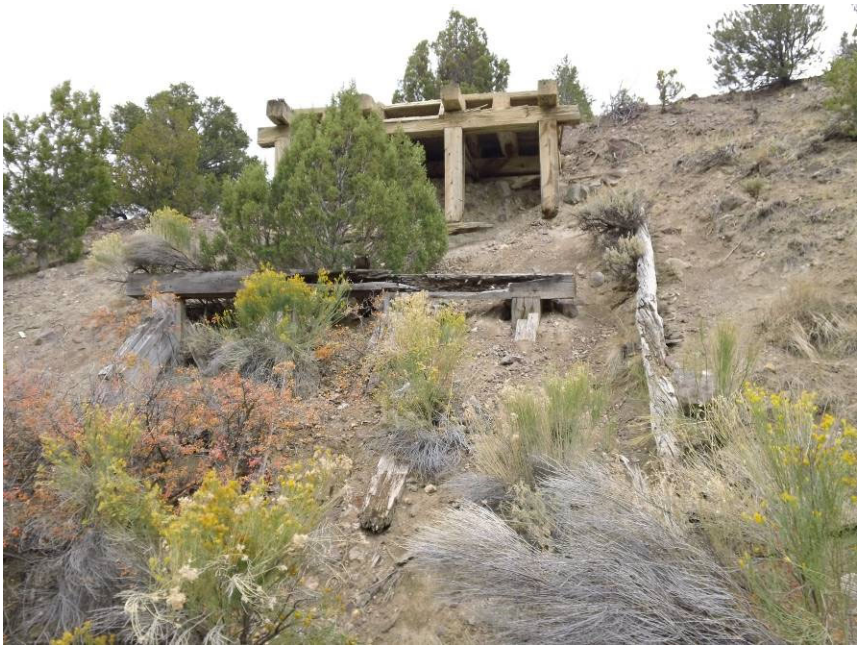
REMEDIAL ACTION PLAN
VOLUNTARY CLEANUP PROGRAM

SITE: Former Antimony Mill

LOCATION: Antimony Canyon, Utah



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REMEDIAL ACTION PLAN
FORMER ANTIMONY MILL SITE
ANTIMONY CANYON ABOUT 5.5 MILES TO THE EAST ANTIMONY IN UNINCORPORATED GARFIELD COUNTY, UTAH

VOLUNTARY CLEANUP PROGRAM (No.: C106)

20-Jul-2023

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CONTENTS **The Richard William Davis Trust / DVTR-0001-21-03-UT**

FIGURES

APPENDICES

REMEDIAL ACTION PLAN
FORMER ANTIMONY MILL SITE IN ANTIMONY CANYON ABOUT 5.5 MILES TO THE EAST OF THE TOWN OF ANTIMONY IN UNINCORPORATED GARFIELD COUNTY, UTAH

VOLUNTARY CLEANUP PROGRAM (Site No.: C106)

1.0 INTRODUCTION

This Remedial Action Plan was prepared to describe the activities and procedures to be used to excavate, transport, and dispose of ore piles, mill tailings, and near surface soil impacted with antimony, arsenic, cadmium, lead, and thallium at the former Antimony Mill located in Antimony Canyon roughly 5.5 miles to the east of the town of Antimony in unincorporated Garfield County, Utah ("subject property" or "site"). Excavation is proposed to remove the ore piles, mill tailings, and shallow soils at the site with concentrations of antimony, arsenic, and thallium above the site-specific cleanup levels developed by the US Forest Service through a Risk Assessment for Exposure to Metal-Contaminated Soil applying a Recreational Scenario.

1.1 Project Objectives

The objective of the activities described in this Remedial Action Plan (RAP) include:

- Excavating two ore piles, mill tailings adjacent to the former mill, and shallow soils in downslope areas of the former mill; and transporting and disposing at an appropriately permitted facility;
- Taking active steps to monitor the excavating, handling, and transporting activities for compliance with relevant regulatory requirements; and
- Implementing measures to be protective of human health and the environment through applying mitigation measures for airborne dust and fugitive emissions associated with excavating, loading, and transporting activities.

2.0 BACKGROUND

This section includes information about the operational history of the site, previous environmental investigations, and regulatory status of the subject property obtained through public sources and data acquired through previous investigations of the site.

2.1 Site Location

The Antimony Mill was constructed along the southern edge of a roughly 5-acre patented mine claim (Claim 38B) in an area roughly 100 feet to the south of Antimony Creek and immediately to the south of Forest Road 138 approximately 5.5 miles to the east of the town of Antimony in the Northeast Quarter (NE¼), Section 21, Township 31 South, Range 1 West, Salt Lake Base & Meridian (SLB&M). The site and Claim 38B are generally surrounded by land administered by the Dixie National Forest along the eastern edge of the Escalante Ranger District at roughly Latitude: 38º05'55.2" / Longitude: 111º53'57.4". The location of the site is depicted in Figure 1.

2.2 Site Description

The former mill is constructed on a river terrace about 100 feet to the south of Antimony Creek adjacent to the south side of Forest Road 138. Residual structural elements include three geometric-shaped, rock-and-masonry foundations extending about 4o to 45 feet above the grade of the road to the top of the adjacent terrace along with some rock and concrete foundations, dimensional lumber/wood beams, and dilapidated roofing. Some wood beams and dimensional lumber remain atop the upper foundational elements with some wood beams strewn across the adjacent hillside. The uppermost wood beams and roofing are generally at-grade with the top of the terrace. Some perimeter-spread concrete foundations abut the northeastern corner of the lower rock-and-masonry foundation next to Forest Road 138 that includes embedded metal attachment bolts, presumably to attached skid-mount equipment in the past. Surrounding the foundation are mill tailings with some visual evidence of mill tailings extending across the surface in areas to the north of Forest Road 138 toward Antimony Creek.

An ore pile is located immediately south of the upper wood-beam elements of the former mill and roughly 75 feet to the south of the mill in an area adjacent to an off-road vehicle trail. Some mill tailings are also located on the upper wood-beam roof elements of the former mill. Remaining areas of the 5-acre claim consist of undeveloped bottomlands along Antimony Creek with cottonwoods, birch, and other broad-leaved deciduous trees and riparian undergrowth and pinyon-juniper wooded shrubland with sagebrush, rabbitbrush, mountain mahogany, prickly pear, and clump grasses along terraces and alluvial areas at the bases of mesas and buttes, piedmonts, rock lands, and cliffs areas of Antimony Canyon with higher density pinyon stands at higher elevations.

2.3 Site History

Historical information indicated the antimony ore processing mill was constructed in 1905 and operated at irregular intervals until 1918. Personal diaries and historical accounts noted that mining activities were carried out in nearby areas of Antimony Canyon with high-grade ore removed and sorted by hand, and then transported to and processed at the former mill, which was described as a 3-story wood-frame constructed facility situated on cut-slopes of the river terrace. Reportedly, mined ore entered the former mill via mine-carts along an inclined ramp on the upper (southern) part of the facility with the ore descending through gravity-feed chutes into crushers, sorters, and screens with the processed ore directed to 2- or 4-ton bins in the lower (northern) portion of the facility. The crushed, pulverized, and milled ore directed to the 2- or 4-ton bins was described as a fine grayish powder, which was transported directly to a railroad load-out in Marysvale, Utah. The antimony ore was shipped primarily to munitions manufacturers in various parts of the United States as an additive in the production of bullets. Aerial photographs and topographic maps depict the presence of a ‘mill ruin’ on a subject property from 1941 to the present with very few changes over time. In addition, an unimproved dirt road and ‘Jeep trails’ and/or off-road trails cross the site and site vicinity over the same timeframe.

2.4 Summary of Previous Investigations

The former mill has been the focus of previous environmental investigations performed through programs administered by US EPA and Utah DEQ/DERR. The site is listed on environmental regulatory agency databases as the “Antimony Mill Superfund Site” and former the “Antimony Mill.”

A Preliminary Assessment (PA) of the former Antimony Mill was completed on 17-Jan-2003, which identified mine wastes consisting of two ore piles and some mill tailings. Due to the possible migration of metal contaminants to soil, groundwater, and surface water in Antimony Creek; additional investigation and characterization of the former mill was recommended.

A Site Inspection Work Plan for additional investigation/characterization was prepared in 2006; and outlined, reviewed, and summarized contaminant pathways; and included a sampling approach to identify the volume of residual mine- and mill-related waste and evaluate contaminant conditions and potential impact to human health and environmental through soil, river sediments, surface water, and groundwater. A discussion of field procedures and sample methodologies was included as well as sample locations and types of analyses and data quality objectives, validation, and report outline.

On 29-Sep-2009, an Administrative Order Directing Compliance with a Request for Access was issued in favor of the US EPA directing access to the former mill for personnel with the US EPA, or its assigns, to collect samples in order to evaluate the potential threat to human health and/or the environment from residual mine- and mill-related waste(s) to support decisions regarding further investigation pursuant to CERCLA.

On 5-Oct-2009, a Field Sampling Plan was prepared and included:

- Identify potential on-site contaminants and characterize potential areas of contamination;
- Determine potential impacts to Antimony Creek and downstream users of surface water;
- Ascertain potential impacts to Antimony Spring (a municipal drinking water source);
- Identify other possible undocumented sources of contamination in the vicinity of Antimony Creek;
- Evaluate the potential impacts to human health and environment for the Surface Water Pathway, Groundwater Pathway, and Soil Exposure; and
- Review historical information regarding potential past releases from source areas at the site.

A Site Investigation (SI) of the former mill included collecting and analyzing soil, sediment, and surface water samples. In-field sampling involved using a hand-held X-ray Fluorescence (XRF) unit(s) to determine locations of 'grab' samples. A total of 75 samples at the former mill and areas adjacent to Antimony Creek were analyzed using XRF. Thirteen (13) soil samples, six (6) sediment samples, and six (6) surface water samples were collected for laboratory analyses. Review of analytical results identified roughly 1,000 cubic yards (yds^3) of stockpiled ore, mill tailings, and surface soil at the former mill impacted by antimony, arsenic, aluminum, cadmium, lead, and thallium. Elevated concentrations (more than 3x measured background concentrations) of antimony, arsenic, and thallium were reported in 11 soil samples; cadmium in five (5) soil samples; and aluminum and lead in one (1) soil sample.

On 10-Mar-2010, the US EPA issued a Remedial Site Assessment Decision for Antimony Mill that noted roughly 27,022 square feet of mined ore, mill tailings, and surface soil impacted with antimony and arsenic at concentrations more than three times the background level. However, sediment and surface water samples collected from Antimony Creek failed to identify concentrations of contaminants above regulatory screening levels suggesting a lack of migration of contaminants to surface water or groundwater. Based on a lack of significant population and other sensitive receptors in the general area of the former mill; a lack of threatened, endangered, and candidate species observed in the general area; and lack of an 'observed release(s)' and recreational use in areas proximal to the former mill; the US EPA categorized the Antimony Mill as 'No Further Remedial Action Planned' (NFRAP) with respect to CERCLA status.

As part of a potential acquisition by the US Forest Service, a Phase I Environmental Site Assessment (ESA) of the former mill was completed in 2020, which identified *recognized environmental conditions* related to the presence of ore piles and mill tailings with elevated concentrations of antimony, arsenic, aluminum, lead, and thallium identified through previous investigations. Subsequently, an application for entry into the Voluntary Cleanup Program (VCP) was prepared and submitted to the Utah DEQ/DERR by The Richard William Davis Trust. On 19-Jan-2021, a Voluntary Cleanup Agreement (VCA) was executed by

and between The Richard William Davis Family Trust and the Utah DEQ/DERR, which identified the subject property as Voluntary Cleanup Site No.: C106.

After reviewing environmental reports and documents supporting the VCP Application; on 25-Mar-2021, the Utah DEQ/DERR provided The Richard William Davis Trust with technical comments requesting additional investigation/characterization in support of evaluating and developing remedial actions for the former mill. Following approval by the Utah DEQ/DERR, an investigation of the former mill was carried out in accordance with the *Site Characterization Work Plan, Voluntary Cleanup Program, Former Antimony Mill, Antimony Canyon, Utah* (11-Nov-2021). The investigation included collecting and analyzing ten (10) mill tailings and shallow soil samples; three (3) surface water samples and three (3) sediment samples from Antimony Creek; and a 'groundwater' sample immediately adjacent to Antimony Creek. Background samples ('reference samples') were also collected from nearby areas of Antimony Canyon. The mill tailings, shallow soil, surface water, sediment, groundwater, and background samples were analyzed for aluminum and Priority Pollutant Metals, including; antimony, arsenic, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, thallium, and zinc. In addition, two (2) composite samples were collected from two (2) ore piles and from two (2) areas of mill tailings adjacent to the former mill; and analyzed to develop waste profiles.

Review of geographical and analytical information from the investigation noted the following:

- With the exception of arsenic at a detected concentration of 0.00435 mg/L (milligrams per liter) in one unfiltered surface water sample collected about 500 feet downstream of the former mill, the reported concentrations of contaminants were below the Method Detection Limits (MDLs) and also below the Water Quality Standards of the Utah DEQ (Utah Annotated Code: R317-2) for domestic and agricultural use of surface waters;

- The reported concentrations of antimony and thallium in a streambed sample collected about 200 feet to the west of the former mill were more than three times the detected concentration in the sample collected up-stream of the former mill and notably higher than the reported concentrations of these contaminants in the sample collected further downstream. The concentrations of arsenic detected in streambed sediment samples appeared to increase downstream. Reported concentrations of aluminum, cadmium, and lead were generally similar in all streambed sediment samples;

- Although antimony, arsenic, cadmium, lead, and thallium were detected at concentrations above the MDLs in the composite samples of the ore piles and mill tailings; the reported concentrations suggest that the ore piles and mine tailings would not be considered a hazardous waste for these contaminants;

- Reported concentrations of antimony, arsenic, and thallium in four (4) soil samples were well in excess of the reported concentrations of 'reference samples' including two (2) soil samples located between Forest Road 138 and Antimony Creek located roughly 80 feet to the northwest of the former mill and two (2) mill tailings/soil samples collected from areas adjacent to residual structural elements of the former mill; and

- Review of analytical information suggest the contaminants of concern at the former mill include antimony, arsenic, and thallium; and impact an area of about 21,630 square feet in areas adjacent to the former mill and extending north-northwesterly from the former mill across Forest Road 138 to within roughly 20 feet of Antimony Creek.

Based on the geographical and analytical results of ore piles, mill tailings, near surface soil, surface water, river sediment, and groundwater, it appears that impact related to the former mill is generally limited to the surface and near surface in areas adjacent to the former mill, locations of ore piles, and near surface soil in down-slope areas extending about 80 to 90 feet to the north and northwest of the former mill proximal to

Antimony Creek. The reported concentrations of antimony, arsenic, and thallium in these areas exceed the Regional Screening Levels (RSLs) for both residential and commercial/industrial use.

Toxicity Characteristic Leaching Procedure (TCLP) results of ore piles and mill tailings samples analyzed for antimony, arsenic, cadmium, lead, and thallium were below the respective TCLP limit values. These analytical results suggest the ore piles and mill tailings are not representative of a hazardous waste under the Resource Conservation & Recovery Act (RCRA).

3.0 ENVIRONMENTAL SETTING

Descriptions of the environmental characteristics and physical setting of the subject property are based upon a reconnaissance of the site and a review of readily available information.

3.1 Topography

Antimony Canyon is in the High Plateaus Section of the Colorado Plateau physiographic province and characterized by steep-sided plateaus separated by north-south faults, some of which are capped with volcanic rocks. The former mill is situated along the southern edge of Awapa Plateau and western edge of the Aquarius Plateau in a semi-arid erosional area consisting of relatively flat and narrow bottomlands along Antimony Creek bordered by cliffs and steep-sided mountains, plateaus, and mesas with some localized spires, hoodoos, and steep-sloping alluvial fans and tallis. Elevations in the general area range from roughly 6,780 feet above mean sea level (amsl) at Antimony Creek, near the eastern edge of Antimony Bench, to more than 9,500 feet amsl atop a rolling plateau about a mile to the east of the former mill, which is located on bottomland and river-terrace terrain on the south side of Antimony Canyon at an average elevation of 6,990 feet amsl. Elevations across the former mill are about 40 to 50 feet with an overall slope to the north toward Antimony Creek, which flows in a general westerly direction through Antimony Canyon.

3.2 Geology

Antimony Canyon area is situated in the northwest part of the Colorado Plateau physiographic province, which generally consists of thick sequence of uplifted and relatively flat-lying sedimentary rocks and laterally extensive monoclines eroded into mesas, buttes, and deep narrow canyons forming scattered laccolithic mountains that characterize the plateaus in parts of Utah, Colorado, Arizona, and New Mexico. The subject property is situated along the eastern edge of the Aquarius Plateau to the east of a hogsback composed of Navajo sandstone above a relatively small outcrop of the Chinle formation to the north of Antimony Creek just east of Antimony Bench near the entrance to Antimony Canyon and to the east of the Paunsagunt fault along the eastern edge of the Antimony Valley. The Navajo sandstone is overlain by Carmel formation and capped by Tertiary-age volcanics with Quaternary-age landslide, mudslide, alluvial fan, fluvial, and floodplain deposits. The former mill resides in the bottomlands of Antimony Canyon composed of alluvial, landslide, fluvial, and floodplain deposits.

3.3 Soil

Soil information on file with the Natural Resources Conservation Service does not extend eastward of Antimony Bench, where soils are identified as Bruman gravelly loam and Bruman loam in the *Soil Survey of the Panguitch Area, Parts of Garfield, Iron, Kane, and Piute Counties, Utah.* The Bruman series consists of very deep, well drained, moderately rapidly permeable soils that formed in alluvium derived mainly from basic and intermediate igneous rocks. Bruman soils are found on fan terraces, mountainsides and hillsides with slopes ranging from 2 to 70 percent at elevations from 6,500 to 7,500 feet amsl. These soils have medium to rapid runoff and moderately rapid permeability. Soils in the bottomlands of Antimony Canyon are likely similar to the Bruman series and formed in alluvium derived from igneous and sedimentary rocks and include fine-grained and well-sorted light-colored loam and wind-blown deposits. Canyon walls and

adjacent slopes generally consists of badlands-type soils that are generally clay-rich and extensively eroded by wind and water with minimal vegetation and high drainage.

3.4 Surface Water

The former mill is in the Antimony Creek and East Fork Sevier River tributaries of the Sevier River drainage. The Sevier River rises on the Markagunt Plateau to the south of the city of Panguitch and flows about 225 miles generally northward to Juab County, then northwesterly and then southwesterly through Leamington Canyon, and then south-southwesterly emptying to Sevier Lake, a dry lake. The Sevier River drainage is a closed basin encompassing roughly 10,575 square miles of southern Utah. Primary tributaries of the Sevier River include the San Pitch River, East Fork Sevier River, and Otter Creek. The East Fork Sevier River rises near the southern end of Long Valley to the southwest of Bryce Canyon National Park and flows northerly past the town of Antimony to Otter Creek Reservoir, and the northwesterly emptying to the Sevier River near the town of Junction. Antimony Creek rises in plateau areas to the east of the town of Antimony and flows westerly down Antimony Canyon emptying to the East Fork Sevier River about two miles to the south Antimony draining about 50 square miles.

3.5 Groundwater

The Antimony Valley is within the Antimony subbasin of the larger East Fork Valley Groundwater Basin, which consists primarily of unconsolidated valley fill composed of moderately permeable clays, sands, and gravels with a confining layer in the northern part of the Antimony Valley. Groundwater within the area of the subject property is generally within alluvial, fluvial, and floodplain deposits adjacent to Antimony Creek. Recharge is from precipitation, surface water infiltration, losses from streams, and inflows from consolidated rocks. Groundwater gradient is from the higher mountain areas toward Antimony Creek and then westerly following the trend of Antimony Creek toward the Antimony Valley. Depth to groundwater near the former mill ranges from a few feet below ground surface (bgs) in the bottomland areas to hundreds of feet in the adjacent uplands with some perched groundwater and seeps and springs in upland and cliff areas.

4.0 NATURE AND EXTENT OF CONTAMINATION

Previous investigations of the Antimony Mill by the US EPA and EarthTouch, Inc. identified antimony, arsenic, and thallium in ore piles, mill tailings, and near surface soils at concentrations exceeding the respective RSLs and background concentrations. Based on analytical results, contaminant impact is limited to the surface and uppermost 3 to 9 inches of soil in areas to the north of the former mill, within and beneath ore piles, and within the uppermost 0.5 to 1.5 feet adjacent to the former mill. Given the proximity of the ore piles and former mill, mill tailings, and impacted surface soil to Forest Road 138 and Antimony Creek, the possibility of overland migration of contaminants toward and into Antimony Creek through natural events and mechanical agitation from vehicles would likely increase with time.

4.1 Ore Piles

There are two (2) ore piles located on the southernmost and uppermost part of the former mill and roughly 75 feet to the south of the former mill in an area adjacent to an off-road vehicle trail. The ore pile adjacent to the off-road vehicle trail is mounded along a central axis and roughly 15- by 40- by 3-feet. The ore pile on the southernmost part of the former mill is approximately 10- by 20- by 1.5-feet. Although only analyzed by TCLP, the reported concentrations of antimony, arsenic, and thallium in the ore piles likely exceed the RSLs but are not representative of a hazardous waste pursuant to RCRA. The estimated volume of material in the ore piles is 75 cubic yards.

4.2 Mill Tailings / Shallow Soil

Tailings in and around the former mill generally consist of fine dust deposited on the surface and mixed with near surface soil. Detected concentrations of antimony, arsenic, and thallium exceeded the RSLs and ranged up to 79,300 mg/kg (milligrams per kilogram), 596 mg/kg, and 50 mg/kg, respectively. The majority of mill tailings/shallow soil samples were collected at depths from 0 to 3 inches bgs. The estimated area of impact based on previous investigations ranges from 21,630 to 27,022 square feet. With contamination generally confined to the uppermost 0.5 to 1.5 feet adjacent to the former mill, and within the uppermost 6 to 9 inches of soil in areas to the north and northwest of the former mill, the estimated volume of impact is roughly 660 cubic yards.

4.3 Range of Contaminant Concentrations

Investigation by the US EPA in 2009 and 2010 applied the Superfund Chemical Data Matrix (SCDM) as screening concentrations as part of the evaluation of the Antimony Mill for potential inclusion on National Priorities List (NPL). In addition, two (2) samples were collected from the bottomlands and south wall of Antimony Canyon to identify background concentrations of contaminants of concern. The SCDMs, average background concentrations, and measured range of concentrations of antimony, arsenic, and thallium in shallow soil samples from these investigations are shown below:

Contaminant of Concern	SCDM*	Background**	Range of Concentrations
Antimony	31 mg/kg	2.8 mg/kg	740 – 18,500 mg/kg
Arsenic	23 mg/kg	28.6 mg/kg	74.2 – 488 mg/kg
Thallium	2.5 mg/kg	No Measurement	5.9 – 61.8 mg/kg

*Superfund Chemical Data Matrix (SCDM) value
**Highest measured concentration of two 'background' samples

The investigations of the Antimony Mill by EarthTouch, Inc. in 2021 and 2022 included collecting and analyzing soil samples from areas to the east of the former mill to validate the background concentrations identified by the US EPA. However, the soil samples were collected in an area of recent mass wasting or flash flooding event; and analytical results deviated significantly from previously reported background concentrations. These 'reference values' and ranges of concentrations for antimony, arsenic, and thallium in the soil samples collected in the bottomlands to the east of the former mill are shown below:

Contaminant of Concern	Reference Values	Range of Concentrations
Antimony	20.1 mg/kg	8.2 – 79,300 mg/kg
Arsenic	110 mg/kg	8.2 – 596 mg/kg
Thallium	2.61 mg/kg	0.7 – 49.8 mg/kg

Although investigations of Antimony Mill by the US EPA in 2009 and 2010 failed to identify contaminants of concern in surface water or sediment samples collected from Antimony Creek, the EarthTouch, Inc. investigations in 2021 and 2022 detected arsenic in sediment samples collected from Antimony Creek in an area upstream of the former mill and in both downstream sediment samples from Antimony Creek at concentrations ranging from 26.5 to 69.8 mg/kg.

As noted, during the EarthTouch, Inc. investigations areas roughly 500 feet to the east and up-canyon of the former mill were covered by an estimated 1 to 3 feet of recently deposited material likely associated with a flash-flooding event from a slot-canyon along the south side of Antimony Canyon or a mass wasting event in the lower parts of Antimony Canyon. The recently deposited material extended from areas to the south of Forest Road 138 to the southern embankment of Antimony Creek. Given the reported

concentrations of 'reference values' in the soil samples collected to the east of the former mill, it is likely that the elevated concentrations of contaminants of concern in sediment samples from Antimony Creek are related to the concentrations of contaminants of concern in the material deposited by recent flash flooding or mass wasting ('reference values').

4.4 Site Conceptual Model

The data obtained from previous investigations of Antimony Mill identify surface/near surface contaminants that include soil impacted by mill tailings generated through crushing, grinding, and pulverizing high-grade ore with notable concentrations of antimony, arsenic, and thallium. Other sources of contaminants of concern include residual ore piles and accumulated mill tailings on ground surfaces near the former mill. Given proximity of the former mill, mill tailings, impacted soil, and ore piles to Forest Road 138 and Antimony Creek, there is a possibility of overland migration of contaminants to Antimony Creek through natural events and mechanical agitation that would likely increase with time.

SITE CONCEPTUAL MODEL

Contaminant Source	Potential Release Mechanism	Pathway(s) / Secondary Pathway(s)	Exposure Route	Recreational Receptor			
				Human		Biota	
				On-site	Off-site	Terrestrial	Aquatic
Surface Soil and Shallow Soil	Air Dispersion	Air Emission / Groundwater Surface Water	Inhalation	o	o	o	o
			Ingestion	o	o	o	o
			Dermal	o	o	o	o
	Direct Contact	Soil Contact / Air Emission	Inhalation	o	o	o	o
			Ingestion	o	o	o	o
			Dermal	o	o	o	o
	Plant Uptake	Plant Growth in Impacted Soil	Inhalation	n	n	n	n
			Ingestion	pp	n	pp	n
			Dermal	n	n	n	n
	Runoff / Leaching	Surface Water	-	Refer to surface water contaminant source			
	Leaching	Groundwater	-	Refer to groundwater contaminant source			
Surface Soil to Groundwater	Groundwater	Contact with Groundwater	Inhalation	n	n	n	n
			Ingestion	p (1) (2)	p (1) (2)	p (2)	p (2)
			Dermal	p (1) (2)	p (1) (2)	p (2)	p (2)
	Plant Uptake	Plants in Groundwater	Inhalation	n	n	n	n
			Ingestion	pp	n	pp	n
			Dermal	n	n	n	n
	Discharge to Stream	Surface Water	Ingestion	Refer to surface water contaminant source			
Surface Soil or Groundwater to Surface Water and / or River Sediment	Direct Contact with Surface Water	Contact with Surface Water / Agricultural Use	Inhalation	n	n	n	n
			Ingestion	p (2)	p (2)	p (2)	p (2)
			Dermal	p (2)	p (2)	p (2)	p (2)
	Streambed Sediment	Fish or other Aquatic Biota	Inhalation	n	n	n	n
			Ingestion	pp	pp	pp	pp
			Dermal	o	o	o	o

o - complete pathway
n - indeterminant pathway (due to lack of complete data at this time)
pp- possible pathway (but lack of complete data at this time)
p(1)- groundwater at site not likely reflective of in-situ conditions / no potable water wells within one mile of the subject property
p(2)- indeterminant pathway based on groundwater, surface water, and/or streambed sediment sample information

4.5 Human Health Risk Evaluation

Site Conceptual Models from previous investigations of Antimony Mill identified potential migration and exposure pathways affecting human health that included erosion; transport by meteoric and surface water; dust caused by wind, high-clearance trucks, and off-road vehicles; and infiltration to groundwater. The former mill is located within an unrestricted area adjacent to Forest Road 138 with nearby areas for fishing, camping, and other recreational uses. Recreational users could be easily exposed to elevated concentrations

of antimony, arsenic, and thallium through inhalation, inadvertent ingestion, and direct skin contact with ore piles, mill tailings, and impacted shallow soil at, and next to, the former mill, along Forest Road 138, and adjacent to Antimony Creek. However, given the analytical results associated with surface water and sediment in Antimony Creek, it is unlikely that residents living near the mouth of Antimony Canyon or within the town of Antimony have been or would be exposed to contaminants in and around the former mill.

As part of the potential acquisition of Claim 38B, the US Forest Service evaluated the analytical data from previous investigation of the Antimony Mill by the US EPA in 2009 and 2010. Consistent with the findings of the EarthTouch, Inc. investigation in 2021 and 2022, the US EPA identified three (3) contaminants of concern, including; antimony, arsenic, and thallium.

The US Forest Service processed the analytical data using ProUCL Software available from the US EPA for the three (3) contaminants of concern to obtain an exposure point concentration for risk assessment purposes. The primary function of the ProUCL Software is calculating the 95% Upper Confidence Limit (UCL) of the mean for each contaminant of concern. The US Forest Service noted that use of the sampling approach of the US EPA, which includes selected locations with the highest contaminant concentrations, and application of the ProUCL Software 'typically' yields in results that 'bias high' and provides a conservative characterization of contamination and calculated exposure point concentrations. The US Forest Service analyses of contaminant of concern at the former mill using ProUCL Software generated the following 95% UCLs for antimony, arsenic, and thallium:

Contaminant of Concern	Exposure Point Concentration
Antimony	5,598 mg/kg
Arsenic	266 mg/kg
Thallium	30.5 mg/kg

The base and lower parts of the former mill abut Forest Road 138 and the upper portions of the former mill and ore piles are adjacent to an off-road trail. As such, the US Forest Service prepared a human health risk assessment using a recreational scenario.

To assessment the risk to a recreational visitor to the Antimony Mill, the US Forest Service used assumptions provided by the US Bureau of Land Management (BLM) in the *Screening Assessment Approaches for Metals in Soil at BLM Hazmat/AML [Abandoned Mine Lands] Sites Technical Memorandum* (Sep-2017). Specifically, the following assumptions were used:

- Exposure Frequency: 14 days/year
- Exposure Duration (child): 2 years
- Exposure Duration (adult): 24 years

Target Levels were set at:

- Excess Lifetime Cancer Risk (ELCR): 1E-05
- Hazard Quotient (HQ / 'non-cancer' effects) 1.0

The calculated ELCRs associated with the contaminants of concern for the adult recreational scenario were less than 1E-05; and the calculated HQs were less than 1.0. Although the calculated ELCRs for the child recreational scenario were less than 1E-05, the calculated HQs for antimony and thallium were greater than 1.0 for the Exposure Point Concentrations generated by the ProUCL Software. As such, the US Forest Service suggested remedial actions at the former mill to reduce the health risk associated with antimony and thallium based on the child recreational use scenario.

To identify 'minimum cleanup concentrations' consistent with the Target Levels of the US Forest Service for the adult and child recreational use scenarios, EarthTouch, Inc. 'inverted' the risk assessment model (i.e., assumed the ELCRs would be less than 1E-05 and HQs would be equal to or less than 1.0), which yielded the following concentrations:

Contaminant of Concern	Minimum Cleanup Concentration
Antimony	786 mg/kg
Arsenic	266 mg/kg*
Thallium	19.6 mg/kg

*Based on the risk assessment model and recreational use scenario, the Exposure Point Concentration of arsenic (266 mg/kg) generated an ELCR less than 1E-05 for both the adult and child recreational scenario with HQs less than 1.0.

The 'minimum cleanup concentrations' were used to estimate the volume of material at the former mill that would be involved in remedial actions. Proposed site-specific cleanup levels are discussed in Section 5.

4.6 Ecological Risk Evaluation

The Utah Department of Water Quality (DWQ) identifies Antimony Creek as a Class 3A stream and a cold-water fishery. Antimony Creek is described by the National Wetlands Inventory (NWI) as a perennial stream with unconsolidated bottom and surface water persisting throughout most of the year with groundwater near the surface during periods in which surface water flow may become stagnant or absent. Antimony Creek and East Fork Sevier River are populated with brown trout and rainbow trout with on-line reports of anglers catching 10- to 12-inch fish with dry-flies before releasing. However, it is possible that brown trout or rainbow trout from Antimony Creek may have been consumed by humans.

Discussions with personnel with the US Forest Service indicated a lack of threatened, endangered, or candidate species in the area near Antimony Mill. There are no reports of Bonytail Chub, Razorback Sucker, or Humpback Chub in Antimony Creek. Although the bottomlands along Antimony Creek may provide secondary habitat for Southwestern Willow Flycatcher, this species has not been identified within Antimony Canyon.

Measured concentrations of contaminants of concern in surface water samples from Antimony Creek are below the standards of the Clean Water Act (CWA). The reported concentrations of contaminants of concern in surface water samples collected as part of investigations by US EPA and EarthTouch, Inc. are not significantly different. However, given the proximity of the former mill, ore piles, mill tailings, and impacted soil to Antimony Creek, a possibility of overland migration of contaminants to Antimony Creek through meteoric events, snowmelt, and mechanical agitation by vehicles exists with the likelihood of discharge of contaminants of concern to Antimony Creek increasing with time.

