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February 7, 2013

MEMORANDUM

SUBJECT: First Five-Year Review Report for the Richardson Flat Tailings Site

FROM: Kathryn Hernandez, Remedial Project Manager

TO: Martin Hestmark, Assistant Regional Administrator
Office of Ecosystems Protection and Remediation

Please find attached the first Five-Year Review Report for the Richardson Flat Tailings Site (the site). The review was conducted from November 2012 to February 2013 to determine whether the remedies at the site are protective of human health and the environment.

The review is required by statute and consists of the following activities: review of relevant documents, interviews, review of applicable or relevant and appropriate requirements, and a site inspection.

Review results indicate that Richardson Flat Tailings Site has been successful in significantly reducing contaminant levels in the source area of Operable Unit 1 (OU1). The remedy for OU1 currently protects human health and the environment in that:

- Tailings and sediments have been excavated
- Tailings have been contained through capping with clean soil and
- Surface waters exiting the site meet existing water quality standards.

However, in order for the remedy to be protective in the long term, institutional controls need to be implemented that include restrictions on future land and groundwater use.

I recommend that you accept the attached report.

Attachment

Printed on Recycled Paper

First Five-Year Review Report
for Richardson Flat Tailings
EPA ID UTD980952840

Park City
Summit County, Utah

February 2013

Prepared by
Region 8 USEPA
Denver, Colorado

Martin Hestmark,
Assistant Regional Administrator
Office of Ecosystems Protection
and Remediation

3/14/13
Date

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List of Acronyms

ARAR	Applicable or Relevant and Appropriate Requirement
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CIC	Community Involvement Coordinator
EPA	United States Environmental Protection Agency
FYR	Five-Year Review
IC	Institutional Control
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
O&M	Operation and Maintenance
OU	Operable Unit
PCV	Park City Ventures
PRP	Potentially Responsible Party
RAO	Remedial Action Objective
ROD	Record of Decision
RPM	Remedial Project Manager
TMDL	Total Maximum Daily Load
UDEQ	Utah Department of Environmental Quality
UPCM	United Park City Mines
USCWSG	Upper Silver Creek Watershed Stakeholders Group

Executive Summary

Introduction

The Richardson Flat Tailings Superfund site (the Site) initially covered 160 acres and is located two miles northeast of Park City, Utah. A tailings dam and impoundment on site were used to capture and hold mill tailings from 1953 until 1981, resulting in contamination of soil, groundwater, surface water and air. Contaminants of concern include arsenic, cadmium, copper, lead, mercury, silver and zinc. The EPA proposed the site for listing on the National Priorities List (NPL), but withdrew the proposal prior to final listing. This Five-Year Review (FYR) addresses Operable Unit 1 (OU1). The triggering action for this FYR is the remedial action start date of February 7, 2008.

The Site was expanded to address Lower Silver Creek, which is designated as Operable Unit 2 (OU2). OU2 is located two miles east of Park City, in Summit County, Utah. OU2 is part of the Silver Creek Watershed. OU2 extends approximately 4.5 miles along the banks of Silver Creek from US Hwy 40 on the southern end of the Site, downstream to I-80 on the northern end of the Site. Contaminants of concern in OU2 include arsenic, cadmium, lead and zinc in the soil, sediment, surface water and shallow groundwater. United Park City Mines (UPCM) is beginning the remedial investigation of OU2 in 2013 and therefore OU2 is not included in this FYR.

Technical Assessment

The OU1 remedy is performing as intended. Source materials have been excavated and covered with clean soil; surface waters exiting the Site are below appropriate standards. The Phase 5 Completion Report of the physical remedy was approved by the EPA on November 3, 2011. The Remedial Action Report will be drafted by the PRP and submitted to the EPA for approval when the repository is closed. Institutional controls needed to protect the soil cover and restrict groundwater use have not yet been implemented, but in the interim, no unacceptable exposures are occurring. Risks have been significantly reduced, allowing for potential recreational use in the future. No information has come to light that could call into question the protectiveness of the remedy.

Conclusion

The remedy at OU1 currently protects human health and the environment because tailings and sediments have been excavated; tailings have been contained through capping with clean soil; and surface waters exiting the Site meet existing water quality standards. However, in order for the remedy to be protective in the long term, institutional controls that include restrictions on future land and groundwater use need to be implemented.

The recommended institutional controls include the following:

- Permanently limit the land use to open space with wildlife habitat and non-motorized recreational use
- Permanently restrict new groundwater well installation and use of shallow groundwater within the impoundment area
- Permanently preserve the low-permeability tailings cap and specify the ongoing erosion control and maintenance requirements
- Permanently prohibit unauthorized excavation at the site and of the cap material

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site Name: Richardson Flat Tailings		
EPA ID: UTD980952840		
Region: 8	**State:** UT	**City/County:** Park City/Summit

SITE STATUS	
NPL Status: Proposed	
Multiple OUs? Yes	**Has the site achieved construction completion?** No

REVIEW STATUS
Lead agency: EPA
Author name (Federal or State Project Manager): Kathryn Hernandez and Ryan Burdge
Author affiliation: EPA Region 8 and Skeo Solutions
Review period: 11/01/2012 – 02/07/2013
Date of site inspection: 11/12/2012
Type of review: Statutory
Review number: 1
Triggering action date: 02/07/2008
Due date *(five years after triggering action date)*: 02/07/2013

Issues/Recommendations

OU(s) without Issues/Recommendations Identified in the Five-Year Review:
OU2

Five-Year Review Summary Form (continued)

Issues and Recommendations Identified in the Five-Year Review:

OU(s): 1	Issue Category: Institutional Controls			
	Issue: Institutional controls called for in the ROD are not yet in place.			
	Recommendation: Implement necessary institutional controls to ensure the soil cover is protected and the shallow groundwater is not used. EPA and the PRP will identify the appropriate control instrument and the PRP will be responsible for implementation.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
No	Yes	PRP	EPA	2/15/2014

Protectiveness Statement(s)

Operable Unit: 1	*Protectiveness Determination:* Short-term Protective	*Addendum Due Date (if applicable):* Click here to enter date.
Protectiveness Statement: The remedy at OU1 currently protects human health and the environment because tailings and sediments have been excavated, tailings have been contained through capping with clean soil and surface waters exiting the Site meet existing water quality standards. However, in order for the remedy to be protective in the long term, the following action needs to be taken: implementation of institutional controls that include restrictions on future land and groundwater use. The recommended institutional controls include the following: permanently limit the land use to open space with wildlife habitat and non-motorized recreational use; permanently restrict new groundwater well installation and use of shallow groundwater within the impoundment area; permanently preserve the low-permeability tailings cap and specify the ongoing erosion control and maintenance requirements; permanently prohibit unauthorized excavation at the site and of the cap material.		

First Five-Year Review Report
for Richardson Flat Tailings Superfund Site

1.0 Introduction

The purpose of a five-year review (FYR) is to evaluate the implementation and performance of a remedy in order to determine if the remedy is protective of human health and the environment. FYR reports document FYR methods, findings and conclusions. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The United States Environmental Protection Agency (EPA) prepares FYRs pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Section 121 and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). CERCLA Section 121 states:

> If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each 5 years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.

The EPA interpreted this requirement further in the NCP, 40 Code of Federal Regulations (CFR), Section 300.430(f)(4)(ii), which states:

> If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after initiation of the selected remedial action.

Skeo Solutions, an EPA Region 8 contractor, provided contract support for conducting the FYR at the Richardson Flat Tailings site (the Site) in Park City, Summit County, Utah. This FYR was conducted from November 2012 to February 2013. The PRP is leading the cleanup with the EPA providing oversight. The Utah Department of Environmental Quality (UDEQ), as the support agency representing the State of Utah, has reviewed all supporting documentation and provided input to the EPA during the FYR process.

This is the first FYR for the Site. The triggering action for this statutory review is the on-site construction start date of the remedial action, February 7, 2008. The FYR is required because hazardous substances, pollutants or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure. The Site consists of two operable units (OUs). This FYR only considers OU1 because remedial action has not started for OU2.

2.0 Site Chronology

Table 1 lists the dates of important events for the Site.

Table 1: Chronology of Site Events

Event	Date
EPA discovered contamination	October 1, 1984
EPA proposed the Site to the National Priorities List (NPL)	June 24, 1992
PRP initiated the Site's remedial investigation/feasibility study	September 29, 1989
PRP completed the Site's remedial investigation/feasibility study	July 1, 1992
EPA signed the Site's Record of Decision (ROD) for OU1	July 6, 2005
PRP initiated the Site's remedial design for OU1	August 7, 2007
PRP completed the Site's remedial design and initiated remedial action for OU1	February 7, 2008
PRP and the EPA signed an administrative settlement agreement and order on consent for remedial investigation/feasibility study for OU2	September 29, 2009

