SECOND FIVE-YEAR REVIEW REPORT FOR KENNECOTT (SOUTH ZONE) SUPERFUND ALTERNATIVE SITE SALT LAKE COUNTY & TOOELE COUNTY, UTAH

Prepared by

Utah Department of Environmental Quality
Division of Environmental Response & Remediation
Salt Lake City, Utah

BETSY SMIDINGER

Digitally signed by BETSY SMIDINGER
Date: 2021.08.09 14:25:47 -06'00'

_____

Betsy Smidinger, Director
Superfund and Emergency Management Division

Table of Contents

Tables

Appendices

LIST OF ABBREVIATIONS & ACRONYMS

AOC	Administrative Order on Consent
Agencies	EPA & UDEQ
ARAR	Applicable or Relevant and Appropriate Requirement
BLL	Blood Lead Level
CAMU	Corrective Action Management Unit
CDC	Center for Disease Control
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	Contaminant of Concern
DAQ	Utah Division of Air Quality
DERR	Utah Division of Environmental Response & Remediation
DOGM	Utah Division of Oil, Gas, and Mining
DWQ	Utah Division of Water Quality
EC	Environmental Covenant
EPA	United States Environmental Protection Agency Region 8
ESD	Explanation of Significant Difference
FFS	Focused Feasibility Study
FYR	Five-Year Review
GWPP	Groundwater Protection Program
HQ	Hazard Quotient
IC	Institutional Control
KUALs	Kennecott Unrestricted Action Levels
mg/kg	Milligrams per Kilogram
mg/L	Milligrams per Liter
MOU	Memorandum of Understanding
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
O&M	Operation and Maintenance
O,M&R	Operation, Maintenance, and Replacement
OU	Operable Unit
PM	Project Manager
PRP	Potentially Responsible Party
RA	Risk Assessment
RAGS	Risk Assessment Guidance for Superfund
RAO	Remedial Action Objective
RI	Remedial Investigation
ROD	Record of Decision
RPM	Remedial Project Manager
RSL	Regional Screening Level
RTKC	Rio Tinto Kennecott Copper
SLCO	Salt Lake County
SLCOHD	Salt Lake County Health Department
USGS	United States Geological Survey
µg/dL	Microgram per Deciliter
µg/L	Microgram per Liter
µg/Kg	Microgram per Kilogram
µg/m3	Microgram per Cubic Meter
UDEQ	Utah Department of Environmental Quality
UPDES	Utah Pollution Discharge Elimination System
UDNR	Utah Department of Natural Resources
UU/UE	Unlimited Use and Unrestricted Exposure

I. INTRODUCTION

The purpose of a Five-Year Review (FYR) is to evaluate the implementation and performance of a remedy to determine if the remedy is and will continue to be protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in FYR reports such as this one. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The Utah Department of Environmental Quality (UDEQ), Division of Environmental Response and Remediation (DERR) prepared this FYR pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121, consistent with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 Code of Federal Regulations (CFR) Section 300.430(f)(4)(ii)), and considering policy of the United States Environmental Protection Agency Region 8 (EPA). This FYR has been prepared because hazardous substances, pollutants or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure (UU/UE)[1].

While this is the second FYR for the Kennecott (South Zone) Superfund Alternative Site (Site), FYRs have been done previously for the various operable units (OUs) located within the Site. FYRs for OUs 1, 4, 5, 10, and 11 were completed in 2004 and 2010; and an FYR for OUs 3, 6, 7, and 17 was completed in 2009. Each previous FYR contributed to the 2016 FYR for the Kennecott South Zone, and is the triggering action basis for this FYR. In response to the Explanation of Significant Difference in 2017, this FYR includes OU25 (see the Site Background section).

The Kennecott (South Zone) Operable Units Summary of Risks

Human Exposure Risks remain controlled by Rio Tinto Kennecott Copper (RTKC or Kennecott) maintenance of restricted access to all operational and non-operational areas in operable units on property they own. Employee exposure-risk is prevented by Kennecott maintaining compliance with site- specific industrial land use action levels and managing soils and mine waste above these action levels. Exposure risks to the general public on parcels publicly accessible have been addressed by previous removal actions and the implementation of local institutional controls (ICs). These ICs require ongoing management of soils and mine waste above unrestricted use action levels. The drinking of or contact with impacted ground and surface water is prevented through treatment, use restrictions, discharge permits, or the supply of bottled water or household connection to municipal water supplies.

Ecological Exposure Risks have been evaluated and potential selenium risks are managed by preventing the use of plants during restoration work that can uptake selenium and represents food for small mammals and birds.

The fourteen OUs addressed in this FYR are listed below and shown in Appendix B, Figure 1.

Table 1.0 List of OUs

Operable Unit	Description
1	Includes the Bingham Creek channel and flood plain from Bingham Canyon to the Jordan River, traversing unincorporated Salt Lake County, and the Cities of West Jordan and South Jordan
2	Includes the Zone A and Zone B plume underlying the communities of West Jordan, South Jordan, Riverton, Herriman and unincorporated Salt Lake County

[1] For the Kennecott sites, site specific UU/UE action levels were established in 2015, please refer to Section 1 Site Background, page 2 for more information.

3	Includes the Butterfield Mine Tunnel and Discharge, Canyon and Creek, Residential and Agricultural properties in the City of Herriman and unincorporated Salt Lake County
4	Includes the Large Bingham Reservoir, Small Bingham Reservoir
5	Includes the ARCO Tailings Repository and Bastian Ditch
6	Includes the Lark Waste Rock and Tailings footprint, Midas Creek, Copper Creek, Mascotte Ditch, and other historical facilities
10	Includes tailings deposits within the boundaries of the community of Copperton
11	Includes the historic facilities located in Bingham Canyon
12	Includes the series of cut-off walls, French drains, sedimentation basins, conveyance pipes and monitoring wells along the leading edge of the Bingham Canyon Mine waste rock dumps
16	Includes the groundwater plume located under Bingham Canyon emanating from Dry Fork drainage
18	Includes multiple adits from Middle Canyon to Pine Canyon in Tooele County
20	Includes sediment basins, tunnel adit and drainage, historic mill and a waste rock dump located in the upper reaches of Pine Canyon
24	Includes historic precipitation plant footprints, capped lead mine mill footprint, tunnel adits, Copperton Mill and Process Water Reservoirs
25	Includes various historic mining, milling, smelting, precipitation laundering, conveyance and transportation corridors

This FYR was performed by Douglas Bacon, DERR project manager (PM). Participants included Ken Wangerud, EPA Remedial Project Manager (RPM), and Dave Allison and Scott Everett of the UDEQ. Participating staff from RTKC included Jason Hill, Teresa Cockayne, and Brian Vinton.

Site Background

The Kennecott South Zone spans areas located in both Salt Lake County, about 10 miles southwest of Salt Lake City, and in Tooele County, about six miles southeast of Tooele City. Portions of the Kennecott South Zone include the municipalities of West Jordan, South Jordan, Riverton, Herriman, and unincorporated areas of Salt Lake and Tooele Counties (Appendix B, Figure 1).

From 1863, early miners in the area processed gold, silver, lead, zinc and copper, and erected many mills and smelters. Included within the Kennecott South Zone is the Bingham Mining District, associated waste rock dumps, water management facilities, ore concentrator, and support facilities. Solid wastes from the mining and milling processes (waste rock, tailings, sludges, slimes) were deposited in creeks or on nearby flood plains and valley slopes. The mine wastes eroded and were mobilized downstream into the cities and townships east of the mining district into areas of residential, commercial and agricultural use. The hazardous substances that were released in the mine waste include arsenic and lead in waste rock and tailings, subsequently impacting soils above UU/UE action levels.

For the Kennecott site, the EPA and DERR selected alternative unrestricted (UU/UE) action levels for arsenic, cadmium, lead and selenium. These alternative unrestricted action levels are lower than the operable unit specific residential land use actions levels. The EPA's and DERR's December 2015 technical memorandum specifies the applicability of the Kennecott Site Wide Unrestricted Land Use Action Levels (i.e. Kennecott Unrestricted Action Levels, KUALs). The December 2015 technical memorandum was then attached to and referenced by the August 2017 Explanation of Significant Differences for the Kennecott North and South Zones signed by the EPA and DERR. Though arsenic and lead are the principal contaminants of concern, mine waste can contain cadmium and selenium above the KUALs. The original site human health risk assessment and endangerment assessments recognized arsenic, cadmium, lead and selenium as the contaminants of concern for the overall Kennecott site. Subsequent administrative orders and memorandums further refined the focus of removal actions addressing lead and arsenic as the principal contaminants of concern.

The hazardous substances, pollutants, and contaminants released to groundwater from historic mining activities included sulfate, total dissolve solids (TDS), and various heavy metals above Maximum Contaminant Levels (MCLs). The impacted groundwater is in the principal alluvial aquifer of the Southwest Salt Lake Valley, which is a source of drinking water for the communities of West Jordan, South Jordan, Riverton, Herriman and unincorporated Salt Lake County (SLCO).

In January 1994, the Kennecott South Zone was proposed to the National Priorities List (NPL). Pursuant to a September 1995 memorandum of understanding (MOU) between the EPA, UDEQ, and RTKC, RTKC agreed to complete numerous cleanup projects for the Site as well as the nearby RTKC North Zone. In September 2008, the EPA officially withdrew the proposal to place the Kennecott South Zone on the NPL. The withdrawal was based on removal and remedial work performed and ongoing obligations under remedial action consent decrees that were completed for some of the OUs covered under this FYR. Although early removal efforts effectively allowed the EPA to determine some OUs did not require further work, the previous FYR led the EPA and UDEQ in 2017 to sign an Explanation of Significant Differences (ESD) to specify the need for institutional controls (ICs) for OUs where soils and mine waste was left in place above the KUALs. For more information on site background, chronology, basis to act and response actions, please review the November 1998, December 2000, September 2001, and September 2002 Records of Decision (RODs), the August 2017 ESD, and the 2016 FYR for the Kennecott South Zone.

Under administrative orders, cleanup action memorandums, and records of decisions RTKC and the Atlantic Richfield Company-British Petroleum (ARCO-BP) cleaned up waste rock, mill tailings, slag, sludges, slimes, soils, tail water, surface water and groundwater on their property and private property in the surrounding cities and unincorporated townships bordering their property. These actions were overseen by the EPA and DERR. Respectively on their properties, RTKC and ARCO-BP continue to manage soils and mine waste via operation and maintenance (O&M) plans.

FIVE-YEAR REVIEW SUMMARY FORM

SITE IDENTIFICATION		
Site Name: Kennecott South Zone		
EPA ID: UTD000826404		
Region: 8	**State:** Utah	**City/County:** Salt Lake County
SITE STATUS		
NPL Status: Withdrawn from Proposed NPL		
Multiple OUs? Yes	**Has the site achieved construction completion?** No	
REVIEW STATUS		
Lead agency: State		
Author name: Douglas Bacon		
Author affiliation: UDEQ		
Review period: June 2020 to February 2021		

Date of site inspection: November 2020 to January 2021
Type of review: Statutory
Review number: 2nd combined review
Triggering action date: May 6, 2016
Due date *(five years after triggering action date)*: May 6, 2021

II. RESPONSE ACTION SUMMARY

Basis for Taking Action

In 1990, the EPA and DERR discovered homes had been built on former flood plains having soils contaminated with high levels of lead and arsenic from mobilized solid mine waste. Under administrative orders RTKC and ARCO-BP performed the required characterization studies to assess the nature and extent of metals contamination (specifically, arsenic and lead). During risk assessments in the late 1990s, the EPA and DERR determined that arsenic and lead were the principal contaminants of concern in soil in OUs 1, 3, 4, 5, 6, 10, 11, 18, 20, and 24. High levels of lead and arsenic were found in Bingham Creek and Butterfield Creek and a few intermittent drainages in between.

In 1990, the EPA and DERR also discovered the principal alluvial aquifer of the Southwest Salt Lake Valley was impacted by mining influenced water. Through a remedial investigation RTKC determined that there were two groundwater plumes (Zone A and Zone B) which are located in the principal alluvial aquifer underlying the Southwest Salt Lake Valley. The plumes are designated OU2 of the Kennecott (South Zone) site. The Zone A Plume is attributable to water seepage from the historic Bingham Reservoir (OU4) and acid mine drainage release from the Bingham Mine waste rock dumps. The Zone B Plume is attributable to water seepage from the South Jordan Evaporation Ponds. Both Zone A and B Plumes contain concentrations of sulfate and total dissolved solids (TDS) above the State of Utah Primary Drinking Water Standards. The Zone A Plume also has a core of low-pH acidic waters and concentrations of metals (arsenic, cadmium, copper, manganese) above the State of Utah Primary Drinking Water Standards. The Utah Primary Drinking Water Standards are consistent with the federal standards listed in the Safe Drinking Water Act. The Zone A and B Plumes underlie the cities of West Jordan, South Jordan, Riverton, Herriman, and un-incorporated Salt Lake County where private wells are still in use. Some municipal wells have been taken out of service (South Jordan), while others for West Jordan, Riverton, and Herriman are still in use.

During the assessment of sources of groundwater impacts in OU2, RTKC determined that the historic Water Collection System near the base of the Bingham Mine waste rock dumps was not capturing all acid mine drainage from the dumps. Acid mine drainage typically has sulfate, TDS and metals concentrations above the State of Utah Drinking Water Standards. Along drainages where the waste rock dumps are located, there were a series of impacted alluvial groundwater plumes that were entering the principal aquifer of the Southwest Salt Lake Valley. It was determined that the Water Collection System required upgrades (the upgrades were completed by the time the 2002 ROD was completed).

RTKC also determined during the OU2 assessment that a separate groundwater plume is migrating out of Dry Fork and into the alluvial groundwater underlying Bingham Canyon. Dry Fork is a tributary canyon to Bingham Canyon, where RTKC has historically placed waste rock. The Dry Fork Plume (OU16) is impacted by sulfate, TDS and metals concentrations above the State of Utah Primary Drinking Water Standards. The Dry Fork plume in the alluvial aquifer of Bingham Canyon is not accessible to the general public; however, it was determined the plume could migrate into the Southwest Salt Lake Valley principal alluvial aquifer if it was not contained in Bingham Canyon.

Response Actions

Initially, RTKC voluntarily removed soils and mine waste in OUs 1, 4, 5, and 6. Following these voluntary removal actions, the EPA issued administrative orders requiring soil and mine waste removals (but not specifically to the KUALs) in OUs 1, 3, 4, 5, and 6. The 1998 and 2001 RODs for OUs 1, 4, 5 and OUs 3 and 6, respectively, cover the scope of the previous removal actions and noted that no further action was necessary. Based on current land use and public accessibility, the EPA made a similar decision that no further action was necessary for OUs 10 and 11, and OUs 18, 20, and 24 in the 1998 and 2002 RODs, respectively. Though no further action was determined, if land use were to change, management of soils and mine waste exceeding the KUALs would be necessary. The 2017 ESD requires management of soils and mine waste by RTKC and ARCO-BP on property they own when land use changes. The 2017 ESD also requires local jurisdictions to establish institutional controls (ICs) to ensure management of soils and mine waste at the time of land use change on private property (not owned by RTKC or ARCO-BP). For OUs 1, 5, 10, 11 (1998 ROD), OUs 3 and 6 (2001 ROD), and OU24 (2002 ROD), the EPA deferred remedial action to address impacts to alluvial aquifers to the selected remedy for OU2.

The 1998 Remedial Investigation and Feasibility Study (RI/FS) determined the impacted principal aquifer in the Southwest Salt Lake Valley (OU2) contains two separate plumes of pollutants and contaminants. The 2000 ROD requires active extraction and treatment of the OU2 Zone A Plume, and defers a remedy selection for the OU2 Zone B plume. The 1998 and 2000 RODs require the reconstruction of source control measures at OUs 4, 12, and 16. The 1998 and 2000 RODs also require these facilities to be operated under permits issued by the Division of Water Quality (DWQ) Groundwater Protection Program (GWPP) to prevent ongoing releases of acid mine drainage and other mine contact waters from migrating into the Southwest Salt Lake Valley principal alluvial aquifer. Collaboration between the EPA and UDEQ using both CERCLA and Natural Resource Damage (NRD) authority in 2002 and 2004 (pursuant to a CERCLA Remedial Design and NRD Three-Party Agreement, respectively) required containment, reduction, and provision of treated water to the public in the affected area from the two plumes in OU2.

Certain OUs located within areas of active RTKC operations (OUs 4, 6, 10, 11, 12, 18, 20, 24 and 25) are not accessible to the public. RTKC is required to (a) ensure these areas remain inaccessible except for site workers, (b) develop and update maps to show where soils and mine waste are left in place above KUALs, and (c) manage soils and mine waste when they are excavated, (d) implement the extraction and treatment of groundwater at the OU2 Zone A Plume, and (e) operate the source control measures at OUs 4, 12, and 16 to prevent further groundwater impacts, in compliance with DWQ GWPP permits. ARCO-BP is required to maintain the cap over the ARCO Tails Repository at OU5 and was required to assist with the removals in OU1 and OU5 Bastian Ditch, located on their property.

Generally, the Remedial Action Objectives (RAOs) for the OU cleanups addressed in this FYR are:

- Prevent groundwater contamination from uncontrolled releases;
- Prevent human exposure to unacceptable levels of lead and arsenic at different exposure rates by land use;
- Prevent downstream migration of unacceptable levels of lead and arsenic to developed and undeveloped community areas; and
- Protect flora and fauna in areas of prime wildlife habitat.

The following are OU specific remedy elements:

OU1

Three phases of removal action were implemented by RTKC and ARCO-BP. The removal actions included:

- Removal of lead and arsenic above specific risk-based action levels for current land use to a depth of 18 inches or attainment of the action level which ever came first;
- Restoration to post-removal surface depths (generally backfill of 18 inches) with soils compliant with the action levels for the current use; and
- Management of removed soils in on-site repositories constructed respectively by RTKC (Bluewater repository) and ARCO-BP (ARCO Tails Repository).

Pursuant to administrative orders issued by the EPA, Phase I included remediation of 50 residential properties east of 4800 West with lead concentrations exceeding 2500 mg/kg. During Phase II, contaminated tailings were removed from nine miles of the Bingham Creek Channel proceeding from RTKC's Bingham Reservoir to the downstream side of the Brookside Trailer Park. Tailings with lead greater than the OU1 Commercial Land Use Action Level of 2000 mg/kg were removed to a depth of three feet. During Phase III, an additional 25 residential properties, plus the original 50 residential properties (addressed during Phase I), were remediated to the final OU1 Residential Land Use Action Levels for lead (1100 mg/kg) and arsenic (100 mg/kg). The three phases of removal action did not require cleanup to the KUALs.

The historic railroad corridors (OU24), located in proximity to Bingham Creek Channel, were not addressed at the time of the Bingham Creek removal actions.

Some of the historic sites (OU25), located in proximity to Bingham Creek Channel, were addressed in the western portion of OU1 to the OU1 Commercial Land Use Action Level for lead (2,000 mg/kg).

The 1998 ROD determined no further action was necessary based on the cleanup work and based on land use at the time, even though soils were left in place above the KUALs. Though institutional controls were contemplated under the 1998 ROD they were not specified until later in an Explanation of Significant Differences (ESD) issued in 2017.

The 2017 ESD provides for RTKC to update maps of OU1 and implement ICs (site-wide management plans) on their property in OU1 to manage soils and mine waste with concentrations of lead and arsenic above the KUALs. The 2017 ESD also states ICs were developed by the City of West Jordan and Salt Lake County Health Department to ensure management of soils and mine waste above the KUALs on private property in OU1 when land use is changed. Please refer to Table 2 for a citation of the City of West Jordan and Salt Lake County Health Department ICs. ARCO-BP does not have property in OU1 but for those portions along the northern boundary of OU5, located west of SH-111.

OU2

A collaboration between the EPA and DERR using both CERCLA and Natural Resource Damage (NRD) authority in 2002 and 2004 (pursuant to a CERCLA Remedial Design and NRD Three-Party Agreement, respectively) remedial action is addressing the two plumes comprising OU2, Zone A and Zone B. The ongoing CERCLA selected remedy focuses on the Zone A Plume:

- Operation and Maintenance (O&M) of surface source controls through compliance with the DWQ GWPP permits for the Bingham Reservoirs (OU4), the Water Collection System (OU12), and containment of the Dry Fork Plume underlying Bingham Canyon (OU16)
- IC implementation by the Division of Water Rights (DWR) to ensure third-party groundwater extraction projects do not impede the containment of the Zone A plume
- Provision of point of use water management for private well owners if their wells are impacted by the Zone A plume

- Pump and treatment of the Zone A acidic core at a minimum rate sufficient to contain the plume (2009 O&M plan rate sets the minimum extraction rate at 1200 gallons per minute)
- Development of a plan to mitigate drawdown impacts from pumping the Zone A Plume
- Installation of barrier wells to contain the Zone A Plume and management of the extracted water per agreement by the EPA and DERR
- Groundwater monitoring subject to the requirements of the 2009 Operation, Maintenance and Replacement (OM&R) plan
- Disposal of extracted Zone A acid core groundwater and reverse osmosis treatment concentrates (from the treatment of the barrier well extracted groundwater) in the RTKC tailings impoundment, via the tailings pipeline
- Development of a post mine closure plan for ongoing water management.

The EPA deferred the selection of remedial action to address the Zone B Plume in lieu of a project implemented by Jordan Valley Water Conservancy District (JVWCD) and RTKC to address obligations under the 2004 NRD Three Party Agreement. The 2000 ROD does not specify any action to be taken at the Zone B Plume. JVWCD is acquiring the equivalent of the damaged groundwater resource in Zone B, as listed in the 2004 NRD Three Party Agreement. After acquisition, JVWCD makes this water (which complies with the State of Utah Primary Drinking Water Standards) available to the municipalities in the affected area of OU2 (the cities of West Jordan, South Jordan, Riverton and Herriman). It should be understood that under the 2004 NRD Three Party Agreement JVWCD does not have to extract and treat the Zone B Plume but has elected to do so to date.

The 2017 ESD provides for RTKC to update maps of OU2.

OU3

The removal actions included:

- Removal of lead and arsenic above specific risk-based action levels for current land use to a depth of 18 inches or attainment of the action level which ever came first
- Restoration to pre-removal surface depths (generally backfill of 18 inches) with soils compliant with the action levels for the current use
- Management of removed soils by RTKC in their constructed soil repository
- Prevention of migration of soils and sediments with elevated concentrations of lead and arsenic
- ICs to ensure soils are managed during changes in land use.

Some historic areas (e.g., Queen Mine/Mill) were left in place due to restricted access by the public. During the removal action 85 residential properties were characterized and some required removal action to remove soils above the removal action levels for lead (1,200 mg/kg) and arsenic (100 mg/kg) to a depth of 18 inches. Removal actions were not completed on pasture acreage or larger residential lots as the EPA determined there were no exposure risks at the time. No removal action occurred on agricultural properties in Herriman, as the soils were assessed by the EPA to comply with the OU3 Agricultural Land Use Action Levels for lead (10,000 mg/kg) and arsenic (300 mg/kg). The 2001 ROD specified that property with soils and mine waste above the selected land use action levels left in place are required to be managed during changes in land use by ICs created by the local jurisdiction. The City of Herriman created ICs with the EPA's assistance (refer to Table 2 for the IC citations). The 2001 ROD did not select a method to manage upgradient waste rock from the Bingham Mine located in the northern drainages to Butterfield Canyon where it could mobilize off-site. The EPA previously considered the South Waste Rock Dumps of the Bingham Mine subject to state permits that would address the mine waste as a historic facility.