Comparison of sediment samples from Antimony Creek collected and analyzed by the US EPA in 2009 and 2010 and by EarthTouch, Inc. in 2021 and 2022 suggests an increase in concentrations of contaminants of concern. A screening level evaluation of contaminants of concern in sediments samples collected from Antimony Creek was performed by comparing the analytical results to levels of specific contaminants with high probability of causing adverse effects to aquatic biota generally referred to as Sediment Quality Guidelines, which include a Threshold Effects Concentration (TEC) and Probable Effects Concentration (PEC). The TEC is a concentration below which adverse effects are unlikely to occur. The PEC is a concentration above which adverse effects are likely to be observed.

The reported concentrations of cadmium and lead in sediment samples from Antimony Creek were less than the TECs and PECs for the *Protection of Aquatic Biota in Freshwater Ecosystems*. There are no

published TECs of PECs for antimony or thallium. The detected concentrations of arsenic in three sediment samples collected by EarthTouch, Inc. exceeded the TEC of 9.79 mg/kg. The detected concentrations in two of three sediment samples also exceeded the PEC of 33.0 mg/kg. The reported concentrations of arsenic in six sediment samples collected by US EPA ranged from 18.2 to 36 mg/kg with arsenic concentrations in all sediment samples exceeding the TEC and arsenic levels in one sediment sample exceeding the PEC. The reported concentrations of arsenic in sediment samples collected by EarthTouch, Inc. ranged from 26.5 to 69.8 mg/kg. With the exception of a sediment sample collected immediately downstream of the area of recent deposition and former mill, the detected concentrations of antimony in sediment samples collected by the US EPA and EarthTouch, Inc. were generally similar. Antimony was detected at a concentration of 456 mg/kg in the sediment sample collected from the embankment downstream of the former mill and area of recent deposition.

The Sediment Quality Guidelines are primarily for protection of benthic organisms; and other approaches are more appropriate to calculate sediment concentrations protective of fish, wildlife, and human health. However, the chemical characteristics of material deposited to the east of the former mill by recent flash flooding or mass wasting likely contributed to an increase in concentrations of contaminants of concern in the stream sediment in Antimony Creek. Reported concentrations of contaminants of concern in soil samples collected from areas of recent deposition by EarthTouch, Inc. ('reference values') exceeded the background concentrations reported by the US EPA in 2010; and the deposited material was observed to extend to Antimony Creek. The detected concentration of antimony in a sample of the recently deposited material was nearly 10 times the background concentration reported by US EPA.

The geography of Antimony Canyon, presence of antimony ore within nearby strata, and physical and chemical parameters associated with recent flash flooding or mass wasting deposition suggest multiple sources of potential contaminant impact to Antimony Creek, including naturally occurring high-grade ore in geological formations. Past mining, crushing, and processing activities concentrated contaminants of concern in areas adjacent to Antimony Mill. The remedial action would involve excavating and disposing of the contaminant sources associated with the former mill; and planting and supporting vegetative cover to reduce erosion and transport of residual material to Antimony Creek. However, no mitigative actions related to stabilizing high-grade ore bodies outside of the boundaries of Claim 38B are anticipated.

Vegetation near the former mill ranges from sparse, desert-type plants such as sage and grasses to stands of low growing pinyon pine and juniper with some aspen and conifer species such as pine, spruce, and fir. No threatened or endangered plant species are known from the area near Antimony Mill. Plants in areas adjacent to the former mill are not unduly stressed from contaminants of concern. However, there is the possibility of uptake of contaminants of concern by plant species and subsequent consumption by wildlife and/or livestock that may be present on the Dixie National Forest through grazing permits.

4.7 Remedial Action Objectives

Given the nature and extent of contamination and future recreational use of areas adjacent to the former mill, the remedial action objectives include:

- Remediate the oil piles, mill tailings, and impacted soils with concentrations of contaminants of concern above site-specific cleanup levels to reduce the potential health risks associated with inhalation, ingestion, and direct contact to levels acceptable for recreational use;
- Reduce the potential for migration and deposition of contaminants of concern at concentrations above site-specific cleanup levels into Antimony Creek; and
- Eliminate the need for constructing a repository on land to be administered by the US Forest Service to remove extraordinary requirements that may be associated with long-term operating and monitoring.

5.0 REMEDIAL ACTION

The remedial action alternatives considered included:

- No Action Alternative;
- Excavation, Stabilization, On-Site Consolidation, and Land Use Covenant(s); and
- Excavation with Off-Site Disposal.

No Action Alternative

The No Action Alternative was dismissed given the lack of containment of contaminants of concern or other mitigation measure to reduce the potential risk to human health or the environment, including potential exposure to antimony, arsenic, and thallium related to recreational uses and possible inhalation and inadvertent ingestion, and dermal contact and potential migration of contaminants to Antimony Creek.

Excavation, Stabilization, On-Site Consolidation, and Land Use Covenant(s)

Excavation, stabilization, and consolidation of soils containing antimony, arsenic, and thallium at concentrations warranting remedial action was dismissed by the US Forest Service due to policies related to the acquisition of land impacted by contaminants, operational costs associated with long-term monitoring of a constructed waste stabilization unit, and likelihood of executing a Land Use Covenant (LUC) that may conflict with various Forest Management Plans of the Dixie National Forest. This Alternative would involve identifying and characterizing land within the Dixie National Forest physically suitable for construction of a waste stabilization unit and constructing the waste stabilization unit; excavating, transporting, and accumulating impacted materials within a waste stabilization unit; and routine inspections of the waste stabilization unit over an extended period of time. Given the projected costs and timeframe of implementation, this alternative was dismissed.

Excavation with Off-Site Disposal

Excavating of ore piles, mill tailings, and impacted soil with antimony, arsenic, and/or thallium above a site-specific cleanup level and disposing of these materials at an off-site facility is the recommended alternative as this approach is protective of public health, safety, and welfare by preventing human exposures to concentrations of antimony, arsenic, and thallium exceeding site-specific clean-up levels; cost-effective to implement; prevents the potential migration of contaminants to Antimony Creek. The site-specific cleanup levels would be consistent with US Forest Service requirements related to adult and child recreational use scenarios. The ore piles, mill tailings, and impacted shallow soil would be excavated, transported to a permitted facility, and disposed in accordance with applicable regulations.

5.1 Cleanup Levels

As noted in Section 4.6, the US Forest Service completed a health risk assessment for Antimony Mill with respect to contaminants of concern using Exposure Point Concentrations obtained from investigations by the US EPA in 2009 and 2010 and applying the assumptions included in the US BLM in the *Screening Assessment Approaches for Metals in Soil at BLM Hazmat/AML [Abandoned Mine Lands] Sites Technical Memorandum*, which indicated unacceptable health risks under the child recreational use scenario. In order to identify a 'minimum cleanup concentration' for contaminants of concern, EarthTouch, Inc. performed an 'inversion analysis' using the same health risk model that assumed the ELCR of each contaminant would be less than 1E-05, and HQ of each contaminant would be equal to or less than 1.0. The 'inversion analysis' yielded 'minimum cleanup concentrations' for antimony, arsenic, and thallium of 786 mg/kg, 266 mg/kg, and 19.6 mg/kg, respectively. But applying the 'minimum cleanup concentrations' to the health risk

assessment produced a cumulative HQ for the child recreational use scenario of 2.1. As such, site-specific cleanup levels were developed to achieve the Target Levels of the US Forest Service (ELCR = 1E-05 / HQ = 1.0) for the adult and child recreational use scenarios.

The proposed site-specific cleanup levels are based on relevant regulatory screening levels; cleanup levels used at other mine-related properties in Utah with similar contaminants of concern; and application of the health risk assessment model and exposure scenarios used by the US Forest Service.

With the location of the former mill in an area with naturally occurring elevated concentrations of antimony associated with deposits of stibnite, valentinite, realgar, and orpiment; the proposed site-specific cleanup level for antimony is the RSL for commercial/industrial use of 470 mg/kg. Using this RSL in the health risk assessment model results in a risk for antimony that is less than 1E-05 and HQ of 0.6.

Cleanup levels of 100 mg/kg for arsenic have been accepted by the Utah DEQ/DERR and US EPA for residential use scenarios at many locations across Utah with mine-related contaminants of concern. As part of a previous investigation of the former mill, ore pile samples and mill tailings samples were collected and analyzed to simulate the leaching in landfill or other disposal scenarios. Although the reported concentrations of arsenic in mill tailing samples ranged up to 596 mg/kg, the reported concentrations of arsenic in leachate of the mill tailings samples were less than 0.038 milligrams per liter (mg/L) and less than 1.47 mg/L in the leachate of ore piles samples. These analytical results suggest relatively low mobility of arsenic in mill tailings and ore piles and support a site-specific cleanup level of 100 mg/kg for arsenic. Applying a site-specific cleanup level of 100 mg/kg for arsenic into the health assessment model for a child recreational scenario also yields a risk for arsenic that is less than 1E-05 and HQ of 0.1.

Measured background concentrations of thallium near the former mill during previous investigations are roughly 2.5 to 2.6 mg/kg. Therefore, the RSL for thallium related to residential use (1.6 mg/kg) is not achievable. When applied in conjunction with the proposed site-specific cleanup levels for antimony and arsenic in the health risk assessment model for a child recreational use scenario, the RSL of thallium for commercial/industrial use (23 mg/kg) yields an HQ greater than 1.0 and a cumulative HQ of 1.9.

Geographical and analytical data from previous investigations suggest elevated concentrations of thallium are generally associated with elevated concentrations of antimony and arsenic; however, the relative percent increase in thallium concentrations in ore piles, mill tailings, and impacted soil exceeds arsenic but is less than antimony. Investigations of Antimony Mill by the US EPA identified 'elevated concentrations' as three times the highest background concentration (2.6 mg/kg) or three times the SCDM (2.5 mg/kg). However, using site-specific cleanup levels of 7.5 mg/kg or 7.8 mg/kg along with the proposed site-specific cleanup levels of antimony and arsenic in the health risk assessment model for the child recreation use scenario results in a cumulative HQ of 1.1. To attain the Target Levels of the US Forest Service (ELCR = 1E-05 / HQ = 1.0), a site-specific cleanup level of 6.5 mg/kg for thallium is proposed

The proposed site-specific cleanup levels are summarized below:

Contaminant of Concern	Site-Specific Cleanup Level
Antimony	470 mg/kg
Arsenic	100 mg/kg
Thallium	6.5 mg/kg

6.0 IMPACTED MATERIAL REMOVAL AND DISPOSAL

The remedial actions at Antimony Mill will involve the excavation of ore piles, mill tailings, and metal-impacted soil; which will be disposed at an off-site facility in Garfield County, Utah.

Given the remoteness of the former mill and the variation and distribution of contaminants of concern, a hand-held X-ray fluorescence (XRF) unit will be used to provide real-time screening data to guide the removal of ore piles, mill tailings, and other sources of metal-impacted soil. At the conclusion of excavation activities, soil samples will be collected for laboratory analyses. Residual materials impacted by past operations at the former mill at concentrations above site-specific cleanup levels will be removed until the site-specific cleanup levels are met.

The metal-impacted materials will be either loaded directly into trucks and covered before leaving the area of the former mill or directed to transport bins, covered, and then loaded onto flatbed trucks for transit. Given the access restrictions associated with Forest Road 138, it is likely that smaller trucks and transport bins would be employed to move metal-impacted materials from the former mill to larger transport vehicles deployed near the mouth of Antimony Canyon or directly to the permitted disposal facility. The smaller vehicles would be decontaminated prior to departure to prevent 'track-out' of metal-impacted materials along Forest Road 138. Each transport load from the site to the disposal facility will be accompanied by a Non-Hazardous Waste Manifest.

6.1 Site Preparation Activities

The former mill is on a patented mine claim surrounded by land administered by the US Forest Service. Any permits that may be required by Garfield County or the US Forest Service will be obtained prior to initiating field work.

Prior to the start of excavation and removal actions, roughly 100 to 200 feet of stacked straw-wattles will be installed along the southern embankment of Antimony Creek adjacent to areas of metal-impacted shallow soil identified through past investigations.

The ore piles, mill tailings, and other areas of impacted soil excavation will be located using global position satellite (GPS) coordinates from previous investigations and identified by pin-flags, colored stakes, or similar. If warranted, an XRF will also be utilized to confirm the location and the presence of previously identified soil impacts.

Two bolt-down screw-mounts, with rough dimensions of 2-foot length and 1-inch diameter, on the lower foundation elements of the former mill would be flush-cut with a portable mini-cutter or rotary tool to reduce the potential for injury.

The former mill is situated immediately to the south of Forest Road 138 and areas of excavation are located immediately to the north and south Forest Road 138. During remedial actions Forest Road 138 would be closed to traffic about 500 feet to the west (down-canyon) of the former mill. A warning sign(s) would be erected, and measures implemented to prohibit unauthorized access to excavation areas about the former mill during remedial actions. Traffic cones, temporary barricades, or other obstacles would be used, as appropriate, to prevent unauthorized trucks, off-road vehicles, and other motorized equipment from work areas.

There are no utilities within the general area of Antimony Mill. Therefore, no utility location services will be engaged.

6.2 Excavation Activities by Impacted Area

Ore piles, mill tailings, and areas of metal-impacted soil will be excavated using a Bobcat mini-excavator, backhoe with front-loader, and/or mini-excavator. Hand tools will likely be used in areas adjacent to the remaining structural elements of the former mill. Once excavation activities have advanced to pre-determined depths, a hand-held XRF will be used to take in-situ readings of antimony or arsenic concentrations of exposed excavation floors to guide any additional excavating actions. When in-situ XRF readings indicate residual concentrations of antimony or arsenic are below site-specific cleanup levels, confirmation samples will be collected for laboratory analysis and to document remedial actions.

Ore Piles / Mill Tailings

One ore pile and the mill tailings pile are situated on the ground surface in areas to the south and southeast of the former mill. The ore pile and mill tailings pile along with roughly 6-inches of underlying native soil will be excavated. Additional soil will be excavated from beneath the ore pile and/or mill tailings pile based on in-situ XRF screening to confirm the remedial action objectives have been achieved.

The remaining ore pile is situated on the southernmost and uppermost part of the former mill and will be removed by hand tools and placed into a front-loader for transport to an onsite truck or transport bin.

The mill tailings and metal-impacted material adjacent to the former mill will be excavated using a mini-excavator and hand tools. The former mill is constructed within a river terrace with a slope near the angle of repose with mill tailings and metal-impacted material located adjacent to residential structure elements. Hand tools would be used to move and 'push' the mill tailings and metal-impacted material down-slope to areas accessible by a mini-digger and then placed within trucks or transport bins. Initially, the mill tailings and metal-impacted material adjacent to the former mill will be removed based on visual and physical indicators. Once visual or physical indicators suggest or underlying soil is encountered, additional excavation would be based on the results of in-situ XRF sample data.

Areas beneath ore piles, mill tailings, and within or adjacent to the former mill where the in-situ XRF readings that exceed 470 mg/kg of antimony and/or 100 mg/kg of arsenic will be marked with pin-flags, colored stakes, or marking paint and additional excavation performed. The in-situ XRF readings and additional excavation will continue until the in-situ XRF readings are below 470 mg/kg of antimony and 100 mg/kg of arsenic. Once the in-situ XRF readings are below these cleanup objectives, confirmation samples will be collected for laboratory analyses to verify the cleanup objectives have been achieved.

Shallow Metal-Impacted Soil

Based on previous investigations, the surface soil and shallow soil in areas to the north and northwest of the former mill extending across Forest Road 138 to within about 20 feet of Antimony Creek are impacted with mill tailings. A Bobcat or mini-excavator would be used to remove impacted material in roughly 6-inch lifts and place the impacted soil into a truck(s) or transport bin(s). After the material from the identified area of impact is removed to the target depth (6 inches), in-situ XRF readings will be collected from the bottom and edges of the excavated area and reported concentrations in excess of 470 mg/kg of antimony and/or 100 mg/kg of arsenic will be marked pin-flags, colored stakes, or marking paint and additional excavation performed. The in-situ XRF readings and additional excavation will continue until the in-situ XRF readings are below cleanup objectives and confirmation samples will be collected for laboratory analyses to verify the cleanup objectives have been achieved.

6.3 In-situ XRF Reading Methods

The horizontal and vertical extents of excavations related to ore piles, mill tailings, and metal-impacted soil will be determined in the field through real-time in-situ screening of the soil underlying and adjacent to excavated areas using a portable XRF unit. As excavations are performed, an XRF multi-element analyzer will be used in general accordance with US EPA Method 6200 and manufacturer operations manual for antimony and arsenic. The XRF unit will be calibrated each day in accordance with the procedures of the manufacturer.

6.4 Excavated Material Transport and Disposal

The ore piles, mill tailings, and excavated soil from the former mill will be placed into haul trucks, covered, and then transported to the John's Valley Landfill for disposal. John's Valley Landfill is located roughly three miles to the east of Panguitch, Utah. The proposed truck transport route would be south from Antimony Canyon Road along John's Valley Road to State Route 12; and then west along State Route 12 to US Highway 89; and then north on US Highway 89 to Peterson Wash Road; and then easterly to the John's Valley Landfill. Analytical information related to the ore piles, mill tailings, and impacted soil were provided to the Garfield County Public Works Department, the operator of John's Valley Landfill; which acknowledged the excavated materials could be accepted as solid waste under existing permits. A non-hazardous waste manifest will be issued and accompany each truck transporting a load of metal-impacted materials from the Antimony Mill to John's Valley Landfill.

6.5 Confirmation Sampling

Confirmation samples will be collected following excavation activities and consist of composite samples representing discrete areas of the site. One (1) duplicate sample will be collected for every ten (10) confirmation samples (of fraction thereof) for laboratory analyses. Additional sample volumes in each excavated area will also be collected for laboratory use for matrix spike (MS) and matrix spike duplicate (MSD) samples. In addition, personnel with the Utah DEQ/DERR that are on-site during field activities will be provided with the means, materials, and opportunities to collect spilt samples.

Composite confirmation samples will be collected using stainless-steel hand-trowels. Prior to sample collection, the hand-trowels will be washed in an Alconox/water mixture, rinsed with distilled water, and then advanced into the shallow surface to collect a sample. A new pair of disposable nitrile sampling gloves will be worn for each sample collected to prevent cross-contamination. Samples will be placed in clean jars provided by the laboratory, labeled, and transported to the laboratory under Chain-of-Custody procedures. A summary of sampling methodologies is included in Appendix A.

The location, methodology, and sample frequency for the collection of confirmation samples from various areas of soil impacts at the site are detailed in the following sections:

Ore Piles / Mill Tailings

The ore pile adjacent to the off-road vehicle trail is roughly 15- by 40- by 3-feet; the ore pile on the southernmost part of the former mill is approximately 10- by 20- by 1.5-feet; and the mill tailings pile to the southeast of the former mill is roughly 10- by 20- by 1-foot. Following excavation activities, composite confirmation samples would be collected from the bases of each excavation area based on the geometry; and from the sidewalls of excavation areas with depths exceeding 1-foot bgs. Roughly 200-square-foot areas would be subdivided into four (4) equal quadrants. Equal volumes of underlying soil would be collected at roughly 0- to 2-inch depths from within each quadrant and combined, mixed, and homogenized in 1-gallon plastic bags to produce composite confirmation samples for laboratory analyses. A composite

sample from each sidewall generally aligned to a cardinal compass direction would also be collected in areas were the excavation depths exceed one foot.

Shallow Metal-Impacted Soil

Previous investigations identify mill tailings and metal-impacted soil extending to the north and northwest of former mill and across Forest Road 138 within an approximately 6,000-square-foot area. After excavation of the area is complete, composite confirmation samples would be collected at 0- to 2-inch depths in the underlying soil. Approximately 400-square-foot areas would be subdivided into four (4) equal area quadrants and equal volumes of soil would be collected from within each quadrant and combined, mixed, and homogenized in 1-gallon plastic bags to produce a composite confirmation sample for laboratory analyses.

Areas Adjacent to the Former Mill

Mill tailings and metal-impacted soil were identified in areas adjacent to the residual structural elements of the former mill by previous investigations. Following excavation actions, composite confirmation samples would be collected along the western and eastern edges of the former mill at 0- to 2-inch depths in the underlying soil. Each side of the roughly 80-foot length of the former mill would be subdivided into roughly equal 20- by 20-foot areas and equal volumes of soil would be collected from within each quadrant and combined, mixed, and homogenized in 1-gallon plastic bags to produce a composite confirmation sample for laboratory analyses.

6.6 Laboratory Analyses

Composite confirmation samples would be shipped to Pace Laboratories in Mount Juliet, Tennessee. All samples would be analyzed for the presence of antimony, arsenic, and thallium by EPA Method 6020B. Pace Laboratories will be required to provide 'QC Level 3' data packages to support validation of reported samples concentrations. This includes internal laboratory QC samples; method blanks, laboratory duplicates, laboratory control samples, surrogate spikes, MS and MSD samples, standard reference material samples, and analytical summaries with surrogate recoveries on organic analyses, statistical recovery reports, chromatograms, and narrative. The need for formal data validation will be discussed with the Project Manager with the Utah DEQ/DERR following receipt of laboratory reports and data packages.

6.7 Site Restoration

Structural elements of Antimony Mill will remain following remedial actions. Any historical structure or cultural resource evaluation of the former mill would likely be addressed by the US Forest Service following acquisition.

The remedial actions related to removing ore piles and mill tailings would likely involve excavating from 2 to 6 inches beneath the areas of surface accumulation in areas to the east and south of the former mill in areas of limited vegetation. At the completion of remedial actions, these areas would be contoured to mimic surrounding areas incorporating surface soil from adjacent areas.

Removal of impacted soil in areas to the north and northwest of the former mill near Antimony Creek would likely involve excavation to depths ranging from 4 to 8 inches bgs. Once remedial actions are completed, the excavation area would be backfilled with clean topsoil from a commercial source(s) in Grand County, smoothed using hand tools or hand-held equipment, slightly compacted, and then seeded with a mixture prescribed by the US Forest Service and covered with mulch to reduce erosion and discourage growth of opportunistic weeds.

The seed mixture recommended by the US Forest Service includes:

Seed / Common Name	Seed / Scientific Name	Variety	Pounds / Acre	Viable Seeds / Square Foot
Needle & Thread	*Hesperotipa comata*		1	2.15
Squirreltail, Bottlebrush	*Elymus elymoides*	any	2	6.86
Brome, Mountain	*Bromus marginatus*	Bromar	2	4.04
Bluegrass, Canby	*Poa canbyi*	Canbar	1	17.17
Wheatgrass, Thickspike	*Elymus lanceolatus*		2	6.09
Dropseed, Sand	*Sporobolus cryptandrus*		0.05	5.60
Sweetvetch, Utah	*Hedysarum utahensis*		1	0.63
Yarrow, Western	*Achillea millefolium*		0.1	6.79
Beeplant, Rocky Mountain	*Cleome serrulata*		0.5	0.74
Balsamroot, Arrowleaf	*Balsamorhiza sagittata*		0.5	0.54
Buckwheat, Sulfur-flower	*Eriogonum umbellatum*		0.1	0.11
Goldeneye, Showy	*Heliomeris multiflora*		0.1	2.10
Flax, Lewis	*Linum lewisii*		0.5	1.85

Remedial actions are anticipated to be completed in the autumn months when deciduous plants are entering dormancy. Water from Antimony Creek would be used to ensure soils are moist when seeded, initiate some compaction of soil, and improve soil conditions for root penetration. Some seeded areas would be delineated by habitat fencing. Obstacles or semi-permanent fencing would be installed adjacent to seeded areas between Forest Road 138 and Antimony Creek to minimize potential disturbance by high-clearance trucks and off-road vehicles. The stacked straw-wattles installed along Antimony Creek prior to remedial actions would remain in place to reduce sedimentation to Antimony Creek during the period of plant establishment. Signage would also be posted.

Until Claim 38B is acquired by the US Forest Service or the seeded areas are covered by snow, maintenance inspections would be conducted every 2 to 3 weeks. During this timeframe, maintenance may include weeding/removing non-native invasive species, ensuring soils remain moist, addressing damage caused by human activities, evaluating and controlling erosion, performing additional seeding or planting, and making sure that conditions are optimal for establishment of selected plant species. These activities would be documented by a memorandum-to-file that includes evaluation of site-specific features and photographs. Inspection of the seeded areas would also be conducted after the snow melts in the spring, or through routine monitoring by personnel with the US Forest Service following acquisition.

6.8 Long-Term Management

Remedial actions are intended to address contaminants of concern in ore piles, mill tailings, and shallow soil at and adjacent to Antimony Mill identified through previous investigations. The remedial action objective is cleanup identified areas of concern at and adjacent to the former mill to site-specific risk-based levels based on future recreational use. However, at the conclusion of remedial actions some residual materials with contaminants of concern at concentrations above the Regional Screening Levels (RSLs) for unrestricted use would remain. As the site-specific risk-based levels exceed the RSLs, institutional controls are necessary to identify areas about the former mill with elevated concentrations of contaminants of concern, restrict activities to recreational uses only, prohibit excavating/removing soil or residual materials, constrain development of inhabitable structures or campsites near the former mill, and require managed uses and other activities generally consistent with the Forest Plan for the Antimony Canyon area. In support

of the risk-based remedial actions at the former mill; The Richard William Davis Trust in consultation with the Utah DEQ/DERR, will prepare an Environmental Covenant to address potential risks to human health and the environmental posed by residual contamination at Antimony Mill. The Environmental Covenant will be filed with Grand County upon completion of remedial actions.

Long-term management of the former mill after remedial actions and acquisition by the US Forest Service would be generally consistent with the *Land and Resource Management for the Dixie National Forest* (Forest Plan) that describes applicable activities and managed uses within the Antimony Canyon area (Appendix B). The most relevant parts of the Forest Plan include Riparian Management, Range Management, Timber Management, and Big Game Winter Range.

The Forest Plan summarizes objectives and standards related to natural resource management within the Dixie National Forest; includes overall directions and activities required to achieve desired environmental conditions; and lists management practices, standards, and guidelines for management of specific areas. Routine inspections and evaluations are ongoing throughout the Dixie National Forest in order to achieve desired future conditions. This includes routine inspections of Antimony Canyon to evaluate natural resource conditions and implement management controls, as necessary. The Forest Plan includes programs to monitor soil erosion and water quality, maintain and improve (if necessary) riparian areas, and control noxious weeks with focus on new and smaller populations. The institutional controls summarized in the Environmental Covenant would be absorbed into practices, standards, and guidelines for management of Antimony Canyon and specific areas around the former mill that would include routine inspection and documentation of plant growth and viability in seeded areas, encroachment of noxious weeds, soil erosion or significant surface disturbance, evidence of campsites or excessive recreational use, damage to structural elements of the former mill, and other natural resource management items necessary to achieve the objectives of the Forest Plan. The documentation would be maintained by the Dixie National Forest and used and modified in conjunction with amendments and updates to the Forest Plan.

6.9 Contingency

Should issues arise during remedial actions that are not specifically addressed by this work plan, the Project Manager with the Utah DEQ/DERR will be contacted by telephone to discuss alternatives with follow-up via email to document the conversation(s). As necessary, an addendum to address the issue(s) of concern would be prepared, submitted, and approved by the Utah DEQ/DERR prior to remobilization.

7.0 ENVIRONMENTAL CONTROLS

Remedial actions would include environmental controls consistent with regulatory requirements to address health and safety, site security, air emissions, and potential discharge of contaminants of concern to Antimony Creek. The field activities associated would take place following Utah DEQ/DERR approval of the work plan and public notification.

7.1 Permits

Any permits required by Garfield County or by the US Forest Service will be obtained prior to initiating field work.

The US Forest Service would be informed roughly 2 to 4 weeks prior to the initiation of field actions so that any notifications and/or restrictions related to travel on Forest Road 138 or use of nearby campgrounds may be issued or implemented.

7.2 Site Control

The Antimony Mill and areas of remedial action are adjacent to Forest Road 138 and ATV trail that are open to vehicular traffic. The areas around the former mill are not fenced or, and the property is securely fenced and locked. The selected construction contractor, in cooperation with the Site Safety Officer (SSO), will be responsible for implementing measures to prohibit access to remedial action areas from unauthorized personnel and securing the site during the remedial activities. Traffic cones and/or barricades would be used, as appropriate, to cordon off areas where equipment and personnel would be performing remedial actions to exclude unauthorized persons from the remedial action area.

7.3 Equipment Decontamination

Vehicles and equipment entering the project area would be decontaminated prior to leaving the site to prevent track-out of impacted material. It is anticipated that excavation equipment will remain within the areas of excavation once mobilized to the subject property. Decontamination areas would be located in areas removed from Antimony Creek and identified in consultation with the excavation contractor and personnel with the Utah DEQ/DERR. The method of decontamination would vary with site conditions at the time of remedial actions. In dry conditions, vehicles would travel across a decontamination pad to remove to the extent possible loose soil prior to leaving the project area. As necessary, vehicles and equipment would be swept or brushed to remove soil and dust. Given the condition of Forest Road 138, excavation work and transportation of impacted material would not take place during rain events or during periods of wet conditions.

7.4 Stormwater

A Storm Water Pollution Prevention Plan (SWPPP) would not be required because the disturbance will be less than one acre. However, Best Management Practices (BMPs) will be implemented. Roughly 100 to 200 feet of stacked wattles would be installed along the southern embankment of Antimony Creek adjacent to areas of metal-impacted shallow to prevent migration of contaminants.

7.5 Fugitive Dust Control

The areas of excavation associated with this remedial action are relatively small and quite isolated. In addition, the shallow depths of excavation are not anticipated to generate significant amount of dust. Given access issues, the use of smaller mechanical equipment and hand-tools is anticipated. Excavation work will be performed so that no visible fugitive dust would cross the boundaries of Claim 38B. Dust control would involve applying volumes of water to excavation, loading, tracking, and transit areas, as necessary; limiting the speed of equipment to less than 10 miles per hour and reducing the drop heights as part of loading activities. Work would be suspended during high wind periods.

7.6 Health and Safety Plan

Impacted material excavating and loading activities will follow a project-specific Health & Safety Plan, included as Appendix C.

8.0 PUBLIC PARTICIPATION

Following approval of the RAP by the Utah DEQ/ERR, a public notice will be published in The Insider newspaper in two consecutive editions. The notice will inform the public of a 30-day period to review the RAP and provide comment to the Utah DEQ/DERR. Comments submitted by the public in writing will be addressed at the conclusion of the 30-day period; and the RAP revised, as necessary, prior to the initiation

of remedial actions. The proposed public notice is included in Appendix D. The RAP would also be provided to the US Forest Service for review and comment; and separate notification of the public regarding public lands in Antimony Canyon near the former Antimony Mill. In addition, the public notice will be posted at the US Post Office in Antimony and the Antimony city offices.

9.0 PROJECT SCHEDULE

Based on approval of the RAP and 30-day period for public comment, we anticipate remedial actions to commence in early Sep-2023 with field activities expected to require roughly five (5) consecutive days. Given recreational use of Antimony Canyon, we anticipate field work to begin on a selected Monday morning with completion by the following Friday afternoon to avoid the anticipated increase associated with weekend recreational use.

10.0 REPORTING

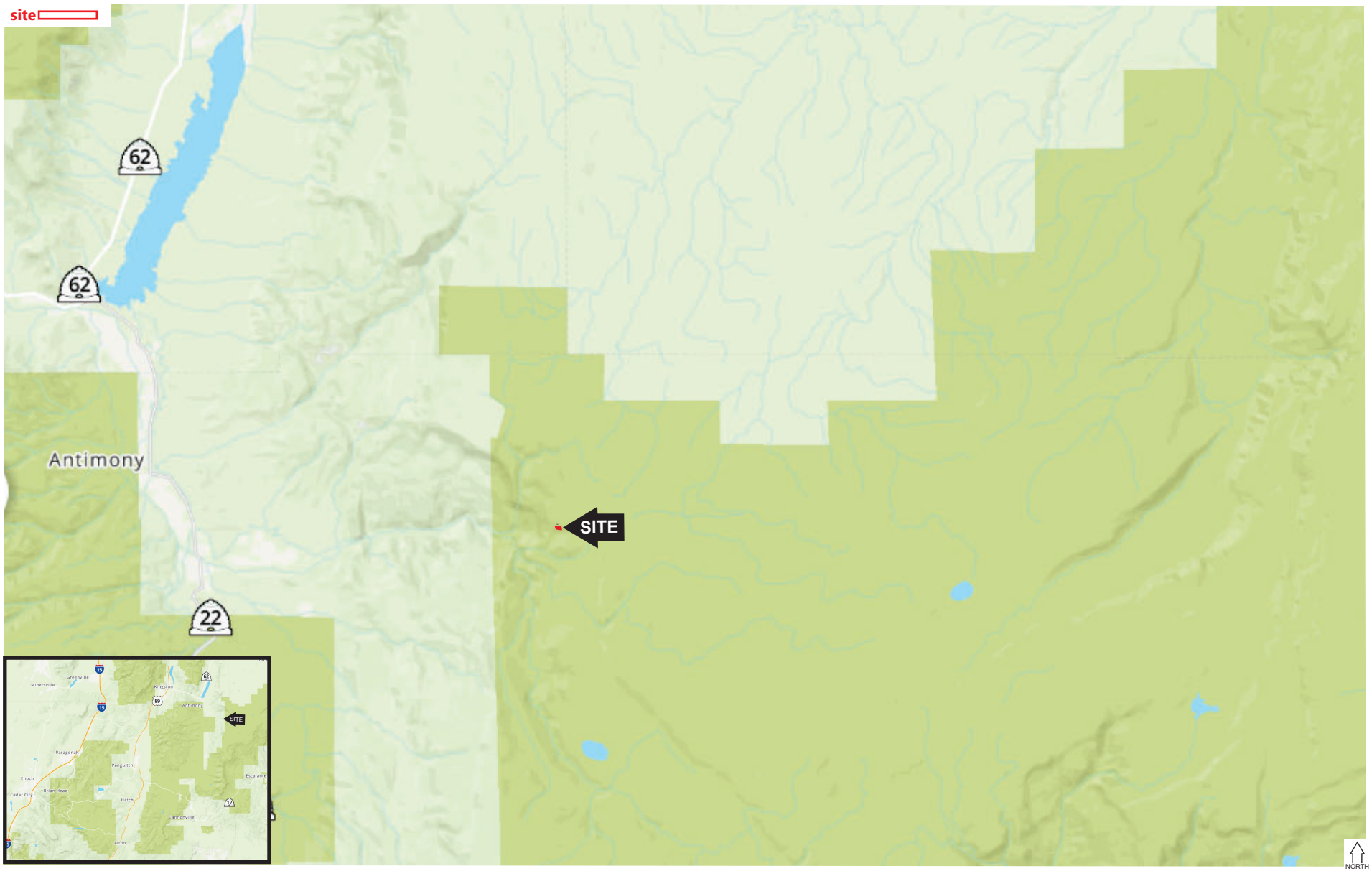
Once field work is completed and confirmation samples analyzed to confirm cleanup of the former mill to site-specific cleanup levels, a report will be prepared and submitted to the Utah DEQ/DERR that describes field activities, depicts areas of excavations, identifies volume/mass of impacted material removed and disposed, and the results of confirmation sampling.

