoring will be required during soil excavation, LTU construction, and initially during LTU operation. Monitoring will likely focus on the air site workers are exposed to as well as ambient air in the area of the MWPS Facility. Air samples may be collected both in areas where site workers are located and near the MWPS Facility boundaries. If air emission limits are placed on the LTU operations, air samples would be collected and analyzed. If LTU operations exceed allowed limits, modifications to operations will need to be implemented. These might include increased irrigation during hot days, thinner lifts, or less frequent tilling of soil.

3.4.4.2 Groundwater Monitoring

Groundwater monitoring will be conducted following the soil and groundwater remedies, according to the LTM plan, which will be developed during the design phase. Frequency, analytes, and wells

monitored will be evaluated periodically and adjusted to optimize monitoring based on reductions in contaminant concentrations or areas of impacts.

#### 3.4.4.3 Soil Monitoring

Soil monitoring will be performed during the soil remedy, primarily as confirmation sampling. Confirmation sampling should be performed after excavation to confirm that remaining contamination is below SSCLs. The frequency, location, and procedure for sample collection will be contained in the soil remedy work plan and the soil remedy Task-Specific Construction Quality Assurance Plan. Soil monitoring for off-site disposal or recycling (methane-producing soil) may also be performed. Periodic monitoring of soil in the LTU will be required. This monitoring should be performed to determine if each lift has reached SSCLs.

### 3.4.5 Waste Management

Several types of waste may be generated during the remedial design investigation and the remedial action. Wastes include impacted water from purging and/or decontamination, impacted soil from drilling and other investigation activities, and disposable field equipment/supplies. Each work plan will contain a section on waste management pertaining to the wastes that will be generated in each phase of investigation and remediation.

### 3.4.6 Remedial Action Oversight and Regulatory Requirements

#### 3.4.6.1 Oversight

DEQ and/or DEQ's consultants will be providing oversight of the investigations, remedial action, and design activities as dictated in the ROD. DEQ will be notified at least 10 days prior to commencing any field activities at the MWPS Facility.

#### 3.4.6.2 Permits and Other Requirements

Regulatory permits and associated requirements will be largely dependent on the final design and implementation strategies of the remedial actions to be implemented at the MWPS Facility. While this section identifies key permits and regulatory requirements anticipated in order to enhance design and implementation coordination, this section is not intended to be an exhaustive listing of required permits nor include all possible local permit requirements. Applicable regulatory and permit requirements will be identified based on the final design and implementation methods to ensure compliance. Additional state and federal regulations which are applicable or relevant are listed in the ERCL table contained in **Appendix A**.

#### 3.4.6.3 Storm Water Discharge Permits

Construction and other land disturbance activities of one acre or greater are required to obtain permit coverage under the General Permit for Storm Water Discharges Associated with Construction Activities, referred to as the General Permit, which is administered by DEQ under its Montana Water Quality Act authority. Land disturbance activities of less than one acre may also be required to obtain coverage under the General Permit if the activity is part of a "larger common plan of development or sale."

#### 3.4.6.4 Air Emissions Permits

Based on the remedial activities currently proposed, an air emission permit should not be required. Remedial activities performed at the MWPS Facility should not cause an exceedance of ambient air standards. Emissions of particular concern include particulate matter (PM) and PM-10 during soil disturbance activities. Design of the implementation methods should include BMPs to prevent emissions during remedial implementation and a detailed monitoring and testing program to both ensure compliance with ambient air emission standards and protect worker health and safety. The Clean Air Act provides limitations for carbon monoxide, hydrogen sulfide, nitrogen dioxide, sulfur dioxide, and ozone, but significant discharges of these compounds are not expected based on the selected alternative described in the ROD.

3.4.6.5 Hazardous Waste Permits

The Montana Hazardous Waste Act incorporates federal regulations 40 CFR Part 270, which establishes a permit program for generators and transporters of hazardous waste, and owners or operators of hazardous waste treatment, storage, or disposal facilities. Additional hazardous waste regulatory requirements will also apply to the remedial actions involving the generation, transportation, treatment, or disposal of hazardous wastes. Additional state and federal regulations that may be applicable are listed in the ERCL table contained in **Appendix A**.

3.4.6.6 Underground Injection Permits

The selected remedial alternatives contained in the ROD include treatment using ISCO to reduce groundwater contaminant concentrations. The USEPA Underground Injection Control Program set forth by 40 CFR 144 and 146 establishes standards and criteria for the injection of substances into aquifers. It is anticipated that compliance with these regulations may require a USEPA injection permit or authorization prior to implementation.

3.4.7 Remedial Design/Remedial Action Schedule

A preliminary schedule for the remedial design and the remedial action is included as **Figure 11**. This schedule includes key components such as remedial design and remedial action deliverables and remedial action tasks. The remedial action components of the schedule in particular are not definite and could be altered significantly. Similarly, the duration of the remedial action is preliminary; the actual duration of the remedial action will depend on final design components, contractor capabilities, weather, unforeseen events, and other variables.

3.4.8 Long Term Monitoring and Maintenance

LTM and maintenance will likely consist of monitoring of institutional controls, LTU operations, monitoring of groundwater contaminant concentrations including MNA parameters, and inspections and maintenance of systems such as the leachate collection systems, LTU liners, and other components. LTM will be performed according to the LTM Plan, to be developed during the remedial design.

3.4.9 Groundwater, Soil Vapor, and Air Monitoring

Monitoring may include sampling some or all of the existing monitoring well network, new monitoring wells, existing nearby irrigation wells, commercial/industrial wells, and/or public water supply wells. The monitoring wells and other wells that will be included in the LTM well network will be determined during remedial design and implementation. Initially, select wells will be monitored semiannually during high and low groundwater elevations to monitor contaminant levels and evaluate the effectiveness of the cleanup. The monitoring frequency will be reevaluated regularly and may be changed as DEQ determines appropriate. Select wells may be monitored for MNA parameters at a frequency determined appropriate by DEQ. Water levels in monitoring wells will also be measured semiannually during high and low groundwater elevations.

Soil vapor monitoring from existing and newly installed monitoring points will be conducted to confirm the effectiveness of the soil and groundwater remedies in reducing soil vapor concentrations. The indoor air SSCLs (**Table 3**) can be used to verify successful remediation of soil vapor and indoor air impacts associated with the MWPS Facility.

Air monitoring will be conducted, as needed, during implementation of the remedy to ensure protection of public health, safety, and welfare, and the environment. Dust suppression will also be used, as necessary, to ensure that particulate levels do not become elevated. Details of these activities will be developed during remedial design.

## 3.5 Construction Completion Reports

Following completion of each portion of the overall remedy (i.e., excavation, LTU, ISCO, etc.), covered under separate remedial design documents, a Construction Completion Report will be

generated. The report will include the following information: a description of the executed phase of the remedy; as-built construction documentation; confirmatory sampling data; waste disposal documentation; and other relevant information.

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State of Washington Department of State, Missoula White Pine Sash Company, Amended Articles of Incorporation, August 18, 1921.

State of Washington Department of State, Missoula White Pine Sash Company, Articles of Merger (merged with Huttig Sash & Door Company), July 30, 1971.

WWW Investments, LLC (WWW). 2011. Email to Colleen Owen with Attachment Regarding Current Drainage Sump Locations. June 22.

**Table 1**
**Site-Specific Cleanup Levels for Groundwater**
Remedial Action Work Plan
Missoula White Pine Sash Facility
Missoula, MT

| Contaminant of Concern | Units | SSCL | Source of SSCL |
|---|---|---|---|
| **VOCs/SVOCs** | | | |
| 2-Methylnaphthalene | µg/L | 27 | EPA Tapwater |
| 1,2,4-Trimethylbenzene | µg/L | 15 | EPA Tapwater |
| Pentachlorophenol | µg/L | 1 | DEQ-7 |
| **Metals** | | | |
| Arsenic | µg/L | 10 | DEQ-7 |
| Barium | µg/L | 1,000 | DEQ-7 |
| Iron | µg/L | 11,000 | EPA Tapwater |
| Lead | µg/L | 15 | DEQ-7 |
| Manganese | µg/L | 320 | EPA Tapwater |
| **Petroleum Hydrocarbons** | | | |
| C9-C10 Aromatics | µg/L | 210 | Derived based on DEQ-7 |
| C9-C12 Aliphatics | µg/L | 700 | Derived based on DEQ-7 |
| C11-C22 Aromatics | µg/L | 210 | Derived based on DEQ-7 |
| C9-C18 Aliphatics | µg/L | 700 | Derived based on DEQ-7 |
| **Dioxins/Furans** | | | |
| 2,3,7,8-TCDD TEQ (2005 TEFs) | pg/L | 2 | DEQ-7 |

**Notes:**

Source: Table 1, Record of Decision, February 2015

Derivation of groundwater SSCLs is presented in Appendix I of BRA Addendum, December 2012

SSCL - Site-specific cleanup level

µg/L - micrograms per liter

pg/L - picograms per liter

**Table 2**
**Site-Specific Cleanup Levels in Soil**
Remedial Action Work Plan
Missoula White Pine Sash Facility
Missoula, MT

| Contaminant | Residential (surface soil) | Commercial/Industrial (surface soil)[1] | Construction Worker (subsurface soil) | Leaching (surface soil) | Leaching (subsurface soil) |
|---|---|---|---|---|---|
| Pentachlorophenol | 8.5 mg/kg | 45 mg/kg | NA | 5.69 mg/kg | 0.27 mg/kg |
| C9-C12 Aliphatics | 500 mg/kg | 4,700 mg/kg | NA | NA | NA |
| C9-C10 Aromatics | 2,400 mg/kg | NA | NA | NA | NA |
| Dioxins/Furans | 40 ng/kg | 310 ng/kg | 470 ng/kg | NA | NA |
| Cadmium | NA | NA | NA | 1.82 mg/kg | NA |
| 1-methylnaphthalene | NA | NA | NA | 0.93 mg/kg | 0.05 mg/kg |
| 2-methylnaphthalene | NA | NA | NA | 60.9 mg/kg | 3.02 mg/kg |
| Hexachlorobenzene | NA | NA | NA | 0.26 mg/kg | 0.01 mg/kg |

**Notes:**

Source: Table 2, Record of Decision, February 2015

SSCL - Site-specific cleanup level

Surface soil - surface to two feet below ground surface

Subsurface soil - greater than two feet below ground surface

mg/kg - milligrams per kilogram

ng/kg - nanograms per kilogram

NA - Not available

[1]Note: Per Section 6.1.1 of the 2012 Baseline Risk Assessment (BRA) Addendum, "Calculated cancer and noncancer risk levels are below acceptable limits for the following populations: ... Current and future commercial/industrial workers on the Scott Street property (exposure to surface soil). ... Because risk estimates are below risk limits for these exposure scenarios, it is not necessary to calculate SSCLs for these media and receptor populations." Therefore, commercial/industrial surface soil SSCLs do not apply to the SSLLP property.

**Table 3**
**Site-Specific Cleanup Levels for Indoor Air**
Remedial Action Work Plan
Missoula White Pine Sash Facility
Missoula, MT

| Contaminant of Concern | Units | Residential SSCL | Commercial SSCL |
|---|---|---|---|
| **VOCs** | | | |
| Benzene | $\mu g/m^3$ | 0.7 | 3.5 |
| Ethylbenzene | $\mu g/m^3$ | 2.2 | 11 |
| Naphthalene | $\mu g/m^3$ | 0.16 | 0.8 |
| Tetrachloroethene | $\mu g/m^3$ | 21 | 105 |
| Trichloroethene | $\mu g/m^3$ | 0.96 | 6.7 |
| Xylenes (m&p and o)[1] | $\mu g/m^3$ | 104 | 438 |
| 1,2,4-Trimethylbenzene | $\mu g/m^3$ | 7.3 | 31 |
| **Petroleum** | | | |
| C5-C8 Aliphatics | $\mu g/m^3$ | 313 | 1,314 |
| C9-C10 Aromatics | $\mu g/m^3$ | 104 | 438 |
| C9-C12 Aliphatics | $\mu g/m^3$ | 52 | 219 |

**Notes:**

Source: Table 3, Record of Decision, February 2015

[1] When evaluating these COCs, the concentrations are summed and compared to the appropriate SSCL.

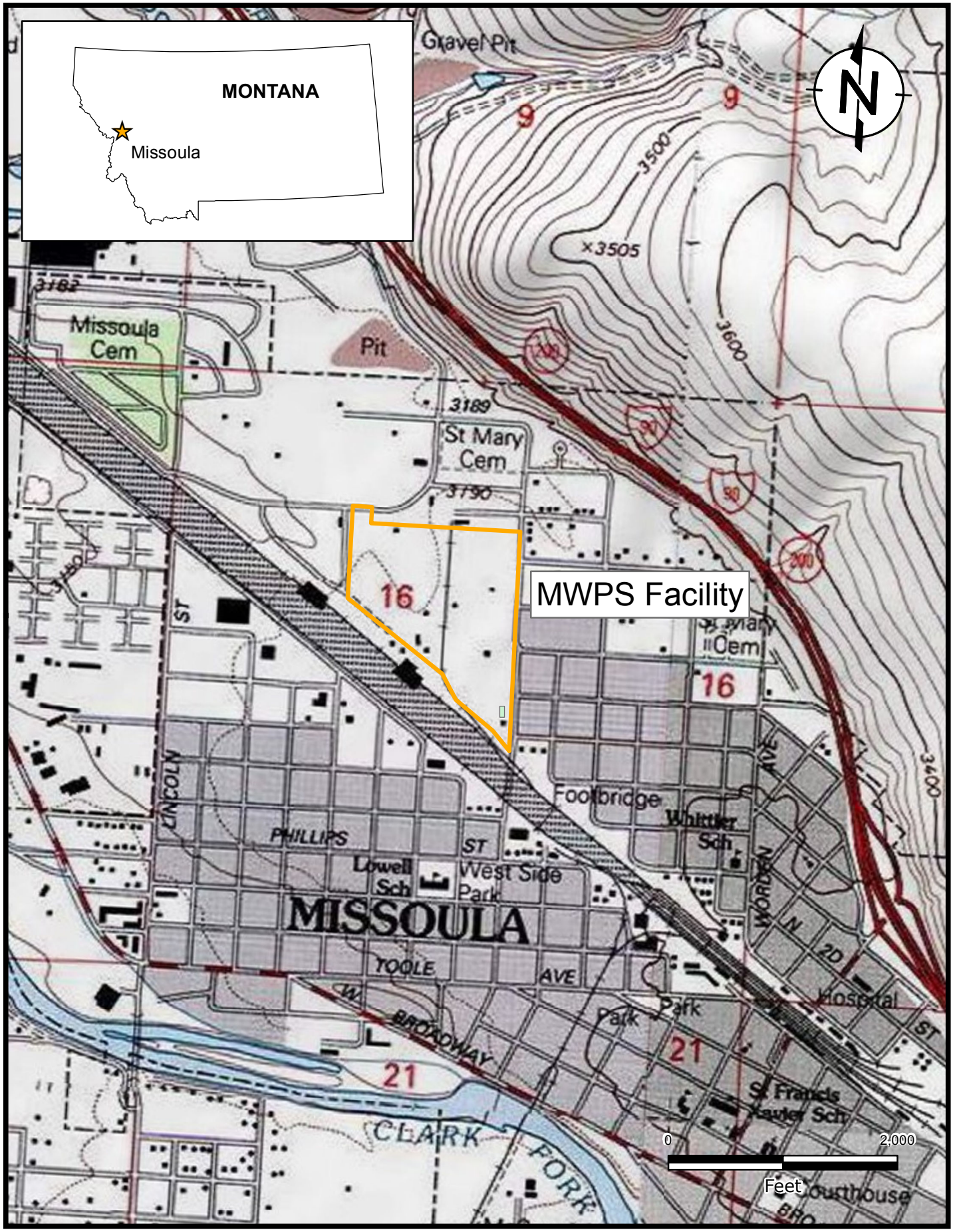
SSCL - Site-specific cleanup level

$\mu g/m^3$ - micrograms per cubic meter

**Table 4**
**Preliminary Sampling Parameters for Assessing Chemical Oxidation**

| Preliminary Parameters | | Typical Considerations for Evaluating Remediation by Chemical Oxidation |
|---|---|---|
| Pentachlorophenol (PCP) | EPA Method 8151 (Soil/Groundwater) | Laboratory analysis for PCP, EPH/VPH and dioxin/furan would be used to evaluate the presence of these contaminants of concern relative to SSCLs. |
| Extractable Petroleum Hydrocarbons (EPH)/Volatile Petroleum Hydrocarbons (VPH) | MassDEP EPH/VPH (Soil/Groundwater) | |
| Dioxins/Furans | EPA Method 8290 (Soil/Groundwater) | |
| Conductivity | Field | Conductivity would be used as a general water quality parameter. |
| Oxidation Reduction Potential (ORP) | Field | The ORP of groundwater reflects the relative oxidizing or reducing nature of the ground-water system. ORP would be used to 1) define regions of the plume under oxidizing and reducing conditions, 2) evaluate potential for redox reactions to occur, 3) validate dissolved oxygen measurements, and 4) determine reduction potential (Eh) values. |

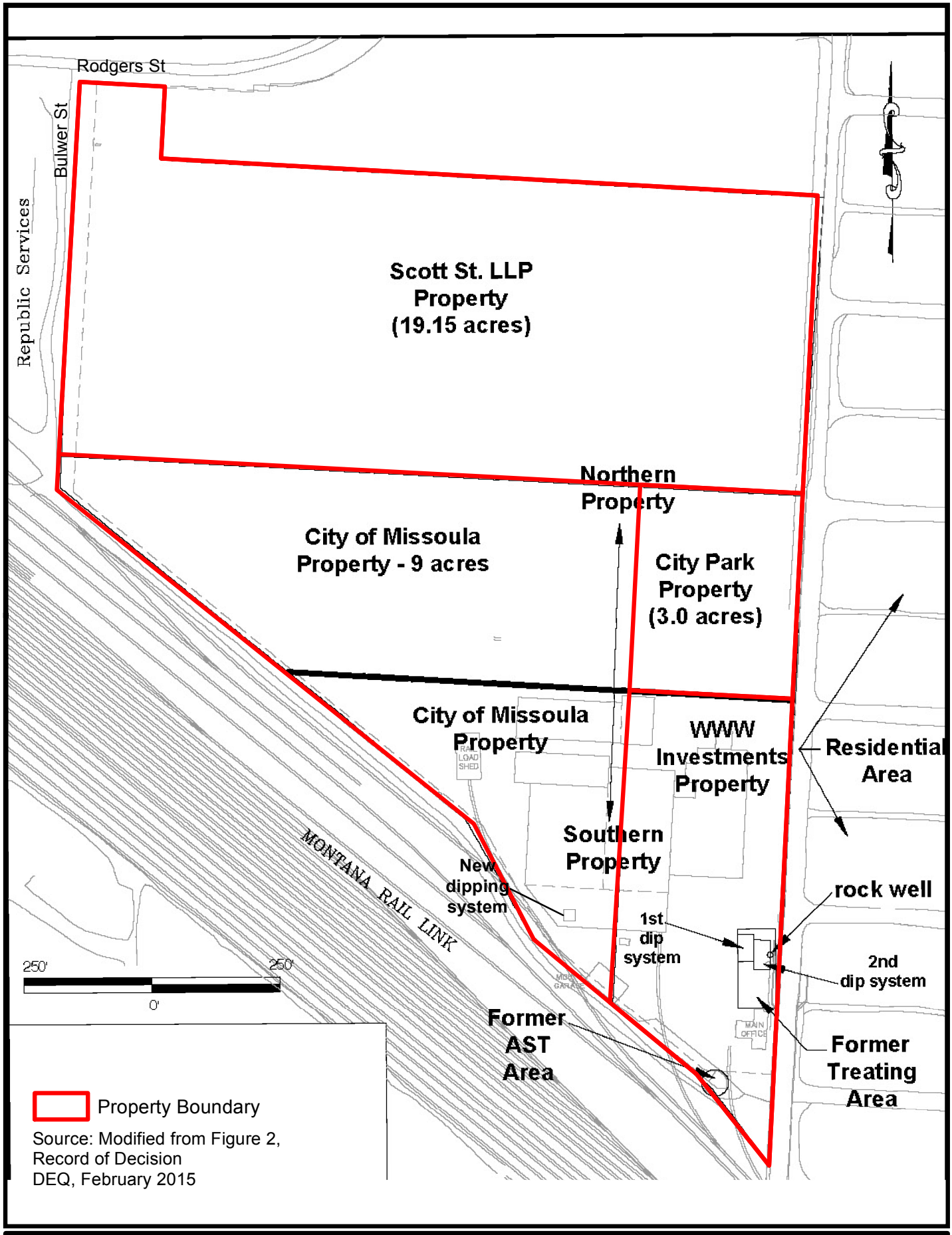
| Preliminary Parameters | | Typical Considerations for Evaluating Remediation by Chemical Oxidation |
|---|---|---|
| Dissolved Oxygen (DO) | Field | DO would be used as a general water quality parameter. |
| pH | Field | pH would be used as a general water quality parameter. |
| Temperature | Field | Temperature would be used as a general water quality parameter. Also, oxygen solubility is dependent on groundwater temperature. |
| Alkalinity | EPA 310.1 | Typically, total alkalinity is primarily due to carbonate alkalinity. Thus, alkalinity is a measure of dissolved carbonate and bicarbonate. |