The 2017 ESD provides for RTKC to update maps of OU3 and implement ICs (site-wide management plans) on their property in OU3 to manage soils and mine waste with concentrations of lead and arsenic above the Kennecott Unrestricted Action Levels. The 2017 ESD also states ICs were developed by the City of Herriman and Salt Lake County Health Department to ensure management of soils and mine waste above the KUALs on private property in OU3 when land use is changed. Please refer to Table 2 for a citation of the City of Herriman and Salt Lake County Health Department ICs.

OU4

Under an administrative order, RTKC took the historic large and small Bingham Reservoirs off-line in the mid-1990s and reconstructed both with liners, sumps, and leak detection. In the process of reconstruction, sludge and tailings from the historic reservoir footprints were removed to RTKC's onsite repositories and their Bingham Mine waste rock dumps. The 1998 ROD requires the new Bingham Reservoirs to be permitted under DWQ's GWPP and to operate in compliance with the permit.

The 2017 ESD provides for RTKC to update maps of OU4 and implement ICs (site-wide management plans) on their property in OU4 to manage soils and mine waste with concentrations of lead and arsenic above the KUALs. The 2017 ESD also states ICs were developed by the Salt Lake County Health Department to ensure management of soils and mine waste above the Kennecott Unrestricted Action Levels when RTKC divests its property ownership. Please refer to Table 2 for a citation of the Salt Lake County Health Department IC.

OU5

Under a 1993 Unilateral Administrative Order, ARCO-BP consolidated soils and mine waste above the KUALs from its 90-acre property in OU5 into a 41-acre repository built on site. In addition, ARCO-BP removed soils and mine waste from ditches (including the Bastian Ditch) on their property and placed the material in their on-site repository. The ARCO Tails Repository was capped to prevent migration, and ARCO-BP is required to perform maintenance and monitoring of the cap to ensure the consolidated soils and mine waste do not migrate. ARCO-BP was also required to monitor groundwater in the vicinity of the repository for a period of five years (1999 to 2004). The 1998 ROD requires ARCO-BP to implement an IC to ensure the land use does not change. ARCO-BP has an IC listed in the federal consent decree settlement that specifies no land use changes on their property.

ARCO-BP and RTKC removed soils and mine waste with lead concentrations greater than 2,000 mg/kg from the Bastian Ditch located on their respective properties. The soils and mine waste removed were disposed of in RTKC's (Bluewater Repository) and ARCO-BPs (ARCO Tails Repository). Areas where OU5-Bastian Ditch was left in place (east of SH-111 and south of 11800 South), based on the current land use at the time, ICs are required to manage changes in land use. The EPA determined no further action was required.

The 2017 ESD provides for the updating of OU5 maps (which RTKC performs) and notes that an operation and maintenance (O&M) plan for covers and caps generated by ARCO-BP is subject to approval by the EPA and DERR. For the ARCO Tails Repository, ARCO-BP maintains the repository pursuant to an O&M plan (which was not originally required under the 1993 UAO to be submitted to the EPA or DERR). For the Bastian Ditch on RTKC's property, since the footprint was cleaned up to 2000 mg/kg (OU5 Commercial Land Use Action Level for Lead) it is subject to RTKC's August 2019 Site Wide Management Plan for Waste Left in Place (2019 WLIP Plan) to ensure ongoing management of soils and mine waste. For the Bastian Ditch on ARCO-BP's property where the footprint was cleaned up to the OU5 Commercial Land Use Action Level for Lead of 2000 mg/kg, it is subject to ARCO-BP's institutional control listed in their consent decree with the EPA. Where the Bastian Ditch is on private property, the 2017 ESD notes these properties are subject to the Salt Lake County Health Department Institutional Control when land use changes. Please refer to Table 2 for a citation of the Salt Lake County Health Department IC.

OU6

During voluntary actions by RTKC, soils and mine waste in various areas throughout the OU, with a lead concentration greater than 1000 mg/kg, were removed by RTKC and deposited in the Bluewater repository or placed on the Bingham Mine waste rock dumps. Tailings were recontoured in place, and concentrations of lead and arsenic were determined to comply with the OU6 open space/recreational land use action levels. RTKC's removal actions were assessed to lower potential exposures to employees, site visitors and trespassers, thus no further action was required in the 2001 ROD.

The 2017 ESD provides for RTKC to update maps of OU6 and implement ICs (site-wide management plans) on their property in OU6 to manage soils and mine waste with concentrations of lead and arsenic above the KUALs. The 2017 ESD also states ICs were developed by the Salt Lake County Health Department to ensure management of soils and mine waste above the KUALs on private property in OU6 when land use is changed. Please refer to Table 2 for a citation of the Salt Lake County Health Department IC.

OU10

The EPA and RTKC evaluated known deposits of tailings in the community of Copperton and on RTKC property. The tailings had concentrations of lead and arsenic which were below land use action levels for OU10 at the time. No further action was required.

The 2017 ESD provides for RTKC to update maps of OU10 and implement ICs (site-wide management plans) on their property in OU10 to manage soils and mine waste with concentrations of lead and arsenic above the KUALs. The 2017 ESD also states ICs were developed by the Salt Lake County Health Department to ensure management of soils and mine waste above the KUALs on private property in OU10 when land use is changed and RTKC divests its property ownership. Please refer to Table 2 for a citation of the Salt Lake County Health Department IC.

OU11

Approximately 26 historic facilities (adits, tunnels, mills, etc.) are in Bingham Canyon; most were either mined away or buried under waste rock. The sites buried under waste rock were determined to not be accessible to the public. Three sites: C.W. Watson Jig, Yellow Cake Plant and the Lead Mine Mill remain accessible, but only to site workers. The EPA determined that they were not accessible to the public. No further action was required.

The 2017 ESD provides for RTKC to update maps of OU11 and implement ICs (site-wide management plans) on their property in OU11 to manage soils and mine waste with concentrations of lead and arsenic above the KUALs. The 2017 ESD also states ICs were developed by the Salt Lake County Health Department to ensure management of soils and mine waste above the KUALs on private property when RTKC divests its property ownership. Please refer to Table 2 for a citation of the Salt Lake County Health Department IC.

OU12

OU12 is a source control measure for OU2. The Water Collection System is used to prevent the ongoing migration of acid mine drainage and contact water from the Bingham Mine waste rock dumps into the down gradient Southwest Salt Lake Valley principal alluvial aquifer. The 1995 State Natural Resource Damage Claim Consent Decree settlement and the EPA source control assessment required RTKC to upgrade the original Water Collection System and they did. By the time of the 2000 ROD, the Water Collection System was permitted by the DWQ GWPP under an operating permit issued in 1999. Since the 2000 ROD, RTKC has maintained compliance with a DWQ GWPP permit.

The 2017 ESD provides for RTKC to update maps of OU12 and implement ICs (site wide management plans) on their property in OU12 to manage soils and mine waste with concentrations of lead and arsenic above the KUALs. The 2017 ESD also states ICs were developed by the Salt Lake County Health Department to ensure management

of soils and mine waste above the KUALs when RTKC divests its property ownership. Please refer to Table 2 for a citation of the Salt Lake County Health Department IC.

OU16

OU16 is an alluvial groundwater plume emanating from Dry Fork Gulch. Dry Fork Gulch is a northern tributary to Bingham Canyon where RTKC has disposed of waste rock for several years. Alluvial groundwater has been impacted by water percolating through the contaminated waste rock. The impacted alluvial groundwater in Bingham Canyon remains upgradient of the Bingham Canyon Cutoff Wall (a part of OU12). The 2000 ROD specifies that RTKC will comply with a DWQ GWPP permit for OU12, which includes monitoring and containment of the Dry Fork Plume by RTKC.

The 2017 ESD provides for RTKC to update maps of OU16 and implement ICs (site-wide management plans) on their property in OU16 to manage soils and mine waste with concentrations of lead and arsenic above the KUALs. The 2017 ESD also states ICs were developed by the Salt Lake County Health Department to ensure management of soils and mine waste above the KUALs when RTKC divests its property ownership. Please refer to Table 2 for a citation of the Salt Lake County Health Department IC.

OU18

There are a series of tunnels and overburden rock dumps located from Middle Canyon to Pine Canyon in Tooele County. The majority are inaccessible and on RTKC property in the Oquirrh Mountains. The Middle Canyon Tunnel (or Water Supply Tunnel), and Middle Canyon Dump (or Water Supply Tunnel Dump), are accessible to the public and located immediately adjacent to Middle Canyon Creek. The Middle Canyon Dump contains overburden rock (from the drilling of the tunnel) with lead concentrations above KUALs. Stabilization of the Middle Canyon Dump and prevention of sediment migration into Middle Canyon Creek was required in the ROD. In addition, the Middle Canyon Tunnel and Dump are inspected annually to assess the Dump's stability. ICs were also required to assist land use planners in the future with any changes to the current use as open space supported in part by the provision of maps where soils and mine waste were left in place above the KUALs.

The 2017 ESD provides for RTKC to implement ICs (site-wide management plans) on their property in OU18 to manage soils and mine waste with concentrations of lead and arsenic above the KUALs.

OU20

The Anaconda Carr Fork support facilities, Bingham Mine-Pine Canyon Tunnel, remnants of the historic Star Mill, and an overburden rock dump with arsenic, located in the upper reaches of Pine Canyon are not accessible to the public. Under oversight by the Division of Oil, Gas and Mining (DOGM) sediment ponds associated with the Pine Canyon Tunnel discharges were capped and revegetated; additional reclamation work under oversight by DOGM is still pending. Subsequent decisions by RTKC and the Division of Water Quality Utah Pollution Discharge Elimination System Program included the permitting of the Pine Canyon Tunnel discharge as a stormwater discharge. Pine Canyon is secure from public access (except for trespassers), and therefore no further action was required.

The 2017 ESD provides for RTKC to implement ICs (site-wide management plans) on their property in OU20 to manage soils and mine waste with concentrations of lead and arsenic above the KUALs. The 2017 ESD required a seed restriction, restricting the use of plant species that can uptake selenium during reclamation, be included in the site-wide management plans.

OU24

Many of the sites within this OU are either actively used as part of the mining and milling facilities, support the mining operations, or are within other operational areas. Once operations cease and facilities are decommissioned, soils and mine waste will be characterized to determine if they exceed an applicable land use action level. If

UU/UE action levels are exceeded, soils and mine waste are to be removed to an OU24 action level applicable for the proposed land use or to a depth of 18 inches, whichever comes first (as listed stated on page 11.14 of the 2002 ROD). The three facilities to be remediated once operations cease include the precipitation plant,

The 2017 ESD provides for RTKC to implement ICs (site-wide management plans) on their property in OU24 to manage soils and mine waste with concentrations of lead and arsenic above the KUALs. The 2017 ESD also states ICs were developed by the Salt Lake County Health Department to ensure management of soils and mine waste above the KUALs on private property in OU24 when land use is changed and RTKC divests its property ownership. Please refer to Table 2 for a citation of the Salt Lake County Health Department IC.

OU25

In a technical memorandum dated February 2016 the EPA and DERR consolidated the over 300 Kennecott Historic Facilities (except for those comprising OU11 in Bingham Canyon) listed in the September 2002 ROD into OU25. The 2017 ESD referenced the consolidation of these historic facilities in 2016 and selected remedy elements for all of them. Though these historic facilities are scattered across the Kennecott North and South Zones, predominantly on RTKC property, for purposes of five-year reviews OU25 was deferred in the 2016 technical memorandum for evaluation under future Kennecott North Zone FYRs. For purposes of this review OU25 is included because it was not evaluated in the 2019 North Zone FYR. It will be included in the 2024 FYR for the North Zone to get the review of OU25 in line with the 2016 technical memorandum.

The 2017 ESD provides for RTKC to update maps of OU25 and implement ICs (site-wide management plans) on their property in OU25 to manage soils and mine waste with concentrations of lead and arsenic above the KUALs. The 2017 ESD also states ICs were developed by the Salt Lake County Health Department to ensure management of soils and mine waste above the KUALs on private property in OU25 when land use is changed and RTKC divests its property ownership. Please refer to Table 2 for a citation of the Salt Lake County Health Department IC.

Status of Remedy Implementation

Remedy implementation and O&M statuses are summarized below for each OU covered under this FYR.

OU1

Remedy implementation: Maps of the geographic boundaries of OU1 have been provided and incorporated by the EPA and DERR into EPA's site viewer GIS system, and shared with local jurisdictions overseeing land use controls via ICs on land not owned by RTKC. GIS maps of OU1 will require ongoing refinement to account for locations of soils above the KUALs as land use changes. In 2019, the EPA and DERR provided a notice of acceptance for RTKC's August 2019 Site Wide Management Plan for Waste Left in Place (2019 WLIP Plan), which specifies management procedures for soils and mine waste in portions of OU1 where RTKC still owns the property and there are no mining and processing operations. No excavation projects have occurred in OU1 by RTKC on land it owns.

O&M: Since 2016 the City of West Jordan and Salt Lake County Health Department have requested assistance from DERR in the review and technical completeness determination of several development projects in OU1. These projects have dealt with the excavation, removal, and, in some cases, consolidation of soils and mine waste onsite. The projects have been for utility corridors, roadways and a park.

OU2

Remedy implementation: Groundwater monitoring continues to be performed in compliance with the OU2 2009 OM&R Plan. Annual monitoring results are reported to the EPA and DERR by RTKC annually on April 15 and shared with the South Zone Technical Review Committee for evaluation by the local stakeholders. Source control measures continue to be implemented at OU4, 12, 16 (see below). RTKC has remained in compliance with

performance and management criteria listed in the 2009 OM&R Plan. An update to the post mine closure water management plan is required during each FYR (Appendix E).

O&M: RTKC submitted their annual remedial progress report for the operational year 2020 (and has the past five years since 2016). Due to COVID-19 the Agencies did not hold a meeting with the South Zone Technical Review Committee, but the report was distributed electronically to the stakeholders. The report documented compliance with the requirements listed in the 2009 OM&R Plan for Zone A of OU2.

OU3

Remedy implementation: Maps of the geographic boundaries of OU3 have been provided and incorporated by the EPA and DERR into EPA's site viewer GIS system, and shared with local jurisdictions overseeing land use controls via ICs on land not owned by RTKC. GIS maps of OU3 will require ongoing refinement to account for location of soils above the KUALs as land use changes. In 2019 the EPA and DERR provided a notice of acceptance for RTKC's 2019 WLIP which specifies management procedures for soils and mine waste in portions of OU1 where RTKC still owns the property and there are no mining and processing operations. No excavation projects have occurred in OU3 by RTKC on its land.

O&M: Since 2016 the City of Herriman has overseen redevelopment projects in OU3 within its jurisdiction. The projects have been for large scale conversion of agricultural lands on the western end of OU3 for residential and commercial mix use. Herriman City maintains records for these projects in their Engineering Department. A project is in discussion as a joint venture to look at developing recreational opportunities in Butterfield Canyon, but no project has yet been proposed under the Salt Lake County Health Department IC or by RTKC under their 2019 WLIP Plan.

OU4

Remedy implementation: The Bingham Reservoirs are operated in compliance with a DWQ GWPP permit, #UGW350006 (permit expired December 21, 2020). Though expired, pursuant to the rules of DWQ's GWPP, operations under the permit continue until the permit is renewed. Operations include monitoring compliance wells and maintaining the leak detection system at the Reservoirs. OU4 is a source control measure for OU2.

Maps of the geographic boundaries of OU4 have been provided and incorporated by the EPA and DERR into EPA's site viewer GIS system and shared with local jurisdictions overseeing land use controls via ICs on land not owned by RTKC. GIS maps of OU4 will require ongoing refinement to account for locations of soils above the KUALs as land use changes. In 2019, the EPA and DERR received RTKC's pending Operational Soils Management Plan and are currently coordinating its review with RTKC. In the meantime, excavation projects, if proposed by RTKC will follow the management steps for soils and mine waste specified in the plan. No excavation projects have occurred in OU4 by RTKC on its land.

O&M: RTKC submitted their compliance monitoring reports to DWQ's GWPP. Pursuant to DWQ's GWPP summary memorandum (see Appendix E) RTKC has maintained compliance with the permit requirements.

OU5

Remedy implementation: Maps of the geographic boundaries of OU5 have been provided and incorporated by the EPA and DERR into EPA's site viewer GIS system, and shared with local jurisdictions overseeing land use controls via ICs on land not owned by RTKC or ARCO-BP. GIS maps of OU5 will require ongoing refinement to account for locations of soils above the KUALs as land use changes. In 2019, the EPA and DERR provided a notice of acceptance for RTKC's 2019 WLIP Plan which specifies management procedures for soils and mine waste in portions of OU5-Bastian Ditch where RTKC still owns the property and there are no mining and processing operations. No excavation projects have occurred in OU5- Bastian Ditch by RTKC on land they own. ARCO-BP is required to maintain and repair the cap over the ARCO Tails Repository and manage the land use to

prevent changes. No excavation projects have occurred in OU5 ARCO Tails Repository or Bastian Ditch by ARCO-BP on land they own.

O&M: Since 2016 Salt Lake County Health Department has requested assistance from DERR for the review and technical completeness determination of a few development projects in OU5 – Bastian Ditch. These projects propose to remove the soil and mine waste associated with the Bastian Ditch, from locations on private property east of SH-111 and south of 11800 South during the development of two residential/commercial mixed-use developments.

RTKC manages soils and mine waste exceeding the KUALs under its 2019 WLIP Plan for portions of OU5 – Bastian Ditch on their property west of SH-111. In 2020 RTKC initiated a risk assessment (RA) for OU5 Bastian Ditch to develop a site-specific residential and commercial land use action level. The EPA and DERR are currently evaluating a sampling and analysis (SAP) and quality assurance project plan (QAPP) for the collection of samples to support the RA. The RA will be used as the support to a revision of the EPA's and DERR's 2015 technical memorandum, which will be incorporated by reference under a pending decision document for the overall Kennecott site (both Zones).

ARCO-BP implements annual site inspection and maintenance actions pursuant to the requirement to maintain and repair the cap at OU5 - ARCO Tails Repository located on their property under an operation and maintenance (O&M) plan. They also observe the stability of the hillside where OU5 – Bastian Ditch was previously removed. Though not required to be submitted to the EPA and DERR, a copy of the 2019 O&M report was provided to DERR as part of this FYR and no major issues were noted. ARCO's 2020 O&M report is still being drafted.

OU6

Remedy implementation: Maps of the geographic boundaries of OU6 have been provided and incorporated by the EPA and DERR into EPA's site viewer GIS system, and shared with local jurisdictions overseeing land use controls via ICs on land not owned by RTKC. GIS maps of OU6 will require ongoing refinement to account for locations of soils above the KUALs as land use changes. In 2019 the EPA and DERR provided a notice of acceptance for RTKC's 2019 WLIP Plan, which specifies management procedures for soils and mine waste in portions of OU6 where RTKC still owns the property and there are no mining and processing operations. No excavation projects have occurred in OU6 by RTKC on land they own.

O&M: Since 2016 Salt Lake County Health Department has requested assistance from DERR in the review and technical completeness determination for a few development projects in OU6. These projects have included a characterization of soils in areas proposed for redevelopment and for a few projects have included proposed management steps for soils and mine waste exceeding an applicable land use action level for OU6. The projects have ranged from recreational trail development, mixed used residential and commercial development, and the development of infrastructure including pipelines and water tanks.

RTKC manages soils and mine waste exceeding the KUALs under its 2019 WLIP Plan for portions of OU6 with no mining and processing operations. For portions of OU6 where there are mining and processing operations, RTKC currently manages soils and mine waste above the KUALs based on land use during excavations. The procedures they implement are from the pending Operational Soils Management Plan per agreement with the EPA and DERR.

In 2020, RTKC sampled an area just south of their Lark access gate and west of SH-111 which is intended to be deeded to a local jurisdiction for the construction of a water tank. RTKC proposed an environmental covenant (EC) for the site since lead concentrations exceed the applicable OU6 Industrial Land Use Action Level. The Lark Water Tank EC which is undergoing review by the EPA and DERR, requires the submission and implementation of a soil management plan to EPA, DERR for review and acceptance prior to the development of the water tank.

In 2020, RTKC initiated a risk assessment (RA) for OU6 to develop a site-specific residential and commercial land use action level. The EPA and DERR are currently evaluating a sampling and analysis (SAP) and quality

assurance project plan (QAPP) for the collection of samples to support the RA. The RA will be used as support to a revision of the EPA's and DERR's 2015 technical memorandum, which will be incorporated by reference under a pending decision document for the overall Kennecott site (both Zones).

OU10

Remedy implementation: Maps of the geographic boundaries of OU10 have been provided and incorporated by the EPA and DERR into EPA's site viewer GIS system and shared with local jurisdictions overseeing land use controls via ICs for land not owned by RTKC. GIS maps of OU10 will require ongoing refinement to account for locations of soils above the KUALs as land use changes. In 2019 EPA and DERR provided a notice of acceptance for RTKC's 2019 WLIP Plan, which specifies management procedures for soils and mine waste in portions of OU10 where RTKC still owns the property and there are no mining and processing operations. No excavation projects have occurred in OU10 by RTKC on land they own.

O&M: Since 2016 no development projects on non-RTKC owned property have been proposed to Salt Lake County Health Department.

RTKC manages soils and mine waste exceeding the KUALs under its 2019 WLIP Plan for portions of OU10 with no mining and processing operations. For portions of OU10 where there are mining and processing operations, RTKC currently manages soils and mine waste above the KUALs based on land use during excavations. The procedures implemented are from the pending Operational Soils Management Plan.

OU11

Remedy implementation: Maps of the geographic boundaries of OU11 have been provided and incorporated by the EPA and DERR into EPA's site viewer GIS system and shared with local jurisdictions overseeing land use controls via ICs for land not owned by RTKC. GIS maps of OU11 will require ongoing refinement to account for locations of soils above the KUALs as land use changes. In 2019 the EPA and DERR provided a notice of acceptance for RTKC's 2019 WLIP Plan, which specifies management procedures for soils and mine waste in portions of OU11 where RTKC still owns the property and there are no mining and processing operations. No excavation projects have occurred in OU11 by RTKC on land it owns.

O&M: RTKC manages soils and mine waste exceeding the KUALs under their 2019 WLIP Plan for portions of OU11 with no mining and processing operations. For portions of OU11 where there are mining and processing operations, RTKC currently manages soils and mine waste above the KUALs based on land use during excavations. The procedures it is implementing are from the pending Operational Soils Management Plan per agreement with the EPA and DERR. No projects have occurred in OU11 by RTKC on land it owns.

OU12

Remedy implementation: The Water Collection System (OU12) continues to operate in compliance with DWQ's GWPP permit for the Bingham Mine, # UGW350010 (permit expires July 25, 2025). Groundwater monitoring continues to be performed pursuant to the permit. Maps of the geographic boundaries of OU12 have been provided and incorporated by the EPA and DERR into EPA's site viewer GIS system and shared with local jurisdictions overseeing land use controls via ICs for land not owned by RTKC. GIS maps of OU12 will require ongoing refinement to account for locations of soils above the KUALs as land use changes.