The Remedial Action Report will include:

- Discussion and photographs of remedial actions;
- Review and evaluation of confirmation sampling results, including quality assurance/quality control related to analytical results and field activities; and
- Documentation of transport and disposal at Garfield County Landfill, including a letter of acceptance of the waste material under existing permit.

FIGURE 1

SITE LOCATION



EarthTouch, Inc.
3135 North Fairfield Road
Layton, Utah 84041

FIGURE 1

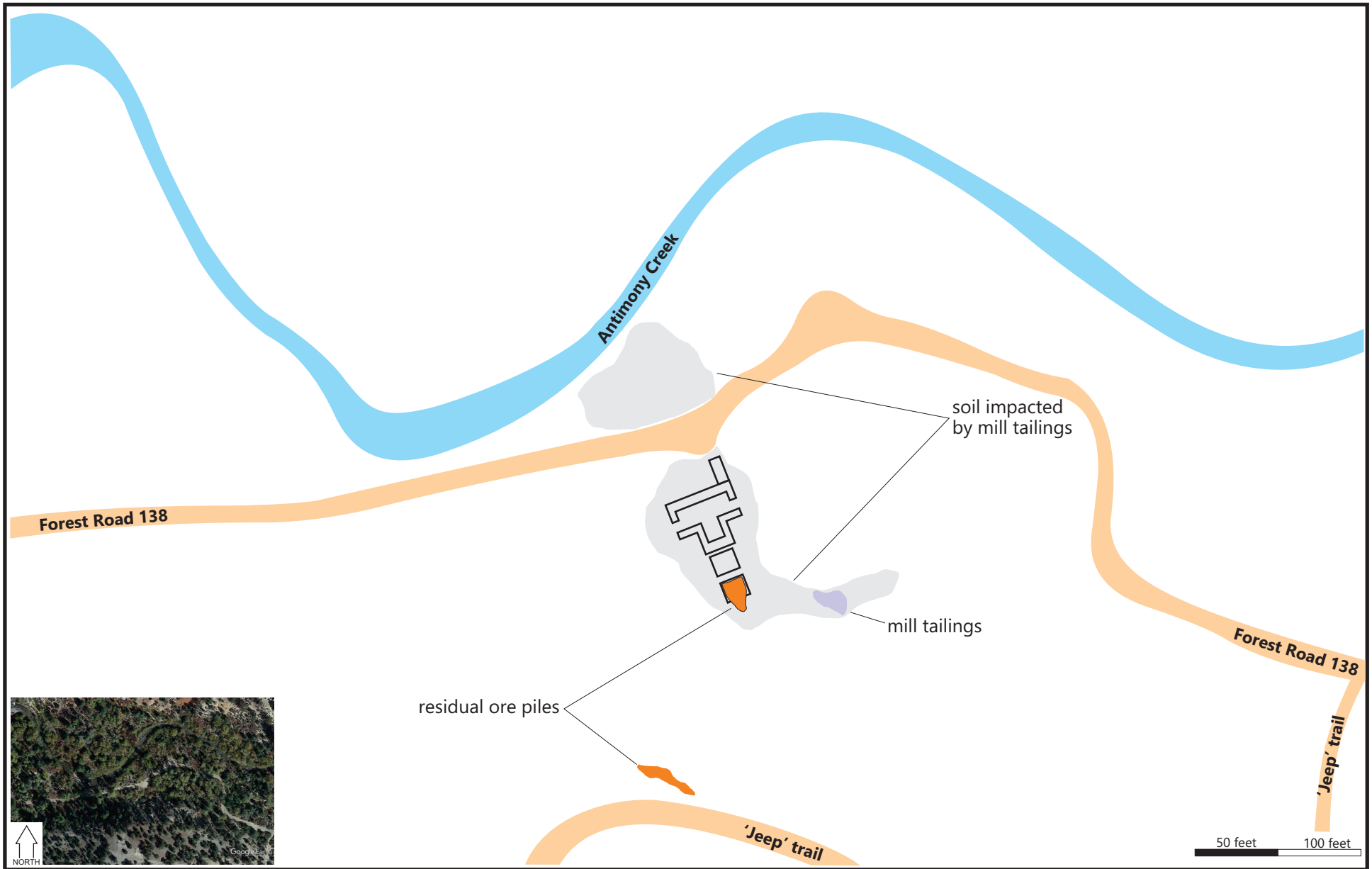
Site Location

Former Antimony Mill
Antimony Canyon 5.5 miles east of Antimony
(Antimony), Garfield County, Utah 84712

Figure:	1
Append:	Ramedial Action Plan
Project:	DVTR-23-0001-03-UT / The Richard William Davis Trust
Analyst:	Brett Cox / Eve Dunn
Source:	MapQuest Antimony / Garfield County, Utah

FIGURE 2

IDENTIFIED AREAS OF IMPACT



earthTouch inc
www.earthtouchinc.com
EarthTouch, Inc.
3135 North Fairfield Road
Layton, Utah 84041

FIGURE 2

Impact Areas

Former Antimony Mill (Claim 38B)
Antimony Canyon Area
(Antimony), Garfield County, Utah 84712

Figure:	2
Append:	Remedial Action Plan
Project:	DVTR-23-0001-03-UT / The Richard William Davis Trust
Analyst:	Brett Cox / Eve Dunn
Source:	Site Characterization Plan EarthTouch, Inc.

APPENDIX A

QUALITY ASSURANCE / QUALITY CONTROL SAMPLE COLLECTION AND ANALYSES

Quality Assurance / Quality Control Procedures

The quality assurance/quality control (QA/QC) procedures described provide a system of safeguards designed to reduce errors and assure that activities described in the Work Plan are of the highest reasonable quality. Although QA/QC is important to each project, it is fundamentally important in the collecting and analyzing soil and groundwater samples to provide the basis for mitigative actions upon which the future use of the subject property depends. The QA/QC procedures to be followed to ensure that field samples would be a valid representation of actual site conditions are summarized in this section. The possible health and safety hazards and the plan to address these concerns are outlined in the Site-specific Health & Safety Plan (SSHP) included in Appendix B.

A.1.0 Field Quality Control Procedures

The Project Manager and Project Geologist will ensure that the Work Plan is followed throughout the subsurface investigation. Boring installation and sample collection will be completed as described in the Work Plan and the Project Geologist will correct any deficiencies observed in the field and will complete tasks as appropriate. The Project Geologist will review the Work Plan, HASP, and related documentation prior to the initiation of field work. Any deficiencies observed in the field will be reported to the Project Manager to ensure that field and analytical data is valid and representative of sampling locations. The Project Geologist will document field activities in a project logbook and will complete field forms as needed while at the site.

A.2.0 Decontamination Procedures

Prior to initiating sample collection, new sampling equipment will be deployed; or existing sampling equipment will be thoroughly cleaned using an Alconox® solution and rinsed with deionized/distilled water or other approved method to ensure no contaminants are present. The following procedures would be followed during field activities to prevent the contamination of samples:

- Non-disposable sampling equipment would be washed in a non-phosphate detergent solution and rinsed with deionized or distilled water and then rinsed and re-rinsed with deionized or distilled water;
- All non-disposable sampling equipment would be moved to the sampling area by personnel wearing clean nitrile gloves and reassembled and immediately used; and
- Rinse water would be captured in 5-gallon containers and transported from the site.

A.3.0 Boring Advancement and Sample Collection

Soil boring and sampling procedures would involve the following.

Preliminary Activities

Proposed hand-auger boring locations are determined through the evaluation of prior assessments and investigations. Field activities will be conducted under a HASP, which addresses the potential health and safety hazards at the subject property. The HASP will also be available at the site during field activities.

Advancement of Borings and Collection of Soil Samples

EarthTouch, Inc. would collect surficial soil samples with stainless-steel trowels or shovels, gloved hands, or disposable plastic spoons; and deeper soil samples with a stainless-steel hand-auger.

The following general guidelines would be followed:

- The site would be inspected, and historical information reviewed to better understand the physical and environmental conditions and potentially impacted media;
- Identify proposed boring location and coordinate with on-site personnel before initiating sampling;
- Inspect each proposed sample location to assure the area is free of subsurface features/structures;
- Sample in areas of anticipated low contaminant concentrations and progress to areas of anticipated higher contamination;
- Complete decontamination of the hand-auger after sample collection prior to mobilizing to a new boring location;
- Restore the boring location to pre-hand-auger condition to the extent practical;
- Record all relevant information in field logbook(s).

Before collecting samples, all reusable, non-disposable sampling equipment would be decontaminated to minimize the potential for cross-contamination. All disposable sample equipment would be inspected before any use to confirm that it is clean and free of potential contaminants. Soil sampling procedures would include the following:

- Unless specifically identified in a proposal or Work Plan, samples for laboratory analysis should be discrete samples;
- Samples must be collected in accordance with the methods specific to the analytical parameters to be analyzed;
- Soil samples must be collected with disposable or decontaminated 'clean' tools;
- Disposable nitrile gloves must be worn during sampling and changed between each sample collection;
- All sample containers should be quickly and adequately sealed with the rims cleaned prior to tightening the lids/caps;
- Sample containers should be appropriately labeled as outlined in Chain-of-Custody procedures;
- Samples must be preserved in a manner consistent with the laboratory parameters to be analyzed and placed within rigid coolers and chilled to 4°C (Celsius) and maintained at this temperature through delivery to the laboratory;
- Sample holding times must conform to the analytical methods; and
- Alternative methods of sampling must be approved by the Project Manager and documented.

Each soil sample will be labeled so that the boring location and sample depth are identified. The boring number and sample depth will be marked on each sample and multiple samples from one boring depth will be labeled as appropriate. The information on the label will be duplicated on the Chain-of-Custody form. When a duplicate sample is collected, the sample will be labeled in the same manner as other samples collected in the field.

After sampling procedures are completed, sampling and boring equipment will be thoroughly cleaned as described above prior to use at other proposed boring locations. The sample locations and soil borings will be backfilled with the removed material.

The soil would be classified using the Unified Soil Classification System (USCS) and descriptions included in the final report. A Soil Boring Log datasheet would be completed in the field, by hand and include; (1) Project Name & Number; (2) Project Location; (3) depth below surface; (4) Sample Interval; (5) Sample Depth & Type; and (6) Soil Description.

Lithological changes would be documented along with the depth to groundwater. The soil descriptions should be precise and comprehensive and include, as relevant, an overall impression of the soil without excessive emphasis on insignificant details.

Excess Soils / Soil Cuttings

Hand-auger cuttings would be returned to boring or sample locations. Disposable field equipment or supplies will be placed in 6-mil trash bags and removed from the site at the conclusion of field activities.

A.4.0 Field Quality Control Samples

The following samples will be collected to evaluate quality assurance:

- A duplicate surface water sample and duplicate soil sample would be collected and submitted to the laboratory for analyses. In addition, samples would be collected for the preparation of Matrix Spike (MS) and Matrix Spike Duplicate (MSD).

A.5.0 Chain-of-Custody

A Chain-of-Custody form accompanies all samples collected by EarthTouch, Inc. that are submitted for laboratory analysis to ensure the integrity of samples and that the appropriate analyses are performed. A Chain-of-Custody form accompanies all samples collected in the field to the designated analytical laboratory; and establishes the documentation necessary to trace sample possession, as well as evidence of collection, shipment, and receipt and analysis by the laboratory.

When samples are collected, the following should be recorded on the Chain-of-Custody:

- Sample location;
- Sample date and time;
- Sample identification number;
- Sample type and media;
- Name of the individual collecting the sample;
- Sample analyses requested;
- Sample preservation type;
- Quality control sample numbers and types;
- Name of individual to whom the samples are relinquished;
- Laboratory service provider in which samples are to be relinquished;
- Shipping Service(s) or method(s) used for sample delivery;
- Date and time of shipment; and
- Shipping waybill or manifest number.

Until such time as samples are transported and ‘relinquished’ to the analytical laboratory, EarthTouch, Inc. personnel would control or otherwise be responsible for custody of the samples. Control (custody) of the samples would be considered as (1) physical possession, (2) in direct view of the individual(s) with physical possession, (3) within a locked/sealed unit controlled by the individual(s) with physical possession, and/or (4) within a secured/restricted area accessible by the individual(s) with physical possession. When

transferring possession of samples, the individual(s) relinquishing custody and receiving custody of the samples will sign and date the Chain-of-Custody form. Samples collected in the field would be hand-delivered by EarthTouch, Inc. personnel to the laboratory or sent to the laboratory via Federal Express with Chain-of-Custody through the transport company. At the time, the samples are 'relinquished' to the laboratory, a copy of the Chain-of-Custody form will be obtained and maintained by EarthTouch, Inc. as physical evidence of 'control' of the samples from the site and used to identify samples from the point of collection through data reporting.

A.6.0 Laboratory Quality Control Procedures

The Project Geologist will ensure that all samples are delivered to the analytical laboratory under chain-of-custody procedures. Soil samples will be delivered to the analytical laboratory the same day. Soil samples collected after normal business hours of the analytical laboratory will be secured at the EarthTouch, Inc. office until delivery can be arranged. However, Chain-of-Custody procedures will be maintained at all times during this process.

The sample analysis will be completed by American West Analytical Laboratories, Inc. (AWAL) and/or ALS Laboratories, which are certified by the Utah Department of Health Services (DHS) through the Environmental Laboratory Certification program. The laboratories will analyze all samples for 'heavy metals' by EPA Methods 6010B and 6020A; and soil samples for total petroleum hydrocarbons (TPH) as diesel range organics (DRO) by EPA Method 8015D, and total recoverable petroleum hydrocarbons (TRPH) by EPA Method 1664A modified.

The guidelines in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," US EPA publication SW-846, other standard US EPA methods, and/or other accepted methods and analytical procedures would be followed to analyze soil and well-point groundwater samples collected from the site. The laboratories for this investigation will have established protocols and quality assurance procedures that meet or exceed applicable EPA guidelines; and will include associated QA/QC procedures as recommended by each method. The analytical methods and quality assurance/quality control (QA/QC) criteria would incorporate the following:

- Internal QC Samples;
- Method Blanks;
- Laboratory Duplicates;
- Laboratory Control Samples;
- Surrogate Spikes;
- Matrix Spike and Matrix Spike Duplicate Samples; and
- Standards Reference Material Samples

Applicable holding times and EPA Methods of analysis will be followed. Calibration tests will be conducted as appropriate to ensure that the analytical results are accurate and valid. Data Quality Indicators are included in Table C. A quality control sample schedule is included as Table C-1. Laboratory established controls for recoveries on matrix spike, matrix spike duplicate, laboratory control samples and laboratory duplicate analyses would be applied. Data quality indicators for matrix spike and laboratory control sample recoveries are summarized in Table C-2. Quality control for the analysis of sample blanks would be for the reported results to be at concentrations less than the applicable Method Detection Limits (MDLs).

All analytical results will be signed and dated by the laboratory. The analytical results will be evaluated, and any anomalies will be identified and discussed with the Project Manager such that a thorough investigation of the validity of the analytical results can be conducted.

Table A
Data Quality Indicators (DQIs)

Parameter	Quality Control Program	Evaluation Criteria	Summary of the QA/QC Goals
Precision	Field Duplicates	Relative Percent Difference (RPD)	RPDs will be less than ±25% (aqueous samples) and a ±50% (solid samples) when detected constrictions are ≥5x the LRL. When detected concentrations are <5x the LRL and the difference between the reported concentrations is less than or equal to the LRL value (for aqueous samples) or less than twice the LRL (for soil/solid samples), the samples will be considered within control.
Bias	Laboratory Control Sample	Percent Recovery	LCS percent recoveries will vary by sample medium, analyte, and methods; and may be either method defaults or laboratory derived
	Matrix Spike (MS) / Matrix Spike Duplicate (MSD)	Percent Recovery RPD	MS/MSD percent recoveries and RPDs will vary by sample medium, analyte, and methods; and may be either method defaults or laboratory derived
Accuracy	Method Blanks	LRLs	Less than the Laboratory Reporting Limits (LRLs)
	Equipment Blanks		Less than the Laboratory Reporting Limits (LRLs)
Representativeness	Standard Operating Procedures (SOPs)	Qualitative determination of SOPs adherence	All samples collected following SOPs
	Holding Times	Holding Times	All samples analyzed within holding times
	Field Equipment Blanks	LRL	Less than LRL
Comparability	Units of Measure	Metric Units	100% of sample results reported in same units
	Analytical Methods	Approved Methods	100% of samples analyzed using approved methods
	Standardized Sampling	Qualitative determination of SOPs adherence	All samples collected following SOPs
	QC Samples		
	10% Field Duplicates	Verify	100% Compliance
	10% Field Blanks	Verify	100% Compliance
	Laboratory QA	Verify	100% Compliance
Completeness	Complete Sampling	Percent Valid Data	90% or more of the planned measurements are valid
Sensitivity	Sample Analyses	LRL	100% of the LRLs are less than Performance Standards

RPD = $\{(X_1 - X_2) / [(X_1 + X_2) / 2]\} \times 100$; where X_1 and X_2 are the reported concentrations of the samples being evaluated
Percent Recovery = $[(X_s - X_i) / sc] \times 100$; where X_s = concentration measured in the spiked samples; X_s =concentrations measured prior to spiking, and *sc* = spike concentration.
Instrument calibration, reference material, standards traceability, and data validation will follow AWALs standard operating procedures.
LRL – Laboratory Reporting Limit
RPD – Relative Percent Difference
SOPs – Standard Operating Procedures

Review of data quality and usability would generally include; review of field data and observations; review of laboratory reports and analytical data, including; results related to trip blanks, laboratory control samples, and laboratory manager comments; and an evaluation of the data in terms of accuracy, precision, and representativeness; and usability of the data. The analytical results from this investigation would also be reviewed with respect to correlation to sample data from previous investigations and evaluated in regard to potential changes in contaminant concentrations of sample media, variations in sample concentrations, and usability of data obtained during previous investigations.

Table A-1
Quality Control Sample Frequency

QA/QC Sample Type	Sample Frequency	Analytical Parameter(s)
Field Duplicates	1 for 10 soil samples collected at the site (or per batch) 1 for 10 surface water samples (or per batch)	Metals
Matrix Spike / Matrix Spike Duplicate	1 added for 10 soil samples collected at the site 1 added set 10 surface water samples collected at the site	Metals
Method Blanks	1 for every 20 samples	Metals
Laboratory Control Samples	1 for every 20 samples	Metals
Laboratory Duplicates	1 for every 20 samples	Metals

Table A-2
Summary of Data Quality Indicators for Matrix Spike and Laboratory Control Recoveries ('Heavy Metals')

Analyte / Parameter	Analytical Method	LCS Low % Rec.	LCS High % Rec.	MS / MSD Low % Rec.	MS / MSD High % Rec.	MS / MSD % RPD.
Antimony	6020B / 6010D	85 / 80	115 / 120	75 / 75	125 / 125	20
Arsenic	6020B / 6010D	85 / 80	115 / 120	75 / 75	125 / 125	20
Aluminum	6020B / 6010D	85 / 80	115 / 120	75 / 75	125 / 125	20
Cadmium	6020B / 6010D	85 / 80	115 / 120	75 / 75	125 / 125	20
Lead	6020B / 6010D	85 / 80	115 / 120	75 / 75	125 / 125	20
Thallium	6020B / 6010D	85 / 80	115 / 120	75 / 75	125 / 125	20

Control limits provided by Pace Laboratories as listed in the laboratory quality assurance manual, which is routinely and continually updated with all MDLs, and the LCS, MS/MSD and RPD control limits for 'heavy metals.' Therefore, the control limits listed above may be different when data are reported by Pace Laboratories.

APPENDIX B

LAND and RESOURCE MANAGEMENT PLAN
for the DIXIE NATIONAL FOREST

https://www.fs.usda.gov/detailfull/dixie/landmanagement/planning/?cid=stelprdb5163370&width=full

APPENDIX C

HEALTH & SAFETY PLAN

PROJECT HEALTH AND SAFETY PLAN FOR EXCAVATION AND REMOVAL OF CONTAMINATED SOIL

FORMER ANTIMONY MILL SITE

Antimony Canyon (Garfield County), Utah

RMEC PJ23E-4634

May 4, 2023

Prepared for:

The Richard William Davis Trust
1483 Springdell Drive
Provo, Utah 84604

DOCUMENT CONTROL

PROJECT HEALTH AND SAFETY PLAN FOR EXCAVATION AND REMOVAL OF CONTAMINATED SOIL

FORMER ANTIMONY MILL, ANTIMONY CANYON, GARFIELD COUNTY, UTAH

PROJECT NUMBER:

PJ23E-4634

PREPARED FOR:

The Richard William Davis Trust
1483 Springdell Drive
Provo, Utah 84604

PREPARED BY:

RMEC Environmental, Inc.
476 West 325 South
Bountiful, Utah 84010

www.rmec.net
e: info@rmec.net
t: (801) 467-3661

AUTHOR(S):

Jamie Russell
Project Manager / Geologist
RMEC Environmental, Inc.

Signature — 5/4/2023 Date

REVIEWER(S):

Daniel Nye, MSPH, CIH
Senior Scientist
RMEC Environmental, Inc.

Signature — 5/4/2023 Date

REVISION HISTORY:

Revision No.	Date Issued	Reason/Comments:
Draft - 01	May 4, 2023	Draft for DERR Review/Comment

TABLE OF CONTENTS

TABLE OF ATTACHMENTS

TABLE OF ACRONYMS

ACGIH	American Conference of Governmental Industrial Hygienists
ANSI	American National Standards Institute
BBP	Blood-borne pathogens
BPWA	Beaver Pond / Wetland Area
CEM	Certified Energy Manager
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CFR	Code of Federal Regulations
CGI	combustible gas indicator
CHMM	Certified Hazardous Materials Manager
CHRIS	Chemical Hazards Response Information System
CIH	Certified Industrial Hygienist
COC	Contaminant of Concern
CPR	Cardio-Pulmonary Resuscitation
CRZ	Contamination Reduction Zone
dBA	decibels measured on the A scale
DERR	UDEQ's Division of Environmental Response and Remediation
DHHS	United States Department of Health and Human Services
DRO	Diesel-Range Organics
DWQ	UDEQ's Division of Water Quality
EPA	United States Environmental Protection Agency
ERCP	Emergency response and contingency plan
EZ	Exclusion Zone
GFCI	ground fault circuit interrupter
GRO	Gasoline-Range Organics
HAZWOPER	Hazardous Waste Operations and Emergency Response
ISL	Utah Initial Screening Level
HASP	Health and Safety Plan
IDLH	Immediately dangerous to life or health
JHA	Job Hazard Analysis
LEL	Lower explosive limit
mg/kg	milligrams per kilogram
mg/m^3	milligrams per cubic meter
$\mu g/m^3$	micrograms per cubic meter
MSDS	Material Safety Data Sheet
MSHA	Mine Safety and Health Administration
NEC	National Electric Code
NFPA	National Fire Protection Association
NIOSH	National Institute for Occupational Safety and Health
NIST	National Institute of Standards and Technology
NTPH	Northern Total Petroleum Hydrocarbon Area
OSHA	Occupational Safety and Health Administration
OVA	organic vapor analyzer
PEL	Permissible exposure level
PID	Photo-Ionization detector
PPE	Personal protective equipment
ppb	parts per billion
ppm	parts per million
RAO	Remedial Action Objectives
RAP	Remedial Action Plan

RMEC	RMEC Environmental, Inc.
RQ	Reportable Quantity
RSL	EPA Regional Screening Levels
SHSO	Site Health and Safety Officer
SLM	sound level meter
SMP	Soil Management Plan
SSSL	Site-Specific Screening Levels
STEL	Short-term exposure limit
SWPPP	Storm Water Pollution Prevention Plan
SZ	Support Zone
TLV	Threshold limit value
TPH	Total Petroleum Hydrocarbons
TWA	Time weighted average
UAC	Utah Administrative Code
UDEQ	Utah Department of Environmental Quality
UPDES	Utah Pollutant Discharge Elimination System
VOC	Volatile organic compound
WBGT	Wet bulb globe thermometer
XRF	X-Ray Fluorescence

WORK SITE PERSONNEL CONTACT NAMES AND NUMBERS

The location of the nearest landline telephone will be the Site Field Office: (____) ____-_____TBD

Below are phone numbers of personnel involved in the Antimony Mill VCP Phase I Remedial Action Plan (RAP) Implementation project.

The cell phone numbers of RMEC construction managers and RAP consultants:

- Jamie Russell (832) 229-6586 Environmental Project Manager, Site Health and Safety Officer (SHSO)
- Daniel Burt (801) 867-3919 Alt. SHSO, Environmental Scientist
- Daryl Hancock (801) 467-3661 (offsite) Principal Scientist, CHMM, CEM
- Daniel Nye (801) 599-3714 (offsite) Certified Industrial Hygienist (CIH)

The cell phone numbers of the Remediation Contractor:

- TBD

The phone numbers of UDEQ DERR/DWQ representatives:

- Bill Rees, DERR (801) 536-4167 (offsite) Environmental Manager, VCP/Brownfields
- Chris Howell, DERR (801) 536-4100 (offsite) Environmental Scientist, VCP/Brownfields

EMERGENCY CONTACT INFORMATION AND HOSPITAL DIRECTIONS

Police Departments

Garfield County Sheriff's Office
375 N. 700 West Panguitch, Utah 84759
911 or (435) 676-2678

Utah Highway Patrol Section 10
Utah 118, 835 E. 300 North Suite 600, Richfield, Utah 84701
911 or (435) 896-2780

Fire Departments

Antimony Fire Department
140 E Center, Antimony, Utah 84712
(435) 624-3306

Kingston Fire Department
44 W 100 S, Kingston, Utah 84743
(435) 577-2270

Panguitch Fire Department
40 N 100 E, Panguitch, Utah 84759
(435) 676-2419

Emergency Services / Ambulance

911 or (435) 676-8811

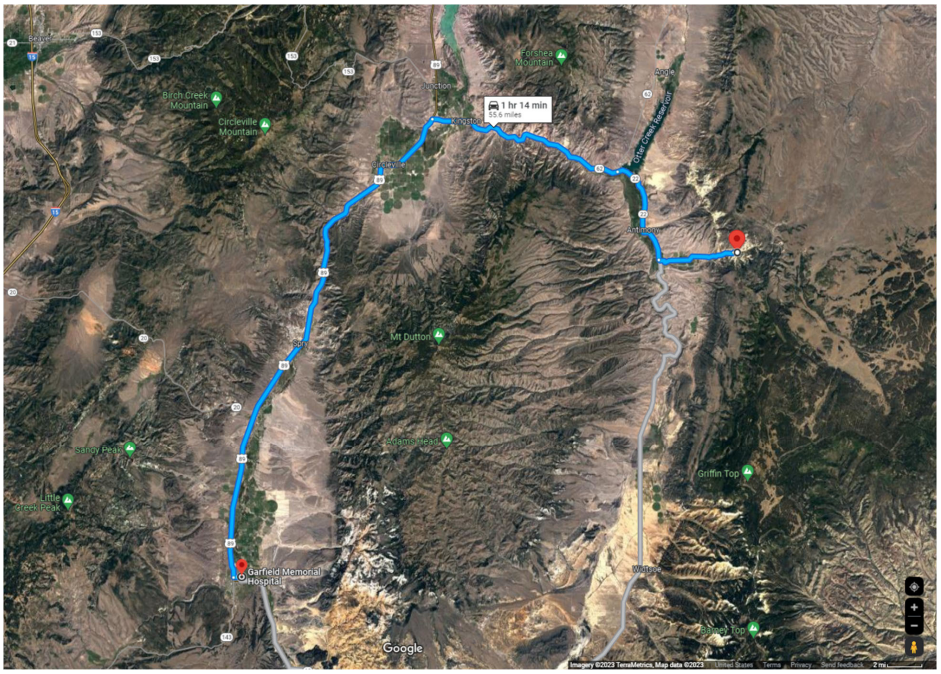
Hospital

Garfield Memorial Hospital
200 N 400 E St, Panguitch, Utah 84759
(435) 676-8811

Directions to Hospital: 1 Hour 14 Minutes (55.5 miles)

Antimony Mill to Garfield Memorial Hospital, via Highway UT-22 / Hwy 22 to Highway US-89

1) Head west on Antimony Canyon Rd/Bench Rd (FR 138) toward Antimony, Utah — 4.9 mi
2) Turn right onto UT-22 N/S Hwy 22, heading northwest — 6.6 mi
3) Continue onto UT-62 — 12.3 mi
4) Turn left onto US-89 S, heading south toward Panguitch, Utah — 31.2 mi
5) Turn left onto E 200 N — 0.5 mi
6) Garfield Memorial Hospital will be on the left – 200 N 400 E St, Panguitch, Utah 84759


1 hr 14 min
55.6 miles
Birch Creek Mountain
Circleville Mountain
Junction
Forshea Mountain
Antimony
Mt Dutton
Sevier
Sandy Peak
Little Creek Peak
Griffin Top
Garfield Memorial Hospital
Widtsoe
Boulder Top
Google

1.0 INTRODUCTION

This Site Health and Safety Plan (HASP) has been prepared by RMEC Environmental, Inc. (RMEC) to describe and summarize the general safety procedures to be implemented to protect contractors and subcontractors while performing field activities conducted at the Former Antimony Mill Site Voluntary Cleanup Program (VCP) Site #C106 (the "Site"), located in Antimony Canyon, Garfield County, Utah.

This HASP has been written for the use of RMEC and its employees. It may also be used as a guidance document by properly trained and experienced RMEC subcontractors and the clients. The client and owner of the property is The Richard William Davis Trust and referred to in this HASP as "The Trust".

It is the intent of RMEC, through corporate commitment, to provide a safe work environment for all on-site employees, on-site subcontractors, vendor personnel, client site representatives, regulatory agency personnel and visitors. The overall purpose of this HASP is to address the potential risks at the Site, define health and safety requirements and procedures to be implemented for the safe operations at the Antimony Mill VCP Site. In addition, this HASP has been developed to fulfill the following objectives:

1. Inform RMEC employees, clients, subcontractors, and visitors on procedures to minimize the potential for injury or exposure to a hazardous condition.
2. Ensure that RMEC employees, clients, subcontractors, and visitors use engineering controls as the preferred method of mitigating hazardous conditions.
3. Provide guidelines for emergency response for known hazards and hazardous situations.
4. Specify actions required to comply with (1) applicable Occupational Safety and Health Administration (OSHA) regulations, (2) and applicable state and local regulations.
5. Provide information necessary for RMEC employees, clients, subcontractors, and visitors to complete the scope of work without further impacting the environment.

The health and safety guidelines in this Plan were prepared specifically for the Antimony Mill VCP Site only; its conditions, purposes, dates and personnel and must be amended if conditions change. This Plan must not be used on any other Site without prior research by trained health and safety specialists. RMEC claims no responsibility for its use by others for purposes unrelated to this project.

This HASP will provide useful information to subcontractors and will assist them in developing their own HASP. Subcontractors should sign this plan (See **Appendix A)** as an acknowledgement of hazard information and notice that they must ensure that the risks posed by work on the Site are addressed. RMEC is readily available to assist subcontractors in identifying and addressing their employees' risks.