3.0 Background

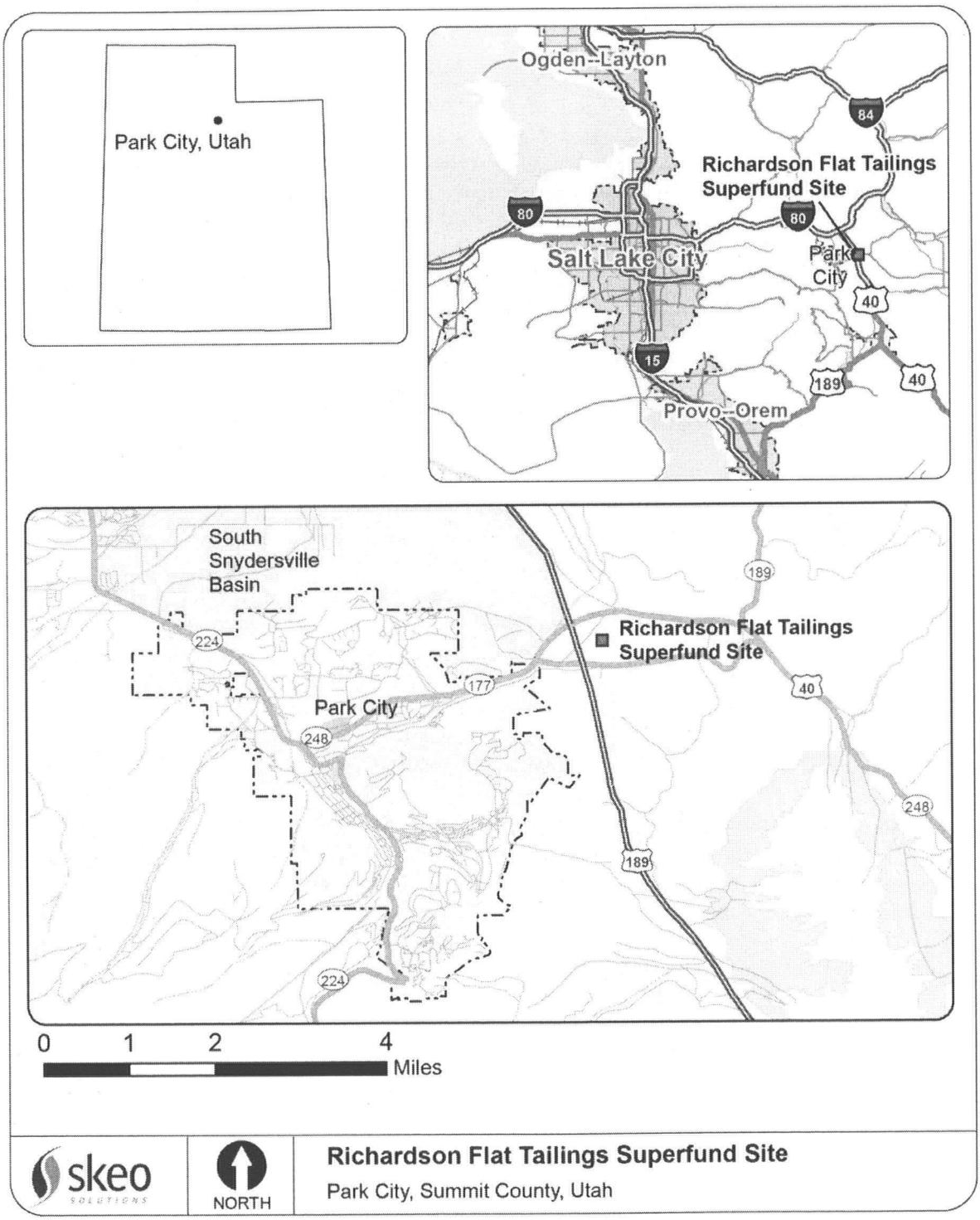
3.1 Physical Characteristics

The Site is an inactive mill tailings impoundment located about 1.5 miles northeast of Park City in Summit County, Utah (Figure 1). The Site lies within the northwest quarter of Section 1 and northeast quarter of Section 2, Township 2 South, Range 4 East, Summit County, Utah. The Richardson Flat property is owned by United Park City Mines (UPCM) and covers approximately 650 acres in a small valley. The OU1 tailings impoundment covers approximately 160 acres in the northwest corner of the property. The impoundment was a mine tailings reservoir prior to 1950 and now houses approximately 7 million tons of sand-sized carbonaceous particles and minerals containing zinc, silver, lead and other metals.

The majority of the Site is a geometrically closed basin, bounded by Highway 248 to the north, a main embankment to the west, and diversion ditches to the south and the northeast (Figure 2). Silver Creek can be found on the northwest border of the Site, separated from the Site by a small stretch of wetlands and riparian vegetation. The Site is part of the much larger Upper Silver Creek Watershed and Silver Creek is the primary surface water source found in the area. Three significant drainages in the watershed, including Ontario Canyon, Empire Canyon and Deer Valley, comprise Silver Creek. Historic mining activities in area canyons left behind six CERLCA sites, each impacting Silver Creek. Because of the volume of mining activity throughout the district and the dynamics of the watershed hydrogeology, it is difficult to identify any one site as the main source of contamination affecting the Silver Creek watershed.

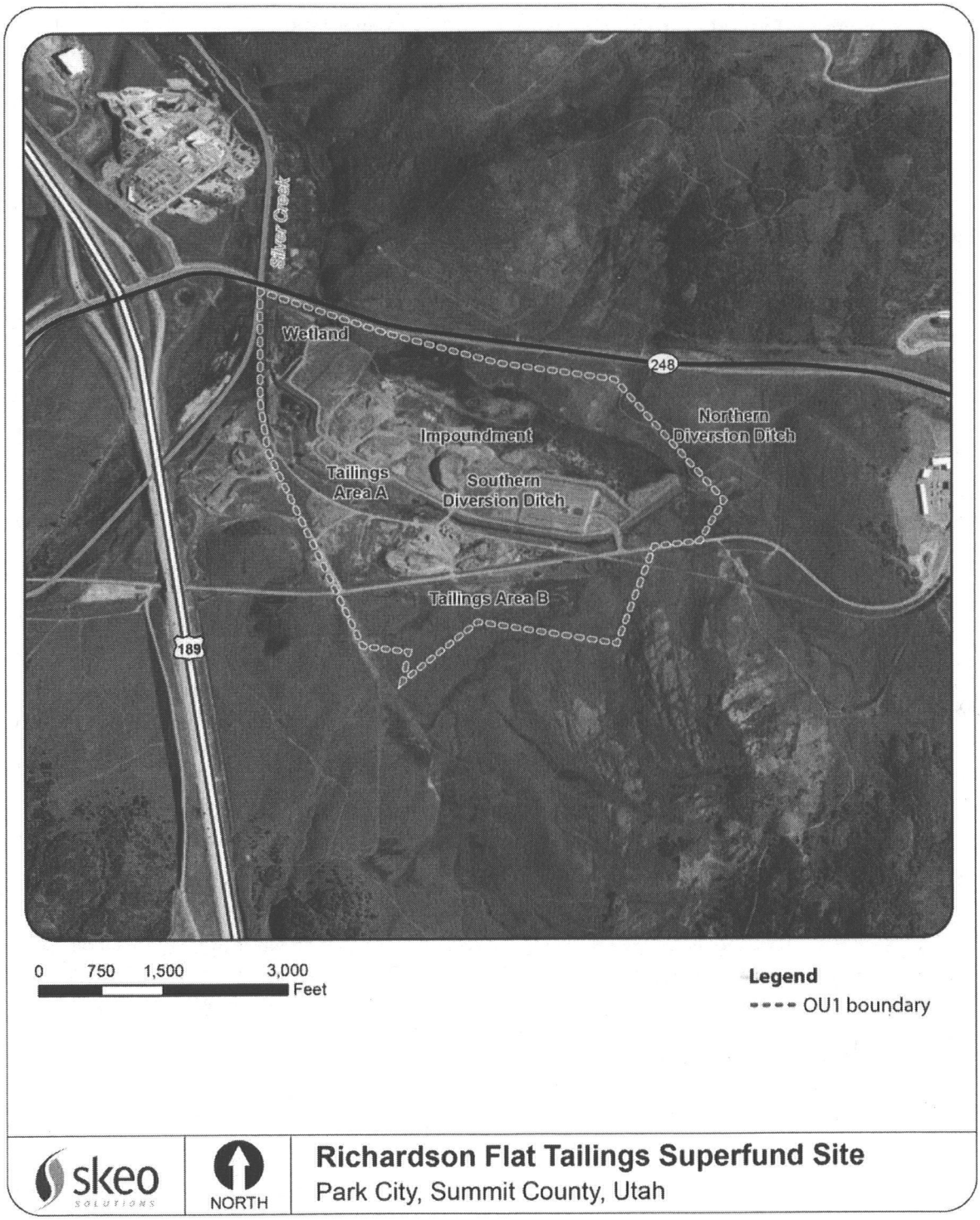
The tailings in the main impoundment (Area A) and the tailings south of the diversion ditch (Area B) are considered the primary waste sources. Impacted media at OU1 include sediments in the south diversion ditch and the wetland area, and the surface waters. A clay layer underlies the tailings in Area A and Area B, so infiltration of groundwater into the underlying aquifer is limited. Surface water at the Site is generally limited to four areas: the wetland area located below the embankment area, the south diversion ditch, the pond located at the terminus of the south diversion ditch and seasonal ponding on the impoundment. The wetland below the embankment, pond and south diversion ditch are the only year-round surface water on site. Water flows from the Site into Silver Creek, located to the northwest of the Site. Seasonally, accumulated precipitation and snow melt can be found on the surface of the main impoundment.

Figure 1: Site Location Map



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site.

Figure 2: Detailed Site Map



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site.

3.2 Land and Resource Use

The Site is located in a rural area within a broad valley of mostly undeveloped rangeland. Most of the land around the Site is undeveloped open space. There are a few small industrial operations near the Site, including a concrete plant on a nearby parcel. Park City and other resort-like residential developments are expanding in the general area. None is closer than 1 mile away.

The Site, and much of the surrounding area, is privately owned by UPCM. Anticipated future land uses for the Site include a mixture of open-space and recreational uses. While no final decision has been made, uses that range from open space wildlife habitat to athletic fields have been discussed. Currently, a small recreational trail skirts the Site along Silver Creek.

The surface water features at the Site, including the south diversion ditch, the wetlands area below the embankment, the pond and Silver Creek are habitat for a limited number of vegetative species, fish and wildlife. All of the surface water and shallow groundwater on the Site eventually discharges to Silver Creek. Silver Creek is classified by the State of Utah as a potential drinking water source, a recreational use feature, a cold water fishery and a potential irrigation source. At present, Silver Creek is used for irrigation and recreational fishing only, and no changes to its use are expected. The State of Utah is considering issuing an advisory against fishing due to elevated metal levels in Silver Creek due to historic mining activities in the area.

The Site does not present a risk to off-site groundwater, but on-site groundwater does contain metals in excess of drinking water standards. Deep groundwater in the immediate area is used only for private wells, and no wells are known to be located within a half mile of the Site. The shallow groundwater at the Site is generally associated with the alluvial system of Silver Creek. This water is very high in solids and is also often contaminated due to water quality in Silver Creek and tailings that are present along the creek in many areas. There are no known uses for the shallow groundwater at this time.

3.3 History of Contamination

In 1953, UPCM was formed through the consolidation of Silver King Coalition Mines Company and Park Utah Consolidated Mines Company. At that time, the Site was already an impoundment for mine tailings. Additionally, tailings were transported to and placed in several distinct low elevation areas in the southeast portion of the Site just outside of the main impoundment. Over time, tailings materials also settled out into these three low areas that were ultimately left outside and south of the present impoundment area as constructed in 1973-74. An embankment constructed along the western area of the Site also appears to have been in place as part of the original design and construction of the tailings pond.

In 1970, Park City Ventures (PCV) entered into a lease agreement with UPCM allowing PCV to deposit additional mine tailings at the Site. Site modifications included

installation of a large embankment along the western edge of the impoundment, construction of containment dike structures along the southern and eastern borders of the impoundment, and creation of a diversion ditch system along the higher slopes north of the impoundment and outside of the containment dikes along the east and south perimeters of the impoundment to collect surface run off.

Over the course of PCV's use of the Site, about 450,000 tons of tailings were deposited through a slurry pipeline that originated at its mill facility. In addition, from 1980 to 1982, Noranda Mining, Inc. leased the mining and milling operations and placed approximately 70,000 tons of tailings at the Site. The companies discontinued use of the impoundment in 1982.