Facility Location Map
Missoula White Pine Sash Facility
Missoula, Montana

FIGURE
**1**

Date: 7/13/2015

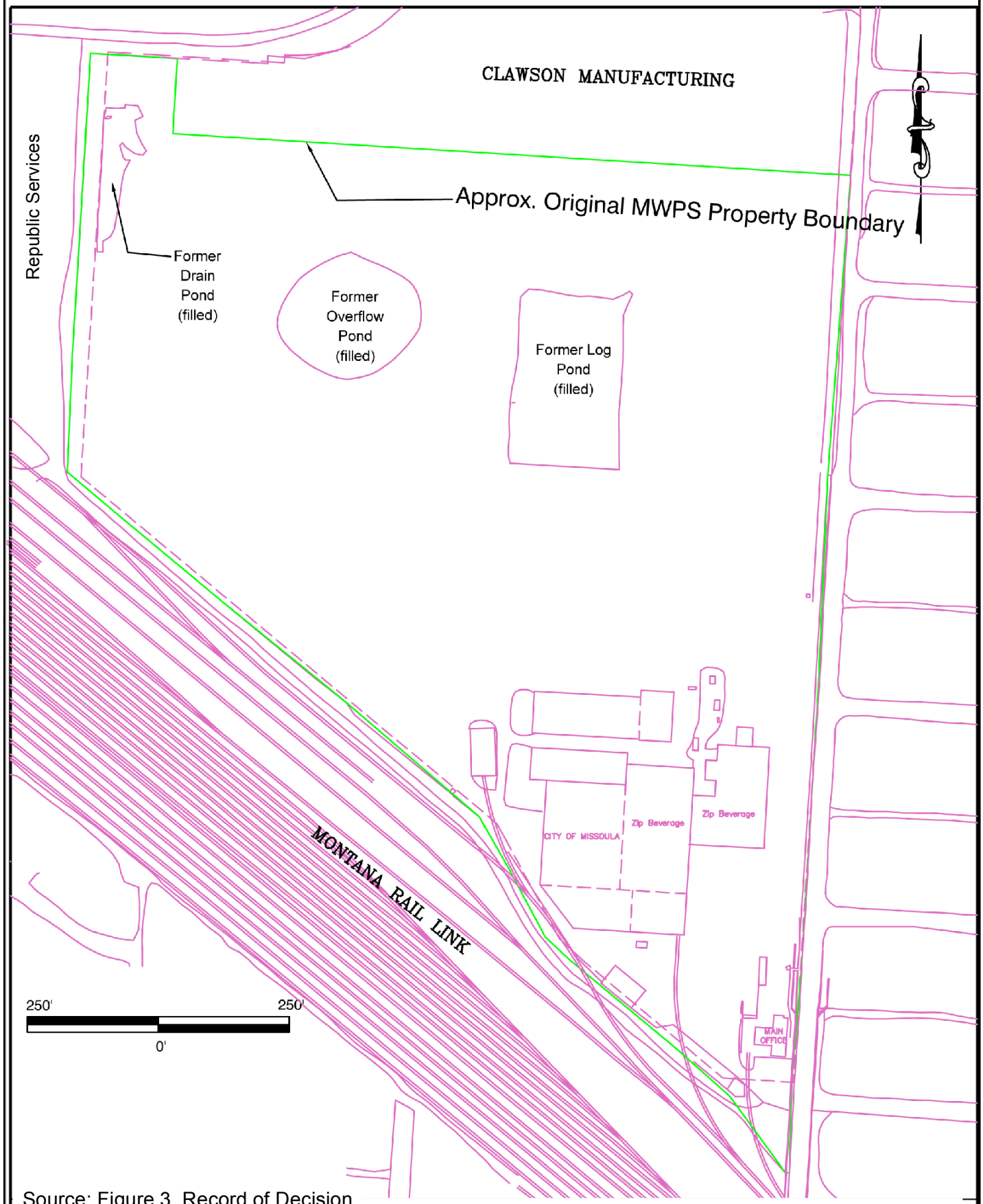



Source: Modified from Figure 2,
Record of Decision
DEQ, February 2015

Property Ownership Map
Missoula White Pine Sash Facility
Missoula, Montana

FIGURE
**2**

Date: 9/2/2015




Source: Figure 3, Record of Decision
DEQ, February 2015

Log Pond, Drain Pond, Overflow Pond
Missoula White Pine Sash Facility
Missoula, Montana

FIGURE
**3**

Date: 7/13/2015

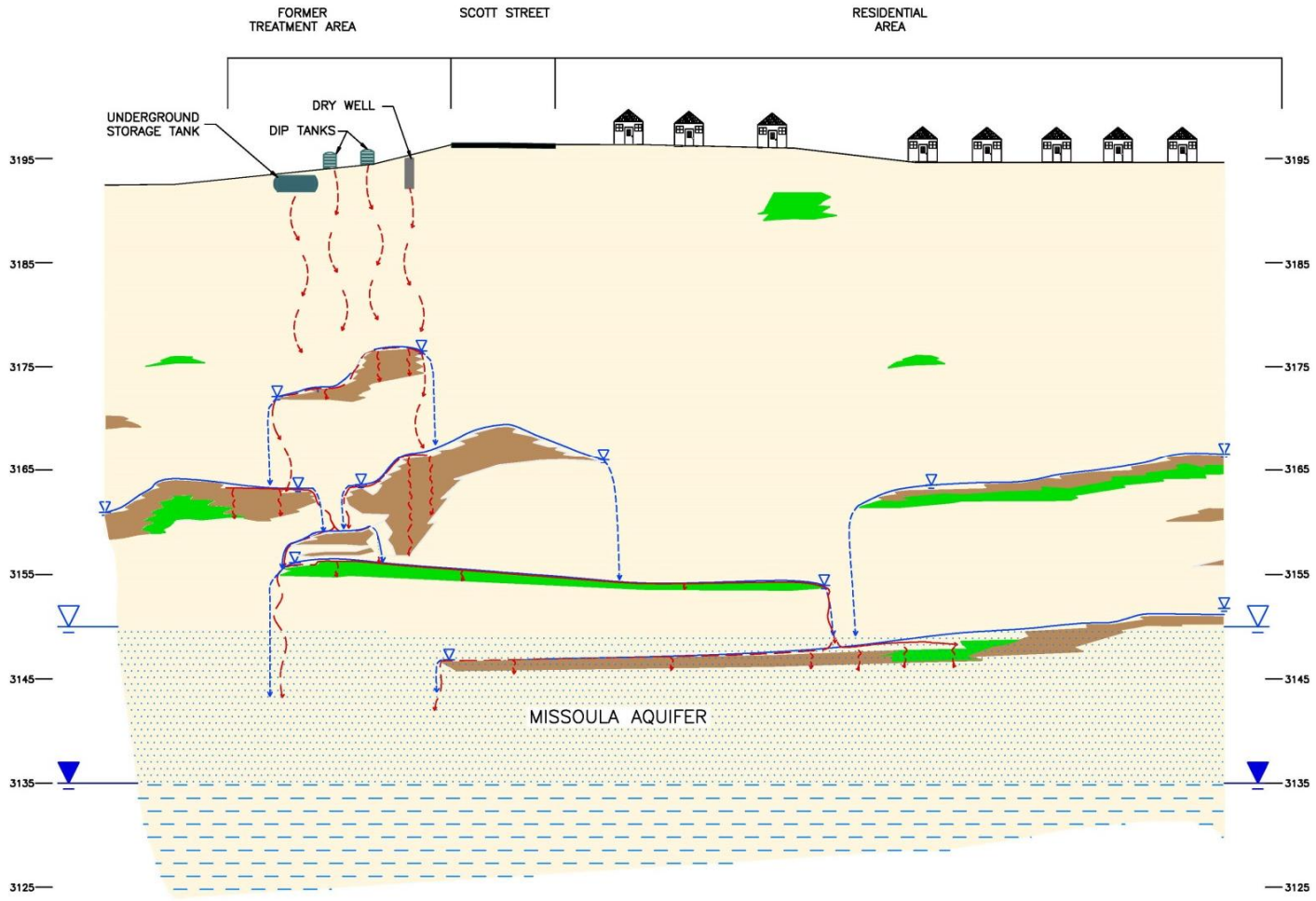
NOTES:
1. GROUNDWATER HAS BEEN ENCOUNTERED INTERMITTENTLY DURING DRILLING AND IN MONITORING WELLS FROM 0.5 FEET TO 3 FEET ABOVE THE DISCONTINUOUS CONFINING LAYERS UNDERLYING THE FACILITY. THIS PERCHED GROUNDWATER, WHEN PRESENT AND MEASURABLE, APPEARS TO FLUCTUATE SEASONALLY ABOVE SOME, BUT NOT ALL, OF THE CONFINING LAYERS. FOR MORE INFORMATION ON PERCHED GROUNDWATER AT THE FACILITY, REFER TO THE SEMIANNUAL GROUNDWATER MONITORING REPORTS FOR THE FACILITY.
2. GROUNDWATER OF THE MISSOULA AQUIFER HAS BEEN OBSERVED BETWEEN 45 AND 60 FEET BELOW GROUND SURFACE AND IS SUBJECT TO SEASONAL FLUCTUATIONS UP TO 15 FEET.

LEGEND

- ASPHALT
- GW/SW/SM = GRAVEL AND SAND DOMINATED LITHOLOGY
- ML/SC = SILT DOMINATED LITHOLOGY
- CL/CLS = CLAY DOMINATED LITHOLOGY
- PERCHED GROUNDWATER TABLE
- MISSOULA AQUIFER HIGH WATER TABLE — ~45 Ft BELOW GROUND SURFACE
- MISSOULA AQUIFER LOW WATER TABLE — ~60 Ft BELOW GROUND SURFACE
- PERCHED GROUNDWATER SEEPAGE
- PENTACHLOROPHENOL IN SOLUTION WITH DIESEL OR MINERAL SPIRITS
- MISSOULA AQUIFER – AREA OF GROUNDWATER FLUCTUATION
- MISSOULA AQUIFER

Source: Figure 5, Record of Decision
DEQ, February 2015

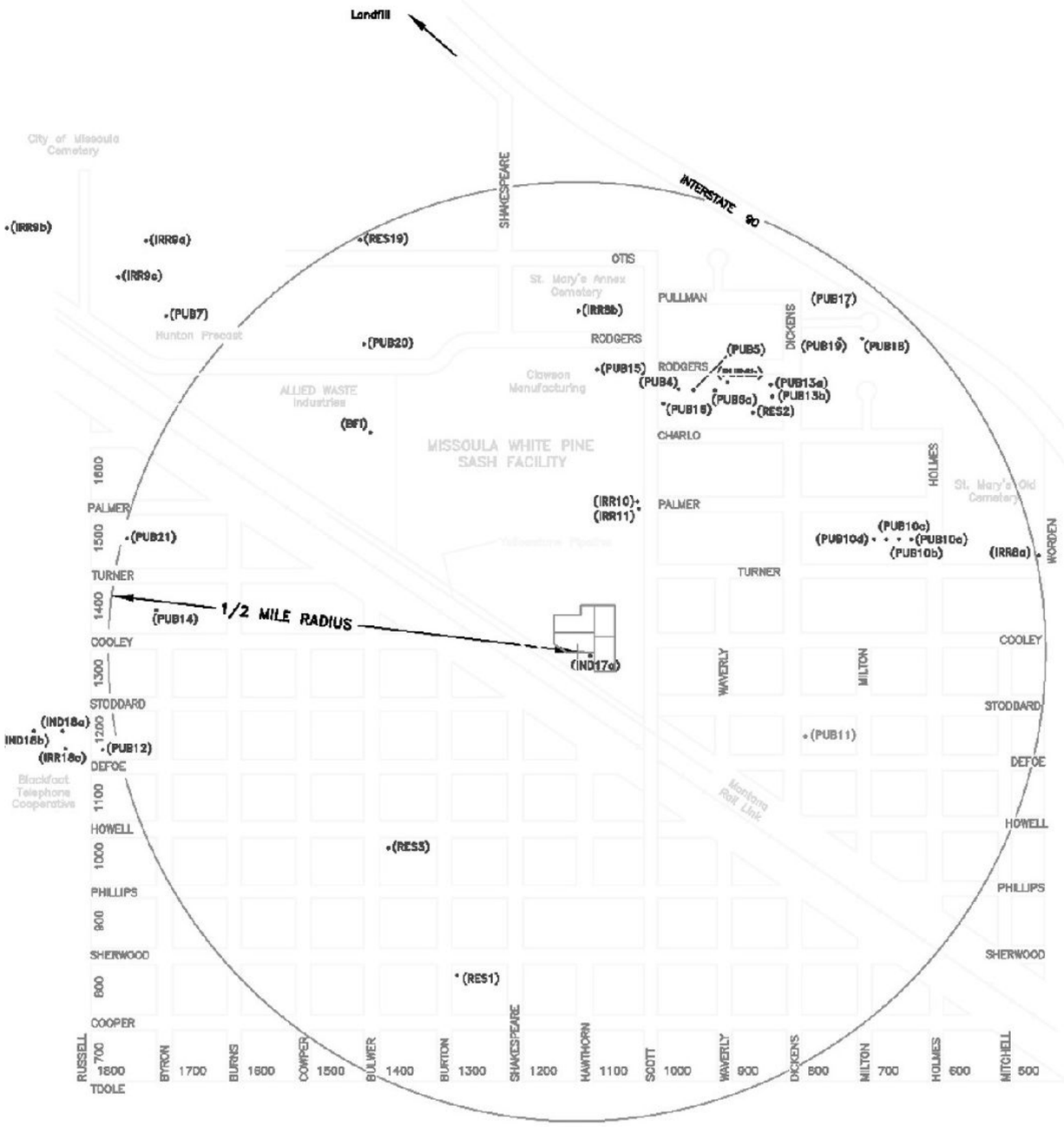
ELEVATIONS IN FEET
ABOVE MEAN SEA LEVEL




# Conceptual Geologic Site Model
# Missoula White Pine Sash Facility
# Missoula, Montana

**Figure 4**

**Date: 7/13/2015**




| WELL NUMBER | WELL LOCATION | OWNER | CONTACT/PHONE # | USAGE | TOTAL DEPTH |
|---|---|---|---|---|---|
| RES1 | 1337 Sherwood (W of house) | Jeff Friess | Jeff Friess/541-8886 | Private | 79.5 |
| RES2 | 1000 Charlo (N of house next to pole) | Curtis Clark | Curtis Clark/543-1968 | Private | 90 |
| RES3 | 1439 Howell (E of house) | Robert Saurer | Robert Saurer/543-3654 | Private | 59 |
| PUB4 | 1007-1015 Rodgers (S of apt. building) | Richard Wilcom | Richard Wilcom/549-6106 | Private | - |
| PUB5 | 1005 Rodgers (S of apt. building) | Matt Burnett | Matt Burnett/721-0647 | Private | 70 |
| PUB6a | 917 Rodgers (E of apt. building) | Star Properties | Jim Frey/549-2260 | Private | 95.5 |
| PUB6b | 913 Rodgers (pumphouse NE of building) | Star Properties | Jim Frey/549-2260 | Private | 92 |
| PUB7 | 1700 Rodgers (N of concrete plant) | Hunton Precast | Ernest Hunton/543-5640 | Private | 90 |
| IRR8a | St. Mary's Old Cemetery (white pumphouse) | St. Mary's Cemetery | Mike Hamlin/543-7951 | Irrigation | - |
| IRR8b | St. Mary's Annex Cemetery (white pumphouse) | St. Mary's Cemetery | Mike Hamlin/543-7951 | Irrigation | - |
| IRR9a | City of Missoula Cemetery (well #1) | City of Missoula | Doug Waters/721-2435 | Irrigation | 152 |
| IRR9b | City of Missoula Cemetery (well #2) | City of Missoula | Doug Waters/721-2435 | Irrigation | 126 |
| IRR9c | City of Missoula Cemetery (red standpipe) | City of Missoula | Doug Waters/721-2435 | Irrigation | 95 |
| BFI | Allied Waste, 1501 Rodgers, east of bldgs | Allied Waste | David Seeberger/728-9572 | Private | 120 |
| PUB10a | 701 Palmer (S of apt. building) | Gary McDermott | Gary McDermott/434-5186 | Public | 101 |
| PUB10b | 711 Palmer (S. of apt. building) | Gary McDermott | Gary McDermott/434-5186 | Public | 101 |
| PUB10c | 721 Palmer (S of apt. building) | William O'Neill | William O'Neill/626-5963 | Public | 99 |
| PUB10d | 731 Palmer (S of apt. building) | William O'Neill | William O'Neill/626-5963 | Public | 99 |
| PUB11 | Dickens and Defoe CLOSED | Mountain Water | Logan Mcinnis/721-5570 | Public | 131 |
| PUB12 | 1200 block North Russell (E side of street) | Mountain Water | Logan Mcinnis/721-5570 | Public | 109.5 |
| PUB13a | 907 Rodgers | Bruce Hayden | Bruce Hayden/548-1803 | Private | 100 |
| PUB13b | 909 Rodgers | Ted Schuster | Ted Schuster/543-4982 | Private | 100 |
| PUB14 | Hollywood Trailer Court (next to trailer 52) | Jim Caplis | Bob Serwacki/542-3360 | Private | - |
| PUB15 | Clawson Manufacturing (in yard next to pole) | Gene Clawson | Gene Clawson/544-3441 | Private | 103 |
| PUB16 | 1706 Scott Street (in basement) | Johnson 34 Properties | Grizzly Prop Mgmt/542-2060 | Private | 92 |
| IND17a | Zip Beverage (in pumphouse south of bldgs) | Zip Beverage | Bill Watkins/728-9543 | Fire | 125 |
| IRR10 | 1309 Scott St. - White Pine Park | City of Missoula | Dave Shaw/552-6264 | Irrigation | 96 |
| IRR11 | 1309 Scott St. - White Pine Park | City of Missoula | Dave Shaw/552-6264 | Irrigation | 96 |
| IND18a | 1221 North Russell (NE of new building) | Blackfoot Telephone | Cyrus Bowman/721-2121 | Industrial | 118.5 |
| IND18b | 1221 North Russell (NW of new building) | Blackfoot Telephone | Cyrus Bowman/721-2121 | Industrial | 118 |
| IRR18c | 1221 North Russell (SSE of new building) | Blackfoot Telephone | Cyrus Bowman/721-2121 | Irrigation | 60 |
| RES19 | 1600 Otis (in pit under SE corner of house) | Kenneth Sandau | George Sandau/549-5058 | Private | - |
| PUB17 | 820 Rodgers | Howard Horton | Prof. Prop. Mgmt/721-8990 | Public | 112 |
| PUB18 | 811 Rodgers | Howard Horton | Prof. Prop. Mgmt/721-8990 | Public | 118 |
| PUB19 | 821 Rodgers | Howard Horton | Prof. Prop. Mgmt/721-8990 | Public | 120 |
| PUB20 | 1620 Rodgers | Joe Brooks | Joe Brooks/549-6148 | Private | 98 |
| PUB21 | Cedar Villas Apartments (center of complex) | Cedar Villas LLP | Chris Thomas/721-5185 | Irrigation | 100 |
| PUB22 | 1734 Stoddard (south side of apt building) | Bob Decou | Bob Decou/728-5378 | Private | 72 |