1.1 Scope and Application

This HASP has been prepared in accordance with applicable OSHA standards for Hazardous Waste Operations and Emergency Response (HAZWOPER) as outlined in the Code of Federal Regulations (CFR) 29 CFR Section 1910.120, and United States Environmental Protection Agency (EPA) guidance documents. The contractors and subcontractors are required to operate in a manner consistent with National Institute for Occupational Safety and Health (NIOSH) Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities; OSHA regulations, particularly in 29 CFR Section 1910.120 and 29 CFR Section 1926.65; state and local regulations, and other EPA guidance. RMEC recommends adherence to this HASP for all individuals performing work at the Site. This HASP applies to all personnel who wish to gain access to the Site. However, all subcontractors, regulatory agency personnel, and other entities and visitors are responsible for their own health and safety.

This HASP provides guidance that allows the Site Safety and Health Officer (SHSO) to respond to changing conditions and make professional judgments regarding the interpretation of monitoring data and related control measures. The HASP also delineates health and safety responsibilities and assigns those responsibilities to project and office personnel. This document must be read and understood by all Site personnel. The specific requirements of this HASP apply to all employees and their subcontractors involved in implementing the described scope of work. Site personnel are required to sign this HASP on the form provided in **Appendix A** as an acknowledgment of agreement, acceptance, and understanding of the contents. Copies of this HASP shall be maintained on-site by the SHSO.

As needed, addenda containing activity-specific health and safety protocols will be prepared and attached to this Site HASP prior to the initiation of each additional field activity. A copy of the Site HASP along with any addenda containing activity specific health and safety information will be kept in a conspicuous location at all times while work is being conducted at the Site. The Site HASP and activity-specific addenda, as a minimum, should contain the following information:

- Names of key personnel responsible for Site health and safety and appointment of a SHSO.
- A health and safety risk evaluation for each Site task and operation.
- Personal protective equipment (PPE) to be used by employees for each Site task and operations being conducted.
- Medical surveillance requirements.
- Frequency and types of air monitoring, personal monitoring, and environmental sampling techniques and instrumentation to be used. Methods of maintenance and calibration of monitoring and sampling equipment to be used.
- Site control measures.
- Decontamination procedures.
- Site's standard operating procedures.
- An Emergency Response and Contingency Plan (ERCP) that addresses effective Site response to emergencies.

All work will be performed in accordance with the requirements outlined in Utah Administrative Code (UAC) Rule R311-211. Confirmation soil samples will be collected by RMEC as prescribed in UAC R311-201. The remediation contractor (RC) to perform the remedial action work has not been selected at this time.

1.2 Codes and Standards

All employees, contractors, subcontractors, vendors and visitors shall comply with applicable portions of the following codes, regulations, and standards for health and safety when performing work at the Site:

- Public Law 91-596, Occupational Safety and Health Act of 1970, Section 5(a)(1), “General Duty Clause”
- 10 CFR Section 834 and 10 CFR 835, Occupational Radiation Protection
- 29 CFR Section 1904, Recording and Reporting Occupational Injuries and Illnesses
- 29 CFR Section 1910, General Industry Safety and Health Standards
- 29 CFR Section 1926, Construction Industry Safety and Health Standards
- 40 CFR Section 50, EPA Regulations on National Primary and Secondary Ambient Air Quality Standards
- 40 CFR Section 300, Superfund Emergency Planning and Community Right to Know, Subchapter J

- 49 CFR, Department of Transportation
- National Consensus Standards (incorporated by reference in 29 CFR Section 1910.120 and 29 CFR Section 1926.65 in particular), American National Standards Institute (ANSI) Standards, National Electric Code (NEC), and National Fire Protection Association (NFPA) Codes
- Threshold Limit Values (TLV) for Chemical Substances and Physical Agents, Biological Exposure Indices, American Conference of Governmental Industrial Hygienists (ACGIH)
- NIOSH, Recommendations for Occupational Safety and Health Standards
- NIOSH, OSHA, US Coast Guard, US EPA Occupational Safety and Health Guidance Manual for Hazardous Waste Activities

1.3 Implementation and Modification

The SHSO is responsible for the implementation of this HASP and will perform daily inspections (on workdays) of the Site, dependent upon field activities. Information noted in the inspection will be logged in the SHSO logbook and will include the area of deficiency, type of deficiency, corrective action to be taken or which has been taken, and the responsible party for the corrective action. If any operation, practice, or equipment does not pass inspection, the affected operation will cease or the faulty equipment will be repaired. Unacceptable practices and/or faulty equipment will be remedied immediately, and the HASP will be modified to correct deficiencies. In addition to daily inspections, the SHSO will perform weekly inspections of all work areas. Documentation of the weekly inspections will be maintained in the Site field office and submitted to the client representative upon request.

This HASP will be updated by RMEC as necessary to correct deficiencies, reflect changes in work scope, actual working conditions, or regulations. These modifications will be communicated to all on-site personnel, clients, contractors, and visitors.

1.4 Approval of the Site Health and Safety Plan

Plan Prepared/Revised By:

Jamie Russell	*Project Manager*
(Name)	(Title)
	May 4, 2023
(Signature)	(Date)

Plan Approved By:

Daniel Nye, MSPH, CIH	*Senior Scientist*
(Name)	(Title)
	May 4, 2023
(Signature)	(Date)

2.0 SITE WORK PLAN

2.1 Site Description

The Antimony Mill was constructed along the southern edge of a roughly 5-acre patented mine claim (Claim 38B) in an area roughly 100 feet to the south of Antimony Creek and immediately to the south of Forest Road 138 approximately 5.5 miles to the east of the town of Antimony in the Northeast Quarter (NE¼), Section 21, Township 31 South, Range 1 West, Salt Lake Base & Meridian (SLB&M). The site and Claim 38B are generally surrounded by land administered by the Dixie National Forest along the eastern edge of the Escalante Ranger District at roughly Latitude: 38º05'55.2" / Longitude: 111º53'57.4". The location of the site is depicted in Figure 1.

The former mill is constructed on a river terrace about 100 feet to the south of Antimony Creek adjacent to the south side of Forest Road 138. Residual structural elements include three geometric-shaped, rock-and-masonry foundations extending about 4o to 45 feet above the grade of the road to the top of the adjacent terrace along with some rock and concrete foundations, dimensional lumber/wood beams, and dilapidated roofing. Some wood beams and dimensional lumber remain atop the upper foundational elements with some wood beams strewn across the adjacent hillside. The uppermost wood beams and roofing are generally at-grade with the top of the terrace. Some perimeter-spread concrete foundations abut the northeastern corner of the lower rock-and-masonry foundation next to Forest Road 138 that includes embedded metal attachment bolts, presumably to attached skid-mount equipment in the past. Surrounding the foundation are mill tailings with some visual evidence of mill tailings extending across the surface in areas to the north of Forest Road 138 toward Antimony Creek.

An ore pile is located immediately south of the upper wood-beam elements of the former mill and roughly 75 feet to the south of the mill in an area adjacent to an off-road vehicle trail. Some mill tailings are also located on the upper wood-beam roof elements of the former mill. Remaining areas of the 5-acre claim consist of undeveloped bottomlands along Antimony Creek with cottonwoods, birch, and other broad-leaved deciduous trees and riparian undergrowth and pinyon-juniper wooded shrubland with sagebrush, rabbitbrush, mountain mahogany, prickly pear, and clump grasses along terraces and alluvial areas at the bases of mesas and buttes, piedmonts, rock lands, and cliff areas of Antimony Canyon with higher density pinyon stands at higher elevations.

2.2 Objectives and Scope of Work

Given the nature and extent of contamination and future recreational use of areas adjacent to the former mill, the remedial action objectives include:

- Remediate the oil piles, mill tailings, and impacted soils with concentrations of contaminants of concern above site-specific cleanup levels to reduce the potential health risks associated with inhalation, ingestion, and direct contact to levels acceptable for recreational use;
- Reduce the potential for migration and deposition of contaminants of concern at concentrations above site-specific cleanup levels into Antimony Creek; and
- Eliminate the need for constructing a repository on land to be administered by the US Forest Service to remove requirements that may be associated with long-term operating and monitoring.

Commented [JR1]: Should this be ore piles?

The scope of work activities described in this Remedial Action Plan (RAP) include:

- Excavating two ore piles, mill tailings adjacent to the former mill, and shallow soils in downslope areas of the former mill; and transporting and disposing at an appropriately permitted facility;
- Taking active steps to monitor the excavating, handling, and transporting activities for compliance with relevant regulatory requirements; and
- Implementing measures to be protective of human health and the environment through applying mitigation measures for airborne dust and fugitive emissions associated with excavating, loading, and transporting activities.

The excavations shall continue until tests demonstrate a level of concentration below the approved screening levels as detailed in the RAP.

3.0 PROJECT ORGANIZATION AND PERSONNEL REQUIREMENTS

This section outlines the health and safety responsibilities of key RMEC personnel on the Antimony Mill VCP Site.

3.1 Organization and Safety Responsibilities

To meet its health and safety objectives for this project, RMEC has developed an organizational system of personnel with health and safety responsibilities. This information is presented below.

Project Manager: Jamie Russell

- Verify that site personnel have read and signed the master copy of this document.
- Perform duties as Emergency Response Team (ERT) Leader.
- Coordinate with the SHSO on accident investigations, as necessary.
- Communicate frequently with the SHSO, workers, and RMEC Certified Industrial Hygienist (CIH) to ensure that implementation of this HASP is active and effective.
- Responsible for the overall health and safety program for field operations.

Onsite Coordinator: Danny Burt

- Acquaint field personnel with potential hazards and procedures to minimize the negative impact of those hazards.
- Notify personnel of proper personal protective equipment (PPE), adequate time, budget, and training for personnel to perform site work in a safe manner.
- Arrange for preparation of the HASP.
- Investigate and report to the SHSO and CIH each work-related illness or injury, near miss, vehicular accident, and property damage incident.

Site Safety and Health Officers: Jamie Russell

- Verify that the guidelines, rules, and procedures in this document are followed for all RMEC site activities.
- Check that RMEC personnel meet OSHA requirements regarding training, medical examinations, and fit testing. Be familiar with local emergency services.
- Conduct a tailgate health and safety meeting before work commences and daily thereafter.
- Conduct additional meetings that may be required for specific job tasks or site activities.
- Maintain and inspect PPE and monitoring equipment, monitor onsite hazards, and monitor the physical condition of site personnel.
- Perform daily inspections of work site activities.
- Maintain health and safety files, which will include training rosters, medical certifications, tailgate meeting notes and rosters, inspection reports, and other health and safety documentation, as applicable.
- Shut down operations that pose a potential threat to site personnel.
- Perform routine air monitoring and/or safety oversight.

Visitors: Owner Representatives, UDEQ-DERR, Others To Be Determined

Follow the direction of the Site Supervisor or the SHSO. Read and understand the requirements of this HASP and sign the appropriate acknowledgment forms. Do not enter the work zone unless the appropriate OSHA-required training and medical monitoring has been obtained and documented and that documentation has been provided to the SHSO. Use PPE as specified by the manufacturer and this HASP.

3.2 Responsibilities of SHSO

Prior to the initiating of field activities at the Site, the personnel responsible for the health and safety of workers conducting intrusive field activities on the Site will be designated as the SHSO. Alternate personnel (Alternate-SHSO) may be designated in the event that the assigned personnel are not available. The SHSO and Alternate SHSO are responsible for the following:

- Maintain copies of this HASP on-site.
- Maintaining a list of addresses and telephone numbers of emergency assistance units (ambulance service, police, and hospitals) and will inform other members of the field team of the existence and location of this list.
- Establishing appropriate health and safety procedures, and familiarizing personnel with health and safety protocols.
- Maintaining that field personnel wear appropriate PPE.
- Modifying health and safety protocols or terminating fieldwork when unsafe work conditions exist. The SHSOs will have enforcement responsibilities, including the authority to **STOP WORK**. The SHSOs have the authority to halt work or dismiss people from the Site if they do not adhere to this HASP.
- Observing field activities for compliance with this HASP and applicable addenda, and documenting that the designated procedures are implemented in the field and that all on-site personnel are familiar with its contents.
- Recording data from direct reading instruments and evaluating potential hazards.
- Make professional judgments regarding interpretation of monitoring data and control measures.
- Monitoring decontamination procedures and evaluating their effectiveness.
- Maintaining the on-site medical surveillance, if required, and emergency medical treatment programs, and assisting in on-site emergencies.
- Recording the occurrence of any Site injury or illness and notifying the applicable managers.
- If unsafe conditions, illness or injury are encountered, or if the level of protection needs to be changed, the SHSOs will consult with the Project Manager, Daryl Hancock, in a timely manner.

3.3 SHSO Personnel

The SHSO will ensure that all personnel entering the Site during Site investigation activities shall have received, read, and signed a copy of this HASP. Subcontractors entering the Site or other Site visitors will be required to provide their own HASP. Subcontractor and visitor HASPs must be approved by the RMEC SHSO. As an alternative, subcontractors or Site visitors may adopt the provisions of this HASP by obtaining and signing a copy of this plan. By signing a copy of the HASP, subcontractors and visitors agree to implement the requirements of the plan. Subcontractors and visitors will remain solely responsible for providing their employees with the necessary training, medical monitoring and personal protective equipment necessary for their activities while on the Site. The Personnel Acknowledgement of HASP (**Appendix A**) is the document that visitors and subcontractors will sign.

3.4 Training and Certification Requirements

All RMEC personnel performing field activities on the Site, including the SHSO and the Alternate SHSO, shall have received forty (40) hours of classroom training as specified in the OSHA HAZWOPER Standard 29 CFR Section 1910.120, and to have undergone and be current with the required annual 8-hour refresher training prior to beginning work. Current copies of the HAZWOPER certificates for all RMEC personnel will be kept on-site appended to this HASP and may be produced on demand.

4.0 TRAINING AND MEDICAL MONITORING

This section includes the required training for all personnel who are exposed to hazardous substances or health hazards determined by personnel exposure sampling or who meet the provisions of OSHA HAZWOPER Standard 29 CFR Section 1910.120.

4.1 General Training and Certification Requirements

All contractor and subcontractor personnel performing excavation activities on the Site shall also have received forty (40) hours of classroom training as specified in the OSHA HAZWOPER Standard 29 CFR Section 1910.120, and to have undergone and be current with the required annual 8-hour refresher training prior to beginning work.

Current copies of the HAZWOPER certificates for each on-site contractor will be kept on-site, and may be produced on demand. Contractors and visitors not entering impacted areas do not need to have the 40-hour HAZWOPER training or certificate, but will need to be escorted by the SHSO or other personnel with the certification.

4.2 Required Initial and Refresher Training

Specific training requirements for personnel (including subcontractors) conducting field activities are divided into the following training categories:

- Type A – Regular Site Personnel Exposed to Hazardous Substances
- Type B – Regular Site Personnel Potentially Exposed to Hazardous Substances Below Permissible Exposure Limits or the Occasional Site Personnel Potentially Exposed to Hazardous Substances Below Permissible Exposure Limits
- Type C – Management and Supervisory Training
- Type D – Site Manger and SHSO
- Type E – Non-hazardous Waste Site Worker Who Works Only in Areas Yielding No Exposure to Mining or Milling Wastes or Hazardous Waste Materials

4.2.1 Type A – Regular Site Personnel Exposed to Hazardous Substances

Site personnel whose job responsibilities cause them to be exposed to, or to have the potential to be exposed to, hazardous substances or health hazards while working on the contaminated properties are required to comply with 29 CFR Section 1910.120(e)(3)(i) or applicable state regulations. This regulation requires Site personnel exposed to hazardous substances to complete forty (40) hours of offsite instruction and three (3) days of field experience supervised by a trained supervisor or equivalent. The project CIH will determine on a case-by case basis if any Site workers require this level of training. This decision will be made on the basis of review of previous and current exposure monitoring in these work areas and as well as historical Site background information.

4.2.2 Type B1 - Regular Site Personnel Potentially Exposed to Hazardous Substances Below Permissible Exposure Limits

Regular Site personnel whose job responsibilities cause them to be potentially exposed to hazardous substances below permissible exposure limits (PELs) or health hazards are required to comply with 29 CFR Section 1910.120(e)(3)(iii) or applicable state regulations. This regulation requires that these personnel receive a minimum of twenty-four (24) hours of off-Site instruction and one day of field

experience supervised by a trained supervisor, or equivalent. The project SHSO or designated representative must ensure that these personnel will not be exposed above PELs. The project CIH will determine on a case-by case basis if any Site workers require this level of training. This decision will be made on the basis of review of previous exposure monitoring in these work areas and possibly historical Site background information. All 24-hour training courses and field training will be documented in the employee's on-site file in **Appendix B** and maintained in the RMEC office trailer.

4.2.3 Type B2 - Occasional Site Personnel Potentially Exposed to Hazardous Substances Below Permissible Exposure Limits

Occasional Site personnel who visit the Site for a specific limited task and whose exposure is determined by the SHSO to be under PELs are required to comply with 29 CFR Section 1910.120(e)(3)(ii) or applicable state regulations. This regulation requires that these personnel receive a minimum of 24 hours of offsite instruction and one day of field experience supervised by a trained supervisor.

In accordance with 29 CFR Section 1910.120(e)(3)(iv), occasional Site personnel having completed an initial 24-hour classroom instruction must complete an additional sixteen (16) hours of classroom instruction and two days of field experience supervised by a trained supervisor before they are qualified to engage in activities that may expose them to hazardous substances above PELs.

4.2.4 Type C – Management and Supervisory Training

In accordance with 29 CFR Section 1910.120(e)(4), individuals who manage or supervise personnel engaged in hazardous waste operations at the Site must receive 40 hours of classroom instruction and three days of field experience supervised by a trained supervisor. In addition, management and supervisory personnel shall receive an additional eight (8) hours of specialized training that addresses the safety and health program, training requirements, personal protective and respiratory equipment program, health hazard monitoring procedures, accident investigation, and emergency response procedures.

4.2.5 Type D – Site Manager and SHSO

In accordance with 29 CFR Section 1910.120(e)(4), individuals who act in the capacity as a SHSO and manage or supervise personnel engaged in hazardous waste operations at the Site must receive 40 hours of classroom instruction and 3 days of field experience supervised by a trained supervisor. In addition, management and supervisory personnel shall receive an additional 8 hours of specialized training that addresses the safety and health program, training requirements, personal protective and respiratory equipment program, health hazard monitoring procedures, accident investigation, and emergency response procedures. In addition, the SHSO must receive a level of training that allows him/her to be qualified to implement and monitor compliance with the HASP, the Fugitive Dust Control Plan, and the Site Security Plan.

4.2.6 Type E – Non-hazardous Waste Site Worker Who Works Only in Areas Yielding No Exposure to Mining or Milling Wastes or Hazardous Waste Materials

Workers who work only in areas where they are not exposed to mine waste materials, such as flag persons off-Site or administrative staff. These persons will receive a minimum of the orientation of the Site hazards as well as instruction of where exclusion zones exist and not to enter.

4.2.7 Refresher Training

Annual refresher 8-hour training in accordance with 29 CFR Section 1910.120(e)(8) shall be completed at least annually following the completion of the individual's 40-hour or 24-hour training course.

4.2.8 Documentation

Training certifications for employees and visitors are filed on-site for reference by the SHSO or designated representative. The Site Manager is responsible for verifying that employee training documentation is complete and current before the employee begins work. Specific-subject training certificates, such as hazard communication training, respirator training, PPE training, and hearing conservation training.

4.2.9 Exempt Personnel

Exempt personnel requesting access to the Site include personnel making deliveries or performing repairs to utilities, public or government officials, untrained visitors, or local residents. Individuals from these groups will not be required to comply with the training requirements. However, access will be limited to designated work, delivery, or observation areas on-site to minimize potential exposure. Observation areas on-site will be upwind from Site operations, as decided on the basis of predominant wind directions in order to avoid exposure to dust or chemical contaminants. Access to observation areas may be restricted by weather conditions or Site activities. The SHSO will handle approvals for exempting personnel on a case-by-case basis.

4.3 First Aid/CPR Training

Prior to performing work at the Site, a number of RMEC and contractor personnel will be trained in First Aid and cardio-pulmonary resuscitation (CPR). Training will be provided for an adequate number of personnel so that at least one trained individual is on-site during each work-shift.

4.4 Site-Specific Training

All personnel working at the Site will have Site-specific training, which will be provided by RMEC. This training will require approximately one hour and includes hazard communication training in accordance with 29 CFR Section 1910.1200 and 29 CFR Section 1926.59. In addition, this training will include emergency contingency planning and protection training.

4.5 Specialized Training

Prior to allowing employees to perform certain types of specialized work, RMEC will also provide to its employees and subcontractors the following training:

- Hazardous Material Emergency Response Training
- Hazardous Materials Driver Training
- Hazardous Communication Training (whenever new chemicals are brought on-site)
- Heavy Equipment or Specialized Equipment Training
- Hearing Conservation Training
- Respiratory Protection Training
- Chemical Specific Training

Documentation of each employee's specialized training will be maintained with this HASP onsite.

4.6 Site Safety Meetings

4.6.1 Pre-Work Site Safety Orientation Training Meeting

A pre-work Site safety orientation/training meeting will be convened prior to the beginning of the first day of work activities at the Site. The meeting will be attended by all Site personnel involved in carrying out the project. The RMEC SHSO or Alternate SHSO will preside over the Site safety orientation/training meeting. The orientation meeting agenda will include the following minimum activities:

- Review the HASP with the attendees.
- Review scheduled activities and associated and specific hazards for the day with the attendees.
- Review the any hazards that may arise from the weather.
- Review the use of PPE and health and safety supplies.
- Review the daily weather forecast and any hazards from the weather.
- Review communication procedures and reporting.
- Collect the attendees' signatures acknowledging receipt and understanding of the Site and HASP, and their agreement to comply with the plan (**Personnel Acknowledgement of HASP, Appendix A**).

4.6.2 Tailgate Site Safety Meetings

Tailgate Site Safety Meetings will also be held and will be attended by all Site personnel involved in carrying out the project. The RMEC Site Manager, SHSO, or Alternate SHSO will preside over the daily Site Safety Meetings. Where procedural deficiencies are identified, additional safety meetings will be conducted to address the situation. All tailgate safety meetings will be documented on the appropriate forms (**Appendix B**) and records will be maintained in RMEC's on-site field office. A tailgate Site safety meeting shall be conducted:

1. At least daily prior to the beginning of each day's work activities;
2. Whenever risks or hazards are thought to change and require additional training;
3. When there are modifications to the HASP applicable to the field personnel; and
4. When new additional personnel or subcontractors arrive to begin new intrusive field work.

The following should be addressed during the Tailgate Site Safety Meetings:

- Safety share of near miss or safety incident to keep in mind.
- Review of planned activities for the day.
- Review the work accomplished and changes from previous day's activities.
- Review the daily weather forecast and any hazards that may arise from the weather.
- Distribute any HASP modifications, if necessary.
- Review the known or suspected hazards that may be encountered.
- Review heavy equipment safety and maintenance.
- Review the PPE required for the day's activities.
- Review the communications procedures and reporting.
- Review the buddy system and Emergency procedures.
- Review Heat/Cold stress, as applicable.

Subcontractors and other Site visitors during active remediation activities shall meet with the RMEC SHSO prior to entering the Site. The RMEC SHSO shall make the determination as to what level of training, based on tasks to be performed, that subcontractors and Site visitors shall require.

4.7 Medical Monitoring

It is unlikely that respiratory protection will be required; however, all personnel performing work that requires a respirator must be medically qualified to do so. Subcontractors and Site visitors may also be required to have such qualification, depending on the activities they will perform on the Site. The RMEC SHSO shall make the determination as to the medical monitoring requirements for subcontractors and Site visitors.

RMEC's field employees working on hazardous waste sites more than thirty (30) days per year will receive a baseline and annual comprehensive medical evaluation to qualify for hazardous waste Site assignments and to monitor work-related illness or contamination. Personnel working on hazardous waste sites less than 30 days per year will receive a baseline and periodic exams (less frequently than annually). Site personnel will also receive exit medical examinations at the termination of their employment with RMEC. Additionally, any employee who suffers an illness or injury that imposes a medical restriction on his or her job duties must have a physician's release statement indicating that he or she is fit for duty before the SHSO will permit that employee to return to full duty.

RMEC is not responsible for subcontractor medical monitoring; however, subcontractors are expected to monitor their employees according to OSHA standards. RMEC is not responsible for providing medical monitoring for other parties visiting the Site. However, RMEC will review certifications to assess whether the monitoring is up to date. Copies of the documentation will be kept readily available on-site.

A physician who is board-certified or board-eligible in occupational medicine will perform medical examinations. Each employee will be evaluated to assess his or her ability to wear required PPE for Site work and his or her overall health. The SHSO will supply the physician with the employee's duty description, contaminants of concern, anticipated exposure levels, PPE to be used, and any applicable information from previous medical examinations. The medical exam will include at a minimum, the following items:

- Medical history
- General medical exam
- Blood chemistry screening profile
- Complete blood count
- Urinalysis
- Serum cholinesterase
- Methemoglobin
- Fitness to wear a respirator (for select individuals)
- Radiological bioassays (If determined necessary by initial radiological survey)
- Chest x-ray (at discretion of physician)
- Update of vaccination (at discretion of physician)
- Stress test (at discretion of physician)

5.0 SITE HAZARD IDENTIFICATION AND JOB HAZARD ANALYSIS

Listed below are known potential hazards that could be found at the Site, first summarized and then explained in more detail.

5.1 Site Hazard Identification

The potential hazards that could be encountered during soil and waste rock removal operations at the Site can be classified as either physical, chemical, or biological hazards and include the following:

❖ **Physical Hazards associated with:**

- Use of motor vehicles to and from the Site and on the Site with uneven terrain;
- Use of heavy mechanical equipment such as excavators, bulldozers, loaders, compactors, and haul trucks;
- Use of electrical equipment;
- Encountering overhead or underground utilities;
- Manual labor activities;
- Slips, trips, and falls;
- Exposure to dust;
- Exposure to noise;
- Exposure to the weather, including sun exposure, storms, and heat or cold stress;
- Excavations, trenches, falls, collapse of sidewalls, entrapment;
- Water seepage into and accumulation in low-lying areas or excavations; and
- Confined space entry is not anticipated at the Site.

❖ **Chemical Hazards associated with:**

- Exposure to heavy metals including: antimony, arsenic, and thallium in contaminated soils;
- Exposure to dust that may contain silica or the above heavy metals; and
- Decontamination activities, such as use of chemical detergents, and dispersal of contaminants to the air during decontamination.

❖ **Biological Hazards associated with:**

- Exposure to blood-borne pathogens (BBPs) from administering first aid treatment;
- Exposure to BBPs transmitted by vectors like mosquitos or ticks, or the bite of a larger animal;
- Encounters with venomous snakes, spiders, scorpions, and stinging insects;
- Encounters with large local mammals, such as cougars, coyotes, bears, deer, and moose;
- Contact with large plants that can injure with thorns and branches, cause trips or falls, or hide the presence of potentially dangerous animals;
- Exposure to poisonous plants and their oils; and
- Exposure to molds and fungus and their spores that live on plants or in soil.

5.2 Job Hazard Analysis – Physical Hazards

5.2.1 Use of Motor Vehicles

Field personnel should be cognizant of potential physical hazards associated with use of motor vehicles during field operations. Use of motor vehicles to and from the Site on public roadways can involve personnel in traffic-related accidents. Use of motor vehicles, particularly ones with a high center of gravity, on-site in steep terrain may lead to roll-overs. The passage of vehicles may kick up toxic dust and mud that may be inhaled or ingested.

5.2.2 Use of Heavy Equipment

Field personnel should be cognizant of potential physical hazards associated with use of heavy mechanical equipment during field operations. Heavy machinery will be on-site during soil excavation, trenching, grading, and other construction activities; particular care will be maintained to avoid accidents. Heavy equipment includes excavators, bulldozers, loaders, compactors, and haul trucks. The hazard is increased if personal protective gear that reduces mobility is required. Many opportunities for accidents exist while working near heavy machinery. In general, workers will be aware of the danger of:

- Falling or swinging objects suspended from winches or cables.
- Potential impact by moving equipment if the operator cannot see you.
- Hardware breaking and flying free, especially while the machinery is operating near its limit.
- Contacting overhead electrical lines with the machinery.
- Rupturing hydraulic or pneumatic hoses.
- Entangling PPE with moving machinery.
- Slips, trips, and falls on machinery.
- Noise exposure.

Each machine presents different specific hazards, which will be discussed in the daily Site Safety Meeting prior to initiating work, and/or if a new machine or method will be used at the Site. The on-site subcontractor supervisor is responsible for ensuring that the machine and work area are ready for safe work conditions. He/she is responsible for ensuring that safe working procedures are followed.

5.2.3 Use of Electrical Equipment

Electrical equipment, if improperly set up or damaged, may release electrical energy, causing damage to other equipment or electrical shock or burns to personnel.

5.2.4 Encountering Underground and Overhead Utilities

Encountering overhead or underground utilities may cause a release of electrical energy, or pressurized water or gas. A review will be made of any available property maps, red line, or as-built to identify potential buried utilities before intrusive activities. Required procedures for identifications, control and avoidance of both underground and overhead utilities are found in 29 CFR Section 1910.180 and 29 CFR Section 1910.333.

Overhead lines, if any, will be avoided and if not, then a spotter shall be designated to observe operations at all times in that area to prevent accidental contact. Any overhead wire shall be considered an energized

line unless the person owning that line, or the electrical utility authorities, indicate that it is not an energized line or it has been locked and tagged out and visibly grounded.

Utility-locating personnel shall also be used to identify, mark, and de-energize buried utilities prior to starting intrusive activities. If additional concerns remain regarding the location of buried utilities, the SHSO shall be contacted for guidance. Given the historical background and undeveloped land, it is unlikely that there will be any pre-existing utilities on-site.

5.2.5 Manual Labor Activities

Physical hazards associated with manual labor activities may include, but not be limited to: strained backs and muscles, pinched or crushed hands and feet.

5.2.6 Slips, Trips, and Falls

Physical hazards include falling and tripping. Site conditions will be changing daily and field personnel shall evaluate specific areas of concern each morning. Field personnel shall become familiar with the specific hazards associated with each work area. Hazards causing slips, trips, and falls may be a result of debris, uneven terrain, sampling at elevated locations, and poor lighting. Field personnel will remain alert to surrounding conditions. Upon arrival at the Site, personnel will inspect the area for tripping or other hazards. These hazards will either be removed from the immediate area or marked to prevent injury. Physical hazards associated with excavator use specifically may include, but not be limited to: falls into excavations or pits or entrapment caused by insufficient grading and soil collapse onto personnel.

5.2.7 Exposure to Dust

Exposure to dust that may contain silica or the above listed heavy metals and petroleum hydrocarbons.

5.2.8 Exposure to Noise

Excessive noise is typically encountered while working with heavy machinery, such as backhoes, bulldozers, drilling rigs, and compactors. The effects of working in the vicinity of noise include:

- Workers being startled, annoyed, or distracted.
- Physical damage to the ear, pain, and temporary and/or permanent hearing loss.
- Communication interference that may increase potential hazards due to the inability to warn of danger and the proper safety precautions to be taken.

5.2.9 Exposure to Weather

Natural phenomena—including excessive heat or cold, rain, snow, ice, tornadoes, and lightning—can affect work activities and increase risk. At the daily Site Safety meeting, weather issues that could affect workers will be addressed. If personnel are working in the sediment excavation areas in the canyons, particular attention will be paid to periods of large amounts of rainfall. During these periods, stream excavation will cease and efforts will be taken to prevent flooding.

Supplementary lighting will be provided if/when field operations continue past dusk. The lighting will be adequate so that the entire work area will be illuminated to an intensity of five (5) foot-candles.

- Exposure to the weather, including sun exposure, storms, and heat or cold stress;
- Excavations, trenches, collapse of sidewalls, entrapment, falls;

- Water seepage into and accumulation in low-lying areas or excavations;

5.2.10 Heat Stress

Working in temperatures exceeding 85 degrees Fahrenheit in construction-related activities presents a potential for heat stress and heat-related illnesses. All employees will be alert to the symptoms of heat stress.

The signs and symptoms of heat exhaustion include extreme fatigue, cramps, dizziness, headache, nausea, profuse sweating, and pale, clammy skin.

Health effects that are related to exposure to hot environments are more common than exposure to cold environments. These effects are increased for personnel wearing protective clothing. Commonly recognized forms of heat disorders are heat cramps, heat exhaustion, and heat stroke.

- Heat cramps are painful spasms of muscles following hard physical work in a hot environment. Cramps usually occur after heavy sweating, and often begin at the end of a work shift.
- Heat exhaustion symptoms include profuse sweating, rapid pulse rate, dizziness, and nausea. The person's skin is cool and clammy, and may be pale. Heat exhaustion victims have a normal or below normal body temperature.
- A heat stroke victim will have increased body temperature. The signs and symptoms of heat stroke includes decreased or no sweating, dry, bright red flushed skin, or a bluish face or conjunctiva, tremors leading to convulsions, delirium, struggling, bright red chest area, hot skin, headache, and vertigo. Heat stroke victims are in need of immediate medical care. Heat stroke is a life-threatening condition. Collapse, unconsciousness, coma, and death may follow if untreated.

The medical emergency response procedures for a victim who may have developed heat stress are described in **Section 10.0. - Emergency Response and Contingency Plan**.