While in operation, PCV deposited the tailings from the slurry pipeline in one constant area in the center of the impoundment, creating a steep, cone-like structure in the middle of the impoundment. After PCV discontinued its use of the Site in 1982, high winds caused tailings from the cone-shaped feature to become airborne.

3.4 Initial Response

The EPA became aware of the Site in the mid-1980s and began initial site assessments in 1984. High-volume air sampling at the Site in 1986 found that arsenic, cadmium, lead and zinc had been released to the air. The EPA originally proposed the Site for listing on the National Priorities List (NPL) in 1988, but ultimately decided not to pursue final listing on the NPL.

In 1993, the EPA Region 8's Superfund Emergency Response Branch conducted an investigation under the "Make Sites Safe" initiative. The investigation concluded that conditions at the Site did not warrant emergency removal actions, but could present unacceptable risks to human health and the environment and should be addressed through long-term remedial action.

Throughout the 1990s, the EPA and UDEQ anticipated UPCM would address the Site through the Utah Voluntary Cleanup Program. UPCM decided against this, but at the same time continued to voluntarily take steps to improve environmental conditions at the Site. Additionally, UPCM began collecting hydrogeologic data, which was used to better understand the groundwater flow and depth of tailings at the Site.

In 1999, EPA, UDEQ, UPCM, Park City Municipal Corporation and other stakeholders formed the Upper Silver Creek Watershed Stakeholders Group (USCWSG). This community-based organization was formed to help the EPA address Superfund-related environmental issues in the Park City area in a cooperative fashion, including issues related to the Site. USCWSG has been very successful and several investigations and cleanups have occurred in Park City as a result. Early in USCWSG's history, UPCM and the EPA agreed to address the Site as an "NPL equivalent" site, using the same process for investigation and cleanup that is required for an NPL site.

On September 28, 2000, the EPA and UPCM signed an Administrative Order on Consent, which called for UPCM to conduct a remedial investigation/focused feasibility study for the Site. Sampling events for the remedial investigation took place in 2001 and 2002. Samples were collected from the various site media, including surface water, groundwater, Area A and B tailings, Area A and B soil cover, and sediments in the south diversion ditch and wetlands area. Sampling confirmed contamination with heavy metals, primarily zinc, lead and arsenic, in the sediments and surface water of the south diversion ditch, the site wetland and Silver Creek.

3.5 Basis for Taking Action

The Site's 2003 baseline human health risk assessment determined there were potential future risks from lead and arsenic to the targeted use population, recreational visitors. The EPA deemed remedial action necessary to maintain and improve the soil cover that was placed on the tailings and prevent disturbances to the soil cover that could allow for exposure to the underlying tailings.

The ecological risk assessment determined there were substantial risks to ecological receptors at the Site from exposure to zinc, cadmium, lead and arsenic found in the various environmental media at the Site. Exposure pathways include direct contact with the sediments within the south diversion ditch and the wetlands area. These exposure areas also present risks to ecological receptors through contact or ingestion of surface water and sediment porewater found at the Site.

4.0 Remedial Actions

In accordance with CERCLA and the NCP, remedial actions are required to protect human health and the environment and to comply with applicable or relevant and appropriate requirements (ARARs). A number of remedial alternatives were considered for OU1, and final selection was made based on an evaluation of each alternative against nine evaluation criteria that are specified in Section 300.430(e)(9)(iii) of the NCP. The nine criteria are:

1. Overall Protection of Human Health and the Environment.
2. Compliance with ARARs.
3. Long-Term Effectiveness and Permanence.
4. Reduction of Toxicity, Mobility or Volume through Treatment.
5. Short-term Effectiveness.
6. Implementability.
7. Cost.
8. State Acceptance.
9. Community Acceptance.

4.1 Remedy Selection

The EPA signed a Record of Decision (ROD) in 2008, selecting a remedy for OU1 of the Site. To address the existing and potential risks, as well as accommodate the anticipated future recreational and ecological use of the Site, the EPA developed nine remedial action objectives (RAOs):

1. Reduce risks to wildlife receptors in the wetland area and south diversion ditch such that hazard indexes for lead are less than or equal to 1.
2. Ensure that recreational users, including children, continue to have no more than a 5 percent chance of exceeding a blood lead level of 10 micrograms per deciliter from exposure to lead in soils.
3. Ensure that recreational users, including children, continue to have no more than 1 x 10^{-4} chance of contracting cancer from exposure to arsenic in soils.
4. Eliminate the risk of catastrophic failure of the tailings impoundment.
5. Ensure that surface water discharged from the Site meets applicable Utah water quality standards.
6. Eliminate the possibility of future groundwater use and withdrawal at the Site;
7. Allow for a variety of future recreational uses.
8. Allow for future disposal of mine tailings from the Park City area within the tailings impoundment until the remedy is complete.
9. Minimize post-cleanup disturbance of tailings and contaminated soil. Provide controls that ensure any necessary disturbance at the Site follows prescribed methods.

The selected remedy addresses mine tailings located in several areas of the Site, including the main impoundment, a section south of the diversion ditch, and the wetlands below the embankment. Other media addressed through the selected remedy are sediments and surface water located within the OU1 boundary.

Major components of the remedy require that:

- Tailings in critical areas outside the impoundment are excavated and moved inside the impoundment.
- Existing soil cover is augmented to achieve a depth of at least 18 inches of soil above tailings.
- Sediments in diversion ditch are covered with clean gravel.
- Contaminated sediments and soils in the wetland below the embankment are excavated and material is placed within the impoundment.
- Wetlands will be restored.
- Embankment is fortified to prevent catastrophic failure.
- Institutional controls (easements and land use restrictions) are implemented to protect soil cover and prevent groundwater use.
- Surface water monitoring is ongoing.

In the short term, the selected remedy allows for placement of mine wastes from other cleanup locations in the Silver Creek Watershed at the Site. This will reduce the cost to implement other cleanups by eliminating the need to haul wastes to a landfill and aid in the overall cleanup of the watershed. Only select locations in the impoundment, generally low spots that require fill, would be used for this purpose.

Surface Water

Discharges from the south diversion ditch are expected to be consistently below the appropriate water quality standards for protection of aquatic wildlife. For zinc, the most critical metal, this value is dependent on water hardness, but is generally between 0.1 and 0.8 milligrams per liter (mg/L). Water discharging from the Site is expected to continue to be of better quality than Silver Creek, and will create a net improvement in water quality downstream. Water quality samples will be collected at the mouth of the diversion ditch quarterly for two years after construction completion to ensure that discharges into Silver Creek meet applicable water quality standards.

Sediments

All sediments in the diversion ditch will be covered with clean fill. All sediments in the wetland will be excavated and replaced with clean fill as necessary. This is based on the physical dimensions of these features, rather than on concentrations within the media. To ensure that all contaminated sediments are removed in the wetland, a remediation goal of 310 milligrams per kilogram (mg/kg) lead was established. This is expected to bring all hazard indices for aquatic wildlife below 1.

Soils

All soil contamination will be covered with at least 18 inches of clean soil (12 inches of low permeability soil plus 6 inches of topsoil), so there should be no appreciable residual human health risk due to incidental exposure if the soil cover is maintained. As an additional measure, soils will be sampled and no soils with concentrations greater than 500 mg/kg lead will be left exposed. Some risks will be associated with potential disturbance of buried tailings, but these are considered minimal and manageable with institutional controls.

Groundwater

The Site does not present a risk to off-site groundwater, but on-site groundwater does contain metals in excess of drinking water standards. Groundwater use at the Site will be restricted through institutional controls to ensure no future unacceptable exposures.

4.2 Remedy Implementation

The PRP initiated the OU1 remedial design on August 7, 2007, and completed it on October 7, 2007. Remedial action began on February 7, 2008. The Phase 5 Completion Report of the physical OU1 remedy was approved by the EPA on November 3, 2011. Completed remedial activities include (see Appendix F for map of remedial task areas):

- Excavation of tailings outside the impoundment. Removal areas include B-1-W, B-2-E, B-3-E, the pond area, the embankment wetland area, and the east and west portions of the south diversion ditch.
- Cover placement in Area B-1-W, F-8 and the rail grade portion of B-3-E.
- Temporary cover placement in F-2 and F-3.
- Surface grading and drainage control.
- Construction of a wedge buttress along the embankment.
- Planting of vegetation to prevent erosion.
- Wetland construction.

Confirmation sampling verified that soils remaining in each source removal area and soils placed as cover contain less than 500 mg/kg lead and 100 mg/kg arsenic. Surface water monitoring has been performed annually to ensure no migration of metals from the Site.

4.3 Operation and Maintenance (O&M)

OU1 is not yet construction complete and O&M activities have not yet commenced. General maintenance issues are related to small and limited revegetation sites that are generally less than 100 square feet.

5.0 Progress Since the Last Five-Year Review

This is the first FYR for the Site.

6.0 Five-Year Review Process

6.1 Administrative Components

The EPA Region 8 initiated the FYR in October, 2012 and scheduled its completion for February 2013. The EPA remedial project manager (RPM) Kathy Hernandez led the EPA site review team, which also included the EPA community involvement coordinator (CIC) John Dalton and contractor support provided to the EPA by Skeo Solutions. The review schedule established consisted of the following activities:

- Community notification.
- Document review.
- Data collection and review.
- Site inspection.
- Local interviews.
- FYR Report development and review.

6.2 Community Involvement

In November 2012, the EPA published a public notice in the Park City newspaper announcing the commencement of the FYR process for the Site, providing contact information for Kathy Hernandez and John Dalton and inviting community participation. The press notice is available in Appendix B. No one contacted the EPA as a result of the advertisement.

The EPA will make the final FYR Report available to the public. The EPA will place copies of the document in the designated site repository: Park City Public Library, located at 1255 Park Avenue Park City, Utah 84060. Upon completion of the FYR, the EPA will place a public notice in the Park City newspaper to announce the availability of the final FYR Report in the Site's document repository.

6.3 Document Review

This FYR included a review of relevant, site-related documents, including the ROD, remedial action reports and recent monitoring data. A complete list of the documents reviewed can be found in Appendix A.

Remedial actions are required to comply with the chemical-specific ARARs identified in the ROD. In performing the FYR for compliance with ARARs, only those ARARs that address the protectiveness of the remedy are reviewed.

Chemical-specific ARARs for surface water identified in the ROD include the Utah Surface Water Quality Standards and Utah Groundwater Standards. The ROD indicated that discharges from the south diversion ditch are expected to be consistently below the appropriate water quality standards for protection of aquatic wildlife, but did not specify specific numerical standards. Currently Surface water data are screened against Utah Surface Water Quality Standards; the most stringent of these standards are the Class 3A Aquatic Wildlife Chronic Criteria. These standards are dependent on hardness and are adjusted appropriately for an average hardness measured at each sample location. There have been no relevant changes to these standards since the ROD was signed.