Source: Figure 6, Record of Decision
DEQ, February 2015

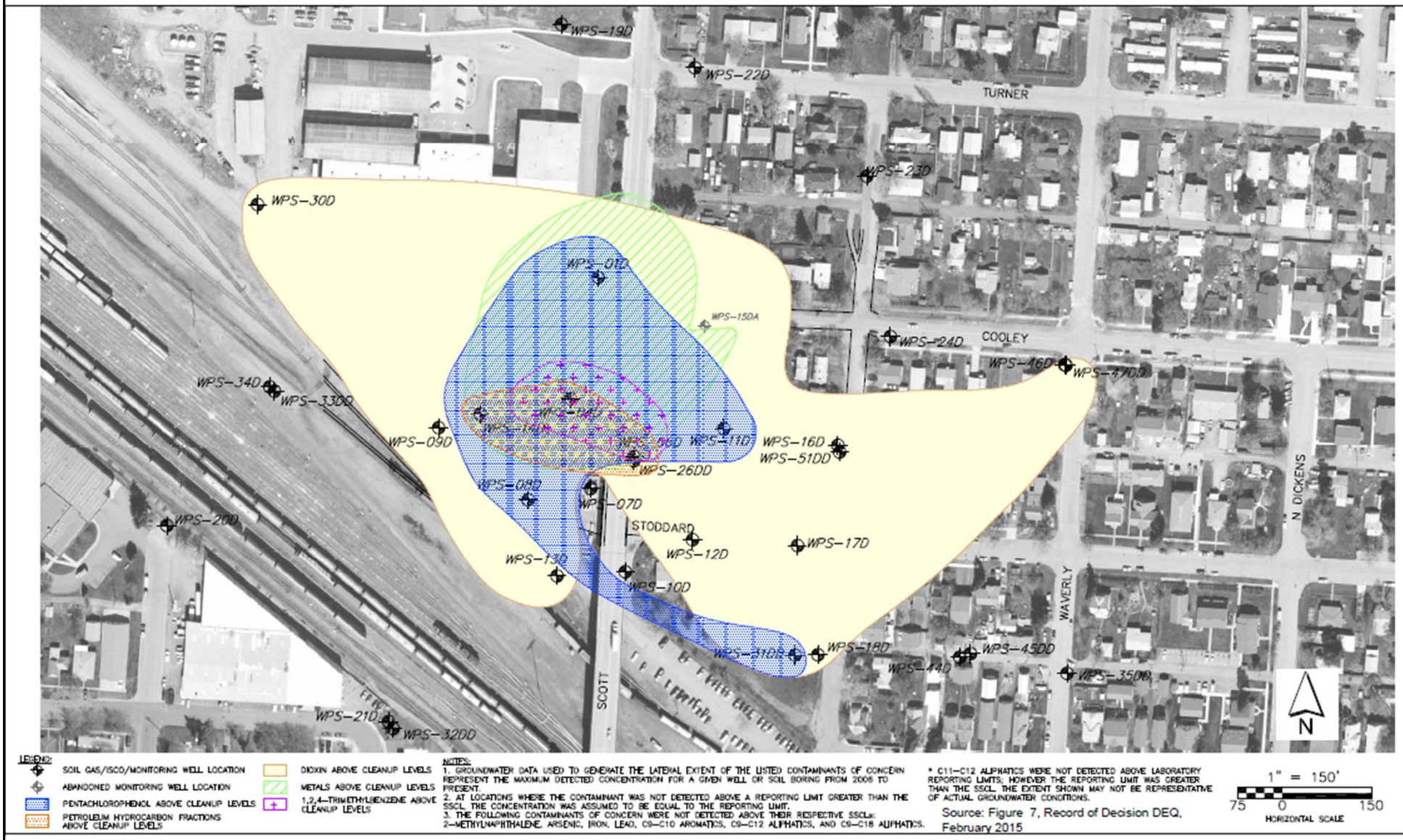
Not to scale

Legend

- (RES3) Water Well Location
  - Total Depth Unknown

Well Locations within 1/2 mile of MWPS
Missoula White Pine Sash Facility
Missoula, Montana

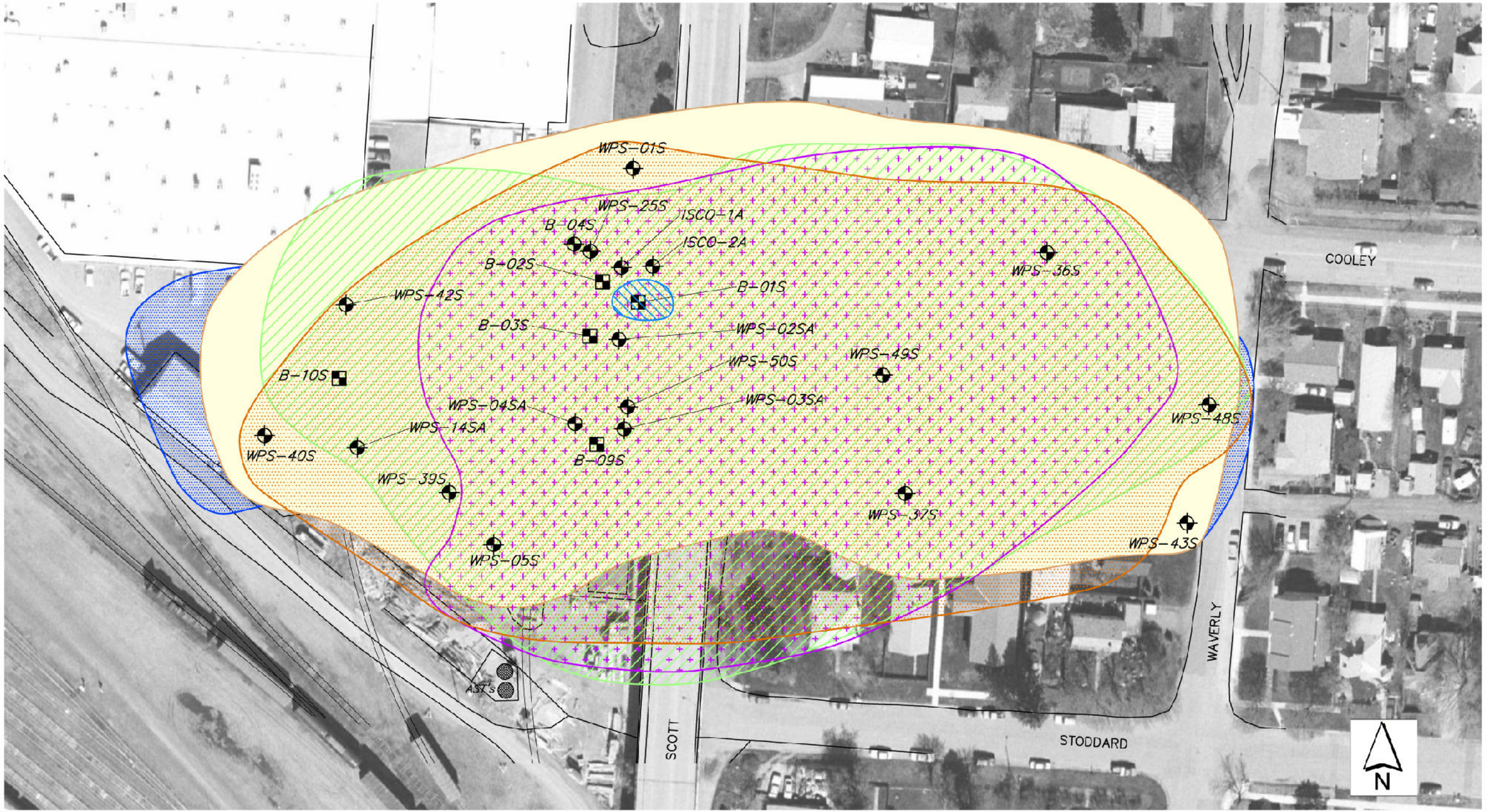
FIGURE
**5**
Date: 7/13/2015




Maximum Potential Lateral Extent of Groundwater Exceeding SSCLs – Missoula Aquifer
Missoula White Pine Sash Facility
Missoula, Montana

Figure 6

Date: 7/13/2015




LEGEND:

- SOIL GAS/ISCO/MONITORING WELL LOCATION
- SOIL BORING LOCATION
- PENTACHLOROPHENOL ABOVE CLEANUP LEVELS
- PETROLEUM HYDROCARBON FRACTIONS ABOVE CLEANUP LEVELS
- DIOXIN ABOVE CLEANUP LEVELS
- METALS ABOVE CLEANUP LEVELS
- 1,2,4-TRIMETHYLBENZENE ABOVE CLEANUP LEVELS
- 2-METHYLNAPHTHALENE ABOVE CLEANUP LEVELS

NOTES:
1. GROUNDWATER DATA USED TO GENERATE THE LATERAL EXTENT OF THE LISTED CONTAMINANTS OF CONCERN REPRESENT THE MAXIMUM DETECTED DATA CONCENTRATION FOR A GIVEN WELL OR SOIL BORING FROM 2006 TO PRESENT.
2. AT LOCATIONS WHERE THE CONTAMINANT WAS NOT DETECTED ABOVE A REPORTING LIMIT GREATER THAN THE SSCL, THE CONCENTRATION WAS ASSUMED TO BE EQUAL TO THE REPORTING LIMIT.

* C11-C22 ALIPHATICS WERE NOT DETECTED ABOVE LABORATORY REPORTING LIMITS; HOWEVER THE REPORTING LIMIT WAS GREATER THAN THE SSCL. THE EXTENT SHOWN MAY NOT BE REPRESENTATIVE OF ACTUAL GROUNDWATER CONDITIONS.

Source: Figure 8, Record of Decision
DEQ, February 2015

1" = 70'
35 0 70
HORIZONTAL SCALE

Maximum Potential Lateral Extent of Groundwater Exceeding SSCLs
Perched Aquifer
Missoula White Pine Sash Facility
Missoula, Montana

FIGURE
**7**

Date: 7/13/2015

N:\Projects\2015\25157153\RAWP Editable Figures\RAWP_Figure 8_08262015.mxd

## Legend

- Area with Residential Surface Soil SSCL Exceedance for Dioxins (40 ng/kg)
- Area with Commercial/Industrial Surface Soil SSCL Exceedance for Dioxins (310 ng/kg)
- Area with Leaching-Based Surface Soil SSCL Exceedance for Cadmium (1.82 mg/kg)
- Area with Methane Exceeding 5% by Volume (Found from 5 to 10 feet bgs)
- Approximate Area with Exceedance of Leaching-Based Surface Soil SSCL Exceedance for Pentachlorophenol (5.69 mg/kg)
- Approximate Area with Exceedance of Leaching-Based Subsurface Soil SSCL Exceedance for Pentachlorophenol (0.27 mg/kg) up to 15' bgs

N

Feet
0 100 200 400

Clawson Manufacturing

Scott Street Partnership Project (19.2 acres)

City of Missoula Property (9.0 acres)

City of Missoula City Park Property (3.0 acres)

WWW Investments Property

Former Treatment Area

Cooley Street

Scott Street

SEE INSET

TFR Building

1028 1/2 Stoddard

Stoddard Street

INSET

Former Treatment Area

Cooley Street

Scott Street

TFR Building

1028 1/2 Stoddard

Feet
0 100

Source: Modified from Figure 9, Record of Decision DEQ, February 2015

bgs: below ground surface
mg/kg: milligram per kilogram
ng/kg: nanogram per kilogram
SSCL: site-specific cleanup level

0-15' bgs Soil Exceeding SSCLs and
Areas Exceeding 5% Methane
Missoula White Pine Sash Facility
Missoula, Montana

FIGURE
**8**

Date: 7/13/2015


Source: Figure 10a, Record of Decision DEQ, February 2015

Maximum Potential Lateral Extent of Subsurface Soil Exceeding PCP SSCL
Missoula White Pine Sash Facility
Missoula, Montana

FIGURE
**9a**
Date: 7/13/2015


LEGEND:

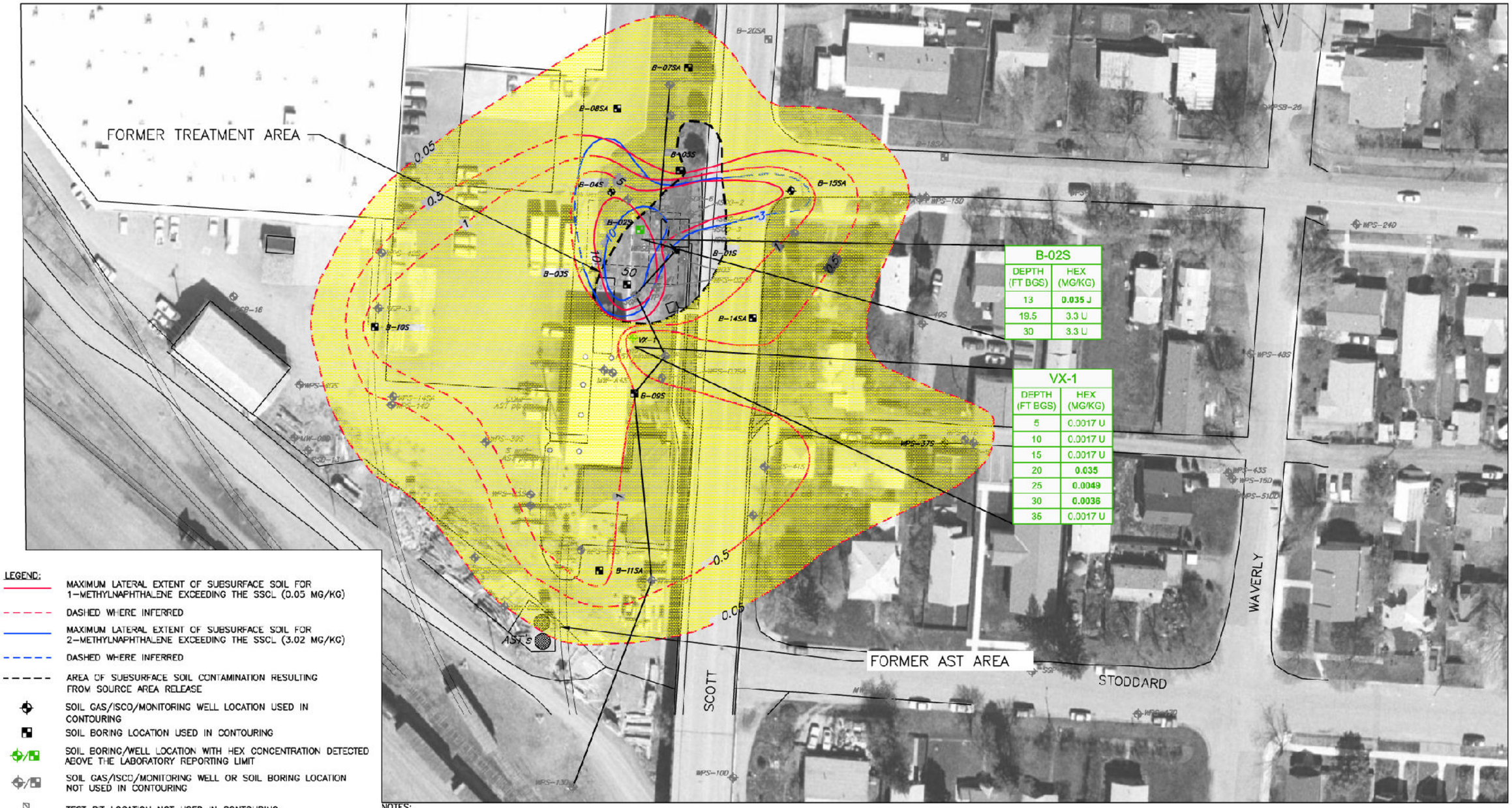
- MAXIMUM LATERAL EXTENT OF SUBSURFACE SOIL EXCEEDING 470 NG/KG
- DASHED WHERE INFERRED
- MAXIMUM LATERAL EXTENT OF SUBSURFACE SOIL EXCEEDING 1000 NG/KG
- DASHED WHERE INFERRED
- AREA OF SUBSURFACE SOIL CONTAMINATION RESULTING FROM SOURCE AREA RELEASE.
- AREA OF DEEP SUBSURFACE CONTAMINATION RESULTING FROM TRANSPORT IN GROUNDWATER FROM SOURCE ZONE. THESE CONTAMINATED SOILS WILL BE ADDRESSED BY THE GROUNDWATER ALTERNATIVES.
- SOIL GAS/ISCO/MONITORING WELL LOCATION USED IN CONTOURING
- SOIL GAS/ISCO/MONITORING WELL LOCATION NOT USED IN CONTOURING
- SOIL BORING LOCATION USED IN CONTOURING
- SOIL BORING LOCATION NOT USED IN CONTOURING
- TEST PIT LOCATION
- CROSS SECTION LINE

NOTES:
1. LATERAL EXTENT OF SUBSURFACE CONTAMINATION EXCEEDING THE SSCL WAS DETERMINED BY USING THE MAXIMUM CONCENTRATION DETECTED AT THE INDICATED LOCATION REGARDLESS OF DEPTH.
2. AT LOCATIONS WHERE THE CONTAMINANT WAS NOT DETECTED ABOVE A REPORTING LIMIT GREATER THAN 470 NG/KG, THE CONCENTRATION WAS ASSUMED TO BE EQUAL TO THE REPORTING LIMIT.
3. THE REPRESENTED COC IS RELATED TO THE SOLUTION USED IN THE WOOD TREATING OPERATION AT MWPS, AND THEREFORE THE EXTENT GENERALLY FOLLOWS THE PETROLEUM AND PENTACHLOROPHENOPL DISTRIBUTION IN SUBSURFACE SOILS

Source: Figure 10b, Record of Decision DEQ, February 2015

Maximum Potential Lateral Extent of Dioxin in Subsurface Soil Exceeding 470 ng/kg
Missoula White Pine Sash Facility
Missoula, Montana

FIGURE
**9b**
Date: 7/13/2015




| B-02S | |
|---|---|
| DEPTH (FT BGS) | HEX (MG/KG) |
| 13 | 0.035 J |
| 19.5 | 3.3 U |
| 30 | 3.3 U |

| VX-1 | |
|---|---|
| DEPTH (FT BGS) | HEX (MG/KG) |
| 5 | 0.0017 U |
| 10 | 0.0017 U |
| 15 | 0.0017 U |
| 20 | 0.035 |
| 25 | 0.0049 |
| 30 | 0.0036 |
| 35 | 0.0017 U |

LEGEND:

- MAXIMUM LATERAL EXTENT OF SUBSURFACE SOIL FOR 1-METHYLNAPHTHALENE EXCEEDING THE SSCL (0.05 MG/KG)
- DASHED WHERE INFERRED
- MAXIMUM LATERAL EXTENT OF SUBSURFACE SOIL FOR 2-METHYLNAPHTHALENE EXCEEDING THE SSCL (3.02 MG/KG)
- DASHED WHERE INFERRED
- AREA OF SUBSURFACE SOIL CONTAMINATION RESULTING FROM SOURCE AREA RELEASE
- SOIL GAS/ISCO/MONITORING WELL LOCATION USED IN CONTOURING
- SOIL BORING LOCATION USED IN CONTOURING
- SOIL BORING/WELL LOCATION WITH HEX CONCENTRATION DETECTED ABOVE THE LABORATORY REPORTING LIMIT
- SOIL GAS/ISCO/MONITORING WELL OR SOIL BORING LOCATION NOT USED IN CONTOURING
- TEST PIT LOCATION NOT USED IN CONTOURING
- CROSS SECTION LINE
- AREA OF DEEP SUBSURFACE CONTAMINATION RESULTING FROM TRANSPORT IN GROUNDWATER FROM SOURCE ZONE. THESE CONTAMINATED SOILS WILL BE ADDRESSED BY THE GROUNDWATER ALTERNATIVES.

NOTES:
1. LATERAL EXTENT OF SUBSURFACE CONTAMINATION EXCEEDING THE SSCL WAS DETERMINED BY USING THE MAXIMUM CONCENTRATION DETECTED AT THE INDICATED LOCATION REGARDLESS OF DEPTH.
2. HEX = HEXACHLOROBENZENE
3. U = NOT DETECTED AT INDICATED REPORTING LIMIT.
4. J = CONCENTRATION IS BETWEEN THE REPORTING LIMIT AND THE DETECTION LIMIT AND IS CONSIDERED AN ESTIMATED VALUE.
5. AT LOCATIONS WHERE THE CONTAMINANT WAS NOT DETECTED ABOVE A REPORTING LIMIT GREATER THAN THE SSCL, THE CONCENTRATION WAS ASSUMED TO BE EQUAL TO THE REPORTING LIMIT.
6. MUCH OF THE SUBSURFACE SOIL DATA INDICATED NON-DETECTABLE CONCENTRATIONS OF THE REPRESENTED COCs (PARTICULARLY HEXACHLOROBENZENE), BUT LABORATORY REPORTING LIMITS EXCEEDED THE SSCLs.
7. THE REPRESENTED COCs ARE RELATED TO THE CARRIER SOLUTION USED IN THE WOOD TREATING OPERATION AT MWPS, AND THEREFORE THE EXTENT GENERALLY FOLLOWS THE PETROLEUM AND PENTACHLOROPHENOL DISTRIBUTION IN SUBSURFACE SOILS.