5.2.11 Cold Stress

Hypothermia results from the body losing more heat than it can generate. The hands and feet are affected first due to the body constricting blood flow in the extremities to conserve heat. The first symptom of hypothermia is shivering, if the body continues to lose heat the victim will have difficulty with speech, forgetfulness, and loss of dexterity, collapse, and death. Frostbite occurs on the extremities of cold exposure victims and is indicated by white spots on the exposed skin. During cold weather personnel must minimize the exposure of bare skin and layer clothing to establish warm air layers in between clothing.

When temperatures are expected to be in the 40s or lower, especially during high winds, the potential cold stress will need to be considered. Cold stress presents as several different syndromes: mild hypothermia, profound hypothermia, frostbite, and chilblains.

The signs and symptoms of hypothermia include shivering, poor coordination, slowed pace, irritability, slurred speech, fatigue, and poor judgment. More severe hypothermia can result in stupor, collapse, and eventually death.

The signs and symptoms of frostbite include stiffness and numbness in body parts (i.e., nose, ears, toes, fingers, etc.) and a noticeable greyish or whitish skin color.

The medical emergency response procedures for a victim who may have developed cold stress are described in **Section 10.0. - Emergency Response and Contingency Plan**.

5.2.12 Confined Space Entry

Confined space entry is not anticipated at the Site. The contractor is responsible for any written Confined Space Entry procedures(s) arising from field activities. RMEC personnel will NOT enter a permit-required confined space for any purpose.

5.3 Job Hazard Analysis – Chemical Hazards

Available data for the Site indicates that potential chemical hazards may be present in topsoil, subsurface soils, and mine waste rock on-site. Exposure to heavy metals is possible, including antimony, arsenic, and thallium. These metals have all been detected in soil samples taken from the Site. Exposure to petroleum hydrocarbons as diesel fuel and potential residual product is also possible during excavation of topsoil and subsurface soils and removal of groundwater in the NTPH area. Diesel fuel has been detected in soil and groundwater samples taken from the Site in the NTPH area.

Field personnel could potentially be exposed by direct contact with COCs in soil through inhalation of dusts containing COCs or ingestion of particulate matter containing COCs, or through inhalation of organic chemical vapor from the detected concentrations of diesel fuel product. The risk of exposure via inhalation or ingestion is likely greater than skin contact. Also, soil and rock typically contain silica, which could be inhaled and eventually cause silicosis of the lungs. Restriction of eating, drinking, or smoking to certain times and places will be enforced at the Site.

Additionally, there may be hazardous chemicals released during decontamination activities, whether part of chemical detergents, or through dispersal of contaminants to the air during washing.

A description of the health effects caused by the heavy metals and diesel fuel and exposure limits can be found in this HASP in **Section 7.0 - Toxicology and Exposure Guidelines for On-Site Chemicals**. Monitoring for the presence of these materials, such as through air monitoring and X-Ray Fluorescence (XRF) soil screening, will be performed when necessary and is described in **Section 9.0 - Environmental Monitoring**.

5.4 Job Hazard Analysis – Biological Hazards

Field personnel are usually exposed to biological hazards on-site by direct contact, such as skin contact with toxic plants, being stung or bitten by a venomous creature, or becoming infected by a BBP after a mosquito or tick bite. Field personnel could also potentially be exposed to biological hazards on-site by inhalation of mold or plant spores or poisonous plant oils dispersed in the wind by fire or disturbance of dry brush.

5.4.1 Exposure to Blood-borne Pathogens

Risks of exposure to BBPs are associated with: medical emergencies requiring CPR; the first aid stabilizing of a victim bleeding or with an open wound; or cleanup of blood, body fluids or tissues, or broken or sharp objects that might be contaminated with bodily fluids. Infectious fluids include: blood cerebrospinal, synovial, pleural, peritoneal, pericardial, reproductive fluids, and any other body fluid that contains visible blood. The OSHA Bloodborne Pathogens Standard is covered under 29 CFR Section 1910.1030.

BBPs can also be transmitted by vectors like mosquitos or ticks. Mosquitos in Utah are known to carry West Nile virus. Ticks in Utah are known to carry Lyme Disease, Rocky Mountain Spotted Fever, or

Colorado Tick Fever, and are most active in Utah from March to mid-July. Standing water in ponds on-site can become breeding grounds for mosquitos.

5.4.2 Animal Bites and Infectious Disease; Rabies

Infectious diseases can be transmitted by the bite of an infected mammal. The source of the infection usually comes from the oral flora of the animal's mouth. It can also be from the feces of the animal, soil, or the natural flora of the skin of the victim. Cat bites are usually puncture wounds. The long, slender teeth can cause deeper wounds which are at more of a risk for osteomyelitis and septic arthritis. Dog and cat scratches can introduce infection as well. Signs of infection from a cat bite usually occur 12 hours after the bite. Signs of infection from dog bites usually occur 24 hours after the bite.

Signs of infection from an animal bite include fever and chills, reddening of the skin (erythema), swelling, tenderness, purulent drainage, foul odor, enlarged and tender lymph nodes (lymphangitis), general ill feeling (malaise), headache, loss of appetite, muscle aches, red streaks from the infected area to the armpit or groin (may be faint or obvious), and throbbing pain along the affected area. Inflamed, warm, tender joints when a bite is close to a joint are concerning for septic arthritis.

Pasteurella multocida infection can occur after dog or cat bites. These infections develop rapidly and can start showing signs of infection such as erythema, edema and tenderness 12-24 hours after a bite.

Capnocytophaga canimorsus can cause a systemic illness after a dog bite. Systemic signs such as fevers, petechial rash, maculopapular rash, cellulitis, hypotension, and sepsis will be seen in these patients.

Cat scratch disease is a syndrome characterized by regional lymphadenopathy that is painful. There can also be low-grade fever, malaise, fatigue, headache, nausea, and anorexia.

Rat-bite fever can occur after a bite from rats, mice, squirrels, or gerbils. It can also occur through exposure to rat feces or urine. Symptoms start 3-7 days after exposure and include rigors, fever, petechial or purpuric rash.

Human bites can also transmit infection, and are frequently related to aggression. Clenched fist injury are the most prevalent human bites. They can be severe due to the close proximity of teeth to the metacarpophalangeal (MCP) joints. With extension of the hand, bacteria can be inoculated into the joints. Clenched fist injury (sustained during fist fights) presents with small wounds around the MCP joints and will have erythema, purulent drainage and tenderness. On physical exam for clenched fist injury or any animal bite that is close to a MCP joint, the wound should be examined on both extension and flexion of the joint to ensure the tendon sheath has not been compromised.

Rabies

Encounters with mammalian wildlife can expose you to rabies. In the United States most rabies cases are transmitted from bats or non-domesticated animals instead of domestic animals. Prodrome symptoms include fever, malaise, anorexia, vomiting, paresthesia, pruritis, or pain. Encephalopathic (brain swelling) symptoms such as hallucinations, bizarre behavior, agitation, and hydrophobia can also occur. Paralysis followed by coma and death are likely.

Because the virus that causes the disease is present in animal saliva, a bite or even a lick from an infected animal can be serious. Infected animals may not show the symptoms of rabies such as frothing at the mouth. They may act aggressive or out of character, such as a nocturnal animal being active during the day.

Avoiding animals is the best prevention for rabies, but if you are bitten, scratched, or licked by a wild animal, wash the area with soap and water immediately. If it is possible and safe to do so, try to trap the animal for testing. Seek medical treatment right away. If you are in frequent contact with wild animals, there are vaccines available to prevent rabies.

5.4.3 Ticks

Ticks are tiny creatures with one apparent body segment, eight legs and large, protruding mouthparts used for sucking blood from an unsuspecting host. Ticks are not insects, but are closely related to spiders and mites. A tick's life cycle can take months to years to complete, depending on environmental conditions and the availability of food. If a tick cannot find food, it will retreat to the leaf litter and remain dormant until conditions are favorable. Ticks are hardy and can last months to years without feeding. They go dormant when it is hot and dry.

Adult ticks more commonly feed on large mammals, including humans. Ticks will grab hold of passing mammals, typically to the legs, from tall grass and latch on. They will take several hours to find a comfortable place before biting and drinking a blood meal. Finding and removing the ticks before they bite is key to avoiding contracting BBPs. Ticks are known carriers of Lyme Disease, Rocky Mountain Spotted Fever, and Colorado Tick Fever.

In Utah

Adult ticks are most likely encountered between March and early-to-mid-July, but are worst during the rainy season. Spring in Utah brings rain to the mountain ranges. Moisture from spring rains and snowmelt creates perfect living conditions for ticks. Walking in the canyons during spring to early summer could result in bites from ticks.

In Utah, the American Dog Tick and Rocky Mountain Wood Tick are most often encountered. They lay their eggs on the ground, and the young ticks seek to feed on small mammals.

There are very few confirmed cases of Lyme disease in Utah. Additionally, ticks in the Rocky Mountain Region have not been shown to carry this disease. Western ticks can carry other diseases, such as Colorado Tick Fever and Rocky Mountain Spotted Fever. If you are bitten by a disease-carrying tick, expect to experience symptoms in about seven days. If a tick has fed on you, it is best to consult a doctor for treatment. Some diseases are bacterial and treatable, while some are non-treatable viruses.

5.4.4 Venomous Snakes

Utah is home to 31 species of snakes. Of these, only seven are venomous. The seven Utah venomous snakes are members of the Viper family and are commonly called pit vipers because of the heat sensory pit located on each side of the snake's head between their nostrils and eyes. The venomous snakes have broad, triangular-shaped heads, and vertical eye pupils.

The seven venomous snake species in Utah are all are various types of rattlesnakes, so if a snake doesn't have a rattle, it is non-venomous to humans. The other 24 non-venomous species of snakes have longer snouts, round pupils, tails that taper to a point, and are harmless, reclusive, nocturnal, and seldom-seen.

The only rattlesnake along the Wasatch Front is the Great Basin rattlesnake. They are small (3 to 4 feet long), shy and benign in both temperament and toxicity. They are reluctant to strike but, like any animal,

they will defend themselves if they feel threatened. Staying on trails and away from rocky or brushy areas will reduce your chances of meeting rattlesnakes.

The seven venomous snake species in Utah are: the sidewinder, the speckled rattlesnake, the Mojave rattlesnake, the western rattlesnake, the Hopi rattlesnake, the midget-faded rattlesnake, and the Great Basin rattlesnake.

If you can't tell if the snake is venomous from a distance, leave it alone and treat it as if it were venomous. Any snake may respond aggressively if agitated. If you encounter a snake outside of human development, leave it alone. Never try to poke, handle, corner or harass a snake. Most snake bites occur when people are trying to handle or kill the snake. Snakes hide well on open trails and in dense grasses. Be aware of your surroundings. Look carefully where you place your feet, and before you sit down on the ground, on rocks, or on logs. Wear closed-toed shoes while hiking. Snakes hibernate during the winter under rocks and in burrows. In the summer they are most active at dawn and dusk. If you hear a rattle, don't jump or panic. Try to locate where the sound is coming from before trying to move. Warn others if they are around. If bitten, treat it as if it were a venomous snakebite. Do not use a tourniquet or cold compress. Do not suck out the venom. Keep the victim calm, remove restrictive clothing and jewelry near the bite, and keep the affected area below the level of the heart. Treat for shock if necessary and get medical attention immediately.

If a snake must be moved out of an area, you may be able to encourage it to leave by aiming a garden hose spray at the snake. For venomous snakes, keep at a safe distance of at least 15 feet away while hosing the snake. Continue to hose until the snake has moved off your property. If the snake will not retreat, stop and call a professional to remove the snake. Snakes may enter buildings in search of shelter or food. Exclude snakes from buildings by closing off all possible entrances.

If you do not know if the snake is venomous, act as if it were and do not attempt to trap and move the snake yourself. In the case of venomous snakes, this should be done only by trained personnel from reputable wildlife removal companies or personnel from the Utah Division of Wildlife Resources or USDA Wildlife Services. DO NOT TRY TO MOVE THE SNAKE YOURSELF.

5.4.5 Spiders, Scorpions, and Stinging Insects

Spiders, scorpions, and stinging insects like bees and wasps can be found throughout various geographic regions, and are especially dangerous to workers who have allergies to the animal. Bees, spiders, and snakes can bite or sting and deliver painful to life-threatening venom.

5.4.6 Wildlife Encounters

Workers in field assignments and/or remote locations sometimes encounter bears, cougars, coyotes, deer, moose, or raccoons while on the job. Some animals are large enough to seriously injure or kill a human if cornered, threatened, protecting young, or infected by disease. To stay safe in the event of a wildlife encounter, understand animal behavior and learn how to respond appropriately.

Wild animals generally avoid human contact, but if you do see an animal in the wild, maintain your distance. Don't attempt to feed, catch or pet a wild animal. Never approach wildlife babies or animal mothers with their babies; the mother's protective response can be very fierce. Report injured or aggressive animals to authorities; don't attempt to give aid to injured wildlife. If an injured animal approaches you, move slowly away. For safety, keep your distance and keep your cool when encountering wild animals. As a last means of defense against aggressive animals, pepper spray can be used. To be effective, it must be sprayed directly

into the animal's face. However, a breeze could blow the spray away or into your own face. If you do decide to use pepper spray, get training to use it properly and safely.

Bears and coyotes try to avoid people, but if you do see one, make as much noise as possible. Do not corner a bear or coyote. If they feel trapped, it may act aggressively. To avoid attracting hungry animals don't carry food products, don't keep food near you, and don't leave food in your opened vehicle.

Sightings of cougars, or mountain lions, are rare, but they have been known to attack humans. If you do encounter a cougar, don't run. Stay calm and hold your position or back away slowly. Convince the animal that you're not prey and that you might be dangerous. Face the cougar and try to appear as large as possible by standing upright and raising your arms. If the cougar acts aggressively, wave your arms and shout. Grab a stick or throw objects at the cougar. If you are attacked, fight back.

Normally, deer are not a threat to humans. Avoid them and do not feed them. When driving, watch for deer crossing signs. Adjust your speed according to the distance you can see up the road. If you see one deer cross the road, wait for others because they often travel together. If you cannot avoid a deer or other animal on the road, it's better to hit it rather than risk skidding off of the road and into a ditch or swerving into another vehicle or tree.

5.4.7 Plant Life

Much of the Site is overgrown with tall grasses, shrubs, and trees that can injure people with thorns and branches, cause trips or falls, or hide the presence of potentially dangerous animals like snakes, bees, and ticks. Exposure to poisonous plants can cause allergic reactions if their oils come in contact with skin. These plants can also be dangerous if burned and their toxins are inhaled, or are dried up and are blown by the wind. Poisonous flora native to Utah includes poison ivy, poison oak, stinging nettle, and oleander.

5.4.8 Molds and Fungus

Exposure to molds and fungus can cause allergic reactions, or in extreme cases, respiratory infections, if their spores are inhaled. Spores can become airborne by high winds, earthquake, passage of a vehicle, or disturbance/excavation of plant life or soil.

5.5 Community Hazard Analysis

Generally, particulate and insignificant vapor emissions are generated during remedial projects of this nature. Activities conducted at the Site will follow the *Fugitive Dust Control* requirements as presented in *Section 7.5* in the approved RAP. Onsite worker exposure to chemicals at concentrations of concern is not expected to occur. Potential exposures to the surrounding community will likely be much less than potential on-site worker exposure, and is therefore also not expected to be of concern, given adherence to dust control measures and the distance to the nearest community structures.

6.0 SITE HAZARD CONTROL MEASURES

This section discusses specific site hazard mitigation, and provides information regarding control methods for potential hazards that might be encountered during field activities. The potential hazards associated with Site operations include physical, chemical, and biological. The probability of encountering these potential hazards and the risk to worker health and safety during operations is dependent on a number of factors. These factors include, but are not limited to: the type of work being performed by personnel, location, time of year, and the equipment used to perform work. This section both general hazards and Site-specific appropriate control measures are discussed. The following bulleted lists indicates the various guidelines to protect workers from hazards during work performed at the Site.

Any change in field procedures must be authorized by the SHSO prior to implementation.

6.1 General Site Safety Worker Protection Guidelines

The following personal hygiene and work conduct guidelines are intended to prevent injuries and adverse health effects. These practices establish general precautionary measures for reducing the risks associated with potentially hazardous work in the area of impacts. All employees, subcontractors, and visitors at the Antimony Mill VCP Site will be required to comply with the following RMEC rules:

- Remember - safety starts with you.
- All personnel must abide by all safety rules and procedures as described in this HASP.
- Report to work rested, physically and mentally fit to perform the job assignment.
- Working while under the influence of intoxicants, narcotics, or controlled substances is strictly prohibited.
- Report all prescription drug use to the SHSO.
- Wear suitable clothing for the weather and the work. Cut-off pants, tank tops, looped earrings or looped or loose body piercing accessories are not allowed.
- Perform all work in minimum of: work boots, safety glasses, sleeved shirt, pants, and hardhat.
- Wear PPE and follow established procedures for a particular job. Do not wear jewelry or loose-fitting clothing when operating or near equipment.
- Work clothing and PPE appropriate for Site conditions will be supplied for all Site personnel.
- Immediately discontinue any operation that could lead to injury, illness, or property damage.
- Call the Site Manager's or SHSO's attention to any behavior or condition that may cause injury or illness to others or damage to property.
- Promptly report near-miss incidents to the Site Manager or SHSO.
- Horseplay, rowdiness, or dangerous jokes are not allowed on the Site.
- Fighting is not allowed on the Site.
- Possession of a firearm on-site is not allowed.
- Do not take shortcuts through any hazardous areas including pinch point locations, excavations, under booms or under suspended loads.
- Promptly report to the Site Manager or SHSO any occupational injury, illness, or exposure to toxic material. If injured, get first aid. Small injuries can become serious if neglected.
- Promptly inform the Site Manager or SHSO whenever new substances, processes, procedures, or equipment that could present new safety and health hazards are brought into work areas or onto projects.
- Work upwind of any field activity.

- Be alert to abnormal behavior of other personnel that may indicate distress, disorientation, or other ill effects.
- Verify that vehicles have an ABC-rated fire extinguisher, first-aid kit, and 32 ounces of eyewash fluid.
- Site activities shall take place during daylight hours only. A minimum of two personnel shall be present at the Site at all times.
- All personnel are required to be familiar with Site access controls, security rules, and emergency procedures.

6.2 Project Hazard Analyses

This section provides information regarding potential hazards that might be encountered during field activities and control methods for those hazards. Both general hazards and Site-specific hazards as well at appropriate control measures are discussed.

6.3 Job Hazard Analysis – Physical Hazards

6.3.1 Work Controls

RMEC will implement work controls designed to maximize worker safety and health and protect the environment. RMEC will execute all work using the following sequence of priorities:

- Identify and use engineering controls as the method of choice for controlling releases of contaminants, minimizing worker exposure and mitigating safety hazards.
- Identify and enforce administrative controls when engineering controls are not feasible.
- Identify and use appropriate PPE to protect workers only when engineering and/or administrative controls are not feasible or ineffective.
- Always use an appropriate level of PPE. Lesser levels can result in unnecessary exposure; excessive levels of safety equipment can impair efficiency and increase the potential for accidents to occur.
- Personnel shall watch for equipment movement, miscellaneous debris, or other physical hazards that may be encountered. If obvious physical hazards are encountered, personnel should inform the SHSO of these hazards. The SHSO shall have these hazards abated immediately.
- Access to the Site will be strictly controlled to authorized workers and visitors.

6.3.2 Permit Programs

The following permit programs will be implemented as necessary. Permits will be kept in the work area, readily accessible to workers, and posted as practical. All personnel working in an area controlled by a permit will be required to read the permit and sign an access log stating that the person understands the permit and the controls it implements. Permits will be prepared by the SHSO and approved by the Site Manager. In general, permits will contain the following information:

- Work locations
- Contaminants of concern
- Safety hazards present
- Monitoring or sampling information
- Engineering or administrative controls
- Training requirements

- Special instructions required to mitigate health and safety concerns

6.3.3 Hazard Communication

A Hazard Communication Program meeting the requirements of 29 CFR Section 1910.1200 or 29 CFR Section 1926.59 will be implemented and maintained on-site. Elements included in the written plan are:

- Delineation of responsibilities for program implementation
- Maintenance of a list of hazardous chemicals used on-site
- Maintenance of material safety data sheets (MSDS) for each chemical
- Proper labeling of containers and pipes
- Non-routine tasks involving chemicals
- Employee training and documentation

Onsite personnel will establish prearranged hand signals or other means of emergency communication if wearing respiratory equipment (equipment seriously impairs speech communications), and when heavy equipment is in use (heavy equipment noise affects ability to hear).

6.3.4 Use of Motor Vehicles

- All Site workers who operate passenger vehicles, including pickup trucks, shall possess a valid driver's license, proof of insurance, and current vehicle registration. Seat belts shall be worn at all times and posted speed limits shall be observed.
- Operate a vehicle only if you are a licensed driver. Seatbelts must be worn when operating a company vehicle or when driving a private vehicle on company business.
- Drive vehicles in a safe manner and obey traffic regulations.
- Use caution while driving in congested areas. Watch for traffic on city streets. Obey all traffic laws.

6.3.5 Excavation Safety

All excavations and trenching will be completed in accordance with 29 CFR Section 1926, Subpart P– Trenching and Excavation. RMEC will implement the following procedures for trenching and excavation, at a minimum:

- RMEC will manage trenches having a depth greater than four (4) feet in accordance with confined space policies.
- Excavations will be engineered using shoring, sloping or benching to prevent cave-in.
- Good housekeeping will be maintained and all open excavations will be clearly marked with barrier tape or fencing.
- Trenches will be identified through flagging or other means such as a temporary berm to prevent personnel, equipment and traffic from falling in.
- Personnel will be provided with a means of entry and exit in accordance with the standard
- Spoils, other materials, and equipment shall be located at least 2 feet from the side of the excavation.

In addition to the above-listed requirements, a competent person (one knowledgeable in soil conditions and trenching and excavation safety) will be designated to ensure that work around trenches and excavations are completed in accordance with applicable OSHA regulations and best management practices. The

competent person will inspect trenches and excavations daily and will have the responsibility and authority to stop work if a dangerous condition exists.

6.3.6 Exclusion Zone (EZ) Procedures

- Do not eat, smoke and/or chew tobacco, apply facial cosmetics, or chew gum in the EZ or the CRZ. Smoking shall only be allowed in designated areas within the SZ.
- Do not allow visitors without adequate safety training into the EZ or the CRZ.
- Enter and exit the EZ or CRZ through appropriate access points only.
- Report all unauthorized access to the EZ of CRZ to the Site Manager and the security guard.
- Do not work alone inside the EZ. Use the "buddy system" defined in OSHA 29 CFR Section 1910.120 during all work activities.
- Enter the EZ only while in proper PPE and with a "buddy." The buddy system will also be in effect at any work zone where respirators are being worn.
- Ensure that a stand-by person is added to the buddy system if PPE is upgraded to Level B (supplied air). The stand-by person shall not enter the EZ unless an emergency calls for such action. The stand-by person must have first-aid training and act as the emergency response person.
- While in the EZ, avoid contact with objects or soil unless the contact is necessary to the field operation.

6.3.7 Fire Prevention and Protection

To prevent the occurrence of unwanted fires, the following requirements must be implemented:

- 29 CFR Section 1926, Subpart F–Fire Protection.
- Fire extinguishers rated at not less than 10 ABC will be located within fifty (50) feet of flammable or combustible liquids in excess of five (5) gallons, or in excess of five (5) pounds of flammable gas.
- Fire extinguishers will be installed in all trailers and buildings.
- Fire extinguishers will be inspected and maintained on a monthly schedule.
- Flammable and combustible liquid and gas storage, and dispensing areas, will be posted with "No Smoking or Open Flame" signs.
- Means of egress in all trailers and buildings will be maintained free of obstructions.
- Fuel storage areas will be maintained free of weeds and other fuel sources.
- Housekeeping will be maintained daily to prevent the accumulation of fuel sources.

6.3.8 Storage and Use of Flammable and Combustible Liquids

Flammable and combustible liquid storage requirements for this project include the following:

- Only approved safety containers shall be used for handling and storage.
- Flammable storage cans shall not be stored in direct sunlight.
- Exits, aisleways, and other means of egress shall not be used for storage.
- All non-bulk materials shall be stored in a flammable cabinet. Stored quantities will not exceed sixty (60) gallons per cabinet. No more than three cabinets will be placed in a single area. Cabinets will not be placed within ten (10) feet of exits.
- A five (5) -foot clear area shall separate outdoor portable tanks.

- A twelve (12) -foot wide access will be maintained for fire equipment to reach outdoor storage areas.
- Outdoor storage areas will be maintained free of weeds, debris, and other fuel sources.
- Outdoor storage tanks will have adequate venting capacity.

Dispensing of flammable and combustible liquids will comply with the following:

- Refueling areas will be located at least twenty-five (25) feet from other operations.
- Spill containment, collection, and clean-up materials will be provided in refueling areas.
- Transfer containers will be electrically bonded together.
- All sparks producing equipment in the immediate vicinity of flammable liquid dispensing operations will be shut down. Adequate cool-down time for generators, pumps, and other portable equipment will be provided prior to refueling.
- Pressure buildup in portable fuel cans will be relieved away from hot surfaces and spark producing equipment.
- Dispensing nozzles will have an automatic shut-off and no "latch open" devices.
- Disconnect switches for refueling equipment will be located away from refueling operations.
- Smoking and spark producing equipment or tools are prohibited in the fueling area.
- A fire extinguisher rated no less than 20 pounds, type ABC, will be securely placed between 25 and 75 feet of each refueling operation.
- All product and rinse water handling and removal will be with a vacuum truck designed for flammable liquid transfers or other explosion-proof and/or air-driven pumping systems.
- Any spills of fuel, sludge, or rinse water will be promptly cleaned up and placed on poly liner. Any spill will be immediately reported to the UDEQ as described in the Emergency Response Plan.

6.3.9 Use of Heavy Equipment

Because heavy equipment may present a diverse number of hazards, the following practices will be observed:

- On-Site equipment shall meet the requirements of all relevant OSHA standards.
- Operator qualifications to use equipment will be verified and documented before initiating work. Equipment operators shall have the experience, skills and knowledge to safely operate the equipment to be used. RMEC will assess whether the operators have appropriate skills and training by: obtaining copies of relevant licenses, evaluating experience relative to job tasks, and evaluate skills by observation.
- All mechanical and transportation equipment will be inspected daily by the SHSO or Site Manager upon arrival to the Site for the presence and proper operation of safety devices. All deficiencies will be corrected before use. Minimum inspection will include: seat belts, back-up alarms, rollover protection, brakes, hydraulic and other fluid systems, equipment controls, and any inspection items recommended by the manufacturer. All equipment brought on-site will have the appropriate safety devices required by the manufacturer.
- Only trained and qualified equipment operators will operate heavy equipment.
- Operators will make daily inspections on all heavy equipment at the beginning of each shift to ensure that parts, accessories, and equipment are in safe operating condition and free of apparent damage. The inspection shall include as a minimum, basic equipment and motor vehicle components and systems such as service brakes, parking brakes, emergency brakes, horn, steering mechanisms, operating controls, windshields, windows, mirrors, tires, lights, seat belts, head lamps,

brake lights, rollover protection, backup alarms, and evidence of fluid leaks. Deficiencies shall be documented and corrected prior to use. Copies of inspections shall be maintained on-site. Vehicles must be taken out of service if they don't pass inspection.

- Personnel working around heavy equipment will be taught during Site-specific training about hand-signals, pinch-points, overhead booms, traffic considerations and the appropriate methods to approach a piece of heavy equipment.
- Establish communication with heavy equipment operators before moving in front of a piece of equipment.
- Parked equipment must have the emergency brake set and the attachments down.
- Obtain safety training before operating heavy equipment, such as cranes, front-end loaders, and backhoes.
- Stay clear of overhead loads; do not stand under suspended loads.
- Be aware of contact/pinch points on all heavy equipment.
- Operate a forklift only if you are a trained operator.
- All personnel shall listen for warning signals on construction equipment and shall yield to equipment.
- All equipment operators shall pay careful attention to workers on the ground that may be in their path and provide warning to these personnel prior to moving equipment.
- All employees working in the vicinity of operating heavy equipment shall wear safety vests with reflective tape.
- Personnel working on the ground shall establish contact with equipment operators by waving.

6.3.10 Use of Electrical Equipment

To prevent shock and electrocution injuries, the following requirements will be implemented:

- Employees working with electricity, as part of their job will be trained in electrical safety work practices.
- All work and installation will comply with 29 CFR Sections 1910.331-335, with 29 CFR Section 1926, Subpart K–Electrical and applicable sections of the National Electrical Code (NEC).
- All electrical equipment including portable tools, lighting, and power cords will conform to 29 CFR Section 1926.400.
- All power tools shall be inspected before use.
- A weekly inspection of powered outdoor electrical installations will be ground fault circuit interrupter (GFCI) protected where possible. Outdoor electrical systems not GFCI-protected will be included in an assured grounding program.
- Electrical equipment will be maintained in a safe condition.
- Do not make electrical repairs or install electrical equipment unless you are qualified.
- If equipment must be connected by splicing wires, be sure connections are properly taped and that the splice is electrically and mechanically equal to the cord's quality.
- Be familiar with specific operating instructions for each piece of equipment.
- Consider all wires live until locked and tagged out.
- All pump motors and suction hoses will be bonded to the tank or otherwise grounded to prevent electrostatic ignition during product and rinse water transfers.

6.3.11 Lockout/Tagout

During work where there may be potential exposure to energized systems, such as electrical, hydraulic, mechanical and other systems. Where there is stored energy, employees will use lock-out/tag-out principles. RMEC employees performing lockout/tagout will follow RMEC's Health and Safety procedures, consistent with 29 CFR Section 1910.147. RMEC personnel will coordinate lock-out/tag-out activities through the SHSO.

6.3.12 Encountering Underground and Overhead Utilities

- The excavation and grading contractor will notify Utah Blue Stakes to locate underground improvements in and around the proposed excavation zones.
- All work will be performed under a Blue Stakes utility location notification and the RMEC and the RC personnel will do a walkthrough of the Site to identify potential underground and overhead utility conflicts prior to conducting any work at the Site.
- The area utility locator will be contacted prior to all intrusive activities (i.e., excavating, trenching, grading, and other below ground surface activities) to determine the location of all suspected utility lines on-site.
- Operators shall pay deliberate attention to all types of utility lines. Operating cranes or drill rigs within 10 feet of active overhead power lines is prohibited. The use of equipment in the vicinity of electrical power lines, either overhead or buried, requires that special precautionary measures be taken by all involved in Site work operations.
- If unavoidably close to buried or overhead power lines, have power turned off, with circuit breaker locked and tagged or have the local utility company mask the wires.
- Private utilities (i.e. underground sprinkler pipes) will not be marked by the utility locator.

6.3.13 Manual Labor Activities

Personnel performing material handling shall abide by the following guidelines:

- DO design manual lifting and lowering out of the workplace. If you must perform manual lifting, try not to lift anything above the head or below the waist.
- DO be in good physical shape. If you are not used to lifting, do not attempt manual lifting by yourself.
- DO think before acting. Place material conveniently within reach. Have handling aids available. Make sure sufficient space is cleared.
- DO place the load close to the body. Test the weight before trying to move it. If it is too heavy, get mechanical lifting aid or somebody else to help, or both. Place your feet close to the load. Stand in a stable position with the feet pointing in the direction of movement. Lift by straightening legs.
- DO NOT twist the back or bend sideways.
- DO NOT lift or lower awkwardly.
- DO NOT continue lifting when the load is too heavy.
- Read warning labels on containers and equipment. Follow specified precautions.
- Daily work areas will be completed and documented.
- Comprehensive weekly work area inspections will be completed and documented.
- Verify daily that all equipment and tools are in good condition.
- Do not wear loose clothing near operating equipment. Tie back long hair.

- In addition to the PPE required for work in contaminated areas, heavy leather gloves shall be worn when handling materials or performing other work that could result in hand injuries.

6.3.14 Power and Hand Tools

Power and hand tools use shall be in accordance with the following practices:

- Exercise caution when using hand tools (use the right tool for the right job).
- Tools shall be maintained in good condition and be inspected by the employee prior to use.
- Defective tools shall be removed from service and repaired or disposed.
- Electrical tools shall be double insulated or have a ground plug.
- Tools shall be used only for their intended purpose.

6.3.15 Slips, Trips, and Falls

In all areas feasible (especially support areas) the following actions shall be taken:

- Walkways shall be kept clear of equipment, vegetation, and excavated materials.
- Obstructions will be marked, identified, or barricaded.
- Tripping and poor footing hazards will be repaired as they are discovered or will be clearly identified.
- Housekeeping will be maintained to prevent brush, debris and other refuse from accumulating to the point where it becomes a hazard.
- Tools, electrical cords, hoses, equipment, and materials will be placed in an area that does not cause a tripping hazard or they will be appropriately posted and protected.
- Tools, materials and equipment will be secured to prevent falling.
- Protruding nails in boards will be removed or flattened.
- Keep ground clutter in the work area to a minimum to reduce the potential for tripping; practice good housekeeping around all buildings and equipment.
- Use caution when the ground surface is slick or uneven. Surface on this Site tends to be wet. Look before stepping to the potential for unsecured footing.