6.4 Data Review

Soil

Confirmation sampling verified that soils remaining in each source removal area and soils placed as cover contain less than 500 mg/kg lead and 100 mg/kg arsenic.

Surface Water

Surface water samples have been collected annually since 2008 to determine the effects of remediation on surface water quality. Samples are collected at the end of the south diversion ditch and from waters in the embankment wetland, after the removal of contaminated sediments. In general, metals in the upper section of the south diversion ditch surface water have attenuated over the course of the ditch. The results of all samples

were significantly below the Total Maximum Daily Load (TMDL) limits for the Silver Creek watershed (Appendix G). Zinc concentrations have dropped from a median of 0.13 mg/L to 0.0094 mg/L. Vegetation, macroinvertebrate and fish monitoring indicate that recovery of these ecological systems is ongoing and their health is steadily improving each year.

6.5 Site Inspection

A site inspection was conducted on November 12, 2012. Participants included Kathryn Hernandez, EPA; Ryan Burdge and Treat Suomi, Skeo Solutions; Kerry Gee, UPCM; and Jim Fricke, Resource Management Consultants. The Site Inspection Checklist is in Appendix D and the site photographs are in Appendix E.

Site inspection participants drove and walked relevant portions of the Site, including the stormwater diversion features, capped areas, tailings impoundment and buttress, wetland area, rail trails, and parking area. The Site was covered with snow, but vegetation in the wetlands area appeared to be established. The PRP reported no concerns related to erosion or trespassing and noted the extent to which wildlife have made use of the Site.

Following the site inspection, Skeo Solutions staff reviewed the documents made available to the public in the site repository, the Park City Public Library. The entirety of the administrative record was available on a compact disc. Hard copies of the 2003 baseline human health risk assessment were also available.

Skeo Solutions staff conducted research at the Summit County Public Records Office, but did not find records of restrictive covenants pertaining to the Site. The ROD states that two primary institutional controls will be implemented to mitigate potential risks and ensure the long-term efficacy of the remedy:

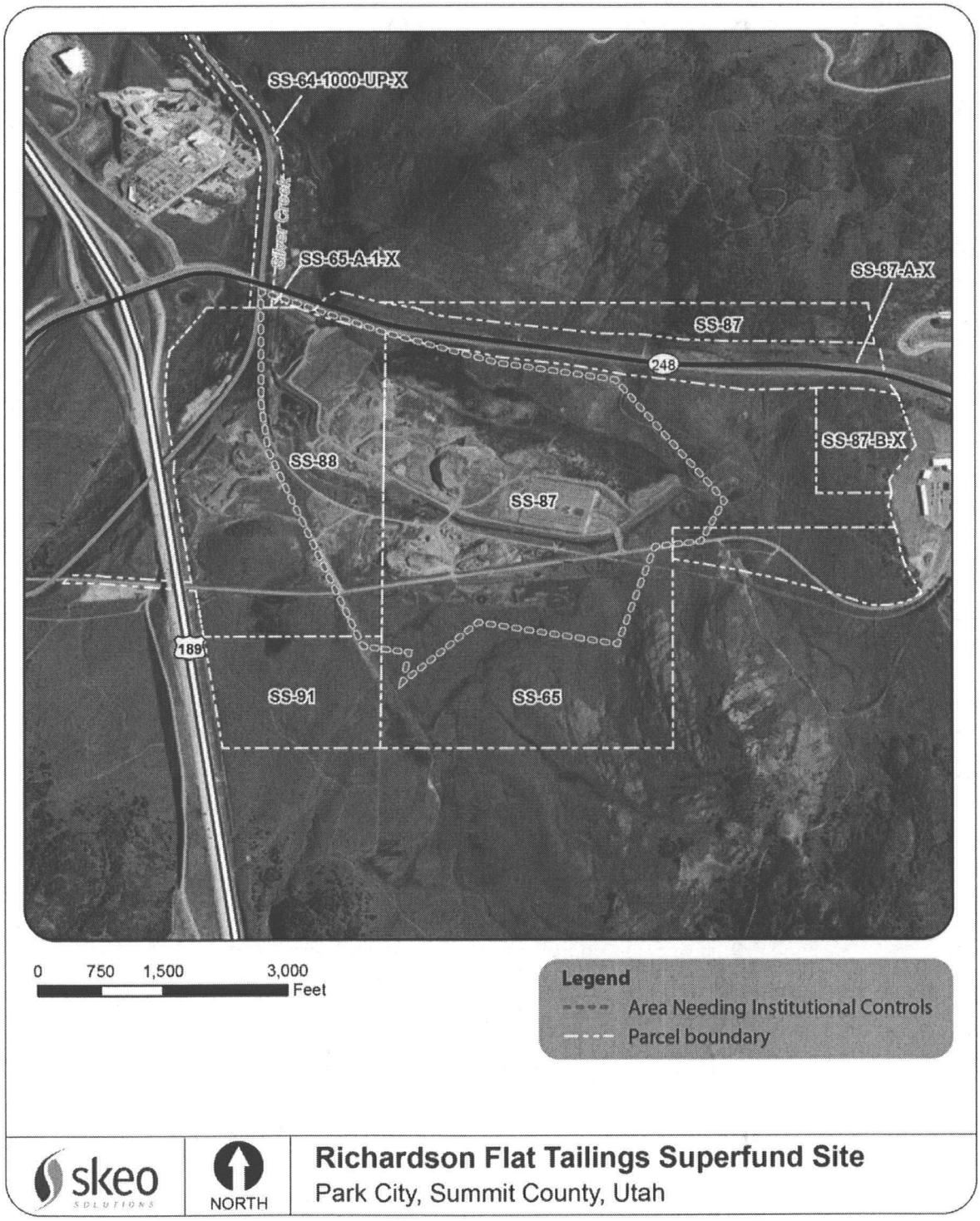
- *Groundwater use restrictions within the site boundary:* the goal is to preclude any use of shallow groundwater, as well as eliminate any significant alteration of the existing hydrogeologic system, such as mixing of aquifers. This will be in the form of a deed restriction and will be the responsibility of the owner of the Site.
- *Land use restrictions within the site boundary:* the goal is to preclude non-recreational uses and to ensure that the soil cover, or similar protections, are maintained. This will be in the form of an environmental covenant and will be the responsibility of the owner of the Site.

Table 2 lists the institutional controls associated with areas of interest at the Site.

Table 2: Institutional Control (IC) Summary Table

Media	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcel(s)	IC Objective	Instrument in Place
Groundwater	Yes	Yes	Site area within Parcels SS-87 and SS-88	Permanently restrict new groundwater well installation and use of shallow groundwater within the impoundment area.	None
Soils	Yes	Yes	Site area within Parcels SS-87 and SS-88	• Permanently limit the land use to open space with wildlife habitat and non-motorized recreational use • Permanently preserve the low-permeability tailings cap and specify the ongoing erosion control and maintenance requirements • Permanently prohibit unauthorized excavation at the site and of the cap material.	None

Figure 3: Institutional Controls Map



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site.

6.6 Interviews

The FYR process included interviews with parties affected by the Site, including the current landowners and regulatory agencies involved in site activities or aware of the Site. The purpose was to document the perceived status of the Site and any perceived problems or successes with the phases of the remedy implemented to date. Park City declined to be interviewed for the FYR. Site stakeholders from the State, Summit County and PRP are in agreement that the remedy is progressing as intended. Appendix C provides the complete interviews, conducted via email.

7.0 Technical Assessment

7.1 Question A: Is the remedy functioning as intended by the decision documents?

Yes, the OU1 remedy is performing as intended. Tailings outside of the impoundment have been excavated and placed under clean fill in the impoundment and the embankment has been stabilized. Revegetation growth on remediated areas has performed well and the constructed wetland areas support healthy vegetation and diverse ecosystems. Flora and fauna have recovered to levels that indicate significant natural resource restoration. Surface water exiting the site is below Silver Creek TMDL and Utah water quality parameters. Maintenance issues are related to small and limited revegetation sites that are generally less than 100 square feet. There have been no performance-related maintenance issues at the site.

Institutional controls to protect the soil cover and restrict groundwater use have not yet been implemented. The areas affected are owned by the PRP and public access is restricted through fencing, signage and an on-site presence. Therefore, in the interim, no unacceptable exposures are occurring. The site managers stated trespassing is not an issue at the Site.

7.2 Question B: Are the exposure assumptions, toxicity data, cleanup levels and remedial action objectives (RAOs) used at the time of remedy selection still valid?

Yes, the exposure assumptions, toxicity data, cleanup levels and RAOs used at the time of the OU1 remedy selection are still valid. The remedy anticipated a future recreational use of the Site, but public access to the Site is currently restricted.

7.3 Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No other information come to light that could call into question the protectiveness of the remedy.

7.4 Technical Assessment Summary

The OU1 remedy is performing as designed and implemented. Source materials have been excavated and covered with clean soil and surface waters exiting the Site are below appropriate standards. The Phase 5 Completion Report of the physical remedy was approved by the EPA on November 3, 2011. Institutional controls needed to protect the soil cover and restrict groundwater use have not yet been implemented, but in the interim, no unacceptable exposures are occurring. Risks have been significantly reduced, allowing for potential recreational use in the future. No information has come to light that could call into question the protectiveness of the remedy.

8.0 Issues

Table 3 summarizes the current site issues.

Table 3: Current Site Issues

Issue	Affects Current Protectiveness?	Affects Future Protectiveness?
Institutional controls called for in the ROD are not yet in place.	No	Yes

9.0 Recommendations and Follow-up Actions

Table 4 provides recommendations to address the current site issues.

Table 4: Recommendations to Address Current Site Issues

Issue	Recommendation / Follow-Up Action	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness?	
					Current	Future
Institutional controls called for in the ROD are not yet in place.	Implement necessary institutional controls to ensure the soil cover is protected and the shallow groundwater is not used. The EPA and the PRP will identify the appropriate control instrument and the PRP will be responsible for implementation.	PRP	EPA	2/15/2014	No	Yes

10.0 Protectiveness Statements

The remedy at OU1 currently protects human health and the environment because tailings and sediments have been excavated, tailings have been contained through capping with clean soil and surface waters exiting the Site meet existing water quality standards. However, in order for the remedy to be protective in the long term, the following action needs to be taken: implementation of institutional controls that include restrictions on future land and groundwater use.

The recommended institutional controls include the following:

- Permanently limit the land use to open space with wildlife habitat and non-motorized recreational use
- Permanently restrict new groundwater well installation and use of shallow groundwater within the impoundment area
- Permanently preserve the low-permeability tailings cap and specify the ongoing erosion control and maintenance requirements
- Permanently prohibit unauthorized excavation at the site and of the cap material

11.0 Next Review

The next FYR will be due within five years of the signature/approval date of this FYR.