1" = 70'
35 0 70
HORIZONTAL SCALE

N

Source: Figure 10c, Record of Decision DEQ, February 2015

Maximum Potential Lateral Extent of Subsurface Soil Exceeding 1-Methylnaphthalene, 2-Methylnaphthalene, and Hexachlorobenzene SSCLs
Missoula White Pine Sash Facility
Missoula, Montana

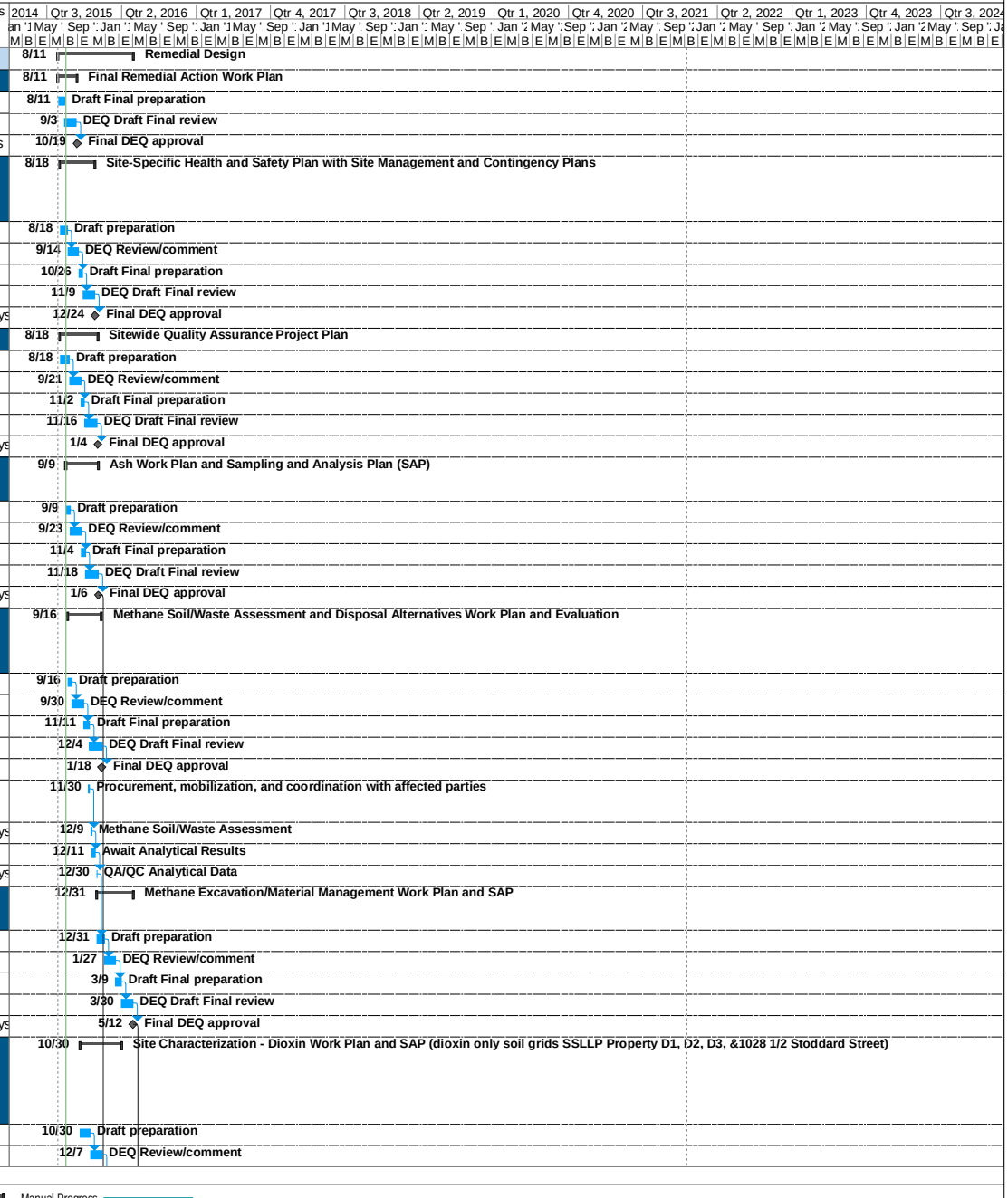
FIGURE
**9c**
Date: 7/13/2015


Possible LTU Location
Missoula White Pine Sash Facility
Missoula, Montana

FIGURE
**10**
Date: 7/13/2015

Figure 11: Remedial Action Work Plan Schedule - Missoula White Pine Sash CECRA Site

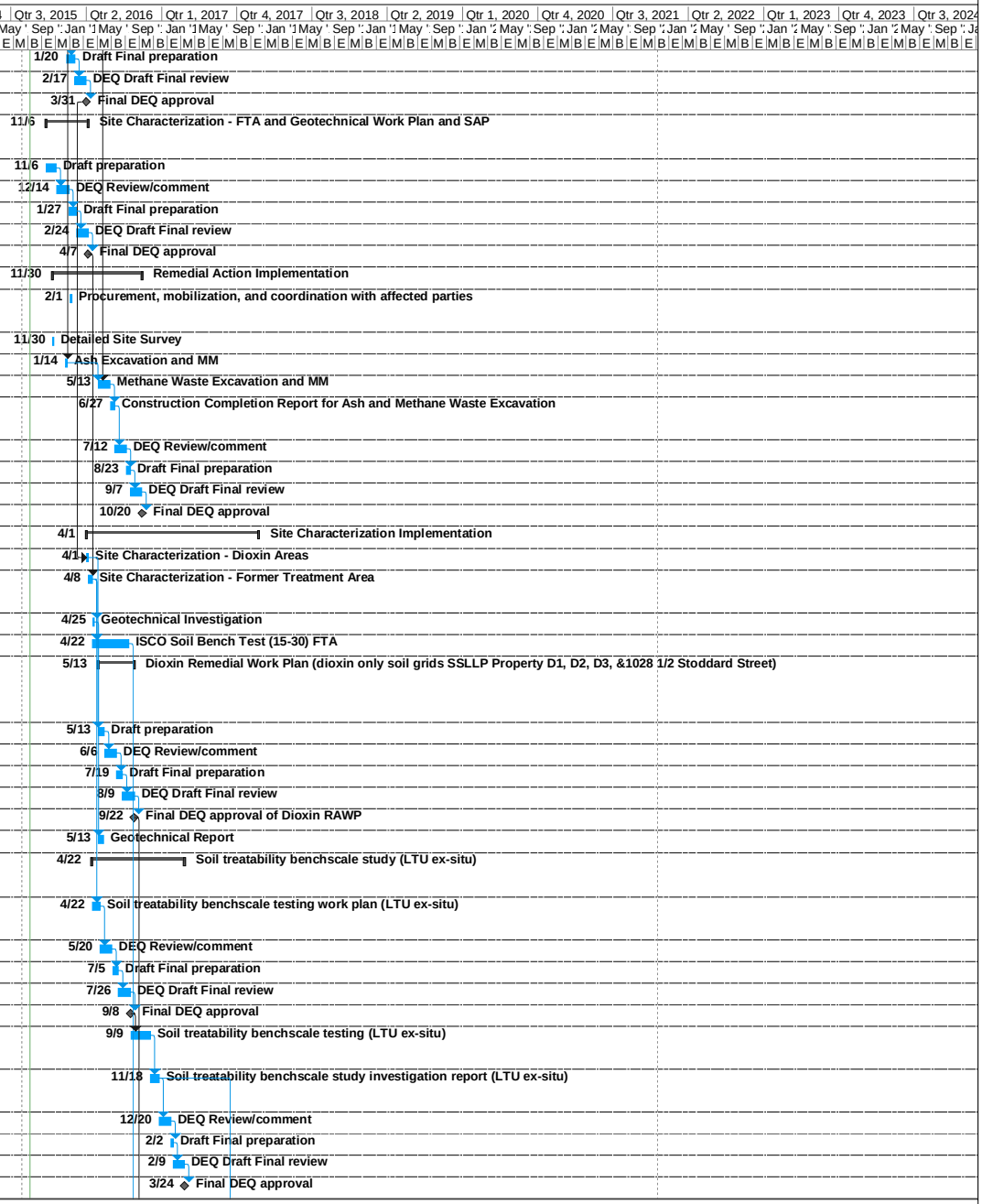
| ID | Outline Number | Task Name | Duration | Start | Finish | Predecessors |
|---|---|---|---|---|---|---|
| 1 | 1 | **Remedial Design** | **193 days** | **Tue 8/11/15** | **Thu 5/12/16** | |
| 2 | 1.1 | **Final Remedial Action Work Plan** | **49 days** | **Tue 8/11/15** | **Mon 10/19/15** | |
| 3 | 1.1.1 | Draft Final preparation | 17 days | Tue 8/11/15 | Wed 9/2/15 | |
| 4 | 1.1.2 | DEQ Draft Final review | 30 days | Thu 9/3/15 | Thu 10/15/15 | |
| 5 | 1.1.3 | Final DEQ approval | 0 days | Mon 10/19/15 | Mon 10/19/15 | 4FS+2 days |
| 6 | 1.2 | **Site-Specific Health and Safety Plan with Site Management and Contingency Plans** | **90 days** | **Tue 8/18/15** | **Thu 12/24/15** | |
| 7 | 1.2.1 | Draft preparation | 18 days | Tue 8/18/15 | Fri 9/11/15 | |
| 8 | 1.2.2 | DEQ Review/comment | 30 days | Mon 9/14/15 | Fri 10/23/15 | 7 |
| 9 | 1.2.3 | Draft Final preparation | 10 days | Mon 10/26/15 | Fri 11/6/15 | 8 |
| 10 | 1.2.4 | DEQ Draft Final review | 30 days | Mon 11/9/15 | Tue 12/22/15 | 9 |
| 11 | 1.2.5 | Final DEQ approval | 0 days | Thu 12/24/15 | Thu 12/24/15 | 10FS+2 days |
| 12 | 1.3 | **Sitewide Quality Assurance Project Plan** | **95 days** | **Tue 8/18/15** | **Mon 1/4/16** | |
| 13 | 1.3.1 | Draft preparation | 23 days | Tue 8/18/15 | Fri 9/18/15 | |
| 14 | 1.3.2 | DEQ Review/comment | 30 days | Mon 9/21/15 | Fri 10/30/15 | 13 |
| 15 | 1.3.3 | Draft Final preparation | 10 days | Mon 11/2/15 | Fri 11/13/15 | 14 |
| 16 | 1.3.4 | DEQ Draft Final review | 30 days | Mon 11/16/15 | Wed 12/30/15 | 15 |
| 17 | 1.3.5 | Final DEQ approval | 0 days | Mon 1/4/16 | Mon 1/4/16 | 16FS+2 days |
| 18 | 1.4 | **Ash Work Plan and Sampling and Analysis Plan (SAP)** | **82 days** | **Wed 9/9/15** | **Wed 1/6/16** | |
| 19 | 1.4.1 | Draft preparation | 10 days | Wed 9/9/15 | Tue 9/22/15 | |
| 20 | 1.4.2 | DEQ Review/comment | 30 days | Wed 9/23/15 | Tue 11/3/15 | 19 |
| 21 | 1.4.3 | Draft Final preparation | 10 days | Wed 11/4/15 | Tue 11/17/15 | 20 |
| 22 | 1.4.4 | DEQ Draft Final review | 30 days | Wed 11/18/15 | Mon 1/4/16 | 21 |
| 23 | 1.4.5 | Final DEQ approval | 0 days | Wed 1/6/16 | Wed 1/6/16 | 22FS+2 days |
| 24 | 1.5 | **Methane Soil/Waste Assessment and Disposal Alternatives Work Plan and Evaluation** | **85 days** | **Wed 9/16/15** | **Mon 1/18/16** | |
| 25 | 1.5.1 | Draft preparation | 10 days | Wed 9/16/15 | Tue 9/29/15 | |
| 26 | 1.5.2 | DEQ Review/comment | 30 days | Wed 9/30/15 | Tue 11/10/15 | 25 |
| 27 | 1.5.3 | Draft Final preparation | 15 days | Wed 11/11/15 | Thu 12/3/15 | 26 |
| 28 | 1.5.4 | DEQ Draft Final review | 30 days | Fri 12/4/15 | Mon 1/18/16 | 27 |
| 29 | 1.5.5 | Final DEQ approval | 0 days | Mon 1/18/16 | Mon 1/18/16 | 28 |
| 30 | 1.5.6 | Procurement, mobilization, and coordination with affected parties | 3 days | Mon 11/30/15 | Wed 12/2/15 | |
| 31 | 1.5.7 | Methane Soil/Waste Assessment | 2 days | Wed 12/9/15 | Thu 12/10/15 | 30FS+4 days |
| 32 | 1.5.8 | Await Analytical Results | 10 days | Fri 12/11/15 | Thu 12/24/15 | 31 |
| 33 | 1.5.9 | QA/QC Analytical Data | 1 day | Wed 12/30/15 | Wed 12/30/15 | 32FS+2 days |
| 34 | 1.6 | **Methane Excavation/Material Management Work Plan and SAP** | **95 days** | **Thu 12/31/15** | **Thu 5/12/16** | |
| 35 | 1.6.1 | Draft preparation | 18 days | Thu 12/31/15 | Tue 1/26/16 | 33 |
| 36 | 1.6.2 | DEQ Review/comment | 30 days | Wed 1/27/16 | Tue 3/8/16 | 35 |
| 37 | 1.6.3 | Draft Final preparation | 15 days | Wed 3/9/16 | Tue 3/29/16 | 36 |
| 38 | 1.6.4 | DEQ Draft Final review | 30 days | Wed 3/30/16 | Tue 5/10/16 | 37 |
| 39 | 1.6.5 | Final DEQ approval | 0 days | Thu 5/12/16 | Thu 5/12/16 | 38FS+2 days |
| 40 | 1.7 | **Site Characterization - Dioxin Work Plan and SAP (dioxin only soil grids SSLLP Property D1, D2, D3, &1028 1/2 Stoddard Street)** | **106 days** | **Fri 10/30/15** | **Thu 3/31/16** | |
| 41 | 1.7.1 | Draft preparation | 24 days | Fri 10/30/15 | Fri 12/4/15 | |
| 42 | 1.7.2 | DEQ Review/comment | 30 days | Mon 12/7/15 | Tue 1/19/16 | 41 |




Task Split Milestone Summary Manual Progress

Figure 11: Remedial Action Work Plan Schedule - Missoula White Pine Sash CECRA Site

| ID | Outline Number | Task Name | Duration | Start | Finish | Predecessors |
|---|---|---|---|---|---|---|
| 43 | 1.7.3 | Draft Final preparation | 20 days | Wed 1/20/16 | Tue 2/16/16 | 42 |
| 44 | 1.7.4 | DEQ Draft Final review | 30 days | Wed 2/17/16 | Tue 3/29/16 | 43 |
| 45 | 1.7.5 | Final DEQ approval | 0 days | Thu 3/31/16 | Thu 3/31/16 | 44FS+2 days |
| 46 | **1.8** | **Site Characterization - FTA and Geotechnical Work Plan and SAP** | **106 days** | **Fri 11/6/15** | **Thu 4/7/16** | |
| 47 | 1.8.1 | Draft preparation | 24 days | Fri 11/6/15 | Fri 12/11/15 | |
| 48 | 1.8.2 | DEQ Review/comment | 30 days | Mon 12/14/15 | Tue 1/26/16 | 47 |
| 49 | 1.8.3 | Draft Final preparation | 20 days | Wed 1/27/16 | Tue 2/23/16 | 48 |
| 50 | 1.8.4 | DEQ Draft Final review | 30 days | Wed 2/24/16 | Tue 4/5/16 | 49 |
| 51 | 1.8.5 | Final DEQ approval | 0 days | Thu 4/7/16 | Thu 4/7/16 | 50FS+2 days |
| 52 | **2** | **Remedial Action Implementation** | **229 days** | **Mon 11/30/15** | **Thu 10/20/16** | |
| 53 | 2.1 | Procurement, mobilization, and coordination with affected parties | 5 days | Mon 2/1/16 | Fri 2/5/16 | |
| 54 | 2.2 | Detailed Site Survey | 3 days | Mon 11/30/15 | Wed 12/2/15 | |
| 55 | 2.3 | Ash Excavation and MM | 5 days | Thu 1/14/16 | Wed 1/20/16 | 23FS+5 days |
| 56 | 2.4 | Methane Waste Excavation and MM | 30 days | Fri 5/13/16 | Fri 6/24/16 | 55,39 |
| 57 | 2.5 | Construction Completion Report for Ash and Methane Waste Excavation | 10 days | Mon 6/27/16 | Mon 7/11/16 | 56 |
| 58 | 2.6 | DEQ Review/comment | 30 days | Tue 7/12/16 | Mon 8/22/16 | 57 |
| 59 | 2.7 | Draft Final preparation | 10 days | Tue 8/23/16 | Tue 9/6/16 | 58 |
| 60 | 2.8 | DEQ Draft Final review | 30 days | Wed 9/7/16 | Tue 10/18/16 | 59 |
| 61 | 2.9 | Final DEQ approval | 0 days | Thu 10/20/16 | Thu 10/20/16 | 60FS+2 days |
| 62 | **3** | **Site Characterization Implementation** | **436 days** | **Fri 4/1/16** | **Tue 12/19/17** | |
| 63 | 3.1 | Site Characterization - Dioxin Areas | 5 days | Fri 4/1/16 | Thu 4/7/16 | 45SS |
| 64 | 3.2 | Site Characterization - Former Treatment Area | 10 days | Fri 4/8/16 | Thu 4/21/16 | 51 |
| 65 | 3.3 | Geotechnical Investigation | 3 days | Mon 4/25/16 | Wed 4/27/16 | 64FS+1 day |
| 66 | 3.4 | ISCO Soil Bench Test (15-30) FTA | 92 days | Fri 4/22/16 | Wed 8/31/16 | 64 |
| 67 | **3.5** | **Dioxin Remedial Work Plan (dioxin only soil grids SSLLP Property D1, D2, D3, &1028 1/2 Stoddard Street)** | **92 days** | **Fri 5/13/16** | **Thu 9/22/16** | |
| 68 | 3.5.1 | Draft preparation | 15 days | Fri 5/13/16 | Fri 6/3/16 | 63FS+25 day |
| 69 | 3.5.2 | DEQ Review/comment | 30 days | Mon 6/6/16 | Mon 7/18/16 | 68 |
| 70 | 3.5.3 | Draft Final preparation | 15 days | Tue 7/19/16 | Mon 8/8/16 | 69 |
| 71 | 3.5.4 | DEQ Draft Final review | 30 days | Tue 8/9/16 | Tue 9/20/16 | 70 |
| 72 | 3.5.5 | Final DEQ approval of Dioxin RAWP | 0 days | Thu 9/22/16 | Thu 9/22/16 | 71FS+2 days |
| 73 | **3.6** | **Geotechnical Report** | **12 days** | **Fri 5/13/16** | **Tue 5/31/16** | **65FS+11 day** |
| 74 | **3.7** | **Soil treatability benchscale study (LTU ex-situ)** | **234 days** | **Fri 4/22/16** | **Fri 3/24/17** | |
| 75 | 3.7.1 | Soil treatability benchscale testing work plan (LTU ex-situ) | 20 days | Fri 4/22/16 | Thu 5/19/16 | 64 |
| 76 | 3.7.2 | DEQ Review/comment | 30 days | Fri 5/20/16 | Fri 7/1/16 | 75 |
| 77 | 3.7.3 | Draft Final preparation | 15 days | Tue 7/5/16 | Mon 7/25/16 | 76 |
| 78 | 3.7.4 | DEQ Draft Final review | 30 days | Tue 7/26/16 | Tue 9/6/16 | 77 |
| 79 | 3.7.5 | Final DEQ approval | 0 days | Thu 9/8/16 | Thu 9/8/16 | 78FS+2 days |
| 80 | 3.7.6 | Soil treatability benchscale testing (LTU ex-situ) | 50 days | Fri 9/9/16 | Thu 11/17/16 | 79 |
| 81 | 3.7.7 | Soil treatability benchscale study investigation report (LTU ex-situ) | 20 days | Fri 11/18/16 | Mon 12/19/16 | 80 |
| 82 | 3.7.8 | DEQ Review/comment | 30 days | Tue 12/20/16 | Wed 2/1/17 | 81 |
| 83 | 3.7.9 | Draft Final preparation | 5 days | Thu 2/2/17 | Wed 2/8/17 | 82 |
| 84 | 3.7.10 | DEQ Draft Final review | 30 days | Thu 2/9/17 | Wed 3/22/17 | 83 |
| 85 | 3.7.11 | Final DEQ approval | 0 days | Fri 3/24/17 | Fri 3/24/17 | 84FS+2 days |