6.3.16 Exposure to Dust

- The contractor will implement dust control procedures (if necessary) during all intrusive activities to ensure the safety of the on-site personnel and the public.
- To minimize the possibility of the accidental ingestion of hazardous materials, no eating, drinking or smoking will be allowed in the immediate area of the excavations.
- All personnel shall remove gloves and wash their hands after leaving the work area and before eating, drinking or smoking. Hand wash stations (wet wipes) will be provided for Site workers.
- Perform work in a manner that will minimize dust from becoming airborne (i.e., use water spray or wet technique when feasible).

6.3.17 Exposure to Noise

Personnel working in environments where noise may exceed 85 decibels measured on the A scale (dBA) over an eight (8) hour time-weighted-average (TWA), are required to have a baseline audiometric exam and be enrolled in a hearing conservation program in accordance with 29 CFR Section 1910.95.

A hearing conservation program consists of training, providing hearing protection, a written procedure and Site monitoring for noise. Hearing conservation training will be provided in initial training, Site-specific training and daily safety meetings. Several different forms of hearing protection will be provided to workers and employees will be allowed to choose which form of hearing protection fits the best. Personnel will be instructed during training about the procedures for selection, issuance and use of hearing protection.

- Noise surveys using a Sound Level Meter will be performed and documented at Site start-up and when new processes are added. All personnel will be informed of the results and areas greater than 85 decibels will be posted.
- Noise levels are not expected to be excessive during any remediation activities at the Site. If noise levels interfere with normal speech communication, affected personnel shall wear hearing protection to abate this physical hazard.
- Personal noise dosimetry may also be performed at the discretion of the SHSO and the CIH.
- Post appropriate signs in areas of continuous noise >85 decibels, time weighted average.
- Use earplugs or earmuffs when noise prevents conversation in a normal voice at a distance of 3 feet. (This is a field rule that indicates noise levels are exceeding 85 decibels.)
- Double protection (e.g., earplugs and muffs) must be used for noises exceeding 104 decibels. All personnel required to use hearing protection must have a hearing test prior to starting work.
- Hearing protection should be required for machine operators/personnel positioned near machinery, or when in the immediate vicinity of these types of heavy. The effect of occupational exposure to noise is to be monitored by contractor or the subcontractor medical surveillance program. Since voice communication may be affected during excessive noise, hand signals may be used in conjunction with voice communication. Hand signals are discussed in **Section 6.3** and **8.16**.

6.3.18 Exposure to Weather

- Monitor weather conditions, particularly wind direction, because they could affect potential exposure.
- Be aware of the amount of solar radiation exposed skin is receiving. Take steps to minimize the potential for sunburn.
- Be alert to fatigue, heat or cold stress, and other environmental factors influencing the normal caution and efficiency of personnel.
- Look up the day's updated forecast every day to be notified of upcoming inclement weather.
- Wear long sleeves and/or sun block on sunny days.
- Cease field activities during severe storms. Seek shelter until the storm has passed.
- If a tornado occurs, seek shelter in the lowest level or interior wall of a substantial building. Do not seek shelter in a trailer or vehicle. Lie flat in the nearest ditch.
- In case of lightning in the area (within 10 miles of the Site), stop all work until 30 minutes after the last visual or audial observation of lightning/thunder. Seek shelter in vehicles until the storm passes as the metal body protects against lightning strikes.

The following sections discuss the symptoms indicating overexposure to hot or cold environments.

6.3.19 Heat Stress

- Abstain from alcohol intake that tends to decrease body's ability to deal with heat.
- Drink several glasses of Gatorade during the day or drink water and use salt on the foods you eat as appropriate.

- Pay attention to the signs of heat stress in yourself and co-workers around you.
- Do not wear impermeable or semi-permeable clothing when your oral temperature exceeds 100.6 degrees Fahrenheit.
- Certain precautions will be required to reduce the likelihood of heat fatigue, heat exhaustion, and heat stroke. Workers will be encouraged to drink liquids from the time they wake up and frequently during the workday. Clean water and shade will be provided and available to all personnel. When temperatures exceed 85 degrees, employees are encouraged to drink water every 15 minutes, even if they are not thirsty, and to take frequent breaks of at least 5 minutes in the shade.

The SHSO will use a wet bulb globe thermometer (WBGT) to determine temperatures and heat index information. This information will then be compared to the ACGIH heat stress indices and work/rest regimes will be determined. In addition, during periods where modified Level D is being used, heart rates and ear temperatures will be taken and compared with baseline heart rates and temperatures for that person. All personnel will receive heat stress training in the Site-Specific Training course, which will include at a minimum:

- Symptoms of heat stress
- Action levels for implementing work/rest regimes
- Factors that affect heat stress
- Emergency care for heat stress

The following are recommended minimum breaks for work performed in protective clothing during hot weather. Values are taken from the 1991-1992 Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, ACGIH, 1991.

Temp. (°F)	Work	Rest	Comments
70 to 75°	3 hours	5 mins	Review heat stress in a safety meeting. Schedule a beverage break every 2 hours at a minimum.
75 to 80°	3 hours	15 mins	Seated rest. Drink at least 8 ounces at each break. Monitor daily body weight changes. Have at least 10 instant ice packs or bags of ice available.
80 to 85°	2 hours	10 mins	As above, but rest area to be shaded. Take pulse before work, at beginning of lunch break, and at end of day.
85 to 90°	90 mins	10 mins	As above, and try to provide a shaded work area. More frequent breaks may be required.
Above 90°	90 mins	10 mins	As above. Try to reschedule work to avoid mid-day heat.

6.3.20 Cold Stress

- Abstain from alcohol intake that tends to decrease body's ability to deal with cold.
- Drink several glasses of Gatorade during the day or drink water and use salt on the foods you eat as appropriate.
- Pay attention to the signs of cold stress in yourself and co-workers around you.

The SHSO will use a WBGT to determine temperatures in cold environments. This information will then be compared to the American Conference of Governmental Industrial Hygienists (ACGIH) cold stress tables and work/warm-up schedules will be determined. All personnel will receive cold stress training in the Site Specific Training course, which will include at a minimum:

- Symptoms of cold stress
- Action levels for implementing work/ warm-up regimens
- Procedures for dressing for cold weather
- Emergency care for cold stress

Workers will be encouraged to wear layers of protective, insulated clothing; keep hands, head, and feet covered and warm; keep clothes dry; eat high-energy foods; and drink plenty of water.

Warm shelter will be provided out of the wind for rest periods. Crews will be encouraged to get warm and dry during lunch periods. Warm liquids with caloric value will be provided, and ample water is essential. Dehydration is a factor in hypothermia and frostbite, and will be avoided.

The medical emergency response procedures for victims who may have developed cold stress are outlined in **Section 5.0**.

- Wear multi-layer cold-weather clothing. The outer layer should be wind-resistant fabric. Be sure to wear appropriate cold weather clothing on hands, feet and head as well.
- Limit total work time in 0□ to 30 □F to four hours. Alternate one hour in and one hour out of the low-temperature area.
- Drink warm fluid and take rest breaks in a warm shelter. Use the buddy system. Avoid heavy sweating.

6.3.21 Fire and Explosions

- Do not start or maintain an open flame, except in designated areas.
- Use a fire extinguisher only to escape or to fight very small fires. Do not attempt to fight large fires.
- Field vehicles must have a 5-pound ABC-rated fire extinguisher that is fully charged and in operable condition.
- Heavy equipment must have a 10-pound ABC-rated fire extinguisher.
- Fuel storage areas must have a 20-pound ABC rated fire extinguisher located 10 feet away.
- Obtain fire extinguisher use training.

6.3.22 Confined Space Entry

- All work will be carried out without personnel entering into tanks. **RMEC personnel will NOT enter a permit-required confined space for any purpose.**
- Entries into excavation or pipeline trenches will be minimized to the extent feasible. Sloping and/or shoring at a 1.5 foot horizontal to 1 foot vertical (1.5:1), in accordance with OSHA rules 29 CFR Sections 1926.650-652, will be used to make excavations safe if any such entries into excavations greater than five feet will occur. A competent person will inspect excavations less than five feet deep to ensure safety prior to entry. In addition, Confined Space Entry Requirements per OSHA 29 CFR Section 1926.1200 may apply if contamination is suspected or known to be present. **RMEC personnel will NOT enter a permit-required confined space for any purpose.**
- If entry into a confined space is required to complete work, the SHSO will evaluate the space in accordance with 29 CFR 1910.146 and determine if the space is permit or non-permit required. If the space is permit required then entry should be controlled through the use of a permit system. An entry supervisor will be required to sign off on the permit and terminate the permit when the project is completed. Permits must be posted outside the confined space and all entrants and attendants must have read and understood the permit.

- Personnel entering, performing attendant duties or acting as the entry supervisor for a permit required confined spaces must have training. Additionally, a method for retrieval of the entrant in case of emergency must be defined and communication with fire and emergency services must be completed. Air monitoring will be performed in all spaces including non-permit required spaces for oxygen, lower explosive limit (LEL), H2S, CO and any other contaminant that may be in the space in concentrations above the permissible exposure limit (PEL). Personnel shall review the requirements of 29 CFR 1910.146 in detail prior to entry.

6.3.23 Portable Ladder

All portable ladders will be used for their designated purposes only. All ladders will be used in accordance with ANSI A-14.2 and A-14.2, OSHA 29 CFR Section 1926, Subpart X, and manufacturer's instructions. Before use, each ladder will be inspected to verify that all parts are in good condition and all components function properly. Defective ladders will be tagged "Do Not Use" by the SHSO, Site Manager or employees.

The following guidelines should be followed when using portable ladders:

- Set ladders on flat, firm surfaces.
- Make sure both handrails of straight ladders are in contact with upper support.
- Secure straight ladders either by having someone holding the ladder on the ground or by tying the ladder to an upper support.
- Retain a 4-to-1 ratio regarding the height of an extension related to the distance the bottom of the ladder is from the wall or vertical plane.
- Extend the handrails of a straight ladder to at least 36 inches above the landing.
- Do not use metal ladders around electrical lines.
- Do not allow more than one person to use a straight ladder at one time.
- Position ladders such that you do not have to lean more than half of your body outside either handrail.
- Do not stand on the top rung or top step of a ladder.
- Before ladders are used, the SHSO will review the ladder usage techniques as applicable.

6.3.24 Fall Protection

Employees working over any machinery, open spaces, hazardous substances, unguarded heights, steep slopes, unprotected edges, or otherwise subjected to falls six (6) feet or greater in height will be protected by adequate fixed scaffolding, guard rails, safety nets, or secured by personal fall arrest systems. Fall protection, stairways and ladders shall meet the requirements of 29 CFR Section 1926, Subpart M–Fall Protection, and 29 CFR Section 1926, Subpart X–Stairways and ladders.

Fall protection training is required for all personnel who may be exposed to falling hazards. Personal fall arrest systems must be inspected prior to each use for wear. Additionally, all lifelines must be protected from abrasion are strung over sharp edges. Personal fall restraint systems must be attached to a support that is capable of holding 5,000 pounds.

6.3.25 Crane Operations, Hoisting and Rigging

Crane operations will be conducted in accordance with 29 CFR Section 1926.550, Cranes and Derricks. Rigging of loads being lifted by cranes shall comply with the requirements of 29 CFR Section 1926.251, Rigging Equipment for Material Handling. A Hoisting and Rigging Plan will be prepared for all lifts greater

than 2,000 pounds and reviewed with the BLM Site representative. The SHSO will be present for all critical lifts. Critical lifts are defined as non-routine lifts for which any of the following conditions exist:

- Operating cranes or drill rigs within 10 feet of active overhead power lines is prohibited.
- Any lift of 30,000 pounds or more.
- The weight of the lift exceeds 75 percent of the crane's rated capacity in the configuration that will be used during the lift.
- Lifts for which the path of travel is out of the operator's view
- Lifts made with more than one piece of lifting equipment
- Lifts involving non-routine or difficult rigging arrangements
- Hoisting of personnel with a crane or derrick
- Lifts involving high value items where damage would result in a unacceptable financial or production loss
- Any lift that the lifting equipment operator believes should be considered critical.

6.3.26 Hot Work Permit

Hot work permits are required for all activities producing a spark or a flame. One very important aspect of a hot work permit is that it will require a fire watch for an appropriate period of time after work is complete. The appropriate length of time for the fire watch will be determined by the SHSO. All hot work requires permit coordination through the SHSO or Site Manager.

6.4 Job Hazard Analysis – Chemical Hazards

6.4.1 Heavy Metals

- The contractor will implement dust control procedures (if necessary) during all intrusive activities to ensure the safety of the on-site personnel and the public.
- To minimize the possibility of the accidental ingestion of hazardous materials, no eating, drinking or smoking will be allowed in the immediate area of the excavations.
- All personnel shall remove gloves and wash their hands after leaving the work area and before eating, drinking or smoking. Hand wash stations (wet wipes) will be provided for Site workers.
- Perform work in a manner that will minimize dust from becoming airborne (i.e., use water spray or wet technique when feasible).
- All personnel must participate in the air-quality exposure-monitoring program by wearing personal monitors or sampling devices designated by the SHSO.

6.4.2 Material Safety Data Sheets

A list of chemicals and corresponding MSDSs will be kept on-site and will be readily accessible to Site workers while in their work areas. MSDS's of commonly used chemicals are available in **Appendix F**, these MSDS's are included for Site preparation activities, additional MSDS's will be obtained and located in RMEC's Field Office as chemicals are brought on-site. A chemical inventory of all chemicals controlled by RMEC will be maintained by the SHSO.

Additionally, employee training will be performed and documented during the initial Site-specific training, and periodically during daily safety meetings if new chemicals are brought on-site.

RMEC requires that primary containers of hazardous chemicals and substances, both in the office and at the job Site, be labeled as to the contents, appropriate hazard warning, and the name and address of the manufacturer. Secondary containers must be labeled with the chemical name and hazards, at a minimum. The SHSO is responsible for label verification for this project, and employees are responsible for reporting unlabeled containers to the SHSO.

MSDSs must be obtained from manufacturers for each hazardous substance or chemical used on the Site. If the manufacturer does not include the MSDS when the item is shipped, the manufacturer will be contacted by the SHSO by telephone or facsimile to obtain the MSDS. A listing of all hazardous chemicals and hazardous substances in use is filed with the MSDSs.

In addition, the chemical will not be used on-site until an MSDS is received. The MSDSs are kept in the field office and are available for review. The SHSO must maintain and review MSDSs for new or changed information. Such information will be made available to affected employees. Site personnel may request MSDSs for review at any time.

6.5 Job Hazard Analysis – Biological Hazards

6.5.1 Exposure to Blood-borne Pathogens

- Contact the SHSO if you contact human body fluids while administering first aid.
- Bloodborne pathogen (BBP) exposure risks are associated with medical emergencies requiring CPR; the stabilizing of a victim bleeding or with an open wound; or cleanup of blood, body fluids or tissues, or broken or sharp objects that might be contaminated with bodily fluids.
- Personnel trained in CPR and first aid will also be trained in BBP awareness. BBP supplies will be provided and readily available for use with first aid supplies.

6.5.2 Ticks

Removing ticks before they feed is ideal for avoiding tick-borne diseases. Different ticks carry different diseases, so be sure to save the tick and have it identified.

- Avoid areas where ticks and their food sources are abundant, i.e., grassy and bushy areas along the edges of woodlands and fields, from March to mid-July.
- Apply tick repellant to clothing before entering tick habitat.
- Wear long pants and long-sleeved shirts. Tuck shirts into pants and pants into socks. While this is helpful, ticks are still capable of finding their way beneath clothing. Wear light-colored clothes to make it easier to detect and remove ticks.
- Conduct tick checks. Ticks usually take a few hours or more to find a feeding location and insert their mouthparts. Frequent examinations for ticks on the body can keep them from beginning to feed. Ticks are small, so check everywhere on your body, including armpits, waistline, belly button, scalp and crotch areas.

To remove larger ticks:

- Use tweezers and grasp the tick as closely to the skin as possible, targeting the mouthparts. If tweezers are not available, use a loop of thread around the mouthparts or a needle between the mouthparts.

- Carefully pull the tick straight upward without twisting or crushing it. Use steady pressure until it releases. Crushing or squeezing a tick can cause it to regurgitate stomach contents into your blood stream, which can transmit tick-borne diseases.

For smaller ticks:

- Scrape the tick with a knife blade or credit card edge, being careful not to cut yourself.
- After removal, place tick in a sealed container in case your doctor wants to see it.
- General treatment:
- If the head accidentally breaks off and remains in your skin, clean the area around the bite and use a sterile needle to carefully lift or scrape the head from the skin.
- Wash the wound and your hands with soap and water after removal. Apply an over-the-counter antibiotic ointment to help reduce the chance of catching a tick-borne or secondary infection.

6.5.3 Venomous Snakes

- Avoid placing hands and feet into concealed areas.
- If possible, avoid contact with poisonous snakes or other reptiles by quietly walking away. If bitten, seek medical assistance immediately.
- If you encounter a snake outside of human development, leave it alone – it's in its natural habitat.
- Never try to poke, handle, corner or harass a snake. Most
- Snake bites occur when people are trying to handle or kill the snake. Teach children to respect wildlife and to look, but not touch.
- Snakes hide well on open trails and in dense grasses. Be aware of your surroundings. Look carefully where you place your feet, and before you sit down on the ground, on rocks, or on logs.
- Wear closed-toed shoes while hiking.
- If you hear a rattle, don't jump or panic. Try to locate where the sound is coming from before trying to move. Warn others if they are around.
- If bitten, treat it as if it were a venomous snakebite. Do not use a tourniquet or cold compress. Do not suck out the venom. Keep the victim calm, remove restrictive clothing and jewelry near the bite, and keep the affected area below the level of the heart. Treat for shock if necessary and get medical attention immediately.
- Snakes are classified as non-game animals and are protected by Utah state laws.
- A person cannot collect or possess a live wild snake without receiving a Certificate of Registration from the Utah Division of Wildlife Resources.
- The best way to reduce problems associated with snakes is to make your property unattractive to them.
- Trim vegetation and remove wood and rock piles to reduce hiding places.
- Control rodents on your property; remove bird feeders, an attractant to rodents.

6.5.4 Spiders, Scorpions, and Stinging Insects

- Use insect repellent to avoid contact with ticks, mosquitoes, and other insects (disease carriers or poisonous), as necessary. Use a solid repellent to minimize potential contamination of field samples. Perform a "tick check" after being in a vegetated area.
- Avoid placing hands and feet into concealed areas.
- Avoid encounters with stinging insects.

6.5.5 Wildlife Encounters Animal Bites and Infectious Disease; Rabies

- Do not approach or agitate animals, especially ones behaving strangely or foaming at the mouth.

6.5.6 Plant Life

- Learn to recognize toxic plants, such as poison oak, poison ivy (clusters of three leaves), and poison sumac.
- Wear long-sleeved shirts, sturdy trousers, and boots when working near toxic plants to minimize the potential of skin contact.
- If exposed to toxic plants, shower as soon as possible with a strong soap (e.g., Fels Naptha). Launder clothing.

6.5.7 Molds and Fungus

- The contractor will implement dust control procedures (if necessary) during all intrusive activities to ensure the safety of the on-site personnel and the public.
- To minimize the possibility of the accidental ingestion of hazardous materials, no eating, drinking or smoking will be allowed in the immediate area of the excavations.
- All personnel shall remove gloves and wash their hands after leaving the work area and before eating, drinking or smoking. Hand wash stations (wet wipes) will be provided for Site workers.
- Perform work in a manner that will minimize dust from becoming airborne (i.e., use water spray or wet technique when feasible).

6.6 Site Access Controls

The public and non-authorized personnel are prohibited entry to the work areas. The Site will be fenced off if possible and properly labeled with signs that reads:

CONSTRUCTION SITE
AUTHORIZED PERSONNEL ONLY – NO PUBLIC ACCESS

7.0 TOXICOLOGY & EXPOSURE GUIDELINES FOR ON-SITE CHEMICALS

The chemicals expected to be on-site during the excavation and removal activities include diesel fuel and the heavy metals antimony, arsenic, and thallium. **Table 5.0** describes the various properties and health effects for the chemicals at the Site, and lists available Threshold Limit Values (TLV), Permissible Exposure Limits (PEL), Time Weighted Averages (TWA), Short-Term Exposure Limits (STEL), and levels considered Immediately Dangerous to Life or Health (IDLH) published for the suspected chemicals of concern. These values come from the listings published by ACGIH, NIOSH, and/or OSHA. The table describes the chemical's name, relevant properties, exposure limits, potential health effects of overexposure, and methods of protection for each chemical. Air monitoring and XRF soil screening for the presence of these materials will be performed when necessary and is described in **Section 9.0 – Environmental Monitoring**.

For metals the pathways for exposure will be either ingestion or inhalation. The monitoring that is performed for personnel safety is covered in **Section 9.0**. Before working in an intrusive work area, consultation with the SHSO should be made to understand the level of protection required prior the start of a work activity. Listed below are the properties, allowable exposure and potential symptoms of over exposure for the constituents of concern on the Antimony Mill VCP Site.

LEL	Lower Explosive Limit	PID	Photo-Ionization Detector
mg/m^3	milligrams per cubic meter	ppm	parts per million

Table 5.0 –
Properties, Health Effects, and Mitigation for Chemicals Associated with Soil and Rock Excavation

Chemical Name	Relevant Properties	Relevant Exposure Limits	Health Hazards	Available Control / Warning Methods
Antimony	Metal: bright silvery or gray metallic metal.	OSHA PEL TWA: 0.5 mg/ m^3	**Exposure Routes:** inhalation, skin absorption, skin and/or eye contact, ingestion. **Short-Term Exposure**: irritation eyes, skin, nose, throat, mouth; cough; dizziness; headache; nausea, vomiting, diarrhea; stomach cramps; insomnia; anorexia; unable to smell properly **Long-Term Exposure:** inflammation of lungs, chronic bronchitis and emphysema.	Prevent skin and eye contact, wear a particulate respirator (APF = 50). Any air-purifying, half-facepiece respirator (gas mask) with a chin-style, front- or back-mounted particulate P100 filter for anticipated dust exposures.
Arsenic	Metal: Noncombustible solid in bulk form, but a slight explosion hazard in the form of dust when exposed to flame. Potential occupational carcinogen.	OSHA PEL TWA: 0.010 mg/ m^3	**Exposure Routes:** inhalation, skin absorption, skin and/or eye contact, ingestion. **Short-Term Exposure**: Ulceration of nasal septum, dermatitis, gastrointestinal disturbances, peripheral neuropathy, respiratory irritation, hyperpigmentation of skin. **Long-Term Exposure:** lung and lymphatic cancer, liver and kidney damage.	Prevent skin and eye contact, wear a particulate respirator (APF = 50). Any air-purifying, half-facepiece respirator (gas mask) with a chin-style, front- or back-mounted particulate P100 filter for anticipated dust exposures.

Chemical Name	Relevant Properties	Relevant Exposure Limits	Health Hazards	Available Control / Warning Methods
Thallium	Soft, silvery-white metal that tarnishes easily. Odorless and tasteless solid.	OSHA PEL TWA: 0.1 mg/m³ OSHA IDLH: 15 mg/m³	**Exposure Routes:** inhalation, skin adsorption, skin and/or eye contact, and ingestion. **Short-Term Exposure**: nausea, diarrhea, abdominal pain, vomiting, chest pain/tightness, pulmonary edema. **Long-Term Exposure:** Eyes, respiratory system, central nervous system, liver, kidneys, gastrointestinal tract, body hair.	Prevent skin and eye contact, wear a particulate respirator (APF = 50). Any air-purifying, half-facepiece respirator (gas mask) with a chin-style, front- or back-mounted particulate P100 filter for anticipated dust exposures.

TLV - TWA = Threshold Limit Value - 8 hr. Time Weighted Average
TLV - TWA reported in ppm represents parts of vapor per million parts of air by volume at temperature of 25°C and pressure of 760 torr.
TLV - TWA reported in mg/m³ represents milligrams of substance per cubic meter (mg/m³) of air.
"Skin" notation indicates route of exposure through cutaneous absorption.

A description of the health effects caused by the heavy metals and diesel fuel is noted below. Monitoring for the presence of these materials, such as through air monitoring and X-Ray Fluorescence (XRF) soil screening, will be performed when necessary and is described in **Section 9.0 - Environmental Monitoring**. The symptoms information below was copied from the NIOSH website (http://www.cdc.gov/niosh/npg).

7.1 Antimony

Antimony is irritating to the skin and mucous membranes and is a systemic poisons. Effects are reported to include a metallic taste in the mouth, vomiting, colic, loss of appetite and weight, and diarrhea. In addition, dermatitis may result that starts as an inflammation of the hair follicles and can progress through pus formation and sloughing to leave a contracted scar. Ingestion may cause severe irritation of lining of stomach and intestines. Inhalation may cause upper respiratory tract irritation and systemic poisoning with symptoms including abdominal pain, nausea, dizziness and dry throat. Prolonged exposure may cause liver and kidney abnormalities or pneumonitis.

7.2 Arsenic

Arsenic toxicity affects the liver, kidneys, skin, lungs, and lymphatic system. Arsenic leaves the body within a few days and does not bio-accumulate except in hair and fingernails. The signs and symptoms of arsenic exposure that may occur include: ulceration of nasal septum, dermatitis, gastrointestinal disturbances, peripheral neuropathy, respiratory irritation, hyperpigmentation of skin. Prolonged exposure could play a

role in the development of diabetes, skin cancer, bladder cancer, lung cancer, vascular (heart) disease, and lung disease. A large enough acute exposure can cause death within two hours to four days. Arsenic is also a potential occupational carcinogen of the lungs and lymphatic system.

7.3 Thallium

Thallium can through inhalation and dermal contact. Thallium can irritate and burn the skin and eyes. Prolonged contact can cause blurred vision and/or loss of vision, nail changes, skin rash and dryness, and hair loss. Exposure can cause fatigue, poor appetite, nausea, vomiting, metallic taste, insomnia, confusion and mood changes. Thallium can damage the nervous system causing headache, weakness, irritability, pain, and “pins and needles” in the arms and legs. Prolonged or repeated exposures can may damage the liver and kidneys and cause tremor, convulsions, and hallucinations.

8.0 DECONTAMINATION PROCEDURES AND CONTROL ZONES

Control boundaries for intrusive construction work areas should be established and marked and secured with fencing, traffic cones, caution tape, warning signs, or similar means to restrict the areas to work personnel. Controlled entry points will be established to prevent the spread of contamination throughout the Site and to ensure that only authorized individuals are permitted into potentially hazardous areas. These Site zones will be applied to work in the repository area as well as the tailings excavation areas. If extensive work in contaminated soils is required during the course removal activities, employees and equipment will require decontamination after leaving the affected areas. In addition, during sampling, affected employees will require some level of decontamination, i.e. removal of any PPE, prior to exiting the work areas.

For activities requiring Level D protection without established work zones, it is unlikely that major decontamination will be necessary. A description of Level C and Level D protection noted above is located in **Section 10.0 – Personal Protective Equipment** of this HASP.

8.1 Work Area Contamination Control Zones

Site zones will be established as needed on the contaminated properties, with marked boundaries to prevent or minimize exposure of unauthorized personnel to hazards and reduce migration of contaminants into clean areas. A three-zone approach will be utilized to control personnel access and contamination translocation, and shall include a Support Zone (SZ), Contamination Reduction Zone (CRZ), and an Exclusion Zone (EZ). These three zones shall be designated as the SZ, the CRZ, and the EZ. Entry into the EZ and CRZ shall be through controlled access points only. This is so to ensure that (1) personnel not directly involved with the project do not unnecessarily enter work zones and, (2) employees properly doff and don PPE in a clean area. Any support facilities, non-essential equipment, and non-authorized personnel are located outside the EZ and CRZ. The boundaries of the EZ and CRZ will be clearly marked and posted with barrier tape or fencing.

8.1.1 Support Zone

The Support Zone is the clean area in which the possibility of encountering hazardous materials or conditions is minimal. The SZ serves, as the main point of contact for visitor check-in. The SZ will include the main access gates to offsite, field offices, vehicle parking lot, and restroom facilities. The SZ will encompass all areas of the Site not included in the EZs or the CRZs. Chemical protective clothing and respiratory equipment are not worn in this area.

Inside the SZ, the following will be available: communication equipment, first-aid supplies, appropriate sanitary facilities, at least one fire extinguisher, and drinking water. Potentially contaminated personnel/materials are not allowed in this zone. The only exception will be appropriately packaged or decontaminated materials. Activities that will routinely be completed in the SZ include any activity that does not directly involve excavation, dewatering, screening, transport or disposal of contaminated soil or sediments or any type of decontamination activities.

8.1.2 Contamination Reduction Zone

The Contamination Reduction Zone will be established between the SZ and the EZ. The CRZ is the area where equipment and personnel are decontaminated. Personnel will remove and/or decontaminate PPE and place it in appropriate containers. Site vehicles and equipment will also be decontaminated in the CRZ. The

CRZ will consist of a decontamination pad (temporary or permanent), a means of washing equipment, Site vehicles, and tools; containers for liquids, solids, and PPE; an eyewash/emergency shower; and a fire extinguisher. Personnel are required to decontaminate upon leaving this zone.

8.1.3 Exclusion Zone

The Exclusion Zone contains the contaminated soil and groundwater work activities at the Site and will be delineated by a fence or signage advising personnel of the EZ perimeter, and that entry is restricted to authorized personnel. The EZ may be extended beyond the temporary fencing or signage as required by air monitoring and XRF soil screening results. Snow fencing, cones, construction tape, and warning signs will mark EZ extensions. Only authorized, trained, and qualified personnel with the appropriate personal and respiratory equipment (as applicable) shall be admitted. In this zone, all personnel must use the buddy system. At the perimeter of the EZ, establish a CRZ. Personnel are required to decontaminate upon exit from the exclusion zone if mud, dirt or other materials potentially containing contamination are present.

The EZ is an area around the excavations a minimum of ten (10) feet from the limits of the excavation or a distance allowable by the Site's configuration. Given this Site's large area and some uncertainty in the delineation of the impacted areas, the EZ at the Site can extend up to fifty (50) feet from the limits of the excavation. Work activities within the EZ pose the greatest possibility of exposure of personnel to hazards. Therefore, the boundaries of the EZ will be clearly marked with snow fencing, flagging, barricade tape, traffic cones, signage, or other signals to limit access. The Site Manager or SHSO shall be responsible for controlling the access points, and keeping bystanders and unauthorized personnel to a minimum.

8.2 Site Control and Security

8.2.1 Site Access for Workers and Visitors

All personnel entering any CRZ or EZ must sign the access control log each time they enter or exit the zone. This access control log provides a means for personnel accounting in case of emergency and it requires that all personnel have read the HASP prior to entry. Only personnel who have received the appropriate training and medical monitoring in accordance with **Section 4.0** of this HASP will be allowed to enter a CRZ or EZ. In addition, visitors entering the limit of work must proceed to the field office trailer and sign the visitor log. Regular full-time employees are exempt from this requirement. Access control logs will be filed in the field office trailer.

Visitor access to an EZ or CRZ will be limited by the following requirements:

- Access shall be limited to visitors performing essential functions such as inspections or evaluations.
- Visitors shall have current initial and refresher health and safety training in accordance with **Section 4.0** of this HASP.
- If respiratory protection is required in the EZ, then visitors must be participants in a medical surveillance program.
- RMEC shall provide an escort for visitors entering an EZ or CRZ.

8.2.2 Site Security

RMEC will implement a Site security program at the Site in an effort to prevent accidents, injuries, vandalism, and tampering caused by unauthorized entry. In order to establish appropriate Site security, RMEC will institute the following controls:

- RMEC will provide signage on buildings and fences that provides the following warning or similar statement: "*Warning, Hazardous Work Area. Do Not Enter Unless Authorized*."
- RMEC will provide temporary lighting around office areas.
- RMEC will check each person entering the work area for proper identification and deny entry for persons not appropriately identified.
- RMEC will maintain a list of persons authorized by training and medical surveillance for work area entry.
- RMEC will restrict vehicle access to the exclusion zone to authorized vehicles only.
- RMEC will secure powered hand-tools, generators and other valuables inside locked facilities.
- RMEC will report any security breaches to the representative immediately. Written reports will follow within five (5) days. Security breaches include unauthorized personnel, deterioration of security fences or missing signs.

8.3 Contamination Prevention

Preventing or avoiding contamination of personnel and equipment will be considered during Site operations. This will help prevent personnel exposure and result in a more efficient decontamination process. Procedures for contamination prevention and avoidance are described below:

- Avoid direct contact with potentially contaminated substances; to the extent possible do not walk through puddles, pools, or mud; avoid kneeling, leaning, or sitting on the working equipment.
- Do not directly handle or touch contaminated materials unnecessarily.
- Inspect PPE to ensure that there are no cuts or tears. Replace damaged PPE immediately.
- Cover any cuts or scrapes on skin.
- Stay upwind of airborne contamination whenever possible.
- Eating, drinking, chewing gum or tobacco, taking medications, and smoking are prohibited on-site near intrusive construction activities. Do not carry flame-producing equipment into work areas.
- Minimize the number of personnel and amount of equipment in contaminated areas to what is necessary for accomplishing the work.
- Use tools and equipment with nonporous exterior surfaces so that they can be easily cleaned and decontaminated.
- Cover monitoring equipment and sampling equipment with clear plastic for ease of decontamination. Do not place monitoring or sampling equipment on potentially contaminated surfaces.
- Be alert to potentially changing exposure conditions, including changes in wind direction, perceptible odors, unusual appearances of soil, groundwater, etc.