Appendix A: List of Documents Reviewed

Resource Management Consultants, Inc, 2007, Remedial Design/Remedial Action Plan (RD/RA), Richardson Flat, Site ID Number: UT980952840.

Resource Management Consultants, Inc, 2007, Phase 1 Field Construction Plan for 2008 Construction Season, Richardson Flat, Site ID Number: UT980952840.

Resource Management Consultants, Inc, 2007, Phase 1 Task Completion Report, Richardson Flat, Site ID Number: UT980952840.

Resource Management Consultants, Inc, 2008, Phase 2 Task Completion Report for 2008 Construction Season, Richardson Flat, Site ID Number: UT980952840.

Resource Management Consultants, Inc, 2009, Phase 3 Task Completion Report for 2009 Construction Season, Richardson Flat, Site ID Number: UT980952840.

Resource Management Consultants, Inc, 2010, Phase 4 Task Completion Report for 2010 Construction Season, Richardson Flat, Site ID Number: UT980952840.

Resource Management Consultants, Inc, 2011, Phase 5 Task Completion Report for 2011 Construction Season, Richardson Flat, Site ID Number: UT980952840.

Resource Management Consultants, Inc, 2011, Task Area Map, Richardson Flat, Site ID Number: UT980952840.

United States Environmental Protection Agency, 2005, Record of Decision, Richardson Flat Tailings, EPA ID UT980952840.

Appendix B: Press Notice

EPA Five-Year Review Planned for the Richardson Flat Tailings Superfund Site

The U.S. Environmental Protection Agency (EPA) is conducting the first Five-Year Review of the remedial actions performed under the Superfund program for Operable Unit (OU) 1 at the Richardson Flat Tailings Superfund site in Salt Lake City, Utah. The purpose of the Five-Year Review is to ensure that the selected cleanup actions for OU1 effectively protect human health and the environment. The Five-Year Review is scheduled to be completed by February, 2013.

The 160-acre site is located southeast of the intersection of State Highway 248 and U.S. Highway 40 approximately 2 miles northeast of Park City, Utah. A tailings dam and impoundment on site were used to capture and hold mill tailings from 1953 until 1981, resulting in contamination of soil, groundwater, surface water and air. Primary contaminants of concern include arsenic, cadmium, copper, lead, mercury, silver and zinc. The EPA proposed the Site for listing on the National Priorities List (NPL) in 1992.

The OU1 remedy addresses mine tailings in several areas of the site and sediments and surface water within the site boundary. Cleanup activities at OU1 include excavation, containment, future disposal of mine tailings from the Park City area within the tailings impoundment, placement of restrictions on future land and groundwater use, and surface water monitoring. Since waste remains on site, the EPA will continue to conduct Five-Year Reviews to make sure the remedy remains protective of human health and the environment.

The EPA invites community participation in the Five-Year Review process: Community members are encouraged to contact the EPA staff with any information that may help the Agency make its determination regarding the protectiveness and effectiveness of the remedies at the site.

Additional site information is available at:

Park City Library
1255 Park Avenue
Park City, UT 84060
435-615-5600

Or visit the **EPA website** at: http://www.epa.gov/region8/superfund/ut/richardsonflat/index.html

If you have questions, please contact:

John Dalton
Community Involvement Coordinator
EPA Region 8
Phone: 303-312-6633
Email: dalton.john@epa.gov

Kathryn Hernandez
Remedial Project Manager
EPA Region 8
Phone: 303-312-6101
Email: hernandez.kathryn@epa.gov

Appendix C: Interview Forms

Richardson Flat Tailings Superfund Site Five-Year Review Interview Form

Site Name: Richardson Flat Tailings **EPA ID No.:** UTD980952840
Interviewer Name: Ryan Burdge **Affiliation:** Skeo Solutions
Subject Name: Mo Slam **Affiliation:** Utah DEQ
Subject Contact Information:
Interview Format (circle one): In Person Phone E-Mail Other:

Interview Category: State Agency

1. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)?

   Overall, the Richardson Flat Tailings site continues to make good progress toward remedy implementation and maintenance.

2. What is your assessment of the current performance of the remedy in place at the Site?

   Current performance of remedy in place at the Site is "good."

3. Are you aware of any complaints or inquiries regarding site-related environmental issues or remedial activities from residents in the past five years?

   Not applicable.

4. Has your office conducted any site-related activities or communications in the past five years? If so, please describe the purpose and results of these activities.

   Meetings, phone calls and on-site visits.

5. Are you aware of any changes to state laws that might affect the protectiveness of the Site's remedy?

   Not applicable.

6. Are you comfortable with the status of the institutional controls at the Site? If not, what are the associated outstanding issues?

   Once implemented, the institutional controls will ensure capped areas are protected and groundwater is not used.

7. Are you aware of any changes in projected land use(s) at the Site?

   Future land use at the Site is not anticipated to change.

8. Do you have any comments, suggestions or recommendations regarding the management or operation of the Site's remedy?

   Overall, United Park City Mines has done a good job.

Richardson Flat Tailings Superfund Site **Five-Year Review Interview Form**

Site Name: **Richardson Flat Tailings** **EPA ID No.: UTD980952840**
Interviewer Name: **Ryan Burdge** **Affiliation: Skeo Solutions**
Subject Name: **Jim Fricke** **Affiliation: Consultant to UPCM**
Subject Contact Information: **8138 S. State St, Midvale, UT, 84047**
Time: **11:00** **Date:12/11/2012**
Interview Location: **RMC Office**

Interview Format (circle one): **In Person** **Phone** **E-Mail** **Other**

Interview Category: **O&M Contractor**

1. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)?

   Implementation of the remedy met all of my expectations. Excavation of tailings in the South Diversion Ditch and other areas outside the impoundment has improved water quality significantly. Surface water exiting the site is well below Silver Creek TMDL and general water quality parameters. Revegetation growth on remediated areas has performed very well, flora and fauna have recovered to levels that indicate significant natural resource restoration. Constructed wetland areas support healthy vegetation and diverse ecosystems. Maintenance issues are related to small and limited revegetation sites that are generally less than 100 square feet. These areas requiring maintenance are being addressed as access to them allows.

2. What is your assessment of the current performance of the remedy in place at the Site?

   The remedy is performing as designed and implemented. Tailings outside of the impoundment have been excavated and placed under clean fill in the impoundment, the embankment has been stabilized, surface water meets applicable Utah water quality standards, and risks to ecological and human health receptors have been reduced significantly. There have been no performance-related maintenance issues at the site.

3. What are the findings from the monitoring data? What are the key trends in contaminant levels that are being documented over time at the Site?

   Monitoring data indicate that water quality has significantly improved. Zinc concentrations have dropped from a median of 0.13 mg/l to 0.0094 mg/l. Vegetation, macroinvertebrate and fish monitoring indicate recovery of theses ecological systems is ongoing and steadily improving each year.

4. Is there a continuous on-site O&M presence? If so, please describe staff responsibilities and activities. Alternatively, please describe staff responsibilities and the frequency of site inspections and activities if there is not a continuous on-site O&M presence.

   Continuous on-site O&M presence is the responsibility of UPCM personnel. Please see the response from Kerry Gee. Contractor personnel collect water quality samples, conduct annual vegetation monitoring and annual aquatic monitoring.

5. Have there been any significant changes in site O&M requirements, maintenance schedules or sampling routines since start-up or in the last five years? If so, do they affect the protectiveness or effectiveness of the remedy? Please describe changes and impacts.

   No, there have been no significant changes in site O&M requirements, schedules or routines.

6. Have there been unexpected O&M difficulties or costs at the Site since start-up or in the last five years? If so, please provide details.

   No.

7. Have there been opportunities to optimize O&M activities or sampling efforts? Please describe changes and any resulting or desired cost savings or improved efficiencies.

   Yes, UPCM is taking on more of the O&M day-to-day monitoring. Consultant time has been reduced, sampling events have been consolidated.

8. Do you have any comments, suggestions or recommendations regarding O&M activities and schedules at the Site?

   No.

Richardson Flat Tailings Superfund Site		Five-Year Review Interview Form	
Site Name:	**Richardson Flat Tailings**	**EPA ID No.:**	**UTD980952840**
Interviewer Name:	**Ryan Burdge**	**Affiliation:**	**Skeo Solutions**
Subject Name:	**Kerry Gee**	**Affiliation:**	**United Park City Mines**

Interview Format (circle one): In Person Phone [E-Mail] Other:

Interview Category: Potentially Responsible Parties (PRPs)

1. What is your overall impression of the remedial activities at the Site?

   The remediation project at the Richardson Flat Tailings site has been successful. The objectives were well documented in the ROD and remedial design/remedial action documents and the results of the remediation construction exceeded these objectives.

2. What have been the effects of the Site on the surrounding community, if any?

   The site has had a positive impact on the surrounding community. The site is now a beautiful area that provides ecological services to an abundant wildlife community. Due to the construction of additional wetlands and the remediation and restoration of other areas at the site, the site now provides habitat for mammals and birds. I also believe that the project has given the local citizenry an opportunity to see firsthand a successful remediation/restoration project.

3. What is your assessment of the current performance of the remedy in place at the Site?

   I believe that the remedy in place is performing as desired. The site has actually recovered from the remediation construction more quickly than anticipated. It is along an important migratory corridor for migratory waterfowl and other birds and its use by wildlife has expanded each year.

4. Are you aware of any complaints or inquiries regarding environmental issues or the remedial action from residents since implementation of the cleanup?

   The only inquiries have been requests to import and dispose of contaminated materials at the Site. I have heard complaints regarding Park City Municipal Corporation's management of the parking lot with the lights left on at night.

5. Do you feel well informed regarding site activities and remedial progress? If not, how might the EPA convey site-related information in the future?

   I feel well informed.

6. Do you have any comments, suggestions or recommendations regarding the management or operation of the Site's remedy?

   Not at this time.

Richardson Flat Tailings Superfund Site Five-Year Review Interview Form

Site Name: Richardson Flat Tailings **EPA ID No.:** UTD980952840
Subject Name: Jami Brackin **Affiliation:** Summit County
Subject Contact Information: jbrackin@summitcounty.org
Time: **Date:** 12/5/2012

Interview Format (circle one): **In Person** **Phone** **Mail** **Other: Email**

Interview Category: **Local Government**

1. Are you aware of the former environmental issues at the Site and the cleanup activities that have taken place to date?

   Yes.

2. Do you feel well-informed regarding the Site's activities and remedial progress? If not, how might the EPA convey site-related information in the future?