O&M: RTKC submitted their compliance monitoring reports to DWQ's GWPP. Pursuant to DWQ's GWPP summary memorandum (see Appendix E). Three groundwater monitoring wells under the GWPP permit #UGW350010 have been out of compliance (ECG907, and ECG1187 since 2006, and ECG925 – no time reported). DWQ listed the causes for the increased sulfate and TDS concentrations as a cracked canal and the application of deicing salt on a roadway. The canal has been repaired and the application rate of deicing salt has been amended. The DWQ GWPP has required continued monitoring of sulfate and TDS concentration trends under the permit to determine if sulfate and TDS concentrations continue to trend upward, warranting further

corrective action. If concentrations continue to increase, DWQ (as the lead agency) and DERR may need to evaluate further sources and modifications under the permit's monitoring requirements.

RTKC manages soils and mine waste exceeding the UU/UE Action Levels and other listed use action levels via their 2019 WLIP Plan for non-operational areas. For operational areas, RTKC currently manages soils and mine waste above the KUALs based on land use during excavations. The procedures implemented are from the pending Operational Soils Management Plan. This includes management of soils during the recent East Waste Rock Extension Project and South Waste Rock Reclamation Project, both being performed in compliance with the DWQ GWPP permit #UGW350010. Concurrent to this review, RTKC has been constructing its new Bingham Mine ore conveyor belt over the Bingham Canyon Waste Rock Dump. The conveyor belt is situated on the dump surface, excavated waste rock was relocated on the Bingham Canyon Waste Rock Dump outside of the conveyor belt footprint.

OU16

Remedy implementation: The Dry Fork Plume underlying Bingham Canyon, is contained by RTKC pursuant to compliance with DWQ's GWPP permit for the Bingham Mine, # UGW350010 (permit expires July 25, 2025). Maps of the geographic boundaries of OU12 have been provided and incorporated by the EPA and DERR into EPA's site viewer GIS system and shared with local jurisdictions overseeing land use controls via ICs for land not owned by RTKC. GIS maps of OU16 will require updates every five years (as required by the 2017 ESD) to account for locations of soils above the KUALs as land use changes. No excavation projects have occurred in OU16 by RTKC on land it owns.

O&M: RTKC submitted their compliance monitoring reports to DWQ's GWPP. Pursuant to DWQ's GWPP summary memorandum (see Appendix E). RTKC has maintained compliance with containing the Dry Fork Plume. The groundwater monitoring well #ECG1100A under the GWPP permit #UGW350010 has been out of compliance. Monitoring well ECG1100A is screened in the Dry Fork Plume underlying Bingham Canyon and subsequently the monitoring data documents the well out of compliance. However, the Dry Fork Plume is being contained by the adjacent extraction well #ECG2787. The DWQ GWPP requires continued monitoring to assess containment and the need for further action.

RTKC manages soils and mine waste exceeding the UU/UE Action Levels and other listed use action levels via their 2019 WLIP Plan for non-operational areas. For operational areas, RTKC currently manages soils and mine waste above the KUALs based on land use during excavations.

OU18

Remedy implementation: Maps of the geographic boundaries of OU18 have been provided and incorporated by the EPA and DERR into EPA's site viewer GIS system. GIS maps of OU18 will require ongoing refinement to account for locations of soils and mine wastes above the KUALs as land use changes. RTKC manages soils and mine waste exceeding applicable land use action levels under their 2019 WLIP Plan. The 2019 WLIP Plan has a seed restriction to ensure the seeds for plant species capable of accumulating selenium are not used during revegetation efforts. No excavation projects have occurred in OU18 by RTKC on land it owns.

O&M: RTKC inspected the tunnels and overburden rock dumps in OU18. They also inspected the Middle Canyon Dump and reported no sediment release to Middle Canyon Creek even though the Dump's southwest embankment continues to show evidence of erosion.

Tooele County has not implemented any ICs for OU18. OU18 remains in RTKC land holdings subject to the requirements of the WLIP Plan (August 2019).

OU20

Remedy implementation: Maps of the geographic boundaries of OU20 have been provided and incorporated by the EPA and DERR into EPA's site viewer GIS system. GIS maps of OU20 will require ongoing refinement to account for locations of soils and mine wastes above the KUALs as land use changes. RTKC manages soils and mine waste exceeding applicable land use action levels under their 2019 WLIP Plan. The 2019 WLIP Plan has a seed restriction to ensure the seeds for plant species capable of accumulating selenium are not used during revegetation efforts at OU20. No excavation projects have occurred in OU20 by RTKC on land it owns.

O&M: Tooele County has not implemented any ICs for OU20. OU20 remains in RTKC land holdings subject to the requirements of the 2019 WLIP Plan.

OU24

Remedy implementation: Maps of the geographic boundaries of OU24 have been provided and incorporated by the EPA and DERR into EPA's site viewer GIS system and shared with local jurisdictions overseeing land use controls via ICs for lands not owned by RTKC. GIS maps of OU24 will require ongoing refinement to account for locations of soils and mine wastes above the KUALs as land use changes. RTKC manages soils and mine waste exceeding applicable land use action levels under their 2019 WLIP Plan. For operational areas, RTKC currently manages soils and mine waste above the KUALs based on land use during excavations. The procedures they implement are from the pending Operational Soils Management Plan per agreement with the EPA and DERR. The 2019 WLIP Plan has a seed restriction to ensure the seeds for plant species capable of accumulating selenium are not used during revegetation efforts at OU24. No excavation projects have occurred in OU24 by RTKC on land it owns.

O&M: RTKC operations in OU24 continue, to support water management at the South Zone mine facilities and milling operations at the Copperton Concentrator. A new conveyor belt from the Bingham Mine is under construction. After the new conveyor belt becomes operational, the conveyor belt in Tunnel 5490 will be removed. RTKC has maintained compliance with its DWQ GWPP for operations at the Copperton Concentrator. Under the permit RTKC has addressed releases from the tailings pipeline pursuant to the permit spills prevention and response plan.

OU25

Remedy implementation: Maps of the geographic boundaries of the historic facilities in OU25 have been provided and incorporated by the EPA and DERR into EPA's site viewer GIS system. GIS maps of OU25 will require ongoing refinement to account for locations of soils and mine waste above the KUALs as land use changes. RTKC manages soils and mine waste exceeding applicable land use action levels pursuant to their site-wide management plans. No excavation projects have occurred in OU25 by RTKC on land it owns.

O&M: The Cities of West Jordan and Herriman, and Salt Lake County Health Department have not had any projects in OU25 changing the current land use.

ICs Overview

Table 2 summarizes ICs, and Figure 1.0 outlines where ICs are currently applied.

Table 2: Summary of Planned and Implemented ICs

Media, engineered controls, and areas that do not support UU/UE based on current conditions	ICs Needed	ICs Called for in the Decision Documents	Impacted Areas	IC Objective	Title of IC Instrument Implemented and Date (or planned)
Groundwater	Yes	Yes	OU2	Evaluate proposed third-party groundwater extraction to prevent impeding remedial progress in OU2	Utah Code Section 73-5-15 the Utah State Engineer and Division of Water Rights published the June 2002 Salt Lake Valley Groundwater Management Plan that calls for a critical evaluation of proposed groundwater extractions within 3000 feet of the 250 mg/L sulfate isoconcentration contour in OU2
Groundwater	Yes	Yes	OU2	Restrict installation of groundwater wells	Utah Code Sections 57-25-101 to 57-25-114 RTKC filed a drilling restriction environmental covenant (recorded by Salt Lake County #10621804, dated February 12, 2009)
Soil, sediment, mine waste	Yes	Yes	OUs 1, 3, 4, 5, 6, 10, 11, 12, 16, 18, 20, 24, 25	RTKC, on property it owns, is to manage soils in OUs located in areas with no operations and with operations to limit potential exposures during excavation projects	RTKC's 2019 WLIP Plan RTKC's pending Operational Soils Management Plan, submitted April 2019; Planned completion – December 31, 2022
Soil, sediment, mine waste	Yes	Yes	OUs 1, 4, 5, 6, 10, 11, 12, 16, 18, 20, 24, 25	Limit land use to industrial and open space unless further response work is initiated under oversight by the Agencies	Utah Code Sections 57-25-101 to 57-25-114 RTKC has and will continue to file environmental covenants restricting land use change on parcels they own, prior to the transfer of ownership
Soil, sediment, mine waste	Yes	No	18, 20 & 25	When property is divested by RTKC in these operable units,	Though not required under a decision document, the EPA and DERR have recognized a need for an IC to be implemented by Tooele County (if

				local land planners would ensure soils are managed using local land use ordinances	they agree to do create an IC). The EPA and DERR will negotiate an IC with Tooele County with a planned completion date of December 2022 (refer to Section VI).
Soil, sediment, mine waste	Yes	Yes	OUs 1, 3, 5, 6, 10, 24, 25	When property is divested by RTKC in these operable units, local land planners will ensure soils are managed using local land use ordinances	City of West Jordan pursuant to Title 5 Chapter 2 (Re-enacted by ordinance, May 13, 2020) South Jordan City does not have an IC. As a backstop, the Salt Lake County Health Department IC (Title 9 Chapter 9.5) is applicable during redevelopment projects. City of Herriman pursuant to Title 4 Chapter 7 (April 6, 2000), Title 10 Chapter 15 Article A (December 13, 2017), and City of Herriman Engineering Department Development Standards Volume 6 – Contamination Procedures Salt Lake County Health Department pursuant to Title 9, Chapter 9.5 (June 18, 2013) Local jurisdictions coordinate with UDEQ to ensure (as needed) soils are managed during building and excavation projects
Notes: a. Administrative rule accessible at: https://le.utah.gov/xcode/Title57/Chapter25/57-25.html					

Active mining and milling facilities and reclamation of the inactive portions of the OUs are conducted in compliance with permits issued by the Division of Water Quality (DWQ), the Division of Air Quality (DAQ), and the Division of Oil, Gas, and Mining (DOGM). Under the 1995 MOU the active processing operations, waste management activities, and closure of these facilities should maintain compliance with these permits where applicable. It has been assumed that these State permits would address soil and mine waste which exceed the KUALs at the time of closure. However, the use of these State permit programs (as noted in the May 2016 FYR) to regulate the active operations and manage legacy soil and mine waste at OUs 4, 6, 10, 11, 12, 16, 24 and 25 at the cessation of operations requires reassessment to determine applicability. Based on agreements by the EPA and DERR, DERR will evaluate if the State permit programs will address the legacy waste issues at mine closure. If not, as agreed the management of the legacy waste issue will be required under the two RTKC site-wide management plans. DERR will draft a technical memorandum for this assessment, which will be referenced in a pending decision document.

Since 2016, RTKC has maintained compliance with their applicable State permits. However, a few facilities permitted by the DWQ Groundwater Protection Program (GWPP) have experienced some un-approved releases

(see Appendix E for the compliance review memoranda from the DWQ GWPP). RTKC has been responsive to the DWQ GWPP corrective action requirements.

In March 2016, the EPA and UDEQ issued a technical memorandum which evaluated the ARARs selected in the 2000 and 2002 RODs. Though the ARARs cannot be changed unless a decision document is re-opened, several inconsistencies were noted and corrected under the memorandum. The memorandum updated citations and relists the ARARs selected under the 2000 and 2002 RODs. A pending decision document is planned to address some remedy clarifications for OUs in the Kennecott North Zone, and may be used to update the ARARs in the March 2016 technical memorandum.

III. PROGRESS SINCE THE LAST REVIEW

This section includes the protectiveness determinations and statements from the last site wide FYR as well as the recommendations from the last site wide FYR and the current status of those previous recommendations

Table 3: Protectiveness Determinations/Statements from the 2016 FYR

OU #	Protectiveness Determination	Protectiveness Statement
OU1 Bingham Creek	Not Protective	The remedy is not protective of human health and the environment because no ICs or maintenance requirements to ensure soils/solid mine waste is managed appropriately. In order to ensure protectiveness, the local jurisdictions will implement mapping and management plans provided by UDEQ.
OU2 South End Groundwater	Not Protective	The remedy is not protective of human health and the environment because uncontrolled releases from the tailings pipeline have occurred. In order to ensure protectiveness, the tailings pipeline should be permitted under Utah's DWQ GWPP. In addition, the liner underneath Oquirrh Lake should be inspected annually to ensure protectiveness.
OU3 Butterfield Canyon and Herriman	Not Protective	The remedy is not protective of human health and the environment because no ICs or maintenance requirements to ensure soils/solid mine waste is managed appropriately. In order to ensure protectiveness, the local jurisdictions will implement mapping and management plans provided by UDEQ. Furthermore, an analysis is needed to identify gaps, if any, between State permits and CERCLA requirements.
OU4 Bingham Reservoir	Not Protective	The remedy is not protective of human health and the environment because there are no ICs or maintenance requirements to ensure soils/solid mine waste is managed appropriately. In order to ensure protectiveness, the local jurisdictions will implement mapping and management plans provided by UDEQ. Furthermore, an analysis is needed to identify gaps, if any, between State permits and CERCLA requirements.
OU5 ARCO Tails Repository - Bastian Ditch	Short Term Protective	The remedy currently protects human health and the environment because no exposures are occurring. However, for the remedy to be protective in the long-term, ICs and O&M plans are needed to ensure soils/solid mine waste is managed appropriately to ensure long-term protectiveness.
OU6 Lark Waste Rock and Tailings	Not Protective	The remedy is not protective of human health and the environment because there are no ICs or maintenance requirements to ensure soils/solid mine waste is managed appropriately. In order to ensure protectiveness, the local jurisdictions will implement mapping and management plans provided by UDEQ.
OU10 Copperton Soils	Not Protective	The remedy is not protective of human health and the environment because there are no ICs or maintenance requirements to ensure soils/solid mine waste is managed appropriately. In order to ensure protectiveness, the local jurisdictions will implement mapping and management plans provided by UDEQ.

OU11 Kennecott Historic Sites (*Located in Bingham Canyon)	Not Protective	The remedy is not protective of human health and the environment because there are no ICs or maintenance requirements to ensure soils/solid mine waste is managed appropriately. In order to ensure protectiveness, the local jurisdictions will implement mapping and management plans provided by UDEQ.
OU12 Water Collection System	Short Term Protective	The remedy currently protects human health and the environment because the groundwater is being managed appropriately. However, for the remedy to be protective in the long-term, a permit gap analysis is needed to identify if State permit authorities overlap with the requirements of CERCLA to ensure long-term protectiveness.
OU16 Bingham Creek Underflow	Short Term Protective	The remedy currently protects human health and the environment because the groundwater is being managed appropriately. However, for the remedy to be protective in the long-term, a permit gap analysis is needed to identify if State permit authorities overlap with the requirements of CERCLA, to ensure long-term protectiveness. In addition, RTKC needs to work with UDEQ to assess and manage, if needed, a potential separate groundwater plume.
OU18 Mine Drainage – Tooele County	Not Protective	The remedy is not protective of human health and the environment because there are no ICs or maintenance requirements to ensure soils/solid mine waste is managed appropriately. In order to ensure protectiveness, the local jurisdictions will implement mapping and management plans provided by UDEQ. In addition, the stability of the dump in Middle Canyon should be inspected annually to ensure long-term protectiveness.
OU20 Pine Canyon	Not Protective	The remedy is not protective of human health and the environment because there are no ICs or maintenance requirements to ensure soils/solid mine waste is managed appropriately. In order to ensure protectiveness, the local jurisdictions will implement mapping and management plans provided by UDEQ. Furthermore, an analysis is needed to identify gaps, if any, between State permits and CERCLA requirements.
OU24 Precipitation Plant, Historic and Operational Rail facilities, Copperton Concentrator and Process Water Reservoirs, Tunnels 5490, 6040 and Unnamed Adit	Not Protective	The remedy is not protective of human health and the environment because there are no ICs or maintenance requirements to ensure soils/solid mine waste is managed appropriately. In order to ensure protectiveness, the local jurisdictions will implement mapping and management plans provided by UDEQ. Furthermore, an analysis is needed to identify gaps, if any, between State permits and CERCLA requirements.

Table 4: Status of Recommendations from the 2016 FYR

OU #	Issue	Recommendations	Current Status	Current Implementation Status Description	Completion Date (if applicable)
1, 3, 4, 5, 6, 10, 11, 18,20, 24	ICs are needed at the local jurisdictions to ensure soil is managed properly.	Implement contaminated soil management plans provided by UDEQ.	Ongoing	ICs with the City of Herriman (OU3) and West Jordan (OU1) are being implemented. For portions of OU1, 4, 5, 6, 10, 11, and 24, the IC enacted by Salt Lake County in 2013 requires revision due to changes in County operations and resource availability and the recent creation of special service districts. The Salt Lake County Health Department IC is applicable when a city does not have its own IC, including South Jordan City. For OU18 and OU20, there is no IC with Tooele County. The OUs are still within RTKC's land holdings and subject to RTKC's Site Wide Management Plan for Waste Left In Place (WLIP) Plan as an IC.	Herriman City adopted Title 4 – Chapter 7 in April 6, 2000 and Title 10 – Chapter 15 in December 13, 2017 West Jordan adopted Title 5 – Chapter 2 in 2001 Salt Lake County Health Department adopted Title 9, Chapter 9.5 in June 18, 2013 The EPA and DERR will negotiate an IC with Tooele County, to be completed (as noted in Section VI) by December 2022
1, 2, 3, 4, 5, 6, 10, 11, 12, 16, 18, 20, 24	O&M plans for inspections, reports, and procedures for managing future encountered waste are necessary for long-term protection of human health and the environment.	Develop and implement a management plan for future encountered waste on PRP property.	Ongoing	RTKC submitted to the Agencies a draft Operational Soils Management Work Plan for locations within operational facilities at the Site. The work plan is under review and pending comments. The Agencies have agreed with RTKC that the intent of the work plan is to be followed during proposed excavation projects while the work plan is under agency review. For non-operational areas, RTKC and the Agencies completed the approval of the WLIP Plan to ensure	RTKC submitted a first draft of the Operational Soils Management Plan in April 2019, will be completed in December 2022 WLIP Plan in non-operational areas completed in August 2019

				soils are managed during propose excavation projects on Kennecott owned parcels.	
2	Uncontrolled releases from the tailings pipeline have occurred.	Permit the tailings pipeline under Utah's DWQ GWPP.	Completed	The DWQ Groundwater Protection Permit #UGW350017 includes the Tailings Pipeline as permitted facility with best available technology (BAT) performance standards, release prevention procedures and spill response requirements to render releases from the pipeline and to manage such when they do.	December 2017
2	Oquirrh Lake liner is not being evaluated.	Inspect the liner underneath Oquirrh Lake annually and provide a report to UDEQ.	Completed	On February 3, 2021, DERR confirmed in a discussion with G. Langston of Daybreak Communities that Oquirrh Lake has not undergone any reconstruction in the past year, and has been managed within 12 inches of its high-water boundary by Daybreak Communities. Inspections during this FYR found the lake water level at average level for winter. Continued inspections will take place each FYR, as listed in Section VI as an "Other Findings".	February 3, 2021
3, 4, 12, 16, 20, 24	It is uncertain that legacy waste will be addressed at closure where RTKC's operations and waste management are regulated under state permits.	Identify gaps, if any, between State permits and CERCLA requirements.	Addressed in Next FYR	Assessment is ongoing, focusing on whether Kennecott operational facilities with legacy waste issues can be addressed through existing State Permit programs. If the legacy waste issues will not be addressed under the State permits, then the legacy waste be managed under RTKC's 2019 WLIP Plan.	
16	There is potentially a groundwater plume of mining influenced water in the alluvium of	Assess whether there is a separate groundwater plume and manage it, if needed	Completed	The assessment determined that there is a groundwater plume of mining influenced water with elevated metals and low pH. The plume continues to be monitored	July 25, 2020

	Bingham Canyon.			and contained under the DWQ Groundwater Protection Permit #UGW350010. Assessment of compliance with the permit will continue each FYR based on the 2017 ESD.	
18	Stability of the dump in Middle Canyon is not being evaluated	Inspect the dump in Middle Canyon annually for stability.	Completed	RTKC performed the inspection this year due to constraints from COVID-19. Inspection found the tunnel drilling overburden dump stable and not eroding into Middle Canyon Creek.	January 7, 2021
20	There is no restriction on the use of seeds of plants capable of up-taking selenium during re-vegetation actions.	RTKC's site-wide management plan will contain a seed use restriction to ensure plants capable of up-taking selenium are not used during revegetation efforts.	Ongoing	A seed restriction is listed in the August 2019 WLIP Plan and a restriction is pending in the Operational Soils Management Plan which is under review.	WLIP Plan completed, August 2019 Operation Soils Management Plan will be completed by December 2022

IV. FIVE-YEAR REVIEW PROCESS

Community Notification, Involvement & Site Interviews

DERR conducted community interviews as part of the FYR process. A public notice was placed in the Deseret News and Salt Lake Tribune newspapers on October 21, 2020. The public notice stated the FYR was in progress and requested public input. No comments were received in response to the public notice.

Upon completion of the FYR report, DERR will make the report available to the public in the administrative record located at Records Centers at DERR in Salt Lake City, Utah and the EPA in Denver, Colorado, and locally at West Jordan City Hall, West Jordan, Utah, the designated site repository. The FYR will also be listed on EPA's website page for the Kennecott South Zone.

Interviews were conducted with Herriman City, South Jordan City, and Riverton City, the Salt Lake County Health Department, Jordan Valley Water Conservancy District (JVWCD), Daybreak Communities, and Friends of the Great Salt Lake; Rio Tinto Kennecott (RTKC) Project Managers also participated in the interviews. The purpose of the interviews was to identify any issues or concerns which may have developed since the previous FYR.

Respective engineering staff with RTKC, the JVWCD, Herriman, South Jordan, and Riverton said the groundwater remediation with the Zone A and Zone B sulfate plume was not migrating while extraction of sulfate was making progress. Herriman City is nearing the end of an expansive and rapid development phase of their community over the last five years. Herriman staff said their institutional controls and mapping have worked well and kept development areas or former agriculture properties soils manageable and without incidents. South Jordan

City and the Daybreak Communities also continue to grow without any issues regarding cleanup areas within their city. The Salt Lake County Health Department said their County soils ordinance is working with emphasis on continued coordination with regulators. Successful implementation of their institutional controls in growing and expanding communities within the Kennecott South Zone is a function of their coordination with the cities and townships in the Kennecott South Zone.

The content of the interviews is provided in Appendix F.

Data Review

No analytical data were collected to support this FYR. Annual remedial progress data reported by RTKC for OU2 is summarized below from their April 2020 South Facilities Groundwater 2019 Remedial Progress Report.

OU2

RTKC's annual remedial progress report for OU2 is under review by the EPA, DERR and the South Zone Technical Review Committee. Pursuant to the 2009 OM&R Plan, there are performance criteria RTKC must comply with. The two performance criteria include: (1) maintaining groundwater sulfate concentrations in the compliance wells at or below 1,500 mg/l, and (2) extracting groundwater at a minimum of 1,200 acre-feet/year from the core of the Zone A Plume (measured on a 5-year rolling average). The 2020 report covers remedial progress observed and operations implemented during 2019 by RTKC. Based on the 2020 report, no significant issues on implementation were observed and RTKC continues to maintain compliance with the two performance criteria.

Pursuant to the 2009 OM&R Plan, RTKC must maintain extractions in the core of the OU2 Zone A Plume of 1,200 acre-feet/year, on a five-year rolling average. RTKC extracted the following volumes (acre-feet) each year from 2016 to 2019: 2,357 acre-feet, 2,494 acre-feet, 2,323 acre-feet, and 2,175 acre-feet respectively. The five-year rolling average (which includes the volumes extracted in 2015 – 2,411 acre-feet) was 2,352 acre-feet and documents compliance with the core water extraction performance criteria.