8.4 Routine Personnel Decontamination Procedures

Decontamination areas will be established to prevent the spread of contamination. Separate areas will be designated for personnel and equipment decontamination to minimize contamination of personnel by overspray from equipment decontamination. Rinse waters or decontamination liquids generated during the personnel and equipment decontamination operations can be used in the repository earthwork operations for moisture conditioning as an appropriate means of their disposal.

It is expected that only diesel or potentially-contaminated soil, groundwater, and/or decontamination water/rinse water would have potential for contact with equipment or operators. Any personnel that may have contacted potentially hazardous materials and any tools or equipment that are used on-site shall be

decontaminated as necessary before leaving the Site. The RC will be responsible for inspecting all equipment leaving the Site to ensure that proper decontamination has been completed.

Personnel exiting any established EZ and CRZ shall proceed through a personnel decontamination station. The sequence for personnel decontamination for Level D, modified Level D or Level C PPE field activities are described below. At this time, only Level D and modified Level D PPE are anticipated at the Site. Specific decontamination procedures and practices will be communicated to all personnel during Site Specific Training. Washing of hands and face are required for all personnel exiting the exclusion zone and CRZ. However, if truck drivers or equipment operators who haul contaminated material into the repository stay in their vehicle and do not exit into a CRZ or EZ at any time during the day, then personal decontamination may not be required.

All potentially contaminated personnel, tools, and equipment leaving the Site shall be decontaminated as follows:

- Tools, equipment, and all reusable PPE that have contacted potentially hazardous materials shall be decontaminated using a soapy water wash, brushes, and a clean water rinse. The wash solutions shall be kept in wading pools and/or 5-gallon plastic buckets and the rinse solutions shall be kept in garden sprayers at the perimeter of the exclusion zone.
- All visible contaminated materials shall be washed from the tools, equipment, and PPE with the wash solutions and then rinsed with a garden sprayer and/or power sprayer. Wash and rinse solutions shall be poured onto the hazardous materials designated for disposal.
- As an alternative to decontamination, Tyvek coveralls, gloves, and/or boot covers will be disposed of in a sanitary landfill, so long as they are not soaked with diesel.
- Hand and face wash (wet wipes) stations will also be provided for additional personnel clean up.

8.5 Non-Routine Personnel Decontamination Procedures

Should an employee come in direct contact with a contaminant, and the routine sequence above is not applicable to the situation, the affected employee shall stay in the CRZ, notify the SHSO and wash or flush the contaminated area with mild soap and water solution.

8.6 Decontamination During Medical Emergencies

Normal personnel decontamination practices will be followed whenever possible. For emergency life-saving first aid and/or medical treatment, normal decontamination procedures may be abbreviated or omitted. In this situation, the SHSO will accompany contaminated victims to advise emergency response personnel on potential contamination present and proper decontamination procedures.

Outer garments may be removed if they do not cause delays, interfere with treatment or aggravate the problem. Protective clothing can be cut away. If the outer garments cannot be safely removed, a plastic barrier between the individual and clean surfaces should be used to help prevent contaminating the inside of the ambulance or medical personnel. Outer garments can then be removed at the medical facility.

8.7 Routine Decontamination Level C (if needed)

- Station #1 Equipment drop
  Deposit equipment used on-site (tools, sampling devices and containers, monitoring instruments, radios, clipboards, etc.) onto plastic drop cloths. Segregation at the drop reduces the probability of cross contamination.

- Station #2 Surface Contaminant
  Scrub outer boots, outer gloves, and chemical-resistant suit with decontamination solution. Rinse off using lots of water.

- Station #3 Remove outer
  Remove tape, outer boots using outer gloves; remove outer gloves and gloves and boots deposit into designated container.

- Station #4 Remove suit
  Using inner gloves, remove suit by rolling the suit away from the body, touching only the inside of the suit. Place suit into designated container.

- Station #5 Inner glove wash
  Wash and rinse inner gloves before touching face piece and rinse.

- Station #6 Remove respirator
  Using clean inner gloves; remove respirator and place on clean plastic.

- Station #7 Remove dnner gloves
  Remove inner gloves by rolling them away from the body and touching only the insides of the gloves. Place in designated container.

- Station #8 Field Wash
  Washing of hands and face is required.

8.8 Routine Decontamination Level D

- Station #1 Equipment drop
  Deposit equipment used on-site (tools, sampling devices and containers, monitoring instruments, radios, clipboards, etc.) onto plastic drop cloths. Segregation at the drop reduces the probability of cross contamination.

- Station #2 Surface Contaminant
  Wipe or brush contamination off of clothes, coveralls or Tyvek, boots, and gloves.

- Station #3 Remove gloves/boots
  Remove boots using gloves; remove work gloves boots.

- Station #4 Remove coveralls
  Remove coveralls or Tyvek by rolling away from the body, touching only the inside of the suit. Place into designated container.

- Station #5 Field Wash
  Washing of hands and face is required.

8.9 Routine Decontamination Level D (Modified)

- Station #1 Equipment drop
  Deposit equipment used on-site (tools, sampling devices and containers, monitoring instruments, radios, clipboards, etc.) onto plastic drop cloths. Segregation at the drop reduces the probability of cross contamination.

- Station #2 Wash and rinse
  Brush off outer boots, gloves, and Tyvek or coveralls.

- Station #3 Remove outer
  Remove outer boots using outer gloves; remove outer gloves and boots and place in designated container.

- Station #4 Remove coveralls
  Using inner gloves, remove coveralls or Tyvek by rolling away from or Tyvek the body, touching only the inside of the suit. Place into designated container.

- Station #5 Remove inner gloves
  Remove inner gloves by rolling them away from the body and touching only the insides of the gloves. Place in designated container.

- Station #6 Field Wash
  Washing of hands and face is required.

8.10 Routine Haul Truck Decontamination from Remediation Areas

Haul trucks will be filled below the top of the truck bed to minimize potential for spilling impacted soil during transport. Should there be material on the outside of the truck as noted during a visual inspection, the truck will be brushed off prior to leaving the excavation area.

Designated vehicles and equipment will typically remain within the EZ; therefore, decontamination within the EZ is not required. In the event a vehicle leaves the EZ, decontamination will be conducted as described below. Haul trucks transporting tailings to the repository and all other vehicles leaving the EZ or CRZ will exit through the decontamination pad.

A decontamination pad will be constructed where the haul road exits an EZ. The decontamination pad will consist of a shallow basin approximately 10 feet wide by 20 feet long covered with crushed rock. A rattle plate will then be placed on top of the rock. The decontamination pad will be located in an accessible location and be equipped with power washers, drainage systems, and appropriate wash water collection systems.

The method of decontamination will vary depending on site conditions. In dry conditions, trucks will drive over the rattle plate to knock off any loose soil prior to leaving the area. During muddy conditions, a wet decontamination procedure may be used if brushing is not sufficient. In this case, a water spray will be used to clean the truck while it is positioned over the decontamination pad. The limited amount of wash water will be contained within the basin and allowed to drain into the subsurface soils.

All vehicles exiting the EZ or CRZ will abide by the following rules if decontamination is required:

- Drivers will come to a full stop in front of the decontamination pad and wait to be waved onto the pad by decontamination pad personnel.
- Once the driver has been waved on, the driver will signal with his horn and pull his vehicle onto the pad.
- Decontamination pad personnel will stop the driver and the driver will set his brake.
- Personnel will then wash the truck from front to back and top to bottom.
- When the signal is given to move, the driver will again signal with his horn and drive slowly off the pad. Drivers will watch carefully in the rear-view mirror for personnel.

- If the truck requires a routine survey, decontamination personnel will direct the driver to an appropriate location so that the truck will not interfere with other operations.

More information on decontamination may be found in the RAP in *Section 9.3.2 – Vehicle and Equipment Decontamination*.

8.11 Routine Road Exit Decontamination

During the later phases of the project the exit to Mayflower Road will be periodically cleaned by use of a motor grader to prevent the accumulation on the road of contaminated materials.

8.12 Heavy Equipment Decontamination

Equipment that comes in contact with contaminated soil will be decontaminated prior to demobilization from the Site. Designated vehicles and equipment will typically remain within the EZ; therefore decontamination within the EZ is not required. In the event a vehicle leaves the EZ, decontamination will be conducted as described in Section 8.10.

8.13 Routine Inspection

Vehicles exiting a CRZ or EZ will be visibly inspected by decontamination personnel for gross contamination. If hauling unit is determined to be in need of gross decontamination, the procedures in **Section 6.5** will be followed.

8.14 Spill Containment

Spills requiring a written spill containment program are not anticipated. The contractor is responsible for any written spill containment program(s) arising from field activities. For emergency procedures in case of a spill on-site, please see **Section 11.4 – Spill Response**.

8.15 Waste Collection and Disposal

All contaminated materials generated through the personnel and equipment decontamination process such as contaminated disposal items, gross debris, decontamination tools, and decontamination liquids and sludges, will be incorporated into the repository unless a high enough concentration of a COC precludes inclusion into the repository stockpile.

8.16 Task Hazard Controls

This section provides information regarding potential hazards on a task by task basis that might be encountered during field activities and control methods for those hazards. Both general hazards and Site-specific hazards as well at appropriate control measures are discussed.

8.16.1 For All General Activities

- Level D PPE is required for all activities, unless contact with chemicals or contaminated material occurs.

- If contact with chemicals or contaminated materials is anticipated consult the SHSO and don chemical protective gloves, booties, and suit. Protective equipment kits should be kept in the transportation vehicle at all times.
- Hearing protection is required in areas where the TWA is above 85 decibels.
- Verify that personnel are aware of hand signals and maintain eye contact with the operator when working near heavy equipment.

8.16.2 For Mobilization Activities

- Use appropriate materials handling techniques while moving equipment and parts around.
- Use the proper tool for the job when installing signage, putting furniture together, etc.
- SHSO should drive hospital route prior to start-up.
- Be aware of pinch points when setting trailers.
- Review emergency procedures with personnel prior to the start of work.
- Do not perform electrical work including making connections unless you are trained.

8.16.3 For Installing Permanent Chain Link Fence for Security

- Use the right tool for the job.
- If using a portable winch or come-along to string the fence, ensure that it is in good condition.
- Wear eye protection at all times.
- Do appropriate housekeeping.

8.16.4 For Site Preparation and Performing Dust Palliative Application

This includes clearing and grinding of specific areas.

- Use wet methods during demolition to control dust.
- Ensure that grinders have appropriate guards.
- Verify that personnel using grinders have appropriate training and eye protection.
- Ensure that personnel are aware of heavy equipment working around them.

8.16.5 For Demolition of Existing Foundations, Slabs, and Piping

- Use wet methods during demolition to control dust.
- Design demolition methods to use mechanical means and not human labor.
- Verify that all personnel are out of the immediate area prior to performing demolition.
- Ensure that personnel performing demolition have had appropriate training.
- Drain all piping systems and monitor piping to ensure that flammables are not present.

8.16.6 For Grading the Subgrade

- Use wet methods during rock stockpile placement to control dust.
- Modified Level D PPE is required for all grading activities, unless contact with chemicals or contaminated material occurs.
- If equipment must be on the top of the stockpile, ensure that berms are built around the top.
- Ensure that personnel are aware of heavy equipment working around them.
- Ensure that all personnel exit equipment using three (3) point contact.

8.16.7 For Constructing an On-Site Repository

- Use wet methods during demolition to control dust.
- Modified Level D PPE is required for all construction activities, unless contact with chemicals or contaminated material occurs.
- Hold daily safety meetings to discuss traffic patterns.
- Ensure that personnel are aware of heavy equipment working around them.

8.16.8 For Excavation of Waste Rock

- Use wet methods during excavation to control dust.
- Modified Level D PPE is required for all remediation activities, unless contact with chemicals or contaminated material occurs.
- Ensure that all transportation vehicles are decontaminated before demobilization off the Site.
- Visual inspection of hauling units to determine if gross decontamination is required.
- Ensure that personnel are aware of heavy equipment working around them.
- Ensure that all personnel exit equipment using three (3) point contact.

8.16.9 For Excavation or Grading of Contaminated Soils

- Use wet methods during excavation to control dust.
- Level D or modified Level D PPE is required for all remediation activities. SHSO will make decision on a case by case basis.
- Perform underground utility inspections prior to any excavation.
- Utilize Blue Stakes or other equivalent method.
- Ensure that all transportation vehicles are decontaminated before demobilization off the Site.
- Visual inspection of hauling units to determine if gross decontamination is required.
- Ensure that personnel are aware of heavy equipment working around them.
- Ensure that all personnel exit equipment using three (3) point contact.

8.16.10 For Transport of Waste Rock to Repository

- Ensure that tailgates are fit properly and leak proof.
- Ensure that all transportation vehicles are decontaminated before leaving the Site.
- Conduct all activities in accordance with The RC's On-Site Transportation and Materials Handling Plan.

8.16.11 For Placement of Clean Fill, Topsoil and Rock Armor

- Use wet methods during installation and excavation to control dust. Use Level D PPE.
- Adhere to general safety practices for operation of heavy equipment.
- Maintain safe distances of equipment and ground personnel.
- Ensure that personnel are aware of heavy equipment working around them.
- Ensure that all personnel exit equipment using three (3) point contact.

8.16.12 For Transport of Material for Off-Site Disposal

- Ensure that personnel are trained under DOT regulations.
- Verify that shipping papers are filled out correctly.

- If contact with chemicals or contaminated materials is anticipated consult the SHSO and don chemical protective gloves, booties and suit. Protective equipment kits should be kept in the transportation vehicle at all times.
- Ensure that all tailgates are tight fitting and are in accordance with DOT regulations
- Verify that transportation vehicles have been decontaminated prior to off-Site shipment.

8.16.13 For Restoring Disturbed Areas

- Use wet methods to control dust while operating heavy equipment.
- Ensure that personnel are aware of heavy equipment working around them.
- If contact with chemicals or contaminated materials is anticipated consult the SHSO and don chemical protective gloves, booties and suit.
- Use appropriate lifting techniques.

8.16.14 For Demobilization

- Use appropriate materials handling techniques while moving equipment and parts around.
- Use the proper tool for the job when installing signage, putting furniture together, etc.
- Be aware of pinch points when setting trailers.
- Pay special attention to housekeeping while demobilizing.
- Do not perform electrical work including making connections unless you are trained.

9.0 ENVIRONMENTAL MONITORING

This section describes instruments and procedures that will be used for environmental monitoring activities at the Antimony Mill VCP Site for both personal and perimeter monitoring. Environmental monitoring will be performed to assess and evaluate worker and/or general public exposure to potential hazards. Decisions regarding environmental monitoring will be made by the SHSO.

9.1 Air Monitoring Plan

The air-monitoring program will meet the following requirements:

1. Identify and quantify airborne levels of hazardous substances to which employees are exposed, based upon-site analysis of contaminants, which have been identified at the Site.
2. Initial monitoring shall be conducted upon initial entry to the Site to identify any IDLH condition, conduct representative real-time monitoring, evaluate the toxic exposure potential, and to identify explosion and/or oxygen deficient atmosphere.
3. This initial monitoring will be performed on the start-up of any new activity or a change in conditions of an existing activity.
4. Periodic monitoring shall be conducted during regular work cycles. Additional monitoring shall be conducted when sufficient changes at the Site have occurred which may affect the exposure potential of personnel engaged in activities on-site.
5. Monitoring shall be representative of employee exposure at the Site

9.1.1 Direct Reading Exposure Monitoring

Direct reading instruments will be used during Site remediation work to assess potential exposure to airborne contaminants and to verify the adequacy of PPE being used. Monitoring strategies will be based on tasks, contaminants, environmental conditions, and other factors.

If necessary, the following instruments will be available at the Antimony Mill VCP Site for exposure monitoring:

1. Dust Tracks
2. Organic vapor analyzer (OVA), including a PID
3. Combustible gas indicator (CGI)
4. Wet bulb globe thermometer (WBGT)
5. Colorimetric-indicating tubes
6. Sound-level meter (SLM)
7. Personnel Sampling Pumps (Gillian Pumps)

Monitoring logs will be kept by the SHSO for each piece of air monitoring equipment. The following information will be recorded:

1. Name and model number of the equipment
2. Date and time of monitoring
3. Air monitoring location
4. Calibration information
5. Background levels
6. Field work to be performed
7. Air monitoring results

8. PPE worn
9. Accidents or incidents
10. Unusual occurrences and personnel complaints
11. Name of person conducting monitoring and calibrations

9.1.2 General Areas (Breathing Zone)

A personal air sampling pump will be used on employees that are deemed by the SHSO to be working on an activity with the greatest chance to exceed the action level, excursion limit, ceiling limit, or TLV/PELs. Monitoring will be conducted during activities in which the potential for exposure to contaminated soils or materials exists. The SHSO or designee will perform this monitoring. A sustained reading for 5 minutes of 10 ppm will prompt engineering controls and dust abatement. If, after that, the sustained reading for 5 minutes of 10 ppm is still recorded, the crew will upgrade to respiratory protection.

In the unlikely event of volatile organic compounds (VOCs) being encountered, a PID will be used to monitor breathing zone concentrations of VOCs in each work area in the CRZ or EZ. The SHSO or designee will perform this monitoring if deemed necessary. A sustained reading of 10 ppm greater than background (noted from the clean area) in the breathing zone for 5 minutes will prompt an upgrade to Level C and the use of a detector tube to determine the contaminant being detected. Monitoring will be continued after the upgrade to Level C to ensure that PPE is appropriate for contaminants. If sustained organic vapor measurements are greater than 10 ppm but less than 100 ppm for unknown compounds or 10 times the PEL for known compounds, supplied respiratory protection is required. If sustained readings are greater than 100 ppm, control measures will be initiated to reduce the potential for exposure and the off-Site migration of vapor (i.e. covering excavation and/or use of water spray to dilute vapor concentration).

9.1.3 Data Quality Assurance for Air Monitoring

Calibration

All instruments shall be calibrated prior to use. Instrument calibration shall be documented on calibration logs. Calibration checks may be used during the day to confirm instrument accuracy. Duplicate readings may be taken to confirm individual instrument response. Air sampling pumps will be calibrated against a National Institute of Standards and Technology (NIST) before and after use. All instruments that fail to read within the manufacturers' specified range or within 20 percent of the standard will be immediately removed from service.

Operations and Maintenance

Instruments shall be operated and maintained in accordance with the manufacturers specifications. The manufacturer's operation and maintenance manual will be kept at the Site work location for each type of instrumentation in use.

Data Review

The CIH or other qualified person will assess and interpret monitoring data and results based on standard industry practices and his/her professional judgment.

Record Keeping and Posting

All samples submitted to an analytical laboratory either for perimeter or personnel sampling data will be accompanied with a chain of custody and any other documentation the lab may require. This documentation, air monitoring logs, calibration information, results of air sampling and current NIOSH or American

Industrial Hygiene Association accreditation certificates for the analytical labs shall be kept on-site in the RMEC field office.

RMEC is responsible for maintaining adequate records of Site monitoring activities, communicating or posting exposure information, and informing employees of monitoring results as may be required. All exposure monitoring and sampling records will be maintained at the Site and made available for inspection and review by representative(s).

Discontinuing or Changing Monitoring Requirements

With the concurrence of the representative(s), Site monitoring may be discontinued or changed after representative initial monitoring is conducted and worker exposures are shown to be adequately controlled through the use of engineering, work practice, or personal protective equipment control measures. If work activities change so that the initial monitoring is no longer representative of worker exposure, monitoring must be reinitiated.

9.2 Explosion Hazard Monitoring Plan

A CGI/LEL meter will be used in all permit-required confined spaces, during torch cutting of process piping and at other sites as appropriate to monitor the possible presence of explosive gases or vapors. The CGI will be an "inherently safe instrument" approved for Class 1 Division 1 locations. Equipment calibration will be performed daily before startup of work per manufacturer's instructions. The alarm will be set to 10 percent of the Lower Explosive Limit (LEL). If feasible, calibration gas should be specific to the combustible gases suspected to be present.

If the monitoring instrument indicates that the LEL is greater than 10 percent but less than 25 percent, personnel may continue work but exercise caution because of the higher levels. At >25 percent LEL, an explosion hazard exists and workers shall be removed from the area immediately and measures taken to reduce or control the conditions.

9.3 Oxygen Deficiency in Confined Spaces

Before entering a confined space, an oxygen meter must be used to measure the oxygen concentration in air. If the oxygen concentration is less than 19.5 percent or greater than 23.5 percent, entry to the space is prohibited. Intrinsically safe fans should be used to ventilate the area. If the oxygen concentration is less than 19.5 percent, Level B PPE must be donned to enter the confined space. Atmospheres above 23.5 percent are considered oxygen enriched and will substantially increase the potential for explosion. Entry into atmospheres greater than 23.5 percent oxygen is not allowed. (Note: Entry into a confined space requires that a permit be obtained from the SHSO).

9.4 Dust Monitoring Plan

Activities conducted at the Site will follow the *Fugitive Dust Control* requirements as presented in *Section 7.5* in the approved RAP. A real-time nuisance dust monitor will be used whenever there is visible dust in the work area. A sustained reading of 5 mg/m³ or ppm in the work area will require engineering controls to be applied until RMEC or RMEC's subcontractor can reduce the dust levels.

If personal exposure monitoring is required, NIOSH Method 7082 will be used and results posted in accordance with OSHA regulations.

9.5 Noise Monitoring Plan

Noise monitoring will be conducted to determine areas where hearing protection is required, and to determine employee exposures. Area noise surveys will be performed using a sound-level meter. Personal noise monitoring will be performed using dosimeters to determine whether worker exposure levels exceed OSHA's 8-hour time weighted average of 85 dBA. Personal noise monitoring shall be performed in accordance with 29 CFR Section 1926.52. All monitoring results will be documented per the requirements of this HASP.

9.6 Heat Stress Monitoring Plan

If warranted, heat stress monitoring shall be conducted to assist in determining and maintaining appropriate work/rest regimens. An electronic WBGT monitor will be used to compare values against the ACGIH Permissible Heat Exposure TLV for workers wearing other than impermeable protective clothing. For workers wearing impermeable protective clothing, initial work/rest regimens will be established using the adjusted temperature index or equivalent. Periodic physiological monitoring (e.g., pulse rate and core temperature [measured in the ear]) shall be used to verify effectiveness and modify work/rest regimens as needed.

9.7 Heavy Metal Exposure Monitoring Plan

The primary COCs for the Antimony Mill VCP Site remediation are antimony, arsenic, and thallium, with two exposure pathways, inhalation or ingestion. Dust control and worker personal hygiene are, therefore, the two most important aspects of producing a safe working environment. The OSHA standard for arsenic is applicable only if workers are exposed to levels exceeding five micrograms per cubic meter (5 µg/m³) or parts per billion (ppb). It is unlikely that work activities from the impacted soils will create an exposure level above this action level. Therefore, workers will initially be equipped with a personal sampling pump and cassette to conform that the construction procedures being employed do not result in worker exposure exceedances.

Personnel exposure monitoring may be performed for other RMEC employees to assess the adequacy of PPE and document employee exposure if the potential for exposure to a contaminant above an action level is possible. An action level is described as 50 percent of the PEL or TLV, whichever is the most conservative. For respirable particulates, an action level of 5 mg/m³ or ppm shall be used for determining when respiratory protection against dust is required. Frequency and type of personnel monitoring at the repository will be determined by the SHSO based on work activities and environmental conditions. However, there are several areas at the Site where specific personnel monitoring is required. Personal dust samples will be required for antimony, arsenic, and thallium during excavation of the most-highly impacted areas of soil.

Exposure monitoring strategies for dusts, fumes, noise or organic vapors shall be based on the current activities, type of work being performed, environmental conditions and the hazards present. Personnel exposure monitoring shall be conducted in accordance with all applicable regulations and standards. Monitoring will be conducted under the following guidelines:

- Personal exposure sampling will be performed where real time instrument readings indicate the potential for employee exposures at concentrations greater than published exposure limits.
- Personal exposure sampling will be conducted in the employees' breathing zone. A minimum of two full shift samples representative of worst-case exposure will be taken to draw preliminary conclusions. Where necessary additional sampling will be conducted.

- When monitoring is performed, sampling pumps will be checked for proper operation at least every 20 to 30 minutes throughout the day. If the monitoring period is only 10 to 30 minutes long, then the pumps should be observed the entire time.
- Employees shall be given the opportunity to observe all monitoring.
- Personal sampling equipment will be calibrated to a primary calibration standard before and after use.
- When personal exposure sampling is performed, the employee representing the worst-case exposure for a given work group (representing a homogenous exposure) will be selected for sampling.
- During the sampling period, the employee will be observed to determine what activities represent the greatest exposure potential.
- Work activities, practices or protective equipment may be changed based upon the sampling analytical results.
- Area sampling may also be performed to gauge the hazard potential of certain areas and tasks or effectiveness of control methods.
- Personal and area sampling and analysis (sampling strategy and analytical methods) will be performed in accordance with the OSHA Industrial Hygiene Technical manual, the NIOSH Manual of Analytical Methods, and acceptable industrial hygiene practices.
- Analytical laboratories accredited by the American Industrial Hygiene Association will perform sample analysis. Prior to sampling, the specific sampling and analytical method should be discussed with the receiving laboratory to determine any special requirements or variations to established methods necessary to collect an acceptable sample. The laboratory selected for analyzing occupational samples will have successfully participated in the latest round of the NIOSH performance analytical test program.
- The laboratory analysis will include field blanks, as required by the individual method or laboratory.
- Sampling analytical results will be provided in writing to the employee within 5 days after receipt of monitoring results. Results will be placed in the employee's permanent file.
- Sampling and analytical information for personal sampling shall be documented and filed in RMEC's office trailer.

9.8 Explosive Limits

If conditions encountered during excavation suggest that potentially explosive conditions may exist the SHSO will cease activities until appropriate health and safety procedures in the explosive environment can be evaluated. Explosive conditions or vapors that might lead to explosive conditions have not been detected in previous assessments of the property.

9.9 XRF Soil Screening

Site workers may be exposed to metals in soil and sediment and require additional characterization during Site activities. Therefore, XRF soil screening in areas requiring additional characterization will be utilized to support Site EZ extents. Based on XRF soil screening, the setback areas will be modified if data indicates concentrations above the Remedial Action Objectives (RAO) and Cleanup Levels as referenced in the RAP *Section 4.7*.

9.10 Noise

Noise generated by excavation equipment exceeds 85 dB in short periods. Experience indicates that for an 8-hour TWA, excavation activities planned on-site will not exceed the 85 dB TWA limit. However, as a standard practice, hearing protection will be provided to employees to use on a voluntary or as-needed basis.

9.11 Dust

Dust control measures should be implemented at all times during intrusive construction activities, if necessary. These activities include, but are not limited to, the following: soil excavation, trenching, grading, and all other below ground surface activities. If dust control measures are not effective for a particular activity, the activity will be halted until an appropriate dust control measure can be developed.

10.0 PERSONAL PROTECTIVE EQUIPMENT (PPE)

PPE shall be selected, used, maintained, and stored in accordance with 29 CFR Section 1910, Subpart I. Engineering, administrative, and/or work practice controls shall be implemented where feasible, rather than relying exclusively on PPE for hazard control.

10.1 Minimum Site PPE Requirements

All field personnel will wear PPE to protect against the potential physical and chemical hazards that have been identified herein and those that become apparent in the field. Level D protection will be required at a minimum for field activities at the Site. All field personnel on the Site during all intrusive construction activities shall wear, at a minimum, the following Level D PPE:

- Standard work clothes. Loose clothing that may catch in moving parts will not be worn.
- Steel-toe safety boots
- ANSI-approved safety glasses or goggles
- ANSI-approved hard hat
- High-visibility vest (while heavy equipment is in operation)
- Leather or canvas work gloves, when necessary
- Chemical resistant gloves—disposable PVC or nitrile (dependent on skin contact potential)
- Hearing protection, ear plugs or ear muffs (during grading and other high-noise activities)
- Tyvek® coveralls (optional, dependent on skin contact potential)
- Chemical resistant boots/covers (optional, dependent on skin contact potential)
- Respiratory protection, half or full-faced (dependent on dust and fume production potential).

Whenever intrusive field work is conducted, the following equipment will be available at the Site (e.g., field vehicle, or at a designated location in the SZ):

- Ear plugs, disposable
- Eye wash bottle(s)
- An ABC fire extinguisher (inspected annually)
- First aid kit that meets the requirements of 29 CFR Section 1926.50
- Orange snow fencing, traffic cones, caution tape, or similar type barrier materials
- Safety goggles or a face shield should be used when a foreseeable splash hazard exists

Hearing protection is recommended for use during heavy machinery operations. Hearing protection will be worn if a preliminary noise survey or past experience indicates that maximum noise levels will exceed 85 decibels at any time during Site operations.

10.2 Training

Appropriate training for all PPE users will be provided by RMEC in the initial Site-specific training given to all workers. Additional training will be performed in 40-hour hazardous waste operations and emergency response training, and daily safety meetings. Emphasis of PPE training will be on the appropriate methods for wearing PPE, donning and doffing correctly, limitations of PPE, action levels for upgrading PPE and emergency responses.

10.3 Inspection of PPE

All personnel who will be required to wear PPE during the course of their work activities will be trained on the proper techniques for inspecting PPE. All PPE will be inspected prior to each use and frequently during the day while in use. Once a week during intrusive activities in affected areas, the SHSO will observe employees wearing PPE and ensure that appropriate inspections are occurring. Results of the SHSO survey will be presented in the daily tailgate meeting.

10.4 Selection of PPE Level and Use

Selection and use of PPE shall be based on the chemical and physical hazards associated with the materials being graded and placed into the repository and the potential for contact with materials while being excavated and transported from tailing areas. RMEC shall maintain an adequate selection of PPE to allow for the handling of unexpected materials.

Anticipated PPE for each major work task were documented in the JHA for that task, located in **Section 6.0**—Site Hazard Control Measures. The SHSO will select the level of PPE for each Site based on tasks, existing conditions, air monitoring, and available analytical data. The need to upgrade or downgrade the level of PPE will be determined and authorized by the SHSO. The SHSO will determine appropriate action levels for upgrading PPE based on air monitoring and hazard evaluation completed during the mobilization phase of work. Respiratory action levels are defined in **Section 7.0—Basic Toxicology and Exposure Guidelines for On-Site Chemicals**.

The level of protection employed may be upgraded, as deemed necessary by the SHSO. If non-routine field activities are initiated, the level of protection will be specified in the activity-specific health and safety addenda. For unknown, uncharacterized, and unanticipated situations, field activities must begin in Level C PPE. Downgrading to Level D PPE will not be permitted until analytical data for the Site have been reviewed. The SHSO must approve all downgrades.

10.5 PPE Terminology

The PPE terminology is defined as follows:

10.5.1 Level D PPE

Personal protective equipment required when minimal skin hazards may exist, but no respiratory protection is required. The following constitutes Level D PPE:

- Safety vests (optional)
- Sleeved shirt
- Full-length pants
- Thermo-luminescent dosimeter (TLD) (If determined necessary through initial radiological screening)
- Boots/shoes; chemical-resistant, steel toe and shank
- Safety glasses or chemical splash goggles meeting ANSI Z.87.1 requirements
- Hard hat meeting ANSI Z.89.1 requirements
- Earplugs and/or earmuffs (optional as applicable)
- Face shield (decontamination pad employees)
- Rain-gear (decontamination pad employees, optional as applicable)
- Safety harnesses, lanyards and lifelines (optional as applicable)

10.5.2 Modified Level D PPE

This level of protection is used when concentration(s) and type(s) of airborne substance(s) are known to be below the permissible exposure limits (PELs) or Threshold Limit Values (TLVs), and when prevention of dermal contact is needed. Air purifying respirators should be readily available.

The following constitute Modified Level D PPE, which may be used as appropriate:

- Safety vests (optional)
- Sleeved shirt
- Half-face respirator (available depending on air monitoring data)
- Full-length pants
- Thermo-luminescent dosimeter (TLD) (If deemed necessary for initial survey)
- Boots/shoes; chemical-resistant, steel toe and shank
- Safety glasses or chemical splash goggles meeting ANSI Z.87.1 requirements
- Hardhat meeting ANSI Z.89.1 requirements
- Coveralls
- Work Gloves
- Safety harnesses, lifelines and lanyards (optional as applicable)
- Earplugs and/or earmuffs (optional as applicable)
- Face shield (decontamination pad employees)

10.6 Chemical Respiratory Protection

Respiratory protection for all RMEC employees will be used in accordance with minimum specifications of commercially obtainable respirators. RMEC's basis for selecting respiratory protection, the assignment of respirators to workers, fit testing, inspection, daily cleaning, disposal of damaged respirators and requirements for training will be monitored by the Site SHSO and modified if Site conditions change. The SHSO has the overall responsibility for determining respiratory protection based on-site conditions, contaminants, engineering controls and specific work tasks.