   I generally feel well-informed, however, updates on the capacity of the repository (OU1) or the creation of other operating units or agency enforcement actions would be nice.

3. Have there been any problems with unusual or unexpected activities at the Site, such as emergency response, vandalism or trespassing?

   Not that I'm aware of.

4. Are you aware of any changes to state laws or local regulations that might affect the protectiveness of the Site's remedy?

   No.

5. Are you aware of any changes in projected land use(s) at the Site?

   No.

6. Has the EPA kept involved parties and surrounding neighbors informed of activities at the Site? How can the EPA best provide site-related information in the future?

   I don't believe there have been any recent efforts (since 2007ish) to involve or inform surrounding neighbors or stakeholders.

7. Do you have any comments, suggestions or recommendations regarding the project?

   The County still has an interest in seeing the repository expanded to the extent possible in an effort to assist residents of Park City.

Appendix D: Site Inspection Checklist

FIVE-YEAR REVIEW SITE INSPECTION CHECKLIST	
I. SITE INFORMATION	
Site name: Richardson Flat Tailings	**Date of inspection:** 11/12/2012
Location and Region: Park City, Summit County, Utah	**EPA ID:** UTD980952840
Agency, office, or company leading the five-year review: EPA, Region 8	**Weather/temperature:** 20s, sunny, snow-covered
Remedy Includes: (Check all that apply) ☒ Landfill cover/containment ☒ Access controls ☒ Institutional controls ☐ Groundwater pump and treatment ☐ Surface water collection and treatment ☐ Other	☐ Monitored natural attenuation ☐ Groundwater containment ☐ Vertical barrier walls
Attachments: ☒ Inspection team roster attached	☐ Site map attached
II. INTERVIEWS (Check all that apply)	
1. **O&M site manager** Jim Fricke Name Title Date Interviewed ☐ at site ☐ at office ☒ by email Phone no. Problems, suggestions; ☐ Report attached _____	
2. **O&M staff** _____ _____ _____ Name Title Date Interviewed ☐ at site ☐ at office ☐ by phone Phone no. _____ Problems, suggestions; ☐ Report attached _____	

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.). Fill in all that apply.

Agency Utah DEQ

Name	Title	Date	Phone No.
Mo Slam		12/26/2012	

Problems; suggestions; ☒ Report attached

Agency Summit County

Name	Title	Date	Phone No.
Jami Brackin		12/05/2012	

Problems; suggestions; ☒ Report attached

Agency _____
Contact

Name	Title	Date	Phone No.

Problems; suggestions; ☐ Report attached

Agency _____
Contact

Name	Title	Date	Phone No.

Problems; suggestions; ☐ Report attached

Agency _____
Contact

Name	Title	Date	Phone No.

Problems; suggestions; ☐ Report attached

4. **Other interviews** (optional) ☐ Report attached

Resident

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**

☒ O&M manual	☒ Readily available	☒ Up to date	☐ N/A
☒ As-built drawings	☒ Readily available	☒ Up to date	☐ N/A
☐ Maintenance logs	☐ Readily available	☐ Up to date	☒ N/A

Remarks: _____

2. **Site-Specific Health and Safety Plan**	☒ Readily available	☒ Up to date	☐ N/A
☐ Contingency plan/emergency response plan	☒ Readily available	☒ Up to date	☐ N/A

Remarks: _____

3. **O&M and OSHA Training Records**	☐ Readily available	☐ Up to date	☒ N/A

Remarks: _____

4.	**Permits and Service Agreements**			
	☐ Air discharge permit	☐ Readily available	☐ Up to date	☒ N/A
	☐ Effluent discharge	☐ Readily available	☐ Up to date	☒ N/A
	☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	☒ N/A
	☐ Other permits _____	☐ Readily available	☐ Up to date	☒ N/A
	Remarks: _____			
5.	**Gas Generation Records**	☐ Readily available	☐ Up to date	☒ N/A
	Remarks: _____			
6.	**Settlement Monument Records**	☐ Readily available	☐ Up to date	☒ N/A
	Remarks: _____			
7.	**Groundwater Monitoring Records**	☒ Readily available	☒ Up to date	☐ N/A
	Remarks: _____			
8.	**Leachate Extraction Records**	☐ Readily available	☐ Up to date	☒ N/A
	Remarks: _____			
9.	**Discharge Compliance Records**			
	☐ Air	☐ Readily available	☐ Up to date	☒ N/A
	☐ Water (effluent)	☐ Readily available	☐ Up to date	☒ N/A
	Remarks: _____			
10.	**Daily Access/Security Logs**	☐ Readily available	☐ Up to date	☒ N/A
	Remarks: _____			
	IV. O&M COSTS			
1.	**O&M Organization**			
	☐ State in-house	☐ Contractor for State		
	☐ PRP in-house	☒ Contractor for PRP		
	☐ Federal Facility in-house	☐ Contractor for Federal Facility		
	☐ _____			

2. **O&M Cost Records**

☐ Readily available ☐ Up to date

☐ Funding mechanism/agreement in place ☐ Unavailable

Original O&M cost estimate _____ ☐ Breakdown attached

Total annual cost by year for review period if available

From mm/dd/yyyy Date	To mm/dd/yyyy Date	_____ Total cost	☐ Breakdown attached
From mm/dd/yyyy Date	To mm/dd/yyyy Date	_____ Total cost	☐ Breakdown attached
From mm/dd/yyyy Date	To mm/dd/yyyy Date	_____ Total cost	☐ Breakdown attached
From mm/dd/yyyy Date	To mm/dd/yyyy Date	_____ Total cost	☐ Breakdown attached
From mm/dd/yyyy Date	To mm/dd/yyyy Date	_____ Total cost	☐ Breakdown attached

3. **Unanticipated or Unusually High O&M Costs During Review Period**

Describe costs and reasons: The site is not yet in O&M.

V. ACCESS AND INSTITUTIONAL CONTROLS ☒ Applicable ☐ N/A

A. Fencing

1. **Fencing damaged** ☐ Location shown on site map ☒ Gates secured ☐ N/A

Remarks: Parking area and site entrances locked.

B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on site map ☒ N/A

Remarks: _____

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented ☐ Yes ☒ No ☐ N/A

Site conditions imply ICs not being fully enforced ☐ Yes ☐ No ☒ N/A

Type of monitoring (e.g., self-reporting, drive by) _____

Frequency _____

Responsible party/agency _____

Contact	_____	_____	mm/dd/yyyy	_____
	Name	Title	Date	Phone no.

Reporting is up-to-date ☐ Yes ☐ No ☒ N/A

Reports are verified by the lead agency ☐ Yes ☐ No ☒ N/A

Specific requirements in deed or decision documents have been met ☐ Yes ☐ No ☒ N/A

Violations have been reported ☐ Yes ☐ No ☒ N/A

Other problems or suggestions: ☐ Report attached

2. **Adequacy** ☐ ICs are adequate ☒ ICs are inadequate ☐ N/A

Remarks: Institutional controls have not yet been added to the site property.

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map ☒ No vandalism evident

Remarks:_____

2. **Land use changes on site** ☒ N/A

Remarks: _____

3. **Land use changes off site** ☒ N/A

Remarks: _____

VI. GENERAL SITE CONDITIONS

A. Roads ☒ Applicable ☐ N/A

1. Roads damaged ☒ Location shown on site map ☒ Roads adequate ☐ N/A

Remarks: _____

B. Other Site Conditions

Remarks: _____

VII. LANDFILL COVERS ☒ Applicable ☐ N/A

A. Landfill Surface

1. **Settlement** (Low spots) ☐ Location shown on site map ☒ Settlement not evident

Arial extent _____ Depth _____

Remarks: _____

2.	**Cracks**	☐ Location shown on site map	☒ Cracking not evident
	Lengths _____	Widths _____	Depths _____
	Remarks: _____		
3.	**Erosion**	☐ Location shown on site map	☒ Erosion not evident
	Arial extent _____		Depth _____
	Remarks: _____		
4.	**Holes**	☐ Location shown on site map	☒ Holes not evident
	Arial extent _____		Depth _____
	Remarks: _____		
5.	**Vegetative Cover**	☒ Grass	☒ Cover properly established
	☒ No signs of stress	☐ Trees/Shrubs (indicate size and locations on a diagram)	
	Remarks: Vegetation was covered in snow, but was reported to be doing well..		
6.	**Alternative Cover** (armored rock, concrete, etc.)		☒ N/A
	Remarks: _____		
7.	**Bulges**	☐ Location shown on site map	☒ Bulges not evident
	Arial extent _____		Height _____
	Remarks: _____		
8.	**Wet Areas/Water Damage**	☒ Wet areas/water damage not evident	
	☐ Wet areas	☐ Location shown on site map	Arial extent _____
	☐ Ponding	☐ Location shown on site map	Arial extent _____
	☐ Seeps	☐ Location shown on site map	Arial extent _____
	☐ Soft subgrade	☐ Location shown on site map	Arial extent _____
	Remarks: _____		
9.	**Slope Instability**	☐ Slides	☐ Location shown on site map
	☒ No evidence of slope instability		
	Arial extent _____		
	Remarks: _____		
B. Benches		☐ Applicable	☒ N/A
	(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)		
1.	**Flows Bypass Bench**	☐ Location shown on site map	☐ N/A or okay
	Remarks: _____		
2.	**Bench Breached**	☐ Location shown on site map	☐ N/A or okay
	Remarks: _____		

3.	**Bench Overtopped**	☐ Location shown on site map	☐ N/A or okay
	Remarks: _____		
C. Letdown Channels		☐ Applicable	☒ N/A
	(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)		
1.	**Settlement** (Low spots)	☐ Location shown on site map	☐ No evidence of settlement
	Arial extent _____		Depth _____
	Remarks: _____		
2.	**Material Degradation**	☐ Location shown on site map	☐ No evidence of degradation
	Material type_____		Arial extent _____
	Remarks: _____		
3.	**Erosion**	☐ Location shown on site map	☐ No evidence of erosion
	Arial extent _____		Depth _____
	Remarks: _____		
4.	**Undercutting**	☐ Location shown on site map	☐ No evidence of undercutting
	Arial extent _____		Depth _____
	Remarks: _____		
5.	**Obstructions**	Type _____	☐ No obstructions
	☐ Location shown on site map	Arial extent _____	
	Size _____		
	Remarks: _____		
6.	**Excessive Vegetative Growth**	Type _____	
	☐ No evidence of excessive growth		
	☐ Vegetation in channels does not obstruct flow		
	☐ Location shown on site map	Arial extent _____	
	Remarks: _____		
D. Cover Penetrations		☐ Applicable	☒ N/A
1.	**Gas Vents**	☐ Active	☐ Passive
	☐ Properly secured/locked	☐ Functioning	☐ Routinely sampled ☐ Good condition
	☐ Evidence of leakage at penetration		☐ Needs Maintenance ☒ N/A
	Remarks: _____		