RTKC also has to maintain a sufficient volume of water extraction at the Barrier Wells in Zone A to contain the plume and ensure the compliance wells remain below 1,500 mg/L sulfate, while providing sufficient feed water to the Zone A Reverse Osmosis (RO) plant. The Zone A RO plant is operated by RTKC to comply with their obligations under the 2004 NRD Three Party Agreement. From 2016 to 2019 RTKC extracted from the barrier wells: 1,012 gpm, 2,086 gpm, 2,130 gpm, and 3,293 gpm respectively. In 2015-16 the Zone A RO plant experienced a force majeure issue under RTKC's NRD response work. Through a joint effort with JVWCD and the City of West Jordan, RTKC determined that manganese in the by-pass water used to re-mineralize the RO permeate was potentially causing the final product water, when comingled with other water in JVWCD's and West Jordan City's distribution systems, to be discolored. This force majeure event caused RTKC to take the Zone A RO plant offline. During such time, RTKC directed the extracted water from the Barrier Wells to the Zone A RO plant for testing manganese reduction strategies and into their process water circuit. The continued extraction at the Barrier wells facilitated RTKC to maintain containment of the Zone A Plume, as noted by the sulfate concentrations observed in the compliance wells for OU2 Overall sulfate concentrations in the compliance wells remained well below the performance criteria of 1,500 mg/L sulfate. The maximum sulfate concentration across all ten wells was observed in 2016, in well #WJG1169B at 568 mg/L sulfate. The Zone A RO Plant manganese filtration treatment for the bypass water was provided a permit to operate by the Utah Division of Drinking Water (DDW) on August 22, 2018. The force majeure status of the Zone A Plant was initiated in March 2016, and the force majeure status was lifted in August 2018.

In addition to performance criteria, there are management criteria listed in the 2009 OM&R Plan to ensure RTKC can maintain the extracted core water from the Zone A Plume and the RO concentrate from the Zone A RO Plant. During the 2016 FYR pH in the tailings slurry, measured at the North Splitter Box (NSB), registered below 6.7. RTKC is required to maintain pH at the NSB at or greater than 6.7. The pH is measured on a continuous basis to ensure the tailings slurry directed to the North Tailings Impoundment (OU15 – North Zone) will not cause the Impoundment to acidify. Review of the NSB monitoring data documented the pH in the tailings slurry was 6.7 or

higher during more than 90% of the time. In 2019 there were three times the pH dropped below 6.7 during the Tailings Pipeline cleaning cycles, when water from the Waste Water Disposal Pump Station (WWDPS, OU4) was directed into the respective pipeline being cleaned. Since 2019, RTKC has a requirement to not allow water from the WWDPS to be sent to either pipeline during cleaning.

Site Inspection

The purpose of the site inspection is to observe the current conditions of the property and to assess the protectiveness of the remedy. Due to COVID-19 site inspection procedures were modified pursuant to agreement by the EPA and DERR. From November 2020 to February 2021 RTKC inspected OUs 1, 4, 5, 6, 10, 11, 12, 16, 18, 20, and 24 within their property boundaries by drone and on the ground by foot. This was completed by Teresa Cockayne and Jason Hill of RTKC. Douglas Bacon, DERR Remedial Project Manager, conducted inspections of operable units within the adjacent communities (OUs 1, 3, 5, 6, 24, and 25) on January 8, 2021. Site inspection photos are provided in Appendix D.

OU1

OU1 was inspected on January 8, 2021 by DERR. Between November and December 2020, RTKC also provided a drone flyover of Bingham Creek from 5600 West to their Bingham Reservoirs (OU4). The ground-based site inspection on January 8, 2021, consisted of observing the creek channel and floodplain from SR-111 to 1300 West. The channel and floodplain were stable and not eroding. No dust was observed during the inspection and is not anticipated because of current vegetation cover. Recent redevelopment projects performed in compliance with the City of West Jordan and Salt Lake County institutional controls were observed. The South Jordan City trailhead just off Skye Drive was observed to have recently undergone a reconstruction/stabilization project. The extent of the project was not understood at the time of the inspection. As noted in Section VI – Other Findings, DERR will coordinate with the City of South Jordan to assess the extent of excavations along the northern boundary of the trailhead parking lot. No other construction projects were observed.

OU2

Between November and December 2020, RTKC performed a ground inspection of the infrastructure used to extract and manage the mining-influenced groundwater in the Zone A Plume at OU2. Based on RTKC's inspection, the three acid core extraction wells were operational and the leading edge/barrier extraction wells were operational. The Zone A RO plant was fully operational at the time of the inspection and the RO concentrate was being managed in RTKC's tailings pipeline without incident. During the inspection, the manganese filtration treatment skid at the plant was operational and functioning within design parameters. Daily log books used to record the flow and depth of water in the extraction wells were found to be up to date at the time of the inspection.

OU3

OU3 was inspected on January 8, 2021, by DERR. DERR accessed the creek channel and associated floodplain from the mouth of Butterfield Canyon at various public access points. This inspection included agricultural and developed portions of the City of Herriman, which have become more developed since the previous FYR.

Since the 2016 FYR, parcels where RTKC removed soils and mine waste on agricultural properties along Butterfield Creek were observed. The post removal surfaces were found to be stable and no significant erosional signs were observed. Agricultural practices on these Herriman Agricultural (HAG) parcels continued after the removal actions by RTKC. Since 2019 parcels HAG007 and HAG010 have been undergoing cleanup to support redevelopment into a residential development. In the historic residential section of Herriman, where the EPA previously performed removal action, a few subdivided residential lots were observed to have been redeveloped for residential use. The City of Herriman has been overseeing these projects under their IC. Previous development projects conducted under the IC were observed to be complete and established, with stable and vegetated open spaces.

Inspection of Butterfield Canyon and Creek, Butterfield Mine Tunnel, was completed by RTKC using a drone and ground inspections between November and December 2020. They appeared to be in good condition. There was no evidence of mine waste rock sediment mobilizing off-site into Butterfield Canyon or Creek. RTKC's stabilization

project in the northern drainages above Butterfield Canyon where the Bingham Mine South Waste Rock Dumps (Queen/Blackjack Gulch, Olsen, Butterfield 1, Castro, South Saints Rest, Saints Rest, and Yosemite) was in progress during the inspection (see the inspection notes for OU12). Butterfield Creek Channel was observed to be stable with no signs of erosion. The Butterfield Mine Tunnel appeared sealed and tunnel water (as designed) was discharging. The discharging water appeared clear. Upon review of DWQ's UPDES Discharge Compliance memo, there is no evidence showing the discharge water to be out of compliance with the permit.

From publicly accessible vantage points, DERR observed conditions of the new waste rock dump benches (part of the South Waste Rock Reclamation Project, OU12) in the Yosemite and Saints Rest drainages. The new benches were observed to be reduced to designed stable final grade. Revegetation efforts were in progress.

OU4

OU4 was inspected by RTKC, by drone and ground inspections between November and December 2020. The surface liner of the Large Bingham Reservoir appeared to be intact and individual cells were fenced to restrict access. Inspection of the sump monitoring stations determined that some of the leak collection sumps contained water, but the water levels were below the regulatory limit established by Utah's DWQ GWPP permit. Daily log books for recording sump water levels and flow rates were observed to be up to date. The sedimentation cell appeared to be in good condition with some sediment buildup. The waste water disposal pump station was operational and no visual signs of leaks were observed around the building.

Water was observed in the Small Bingham Reservoir approximately five feet below the top of the embankment and the liner appeared to be in good condition.

OU5

OU5 was inspected on January 8, 2021, by DERR. RTKC performed a drone fly-over between November and December 2020. There was some snow cover on the ARCO Tails Repository top surface, but the top surface and embankments of the repository appeared stable and vegetated. The slope where the Bastian Ditch was previously removed appeared stable and vegetated. No development projects or soil disturbance was observed. RTKC's perimeter fence west of SH-111 appeared intact.

RTKC provided a drone fly-over of the ARCO Tails Repository and Bastian Ditch historical footprint. The stormwater drainage ditches appeared to be in good condition. Installed riprap appeared to be intact and weedy shrubs were observed along the repository's northern embankment in the vicinity of the stabilizing cribbing.

A one-acre parcel (also owned by ARCO-BP) is north of the northwest corner of the ARCO Tails Repository. A soil pile on the parcel is suspected to contain soil that may have elevated concentrations of arsenic and lead. Some solid mine waste (tailings, waste rock) has been previously observed in the soil pile. Access to the parcel is restricted to RTKC and ARCO-BP personnel only; public access is prevented by RTKC security fences. As noted in Section VI – Other Findings, DERR will coordinate with ARCO-BP to include inspections of their 1-acre parcel and the soil pile located on it to verify it is stable and not being mobilized offsite. The 1-acre parcel, like the larger ARCO-BP Repository parcel is subject to the IC listed in the federal consent decree for OU5.

OU6

OU6 was inspected on January 8, 2021, by DERR. The OU has not changed significantly since the previous FYR. The overall Lark Tailings Area remains vegetated. In 2011, a portion of this OU was transferred to the Church of Jesus Christ of Latter-Day Saints. Another portion of the property, in the vicinity of the Mascotte Ditch and Pond was conveyed to the City of Herriman. The eastern portion of OU6 now managed by Suburban Land Reserve (representing the Church of Jesus Christ – Latter Day Saints) has not been redeveloped, but development is planned. The City of Herriman water tank was observed in place, and the surrounding area was landscaped with native vegetation.

RTKC also provided an inspection by drone fly-over and ground inspection between November and December 2020. Portions of the Lark Tails site appeared to have some surfaces with limited vegetation, but the time frame of

the inspection and colder temperatures may be a contributing factor. The Lark Tails area owned by RTKC is surrounded by fence that was observed to be in good condition and secure. RTKC signage warns of trespassing as the property is privately held.

The Proler facility footprint, Randolph Peterson gate, Mascotte Pond, and Lark Waste Rock Areas of the site appeared to be in stable condition and well vegetated. These locations could have soils above unrestricted land use action levels, but no development activity was observed. These locations are subject to soil and mine waste management under RTKC's 2019 WLIP Plan. Midas Creek Channel was observed by both RTKC and DERR as stable with healthy native vegetation along its embankments. Some discolored sediment along the channel hints of iron staining, which may be indicative of possible mine waste impacts along the channel invert of Midas Creek. Midas Creek on RTKC property is subject to their 2019 WLIP Plan, while sections on private property are subject the compliance with the Salt Lake County Health Department IC.

In 2019 RTKC removed the Midas Creek Silos. The area of the removal looked stable, but revegetation efforts had yet to take hold.

In 2016, RTKC stabilized and reconstructed support beams along segments of the Bingham Tunnel which will bear the weight of new waste rock benches constructed as part of RTKC's East Waste Rock Extension project (OU12). RTKC's inspection found the area around the Bingham Tunnel entrance was secure and there was no equipment outside of the Bingham Tunnel. The support stabilization project appeared to be complete.

OU10

OU10 was inspected by RTKC by drone and ground inspections between November and December 2020. Recent mapping efforts indicate soils near RTKC's historic mine conveyor belt from Tunnel 5490 and rail corridor and yard may contain elevated concentrations of arsenic, cadmium, lead, and selenium. The conveyor belt, rail corridor and yard are within RTKC's property and are subject to their site-wide management plans for soils and mine waste if excavations take place. No excavation projects were observed. The mine conveyor belt from Tunnel 5490 is being replaced and the transfer station has been undergoing reconstruction to support the new conveyor belt coming down the Bingham Canyon Waste Rock Dump. Soils in the vicinity of the transfer station were observed to be stable. The rail corridor and yard are not in use. Soils in a hollow near the Copperton Rail Yard were devoid of vegetation, but the area is secured by RTKC as it is buffer land between their operations and the community of Copperton, Utah.

OU11

OU11 was inspected by RTKC by drone between November and December 2020. Most of the Kennecott historic sites are either buried under the Bingham Canyon Waste Rock Dump or have been mined away. Three historic facilities are accessible to site workers and site visitors: C.W. Watson Jig, Yellow Cake Plant and the Lead Mine Mill. The historic footprint of the Jig appeared stable; the historic Yellow Cake Plant supports a warehouse for operational material; and the Lead Mine Mill slopes near the Precipitation Plant appeared stable with vegetation.

RTKC has recently been working to reconstruct the Bingham Mine Crusher conveyor belt system which has required additional fill and cover within Bingham Canyon and the western extent of the South Facilities Water Management and Precipitation Plant. The fill used in this project, to prepare for the new conveyor and enhance stormwater capture basins, has added to the depth of cover over the C.W. Watson Jig site.

OU12

OU12 was inspected by RTKC by drone and ground inspections between November and December 2020. The Water Collection System is comprised of cut-off walls, French drains, conveyance pipes, concrete conveyance canals and stormwater containment basins in the 27 drainages where the Bingham Mine waste rock dumps are located. The structures of the Water Collection System and the waste rock dumps of the Bingham Mine appeared to be in good condition. No contact water was observed migrating past the cutoff walls of the Water Collection System. The drainages with waste rock dumps in them that were inspected include: Bingham Canyon, Bluewater (1 and 2), Midas, Congor, South Congor, Crapo, South Crapo, Keystone, Copper (1, 2, 3, and 4), of the Eastside

waste rock dumps and Yosemite, Saints Rest, South Saints Rest, Butterfield, Castro, Olsen, and Queen-Blackjack Gulch of the Southside waste rock dumps. Low volume flows of acid mine drainage were observed in the conveyance pipes located in the Southside waste rock dumps (Queen, Olsen and Castro) and a higher volume of acid mine drainage was observed flowing in the conveyance pipes in the Eastside waste rock dumps (Congor, Bluewater and Midas). Some erosional gullies were observed along the lower rail dumps in the Eastside waste rock dump drainages. These areas are behind RTKC's Water Collection System and soil mobilized from the gullies is captured by sediment basins upgradient of the cut-off walls in each drainage.

Overall, the Water Collection System was observed to be enhanced by the East Waste Rock Extension and South Waste Rock Reclamation projects.

The Bingham and Mascotte Tunnels (though located in OU6, water produced in both is managed by the Water Collection System) were in good condition with no uncontrolled releases observed. Old Bingham Tunnel (not the same as the Bingham Tunnel located in OU6) located in the Midas Drainage had standing water outside of its portal. The Bingham Tunnel portal and mine pool is located upgradient of the Midas 1 cutoff wall. The portal opening is situated below the surrounding surfaces, so there was no observable surface flow. Water from the tunnel is piped to the Midas pump station and delivered to the Bingham Reservoir. Mining-influenced water collected by the Water Collection System is pumped at the Midas Pump Station due to an elevation increase to reach the conveyance pipe to the Bingham Reservoir.

OU16

OU16 was inspected by RTKC by drone between November and December 2020. Compliance wells ECG1100A and ECG2789A&B were observed from the air. The monitoring and extraction wells are intact and accessible by RTKC employees.

OU18

OU18 was inspected by RTKC by drone and ground inspections between November and December 2020 and includes a series of tunnels and overburden rock dumps. The various tunnels along the western part of the Oquirrh Mountains are inaccessible to the public. The western Oquirrh tunnels include Bingham West Dip, Copper Boy and Helen B and are on located on high, steep slopes of the western flank of the Oquirrh mountains. The individual tunnels were observed to have been sealed off intentionally or, in the case of the Helen B, by localized surface erosion. Rock dumps, suspected to be comprised of overburden from the drilling of the tunnels, are located outside of the Bingham West Dip and Helen B Tunnels. The rock is angular and not able to support plant growth of voluntary native vegetation species in the vicinity of these two tunnels. The limitation on plant growth may be a function of limited water and the rocky nature of the dump material. These dumps are along the western slope of the Oquirrh Mountains, just below the ridgeline, on property owned by RTKC and not accessible to the public. Management of soils and mine waste at these tunnels falls under RTKC's site wide management plans, per the 2017 ESD.

The Water Supply Tunnel and Water Supply Tunnel Dump (a.k.a. Middle Canyon Tunnel and Middle Canyon Tunnel Dump) were inspected by RTKC. RTKC owns the land both are located on. Both the Tunnel and Dump are accessible to the public, but access by the general public would be trespassing. The land use, open space, in this area has not changed since the last FYR. The Water Supply Tunnel is secured with a recessed steel bulkhead door and reinforced concrete portal entrance. Water produced in the Tunnel is piped from within the Tunnel and below the Water Supply Tunnel Dump's top surface to the base of the Dump and into Middle Canyon Irrigation Company's collection sump. No water was observed exiting the Tunnel and flowing across the Dump's top surface.

Vehicle access to the top surface of the Water Supply Tunnel Dump is restricted by a series of concrete Jersey barriers. The Dump's top surface is graded to direct storm water to a drainage channel leading from the top of the Dump down its western embankment and into Middle Canyon Creek. The Dump's top surface was previously ripped to assist revegetation efforts. However, due to the angular rock comprising the top surface, it is void of significant plant growth. The Dump's southwestern and western slopes showed signs of increased erosion, but

scrub oak, and alpine forbs previously observed, were still present. Material was observed to have sloughed to the base of the Dump. Ongoing erosion could compromise the water retention berm located along the leading edge of the Dump's top surface. Sloughed material from the Dump was observed near, but not in, the channel of Middle Canyon Creek, but ongoing erosion could impact Middle Canyon Creek. Previous soil samples indicate the area exceeds the unrestricted land use action levels for arsenic and lead. Management of soils and mine waste is performed by RTKC under their site wide management plans. RTKC inspects that Dump annually, and findings are discussed with DERR.

OU20

OU20 was inspected by RTKC by drone and ground inspection between November and December 2020. OU20 is owned by RTKC and is used as open space. Vehicular and public access is secured by a locked gate near the mouth of Pine Canyon. The inspection found the floor and side slopes of Pine Canyon well-vegetated. There is angular rock in a dump located on the south slope of the Canyon near the Carr Fork adit in the middle of the Canyon that is devoid of vegetation. Some minor erosional gullies were observed, but angular rock was not observed mobilized down the Canyon. The surfaces around the Carr Fork adit, head shaft and Pine Canyon Tunnel in the upper-middle portion of Pine Canyon were stable. Upper reaches of Pine Canyon are steep-walled, narrow canyons that are comprised of rocky surfaces and are difficult to traverse. The footprint of the historic Star Mill was not detected during the inspection.

Demolished concrete footings for an unknown structure were observed at the opening of the southern side canyon. RTKC is unaware of what this structure was historically. Management of soils and mine waste is performed by RTKC under their site-wide management plans. RTKC inspects Pine Canyon periodically and findings are discussed with DERR.

OU24

OU24 was inspected by RTKC by drone and ground inspections between November 2020 and February 2021. The following facilities comprising OU24 were inspected: Precipitation Plant, Copperton Concentrator and Process Water Reservoir, Bingham & Garfield Rail Line, Ore Haulage Rail Line – Copperton High and Low Lines, Copperton Rail Yard, and Kennecott North End Operational Rail Lines. General surfaces at these facilities appeared stable. Although some areas were covered with snow, soil and asphalt surfaces did not show signs of erosion or intrusion. The stormwater retention ponds appeared stable and well-vegetated around the Copperton Concentrator. Segments of the various rail corridors still exist, with slag and waste rock visible.

From 5600 West to Bingham Junction, the 1960s Denver Rio Grande Rail Corridor paralleling Old Bingham Highway was previously converted by UTA into the Mid Jordan Trax Line. Portions of the historic rail corridor with slag remain in place from 5600 West to RTKC's rail yard in Copperton, Utah. Between 5600 West and SH-111 the rail corridor is accessible to the public (though such access would be trespassing). The rail corridor is located along the northern boundary of the Bingham Flats area (which is part of OU1). Some sections of the rail corridor were previously removed by RTKC and its land development group to facilitate redevelopment in the Bingham Flats area for commercial and industrial land use. Rocky Mountain Power previously constructed a high-tension power line along the rail corridor with poles excavated into the rail bed.

The rail corridors of the Bingham and Garfield (B&G) and Copperton High and Low rail grades appeared to be comprised of local borrow material with scattered deposits of slag and waste rock. The embankments of the inspected rail corridors demonstrated a range of success of vegetative growth, mostly comprised of native grasses and forbs such as rabbit brush. Soils and rail ballast were stable, but not well vegetated.

OU25

OU25 sites were inspected by Kennecott between November and December 2020, at the same time as the other OUs covered by this FYR. Unless otherwise specifically pointed out, the majority of the OU25 sites are currently in RTKC land holdings and secure. No control, security or short terms issues were observed or reported by RTKC.

V. TECHNICAL ASSESSMENT

Because of similar or common information that is applicable in addressing the three questions of the technical assessment for the OUs of the Kennecott South Zone, the three questions are consolidated. OU specific information is included under Question A.

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

The remedies are functioning as intended by the decision documents. Past removal actions successfully removed soils and mine waste above the applicable land use action levels at the time of the action. RTKC is containing groundwater plumes and meeting treatment specifications. ICs have been implemented by local jurisdictions to ensure the long-term management of soils and mine waste left in place with elevated contaminants of concern when development is proposed for property not owned by RTKC or ARCO-BP, or when both divest their interest in their land holdings. Further action by Salt Lake and Tooele Counties is needed to address the implementation of ICs to ensure long-term protectiveness. Where applicable RTKC is complying with State permit program requirements during the operation of groundwater source control facilities.

OU1: Portions of OU1 within the land holdings of RTKC are secure, inaccessible, and subject to long term management under site-wide management plans created by RTKC. An IC implementation plan for OU1 has been provided by DERR to Salt Lake County Health Department and the City of West Jordan to assist both with implementing their IC programs to oversee management of soils and mine waste with concentrations of lead and arsenic above the KUALs, during redevelopment projects. Redevelopment projects to date, overseen by the City of West Jordan and Salt Lake County Health Department, have ensured soils and mine waste have been managed in compliance with their ICs.

OU2: The Zone A Plume continues to be contained in place and reduced. Groundwater monitoring continues to support that sulfate reduction is occurring along the leading edge of the Zone A Plume. RTKC continues to manage extracted core water in their tailings pipeline circuit (which is part of the Kennecott North Zone) and manage extracted water from the leading edge of the core at their reverse osmosis treatment plant. RTKC has maintained operability of the extraction wells 90% of the time and has maintained compliance with their response action performance and management criteria.

OU3: Portions of OU3 within the land holdings of RTKC are secure and inaccessible to the public. However, areas of OU3 along the Salt Lake County Road and Butterfield Creek in Butterfield Canyon, not within RTKC land holdings are accessible. RTKC's land holdings in OU3 are subject to long term management under RTKC's 2019 WLIP Plan. An IC implementation plan for OU3 has been provided by DERR to the Salt Lake County Health Department and the City of Herriman. The implementation plan assists both agencies with implementing their IC programs to oversee management of soils and mine waste with concentrations of lead and arsenic above the KUALs. Redevelopment projects to date overseen by the City of Herriman and Salt Lake County Health Department have managed soils and mine waste in compliance with their ICs.

OU4: The Bingham Reservoirs are operated as a source control measure for OU2 in compliance with a DWQ GWPP permit. Past removal action during the reconstruction of the Bingham Reservoirs successfully removed soils and mine waste above the applicable land use action levels. The Bingham Reservoirs are secure within RTKC's land holdings and inaccessible to the public. OU4 will be subject to RTKC's pending Operational Soils Management Plan once the plan is completed.