10.6.1 Purpose and Objective

The purpose of RMEC's program is as follows:

- Provide adequate respiratory protection to Site personnel where there is a potential for exposure to toxic or nuisance substances in excess of allowable concentrations.
- Provide adequate respiratory equipment to employees who may request such equipment.
- Determine that employees assigned to Site work requiring respiratory protection are physically able to wear respiratory protection equipment.

Objectives of the respiratory protection programs are as follows:

- Address the Site hazards, the need for respiratory protection, and the selection of the appropriate NIOSH or Mine Safety and Health Administration (MSHA)-approved equipment during preparation of this HASP.
- Use engineering controls at the work Site to minimize the potential for exposure. If engineering controls are not feasible, respiratory equipment must be used.
- Make available to employees the appropriate Respiratory Protection Policy describing the issuance, cleaning, inspection, and storage of respirators.

- Fit test employees that are required to wear respirators using ANSI-approved fit-testing techniques. Fit test records and respiratory issuance forms are maintained by the SHSO.
- Ensure that respirators are inspected, maintained, sanitized, and appropriately stored.

Note: Change-out of air purifying respirator cartridges will be completed on a schedule determined by the SHSO. All cartridge change-out schedules will be based on a cartridge loading assessment as described in 29 CFR Section 1910.134. At a minimum, cartridges will be changed out daily when used.

Site visitors, subcontractors, or others who may request entry into the EZ must show proof of current annual respirator fit testing. Copies of this documentation will be kept readily available on-site, as applicable.

10.6.2 Use of Respiratory Protection

The SHSO will use analytical soil sampling data (if available) and real-time monitoring to ensure that personnel are in the appropriate level of respiratory protection. The SHSO will use the following action levels to upgrade PPE:

- Dust - A sustained reading for 5 minutes of 5 mg/m^3 will prompt engineering controls and dust abatement. If after that the sustained reading for 5 minutes of 5 mg/m^3 is still recorded the crew will upgrade to respiratory protection.
- Oxygen - In areas such as confined spaces where oxygen is less than 19.5%-Level B is required
- Antimony, arsenic, and thallium - Action levels for specific contaminants will be determined by the SHSO based on the PEL.

Respiratory protection will consist of half-face air purifying respirators with P-100 cartridges. All personnel required to wear respirators shall have medical approval to wear the respirators and a current respirator fit test on record. The RMEC SHSO will perform a respirator fit test for those workers needing one if they can provide evidence of medical approval to wear a respirator.

10.6.3 Record Keeping

RMEC will maintain current fit test records and medical certifications for all employees who are required to wear a respirator during the course of their job duties. These records will be maintained in the health and safety files located at RMEC's office trailer.

In addition, MSDS or Chemical Hazards Response Information System (CHRIS) Sheets will be available at the Site for materials that will be used on-site and substances that pose a reasonable health and safety risk to Site personnel as listed in **Section 5.3**. The MSDS Sheets are included in **Appendix F**.

11.0 EMERGENCY RESPONSE AND CONTINGENCY PLAN

This Emergency Response and Contingency Plan (ERCP) section must be reviewed and updated, by the SHSO, prior to initiating any intrusive field activities on the Site. This section details contingency procedures that have been developed to deal with major incidents that might occur during field activities.

11.1 General Information

Pertinent emergency information and contingency plans are provided in this section. Copies of RMEC's ERCP will be maintained in the RMEC office trailer by the SHSO.

11.1.1 Employee Training

All RMEC personnel performing work at the Site will be trained on the contents of this Emergency Response and Contingency Plan (ERCP) prior to starting work and when tasks or conditions change. Training shall include the contents of this ERCP, assembly points and identification of the Emergency Management Organization. Review of the ERCP will be included in Site Specific training.

11.2 Emergency Reporting

11.2.1 Notification

As part of RMEC's pre-emergency planning, the SHSO will verify that all cell phones being used have the capability to reach local emergency authorities through dialing 911.

11.2.2 How to Report an Emergency

When calling 911 for assistance in an emergency situation, the following information should be provided:

1. Name of person calling
2. Telephone number of caller's location
3. Name of person(s) exposed or injured
4. Nature of emergency
5. Location of the emergency
6. Actions already taken

The recipient of the call should hang up first, not the caller.

11.2.3 General Personnel Accounting Procedures and Assembly Point

RMEC's SHSO shall designate an assembly point on the property and notify all personnel of that assembly point. All employees at other remote locations will report to the assembly point or notify their SHSO immediately of their location. The SHSO will verify that all employees are accounted for. If any employees are unaccounted for, the SHSO will immediately notify the fire chief of the number of personnel missing and their possible location.

11.2.4 OSHA Reporting

If an incident occurs where there is loss of life or more than three employees hospitalized, verbal reporting to OSHA is required as soon as possible. The CIH or Site Manager is responsible for performing this notification. The phone number for OSHA is 1-800-321-6742.

11.2.5 Key Contact Information

Key contacts (name, address, and telephone number) for HASP project communication purposes will be established by the SHSO at the beginning of each field activity involving intrusive work on the Site. The SHSO will maintain this "List of Emergency Telephone Numbers" of key contacts. At a minimum, the key contacts shall include the following:

- Contractors, corporate health and safety officer
- Project manager
- Property owner's representative
- Business owner's representative

A copy of the "List of Emergency Telephone Numbers" will be carried, along with the contractor's and the subcontractors' (if available) mobile phones. Contingency response plans will be reviewed with on-site personnel weekly to promote timely implementation of the contingency plan should one of the events described in the following section occur.

11.3 Public Relations

Members of the press or other interested parties may ask RMEC employees questions regarding the Site or the situation. All RMEC employees will refer all questions to the appropriate representative. This policy will also be in place during non-emergency situations.

11.4 Emergency Site Communications

Defining methods of communicating to emergency services is an important part of emergency planning activities. Listed below are the communications methods to be used for both office and field personnel on The Site. These methods shall be modified or augmented, if necessary, based on actual Site conditions. In addition, this section addresses the appropriate practices for addressing public relations in emergency situations.

11.4.1 Administrative and Management Support Personnel

Administrative and management support personnel will be working primarily in offices at the Site with dedicated phone systems. Phones will be used as the primary form of communication with emergency services. Secondary or back-up communications include the use of motor vehicles, cellular telephones or other phones. The RMEC field office will also have a hand-held radios for communication with each other and onsite field personnel.

11.4.2 Communication of Field Personnel to Emergency Services

Personnel working in the field will use radios or cellular phones as the primary form of communication with emergency services. Key employees such as the Site Manager and SHSO will carry cellular telephones.

Radios will be provided to work crews as necessary. Cellular phones and radios shall be tested before field operations begin to ensure that they perform adequately between the Site location and emergency services.

11.4.3 Communication Among Field Site Personnel

Communication protocols for field personnel include the following:

- Radios - Radios are utilized as appropriate by field teams for communication with the Site support facilities and base station.
- Airhorns or bullhorns - Airhorns or bullhorns may be used by the Site Manager or SHSO during an emergency situation, if no other form of communication is available. Procedures for the use of airhorns or bullhorns will be covered in Site Specific Training.
- Hand Signals - Hand signals shall be used by field teams along with the buddy system to ensure that potential emergency situations are communicated to all Site personnel. Hand signals are particularly important when communicating with heavy equipment operators or in areas where speaking is impaired (respirator use, areas of high noise). The entire field team shall become familiar with the hand signals used before operations commence and hand signal use shall be covered during Site-Specific training.

Hand Signals

When voice communication is not possible, field workers may utilize the following signals:

- Waving hand toward the body in a "come here" gesture - COME HERE.
- Pushing one or both hands away from the body in a "back up" gesture - BACK UP.
- Extending both arms, hands open, palms forward, and stopping them abruptly, directly in front of the torso at shoulder level - STOP RIGHT WHERE YOU ARE.
- Throwing the right clenched fist with extended right thumb abruptly over the right shoulder in a "let's get out of here" gesture – LET'S GET OUT OF HERE!
- Thumbs up - YES/EVERYTHING'S OKAY.
- Thumbs down - NO/THIS DOESN'T LOOK GOOD.
- Hands grasping throat – I'M CHOKING/OUT OF AIR.
- Hands of top of head - I NEED ASSISTANCE.

11.5 Locations of Resources Available to Onsite Personnel

- Toilet Facilities: RC will provide chemical toilets at the office complex and other areas as needed.
- Drinking Water: RC will supply drinking water in the office trailers at the office complex and Site personnel will carry personal water to designated field locations.
- Telephone: Field personnel will have a cellular phone on-site. Additionally, land-line phones can be set up at the office complex.
- Radios: All supervisory RMEC, RC, or employees on-site will have access to a field radio and the field office will have a base station.

11.6 Emergency Response Equipment

The field vehicles will be stocked with the following emergency response equipment:

- 5-pound ABC-rated fire extinguisher

- Two eyewash bottles
- Small first aid kit

In addition to the equipment required on vehicles, the SHSO will maintain the following response equipment on-site:

- Large first aid kit
- Eyewash station
- Fire extinguishers
- Fire blanket
- Emergency response disposable PPE
- Personal decontamination supplies

11.7 Emergency Preparedness

In an effort to prevent or minimize incidents that may occur at the Site, RMEC will put several preventative measures in place. These measures include:

- Pre-emergency planning will be completed by the SHSO. This planning will include, reviewing potential emergency situations with the Site Manager, discussing emergency preparedness with the local emergency services representatives, and holding emergency response drills.
- The SHSO will ensure that all cellular phones used on-site have the capability to reach local emergency authorities through dialing 911.
- Emergency response training will be provided to all employees who will participate in the ERT.
- ERCP training for all employees will be conducted prior to job start-up
- Maintenance of the emergency response equipment
- Routine inspections to determine emergency situations that may exist.
- Discussion with Site management about contingencies in case an emergency must cause work to halt or change.
- Posting of Hospital routes and emergency numbers in general work area.

11.8 Emergencies and Assistance

If an emergency develops on-site, personnel shall immediately help the person(s) requiring attention by giving first-aid assistance. If additional help is required, the SHSO will summon emergency rescue or provide transportation to the nearest emergency medical facility or other assistance as necessary.

When Site investigation and removal activities are occurring on the Site, vehicles or equipment shall not block access to the Site at any time. Emergency vehicle access shall be maintained at all times.

11.9 First Aid

The SHSO will be immediately advised of any situation requiring more than minor first aid. An industrial first-aid kit and ABC fire extinguisher will be available adjacent to the work area. The first aid kit must meet the requirements of 29 CFR Section 1926.50, and will be maintained in the contractor's and subcontractor's field vehicle and/or office trailer. The first aid supplies will be replenished by the SHSO as needed. Personnel aware of accidents or injuries will take immediate action to ensure that appropriate first aid is administered and will report the incident to the SHSO.

11.10 Contingency Plans

These contingency plans have been developed by RMEC to present procedures that should be followed in the event of an emergency at the field Site. This section also specifies the general procedures you should follow, who you should notify, and the information you should report if you are the first on the scene of an emergency. A variety of events that are potential hazards to human health and the environment are discussed, including the following:

- Medical emergencies
- A fire or explosion
- Chemical exposure
- Severe weather
- Earthquake
- A chemical or petroleum spill or accident
- Other events presenting a hazard to human health or the environment

11.10.1 Response Sequence for First Arrivals

If you are first on the scene, respond as follows:

1. Evacuate the incident area (if necessary). Remember that your safety must be the primary consideration.
2. Restrict access to the incident area.
3. Restrict the use of ignition sources for incidents involving flammable substances.
4. Call 911. Report the following information:
    a. Your name
    b. Company affiliation
    c. Telephone number from which you are calling
    d. Location and type of incident
    e. Injuries, if any, and the number and type of those injuries
    f. Details concerning the substance(s) involved (identification, amount, spill rate, size of area involved), if known
    g. Direction the spill is moving (if applicable) and the direction the wind may be dispersing airborne contaminants
    h. Surficial material on which the spill occurred (i.e., asphalt, gravel, etc.)
    i. Any first response action that has been taken
    j. The time the incident occurred or when you discovered it
    k. Any additional pertinent information
5. Notify the SHSO after the emergency response team has been contacted. The SHSO will then notify the CIH.
6. Coordinate with emergency response personnel when they arrive.

11.11 Medical Emergency Response Plan

Should any person visiting or working at the Site be injured or become ill, notify the SHSO and initiate the following emergency response plan:

- If able, the injured person will proceed to the nearest available source of first aid. If necessary, wash the injured area with soap and water.

- **Eye Injury** - If the injury involves foreign material in the eyes, immediately flush the eyes with emergency eye wash solution and rinse with copious amounts of water at the nearest emergency eye wash station. Obtain or administer first aid as required. If further medical treatment is required, seek medical assistance as discussed below.
- If the victim is unable to walk, but is conscious, and there is no evidence of spinal injury, escort or transport the injured person to the nearest first aid facility. If the victim cannot be moved without causing further injury, such as in the case of a severe compound fracture, take necessary emergency steps to control bleeding and immediately call for medical assistance as discussed below.
- If the victim is unconscious or unable to move, **Do Not Move the Injured Person Unless Absolutely Necessary to Save His or Her Life** until the nature of the injury has been determined.
- **Spinal Injury** - If there is any evidence of spinal injury, do not move the victim. Administer CPR if the victim is not breathing, control severe bleeding, and immediately contact Emergency Medical Services (911) and advise them of the situation. Otherwise, seek medical assistance as discussed below.
- If the injury to the worker is related to the physical hazards previously identified in Section 2.0, appropriate first-aid procedures will be instituted as follows:
    - **Hypothermia** – If a worker suffers from hypothermia, medical attention will be sought immediately. The employee will be moved out of the cold, and warm clothing or blankets will be provided. Warming will take place slowly; no food or beverage will be administered.
    - **Frostbite** – Any worker suffering from frostbite will be moved to a warm area immediately. Frostbitten areas of the body will be placed in warm (100 to 105 degrees) water, NOT hot water. Areas of concern will be handled gently and will not be rubbed or massaged. If toes or fingers are affected, gauze will be placed between them after warming them. The injured parts will be loosely bandaged. If the part has been thawed and refrozen, it will be rewarmed at room temperature. If necessary, medical assistance will be sought.
    - **Heat Stroke** – If a worker suffers a heat stroke, medical attention will be sought immediately. The victim will be moved out of the heat and into a cooler area. The victim will be cooled as quickly as possible by immersing him or her in a cool bath, or wrapping wet sheets around the body. While waiting for an ambulance to arrive, the victim will be watched for symptoms of shock. Nothing will be given orally.
    - **Heat Exhaustion** – If any worker suffers from heat exhaustion, he or she will be moved out of the heat and into a cooler place. The victim will lie down with his or her feet up. Clothing will be removed or loosened; cold packs, wet towels, or sheets will be used to cool the skin. One-half glass of water will be administered every 15 minutes if the victim is fully conscious and can tolerate it. During all of these procedures, the victim will be observed for symptoms of shock. If the victim has not recovered within a half-hour, or if the victim's condition worsens, medical attention will be sought.

If further medical treatment is required and

a) The injury is not severe, contact the local hospital and take the injured party to the hospital by private automobile.
b) The injury is severe, immediately call Emergency Medical Services (911).

The SHSO will accompany the injured person to the hospital to ensure prompt and proper medical attention. After proper medical treatment has been obtained, the SHSO shall document the incident.

Note that the anticipated nature of chemical constituents that may be encountered during intrusive field activities does not present an immediate threat to human health. Immediate emergency treatment of injuries will take precedence over rigorous personal decontamination.

11.12 Fire and Explosion

In the event of a fire or explosion, the SHSO will take the following steps:

- If the situation is readily controllable, take immediate action to do so.
- If the situation is uncontrollable, clear personnel working in the immediate area and notify the local Fire Department (911).
- Notify the SHSO.

Contractor personnel will remain at the scene of the fire until the local fire department arrives. Once professional firefighting personnel have arrived, contractor personnel will remain at the disposal of the fire chief. The SHSO will function as liaison between response personnel in the incident.

11.13 Chemical Exposure First Aid

The following procedures will be followed in case of chemical exposure during intrusive field activities:

- **Eye contact**: flush with clean water for 15 minutes or more. Try to flush under the lids. Get medical attention immediately.
- **Inhalation**: get person to fresh air. Monitor for signs of exposure. Watch for signs of respiratory difficulty. Call EMS (911). Perform emergency rescue breathing, if appropriate, until relieved by an emergency unit.
- **Skin contact**: flush area with clean water for at least 15 minutes. If burns are evident, get immediate medical attention. Do not use soap on affected area. BEWARE: Signs and symptoms may develop later due to dermal exposure.
- **Ingestion**: If contaminated materials are ingested, vomiting will not be induced. Medical attention will be sought immediately.

If anyone has been overexposed or has shown or is showing signs of exposure, he/she will be examined by a physician, according to OSHA's 1910.120 (f).

11.14 Severe Weather Response Plans

This section specifies what you should do in the event of a severe weather emergency, including electrical storms, high winds, heavy rain or hail, and tornadoes. A general response to natural disasters is:

- Report to your assigned area.
- Each supervisor will make an accurate head count
- Do not panic.

11.14.1 Electrical Storms

- Seek shelter at the support facility or in the field vehicles.
- Do not stand near or under high objects, such as trees or power poles.

11.14.2 High Winds

- Seek shelter at the support facility (if anchored) or in the field vehicles.
- Do not drive high profile vehicles at high speeds.

- Park vehicles heading into the wind.
- Don a respirator or wear safety goggles and a kerchief covering your nose and mouth.

11.14.3 Heavy Rain or Hail

- Seek shelter at the support facility or in the field vehicles.
- Do not attempt to drive a vehicle if you are in an area that is or has the potential for flooding, unless you are moving out of a low area.

11.14.4 Tornadoes

- Seek shelter underground or in a closet, bathroom, or interior wall of a substantial building. Get under something sturdy and cover your head.
- Do not stay in a trailer or vehicle. Leave the trailer or vehicle and lie flat in the nearest ditch if substantial shelter is not available.
- Stay away from large areas of glass.
- Stay away from large unsupported roofs.
- Drive a field vehicle away from the tornado's path if the tornado is far enough away to do so safely. (Note: This is not a recommended response because tornadoes can change direction or travel faster than anticipated, which puts you in more danger than you would be if lying in a ditch.)

11.15 Flash Floods Emergency Response

If a flash flood warning is issued, climb to higher ground. Seek shelter on stable ground. Do not stay in an area that is characterized by uncompacted loose material on a steep slope. For work in the streambed or low-lying areas, flash floods are unlikely but a possibility. When working in the streambed areas, stay alert to changing weather conditions including those that may not be in the immediate vicinity, but upgradient within the watershed.

11.16 Earthquakes Emergency Response

If you are INSIDE:

If an earthquake occurs while you are in a building or structure, follow these instructions:

- Stand in an interior doorway or get under a desk or table.
- Stay away from areas containing a large amount of glass.
- Do not use stairways or elevators during the tremor.
- If possible, turn off gas supplies and ignition sources.
- Be aware of the potential for live downed wires.
- Make sure the telephone handset is on the hook. Do not use the telephone for non-emergency calls.
- Evacuate the building when the tremors have ceased. Be aware of the potential for aftershocks.
- Walk briskly. Do not run. Do not pick up personal items.
- Report to a predetermined assembly area and notify your supervisor or the area monitor that you are safe.
- Report missing persons.

If you are OUTSIDE:

If an earthquake occurs while you are outside, follow these instructions:

- Avoid buildings, trees, areas with large amounts of glass, and power lines.
- Avoid downed wires.
- If operating heavy equipment or a motor vehicle, stop immediately but stay in the vehicle until the tremors have stopped.
- If operating a motor vehicle on a bridge, proceed to solid ground if the end of the bridge is close.
- If operating a motor vehicle on a bridge at mid-span, get out of the vehicle and begin walking to the nearest solid ground.

11.17 Fire Prevention and Protection Plan

The Antimony Mill VCP Site has the potential for range fire as well as construction-related fires. Major workplace fire hazards include:

1. Vegetation
2. Construction Debris
3. Lubricants
4. Fuels
5. Cleaning and Degreasing Agents
6. Building Materials

Possible sources of ignition include:

1. Lightning
2. Internal combustion Engines
3. Smoking
4. Electrical Spark
5. Friction
6. Welding
7. Open Flame

Steps to be taken to minimize the potential of a fire include the following:

- Obey "No Smoking" signs and only use a designated smoking area located out of exclusion zones.
- Label and store flammable liquid containers in a protected, ventilated, and approved area.
- Use only approved containers for flammable liquid storage.
- Use minimum amounts of flammable liquids.
- Shut off engines before refueling, if possible.
- Do not refuel a hot engine, unless an ABC-rated fire extinguisher is nearby.
- Store oily rags in a self-closing metal container. Dispose such containers properly.
- Bond and ground all flammable liquid containers and transfer equipment when transfer-ring or filling product.
- Use intrinsically safe equipment in areas potentially containing flammable vapor.
- Maintain good housekeeping, promptly remove and dispose of accumulation of combustible scrap and debris.
- Don’t allow rubbish to accumulate.
- Maintain adequate clearance between heating facilities and combustible materials.
- Ensure that exits of all office and work trailers are clearly marked.

Motorized field equipment will be fitted with onboard fire extinguishers; fire suppression equipment will also be mounted in the office facility area. During Site orientation, instruction will be given to RMEC's and its subcontractor's employees on the use of fire suppression equipment.

Fire Marshal

The Fire Marshal oversees fire safety throughout the county under the direction of the Fire Chief. This is done by conducting annual or semi-annual inspections on businesses throughout the county to ensure operating conditions are not endangering life or property. Inspections are also required seasonally on fireworks stands as well as to any type of mass gathering in an attempt to mitigate accidents or injury. The Fire Marshal is also over the inspection of new construction that requires fire sprinkler protection whether it is residential, commercial or industrial.

Fire Warden

The Fire Warden oversees all wildland operations in the county whether that is fire mitigation through education, actual brush clearing, to fire suppression activities. The Fire Warden operates under the Fire Chief and also the State Forestry and Land Fire Management Officer. The Warden is involved with the various developments in the wild land urban interface throughout the county in the prevention and mitigation of wild fires and each area's specific risks.

11.18 Fire Emergency Response Plan

If a small fire occurs on a piece of equipment and it is possible to do so safely, extinguish it with the on-board fire extinguisher. Remember to follow these directions to put out the fire:

- PASS = Pull, Aim, Squeeze, Sweep
- Aim at the base of the flame.
- Use the appropriate type of fire extinguisher (e.g., do not use a water type fire extinguisher on an electrical fire or on combustible or flammable liquid).
- Remember that the spray only lasts a few seconds.

If a large fire occurs at the work Site:

- Notify a supervisor immediately.
- Move flammable and combustible items out of the path of the fire.
- Do not attempt to put out a large fire with the field vehicle fire extinguisher.
- Evacuate the work area immediately.
- Call 911.
- Report to your assigned assembly point.
- Do not address medical emergencies until you are out of danger.
- Each supervisor will make a head count to ensure that all personnel are accounted for.
- Ensure that at least two RMEC personnel remain on-site approximately 30 feet upwind until Emergency Services has arrived to brief the response team.

The assigned assembly point for the project for those personnel working in the repository area will be on Antimony Mill Road by the main entrance. The signal for employees to assemble in the designated area is three long blasts with an emergency air horn. The same procedure is to be followed in the case of an explosion.

Because the danger of a range fire is possible either through the work at the Site or through an act of nature, the following procedures are to be followed in the case of a major fire:

- Precautions to prevent fires spreading beyond piles being burned will include a firebreak and adequate equipment to maintain and control burning activities.
- Compliance will be made with agreements between the Bureau of Land Management and the Contracting Officer's Representative for prevention of fires and suppression of any fires that occur in the immediate area of work.
- If burning is performed, a suitable supply of hand tools and other necessary fire equipment and supplies for use in the suppression of fires shall be readily available.
- Prior to burning a material, the burn area will be inspected by the Fire Department representative and the contractor to mutually agree that adequate provisions have been made to burn safely.
- For the purpose of fighting range and forest fires on, or in the vicinity of, the project that were not caused by the Contractor or the Contractor's employees and when requested by the Contracting Officer's Representative, the Contractor's employees and equipment shall be placed temporarily at the disposal of the Fire Department.
- Any employees and equipment furnished will be relieved from firefighting as soon as the Fire Department finds that it is practicable to employ other labor and equipment adequate for protection of the area.

11.19 Spill Prevention

To minimize the potential for a spill, follow these guidelines:

- Receive instruction concerning recognition of potential spill problems, preventative maintenance actions, and increased safety awareness.
- Inspect stored materials at the beginning of each work shift. Note container condition, as well as any leaks or staining that may be related to or indication of a potential spill. Any abnormalities and steps taken to remedy the situation must be reported immediately to the Site Supervisor and SHSO.
- Inspect vehicles and equipment at the beginning of each day. Note equipment conditions, as well as any leaks or staining that may be related to or indicative of a potential spill. Loose and or worn connections and worn hoses will also be noted. Any abnormalities must be reported immediately to the Site Supervisor and SHSO and steps should be taken to remedy the situation before continuing transfer activities.
- Make sure that hazardous materials are compatible with the containers in which they are being used or stored. Do not store materials that are likely to react when exposed together in the same area. Caustics and corrosives will be stored in separate cabinets affixed with caution labels. Spillable items, if stored on shelves, will be no higher than 4 feet off the floor surface. (This height is to limit the potential for getting a toxic substance in the eyes.)
- Store containers larger than 1 gallon separately from smaller quantities. Larger liquid storage containers will be stored in a warehouse and must have a secondary containment system. This system can be as simple as a liner with a berm constructed of 4-inch by 4-inch boarding and should be able to contain an amount 10 percent greater than that of the original container.
- Transfer liquid with catch basins under each joint or valve or with the hose or pipe lined so that no liquid can escape.

11.20 Spill Reporting

Releases involving quantities of a hazardous material greater than the reportable quantities in 40 CFR Section 302.4—Hazardous Substances or 40 CFR Section 355.40—Extremely Hazardous Substances, must meet federal reporting requirements. The project/facility must comply with the federal reporting requirement once it has been determined that the reportable quantity release has occurred in a 24-hour period by an immediate notification of the National Emergency Response Center at (800) 424-8802. This number is available 24 hours day, 365 days per year.

Types of spills that are required to be reported to the EPA include:

- Extremely Hazardous Substances (as defined by 40 CFR Section 355)
- Comprehensive Environmental Response Compensation and Liability Act (CERCLA) Hazardous Substances (as defined by 40 CFR Section 302)
- Oil spills that cause sheen on navigable waters or are in excess of the Reportable Quantity (RQ)

In addition to the Federal reporting requirement, the project/facility must immediately notify the Utah Department of Environmental Quality (DEQ) using the following 24-Hour Utah Department of Environmental Quality emergency telephone number: (801) 536-4123

Please contact the SHSO or CIH for additional guidance regarding spill reporting.

11.21 Initial Spill Response

When a fuel or other chemical spill occurs, respond as follows:

1. Call the SHSO to report the incident.
2. Minimize or contain the flow by shutting off a valve, repairing the leak, righting an over-turned barrel, or similar appropriate action. Remember that your safety is of primary concern. Only attempt emergency response actions if you can do so without injury or harm to yourself.
3. Provide first aid to injured persons as needed.
4. Maintain a perimeter around spill area to ensure that unauthorized public access is prevented.
5. Remain at a safe distance until your supervisor or Emergency Services advises you to return to your work area.

For additional information on spill response and specific notifications, refer to RMEC's Spill Prevention and Control Plan.

11.22 First Aid Plan

Personnel injured while working on the job Site are to be given immediate first aid as appropriate. Emergency medical response teams should be contacted and apprised of the injury as soon as the injured person is stabilized or made comfortable. Emergency response personnel are to be informed of Site contaminants and someone knowledgeable of the Site will accompany the injured person to the hospital.

11.23 Overexposure

In cases where an employee has received an overexposure or the employee is exhibiting symptoms of an overexposure, follow this protocol:

- Assess whether the employee needs immediate medical attention. If medical attention is required, contact the SHSO to determine if project personnel should transport employee to a medical facility or if on-site first aid is adequate.
- If off-Site medical attention is deemed necessary, a RMEC employee should accompany the person to the hospital.
- Provide as much information as possible to the attending physician about the material the employee was exposed to.
- If the employee does not require immediate medical attention, remove the person from the area.
- Provide first aid as needed.
- Notify the SHSO and CIH.
- The SHSO will then don appropriate chemical protection and perform air or soil monitoring as appropriate. Samples of the contaminated material can be taken and submitted to a laboratory for analysis to gauge the exact concentration and nature of the contamination.
- All monitoring results will be provided to the employee.

11.24 Personnel Contamination

If clothing or skin becomes contaminated with hazardous materials, the following steps will be taken:

- If the contamination is on clothing, the employee will attempt to remove the clothing without spreading contamination.
- If the contamination is on skin, the employee will try to brush off contamination using a damp cloth. If this does not remove the contamination, the employee will call the SHSO for further instructions.

11.25 Unforeseen Circumstances

The Health and Safety procedures specified in this plan are based on available data that suggest minimal potential for worker exposure to significant levels of hazardous substances. If substantially higher levels of contamination are encountered in the soil, surface water, or groundwater, and/or if situations arise that are obviously beyond the scope of the monitoring, respiratory protection and decontamination procedures specified, work activities will be modified or, if necessary, halted pending discussion with the SHSO and implementation of appropriate protective measures.

11.26 Accident and Injury Investigations

After an incident has occurred, the SHSO and Site Manager will convene a meeting within 24 hours that includes personnel involved in the incident in order to review procedures and understand the root causes of the injury. The point of this meeting is to simply improve the first aid or emergency management system and not to place blame. Documentation of this critique session will be attached to the incident form and placed in RMEC's file for the project. Additionally, any transcripts of conversations with state and federal agencies regarding any emergency situation will be included.

11.27 Accident/Incident Reports

After the incident has been addressed, the SSHO must follow the Incident Reporting Procedures and complete the RMEC Incident investigation form (**Appendix I**). This report shall then be forwarded to the CIH and the Project Manager. Additionally, incidents shall be reported to the client as soon as possible and followed by a written report within five days.

A health and safety incident report will be prepared if incidents such as the following occur:

- Illness
- Injury
- Fire, explosion
- Vehicular accident
- Property damage
- Unexpected exposure
- Health and safety infraction

The report will provide a description of the incident, its possible cause, individuals involved, witnesses, and emergency or corrective actions taken. The report will be delivered to the SHSO within one day, if the incident involves medical treatment and five days for other incidents.

12.0 REFERENCES

American Conference of Governmental Industrial Hygienists (ACGIH). *1991-1992 Threshold Limit Values (TLV) for Chemical Substances and Physical Agents and Biological Exposure Indices,* 1997.

EarthTouch, Inc. *Remedial Action Plan (RAP) – Former Antimony Mill, Voluntary Cleanup Program VCP Site #C106,* May 8, 2023.

International Agency for Research on Cancer (IARC), 1987 to 1998.

National Institute for Occupational Safety and Health (NIOSH) / Occupational Safety and Health Administration (OSHA) / United States Coast Guard (USCG) / U.S. Environmental Protection Agency (EPA). *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities*, October 1985.

OSHA. *Construction Industry Standards,* 29 CFR Section 1926.

OSHA. *General Industry Standards,* 29 CFR Section 1910.120. *Hazardous Waste Operations and Emergency Response (HAZWOPER)*.

OSHA. *Permissible Exposure Level based on 8 hour time weighted average,* 29 CFR Section 1910 Subpart Z.

U.S. Department of Health and Human Services (DHHS). *NIOSH Occupational Health Guidelines for Chemical Hazards*, January 1991.

U.S. DHHS. *NIOSH Pocket Guide to Chemical Hazards,* Publication 2010-168c. September 2010. website: http://www.cdc.gov/niosh/npg

Utah Hogle Zoo Public Relations. *Wild Aware Utah,* website: http://www.wildawareutah.org/utah-wildlife-information/snakes

APPENDICES

APPENDIX A:

PERSONNEL ACKNOWLEDGEMENT OF HASP

APPENDIX B:

DAILY TAILGATE MEETING & HEALTH & SAFETY BRIEFING FORMS

APPENDIX C:

INCIDENT INVESTIGATION /NEAR MISS INVESTIGATION REPORT

APPENDIX D

PROPOSED PUBLIC NOTICE

PUBLIC NOTICE
Utah Department of Environmental Quality
Voluntary Cleanup Program (VCP)

The public is invited to provide comment on a Remedial Action Plan that describes mitigation activities related to residual ore and tailings from historical operations at the former Antimony Mill located in Antimony Canyon about 5.5 miles to the east of the town of Antimony in unincorporated Garfield County, Utah (Site). The Site has been impacted by past uses and mitigation actions to minimize potential human and environmental exposures to potential contaminants include excavating residual ore piles, mill tailings, and impacted soil; and transporting and disposing of these materials at a permitted facility. Mitigation actions will be carried out by The Richard William Davis Trust, the applicant of record to the VCP. Copies of the Remedial Action Plan are available for review at the Utah Department of Environmental Quality, Division of Environmental Response & Remediation, 195 North 1950 West, Salt Lake City, Utah 84116. For information, contact Chris Howell at (801) 536-4100 (chowell@utah.gov). The public is encouraged to comment on the RAP through (*date*).