Task Split Milestone Summary Manual Progress

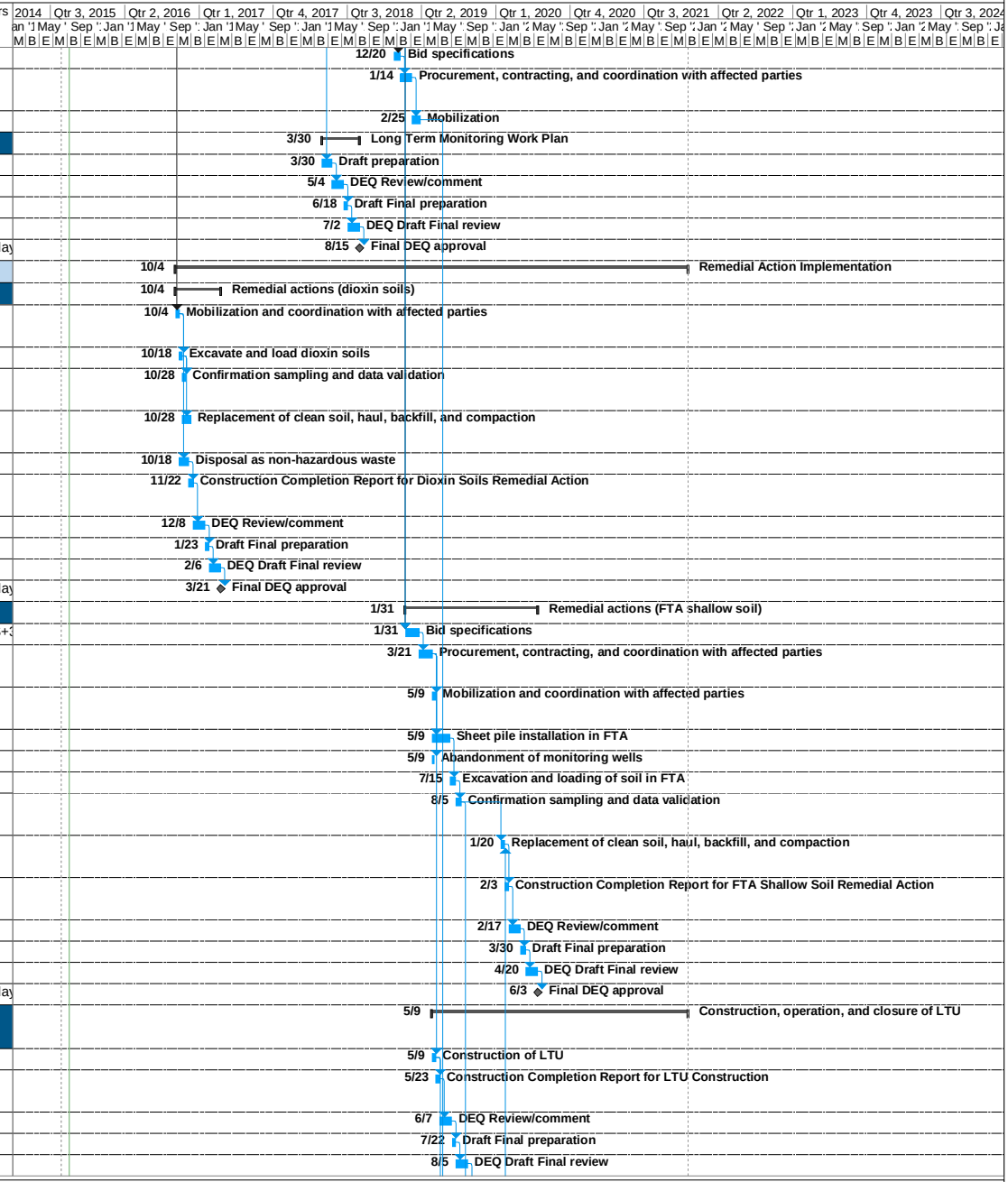
Figure 11: Remedial Action Work Plan Schedule - Missoula White Pine Sash CECRA Site

| ID | Outline Number | Task Name | Duration | Start | Finish | Predecessors |
|---|---|---|---|---|---|---|
| 86 | **3.8** | **ISCO pilot test work plans** | **97 days** | **Thu 9/1/16** | **Fri 1/20/17** | |
| 87 | 3.8.1 | ISCO pilot study work plan (s/gw) | 20 days | Thu 9/1/16 | Thu 9/29/16 | 66 |
| 88 | 3.8.2 | DEQ Review/comment | 30 days | Fri 9/30/16 | Thu 11/10/16 | 87 |
| 89 | 3.8.3 | Draft Final preparation | 15 days | Fri 11/11/16 | Mon 12/5/16 | 88 |
| 90 | 3.8.4 | DEQ Draft Final review | 30 days | Tue 12/6/16 | Wed 1/18/17 | 89 |
| 91 | 3.8.5 | Final DEQ approval | 0 days | Fri 1/20/17 | Fri 1/20/17 | 90FS+2 days |
| 92 | **3.9** | **ISCO pilot test implementation** | **232 days** | **Mon 1/23/17** | **Tue 12/19/17** | |
| 93 | 3.9.1 | Planning/mobilization (ISCO) and coordination with affected parties | 20 days | Mon 1/23/17 | Fri 2/17/17 | 91 |
| 94 | 3.9.2 | ISCO pilot (s/gw) + data validation | 120 days | Mon 2/20/17 | Tue 8/8/17 | 93 |
| 95 | 3.9.3 | ISCO pilot study completion report | 20 days | Wed 8/9/17 | Wed 9/6/17 | 94 |
| 96 | 3.9.4 | DEQ Review/comment | 30 days | Thu 9/7/17 | Wed 10/18/17 | 95 |
| 97 | 3.9.5 | Draft Final preparation | 10 days | Thu 10/19/17 | Wed 11/1/17 | 96 |
| 98 | 3.9.6 | DEQ Draft Final review | 30 days | Thu 11/2/17 | Fri 12/15/17 | 97 |
| 99 | 3.9.7 | Final DEQ approval | 0 days | Tue 12/19/17 | Tue 12/19/17 | 98FS+2 days |
| 100 | **4** | **Work Plans** | **392 days** | **Thu 9/7/17** | **Mon 3/25/19** | |
| 101 | **4.1** | **Conceptual design reports and work plans (LTU)** | **324 days** | **Thu 9/7/17** | **Mon 12/17/18** | |
| 102 | 4.1.1 | LTU conceptual design report/work plan | 30 days | Thu 9/7/17 | Wed 10/18/17 | 95 |
| 103 | 4.1.2 | DEQ Review/comment | 30 days | Thu 10/19/17 | Fri 12/1/17 | 102 |
| 104 | 4.1.3 | Draft Final preparation | 10 days | Mon 12/4/17 | Fri 12/15/17 | 103 |
| 105 | 4.1.4 | DEQ Draft Final review | 30 days | Mon 12/18/17 | Tue 1/30/18 | 104 |
| 106 | 4.1.5 | Final DEQ approval | 0 days | Tue 1/30/18 | Tue 1/30/18 | 105 |
| 107 | 4.1.6 | LTU preliminary design report/work plan | 40 days | Wed 1/31/18 | Tue 3/27/18 | 106 |
| 108 | 4.1.7 | DEQ Review/comment | 30 days | Wed 3/28/18 | Tue 5/8/18 | 107 |
| 109 | 4.1.8 | Draft Final preparation | 10 days | Wed 5/9/18 | Tue 5/22/18 | 108 |
| 110 | 4.1.9 | DEQ Draft Final review | 30 days | Wed 5/23/18 | Thu 7/5/18 | 109 |
| 111 | 4.1.10 | Final DEQ approval | 0 days | Mon 7/9/18 | Mon 7/9/18 | 110FS+2 days |
| 112 | 4.1.11 | LTU final design report/work plan | 40 days | Tue 7/10/18 | Tue 9/4/18 | 111 |
| 113 | 4.1.12 | DEQ Review/comment | 30 days | Wed 9/5/18 | Tue 10/16/18 | 112 |
| 114 | 4.1.13 | Draft Final preparation | 10 days | Wed 10/17/18 | Tue 10/30/18 | 113 |
| 115 | 4.1.14 | DEQ Draft Final review | 30 days | Wed 10/31/18 | Thu 12/13/18 | 114 |
| 116 | 4.1.15 | Final DEQ approval | 0 days | Mon 12/17/18 | Mon 12/17/18 | 115FS+2 days |
| 117 | **4.2** | **Conceptual design reports and work plans (ISCO)** | **326 days** | **Thu 9/7/17** | **Wed 12/19/18** | |
| 118 | 4.2.1 | ISCO conceptual design report/work plan | 30 days | Thu 9/7/17 | Wed 10/18/17 | 81,95 |
| 119 | 4.2.2 | DEQ Review/comment | 30 days | Thu 10/19/17 | Fri 12/1/17 | 118 |
| 120 | 4.2.3 | Draft Final preparation | 10 days | Mon 12/4/17 | Fri 12/15/17 | 119 |
| 121 | 4.2.4 | DEQ Draft Final review | 30 days | Mon 12/18/17 | Tue 1/30/18 | 120 |
| 122 | 4.2.5 | Final DEQ approval | 0 days | Thu 2/1/18 | Thu 2/1/18 | 121FS+2 days |
| 123 | 4.2.6 | ISCO preliminary design report/work plan | 40 days | Fri 2/2/18 | Thu 3/29/18 | 122 |
| 124 | 4.2.7 | DEQ Review/comment | 30 days | Fri 3/30/18 | Thu 5/10/18 | 123 |
| 125 | 4.2.8 | Draft Final preparation | 10 days | Fri 5/11/18 | Thu 5/24/18 | 124 |
| 126 | 4.2.9 | DEQ Draft Final review | 30 days | Fri 5/25/18 | Mon 7/9/18 | 125 |
| 127 | 4.2.10 | Final DEQ approval | 0 days | Wed 7/11/18 | Wed 7/11/18 | 126FS+2 days |
| 128 | 4.2.11 | ISCO final design report/work plan | 40 days | Thu 7/12/18 | Thu 9/6/18 | 127 |
| 129 | 4.2.12 | DEQ Review/comment | 30 days | Fri 9/7/18 | Thu 10/18/18 | 128 |
| 130 | 4.2.13 | Draft Final preparation | 10 days | Fri 10/19/18 | Thu 11/1/18 | 129 |
| 131 | 4.2.14 | DEQ Draft Final review | 30 days | Fri 11/2/18 | Mon 12/17/18 | 130 |
| 132 | 4.2.15 | Final DEQ approval | 0 days | Wed 12/19/18 | Wed 12/19/18 | 131FS+2 days |
| 133 | **4.3** | **ISCO Work Plan Implementation** | **66 days** | **Thu 12/20/18** | **Mon 3/25/19** | |


Task Split Milestone Summary Manual Progress

Figure 11: Remedial Action Work Plan Schedule - Missoula White Pine Sash CECRA Site

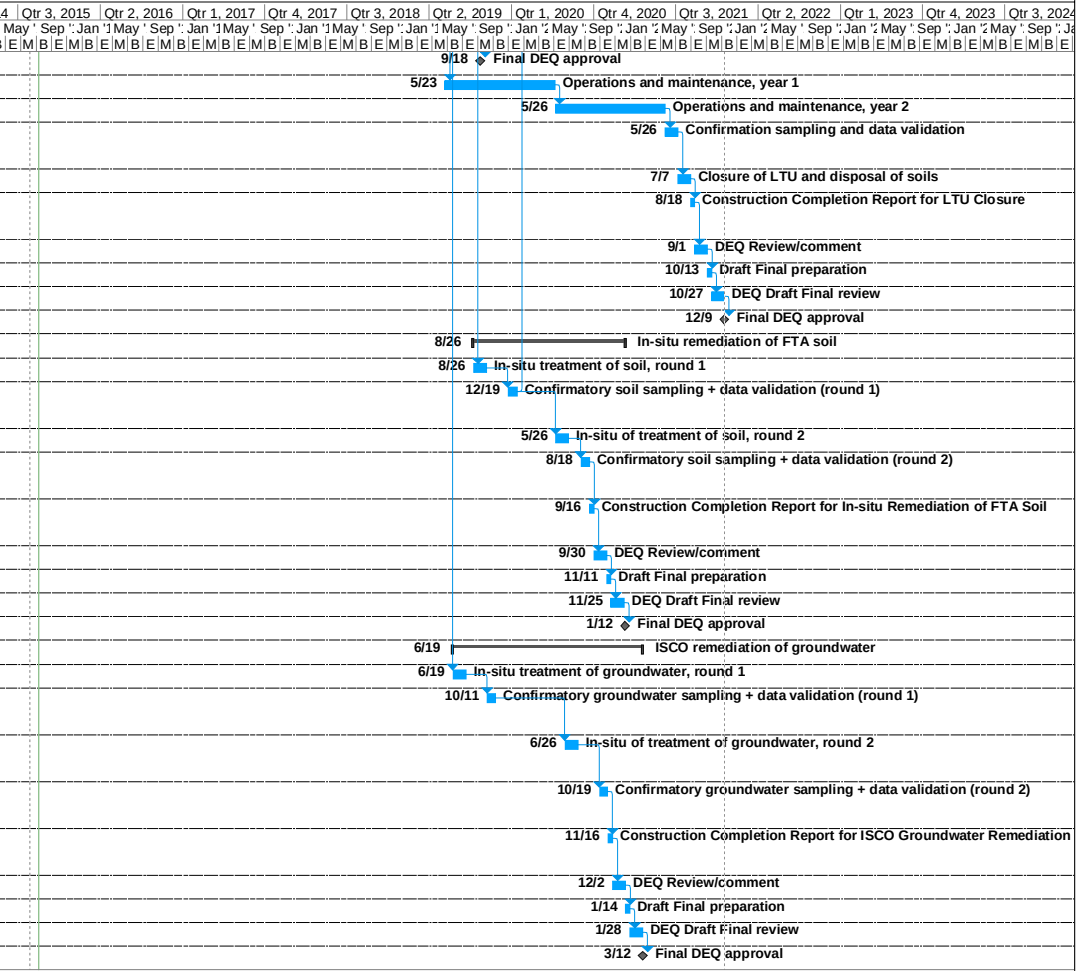
| ID | Outline Number | Task Name | Duration | Start | Finish | Predecessors |
|---|---|---|---|---|---|---|
| 134 | 4.3.1 | Bid specifications | 15 days | Thu 12/20/18 | Fri 1/11/19 | 132,116 |
| 135 | 4.3.2 | Procurement, contracting, and coordination with affected parties | 30 days | Mon 1/14/19 | Fri 2/22/19 | 134 |
| 136 | 4.3.3 | Mobilization | 21 days | Mon 2/25/19 | Mon 3/25/19 | 135 |
| 137 | **4.4** | **Long Term Monitoring Work Plan** | **97 days** | **Fri 3/30/18** | **Wed 8/15/18** | |
| 138 | 4.4.1 | Draft preparation | 25 days | Fri 3/30/18 | Thu 5/3/18 | 123 |
| 139 | 4.4.2 | DEQ Review/comment | 30 days | Fri 5/4/18 | Fri 6/15/18 | 138 |
| 140 | 4.4.3 | Draft Final preparation | 10 days | Mon 6/18/18 | Fri 6/29/18 | 139 |
| 141 | 4.4.4 | DEQ Draft Final review | 30 days | Mon 7/2/18 | Mon 8/13/18 | 140 |
| 142 | 4.4.5 | Final DEQ approval | 0 days | Wed 8/15/18 | Wed 8/15/18 | 141FS+2 day |
| 143 | **5** | **Remedial Action Implementation** | **1323 day** | **Tue 10/4/16** | **Thu 12/9/21** | |
| 144 | **5.1** | **Remedial actions (dioxin soils)** | **117 days** | **Tue 10/4/16** | **Tue 3/21/17** | |
| 145 | 5.1.1 | Mobilization and coordination with affected parties | 10 days | Tue 10/4/16 | Mon 10/17/16 | 72FS+7 days |
| 146 | 5.1.2 | Excavate and load dioxin soils | 8 days | Tue 10/18/16 | Thu 10/27/16 | 145 |
| 147 | 5.1.3 | Confirmation sampling and data validation | 10 days | Fri 10/28/16 | Thu 11/10/16 | 146 |
| 148 | 5.1.4 | Replacement of clean soil, haul, backfill, and compaction | 20 days | Fri 10/28/16 | Mon 11/28/16 | 146 |
| 149 | 5.1.5 | Disposal as non-hazardous waste | 25 days | Tue 10/18/16 | Mon 11/21/16 | 145 |
| 150 | 5.1.6 | Construction Completion Report for Dioxin Soils Remedial Action | 10 days | Tue 11/22/16 | Wed 12/7/16 | 149 |
| 151 | 5.1.7 | DEQ Review/comment | 30 days | Thu 12/8/16 | Fri 1/20/17 | 150 |
| 152 | 5.1.8 | Draft Final preparation | 10 days | Mon 1/23/17 | Fri 2/3/17 | 151 |
| 153 | 5.1.9 | DEQ Draft Final review | 30 days | Mon 2/6/17 | Fri 3/17/17 | 152 |
| 154 | 5.1.10 | Final DEQ approval | 0 days | Tue 3/21/17 | Tue 3/21/17 | 153FS+2 day |
| 155 | **5.2** | **Remedial actions (FTA shallow soil)** | **342 days** | **Thu 1/31/19** | **Wed 6/3/20** | |
| 156 | 5.2.1 | Bid specifications | 35 days | Thu 1/31/19 | Wed 3/20/19 | 128,116FS+3 |
| 157 | 5.2.2 | Procurement, contracting, and coordination with affected parties | 35 days | Thu 3/21/19 | Wed 5/8/19 | 156 |
| 158 | 5.2.3 | Mobilization and coordination with affected parties | 10 days | Thu 5/9/19 | Wed 5/22/19 | 157 |
| 159 | 5.2.4 | Sheet pile installation in FTA | 45 days | Thu 5/9/19 | Fri 7/12/19 | 157 |
| 160 | 5.2.5 | Abandonment of monitoring wells | 5 days | Thu 5/9/19 | Wed 5/15/19 | 157 |
| 161 | 5.2.6 | Excavation and loading of soil in FTA | 15 days | Mon 7/15/19 | Fri 8/2/19 | 159 |
| 162 | 5.2.7 | Confirmation sampling and data validation | 15 days | Mon 8/5/19 | Fri 8/23/19 | 161 |
| 163 | 5.2.8 | Replacement of clean soil, haul, backfill, and compaction | 10 days | Mon 1/20/20 | Fri 1/31/20 | 162,187 |
| 164 | 5.2.9 | Construction Completion Report for FTA Shallow Soil Remedial Action | 10 days | Mon 2/3/20 | Fri 2/14/20 | 163 |
| 165 | 5.2.10 | DEQ Review/comment | 30 days | Mon 2/17/20 | Fri 3/27/20 | 164 |
| 166 | 5.2.11 | Draft Final preparation | 15 days | Mon 3/30/20 | Fri 4/17/20 | 165 |
| 167 | 5.2.12 | DEQ Draft Final review | 30 days | Mon 4/20/20 | Mon 6/1/20 | 166 |
| 168 | 5.2.13 | Final DEQ approval | 0 days | Wed 6/3/20 | Wed 6/3/20 | 167FS+2 day |
| 169 | **5.3** | **Construction, operation, and closure of LTU** | **664 days** | **Thu 5/9/19** | **Thu 12/9/21** | |
| 170 | 5.3.1 | Construction of LTU | 10 days | Thu 5/9/19 | Wed 5/22/19 | 157 |
| 171 | 5.3.2 | Construction Completion Report for LTU Construction | 10 days | Thu 5/23/19 | Thu 6/6/19 | 170 |
| 172 | 5.3.3 | DEQ Review/comment | 30 days | Fri 6/7/19 | Fri 7/19/19 | 171 |
| 173 | 5.3.4 | Draft Final preparation | 10 days | Mon 7/22/19 | Fri 8/2/19 | 172 |
| 174 | 5.3.5 | DEQ Draft Final review | 30 days | Mon 8/5/19 | Mon 9/16/19 | 173 |