OU5: The ARCO Tails Repository is located within the land holdings of RTKC and ARCO-BP, is secure, inaccessible to the public, and subject to long term management under ARCO-BP's site-specific operation and maintenance plan and land use control. OU5 – Bastian Ditch is in part located on RTKC's property in the Lark Area (south of 11800 South), and is subject (while RTKC retains ownership of the land) to RTKC's 2019 WLIP Plan. OU5 – Bastian Ditch is also located on the respective property of ARCO-BP near Copperton. Portions of OU5 – Bastian Ditch are also located on private property east of SH-111 and south of 11800 South. These areas of the Bastian Ditch are subject to the Salt Lake County Health Department IC. In areas where the Bastian Ditch remains in place, lead and arsenic concentrations can exceed the KUALs. To date, redevelopment projects

overseen by the Salt Lake County Health Department have managed soils and mine waste in compliance with their ICs.

OU6: The portions of OU6 within the land holdings of RTKC are secure, inaccessible, and subject to long term management under management plans created by RTKC including the 2019 WLIP Plan, and the pending Operational Soils Management Plan. To date, redevelopment projects overseen by the Salt Lake County Health Department have generally complied with their ICs.

OU10: The historical tailings deposits are located on RTKC property in areas used currently as open space and support for their mining and water management operations. The tailings deposits are secure within RTKC's land holdings and inaccessible to the public. OU10 is subject to RTKC's 2019 WLIP Plan and will be to the pending Operational Soils Management Plan.

OU11: Past removal action during the removal of the Yellow Cake Plant and demolition of the Precipitation Plant (which overlies the historic Lead Mine Mill) successfully removed soils and mine waste above the applicable land use action levels. Soils at the footprint of all three historic facilities still exceed the KUALs for lead and arsenic. The three historic facilities, C.W. Watson Jig, Yellow Cake Plant, and Lead Mine Mill are secure within RTKC's land holdings and inaccessible to the public. OU11 will be subject to RTKC's pending Operational Soils Management Plan once the plan is completed.

OU12: RTKC has maintained compliance with its DWQ GWPP permit restrictions and corrective action requirements for three monitoring wells). RTKC has also been successfully implementing its East Waste Rock Expansion and South Waste Rock Reclamation projects at the Bingham Mine in compliance with its requirements from both the DWQ GWPP Program and DOGM Minerals Program.

OU16: RTKC has maintained compliance with its DWQ GWPP permit restrictions and corrective action requirements, which includes monitoring and containment of the groundwater plume emanating from the Dry Fork drainage into Bingham Canyon.

OU18: OU18 is subject to the requirements to manage in place soils and mine waste (ensuring stabilization of the waste in place) pursuant to RTKC's 2019 WLIP Plan. RTKC has provided (and continues to update) maps showing where solid mine waste has been left in place.

OU20: OU20 is subject to the requirements to manage in place solid mine waste (in part ensuring stabilization of the waste in place) pursuant to RTKC's 2019 WLIP Plan. RTKC has provided (and continues to update) maps showing where solid mine waste has been left in place. RTKC has also maintained compliance with its DWQ UPDES permit and DOGM bond requirements in OU20.

OU24: The Precipitation Plant, the Copperton Concentrator and Process Water Reservoir, tunnels, and adits are subject to DWQ GWPP permits over alluvial groundwater management in Bingham Canyon and the Concentrator operations directly. Past removal action during the demolition of the Precipitation Plant successfully removed soils and mine waste above the applicable land use action levels. The Precipitation Plant, Tunnels, Adit, Copperton Concentrator and Process Water Reservoir, and the rail corridors are secure within RTKC's land holdings and inaccessible to the public. The 1960s Denver Rio Grande Rail Corridor extends from SH-111 to Bingham Junction. From SH-111 to 5600 West (along the northern boundary of the Bingham Flats area, OU1) it is still in place in locations. East of 5600 West the rail line was previously converted by UTA into the Mid-Jordan Trax Line. To date, redevelopment projects overseen by the City of West Jordan and the Salt Lake County Health Department have managed soils and mine waste in compliance with their ICs. Within RTKC land holdings, soils and mine waste management at these facilities under RTKC's site-wide management plans.

OU25: The historical facilities in the Kennecott South Zone are predominantly within RTKC land holdings and secure from public access. These facilities are in both Salt Lake and Tooele County. The few historic facilities not within RTKC's land holdings in Salt Lake County are in areas where the Salt Lake County Health Department IC

is applicable for potential land use changes. Within RTKC land holdings, soils and mine waste management at these facilities is under RTKC's site-wide management plans.

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

For Soils Above Unrestricted Use

OUs 1, 3, 4, 5, 6, 10, 11, 12, 16, 18, 20, 24, 25: The current soil cleanup levels selected in the ROD for these OUs were based on the estimated risks defined in the EPA's Risk Assessment Guidance for Superfund (RAGS, Part A). No new contaminants of concern or contaminant sources have been identified since the ROD and the commencement of the risk assessment. There have been changes to the exposure assumptions and toxicity information since the document was issued. Because these documents were developed prior to the EPA's Risk Assessment Guidance (RAGS) Part F (2009), the exposure assumptions for the inhalation exposure pathway were conducted differently. The exposure metric that was used in the OU risk assessments and ROD used an inhalation concentration that was based on ingestion rate and body weight milligrams per kilogram per day (mg/kg-day). The updated methodology uses the concentration of chemical in the air, with the exposure metric of µg/m3. The inhalation pathway is minor compared to the soil ingestion pathway, which is the major risk factor at these OUs. Revising the inhalation calculations to be consistent with the most recent EPA guidance would not change the current cleanup levels.

Under the current EPA Office of Land and Emergency Management policy, the soil lead screening level was established so that a typical child or similarly exposed group of children would have an estimated probability of no more than 5 percent of exceeding a blood lead level (BLL) of 10 micrograms per deciliter (µg/dL). The 10 µg/dL BLL target concentration is based (in part) on the 1991 Center for Disease Control's (CDC) blood lead "level of concern." In 2012, CDC accepted the recommendations of its Advisory Committee on Childhood Lead Poisoning Prevention that the "level of concern" be replaced by a reference value based on the 97.5th percentile of the National Health and Nutrition Examination Survey-generated BLL distribution in children 1-5 years old (currently 5 µg/dL).

For lead in soil, the EPA's Office of Solid Waste and Emergency Response Directives 9355.4-12 (EPA, 1994) and 9200.4-27P (EPA, 1998), were identified as federal chemical-specific To Be Considered guidance documents. However, since 1994 and 1998 when those documents were issued, increasing evidence has shown that blood lead levels below 10 µg/dL may also have negative health impacts. Because of this, the agencies will look at the cleanup levels used at this site and determine if any additional work needs to be done.

For Groundwater Above Unrestricted Use

OU2: The exposure assumptions, toxicity data, cleanup levels and RAOs used at the time of the remedy selection are still valid.

OU4: The operation of the Bingham Reservoirs is in compliance with the DWQ GWPP permit. The methodology used to establish groundwater protection limits and restrict discharges is still valid.

OU12: The operation of the Water Collection System is in compliance with the DWQ GWPP permit. The methodology used to establish groundwater protection limits and restrict discharges is still valid.

OU16: The operation of the extraction well and monitoring well in use to contain the Dry Fork Plume is in compliance with the DWQ GWPP permit. The methodology used to establish groundwater protection limits and restrict discharges is still valid.

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

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

VI. ISSUES/RECOMMENDATIONS

Issues/Recommendations				
OU(s) without Issues/Recommendations Identified in the FYR:				
OU2				
Issues and Recommendations Identified in the FYR:				
OU(s): 1, 3, 4, 5, 6, 10, 11, 12, 16, 24, 25	**Issue Category: Institutional Controls**			
	Issue: The Salt Lake County Health Department's Title 9 Chapter 9.5 IC needs revision, given that implementation of the existing County IC ordinance is hindered by lack of clarity regarding roles and limited coordination between Salt Lake County Health Department and the Salt Lake County Metro Service Districts (MSDs) and incorporated cities.			
	Recommendation: The EPA and DERR should coordinate with Salt Lake County Health Department to revise the County IC addressing: 1) pre-screening issues, and 2) technical document approvals. The EPA and DERR should assist in developing solutions to achieving effective coordination with other county and city redevelopment programs.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	State	EPA/State	12/31/2022
OU(s): 1, 4, 6, 10, 11, 12, 16, 24, 25	**Issue Category: Institutional Controls**			
	Issue: For OUs within the boundaries of an RTKC operating facility or including an operating facility the management of soils and mine waste (during excavation project) along with maintenance of engineering controls, implementation of ICs, inspections and reporting are covered in the pending Operational Soils Management Plan. Until the plan's completion RTKC, the EPA and DERR coordinate on excavation projects using the general terms of the pending management plan and the 1996 Administrative Order on Consent.			
	Recommendation: RTKC, the EPA and DERR should complete the pending Operational Soils Management Plan before the end of the calendar year 2022 which will have the added benefit of supporting the ongoing effort to develop a final site-wide settlement consent decree under CERCLA.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	PRP	EPA/State	12/31/2022

OU(s): 4, 6, 10, 11, 12, 16, 24, 25	Issue Category: Operations and MaintenanceOperations and Maintenance			
	Issue: State operating permits cover active operations or reclamation in portions of these OUs Soils, solid mine waste, and groundwater in these operational areas that have contaminants of concern above CERCLA selected cleanup or use levels may not be addressed at mine closure by these state permitting programs. As noted in the 2016 FYR, DERR and the EPA are evaluating the need for further action in a pending technical memorandum for the impacted soils, mine waste and groundwater, but this evaluation is not done.			
	Recommendation: DERR and the EPA will complete the pending permit management of legacy waste evaluation, summarize results in a technical memorandum, and select necessary remedy clarifications in a decision document.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	State	EPA/State	12/31/2022

OU(s): 5	Issue Category: Operations and Maintenance			
	Issue: Annually, ARCO-BP inspects the ARCO Tails Repository and Bastian Ditch footprint on their property to verify the condition of the installed caps and engineering structures, and post removal surface stability (the Bastian Ditch alignment is along the vertical wall of the hillside to the south of the repository). The annual inspection report covers inspection results and maintenance activity. The work plan and subsequent annual inspection reports are not required to be provided to the EPA and DERR.			
	Recommendation: To ensure the long-term protectiveness of the selected remedy, BP will be requested to provide a copy of their work plan and annual inspection reports to the EPA and DERR.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	PRP	EPA/State	12/31/2021

OU(s): 18, 20, 25	Issue Category: Institutional Controls
	Issue: Excavation of soil and mine waste is currently managed under RTKC's site-wide management plants. Tunnels, waste rock and overburden rock dumps, shafts, mill footprints and other historic facilities in OUs 18, 20 and 25 (in Tooele County) are also inspected and secured by RTKC. At the time of RTKC's divestment of ownership these OUs will not be subject to a local jurisdictional IC to ensure soil management during land use changes because Tooele County does not have an IC.
	Recommendation: The EPA and DERR will coordinate with Tooele County to address solutions to future land use planning and management of soil and mine waste exceeding the KUALs

Affect Current Protectiveness	Affect Future Protectiveness	Party Responsible	Oversight Party	Milestone Date
No	Yes	Other	EPA/State	12/31/2022

Other Findings

In addition, the following findings were identified during the FYR and may improve performance of the remedy, reduce costs, improve management of O&M, accelerate site close out, conserve energy, promote sustainability, etc), The following actions do not affect current and/or future protectiveness:

- OU1, OU5, OU6 - Currently the City of South Jordan has elected not to create its own IC for the management of soils and mine waste during excavation projects. Periodically DERR will coordinate with the City to reassess their stance. However, the Salt Lake County ordinance applies to all properties in contaminated areas, in cities that don't have IC ordinances.
- OU1 – Directly north of the South Jordan City Bingham Creek Trailhead parking lot off Skye Drive, the ground surface showed evidence of previous excavation work. DERR will contact the City to assess details about the excavation.
- OU1, OU20 – Overburden dumps with angular rock (from tunnel drilling) are located at high elevations on RTKC property. The EPA, DERR and RTKC will coordinate on annual inspections to assess any downstream mobilization of the angular rock dumps under RTKC's site-wide management plans.
- OU2 – During future FYRs water management in Oquirrh Lake will be assessed to determine any net loss indicative of infiltration past the liners in the lake bed.
- OU5 - ARCO-BP has a 1-acre parcel that is secured by RTKC but has yet to be characterized. The EPA, DERR and ARCO-BP will collaborate on a characterization effort to assess for potential elevated metal concentrations.

VII. PROTECTIVENESS STATEMENT

Protectiveness Statements	
Operable Unit: **OU1 Bingham Creek**	Protectiveness Determination: Short-term Protective
Protectiveness Statement: The remedy at OU 1 currently protects human health and the environment because portions of OU1 are within the land holdings of RTKC, are secure, and inaccessible. Soils and mine waste are subject to long term management under site-wide management plans created by RTKC. DERR assists the SLCO HD and City of West Jordan with implementing their IC programs to oversee management of soils and mine waste during redevelopment projects on non-RTKC owned property which to date have been managed in compliance with their ICs. In order for the remedy to be protective in the long-term, the following actions need to be taken to assure protectiveness: complete required revisions of the Salt Lake County IC; RTKC's completion of their Operations Soil Management Plan. The Salt Lake County IC needs to be revised to address coordination issues. The coordination issues include: 1) the Salt Lake County Metro Service Districts and the Health Department; and 2) incorporated cities within Salt Lake County which do not have their own ICs.	
Operable Unit: **OU2 South End Groundwater**	Protectiveness Determination: Protective
Protectiveness Statement: The remedy selected for OU2 for the Zone A Plume is protective of human health and the environment.	

The contaminated groundwater plume is contained; ICs are in place and contaminated groundwater is being treated. RTKC maintains extraction rates sufficient to contain and reduce the Zone A Plume. Balancing extraction rates with maintaining contact with solid phase contaminants adsorbed to the soil particles of aquifer and aqueous phase contaminants will maintain long term protectiveness by ensuring the pump and treat remedy continues to reduce the plume.

Operable Unit: **OU3 Butterfield Canyon and Herriman**	Protectiveness Determination: Short-term Protective

Protectiveness Statement:

The remedy at OU 3 currently protects human health and the environment because portions of OU3 are within the land holdings of RTKC, are secure, and inaccessible. Soils and mine waste are subject to long term management under site-wide management plans created by RTKC. DERR assists the SLCO HD and City of Herriman with implementing their IC programs to oversee management of soils and mine waste during redevelopment projects on non-RTKC owned property which to date have been managed in compliance with their ICs. In order for the remedy to be protective in the long-term, the following actions need to be taken to assure protectiveness: complete required revisions of the Salt Lake County IC; RTKC's completion of their Operations Soil Management Plan. The Salt Lake County IC needs to be revised to address coordination issues. The coordination issues include: 1) the Salt Lake County Metro Service Districts and the Health Department; and 2) incorporated cities within Salt Lake County which do not have their own ICs.

Operable Unit: **OU4 Bingham Reservoir**	Protectiveness Determination: Short-term Protective

Protectiveness Statement:

The remedy at OU 4 currently protects human health and the environment because the reconstruction of the reservoirs included triple liners, leak detection and collection of sumps which protects the Southwest Salt Lake Valley principal aquifer. In addition, the Bingham Reservoir complex is operated in compliance with an issued DWQ's GWPP permit. OU4 is within the land holdings of RTKC, is secure, and inaccessible. Soils and mine waste are subject to long term management under site-wide management plans created by RTKC. Once RTKC divest its property ownership, a local jurisdictional IC will be required unless the property is covered by an environmental covenant. In order for the remedy to be protective in the long-term, the following actions need to be taken to assure protectiveness: complete required revisions of the Salt Lake County IC; RTKC's completion of their Operations Soil Management Plan. The Salt Lake County IC needs to be revised to address coordination issues. The coordination issues include: 1) the Salt Lake County Metro Service Districts and the Health Department; and 2) incorporated cities within Salt Lake County which do not have their own ICs. In addition, DERR and EPA need to complete their state permit evaluation to consider whether legacy mine waste will be addressed at mine closure.

Operable Unit: **OU5 ARCO Tails Repository, Bastian Ditch**	Protectiveness Determination: Short-term Protective

Protectiveness Statement:

The remedy at OU 5 currently protects human health and the environment because ARCO-BP secures, inspects and maintains the ARCO Tails Repository and Bastian Ditch footprint on their property to verify the installed caps and engineering structures are performing as required and the post removal surface is stable. Portions of OU 5 Bastian Ditch within the land holdings of RTKC, are secure, inaccessible. Soils and mine waste are subject to long term management under site-wide management plans created by RTKC. DERR assists the SLCO HD and the Cities of West Jordan and Herriman with implementing their IC programs to oversee management of soils and mine waste during redevelopment projects on non-RTKC and non-ARCO-BP owned property which to date have been managed in compliance with their ICs. Once RTKC or ARCO-BP divest their property ownership, a local jurisdictional IC will be required unless the property is covered by an environmental covenant. In order

for the remedy to be protective in the long-term, the following actions need to be taken to assure protectiveness: complete required revisions of the Salt Lake County IC. The Salt Lake County IC needs to be revised to address coordination issues. The coordination issues include: 1) the Salt Lake County Metro Service Districts and the Health Department; and 2) incorporated cities within Salt Lake County which do not have their own ICs. In addition, ARCO-BP will be requested to provide a copy of their operation and maintenance work plan and annual inspection reports to EPA and DERR. Though not directly affecting protectiveness, RTKC, DERR and EPA are evaluating further risk assessment data and may proceed with a decision document to add an OU5 Bastian Ditch specific Residential and Commercial Land Use Action Level for arsenic and lead.

Operable Unit: **OU6 Lark Waste Rock and Tailings**	Protectiveness Determination: Short-term Protective

Protectiveness Statement:

The remedy at OU 6 currently protects human health and the environment because portions of OU 6 within the land holdings of RTKC, are secure, and inaccessible. Soils and mine waste are subject to long term management under site-wide management plans created by RTKC. DERR assists the SLCO HD and the City of Herriman with implementing their IC programs to oversee management of soils and mine waste during redevelopment projects on non-RTKC owned property which to date have been managed in compliance with their ICs. In order for the remedy to be protective in the long-term, the following actions need to be taken to assure protectiveness: complete required revisions of the Salt Lake County IC; RTKC's completion of their Operations Soil Management Plan. The Salt Lake County IC needs to be revised to address coordination issues. The coordination issues include: 1) the Salt Lake County Metro Service Districts and the Health Department; and 2) incorporated cities within Salt Lake County which do not have their own ICs. Though not directly affecting protectiveness, RTKC, DERR and EPA are evaluating further risk assessment data and may proceed with a decision document to add an OU6 specific Residential and Commercial Land Use Action Level for arsenic and lead.

Operable Unit: **OU10 Copperton Soils**	Protectiveness Determination: Short-term Protective

Protectiveness Statement:

The remedy at OU 10 currently protects human health and the environment because portions of OU 10 are within the land holdings of RTKC and secure, and inaccessible. Soils and mine waste are subject to long term management under site-wide management plans created by RTKC. DERR assists the SLCO HD with implementing their IC program to oversee management of soils and mine waste during redevelopment projects on non-RTKC owned property which to date have been managed in compliance with their ICs. In order for the remedy to be protective in the long-term, the following actions need to be taken to assure protectiveness: complete required revisions of the Salt Lake County IC; RTKC's completion of their Operations Soil Management Plan. The Salt Lake County IC needs to be revised to address coordination issues. The coordination issues include: 1) the Salt Lake County Metro Service Districts and the Health Department; and 2) incorporated cities within Salt Lake County which do not have their own ICs.

Operable Unit: **OU11 Kennecott Historic Sites (Located in Bingham Canyon)**	Protectiveness Determination: Short-term Protective

Protectiveness Statement:

The remedy at OU 11 currently protects human health and the environment because OU 11 is within the land holdings of RTKC, secure, and inaccessible. Soils and mine are waste subject to long term management under site-wide management plans created by RTKC. Once RTKC divest its property ownership, a local jurisdictional IC will be required unless the property is covered by an environmental covenant. In order for the remedy to be protective in the long-term, the following actions need to be taken to assure protectiveness: complete required revisions of the Salt Lake County IC; RTKC's completion of their Operations Soil Management Plan. The Salt Lake County IC needs to be revised to

address coordination issues. The coordination issues include: 1) the Salt Lake County Metro Service Districts and the Health Department; and 2) incorporated cities within Salt Lake County which do not have their own ICs. In addition, DERR and EPA need to complete their state permit evaluation to consider whether legacy mine waste will be addressed at mine closure.

Operable Unit: **OU12 Water Collection System**	Protectiveness Determination: Short-term Protective

Protectiveness Statement:

The remedy at OU 12 currently protects human health and the environment because OU 12 is within the land holdings of RTKC, secure, and inaccessible. Soils and mine waste are subject to long term management under site-wide management plans created by RTKC. The Water Collection System is operated in compliance with an issued Utah GWPP permit. Once RTKC divest its property ownership, a local jurisdictional IC will be required unless the property is covered by an environmental covenant. In order for the remedy to be protective in the long-term, the following actions need to be taken to assure protectiveness: complete required revisions of the Salt Lake County IC; RTKC's completion of their Operations Soil Management Plan. The Salt Lake County IC needs to be revised to address coordination issues. The coordination issues include: 1) the Salt Lake County Metro Service Districts and the Health Department; and 2) incorporated cities within Salt Lake County which do not have their own ICs. In addition, DERR and EPA need to complete their state permit evaluation to consider whether legacy mine waste will be addressed at mine closure.

Operable Unit: **OU16 Bingham Creek Underflow**	Protectiveness Determination: Short-term Protective

Protectiveness Statement:

The remedy at OU 16 currently protects human health and the environment because OU 16 is within the land holdings of RTKC, secure, and inaccessible. Soils and mine waste generated during the construction, maintenance of the monitoring and extraction system for the plume are subject to management under site-wide management plans created by RTKC. RTKC is containing the plume in compliance with an issued Utah GWPP permit. In order for the remedy to be protective in the long-term, the following actions need to be taken to assure protectiveness: DERR and EPA need to complete their state permit evaluation to consider whether legacy mine waste will be addressed at mine closure.

Operable Unit: **OU18 Mine Drainage – Tooele County**	Protectiveness Determination: Short-term Protective

Protectiveness Statement:

The remedy selected at OU18 currently protects human health and the environment because soils and mine waste on RTKC owned lands are secure, inaccessible, and subject to long term management under site-wide management plans created by RTKC. However, in order for the remedy to be protective in the long-term, EPA and DERR will work with Tooele County to develop a local jurisdictional IC required when RTKC divests ownership of properties.