2. **Gas Monitoring Probes**

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition

☐ Evidence of leakage at penetration ☐ Needs maintenance ☒ N/A

Remarks: _____

3. **Monitoring Wells** (within surface area of landfill)

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition

☐ Evidence of leakage at penetration ☐ Needs Maintenance ☒ N/A

Remarks: _____

4. **Extraction Wells Leachate**

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition

☐ Evidence of leakage at penetration ☐ Needs Maintenance ☒ N/A

Remarks: _____

5. **Settlement Monuments** ☐ Located ☐ Routinely surveyed ☒ N/A

Remarks: _____

E. Gas Collection and Treatment ☐ Applicable ☒ N/A

1. **Gas Treatment Facilities**

☐ Flaring ☐ Thermal destruction ☐ Collection for reuse

☐ Good condition ☐ Needs Maintenance

Remarks: _____

2. **Gas Collection Wells, Manifolds and Piping**

☐ Good condition ☐ Needs Maintenance

Remarks: _____

3. **Gas Monitoring Facilities** (e.g., gas monitoring of adjacent homes or buildings)

☐ Good condition ☐ Needs Maintenance ☐ N/A

Remarks: _____

F. Cover Drainage Layer ☐ Applicable ☒ N/A

1. **Outlet Pipes Inspected** ☐ Functioning ☐ N/A

Remarks: _____

2. **Outlet Rock Inspected** ☐ Functioning ☐ N/A

Remarks: _____

G. Detention/Sedimentation Ponds ☐ Applicable ☒ N/A

1. **Siltation** Area extent _____ Depth _____ ☐ N/A

☐ Siltation not evident

Remarks: _____

2.	**Erosion**	Area extent _____	Depth _____
	☐ Erosion not evident		
	Remarks: _____		
3.	**Outlet Works**	☐ Functioning	☐ N/A
	Remarks: _____		
4.	**Dam**	☐ Functioning	☐ N/A
	Remarks: _____		
H. Retaining Walls		☐ Applicable	☒ N/A
1.	**Deformations**	☐ Location shown on site map	☐ Deformation not evident
	Horizontal displacement _____		Vertical displacement _____
	Rotational displacement _____		
	Remarks: _____		
2.	**Degradation**	☐ Location shown on site map	☐ Degradation not evident
	Remarks: _____		
I. Perimeter Ditches/Off-Site Discharge		☐ Applicable	☒ N/A
1.	**Siltation**	☐ Location shown on site map	☐ Siltation not evident
	Area extent _____		Depth _____
	Remarks: _____		
2.	**Vegetative Growth**	☐ Location shown on site map	☐ N/A
	☐ Vegetation does not impede flow		
	Area extent _____		Type _____
	Remarks: _____		
3.	**Erosion**	☐ Location shown on site map	☐ Erosion not evident
	Area extent _____		Depth _____
	Remarks: _____		
4.	**Discharge Structure**	☐ Functioning	☐ N/A
	Remarks: _____		
VIII. VERTICAL BARRIER WALLS		☐ Applicable	☒ N/A
1.	**Settlement**	☐ Location shown on site map	☐ Settlement not evident
	Area extent _____		Depth _____
	Remarks: _____		

2. **Performance Monitoring** Type of monitoring _____

☐ Performance not monitored

Frequency _____ ☐ Evidence of breaching

Head differential _____

Remarks: _____

IX. GROUNDWATER/SURFACE WATER REMEDIES ☐ Applicable ☒ N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines ☐ Applicable ☒ N/A

1. **Pumps, Wellhead Plumbing, and Electrical**

☐ Good condition ☐ All required wells properly operating ☐ Needs Maintenance ☐ N/A

Remarks: _____

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**

☐ Good condition ☐ Needs Maintenance

Remarks: _____

3. **Spare Parts and Equipment**

☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided

Remarks: _____

B. Surface Water Collection Structures, Pumps, and Pipelines ☐ Applicable ☒ N/A

1. **Collection Structures, Pumps, and Electrical**

☐ Good condition ☐ Needs Maintenance

Remarks: _____

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances**

☐ Good condition ☐ Needs Maintenance

Remarks: _____

3. **Spare Parts and Equipment**

☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be pr vided

Remarks: _____

C. Treatment System ☐ Applicable ☒ N/A

1. **Treatment Train** (Check components that apply)

☐ Metals removal ☐ Oil/water separation ☐ Bioremediation

☐ Air stripping ☐ Carbon adsorbers

☐ Filters _____

☐ Additive (e.g., chelation agent, flocculent) _____

☐ Others _____

☐ Good condition ☐ Needs Maintenance

☐ Sampling ports properly marked and functional

☐ Sampling/maintenance log displayed and up to date

☐ Equipment properly identified

☐ Quantity of groundwater treated annually _____

☐ Quantity of surface water treated annually _____

Remarks: _____

2. **Electrical Enclosures and Panels** (properly rated and functional)

☐ N/A ☐ Good condition ☐ Needs Maintenance

Remarks: _____

3. **Tanks, Vaults, Storage Vessels**

☐ N/A ☐ Good condition ☐ Proper secondary containment ☐ Needs Maintenance

Remarks: _____

4. **Discharge Structure and Appurtenances**

☐ N/A ☐ Good condition ☐ Needs Maintenance

Remarks: _____

5. **Treatment Building(s)**

☐ N/A ☐ Good condition (esp. roof and doorways) ☐ Needs repair

☐ Chemicals and equipment properly stored

Remarks: _____

6. **Monitoring Wells** (pump and treatment remedy)

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition

☐ All required wells located ☐ Needs Maintenance ☐ N/A

Remarks: _____

D. Monitoring Data

1. **Monitoring Data**

☐ Is routinely submitted on time ☐ Is of acceptable quality

2. **Monitoring data suggests:**

☐ Groundwater plume is effectively contained ☐ Contaminant concentrations are declining

E. Monitored Natural Attenuation			
1. **Monitoring Wells** (natural attenuation remedy)			
☐ Properly secured/locked	☐ Functioning	☐ Routinely sampled	☐ Good condition
☐ All required wells located	☐ Needs Maintenance		☒ N/A
Remarks: _____			

X. OTHER REMEDIES

If there are remedies applied at the site and not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

The remedy is functioning as designed.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

The Site is not yet in the O&M phase.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future.

None noted

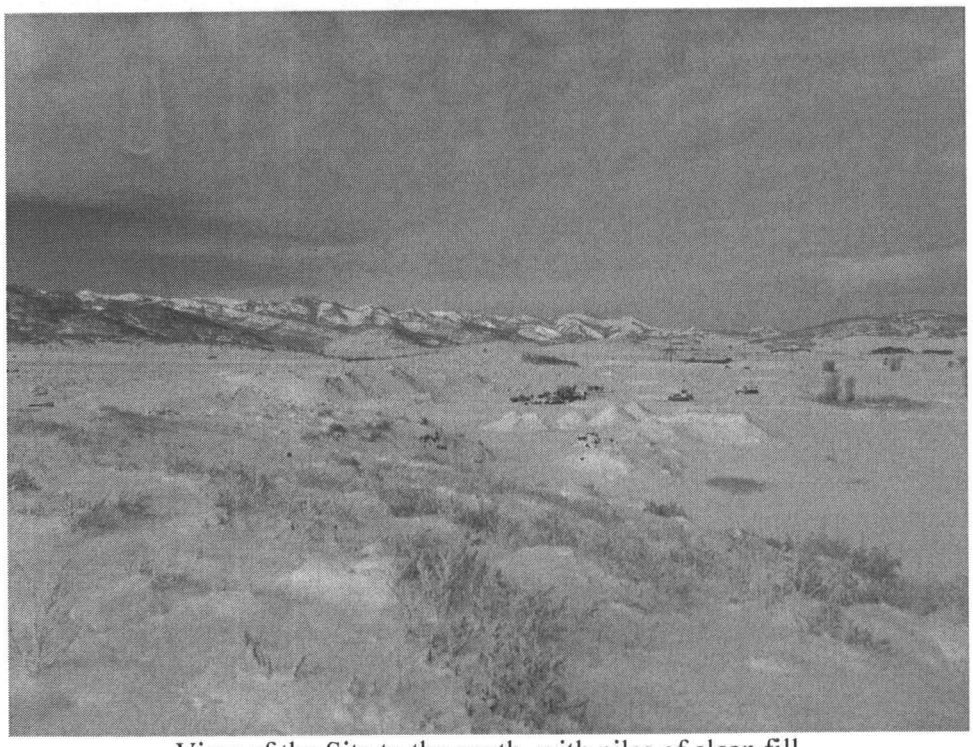
D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

None noted

Appendix E: Photographs from Site Inspection Visit

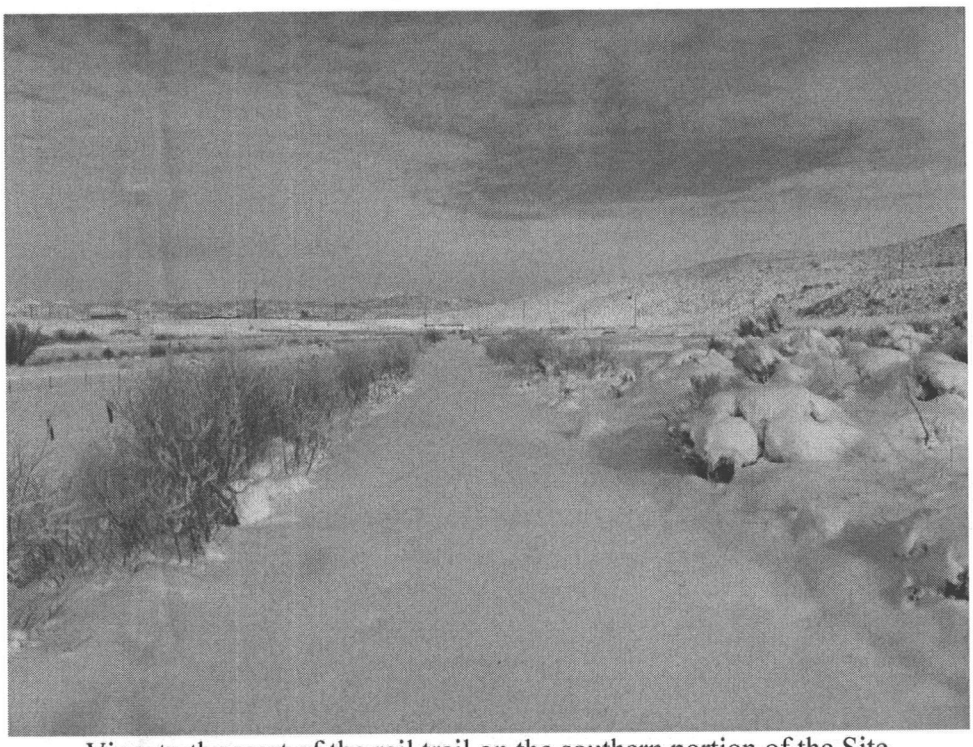
View of the Site to the north, with parking area and stormwater diversion channel.