Task Split Milestone Summary Manual Progress

Figure 11: Remedial Action Work Plan Schedule - Missoula White Pine Sash CECRA Site

| ID | Outline Number | Task Name | Duration | Start | Finish | Predecessors |
|---|---|---|---|---|---|---|
| 175 | 5.3.6 | Final DEQ approval | 0 days | Wed 9/18/19 | Wed 9/18/19 | 174FS+2 day |
| 176 | 5.3.7 | Operations and maintenance, year 1 | 255 days | Thu 5/23/19 | Fri 5/22/20 | 170 |
| 177 | 5.3.8 | Operations and maintenance, year 2 | 257 days | Tue 5/26/20 | Tue 5/25/21 | 176 |
| 178 | 5.3.9 | Confirmation sampling and data validation | 30 days | Wed 5/26/21 | Tue 7/6/21 | 177 |
| 179 | 5.3.10 | Closure of LTU and disposal of soils | 30 days | Wed 7/7/21 | Tue 8/17/21 | 178 |
| 180 | 5.3.11 | Construction Completion Report for LTU Closure | 10 days | Wed 8/18/21 | Tue 8/31/21 | 179 |
| 181 | 5.3.12 | DEQ Review/comment | 30 days | Wed 9/1/21 | Tue 10/12/21 | 180 |
| 182 | 5.3.13 | Draft Final preparation | 10 days | Wed 10/13/21 | Tue 10/26/21 | 181 |
| 183 | 5.3.14 | DEQ Draft Final review | 30 days | Wed 10/27/21 | Tue 12/7/21 | 182 |
| 184 | 5.3.15 | Final DEQ approval | 0 days | Thu 12/9/21 | Thu 12/9/21 | 183FS+2 day |
| 185 | **5.4** | **In-situ remediation of FTA soil** | **352 days** | **Mon 8/26/19** | **Tue 1/12/21** | |
| 186 | 5.4.1 | In-situ treatment of soil, round 1 | 30 days | Mon 8/26/19 | Mon 10/7/19 | 162 |
| 187 | 5.4.2 | Confirmatory soil sampling + data validation (round 1) | 20 days | Thu 12/19/19 | Fri 1/17/20 | 186FS+50 days |
| 188 | 5.4.3 | In-situ of treatment of soil, round 2 | 30 days | Tue 5/26/20 | Mon 7/6/20 | 187FS+90 da |
| 189 | 5.4.4 | Confirmatory soil sampling + data validation (round 2) | 20 days | Tue 8/18/20 | Tue 9/15/20 | 188FS+30 days |
| 190 | 5.4.5 | Construction Completion Report for In-situ Remediation of FTA Soil | 10 days | Wed 9/16/20 | Tue 9/29/20 | 189 |
| 191 | 5.4.6 | DEQ Review/comment | 30 days | Wed 9/30/20 | Tue 11/10/20 | 190 |
| 192 | 5.4.7 | Draft Final preparation | 10 days | Wed 11/11/20 | Tue 11/24/20 | 191 |
| 193 | 5.4.8 | DEQ Draft Final review | 30 days | Wed 11/25/20 | Fri 1/8/21 | 192 |
| 194 | 5.4.9 | Final DEQ approval | 0 days | Tue 1/12/21 | Tue 1/12/21 | 193FS+2 day |
| 195 | **5.5** | **ISCO remediation of groundwater** | **442 days** | **Wed 6/19/19** | **Fri 3/12/21** | |
| 196 | 5.5.1 | In-situ treatment of groundwater, round 1 | 30 days | Wed 6/19/19 | Wed 7/31/19 | 136FS+60 da |
| 197 | 5.5.2 | Confirmatory groundwater sampling + data validation (round 1) | 20 days | Fri 10/11/19 | Thu 11/7/19 | 196FS+50 days |
| 198 | 5.5.3 | In-situ of treatment of groundwater, round 2 | 30 days | Fri 6/26/20 | Thu 8/6/20 | 197FS+160 days |
| 199 | 5.5.4 | Confirmatory groundwater sampling + data validation (round 2) | 20 days | Mon 10/19/20 | Fri 11/13/20 | 198FS+50 days |
| 200 | 5.5.5 | Construction Completion Report for ISCO Groundwater Remediation | 10 days | Mon 11/16/20 | Tue 12/1/20 | 199 |
| 201 | 5.5.6 | DEQ Review/comment | 30 days | Wed 12/2/20 | Wed 1/13/21 | 200 |
| 202 | 5.5.7 | Draft Final preparation | 10 days | Thu 1/14/21 | Wed 1/27/21 | 201 |
| 203 | 5.5.8 | DEQ Draft Final review | 30 days | Thu 1/28/21 | Wed 3/10/21 | 202 |
| 204 | 5.5.9 | Final DEQ approval | 0 days | Fri 3/12/21 | Fri 3/12/21 | 203FS+2 day |




Task Split Milestone Summary Manual Progress

# APPENDIX A
# A. ENVIRONMENTAL REQUIREMENTS, CRITERIA, AND LIMITATIONS

| Federal or State ERCL Citation | Description | Preliminary Identification of Compliance |
|---|---|---|
| | **CONTAMINANT SPECIFIC REQUIREMENTS** | |
| **Groundwater** | | |
| 40 Code of Federal Regulations (CFR) Part 141 **(Applicable)**<br><br>40 CFR Part 143.3 **(Relevant)** | Maximum Contaminant Levels (MCLs) and Maximum Contaminant Level Goals (MCLGs)<br>Because groundwater in the vicinity of the site is used as a drinking water source, the MCLs and non-zero MCLGs specified in 40 CFR Part 141 (National Primary Drinking Water Regulations) are identified. The EPA has designated the Missoula Aquifer as a Sole Source Aquifer, which is an aquifer that provides more than 50% of drinking water consumed in the overlying area, and where there is no viable alternative drinking water source.<br><br>At the MWPS Facility, barium is the only primary contaminant of concern with a non-zero MCLG; MCLG for barium is 2,000 µg/L which is equivalent to the MCL for barium. MCLs for the primary contaminants of concern in groundwater are listed below. However, compliance with all MCLs is required and remedial actions must meet the MCLs for all contaminants at the MWPS Facility, including any breakdown products generated during remedial actions. For the primary contaminants of concern, the MCLs are listed below, with all levels provided in µg/L.<br><br>Arsenic: 10, Barium: 2,000, Dioxin/furans: 0.00003 (2,3,7,8-TCDD TEQ [2005 TEFs]), Pentachlorophenol: 1, and Lead: 15.<br><br>Secondary Maximum Contaminant Levels<br>Because groundwater in the vicinity of the site is used as a drinking water source, the Secondary Maximum Contaminant Levels (SMCLs) specified in 40 CFR Part 143.3 are relevant requirements which are ultimately to be attained by the remedy for the site. 40 CFR Part 143.3 contains standards for iron, manganese, color, odor, and corrosivity which are relevant to the remedial action. | The cleanup levels at the MWPS Facility are based on Montana numeric water quality standards, MCLs or other applicable groundwater quality regulations. Source materials identified during site investigations, such as contaminated soils, will be removed. Wastes generated during the remedial activities will be stored and treated or disposed of in such a manner as to not re-impact groundwater quality. Soil treated in onsite LTUs will be equipped with liners and leachate collection systems to prevent recontamination of the groundwater. Leachate will be collected and stored for either recirculation into the LTU or off-site disposal, depending on the properties of the leachate and the irrigation needs. Excess leachate or groundwater collected during sampling activities will either be disposed offsite or treated and discharged to the City sewer (POTW) through an industrial discharge permit. Contaminated soils and other contaminated media will be treated, recycled or disposed of in accordance with solid and hazardous waste ERCLs in a manner that does not degrade the aquifer. In addition, the remedy provides for active treatment of the groundwater through chemical oxidation followed by long term monitoring. |
| Section 75-5-605, Montana Code Annotated (MCA) **(Applicable)**<br>Section 75-5-303, MCA **(Applicable)**<br>Section 75-6-112, MCA **(Applicable)** | The Montana Water Quality Act, § 75-5-605, MCA provides that it is unlawful to cause pollution of any state waters and § 75-6-112, MCA provides that is unlawful to discharge drainage or other waste that will cause pollution of state waters used as a source for a public water supply or for domestic use as well as prohibits other unlawful actions. Section 75-5-605, MCA also states that it is unlawful to place or cause to be placed any wastes where they will cause pollution of any state waters. Section 75-5-303, MCA states that existing uses of state waters and the level of water quality necessary to protect the uses must be maintained and protected. | To prevent state waters from degradation/pollution, wastes generated during the remedial activities will be stored and treated or disposed of in such a manner as to not re-impact groundwater quality. Soil treated in onsite LTUs will be equipped with liners and leachate collection systems to prevent recontamination of the groundwater. Leachate will be collected and stored for either recirculation into the LTU or off-site disposal, depending on the properties of the leachate and the irrigation needs. Excess leachate or groundwater collected during sampling activities will either be disposed offsite or treated and discharged to the City sewer (POTW) through an industrial discharge permit. Contaminated soils and other contaminated media will be treated, recycled or disposed of in accordance with solid and hazardous waste ERCLs in a manner that does not degrade water quality. In addition, the remedy provides for active treatment of the groundwater through chemical oxidation followed by long term monitoring which will ensure that cleanup levels are met. The remedy work plans will address releases that may occur during implementation of the remedy. |
| Administrative Rules of Montana (ARM) 17.30.1006 **(Applicable)**<br><br>ARM 17.30.1011 **(Applicable)** | Montana Groundwater Pollution Control System<br>ARM 17.30.1006 classifies groundwater into Classes I through IV based upon its specific conductance and establishes the groundwater quality standards applicable with respect to each groundwater classification. Class I is the highest quality class; Class IV the lowest. Class I groundwater has a specific conductance of less than 1,000 micromhos per centimeter (µmhos/cm) at 25 degrees Celsius. As discussed in Section 5.2.3 of the ROD, the June 2013 groundwater sampling event indicated that the specific conductance of perched groundwater ranged from 360 µmhos/cm at well B-09S to 1,190 µmhos/cm at well B-02S and the specific conductance of the Missoula Aquifer ranged from 374 umhos/cm at well WPS-14D to 699 umhos/cm at well WPS-04D (Douglass, 2013c). Therefore, based on its specific conductance, groundwater at the MWPS Facility has been classified as Class I groundwater. Concentrations of substances in groundwater within Class I may not exceed the human health standards for groundwater listed in Circular DEQ-7, Montana Numeric Water Quality Standards, October 2012. For the primary contaminants of concern, the Circular DEQ-7 standards and MCLs are listed below. All levels are provided in µg/L.<br><br>Arsenic: 10, Barium: 1,000, Dioxin/furans: 0.000002 (2,3,7,8-TCDD TEQ [2005 TEFs]), Pentachlorophenol: 1, and Lead: 15.<br><br>For concentrations of parameters for which human health standards are not listed in DEQ-7, ARM 17.30.1006 allows no increase of a parameter to a level that renders the waters harmful, detrimental or injurious to the beneficial uses listed for that class of water.<br><br>ARM 17.30.1011 provides that any groundwater whose existing quality is higher than the standard for its classification must be maintained at that high quality in accordance with Section 75-5-303, MCA, and ARM Title 17, chapter 30, subchapter 7. | The cleanup levels at the MWPS Facility are based on Montana numeric water quality standards, MCLs or SSCLs. Source materials identified during site investigations, such as contaminated soils, will be removed. Wastes generated during the remedial activities will be stored and treated or disposed of in such a manner as to not re-impact groundwater quality. Soil treated in onsite LTUs will be equipped with liners and leachate collection systems to prevent recontamination of the groundwater. Leachate will be collected and stored for either recirculation into the LTU or off-site disposal, depending on the properties of the leachate and the irrigation needs. Excess leachate or groundwater collected during sampling activities will either be disposed offsite or treated and discharged to the City sewer (POTW) through an industrial discharge permit. Contaminated soils and other contaminated media will be treated, recycled or disposed of in accordance with solid and hazardous waste ERCLs in a manner that does not degrade the aquifer. In addition, the remedy provides for active treatment of the groundwater through chemical oxidation followed by long term monitoring. |
| **Surface Water** | | |
| ARM 17.30.607 **(Applicable)**<br>ARM 17.30.623 **(Applicable)**<br>DEQ-7 standards **(Applicable)**<br><br>ARM 17.30.705 **(Applicable)** | The MWPS facility is located approximately 0.5 miles to the north of the Clark Fork River and no surface water bodies are impacted by contamination from the facility. ARM 17.30.607 provides that the Clark Fork River is classified as B-1. ARM 17.30.623 provides the classification standards and beneficial uses for the B-1 classification and provides that concentrations of carcinogenic, bioconcentrating, toxic, or harmful parameters that would remain in the water after conventional water treatment may not exceed DEQ-7 standards. The section also provides the specific water quality standards for water classified as B-1 that must be met.<br><br>ARM 17.30.705 provides that for any surface water, existing and anticipated uses and the water quality necessary to protect these uses must be maintained and protected unless degradation is allowed under the nondegradation rules at ARM 17.30.708 | There is no current data indicating that the MWPS Facility is impacting the Clark Fork River or other surface water. However, if information regarding the presence of or impact on surface water changes, DEQ will be notified and compliance with relevant and applicable standards will be investigated. |

| Federal or State ERCL Citation | Description | Preliminary Identification of Compliance |
|---|---|---|
| **Air Quality** | | |
| The Clean Air Act (42 USC §§ 7401 et seq.) **(Applicable)**<br><br>Sections 75-2-101, et seq., MCA **(Applicable)**<br><br>ARM 17.8.204 and 206 **(Applicable)**<br><br>ARM 17.8.220 **(Applicable)** | The Clean Air Act (42 USC §§ 7401 et seq.) provides limitations on air emissions resulting from cleanup activities or emissions resulting from wind erosion of exposed hazardous substances.<br><br>Sections 75-2-101, et seq., MCA provides that state emission standards are enforceable under the Clean Air Act of Montana.<br><br>ARM 17.8.204 and 206 establish monitoring, data collection, and analytical requirements to ensure compliance with ambient air quality standards and require compliance with the Montana Quality Assurance Project Plan except when the DEQ determines more stringent requirements are necessary.<br><br>ARM 17.8.220. Settled particulate matter shall not exceed a 30 day average of 10 grams per square meter. | During the development of design documents, Huttig will confirm whether an air permit is needed. The remedy work plans will include dust control measures to prevent particles or contaminants from becoming airborne and procedures for air monitoring to verify compliance with ambient air standards. Remedial actions will be halted if air monitoring indicates dust concentrations are approaching air quality limitations and will not resume until adequate dust control measures are in place. If ambient air monitoring is required, ARM 17.8.204 provides that such sampling and data collection must be performed as specified in the Montana Quality Assurance Project Plan, incorporated by reference in ARM 17.8.202, unless DEQ determines more stringent requirements are needed. |
| ARM 17.8.223 **(Applicable)** | ARM 17.8.223. PM-10 concentrations in the ambient air shall not exceed a 24 hour average of 150 micrograms per cubic meter of air and an annual average of 50 micrograms per cubic meter of air. | Activities proposed in the ROD include excavation, soil treatment and other land disturbance activities. The remedy work plans will include dust control measures to prevent particles or contaminants from becoming airborne and procedures for air monitoring to verify compliance with ambient air standards. Remedial actions will be halted if air monitoring indicates dust concentrations are approaching air quality limitations and will not resume until adequate dust control measures are in place. |
| ARM 17.8.210, 17.8.211, 17.8.212, 17.8.213, 17.8.214, and 17.8.222 **(Applicable)** | Ambient air standards are also promulgated for sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone, hydrogen sulfide, and lead. If emissions of these compounds were to occur in connection with any remedial action, these standards would be applicable. | Activities proposed in the ROD are not expected to result in exceedances of ambient air quality standards for carbon monoxide, hydrogen sulfide, nitrogen dioxide, sulfur dioxide, lead, or ozone. |
| **Methane** | | |
| ARM 17.50.1106 **(Relevant)** | ARM 17.50.1106 specifies the concentration of methane gas generated by a solid waste facility cannot exceed 25% of the lower explosive limit (LEL) for methane in facility structures. | Activities proposed in the ROD include excavation of methane-impacted soils. Methane will be monitored at all times during excavation activities using a gas meter to ensure a safe working environment and also to partially verify the soil meets disposal criteria. |
| **LOCATION SPECIFIC REQUIREMENTS** | | |
| **The Endangered Species Act** | | |
| 16 U.S.C. § 1531 et seq., 50 CFR Part 402, 40 CFR 6.302(h), 40 CFR 257.3-2 **(Relevant)** | This statute and implementing regulations (16 U.S.C. § 1531 et seq., 50 CFR Part 402, 40 CFR 6.302(h), and 40 CFR 257.3-2) require that any federal activity or federally authorized activity may not jeopardize the continued existence of any threatened or endangered species or destroy or adversely modify a critical habitat. Compliance with this requirement involves consultation with the U.S. Fish and Wildlife Service (USFWS) and a determination of whether there are listed or proposed species or critical habitats present at the facility, and, if so, whether any proposed activities will impact such wildlife or habitat. | No threatened or endangered species or critical habitat have been identified on the MWPS Facility. However, if threatened or endangered species or critical habitats are subsequently encountered during remedial actions, compliance with these ERCLs is required and consultation with the USFWS will occur. |
| **Montana Nongame and Endangered Species Conservation Act** | | |
| Montana Nongame and Endangered Species Act, §§ 87-5-101 et seq., § 87-5-201, MCA, **(Applicable)**<br><br>ARM 12.5.201 **(Applicable)** | §§ 87-5-101 et seq. Endangered species should be protected in order to maintain and to the extent possible enhance their numbers. This regulatory citation lists endangered species, prohibited acts and penalties. See also, § 87-5-201, MCA, (Applicable) concerning protection of wild birds, nests and eggs.<br><br>ARM 12.5.201. Certain activities are prohibited with respect to specified endangered species. | No threatened or endangered species or critical habitat have been identified on the MWPS Facility. However, if threatened or endangered species or critical habitats are subsequently encountered during remedial actions, compliance with these ERCLs is required and consultation with the USFWS will occur. |
| **Migratory Bird Treaty Act** | | |
| 16 U.S.C. § 703, et seq. **(Relevant)** | This requirement (16 U.S.C. § 703 et seq.) establishes a federal responsibility for the protection of the international migratory bird resource and requires continued consultation with the USFWS during remedial design and remedial action to ensure that the cleanup of the site does not unnecessarily impact migratory birds. | As determined in the ROD, the MWPS facility is not attractive to migratory waterfowl and the level of human activity is likely to discourage significant use by wildlfe. However, if international migratory bird resources are subsequently encountered during remedial actions, consultation with the USFWS will occur. |
| **Bald Eagle Protection Act** | | |
| 16 U.S.C. § 668, et seq. **(Relevant)** | This requirement (16 U.S.C. § 668 et seq.) establishes a federal responsibility for protection of bald and golden eagles, and requires continued consultation with the USFWS during remedial design and remedial action to ensure that any cleanup of the site does not unnecessarily adversely affect the bald and golden eagle. | As determined in the ROD, animal species of special concern (including bald and golden eagles) have not been identified at the MWPS Facility. However, if bald or golden eagles are subsequently encountered during remedial actions, consultation with the USFWS will occur. |
| **Historic Sites, Buildings, Objects, and Antiquities Act** | | |
| 16 U.S.C. 461, et seq. **(Relevant)** | These requirements, found at 16 U.S.C. 461 et seq., provide that, in conducting an environmental review of a proposed action, the responsible official shall consider the existence and location of natural landmarks using information provided by the National Park Service pursuant to 36 CFR 62.6(d) to avoid undesirable impacts upon such landmarks. | To date, no such landmarks are identified in the area. Therefore, no further actions are required to comply with this requirement. In addition, historic cultural resources at the MWPS Facility were evaluated in the Feasibility Study (FS) (Douglass, 2015) and the Montana State Historic Preservation Office was consulted. |
| **Resource Conservation and Recovery Act** | | |
| 40 CFR 264.18 **(Relevant)** | This requirement (40 CFR 264.18) provides location standards for owners and operators of hazardous waste management units. Portions of new management units must not be located within 200 feet of a fault which has had displacement in Holocene time and management units in or near a 100 year floodplain must be designed, constructed, operated, and maintained to avoid washout. | Activities required by the ROD include construction of one land treatment unit (LTU). The site is not located within 200 feet of any known faults, and is also not located within the 100 year floodplain. |