Operable Unit: **OU20 Pine Canyon**	Protectiveness Determination: Short-term Protective

Protectiveness Statement:

The remedy selected at OU20 currently protects human health and the environment because soils and mine waste on RTKC owned lands are secure, inaccessible, and subject to long term management under site-wide management plans created by RTKC. However, in order for the remedy to be protective in the long-term EPA and DERR will work with Tooele County to develop a local jurisdictional IC required when RTKC divests ownership of properties. RTKC also maintains compliance with DWQ's UPDES permit for the discharge of water from the Pine Canyon Tunnel. No compliance issues have arisen. Management of the Tunnel discharge under

the UPDES permit is protective in the long term.	
Operable Unit: **OU24 Precipitation Plant, Copperton Concentrator, Tunnels-Adits**	Protectiveness Determination: Short-term Protective
The remedy at OU 24 currently protects human health and the environment because portions of OU 24 are within the land holdings of RTKC, are secure, and inaccessible. Soils and mine waste are subject to long term management under site-wide management plans created by RTKC. The Copperton Concentrator is operated in compliance with an issued Utah GWPP permit. DERR assists the SLCO HD and the City of West Jordan with implementing their IC programs to oversee management of soils and mine waste during redevelopment projects on non-RTKC owned property which to date have been managed in compliance with their ICs. In order for the remedy to be protective in the long-term, the following actions need to be taken to assure protectiveness: complete required revisions of the Salt Lake County IC; RTKC's completion of their Operations Soil Management Plan. The Salt Lake County IC needs to be revised to address coordination issues. The coordination issues include: 1) the Salt Lake County Metro Service Districts and the Health Department; and 2) incorporated cities within Salt Lake County which do not have their own ICs. In addition, DERR and EPA need to complete their state permit evaluation to consider whether legacy mine waste will be addressed at mine closure.	
Operable Unit: **OU25 Kennecott Historic Sites (Not located in Bingham Canyon)**	Protectiveness Determination: Short-term Protective
The remedy at OU 25 currently protects human health and the environment because portions of OU 25 are within the land holdings of RTKC, are secure, and inaccessible. Soils and mine waste are subject to long term management under site-wide management plans created by RTKC. DERR assists the SLCO HD and the Cities of West Jordan and Herriman with implementing their IC programs to oversee management of soils and mine waste during redevelopment projects on non-RTKC owned property which to date have been managed in compliance with their ICs. In order for the remedy to be protective in the long-term, the following actions need to be taken to assure protectiveness: complete required revisions of the Salt Lake County IC; RTKC's completion of their Operations Soil Management Plan. The Salt Lake County IC needs to be revised to address coordination issues. The coordination issues include: 1) the Salt Lake County Metro Service Districts and the Health Department; and 2) incorporated cities within Salt Lake County which do not have their own ICs.	

VIII. NEXT REVIEW

The next FYR Report for the Kennecott South Zone Superfund Alternative Site is required five years from the completion date of this review.

APPENDIX A – REFERENCE LIST

BP Remediation Management Services Company, 2019 Annual Inspection and Maintenance Report – Copperton Tailings Impoundment Property; December 2019

Rio Tinto Kennecott, Site-Wide Management Plan for Wastes Left In Place. Kennecott North Zone and South Zone Sites; August 12, 2019

Rio Tinto Kennecott, South Facilities Groundwater 2019 Remedial Progress Report; April 2020

Rio Tinto Kennecott, Memorandum - Five Review for Operable Unit #2 (OU2); Post-Mining Water Management Plan; February 2021

Rio Tinto Kennecott Utah Copper, South Facilities Groundwater Operation, Maintenance and Replacement Plan; April 2009

U.S. Environmental Protection Agency and Utah Department of Environmental Quality, Explanation of Significant Differences – Kennecott South Zone Operable Unit 2; August 20, 2003

U.S. Environmental Protection Agency and Utah Department of Environmental Quality, Explanation of Significant Differences –Kennecott South Zone Operable Unit 2; June 12, 2007

U.S. Environmental Protection Agency and Utah Department of Environmental Quality, Explanation of Significant Differences – Kennecott North Zone Site & Kennecott South Zone Site, August 11, 2017

U.S. Environmental Protection Agency and Utah Department of Environmental Quality, Record of Decision Kennecott South Zone Site – Operable Units 1, 4, 5, 10, portions of 11, and 17 Bingham Creek and Bingham Canyon Area; November 3, 1998

U.S. Environmental Protection Agency and Utah Department of Environmental Quality, Record of Decision Kennecott South Zone Site – Operable Unit 2 Southwest Jordan River Valley Groundwater Plumes; December 13, 2000

U.S. Environmental Protection Agency and Utah Department of Environmental Quality, Record of Decision Kennecott South Zone Site – Operable Units 3 (Butterfield Mine, Butterfield Canyon, and Herriman), 6 (Lark Waste Rock and Tailings), and 7 (South Jordan Evaporation Ponds; September 28, 2001

U.S. Environmental Protection Agency and Utah Department of Environmental Quality, Record of Decision Kennecott North Zone Site & Kennecott South Zone Site – Operable Units (North Zone) 8, 13, 14, 15, 19, 22, 23 and (South Zone) 18, 20, and 24; September 26, 2002

U.S. Environmental Protection Agency and Utah Department of Environmental Quality, Technical Memorandum – Compilation of soil and groundwater action levels; December 29, 2015

U.S. Environmental Protection Agency and Utah Department of Environmental Quality, Technical Memorandum – Operable Units; February 5, 2016

U.S. Environmental Protection Agency and Utah Department of Environmental Quality, Technical Memorandum – Compilation of Applicable, Relevant and Appropriate Requirements; March 31, 2016

Utah State Trustee for Natural Resource Damages Letter, RE: Response to March 17, 2016 Rio Tinto Kennecott Bingham Canyon Water Treatment Plant force majeure declaration; March 30, 2016

Utah State Trustee for Natural Resource Damages Letter, RE: Rio Tinto Kennecott Copper's letter entitled Lifting Force Majeure and Resuming Zone A RO Plant Operations dated 24 August 2018; dated September 13, 2018

Utah Department of Environmental Quality and U.S. Environmental Protection Agency, First Five-Year Review Report for Kennecott South Zone Superfund Site; May 6, 2016

Utah Division of Water Quality Groundwater Protection Program, Memo – Compliance Summary of South End Kennecott Ground Water Discharge Permit. December 2020

Utah Division of Water Quality Utah Pollution Discharge Elimination System Program, Memo – Compliance Summary of Kennecott Utah (KUC) UPDES Permit No. UT0000051. February 2021

Utah Division of Oil, Gas and Mining, Memo - Compliance Summary of Rio Tinto Kennecott Mining Permits South Zone – East side of the Oquirrh Mountain Range, February 2021

Utah Division of Oil, Gas and Mining, Memo - Compliance Summary of Rio Tinto Kennecott Mining Permits – West side of the Oquirrh Mountain Range, February 2021

APPENDIX B – SITE MAP

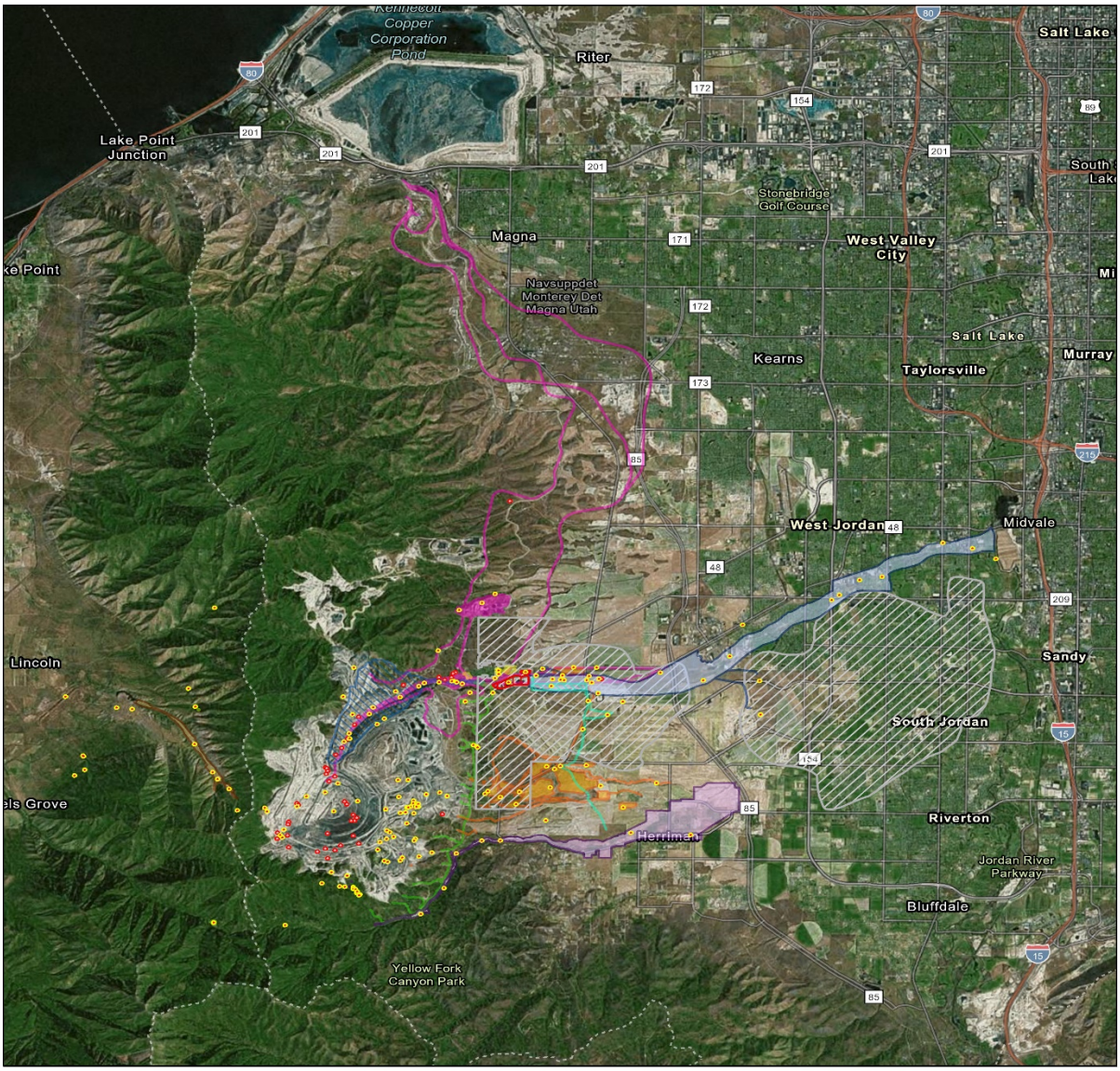

Figure 1.0 Kennecott South Zone Operable Units

- OU 1 Bingham Creek
- OU 2 SW Jordan River Valley Groundwater Plumes
- OU 3 Butterfield Canyon and Herriman
- OU 4 Large Bingham Reservoir
- OU 5 Arco Tailings
- OU 6 Lark Waste Rock and Tailings
- OU 10 Copperton Soils
- OU 11 Kennecott Historic Sites
- OU 12 Eastside Collection System
- OU 16 Bingham Creek Underflow
- OU 18 Mine Drainage Tooele County
- OU 20 Pine Canyon
- OU 24 Precipitation Plant
- OU 25 Historic Facilities

Date: January 25, 2021
Map Projection: UTM Zone 12N, WGS84, Meters
Data Sources:
Boundaries: *U.S. EPA* (2017);
Base Map: *Esri World Imagery (Clarity) Web Service* (2021).

Boundaries are based on the nature and extent of contamination and are subject to change

0 2 4 Miles

Area Enlarged

APPENDIX C – SITE INSPECTION CHECKLIST

I. SITE INFORMATION

Site name: Kennecott South Zone	**Date of inspection:** Nov. 2020 to Feb. 2021
Location and Region: Salt Lake & Tooele County, Utah 8	**EPA ID:** UTD070926811
Agency, office, or company leading the five-year review: DERR	**Weather/temperature:** Variable – Cold, Cloudy, Rainy to Warm, Sunny

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☐ Access controls
- ☒ Institutional controls
- ☒ Groundwater pump and treatment
- ☒ Surface water collection and treatment
- ☒ Other Non-time critical removal, surface water monitoring, soils management
- ☒ 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** Jason Hill (Name) | Principal Advisor – Land Resources (Title) | 12/09/20 (Date)
   Interviewed ☐ at site ☐ at office ☒ by phone Phone no. 801-569-6442
   Problems, suggestions; ☒ Report attached See appendix F for interview log

2. **O&M staff** Teresa Cockayne (Name) | Remediation Senior Advisor - Environment (Title) | 12/09/20 (Date)
   Interviewed ☐ at site ☐ at office ☒ by phone Phone no. 801-204-2833
   Problems, suggestions; ☒ Report attached See appendix F for interview log

   O&M staff Brian Vinton (Name) | Principal Advisor – Water Resources (Title) | 12/09/20 (Date)
   Interviewed ☐ at site ☐ at office ☒ by phone Phone no. 801-569-7887
   Problems, suggestions; ☒ Report attached See appendix F for interview log

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 Division of Water Quality
Contact Brian Hamos (Name) | Env. Scientist III (Title) | bhamos@utah.gov (Email)
Problems; suggestions; ☒ Report attached: See Appendix E for a complete permit compliance assessment

Agency Utah Division of Water Quality
Contact Sara Ward (Name) | Env. Scientist III (Title) | sarahward@utah.gov (Email)
Problems; suggestions; ☒ Report attached: See Appendix E for a complete permit compliance assessment

Agency Utah Division of Oil, Gas, and Mining
Contact Leslie Heppler (Name) | Engineer (Title) | lheppler@utah.gov (Email)
Problems; suggestions; ☒ Report attached: See Appendix E for a complete permit compliance assessment

Agency Utah Division of Oil, Gas, and Mining
Contact Kim Coburn (Name) | Environmental Scientist (Title) | kcoburn@utah.gov (Email)
Problems; suggestions; ☒ Report attached: See Appendix E for a complete permit compliance assessment

Agency Salt Lake County Health Department
Contact Dan Moore (Name) | Hazardous Waste Supervisor (Title) | dmoore@slco.org (Email)
Problems; suggestions; ☒ Report attached: See Appendix F for interview log

4. **Other interviews** (optional) ☐ Report attached: See Appendix F

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: RTKC's Site Wide Management Plan for Waste Left in Place is readily available, as is the OU2 O, M&R Plan; EPA & UDEQ have copies. Still pending, a site wide operation & maintenance plan is in development for soils management around operational facilities. ARCO was not required to submit an O&M work plan or reports to EPA and DERR for their repository in OU5 just compliance monitoring reports for five years after the selected remedy.

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: RTKC's current health and safety, and contingency plan is in their 1996 AOC work plan

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: See Appendix E for an evaluation of RTKC's compliance with state permits

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: Groundwater monitoring quarterly reports pursuant to the site Groundwater Characterization Monitoring Plan (GCMP) are managed by the DWQ GWPP, DERR has copies. OU2 groundwater monitoring report is provided to EPA and UDEQ every April 15th, the 2020 report is referenced. Formal submission of the OU2 annual remediation progress report is not required, it is considered draft by EPA and DERR.

8. **Leachate Extraction Records** ☒ Readily available ☒ Up to date ☐ N/A
Remarks: Containment of acid mine drainage and other contact water from the Bingham Mine waste rock dumps (Eastside and Southside) is performed by their Water Collection System (OU12) in compliance with the requirements of the DWQ GWPP permit for the Bingham Mine (see Appendix E). DWQ receives RTKC's permit compliance well monitoring reports.

9. **Discharge Compliance Records**

☐ Air	☐ Readily available	☐ Up to date	☐ N/A
☒ Water (effluent)	☒ Readily available	☒ Up to date	☐ N/A

Remarks: See Appendix E for DWQ's UPDES permit compliance memo which covers the UPDES discharges from the Butterfield Mine (OU3) and Pine Canyon (OU20).

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

☐ Other_____
_____

2. **O&M Cost Records**
☐ Readily available ☐ Up to date ☒ N/A
☐ Funding mechanism/agreement in place
Original O&M cost estimate_____ ☐ Breakdown attached

Total annual cost by year for review period if available

From_____ To_____ _____ ☐ Breakdown attached
Date Date Total cost

3. **Unanticipated or Unusually High O&M Costs During Review Period**
Describe costs and reasons: _____

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

A. Fencing

1. **Fencing damaged** ☐ Location shown on site map ☐ Gates secured ☒ N/A
Remarks: Access to RTKC and ARCO property is controlled via 5-string and 10-string barbed-wire fence and permanent 6-foot chain-link fence with pass card entry gates.

B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on site map ☐ N/A
Remarks: Most fencing is signed with metal signs acknowledging the property is owned by RTKC and warning against trespassing.

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): Self reporting, drive by observing infractions
Frequency: PRP – monthly, UDEQ – annually if not more frequent, Cities - weekly
Responsible party/agency: Property held in ownership by the PRP – RTKC is responsible to follow its proprietary ICs, Property held in ownership by third parties – West Jordan, Herriman and Salt Lake County Health Department are responsible for enforcing ICs

Contact:

Name	Title	Email
Teresa Cockayne, RTKC	Remediation Senior Advisor - Environment	Teresa.Cockayne@riotinto.com
Dan Moore, Salt Lake County HD	Hazardous Waste Supervisor	dmoore@slco.org
Nate Nelson, West Jordan City	City Engineer	naten@wjordan.com
Jonathan Bowers, Herriman City	City Engineer	jbowers@herriman.org

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

Remarks: Tooele County does not have an IC; Salt Lake County is evaluating its ability to implement its IC

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

Remarks: RTKC is coordinating with DERR to complete a site management plan for soil in operational areas as an IC. RTKC has a site wide management plan for waste left in place in non-operational areas in their land holdings, to address mine waste when it is discovered as an IC. SLCO Health Department and DERR are concurrently working on evaluation on how better to implement SLCO's IC (Title 9 Chapter 9.5).

D. General

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

Remarks: _____

2. **Land use changes on site** ☐ N/A

Remarks: No changes from the mining operations and use of land as open space buffer. RTKC is reconstructing is ore conveyor from the in-pit crusher to the Copperton Concentrator, through Bingham Canyon over the Bingham Canyon waste rock dump. ARCO has not changed any land use at OU5.

3. **Land use changes off site** ☐ N/A
Remarks: Numerous developments in the Southwest quadrant of the Salt Lake Valley are taking place in portions of OUs 1, 3, 5 and 6 (in the communities of West Jordan, South Jordan and Herriman)

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: See Appendix D of the 2021 FYR report for inspection photos and captions

VII. REPOSITORY & WASTE ROCK COVERS ☒ Applicable ☐ N/A

A. Surfaces

1. **Settlement** (Low spots) ☐ Location shown on site map ☐ Settlement not evident ☐ N/A
Areal extent_____ Depth_____
Remarks: _____

2. **Cracks** ☐ Location shown on site map ☒ Cracking not evident ☐ N/A
Lengths_____ Widths_____ Depths_____
Remarks: ARCO's inspection reports noted no intrusion cracks along the cribbing of its repository (OU5). RTKC's Bluewater Repository had no observable erosional gullies.

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident ☐ N/A
Areal extent_____ Depth_____
Remarks: RTKC's Bluewater waste rock dump located in the Bingham Mine Eastside Waste Rock Dumps had at least one erosional gully along the lower vegetated rail dump slope. The upper slope of the Bingham Canyon waste rock dump also had an erosional gully. The erosional gullies are located up-gradient of RTKC's Water Collection System (OU12) which contains surface flows in addition to alluvial flow. RTKC's Middle Canyon Tunnel Dump (OU18) has evidence of sloughing along its western/southwestern face but material was not observed in the nearby creek channel. See Appendix D of the 2021 FYR report for more detail.

4. **Holes** ☐ Location shown on site map ☐ Holes not evident ☒ N/A
Areal extent_____ Depth_____
Remarks_____

5. **Vegetative Cover** ☒ Grass ☐ Cover properly established ☒ No signs of stress
☐ Trees/Shrubs (indicate size and locations on a diagram)
Remarks: Vegetative covers are intact and doing well, or under construction.

ARCO's repository cap (OU5) was observed to be in good condition with minimal animal burrows. Principal issue is noxious weeds with deep roots which can penetrate the drainage layer over the liner. ARCO's maintenance contractor performs noxious weed control annually.

RTKC's cover on their Bluewater Repository is temporary as the Repository is actively being used. It is well vegetated. Newly relaxed slopes at the East Waste Rock Expansion and South Waste Rock Reclamation projects are being revegetated. RTKC's Middle Canyon Tunnel Dump (OU18) is not well vegetated due to the angular rock characteristics of the material in the dump and the relatively high alpine location and limited water available to sustain plant growth. Other tunnel dumps in OU18 and OU20 have various native voluntary vegetation on their surfaces (see Appendix D of the 2021 FYR report). As part of their East Waste Rock Expansion (EWRE) and South Waste Rock Reclamation (SWRR) projects at the Bingham Mine, the newly installed benches are being relaxed and revegetated overseen by DWQ GWPP and DOGM's mine reclamation program.

6. **Alternative Cover (armored rock, concrete, etc.)** ☒ N/A
Remarks: _____
_____

7. **Bulges** ☐ Location shown on site map ☒ Bulges not evident ☐ N/A
Areal extent_____ Height_____
Remarks_____
_____

8. **Wet Areas/Water Damage** ☒ Wet areas/water damage not evident
☐ Wet areas ☐ Location shown on site map Areal extent_____
☐ Ponding ☐ Location shown on site map Areal extent_____
☐ Seeps ☐ Location shown on site map Areal extent_____
☐ Soft subgrade ☐ Location shown on site map Areal extent_____
Remarks: _____
_____

9. **Slope Instability** ☐ Slides ☐ Location shown on site map ☐ No evidence of slope instability
Areal extent NA
Remarks: RTKC's Middle Canyon Tunnel Dump (OU18) western/southwestern slope has shown signs of instability but the material that has sloughed has not moved into the nearby creek channel.

B. Benches ☒ Applicable ☐ N/A
Remarks: RTKC's East Waste Rock Expansion (EWRE) and South Waste Rock Reclamation (SWRR) projects are in the process of relaxing the slopes and creating a stabilized surface along the benches in both Bingham Mine waste rock dump locations. The work is being performed in compliance with requirements from the DWQ GWPP and DOGM Mining Reclamation program permits.

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

Remarks: RTKC's newly constructed "down drains" along the newly relaxed slopes of the EWRE and SWRR projects are constructed with slabs of what can best be described as sectional rip-rap mats, providing substantially well armored channels to let precipitation drain in discrete locations along the dump faces.

RTKC's "down drain" on the western slope of the Middle Canyon Tunnel Dump (OU12) is substantively armored and well intact.

ARCO's drainage channels and directional berms on their repository (OU5) were well intact and in an operational state of condition.

1. **Settlement** ☐ Location shown on site map ☒ No evidence of settlement
Areal extent_____ Depth_____
Remarks: _____
_____

2. **Material Degradation** ☐ Location shown on site map ☒ No evidence of degradation
Material type_____ Areal extent_____
Remarks: _____
_____

3. **Erosion** ☐ Location shown on site map ☒ No evidence of erosion
Areal extent_____ Depth_____
Remarks: _____
_____

4. **Undercutting** ☐ Location shown on site map ☒ No evidence of undercutting
Areal extent_____ Depth_____
Remarks: _____
_____

5. **Obstructions** Type_____ ☒ No obstructions
☐ Location shown on site map Areal 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 Areal 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: As reported by DWQ's GWPP (see Appendix E of the 2021 FYR report) RTKC continues to comply with monitoring requirements under the permit for OU12 and OU16. ARCO is no longer required to monitor its groundwater wells at its repository located in OU5.

4. **Leachate Extraction Wells**
☐ 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** Areal extent_____ Depth_____ ☒ N/A
☐ Siltation not evident
Remarks: _____

2. **Erosion** Areal extent_____ Depth_____
☒ Erosion not evident
Remarks: _____

3. **Outlet Works** ☒ Functioning ☐ N/A
Remarks: ARCO's outlet at their sedimentation basin (OU5) is clean and operational. RTKC's reconstructed sediment basin outlets at the EWRE and SWRR projects (OU12) are operational and free of debris.

4. **Dam** ☒ Functioning ☐ N/A
Remarks: ARCO's and RTKC's sediment basin embankments are stable and operational.

H. Retaining Walls ☒ Applicable ☐ N/A

1. **Deformations** ☐ Location shown on site map ☒ Deformation not evident
Horizontal displacement_____ Vertical displacement_____
Rotational displacement_____
Remarks: ARCO's inspection reports (see Appendix D of the 2021 FYR report) noted some cracks along its repository's (OU5) cribbing wall along its northern embankment. The cracks were not substantive and did not require maintenance. No soils behind the wall was observable.