View of the Site to the south, with piles of clean fill.

View of wetland area in northwest corner of the Site.

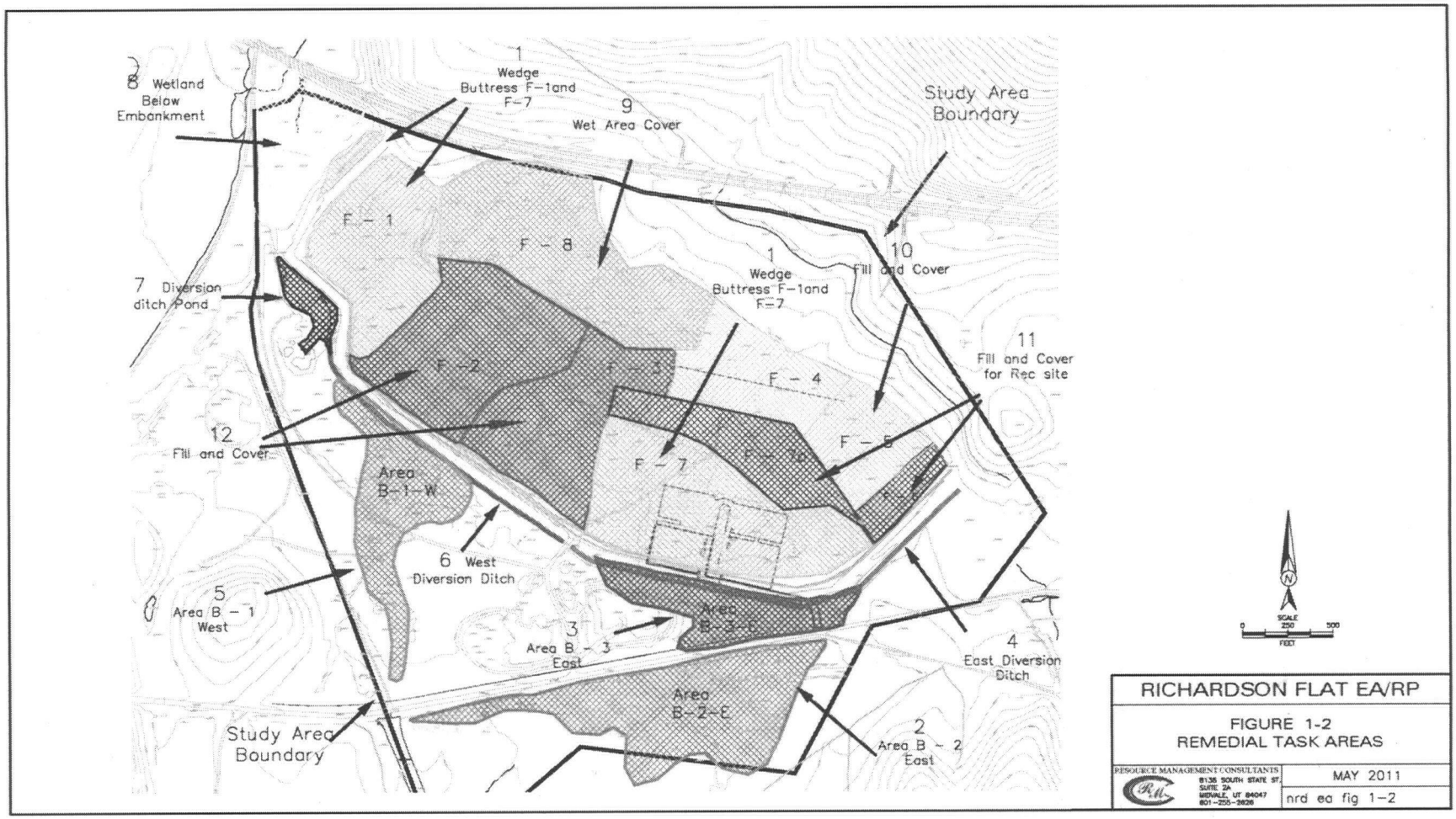
View of the Site to the southwest, with fence line and rail trail.

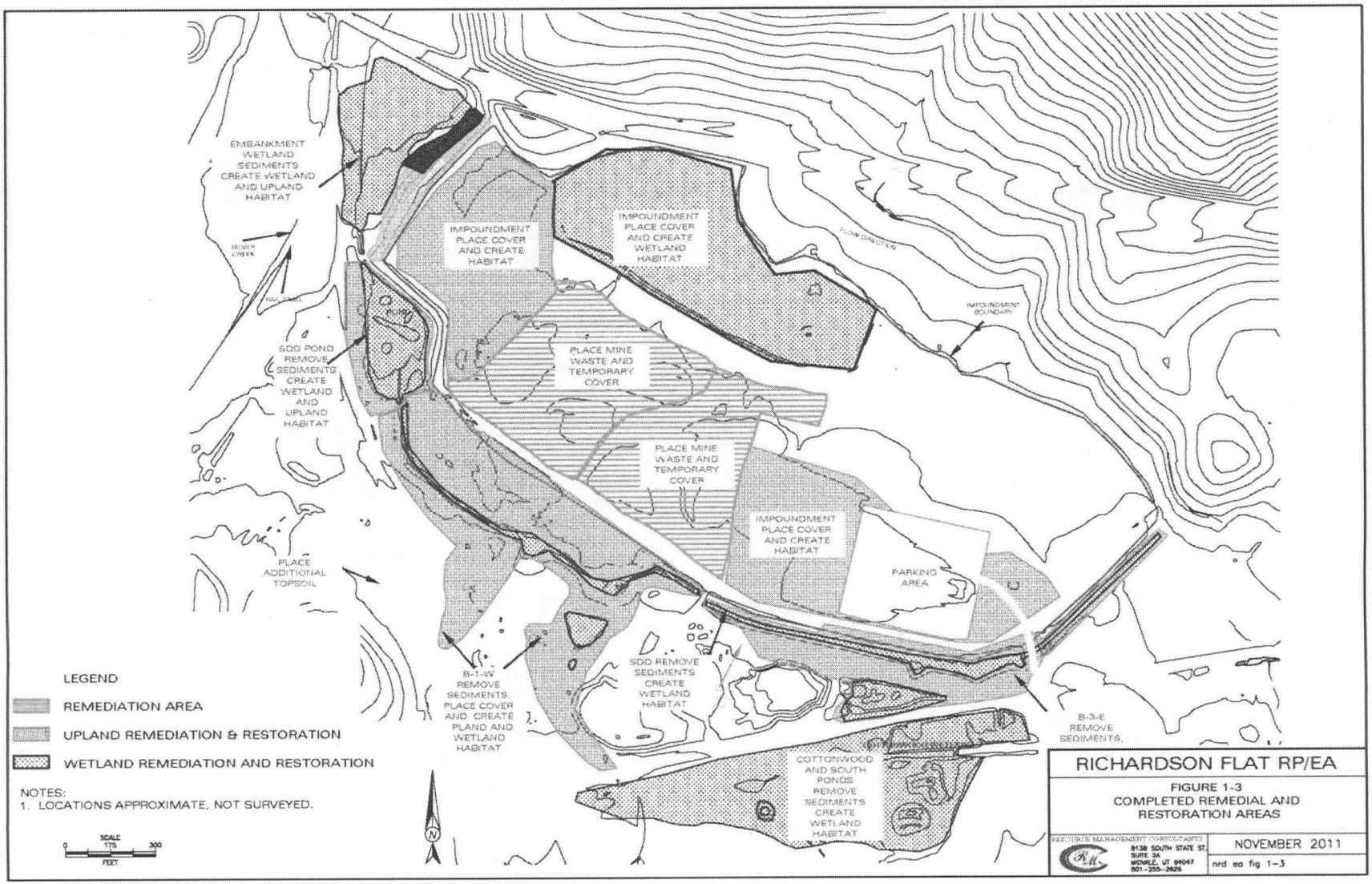


View to the west of the rail trail on the southern portion of the Site.

Locked entrance to parking area.

Appendix F: Site Maps




EMBANKMENT WETLAND SEDIMENTS CREATE WETLAND AND UPLAND HABITAT
SILVER CREEK
IMPOUNDMENT PLACE COVER AND CREATE HABITAT
IMPOUNDMENT PLACE COVER AND CREATE WETLAND HABITAT
FLOW DIRECTION
IMPOUNDMENT BOUNDARY
SDD POND REMOVE SEDIMENTS CREATE WETLAND AND UPLAND HABITAT
PLACE MINE WASTE AND TEMPORARY COVER
PLACE MINE WASTE AND TEMPORARY COVER
IMPOUNDMENT PLACE COVER AND CREATE HABITAT
PARKING AREA
PLACE ADDITIONAL TOPSOIL
B-1-W REMOVE SEDIMENTS. PLACE COVER AND CREATE PLAND AND WETLAND HABITAT
SDD REMOVE SEDIMENTS CREATE WETLAND HABITAT
B-3-E REMOVE SEDIMENTS.
COTTONWOOD AND SOUTH PONDS REMOVE SEDIMENTS CREATE WETLAND HABITAT
LEGEND
REMEDIATION AREA
UPLAND REMEDIATION & RESTORATION
WETLAND REMEDIATION AND RESTORATION
NOTES:
1. LOCATIONS APPROXIMATE, NOT SURVEYED.
SCALE
0 175 300
FEET
N
RICHARDSON FLAT RP/EA
FIGURE 1-3
COMPLETED REMEDIAL AND RESTORATION AREAS
NOVEMBER 2011
nrd ea fig 1-3

Appendix G: 2011 Monitoring Data

Sample ID	Date	Total Cadmium (mg/L)	Dissolved Cadmium (mg/L)	Total Zinc (mg/L)	Dissolved Zinc (mg/L)	Location
RF92011-W	9/20/11	-	-	0.0225	-	Terminus of the South Diversion Ditch at RF6-2.
RT-6 TOTAL ZN & CD	8/24/11	<0.000180	<0.000180	0.0126	0.0066	
1	8/18/11	-	-	0.0822	0.073	Embankment Wetland after source removal.
2	8/18/11	-	-	0.0397	0.0215	
3	8/18/11	-	-	0.101	0.0555	
4	8/18/11	-	-	0.0765	0.0606	
5	8/18/11	-	-	0.0351	0.0134	