| Federal or State ERCL Citation | Description | Preliminary Identification of Compliance |
|---|---|---|
| **Wetlands, Floodplains, and Streambed Preservation** | | |
| Various | As described in the ROD, there are no designated wetlands, floodplains, or other surface water bodies present at the MWPS Facility. Therefore, certain ERCLs (including but not limited to the Floodplain Management Order, 40 CFR Part 6, Appendix A, Executive Order No. 11,988; Protection of Wetlands Order, 40 CFR Part 6, Appendix A, Executive Order No. 11,990; 33 USC § 1344(b)(1); the Montana Floodplain and Floodway Management Act and Regulations, §§ 76-5-401, et seq., MCA, ARM 36.15.601, et seq.; Fish and Wildlife Coordination Act, 16 USC §§ 661 et seq. and 40 A-6 CFR § 6.302(g); dredge and fill regulations, 40 CFR Part 230; and the Montana Natural Streambed and Land Preservation Act and Regulations, § 75-7-102, MCA, and ARM 36.2.401 et seq.) have not been identified. | As described in the ROD, there are no designated wetlands, floodplains, or other surface water bodies present at the MWPS Facility. If information regarding the presence of, or impact on, wetlands, floodplains, or surface water changes, DEQ may identify applicable or relevant ERCLs. |
| **Montana Solid Waste Management Act** | | |
| Solid Waste Management Act, Sections 75-10-201 et seq., MCA and ARM 17.50.501 et seq.<br><br>ARM 17.50.523 **(Applicable)**<br><br>Section 75-10-212, MCA **(Applicable)** | Regulations promulgated under the Solid Waste Management Act, Sections 75-10-201 et seq., MCA, and pursuant to the federal Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act, 42 U.S.C §§ 6901 et seq. (RCRA Subtitle D), specify requirements that apply to the location of any solid waste management facility. DEQ did not select a remedy that includes construction of an onsite solid waste facility so has not identified citing regulations such as ARM 17.50.505, design regulations such as ARM 17.50.506, or closure regulations such as ARM 17.50.530.<br><br>Any media disposed offsite will be taken to a licensed solid waste facility that is in compliance with applicable regulations. Transportation of that material must comply with ARM 17.50.523 which requires that waste be transported in such a manner as to prevent its discharge, dumping, spilling or leaking from the transport vehicle.<br><br>Section 75-10-212, MCA prohibits dumping or leaving any debris or refuse upon or within 200 yards of any highway, road, street, or alley of the State or other public property, or on privately owned property where hunting, fishing, or other recreation is permitted. | There is one LTU specified in the ROD for the treatment of PCP-containing soil (F032 listed hazardous waste), which is regulated under separate hazardous waste regulations as well as the Montana solid waste management regulations. Other non-hazardous wastes generated during implementation of the ROD will be placed in the appropriate container and temporarily stored in a centralized storage area pending characterization and final disposition. Non-hazardous waste will be reused to the maximum extent practicable. Non-hazardous solid waste that cannot be reused will be disposed offsite at the appropriate disposal facility. All offsite disposal will occur in covered vehicles to prohibit spillage. Other solid waste (i.e., plastic wrapping, cardboard, etc.) will be contained in a plastic bag (if necessary), double-bagged (if necessary), and placed in a waste disposal dumpster for collection and appropriate disposal as solid waste. |
| **ACTION SPECIFIC REQUIREMENTS** | | |
| **Point Source Controls** | | |
| ARM 17.30.1201 et seq., and ARM 17.30.1301 et seq. | ARM 17.30.1201 et seq, and ARM 17.30.1301 et seq. would be applicable if point sources of water contamination are retained or created by any remediation activity. Applicable Clean Water Act standards would apply to those discharges. | The tasks detailed in the ROD do not indicate there will be point source discharge from water. Leachate will be collected and stored for either recirculation into the LTU or off-site disposal, depending on the properties of the leachate and the irrigation needs. Excess leachate or groundwater collected during sampling activities will either be disposed offsite or treated and discharged to the City sewer (POTW) through an industrial discharge permit. |
| **Air Quality Regulations** | | |
| ARM 17.8.304 and 17.8.308 **(Applicable)**<br><br>ARM 17.24.761 **(Relevant)** | ARM 17.8.304 and 17.8.308 state that no person shall cause or authorize the production, handling, transportation, or storage of any material; or cause or authorize the use of any street, road, or parking lot; or operate a construction site or demolition project, unless reasonable precautions to control emissions of airborne particulate matter are taken. Emissions of airborne particulate matter must be controlled so that they do not exhibit an opacity of 20% or greater averaged over six consecutive minutes.<br><br>ARM 17.24.761 specifies a range of measures for controlling fugitive dust emissions during mining and reclamation activities and requires that a fugitive dust program be implemented. Some of these measures could be considered relevant to control fugitive dust emissions in connection with excavation, earth moving, and transportation activities. Such measures include, for example, paving, watering, chemically stabilizing, or frequently compacting and scraping roads, promptly removing rock, soil or other dust-forming debris from roads, tilling, restricting vehicles speeds, revegetating, mulching, or otherwise stabilizing the surface of areas adjoining roads, restricting unauthorized vehicle travel, minimizing the area of disturbed land, and promptly revegetating regraded lands. | Dust suppression and control of certain substances that may be released into the air as a result of earth moving, transportation and similar actions may be necessary to meet air quality requirements. The remedy work plans will include dust control measures to prevent particles or contaminants from becoming airborne and procedures for air monitoring to verify compliance with ambient air standards. Remedial actions will be halted if air monitoring indicates dust concentrations are approaching air quality limitations and will not resume until adequate dust control measures are in place. |
| **Groundwater Act** | | |
| Section 85-2-505, MCA **(Applicable)**<br><br>Section 85-2-516, MCA **(Applicable)**<br><br>ARM 17.30.641 **(Applicable)** | Section 85-2-505, MCA precludes the wasting of groundwater. Any well producing waters that contaminate other waters must be plugged or capped, and wells must be constructed and maintained so as to prevent waste, contamination, or pollution of groundwater.<br><br>Section 85-2-516, MCA states that within 60 days after any well is completed a well log report must be filed by the driller with the Montana Bureau of Mines and Geology.<br><br>ARM 17.30.641 provides standards for sampling and analysis of water to determine quality. | New wells constructed for implementation of the ROD will be installed for groundwater monitoring and possibly for remediation. Wells will be properly constructed to prevent further contamination or pollution of groundwater. Drilling subcontracts will require that drillers complete and file a well log report with the Montana Bureau of Mines and Geology. Compliance water quality monitoring will be conducted using methods approved by DEQ. |
| ARM 17.30.646 **(Applicable)** | ARM 17.30.646 requires that bioassay tolerance concentrations must be determined using the latest available research results for the materials, by bioassay tests procedures for simulating actual stream conditions as set forth in 40 CFR Part 136 (July 1, 2007). | Bioassays will not be required as part of the tasks detailed in the ROD. |
| ARM 36.21.670-678 and ARM 36.21.810 **(Applicable)** | ARM 36.21.670-678 and ARM 36.21.810 specify certain requirements that must fulfilled when abandoning monitoring wells. | Well abandonment activities at the MWPS Facility will be performed in accordance with ARM 36.21.670-678 and ARM 36.21.810. |
| **Substantive MPDES Permit Requirements** | | |
| ARM 17.30.1342-1344 **(Applicable)** | ARM 17.30.1342-1344 set forth the regulations and substantive requirements applicable to all Montana Pollutant Discharge Elimination System (MPDES) and National Pollution Discharge Elimination System (NPDES) permits. The substantive requirements, including the requirement to properly operate and maintain all facilities and systems of treatment and control are applicable requirements. | The tasks detailed in the ROD do not include wastewater discharges. Leachate will be collected and stored for either recirculation into the LTU or off-site disposal, depending on the properties of the leachate and the irrigation needs. Excess leachate or groundwater collected during sampling activities will either be disposed offsite or treated and discharged to the City sewer (POTW) through an industrial discharge permit. |
| **Technology-Based Treatment** | | |
| ARM 17.30.1203 and 40 CFR Part 125 **(Applicable)** | ARM 17.30.1203 incorporates provisions of 40 CFR Part 125 for criteria and standards for the imposition of technology-based treatment requirements. For toxic and nonconventional pollutants, treatment must apply the best available technology economically achievable (BAT); for conventional pollutants, application of the best conventional pollutant control technology (BCT) is required. Where effluent limitations are not specified for the particular industry or industrial category at issue, BCT/BAT technology-based treatment requirements are determined on a case by case basis. | The tasks detailed in the ROD do not include wastewater discharges. Leachate will be collected and stored for either recirculation into the LTU or off-site disposal, depending on the properties of the leachate and the irrigation needs. Excess leachate or groundwater collected during sampling activities will either be disposed offsite or treated and discharged to the City sewer (POTW) through an industrial discharge permit. |

| Federal or State ERCL Citation | Description | Preliminary Identification of Compliance |
|---|---|---|
| **Storm Water Runoff** | | |
| ARM 17.30.1341-1344 **(Applicable)**<br><br>ARM 17.24.633 **(Relevant)** | ARM 17.30.1341-1344 states that storm water point sources require a Storm Water Discharge General Permit. Generally, the permit requires the permittee to implement Best Management Practices (BMP) and to take all reasonable steps to minimize or prevent any discharge which has a reasonable likelihood of adversely affecting human health or the environment. MPDES permits are applicable to storm water runoff discharges.<br><br>ARM 17.24.633 requires that all surface drainage from a disturbed area be treated by the best technology currently available (BTCA). | Land disturbance activities including excavation of contaminated soils and LTU construction will likely require coverage under the MPDES General Permit. As part of obtaining permit coverage, Huttig will be required to submit a SWPPP for remedial activities performed on the MWPS Facility. The SWPPP addresses the requirements contained in the storm water management regulations. |
| **RCRA Subtitle C Requirements and corresponding State requirements** | | |
| RCRA, 42 U.S.C. §§ 6901 et seq., and Montana Hazardous Waste Act, Sections 75-10-401 et seq., MCA **(Applicable)** | The Resource Conservation and Recovery Act (RCRA), 42 U.S.C. Sections 6901 et seq., and the Montana Hazardous Waste Act, Sections 75-10-401 et seq., MCA, and regulations under these acts establish a regulatory structure for the generation, transportation, treatment, storage and disposal of hazardous wastes. These requirements are applicable to substances and actions at the MWPS Facility that involve the active management of hazardous wastes, including excavation of listed hazardous waste and the PCP LTU described in the ROD. | If hazardous waste is generated during implementation of the ROD, it will be managed in accordance with RCRA, 42 U.S.C. Sections 6901 et seq., and the Montana Hazardous Waste Act, Sections 75-10-401 et seq., MCA. One onsite LTU will be utilized for treatment of PCP-containing soil; which is a F032 listed hazardous waste. A hazardous waste transporter is not required to transport hazardous waste from a work area to the LTU or a centralized storage area, provided transportation remains within the CAMU area designated by DEQ. If hazardous waste needs to be transported outside the Facility, a hazardous waste transporter will be used and the hazardous waste will be manifested. Hazardous waste generated during implementation of the ROD, other than the PCP-containing soil to be treated in the LTU, may be temporarily stored onsite in a manner that meets regulatory requirements. The design of the storage location will be discussed in the design documents prepared by Huttig and a checklist specifying each RCRA requirement (ERCL) will be provided in each design document to ensure compliance. No hazardous wastes will be disposed of at the site. |
| 40 CFR 261 **(Applicable, as incorporated by the Montana Hazardous waste Act)**<br><br>40 CFR 261.31 **(Applicable)** | Wastes may be designated as hazardous by either of two methods: listing or demonstration of a hazardous characteristic. Listed wastes are the specific types of wastes determined by EPA to be hazardous as identified in 40 CFR Part 261, Subpart D (40 CFR 261.30 - 261.33). Listed wastes are designated hazardous by virtue of their origin or source, and must be managed as hazardous wastes regardless of the concentration of hazardous constituents. Characteristic wastes are those that by virtue of concentrations of hazardous constituents demonstrate the characteristic of ignitability, corrosivity, reactivity or toxicity, as described at 40 CFR Part 261, Subpart C.<br><br>40 CFR 261.31 defines F032 waste as: "wastewaters (except those that have not come into contact with process contaminants), process residuals, preservative drippage, and spent formulations from wood preserving processes generated at plants that currently use or have previously used chlorophenolic formulations (except potentially cross-contaminated wastes that have had the F032 waste code deleted in accordance with § 261.35 of this chapter or potentially cross-contaminated wastes that are otherwise currently regulated as hazardous wastes and where the generator does not resume or initiate use of chlorophenolic formulations). This listing does not include K001 bottom sludge from the treatment of wastewater from wood preserving processes that use creosote and/or pentachlorophenol."<br><br>As described in the ROD, media on the southern portion of the MWPS Facility is contaminated with PCP from process residuals, preservative drippage, and spent formulations from a wood treating process that used chlorophenolic formulations. Therefore, the MWPS Facility contains F032 listed hazardous wastes and the various media and wastes contaminated by the F032 wastes are hazardous pursuant to 40 CFR Part 261. | The PCP-containing soil located at the MWPS Facility (inclusive of the PCP-containing soil on the southern portion of the Facility) has been designated as an F032 listed hazardous waste and the selected remedy is to treat it in an onsite LTU until PCP concentrations are below the appropriate cleanup levels and below the universal treatment standards if the soil is to be disposed of off-site. The methane-, ash- and dioxin/furans-containing soils, not containing PCP, have been designated as non-hazardous. |
| 40 CFR Part 262 **(Applicable, as incorporated by the Montana Hazardous waste Act)** | The RCRA regulations at 40 CFR Part 262 establish standards that apply to generators of hazardous waste. These standards include requirements for obtaining an EPA identification number and maintaining certain reports. These standards are applicable for any waste which will be transported offsite. | If hazardous waste is generated during implementation of the ROD, it will be handled/transported in accordance with applicable RCRA regulations and Huttig must obtain an EPA ID number and file the necessary reports. A hazardous waste transporter is not required to transport hazardous waste from a work area to the LTU or centralized storage area, provided transportation remains within the CAMU area designated by DEQ. If hazardous waste needs to be transported for disposal outside the Facility, a hazardous waste transporter will be used, the hazardous waste will be manifested, and a spill prevention response plan will be in place prior to transport. Hazardous waste to be disposed of offsite at a permitted RCRA disposal facility will be transported by a hazardous waste transporter and will be manifested. No hazardous waste will be disposed of onsite. |
| 40 CFR Part 263 **(Applicable, as incorporated by the Montana Hazardous waste Act)**<br><br>40 CFR 264, Subpart B **(Applicable, as incorporated by the Montana Hazardous waste Act)** | The RCRA regulations at 40 CFR Part 263 establish standards that apply to transporters of hazardous waste. These standards include requirements for immediate action for hazardous waste discharges. These standards are applicable for any on-site or offsite transportation.<br><br>The regulations at 40 CFR 264, Subpart B establish general facility requirements. These standards include requirements for general waste analysis, security and location standards. | |
| 40 CFR 264, Subpart F **(Applicable, as incorporated by the Montana Hazardous waste Act)** | The regulations at 40 CFR 264, Subpart F establish requirements, including monitoring requirements, for groundwater protection for RCRA-regulated solid waste management units (including LTUs). Subpart F provides for three general types of groundwater monitoring: detection monitoring (40 CFR 264.98); compliance monitoring (40 CFR 264.99); and corrective action monitoring (40 CFR 264.100). Monitoring wells must be cased according to 40 CFR 264.97(c). Monitoring is required during the active life of a hazardous waste management unit. If hazardous waste remains, monitoring is required for a period necessary to protect human health and the environment. | A long term monitoring plan will be developed during the remedial design phase and will comply with the groundwater monitoring requirements. |
| 40 CFR Part 264, Subpart G **(Applicable, as incorporated by the Montana Hazardous waste Act)** | 40 CFR Part 264, Subpart G establishes that hazardous waste management facilities must be closed in such a manner as to (a) minimize the need for further maintenance and (b) control, minimize or eliminate, to the extent necessary to protect public health and the environment, post-closure escape of hazardous wastes, hazardous constituents, leachate, contaminated runoff or hazardous waste decomposition products to the ground or surface waters or to the atmosphere. Requirements for facilities requiring post-closure care include the following: the facilities must undertake appropriate monitoring and maintenance actions, control public access, and control post-closure use of the property to ensure that the integrity of the final cover, liner, or containment system is not disturbed. In addition, all contaminated equipment, structures and soil must be properly disposed of or decontaminated unless exempt and free liquids must be removed or solidified, the wastes stabilized, and the waste management unit covered. | The selected remedy is to treat hazardous waste in the LTU until PCP concentrations are reduced to cleanup standards and the universal treatment standard (UTS). Once all treated soil meets the appropriate cleanup level and UTS, the LTU will be closed. Hazardous waste will not be left onsite following closure. |
| 40 CFR Part 264, Subpart I and 40 CFR 261.7 **(Applicable, as incorporated by the Montana Hazardous waste Act)** | 40 CFR Part 264, Subpart I apply to owners and operators of facilities that store hazardous waste in containers. These regulations are applicable to any storage of purge water or other media containing F032 hazardous waste. Also, 40 CFR 261.7 contains regulatory requirements of residues of hazardous waste in empty containers. | Hazardous waste generated during implementation of the ROD, other than the PCP-containing soil to be treated in the LTU, may be temporarily stored onsite in a manner that meets regulatory requirements. The design of the storage location will be discussed in the design documents prepared by Huttig and a checklist specifying each RCRA requirement (ERCL) will be provided in each design document to ensure compliance. |

| Federal or State ERCL Citation | Description | Preliminary Identification of Compliance |
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| 40 CFR Part 264, Subpart L **(Applicable, as incorporated by the Montana Hazardous waste Act)** | 40 CFR Part 264, Subpart L applies to owners and operators of facilities that store or treat hazardous waste in piles. The regulations include requirements for the use of run-on and run-off control systems and collection and holding systems to prevent the release of contaminants from waste piles. These regulations are applicable to any storage in waste piles. | If stockpiles are utilized to temporarily store hazardous wastes, the stockpile will have the appropriate run on/off controls and collection system to prevent the release of contaminants from the piles. The hazardous waste LTU will be designed to also meet these requirements including a liner and leachate collection system. |
| 40 CFR Part 264, Subpart M **(Applicable, as incorporated by the Montana Hazardous waste Act)**<br><br>40 CFR Part 264, Subpart S **(Applicable, as incorporated by the Montana Hazardous waste Act)** | 40 CFR Part 264, Subpart M applies to owners and operators of facilities that treat hazardous waste in land treatment units. These regulations are applicable to the design and operation of the PCP LTU discussed in the ROD.<br><br>40 CFR Part 264, Subpart S provides special provisions for cleanup; 40 CFR 264.552 allows the designation of a corrective action management unit (CAMU) located within the contiguous property under the control of the owner or operator where the wastes to be managed in the CAMU originated and provides requirements for siting, managing, and closing the CAMU. If staging piles are needed during remediation, compliance with 40 CFR 264.554 will be required. | Remedial action design and operation involving the PCP LTU shall fulfill the regulations in 40 CFR 264, Subpart M and S. One onsite LTU will be utilized for treatment of PCP-containing soil; which is a F032 listed hazardous waste. A hazardous waste transporter is not required to transport hazardous waste from a work area to the LTU or a centralized storage area, provided transportation remains within the CAMU area as designated by DEQ. The design of the LTU will be discussed in the design documents prepared by Huttig and a checklist specifying each RCRA requirement (ERCL) will be provided in each design document to ensure compliance. |
| 40 CFR 264.554 **(Applicable, as incorporated by the Montana Hazardous waste Act)** | 40 CFR 264.554 sets forth the requirements for a staging pile. A staging pile must be located within the contiguous property under the control of the owner/operator where the wastes to be managed in the staging pile originated. The staging pile must be designed so as to prevent or minimize releases of hazardous wastes and hazardous constituents into the environment, and minimize or adequately control cross-media transfer, as necessary to protect human health and the environment (for example, through the use of liners, covers, run-off/run-on controls, as appropriate). The staging pile must not operate for more than two years (unless an extension is provided) and cannot be used for treatment. | If stockpiles are utilized to temporarily store hazardous wastes, the stockpile will have the appropriate run on/off controls and collection system to prevent the release of contaminants from the piles. The hazardous waste LTU will be designed to also meet these requirements including a liner and leachate collection system. |
| 40 CFR 268 **(Applicable, as incorporated by the Montana Hazardous waste Act)** | Because F032 listed waste is present at the site, the RCRA Land Disposal Restrictions (LDRs) treatment levels set for at 40 CFR Part 268 are applicable requirements including the treatment levels for F032 listed wastes for the disposal of hazardous wastes generated at the facility. Hazardous wastes are prohibited from disposal onsite. | F032 listed wastes will be treated to site-specific cleanup levels and universal treatment standards prior to offsite disposal as non-hazardous waste. Hazardous waste will not be disposed of onsite. A confirmation sampling plan is required which will provide for data collection and comparison to cleanup levels and universal treatment standards. DEQ must approve all confirmation sampling results prior to disposal offsite as non-hazardous waste. |
| Hazardous Waste Identification Rule (HWIR), 63 Fed. Reg. 65874, 40 CFR 268.49(c) (1)(C), and 40 CFR 268.48 **(Applicable, as incorporated by the Montana Hazardous waste Act)** | The Hazardous Waste Identification Rule (HWIR) for Contaminated Media promulgated at 63 Fed. Reg. 65874 (November 30, 1998) allows listed waste treated to levels protective of human health and the environment to be disposed of onsite without triggering land ban or minimum technology requirements for these disposal requirements. Treated soils containing hazardous waste will need to meet site-specific cleanup levels as well as the LDR treatment standards (40 CFR 268.49(c)(1)(C)), which require that contaminated soil to be land disposed be treated to reduce concentrations of the hazardous constituents by 90 percent or meet hazardous constituent concentrations that are ten times the universal treatment standards (UTS) (found at 40 CFR 268.48), whichever is greater, to avoid triggering land ban. | |
| 40 CFR Part 270 **(Applicable, as incorporated by the Montana Hazardous waste Act)** | 40 CFR Part 270 sets forth the hazardous waste permit program. The substantive requirements set forth in 40 CFR Part 270, Subpart C (permit conditions), including the requirement to properly operate and maintain all facilities and systems of treatment and control are applicable requirements. | If hazardous waste is generated, Huttig will be required to obtain a hazardous waste permit in compliance with these regulations. |
| 40 CFR 264.116 and .119, 40 CFR 264.228(a)(2)(i), and 40 CFR 264.228(a)(2)(iii)(B)(C)(D) and .251(c)(d)(f) **(Relevant)** | For any management (i.e., treatment, storage, or disposal) or removal or detention, the RCRA regulations found at 40 CFR 264.116 and .119 (governing notice and deed restrictions), 40 CFR 264.228(a)(2)(i) (addressing de-watering of wastes prior to disposal), and 40 CFR 264.228(a)(2)(iii)(B)(C)(D) and .251(c)(d)(f) (regarding run-on and run-off controls), are relevant requirements for any waste management units created or retained at the site that contain non-exempt waste. A construction de-watering permit covers similar requirements and is applicable to the MWPS Facility. | If dewatering is necessary, Huttig will obtain a construction dewatering permit which will address de-watering and run-on and run-off controls, as applicable. In addition, institutional controls required by DEQ will be placed to ensure the protection of human health. |
| Montana Hazardous Waste Act, Sections 75-10-401 et seq., MCA **(Applicable)**<br><br>ARM 17.53.501-502 **(Applicable)**<br><br>ARM 17.53.601-604 **(Applicable)**<br><br>ARM 17.53.701-708 **(Applicable)**<br><br>ARM 17.53.801-803 **(Applicable)**<br><br>ARM 17.53.1101-1102 **(Applicable)**<br><br>Section 75-10-422 MCA **(Applicable)**<br><br>ARM 17.53.1201-1202 **(Applicable)** | The Montana Hazardous Waste Act, Sections 75-10-401 et seq., MCA and regulations under this act establish a regulatory structure for the generation, transportation, treatment, storage and disposal of hazardous wastes. These requirements are applicable to substances and actions at the MWPS Facility that involve hazardous wastes.<br><br>ARM 17.53.501-502 adopts the equivalent of RCRA regulations at 40 CFR Part 261, establishing standards for the identification and listing of hazardous wastes, including standards for recyclable materials and standards for empty containers, with certain State exceptions and additions.<br><br>ARM 17.53.601-604 adopts the equivalent to RCRA regulations at 40 CFR Part 262, establishing standards that apply to generators of hazardous waste, including standards pertaining to the accumulation of hazardous wastes, with certain State exceptions and additions.<br><br>ARM 17.53.701-708 adopts the equivalent to RCRA regulations at 40 CFR Part 263, establishing standards that apply to transporters of hazardous waste, with certain State exceptions and additions.<br><br>ARM 17.53.801-803 adopts the equivalent to RCRA regulations at 40 CFR Part 264, establishing standards that apply to hazardous waste treatment, storage and disposal facilities, with certain State exceptions and additions.<br><br>ARM 17.53.1101-1102 adopts the equivalent to RCRA regulations at 40 CFR Part 268, establishing land disposal restrictions, with certain State exceptions and additions.<br><br>Section 75-10-422 MCA prohibits the unlawful disposal of hazardous wastes.<br><br>ARM 17.53.1201-1202 adopts the equivalent to RCRA regulations at 40 CFR Part 270 and 124, which establish standards for permitted facilities, with certain State exceptions and additions. | Remedial action design and operation involving the LTU utilized for treatment of PCP-containing soil, a F032 listed hazardous waste, requires compliance with these regulations. A hazardous waste transporter is not required to transport hazardous waste from a work area to the LTU or a centralized storage area, provided transportation remains within the CAMU as defined by DEQ. If hazardous waste is generated, Huttig will obtain an EPA ID number and will be registered as a RCRA generator which will determine the specific requirements that apply. If hazardous waste needs to be transported outside the Facility, a hazardous waste transporter will be used and the hazardous waste will be manifested. Hazardous waste generated during implementation of the ROD, other than the PCP-containing soil to be treated in the LTU, will be contained in appropriate containers that meet the requirements of RCRA and stored in an access-controlled outdoor location in a manner that meets RCRA requirements. The design of these containers and storage location will be discussed in the design documents prepared by Huttig and a checklist specifying each RCRA requirement (ERCL) will be provided in each design document to ensure compliance. Hazardous wastes will not be disposed of at the MWPS Facility. |
| **Underground Injection Control Program** | | |
| 40 CFR 144 and 146 **(Applicable)** | All injection wells are regulated under the Underground Injection Control Program in accordance with 40 CFR 144 and 146 which set forth the standards and criteria for the injection of substances into aquifers. Wells are classified as Class I through V, depending on the location and the type of substance injected. For all classes, no owner may construct, operate or maintain an injection well in a manner that results in the contamination of an underground source of drinking water at levels that violate MCLs or otherwise adversely affect the health of persons. Each classification may also contain further specific standards, depending on the classification. | The ROD includes treatment utilizing in-situ chemical oxidation to reduce the groundwater contaminant concentrations. Compliance with the regulation will require an EPA injection permit or authorization prior to implementation. The ROD requires the use of Cool-Ox unless a different oxidant that does not generate undesirable byproducts is identified during remedial design. |