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
Areal extent_____ Depth_____
Remarks: ARCO's OU5 repository does not have an off-site discharge. Drainage ditches and sediment basin were free of sediments. RTKC's Bluewater Repository and Bingham Mine Waste Rock Dumps are designed to have no discharge. Sediment basins along the Eastside and Southside Waste Rock Dumps were free of sediment.

2. **Vegetative Growth** ☐ Location shown on site map ☐ N/A
☐ Vegetation does not impede flow
Areal extent_____ Type_____
Remarks: ARCO's OU5 drainage ditches and sediment basin overflow were free of vegetation.

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident
Areal extent_____ Depth_____
Remarks: ARCO's OU5 drainage ditches and sediment basin overflow had no visible erosion.

4. **Discharge Structure** ☐ Functioning ☒ N/A
Remarks: _____

VIII. VERTICAL BARRIER WALLS ☒ Applicable ☐ N/A

1. **Settlement** ☐ Location shown on site map ☒ Settlement not evident
Areal extent_____ Depth_____
Remarks: The majority of RTKC's cut-off walls of OU12 recently were reconstructed as part of their EWRE and SWRR projects so no settlement was observed.

2. **Performance Monitoring** ☐ **Performance not monitored**

Type of monitoring: RTKC monitors the various cutoff walls comprising the Water Collection System (OU12) located downgradient of the Bingham Canyon Eastside and Southside Waste Rock Dumps in each drainage that waste rock is located in. RTKC operates the Water Collection System in compliance with the DWQ GWPP for the Bingham Mine (see Appendix E). There are compliance wells established by RTKC, required by DWQ, that are monitored based on the frequency required in the permit.

Frequency: See Appendix E for DWQ GWPP's compliance memorandum to DERR.

☐ Evidence of breaching

Head differential_____

Remarks: Some compliance wells have been out of compliance with TDS established limits. The compliance wells continued to be monitored as the current corrective action being required by DWQ. RTKC recently reconstructed the OU12 Water Collection System at the Bingham Mine waste rock dumps as part of their EWRE and SWRR projects. In so doing RTKC has and maintains equipment to repair and maintain the new pipelines, sediment basins, French Drains, cutoff walls of the system.

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: See Appendix D of the 2021 FYR report for inspection photos and captions. RTKC's equipment at OU2 is operational/available 90% of the year. Pumps experience periodic issues due to power spikes and wear due to the startup of wells periodically. RTKC implements a maintenance program and reports to DERR well issues as they arise. RTKC maintains the containment of the OU16 Dry Fork Plume (Bingham Canyon Underflow) by pumping extraction well #ECG2787 pursuant to the DWQ GWPP permit for the Bingham Mine (see Appendix E).

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
☒ Good condition ☐ Needs Maintenance
Remarks: For OU2 the extraction system equipment was in operational condition. Sumps and valving boxes were not observed to have any standing water, so there were no observable leaks at OU2. The extraction and monitoring well for OU16 were intact and operational.

3. **Spare Parts and Equipment**
☒ Readily available ☒ Good condition ☐ Requires upgrade ☐ Needs to be provided
Remarks: RTKC maintains replacement pumps, motors, and general equipment to keep its OU2 extraction wells operational. Parts and equipment are available.

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

1. **Collection Structures, Pumps, and Electrical**
☒ Good condition ☐ Needs Maintenance
Remarks: RTKC's OU12 sedimentation basin outlets, pipelines are buried. Based on flow rates from each of the Bingham Mine waste rock drainages these basins and pipelines are operational and no operational issues were reported by RTKC. RTKC's Water Collection System pipeline is gravity feed to their Waste Water Disposal Pump Station (WWDPS).

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
☒ Good condition ☐ Needs Maintenance
Remarks: RTKC's OU12 Water Collection System uses French Drains to collect surfaces waters flowing upgradient of cutoff walls located in the drainages below the Bingham Mine waste rock dumps. The French Drains were observed to be in good condition and no operational issues were reported by RTKC. RTKC's OU2 remedy has no surface water collection systems.

3. **Spare Parts and Equipment**
☒ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided
Remarks: RTKC maintains equipment to repair and maintain the new pipelines, sediment basins, French Drains, cutoff walls of the system.

C. Treatment System ☒ Applicable ☐ N/A

1. **Treatment Systems** (Check components that apply)
☐ Metals removal ☐ Oil/water separation ☐ Bioremediation
☐ Air stripping ☐ Carbon adsorbers
☐ Filters_____
☐ Additive (*e.g.*, chelation agent, flocculent) _____
☒ Others: Tailings Pipeline Neutralization and a Reverse Osmosis treatment system for acid mine drainage from the Bingham Mine waste rock dumps (OU12) and the OU2 acid core (tailings neutralization) and barrier well water (RO). See below remarks

☒ Good condition ☐ Needs Maintenance
☒ Sampling ports properly marked and functional
☒ Sampling/maintenance log displayed and up to date
☒ Equipment properly identified

☒ Quantity of acidic mine water treated in tailings pipeline in 2019 - approx. 3,800 gpm
☒ Quantity of OU2 barrier wells water managed in 2019 – approx. 3,293 gpm (some water goes into RTKC's process water circuit, some goes to the OU2 Zone A RO plant as feedwater, and some goes to RTKC's tailings pipeline during well start-up).

Remarks: RTKC neutralizes acidic mine drainage from the Bingham Mine waste rock dumps collected by the OU12 Water Collection System and manages other mine contact waters stored at OU4 Bingham Reservoir in their tailing pipeline at the Copperton Concentrator. Neutralization of acidic mine water takes place in the pipeline by mixing with tailings throughput from the Copperton Concentrator with a manageable neutralization potential. RTKC also treats acidic water from the core of the OU2 Zone A plume in this same manner. For the water extracted at the OU2 Zone A barrier wells (located along the leading edge of the Zone A plume core), RTKC uses reverse osmosis (RO), a manganese filtration unit and other additional pre and post treatment systems (e.g. anti-scalant, fluoridation, disinfectant) to treat the water to comply with Utah's Primary and Secondary Drinking Water Standards. RTKC's maintains compliance with their Utah Division of Drinking Water – Drinking Water System Permit.

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: See Appendix D of the 2021 FYR report

4. **Discharge Structure and Appurtenances**
☒ N/A ☐ Good condition ☐ Needs Maintenance
Remarks: RTKC manages the treatment concentrates from their OU2 Zone A reverse osmosis plant, the extracted acid core waters from the OU2 Zone A plume core extraction program, and other surface contact water contained by OU12 in their Copper Concentrator Tailings Pipeline which does not have a discharge outlet. The overall tailings slurry is delivered to RTKC's North Tailings Impoundment which is part of the Kennecott North Zone, OU15. A FYR for OU15 was completed in 2019 (see the 2019 report).

5. **Treatment Building(s)**
☐ N/A ☒ Good condition (esp. roof and doorways) ☐ Needs repair
☒ Chemicals and equipment properly stored
Remarks: See Appendix D of the 2021 FYR report

6. **Monitoring Wells** (pump and treatment remedy)
☒ Properly secured/locked ☒ Functioning ☒ Routinely sampled ☒ Good condition
☐ All required wells located ☐ Needs Maintenance ☐ N/A
Remarks: Compliance well network is in place and operational. Overall monitoring well network is also operational. DERR and RTKC coordinate closely when a system well (monitoring, compliance, extraction) for OU2 is in an area undergoing redevelopment, to ensure the integrity of the well is maintained. If a replacement strategy is necessary, RTKC coordinates such with DERR.

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

D. 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: For OU12 and OU16, see Appendix E for Utah's DWQ permit compliance memorandum. Groundwater monitoring is performed by RTKC and reviewed by the Utah DWQ,

For OU2 RTKC, UDEQ and EPA and others on an annual basis evaluate monitoring data pursuant to the 2009 O, M&R Plan. RTKC is current with their annual reporting requirements on operations at OU2 with EPA and UDEQ. MNA is part of the "passive" component to the selected remedy for OU2 once the "active" remediation (extraction) performance goals are attained.

X. OTHER REMEDIES

NA

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 remedies are functioning as selected in the RODs (1998, 2000, 2001, 2002) for the OUs. Short term protectiveness is being met for the OUs with a solid mine waste issue. Long term protectiveness is effectively hindered by issues with IC implementation issues. For the mine water and groundwater management operable units, OU2, 12, 16 the selected remedies are protective.

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.

See Question A above.

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.

For the solid mine waste operable units (OU1, 3, 5, 6, 10, 18, 20, 24, and 25) not owned by RTKC or ARCO, the limits of IC implementation are real and could in the future limit the long-term protectiveness of the selected remedy. Ability to communicate and coordinate on IC implementation among local jurisdictions is at the root of the implementation concern.

D. Opportunities for Optimization

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

For OUs, 1, 3, 4, 5, 6, 10, 11, 18, 20, 24, and 25 soil management is not generally a focus for optimization by EPA and UDEQ. Management strategies for soil management is typically proposed by proponents of land use change in these OUs in compliance with ICs. For OU4, 12, and 16 management of contact water and impacted alluvial groundwater is overseen by the Utah DWQ under GWPP permits. As it pertains to optimizing the management of contact water at these OUs, DWQ and RTKC would coordinate.

For OU2, RTKC, EPA and UDEQ do consider how best to manage the extraction of the Zone A Plume in a manner that balances water level draw downs and extraction rates, to maintain connection to transmissive zones of contaminated alluvial groundwater. The OU2 containment and reduction remedy overtime will reduce the mass of contaminants by “flushing” the impacted alluvial aquifer, but the ability to maintain contact with contaminated water is a critical operability concern. This management evaluation is done on an annual basis when RTKC reports on annual cleanup progress.

APPENDIX D – SITE INSPECTION PHOTOS

OU1

Photo 1 - Pictured is an aerial view of Bingham Canyon with the Bingham Canyon Waste Rock Dump in the background, KCC Precipitation Plant footprint in the middle of the frame, and Tunnel 5490 and the old Bingham Mine Ore Conveyor in the foreground. The footprint of the historic Yellow Cake Plant (OU11) is located on the northern hillside (in the upper right quadrant) and is now the site of material warehouses for RTKC. Bingham Creek (red arrow) is located along the southern boundary of the Precipitation Plant and is directed to the Large Bingham Reservoir.

Photo 2 - Pictured is the reclaimed eastern embankment of the Bingham Canyon Waste Rock Dump. Located along the left side of the photo is the excavated alignment for the new Bingham Mine Ore Conveyor. Located just below the top of the dump (red circle), above the first road cut and right of the new conveyor is an erosional gully, RTKC has been requested to repair, which resulted from a 2013 high intensity storm event.

OU1

Photo 3 - Pictured is the Bingham Reservoir Complex near the mouth of Bingham Canyon. More info on the Bingham Reservoirs is provided in the photos for OU4. Bingham Creek reappears near the base of the Large Bingham Reservoir spillway (red arrow).

Photo 4 - Nearly completed, the new Bingham Mine Ore Conveyor runs from the Bingham Mine Pit Crusher to the Copperton Concentrator. The conveyor is bedded on waste rock. Material removed was used to recontour the base of the Bingham Canyon Waste Rock Dump with new storm water sediment capture basins.

OU1

Photo 5 - Pictured is the eastern extent of Bingham Canyon from the Bingham Canyon Waste Rock Dump. New storm water sediment retention basins were under construction at the base of the Bingham Canyon Waste Rock Dump. The KCC Precipitation Plant is in the middle of the frame, and the Large Bingham Reservoir (red arrow) is in the background (center left) with the Town of Copperton is out of frame in the upper left quadrant.

Photo 6 - Pictured is another view of the new Bingham Mine Ore Conveyor under construction. The conveyor begins to traverse laterally along the embankment of the Bingham Canyon Waste Rock Dump (view is east/northeast). Storm water sediment basins were still under construction. The KCC Precipitation Plant is just out of frame in the upper right quadrant.

OU1

Photo 7 - Pictured adjacent to the new Bingham Mine Ore Conveyor is a concrete lined storm water down-drain and the first of storm water sediment basin at the base of the Bingham Canyon Waste Rock Dump. Storm water will be distributed to successive lower basins to dissipate flow, energy and to distribute volume.

Photo 8 - Pictured is the Cemetery Pond which was previously cleaned up during the Bingham Creek Phase II removal action. Water from the OU2 Zone A RO plant can be directed to this pond as needed. The Cemetery Pond is well vegetated and generally does not contain water. In the foreground is a section of the 1960s Denver Rio Grande (DRG) Rail Corridor (red arrow, part of OU24).

OU1

Photo 9 -- Pictured from SH-111 is the Bingham Creek Channel (red arrow), the view is to the west. The Channel is well vegetated with sage brush, rabbit brush, and grasses.

Photo 10 - Pictured is the Bingham Creek Channel (red arrow) looking east from SH-111. From this point the Channel's cut shallows and the floodplain widens. Both the Channel and floodplain are well vegetated with grasses and a few pockets of scrub oak, sage brush, and rabbit brush. Surfaces of both the Channel and floodplain are stable.

OU1

Photo 11 - Pictured is the culvert outlet for Bingham Creek where it flows under SH-111. The Outlet area is well vegetated and no water was observed. Some general solid waste debris (garbage) was observed around the outlet area.

Photo 12 - Pictured south of the Bingham Creek Channel, north of the Trans Jordan Landfill's (TJL) fence line, is an area previously impacted by storm water runoff in the early 2000s. This portion of the Bingham Creek Floodplain was repaired by the operator at the TJL. Re-vegetation efforts have been successful though there remains a bare batch around the utility pole in the background.

OU1

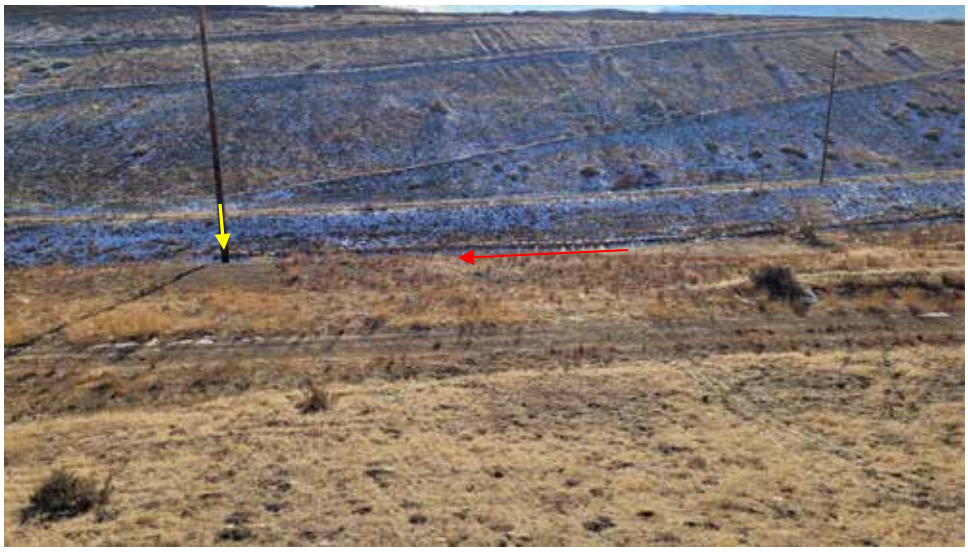

Photo 13 - Pictured is the Bingham Creek Channel (red arrow) and floodplain between the TJL (background) and the Bingham Creek Channel's northern embankment (the photo vantage point). Stones along the channel (parallel to red arrow) were placed during the Bingham Creek Phase II removal action to stabilize the soils. Soils around the utility pole (yellow arrow) have lead concentrations just below the surface of approximately 1,400 milligrams per kilogram (mg/kg).

Photo 14 - Pictured is the western extent of the Bingham Creek Channel and floodplain looking back to SH-111. Surfaces are well vegetated, fairly flat (no discernible channel invert), and no flowing water was observed. The photo was taken near the western extent of the Bingham Flats area now part of Oquirrh Park, a commercial development by LHM - Daybreak Communities.

OU1

Photo 15 - Pictured is the “Big Bend” of Bingham Creek. This location is topographically below the western extent of the Bingham Flats area. Here the Channel is restricted by the footprint of TJL (fence line). Soils contain gravel and limited water (mostly from rain) falls on this area. Thus, revegetation has not been successful here. Soils in the Floodplain and embankments are stable, no erosion was observed.

Photo 16 - Pictured is a portion of the western extent of the Bingham Flats Oquirrh Park area, a commercial/industrial development in the LHM - Daybreak Communities. New construction is taken place along the southern side of the road (left). In the background to the right is eBay’s data center. LHM - Daybreak Communities controls land use changes in this area.

OU1

Photo 17 - In the Bingham Flats area new construction was observed to the north of the location in Photo 16. Prior to sale, the Bingham Flats area was assessed by RTKC in the 1990s and further cleanup work was performed in 2016 to address soils above the (Kennecott Unrestricted Action Levels (KUALs) for arsenic and lead.

Photo 18 - Pictured is the Mountain View Corridor roadway intersection with Old Bingham Highway. The vegetated soil (center background) is a repository that was constructed by UDOT during the Mountain View Corridor construction. UDOT consolidated and covered rail bedding material (slag) and soils with concentrations of lead above 2000 mg/kg and arsenic above 100 mg/kg from the historic 1960s DRG Rail Corridor. The repository is well vegetated and stable.

OU1

Photo 19 - Pictured in the central portion of Bingham Flats is a Rocky Mountain Power substation. The historic 1960s DRG Rail Corridor (red arrow, foreground) still has slag (not leachable) as rail bedding in place. The rail corridor is subject to ICs created by the City of West Jordan and Salt Lake County Health Department. The power substation has been in place since prior to the Bingham Creek Phase II cleanup.

Photo 20 - Pictured from approximately 5000 West is Salt Lake County (SLCO) Parks & Recreation's (P&R) Welby Gravel Pit redevelopment project. In the foreground to the left is the SLCO BMX bike recreation facility and in background before the houses is the Welby Pit redevelopment project, Bingham Creek Channel and floodplain. Interstate Brick, a commercial entity located in the eastern extent of the Bingham Flats area is located out of frame to the right.

OU1

Photo 21 - Pictured is the northeastern extent of SLCO P&R's Welby Gravel Pit redevelopment project, the view is southwesterly from 4800 West. The historic Bingham Creek Channel traversed this site in the background. The vegetated hillside (right) leads up to residential homes.

Photo 22 - Pictured is a broad overview of SLCO P&R's Welby Gravel Pit redevelopment project, the view is northwesterly from 4800 West. Based on current land topography, the historic Bingham Creek Channel is not observable. Eventually a graded channel will be maintained for flood control capacity.

OU1

Photo 23 - Pictured is the western end of South Jordan City's Bingham Creek Trailhead park on Skye Drive. Located north of Skye Drive and the park is a residential neighborhood built prior to the Bingham Creek Phase II cleanup. Recent hillside stabilization work was observed (stone walls). South Jordan City will be contacted to ascertain the extent of soil excavation during the project. This hillside had a historical irrigation ditch which conveyed waters from Bingham Creek to the historically farmed land where the houses now are located.

Photo 24 - Pictured is South Jordan City's parking lot for their Bingham Creek Trailhead park adjacent to Skye Drive. This area was the subject of an RTKC removal action prior to the previous FYR in 2016. The parking lot and trail were found in good condition.

OU1

Photo 25 - Pictured just west of Skye Drive is the Bingham Creek Channel, the culvert underlies Skye Drive. Vegetative cover in the Channel has not changed since the previous FYR. No water was observed in the Channel nor was any erosion observed along the Channel. The Channel in this location is well incised and narrow.

Photo 26 - Pictured just east (downgradient) from Skye Drive is the Bingham Creek Channel. The Channel is well vegetated and has not changed since the previous FYR. No water was observed in the Channel nor was any erosion observed along the Channel. The Channel in this location is well incised and narrow.

OU1

Photo 27 - Pictured upgradient and west of 4000 West is the Bingham Creek Channel (bounded by the scrub oak). The Channel traverses through the neighborhood park. The Channel is well vegetated, which has not changed since the last FYR. No water was observed in the Channel nor was any erosion observed along the Channel.

Photo 28 - Pictured is the Bingham Creek Channel just upgradient of the culvert under 4000 West. The Channel is well rip-rapped above the culvert. No water was observed in the Channel nor was any erosion observed along the Channel.

OU1

Photo 29 - Pictured upgradient and west of 3400 West is the Bingham Creek Channel (red arrow). The Channel flows northeast, just north of the Jordan Valley Hospital (and was part of the Bingham Creek Phase II cleanup in the 1990s). The Channel was well vegetated, a condition that has not changed since the last FYR. A project by UDOT to reconstruct Bangerter Highway managed Bingham Creek soils under the City of West Jordan's IC in the vicinity and the Channel was revegetated as part of the project.

Photo 30 - Pictured east and downgradient of 3400 West is the Bingham Creek Channel. The pictured grated box directs flow in the Channel past the Welby Canal. No water was observed in the Channel nor was any erosion observed along the Channel and around the Canal.

OU1

Photo 31 - Pictured east and downgradient of 3200 West is the Bingham Creek Channel (south of Haun Drive) in West Jordan City. The Channel is cement lined in this location and bounded by residential parcels. No water was observed in the Channel nor was any evidence of erosion observed along the Channel. The tops of the Channel embankments were well vegetated with scrub oak, willows, grasses, and other weedy species.

Photo 32 - Pictured south and upgradient of Haun Drive is the Bingham Creek Channel, which is cement lined. The Channel through a residential development which predates the Bingham Creek Phase I & III cleanups. The Channel characteristics have not changed since the last FYR. No water was observed in the Channel nor was any erosion observed along the Channel.

OU1

Photo 33 - Pictured northeast from 2700 West is the Bingham Creek Channel just below the culvert under 2700 West. The Channel has a soil and rock bottom, with a dense thicket of willows and grasses. The Channel acts as a boundary between the residential parcels to the north and the Glenmoore Golf Course to the south (to the right, not visible). No water or erosion was observed.

Photo 34 - Pictured east and downgradient of 2200 West is the Bingham Creek Channel (red arrow) as it traverses northeast, south of the West Jordan senior assisted living facility (out of frame, upper left quadrant) and the residential parcels (upper right quadrant). West Jordan maintains a trail along the Channel. The Channel has not been changed since the last FYR, it is still well vegetated and defined. No water was observed in the Channel nor was any erosion observed along the Channel.

OU1

Photo 35 - Pictured north and downgradient of Sugar Factory Road is the Bingham Creek Channel and a box culvert under Sugar Factory Road. No water was observed in the Channel. The Channel below the culvert is well armored with large rock. Vegetation observed has not changed since the last FYR.

Photo 36 - Pictured east and downgradient of the Sugar Factory Road box culvert is the Bingham Creek Channel. Frozen water may be evidence of localized springs or may be ponded water from recent snow melt. The Channel embankments are well vegetated and appeared stable. Further east of this location the embankments get steeper and the City of West Jordan intends to stabilize the embankments in the future.

OU1

Photo 37 - Pictured east and downgradient of 1700 West (Redwood Road) is the Bingham Creek Channel (red arrow) as it enters the Brookside Mobile Home Park. The Channel characteristics have not changed since the last FYR. Most of the Channel is fairly incise and narrow with grass vegetation along the top of embankments. Some mobile home units have fences above the Channel.