| Federal or State ERCL Citation | Description | Preliminary Identification of Compliance |
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| **Tanks/Piping/Free Product Removal** | | |
| ARM 17.56.607 **(Relevant)** | ARM 17.56.607 specifies that all free product must be removed to the maximum extent practicable before a release may be considered resolved. | Information generated during the Remedial Investigation (Envirocon, 1998) indicates that all known tanks and underground piping have been removed from the MWPS Facility and that there is no known free product. However, if free product is encountered during remedial activities at the MWPS Facility, DEQ will be notified and may identify additional applicable or relevant ERCLs. |
| ARM 17.56.702 **(Applicable)** | ARM 17.56.702 requires that all tanks and connecting piping which are taken out of the service permanently must be removed from the ground. This applies if any remaining underground piping is encountered during remedial activities. | Information generated during the Remedial Investigation (Envirocon, 1998) indicates that all known tanks and underground piping have been removed from the MWPS Facility. However, if underground storage tanks and/or associated piping is encountered during remedial activities at the MWPS Facility, DEQ will be notified and may identify additional applicable or relevant ERCLs. |
| **Reclamation Requirements** | | |
| ARM 17.24.631(1), (2), (3)(a) and (b) **(Relevant)** | ARM 17.24.631(1), (2), (3)(a) and (b): Disturbances to the prevailing hydrologic balance will be minimized. Changes in water quality and quantity, in the depth to groundwater and in the location of surface water drainage channels will be minimized, to the extent consistent with the selected response alternatives. Other pollution minimization devices must be used if appropriate, including stabilizing disturbed areas through land shaping, diverting runoff, planting quickly germinating and growing stands of temporary vegetation, mulching, and control of toxic-forming waste materials. | A SWPPP will be developed as part of the design of the remedial actions. The remedy work plans will also include dust control measures to prevent particles or contaminants from becoming airborne. The remedy work plan will also include a description of how backfilling and drainage will be achieved. The long-term monitoring plan will include details on periodic inspections of the backfilled revegetation areas. Grading will be performed to minimize erosion after backfilling is complete. The backfill material must meet typical structural requirements (consistent with response to comment 39 in Part 3 of the ROD). |
| ARM 17.24.633 **(Relevant)** | ARM 17.24.633: Surface drainage from a disturbed area must be treated by the best technology currently available (BTCA). Treatment must continue until the area is stabilized. | |
| ARM 17.24.635, 636, and 637 **(Relevant)** | ARM 17.24.635, 636, and 637: Set forth requirements for temporary and permanent diversions. | |
| ARM 17.24.638 **(Relevant)** | ARM 17.24.638: Sediment control measures must be implemented during operations. | |
| ARM 17.24.640 **(Relevant)** | ARM 17.24.640: Discharges from diversions must be controlled to reduce erosion and enlargement of stream channels, and to minimize disturbance of the hydrologic balance. | |
| ARM 17.24.641 **(Relevant)** | ARM 17.24.641: Practices to prevent drainage from acid or toxic forming spoil material into ground and surface water will be employed. | |
| ARM 17.24.643 - 646 **(Relevant)** | ARM 17.24.643 through 17.24.646: Provisions for groundwater protection, groundwater recharge protection, and groundwater and surface water monitoring. | |
| ARM 17.24.701 and 702 **(Relevant)** | ARM 17.24.701 and 702: Requirements for redistributing and stockpiling of soil for reclamation. Also outline practices to prevent compaction, slippage, erosion, and deterioration of biological properties of soil. | |
| ARM 17.24.703 **(Relevant)** | ARM 17.24.703: When using materials other than, or along with, soil for final surfacing in reclamation, the operator must demonstrate that the material (1) is at least as capable as the soil of supporting the approved vegetation and subsequent land use; and (2) the medium must be the best available in the area to support vegetation. Such substitutes must be used in a manner consistent with the requirements for redistribution of soil in ARM 17.24.701 and 702. | |
| ARM 17.24.711 **(Relevant)** | ARM 17.24.711: Requires that a diverse, effective and permanent vegetative cover of the same seasonal variety and utility as the vegetation native to the area of land to be affected must be established. This provision would not be relevant and appropriate in certain instances, for example, where there is dedicated development. | |
| ARM 17.24.713 **(Relevant)** | ARM 17.24.713: Seeding and planting of disturbed areas must be conducted during the first appropriate period for favorable planting after final seedbed. | |
| ARM 17.24.714 **(Relevant)** | ARM 17.24.714: Mulch or cover crop or both must be used until adequate permanent cover can be established. | |
| ARM 17.24.716 **(Relevant)** | ARM 17.24.716: Establishes method of revegetation. | |
| ARM 17.24.717 and Section 82-4-233, MCA **(Relevant)** | ARM 17.24.717: Relates to the planting of trees and other woody species if necessary, as provided in § 82-4-233, MCA, to establish a diverse, effective, and permanent vegetative cover. | |
| ARM 17.24.718 **(Relevant)** | ARM 17.24.718: Requires soil amendments if necessary to establish a permanent vegetative cover. | |
| ARM 17.24.721 **(Relevant)** | ARM 17.24.721: Specifies that rills or gullies must be stabilized and the area reseeded and replanted it the rills and gullies are disrupting the reestablishment of the vegetative cover or causing or contributing to a violation of water quality standards for a receiving stream. | |
| ARM 17.24.723 **(Relevant)** | ARM 17.24.723: Requires periodic monitoring of vegetation, soils, water, and wildlife. | |
| ARM 17.24.724 **(Relevant)** | ARM 17.24.724: Specifies how revegetation success is measured. | |
| ARM 17.24.726 **(Relevant)** | ARM 17.24.726: Sets the required methods for measuring vegetative success | |
| ARM 17.24.731 **(Relevant)** | ARM 17.24.731: If toxicity to plants or animals is suspected, comparative chemical analysis may be required | |
| **Noxious Weeds** | | |
| Section 7-22-2101(8)(a), MCA **(Applicable)** | Section 7-22-2101(8)(a), MCA defines "noxious weeds". | A revegetation plan will be developed in cooperation with the Missoula County Weed District. The district weed board will be notified of the remediation actions at least 15 days prior to excavation. Periodic inspections of revegetated areas will be performed unitl vegetation is successfully established. These inspections will include noxious weed surveys and mitigation will be performed as necessary. DEQ requires that Huttig obtain written approval of revegetation plans from the Weed District prior to submittal to DEQ as part of remedy design. A copy of theWeed District approval must be included as part of the remedial action work plan submittal. |
| ARM 4.5.201 - 204 **(Applicable)** | ARM 4.5.201 - 204 lists designated noxious weeds. | |
| Sections 7-22-2109(2)(b) and Section 7-22-2152, MCA **(Applicable)** | Designated noxious weeds must be managed consistent with weed management criteria developed under § 7-22-2109(2)(b), MCA and in compliance with § 7-22-2152, MCA. | |

| Federal or State ERCL Citation | Description | Preliminary Identification of Compliance |
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| **OTHER LAWS (NON-EXCLUSIVE LIST)** | | |
| **Occupational Safety & Health Regulations** | | |
| 29 CFR 1910 **(Applicable)** | 29 CFR 1910: The federal Occupational Safety and Health Act (OSHA) regulations are applicable to worker protection during conduct of all remedial activities. | A site-specific health and safety plan (HASP) will be developed and implemented for remedial activities performed on the MWPS Facility. The HASP will include information on site hazards, job procedures, emergency response, personnel training requirement, site control, air monitoring, and personnel protection equipment. |
| **Public Water Supply Regulations** | | |
| ARM 17.38.101 **(Applicable)** | ARM 17.38.101 provides construction standards for reconstruction or modification of any public water supply line or sewer line. This regulation would be applicable if the remedial action at the site requires any reconstruction or modification of public water supply or sewer lines. | Reconstruction or modification of public water supply lines or sewer lines, if necessary, will be performed in accordance with applicable standards. |
| **Water Rights** | | |
| Section 85-2-101, MCA **(Applicable)**<br><br>Parts 3 and 4 of Title 85, Chapter 2, MCA **(Applicable)** | Section 85-2-101, MCA declares that all waters within the state are the state's property, and may be appropriated for beneficial uses. The wise use of water resources is encouraged for the maximum benefit to the people and with minimum degradation of natural aquatic ecosystems.<br><br>Parts 3 and 4 of Title 85, Chapter 2, MCA set out requirements for obtaining water rights and appropriating and utilizing water. All requirements of these parts are laws which must be complied with in any action using or affecting water of the state. | Activities proposed in the ROD are not expected to require any water rights. |
| **Controlled Groundwater Areas** | | |
| Section 85-2-507, MCA **(Applicable)** | Pursuant to § 85-2-507, MCA the Montana Department of Natural Resources and Conservation may grant either a permanent or temporary controlled groundwater area. The maximum allowable time for a temporary area is two years, with a possible two-year extension. | Institutional controls identified in the ROD include use of restrictive covenants or a controlled groundwater area (or both), to limit groundwater use until it meets SSCLs. If a controlled groundwater area is required, DEQ will determine the timing of the petition to the Department of Natural Resources and Conservation necessary to begin the rulemaking process to implement a controlled groundwater area in compliance with these requirements. |
| Section 85-2-506, MCA **(Applicable)** | Pursuant to § 85-2-506, MCA, designation of a controlled groundwater area may be proposed if: (i) excessive groundwater withdrawals would cause contaminant migration; (ii) groundwater withdrawals adversely affecting groundwater quality within the groundwater area are occurring or are likely to occur; or (iii) groundwater quality within the groundwater area is not suited for a specific beneficial use. | |
| **Montana Occupational Safety and Health Act** | | |
| Section 50-71-111 et seq., MCA **(Applicable)**<br><br>ARM 17.74.101 **(Applicable)**<br><br>ARM 17.74.102 **(Applicable)**<br><br>Sections 50-71-201-203, MCA **(Applicable)** | The Montana Occupational Safety and Health Act found at Sections 50-71-111 et seq., MCA are applicable to the health and safety of workers during remedial activities.<br><br>ARM 17.74.101 addresses occupational noise. In accordance with this section, no worker shall be exposed to noise levels in excess of the levels specified in this regulation. This regulation is applicable to limited categories of workers and for most workers the similar federal standard at 29 CFR 1910.95 applies.<br><br>ARM 17.74.102 addresses occupational air contaminants. The purpose of this rule is to establish maximum threshold limit values for air contaminants under which it is believed that nearly all workers may be repeatedly exposed day after day without adverse health effects. In accordance with this rule no worker shall be exposed to air contaminant levels in excess of the threshold limit values listed in the regulation.<br><br>Sections 50-71-201-203, MCA, state that every employer must provide and maintain a safe place of employment, provide and require use of safety devices and safeguards, and ensure that operations and processes are reasonably adequate to render the place of employment safe. The employer must also do every other thing reasonably necessary to protect the life and safety of its employees. Employees are prohibited from refusing to use or interfering with the use of safety devices. | A site-specific HASP will be developed and implemented for remedial activities performed on the MWPS Facility. The HASP will include information on site hazards including noise, job procedures, emergency response, personnel training requirement, site control, air monitoring, and personnel protection equipment. |
| **Employee and Community Hazardous Chemical Information Act** | | |
| Sections 50-78-201, 202, and 204, MCA **(Applicable)** | Sections 50-78-201, 202, and 204, MCA, state that each employer must post notice of employee rights, maintain at the work place a list of chemical names of each chemical in the work place, and indicate the work area where the chemical is stored or used. Employees must be informed of the chemicals at the work place and trained in the proper handling of the chemicals. | A site-specific HASP will be developed and implemented for remedial activities performed on the MWPS Facility. The HASP will include information on site hazards including a list of chemical names, where chemicals are stored, and training requirements associated with handling of chemicals. |

# APPENDIX B
# B. REGULATOR CONTACTS AND STAKEHOLDERS

| **Appendix B: Contact Information** | | **Project Role** |
|---|---|---|
| Name | Syris Trahan | DEQ MWPS Project Manager |
| Affiliation | DEQ | |
| Address | 1225 Cedar Street<br>Helena, MT 59601 | |
| Phone | 406-444-6556 | |
| Fax | | |
| email | strahan@mt.gov | |
| | | |
| Name | Moriah Bucy | DEQ State Superfund Section Supervisor |
| Affiliation | DEQ | |
| Address | 1225 Cedar Street<br>Helena, MT 59601 | |
| Phone | 406-444-6336 | |
| Fax | | |
| email | mbucy@mt.gov | |
| | | |
| Name | Jon Harvala | MCCHD |
| Affiliation | Missoula City/County Health Department | |
| Address | 301 West Alder<br>Missoula, MT 59802 | |
| Phone | 406-258-3109 | |
| Fax | | |
| email | jharvala@co.missoula.mt.us | |
| | | |
| Name | Bill Watkins | Landowner and Operator |
| Affiliation | Zip Beverage/WWW, LLC | |
| Address | 1301 Scott Street<br>Missoula, MT 59802 | |
| Phone | 406-728-9543 | |
| Fax | | |
| email | bwatkins@zipbeverage.com | |
| | | |
| Name | Mike Stevenson | Landowner |
| Affiliation | Scott Street Partnership, LLC | |
| Address | 122 Red Bridge Lane South<br>Anaconda, MT 59711 | |
| Phone | 406-240-3108 | |
| Fax | | |
| email | mstevenson1349@gmail.com | |
| | | |
| Name | Bob Oakes | Community Organization |
| Affiliation | North Missoula Community Development Center | |
| Address | 1500 Burns Street<br>Missoula, MT 59802 | |
| Phone | 406-829-0873 | |
| Fax | | |
| email | nmcdc@montana.com | |

| **Appendix B: Contact Information** | | **Project Role** |
|---|---|---|
| Name | Mark Vander Meer | Lessee & Operator |
| Affiliation | Bad Goat Forest Products | |
| Address | P.O. Box 16781<br>Missoula, MT 59808 | |
| Phone | (406) 541-2565 | |
| Fax | | |
| email | mark@watershedconsulting.com | |
| | | |
| Name | Rebecca Kujawa | Huttig Building Products |
| Affiliation | Huttig Building Products, Inc. | |
| Address | 555 Maryville University Dr., Suite 400<br>St. Louis, MO 63141 | |
| Phone | (314) 216-2886 | |
| Fax | | |
| email | rkujawa@huttig.com | |
| | | |
| Name | Dan Schneider | Consultant to Huttig - Project Manager |
| Affiliation | Terracon | |
| Address | 10625 W. I-70 Frontage Rd N, Ste 3<br>Wheat Ridge, CO 80033 | |
| Phone | (303) 454-5247 | |
| Fax | | |
| email | dfschneider2@terracon.com | |
| | | |
| Name | Bryan Douglass | Consultant to Huttig - Site Manager |
| Affiliation | Douglass, Inc. | |
| Address | 4945 Goodan Lane<br>Missoula, MT 59808 | |
| Phone | 406-543-9612 | |
| Fax | | |
| email | bryan@douglassmt.com | |
| | | |
| Name | James J & Patricia Loran | Landowner |
| Affiliation | Owners of 1028 1/2 Stoddard St | |
| Address | 1444 MT Highway 83<br>Greenough, MT 59823 | |
| Phone | 406-244-0048 | |
| Fax | | |
| email | | |
| | | |
| Name | Ross Miller | Utility |
| Affiliation | Mountain Water Company | |
| Address | 1345 W Broadway St<br>Missoula, MT 59802 | |
| Phone | 406-532-5160 | |
| Fax | | |
| email | ross@mtnwater.com | |

| **Appendix B: Contact Information** | | **Project Role** |
|---|---|---|
| Name | John Wilson | Missoula Public Works Director |
| Affiliation | Missoula Public Works Department | |
| Address | 435 Ryman Street<br>Missoula, MT 59802 | |
| Phone | 406-552-6000 | |
| Fax | | |
| email | jwilson@ci.missoula.mt.us | |
| | | |
| Name | John Engen | Mayor |
| Affiliation | City of Missoula | |
| Address | 435 Ryman Street<br>Missoula, MT 59802 | |
| Phone | 406-552-6001 | |
| Fax | | |
| email | mayorstaff@ci.missoula.mt.us | |
| | | |
| Name | Jack Stucky | Vehicle Maintenance Superintendent |
| Affiliation | City of Missoula | |
| Address | 435 Ryman Street<br>Missoula, MT 59802 | |
| Phone | 406-552-6387 | |
| Fax | | |
| email | jstucky@ci.missoula.mt.us | |
| | | |
| Name | Brian Hensel | Street Maintenance Superintendent |
| Affiliation | City of Missoula | |
| Address | 435 Ryman Street<br>Missoula, MT 59802 | |
| Phone | 406-240-2742 | |
| Fax | | |
| email | bhensel@ci.missoula.mt.us | |

**Note: Future lessees at the MWPS Facility will be added to the list of stakeholders as appropriate.**