Photo 38 - Pictured west and upgradient of 1500 West is the Bingham Creek Channel (red arrow) at the downgradient end of the Brookside Mobile Home Park. The Channel characteristics have not changed since the last FYR. No erosion or eroded sediment/soils were observed. Channel embankments are well vegetated with grasses.

OU1

Photo 39 - Pictured east and downgradient of 1500 West is the Bingham Creek Channel. Under the City of West Jordan and Salt Lake County Health Department oversight, Salt Lake County Flood Control (SLCO FC) in 2019 redeveloped the Channel from 1500 West to 1300 West to enhance flood control capacity. Soils were retained onsite (under the paved access road) that were above the KUALs for arsenic and lead. The Channel is well armored and no erosion was observed, water was observed.

Photo 40 - Pictured west and upgradient of 1300 West is the Bingham Creek Channel. As noted, in 2019 SLCO FC increased the flood control capacity of the Channel, reconstructing it with rip-rap to stabilize the slopes. No erosion or eroded sediment/soils were observed, water was observed.

OU1

Photo 41 - Pictured east and downgradient of 1300 West is the Bingham Creek Channel. The Channel has not changed since the last FYR. The Channel begins a traverse through agricultural parcels (used for grazing). Further northeast the Channel runs through a buried culvert under an asphalt and paving business. Eventually Bingham Creek discharges into the Jordan River about 930 feet south of 7800 South. No erosion was observed along the Channel, the southern embankment has cribbing for stabilization, and water was observed.

Photo 42 - Pictured is an example of signage the cities of West Jordan and South Jordan use to remind the public to not dump solid waste/garbage into Bingham Creek. Though enhanced with trails and parks, solid waste is dumped into sections of Bingham Creek. Rarely have fish been observed in the Channel, mallards have been observed in the past.

OU2

Photo 43 - Pictured is Acid Extraction Well #ECG1146. ECG1146 is the original extraction well, constructed by RTKC, in response to CERCLA and State NRD investigations. The building houses the well piping, and metering equipment. No leakage around the well head and casing (left side of the frame) was observed.

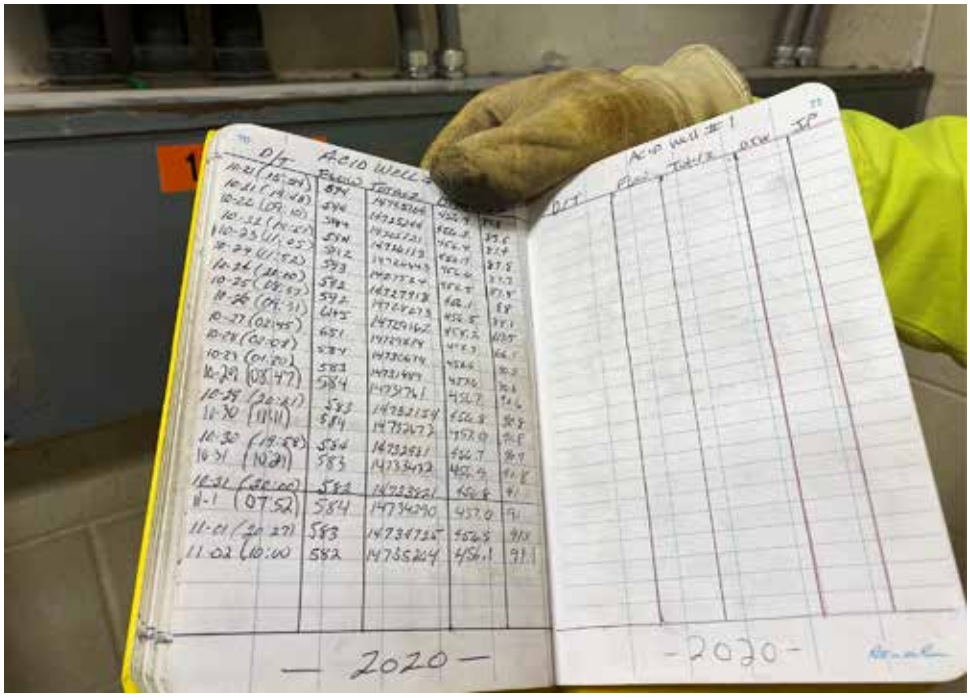

Photo 44 - Pictured is the daily log book, which RTKC uses to record flow and depth to water measurements at Acid Extraction Well #ECG1146.

OU2

Photo 45 - Pictured is the well piping for Acid Extraction Well #ECG1146. No signs of leakage were observed.

Photo 46 - Pictured is the pipe used to convey water from Acid Extraction Well #ECG1146 to RTKC's Tailings Pipeline. The sump box is designed to capture water from the conveyance pipe if a leak occurs and gravity flows back to the well. The sump has a metered probe that measures water depth in the sump and relays the measurement to RTKC's South Facilities Water Management computer hub. The computer system will send an alarm if water levels in the sump box reach a certain height. Standing water in the sump is likely from recent snow melt as there have been no detected leaks reported by RTKC.

OU2

Photo 47 - Pictured is Acid Extraction Well #BSG2784. The building supports the piping, and metering equipment for the well. No leakage around the well head and casing (located in front of the building) was observed. BSG2784 is Acid Extraction Well #3 and is the most recently constructed.

.

Photo 48 - Pictured is the daily log book which RTKC uses to record flow and depth to water measurements for Acid Extraction Well #BSG2784.

OU2

Photo 49 - Pictured is the well piping inside of well house for BSG2784. No signs of leakage were observed.

Photo 50 - Pictured is the pipe used to convey water from BSG2787 to the Tailings Pipeline. The sump box is equipped with metering to alarm the RTKC computer system of rising water, and is designed to collect water if there is a break in the pipe. No water was observed in the sump box.

OU2

Photo 51 - Pictured is the well house for Barrier Well 1, #B2G1193 (or K60). The well house contains the mechanical systems, piping, and metering equipment. No leakage around the well head and casing was observed which is out of frame to the right.

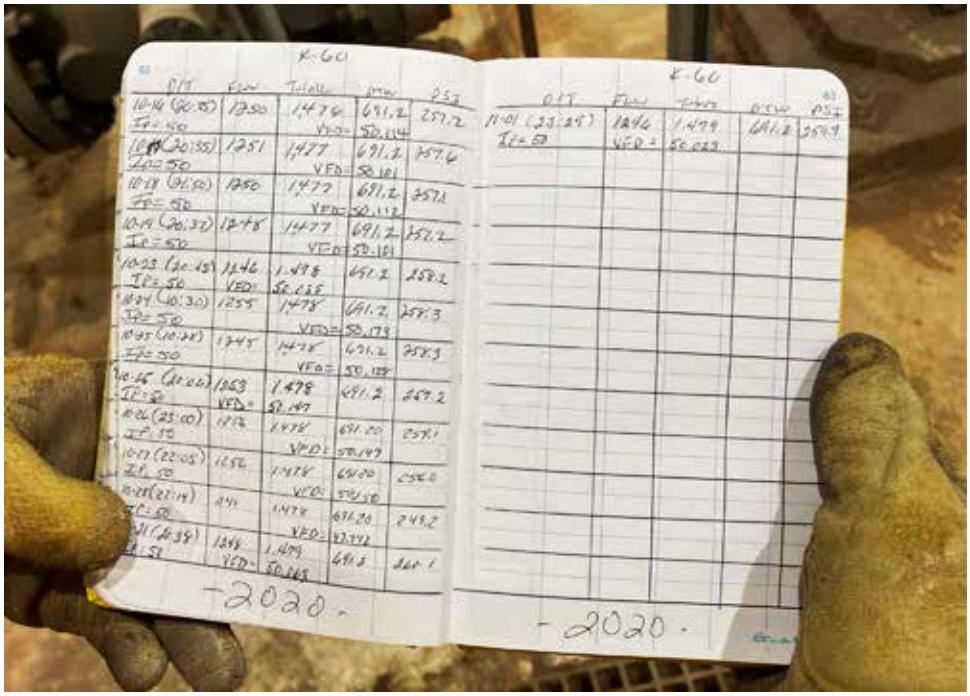

Photo 52 - Pictured is the daily log book which RTKC used to record flow and depth to water measurements for B2G1193.

OU2

Photo 53 - Pictured is the well pump, piping and metering equipment for B2G1193. No signs of leakage were observed.

Photo 54 - Pictured is the well head, casing, and pipe, as well as the housing for Barrier Well #BFG1200 (or K109). No leaks were observed.

OU2

Photo 55 - Pictured is the daily log book which RTKC used to record flow and depth to water measurements for BFG1200.

Photo 56 - Pictured is the well pump, piping and metering equipment for BFG1200. No signs of leakage were observed.

OU2

Photo 57 - Pictured is the well head, casing, and pipe, as well as the housing for Barrier Well #BSG2828 (the most recent barrier well). No leaks were observed.

Photo 58 - Pictured is the daily log book which RTKC used to record flow and depth to water measurements for BSG2828.

OU2

Photo 59 - Pictured is the well pump, piping and metering equipment for BSG2828. No signs of leakage were observed.

Photo 60 - Pictured is the vertical casing for Compliance Monitoring Well #BSG1135. The casing is secured by the depictured cap and a lock. Each of the three 2-inch monitoring well completions are inside the casing. Each compliance well (10 in total) are a triple completion with each completion (A, B, and C) screened at different vertical heights within the aquifer. BSG1135 is located southeast of the Zone A Plume north of 11800 South and west of Mountain View Corridor.

OU2

Photo 61 - Pictured are the three 2-inch monitoring well completions inside the casing for Compliance Well BSG1135.

Photo 62 - Pictured is the vertical casing for Compliance Monitoring Well HMG1123. The casing is secured by cap and lock. HMG1123 is located on the southern boundary of the Zone A Plume adjacent to 11800 South.

OU2

Photo 63 - Pictured are the three 2-inch monitoring well completions for Compliance Well HMG1123 inside the casing.

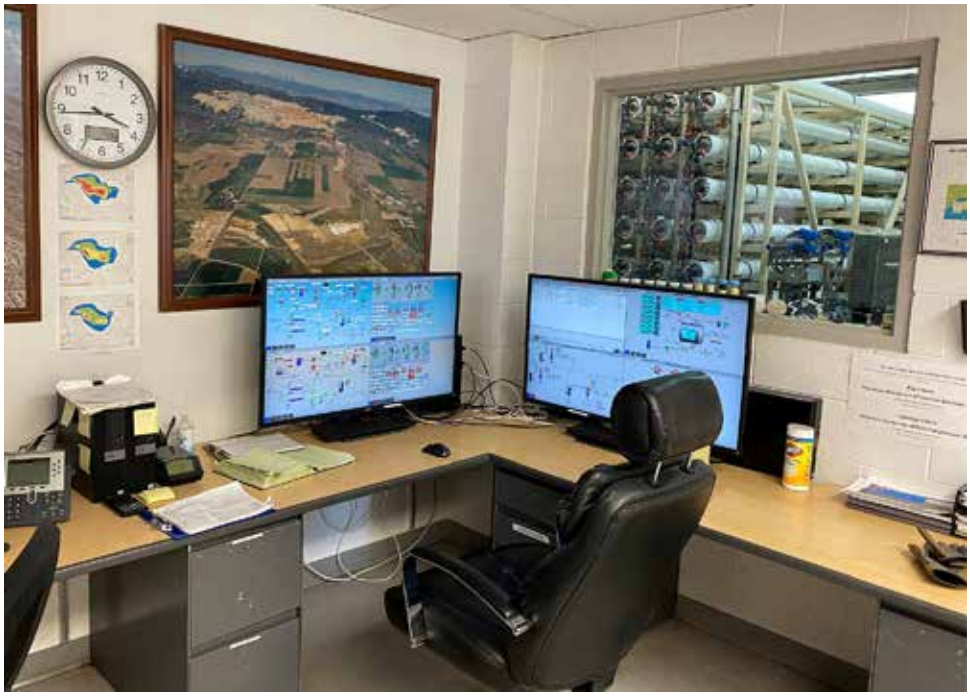

Photo 64 - Pictured is the control room for RTKC's Zone A Reverse Osmosis (RO) plant. Staff manage the plant during the day. The computer system is able to provide real time notifications to staff during evening shifts and has built in logic controls to facilitate the plant being operated remotely.

OU2

Photo 65 - Pictured are the feed water and finish water storage tanks for the Zone A RO plant. The feed water tanks store water from the barrier wells. Prior to entering the plant, the feed water is directed through UV disinfectant. Product water prior to leaving the plant is degasified to remove radon. Also pictured is the various piping to convey water. No leaks were observed.

Photo 66 - Pictured are the stainless-steel vessels containing either bag or cartridge filters. The bag and cartridge filter systems are used to pre-treat the feed water to remove large particles (for example, sand) which can be abrasive on the RO membrane surfaces. These filters are used to reduce the maintenance necessary for the RO membranes and to extend their useable life.

OU2

Photo 67 - Pictured are the pressurization pumps used to increase feed water pressure higher prior to entering the RO membrane treatment system. The feed water has to be pressurized to force the water through the membranes.

Photo 68 - Pictured are the two RO membrane treatment skids each capable of treating 1,500 gallons per minute (gpm). Each skid consists of two treatment stages, the concentrate or byproduct of the first stage becomes the feed water for the second stage. Each treatment skid is able maintained to have a recovery efficiency of approximately 75%. Each white PVC horizontal vessel holds 7 RO membrane units. No leaks were detected.

OU2

Photo 69 - Pictured is the new manganese filtration vessel. Manganese in the bypass water (which is used to control the TDS of the final product water) is filtered prior to the bypass water being blended with the RO permeate (treated water) to increase the TDS concentration to the final TDS concentration of 250 mg/L.

Photo 70 - Pictured is another view of the manganese filtration vessel. No leaks were detected.

OU3

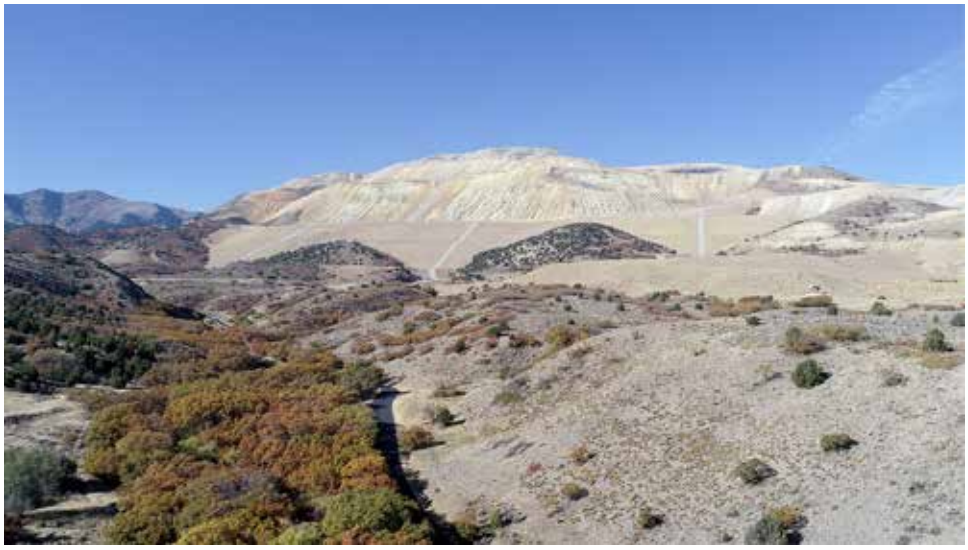

Photo 71 - Pictured is an aerial view west of the mouth of Butterfield Canyon with the Bingham Mine Southside Waste Rock Dumps visible in the background located north of Butterfield Canyon.

Photo 72 - Pictured is an aerial view east from the mouth of Butterfield Canyon looking toward the City of Herriman. The pictured Salt Lake County road provides access to the Oquirrh Mountain ridgeline at the top of Butterfield Canyon. The photo was taken from wild burro center access road (out of frame to the right). Butterfield Creek runs along the scrub oak pictured in the right side of the photo (red arrow).

OU3

Photo 73 - Pictured is Butterfield Creek (located along the edge of the tree canopy) and flood plain. The Creek is shallow and during high flows can cross the floodplain as evidence by the lines if the sand substrate to the left of the trees. The floodplain is vegetated but has a fair amount of bare ground.

Photo 74 - Pictured is Yosemite Drainage just above the SLCO road in Butterfield Canyon. The Yosemite Drainage is incised along this lower stretch and has previously been impacted by releases of waste rock sediment from the South Waste Rock Dump located in the upper reach of the Yosemite Drainage. The Yosemite Drainage channel is well vegetated with sagebrush, rabbitbrush and grasses but the bottom is comprised of gravelly silt. No signs of recent erosion were observed.

OU3

Photo 75 - Pictured south from the SLCO road (downgradient) is the culvert outlet that conveys storm water from the Yosemite Drainage into Butterfield Creek. The outlet (red circle) appeared stable and no signs of recent erosion were observed.

Photo 76 - Pictured is Butterfield Creek and flood plain above the confluence with Yosemite Drainage. The flood plain is well vegetated with grasses and stands of scrub oak. The paved SLCO road is just visible in the upper right quadrant of the photo. The unvegetated hillside in the upper right quadrant of the photo is a portion of the South Waste Rock Dumps of the Bingham Canyon mine.

OU3

Photo 77 - Pictured is the Butterfield Creek Channel and floodplain form another vantage point where Photo 76 was taken. The Creek Channel is in the willows and tamarisk (red arrow) and the floodplain is to the left. Water was observed flowing. The floodplain is vegetated and stable.

Photo 78 - Pictured is a flock of Rio Grande or Merriam Wild Turkeys in Butterfield Canyon. When the SLCO road is closed for winter, wildlife viewings become more abundant. Turkeys have populated Butterfield Canyon.

OU3

Photo 79 - Pictured is the Olsen Drainage above its confluence with Butterfield Canyon from the SLCO road. The Drainage is stable and well vegetated.

Photo 80 - Pictured is an entrance to Butterfield Mine Tunnel. Water produced along the tunnel is piped to the SLCO road and discharged to Butterfield Creek in compliance with a UPDES permit.

OU3

Photo 81 - Pictured is water from the Butterfield Mine Tunnel. The Tunnel discharge has remained in compliance with the UPDES permit requirements for the last five years. The water was observed to be clear and there is a fair amount of aquatic vegetation in this location indicative of the quality of the water.

Photo 82 - Pictured from the downgradient side is the lower sediment collection basin (red arrow) of a series of sediment basin constructed during the Butterfield Canyon Waste Rock removal project. The basins remain but generally are un-used currently. They are well vegetated with willows, tamarisk, scrub oak and grasses.

OU3

Photo 83 - Pictured is a segment of Butterfield Creek Channel in a thicket of scrub oak. The Channel runs through thickets of scrub oak and can have steep embankments which can be subject to erosion. No signs of recent erosion were observed. The thickets of scrub oak, cottonwoods, aspen can be dense, leading to a fair amount of leaf litter in the Creek Channel.

Photo 84 - Pictured is a segment of Butterfield Creek Channel with a shallower channel invert and wider flood plain. In locations where the is a wider floodplain in the Canyon, there tends to be more grasses, willows and tamarisk. No signs of recent erosion were observed.

OU3

Photo 85 - Pictured is a segment of Butterfield Creek downgradient of the confluence with Olsen Drainage. The Channel is well vegetated by a dense a thicket of willows, tamarisk which prevents easy access. The Channel is fairly wider at this point and the flow is slower.

Photo 86 - Pictured is the lower area where waste rock previously located in the middle reach of Butterfield Canyon was removed from below Butterfield Mine Tunnel. The hillside surface is steep, with revegetation still in progress where the waste rock was removed. From the Canyon floor to the tree line demonstrates the vertical height of the waste rock previously located in the Canyon.

OU3

Photo 87 - Pictured is another segment of Butterfield Canyon. During a 2013 high intensity storm event a section of the Channel got eroded enough to compromise the integrity of SLCO road. To address this, SLCO installed larger culverts (as pictured) to manage future storm water runoff.

Photo 88 - Pictured is another segment of Butterfield Creek Channel. At times the cottonwoods and aspens in this stretch provide some canopy cover which adds to leaf litter in fall and have stabilized the embankments. No signs of recent erosion were observed.

OU3

Photo 89 - Pictured is another segment of Butterfield Creek Channel. In addition to willows and grasses, other wetland plant species can be observed in the Channel. The aquatic and wetland plants do a great job stabilizing the embankments of the Channel and preventing erosion. The vegetation also serves as habitat to passerine bird species and small animals. Because water is not always available in the Creek, rarely are fish observed.

Photo 90 - Pictured is an aerial view of Butterfield Canyon below the confluence with Yosemite Drainage (out of frame to the lower left quadrant). Tailings located under the SLCO road has lead and arsenic concentrations above the KUAs. Butterfield Creek is under the canopy of scrub oak.

OU3

Photo 91 - Pictured is and aerial view of the confluence of Saints Rest Drainage and Butterfield Canyon, upgradient of the confluence with Yosemite Drainage. This area was impacted by waste rock sediment released during a 2013 intense storm event. Tailings located under the SLCO road contains lead and arsenic concentrations above the KUALs.

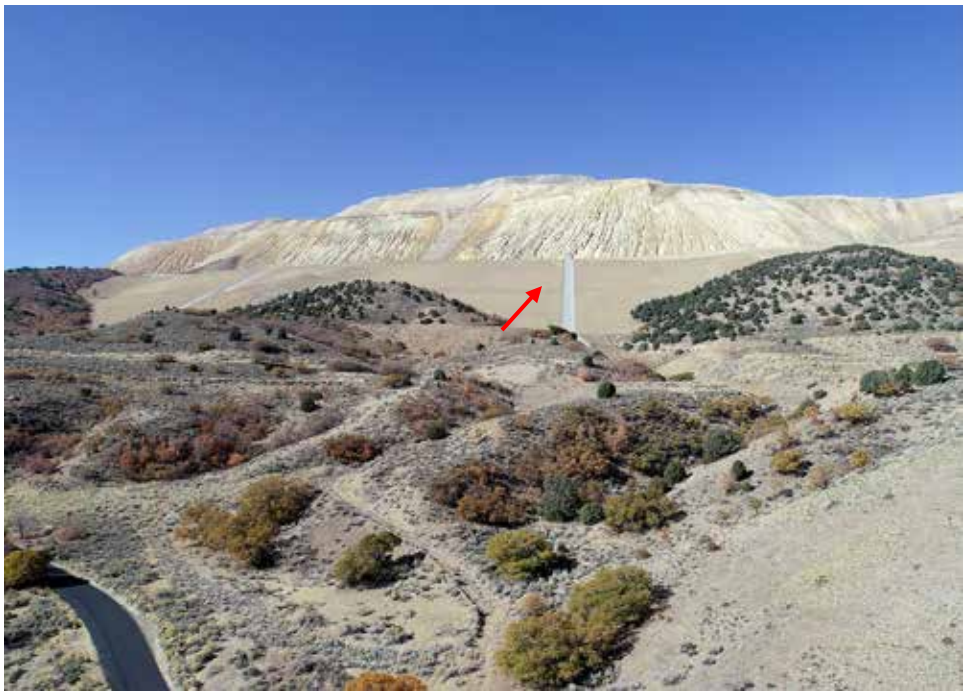

Photo 92 - Pictured is the Saints Rest Drainage above the SLCO Road in Butterfield Canyon, and the South Waste Rock Dump located in the upper reach. The new bench of waste rock (red arrow) is part of the reclamation project Kennecott is pursuing to increase stabilization of the South Waste Rock Dump and storm water containment capacity.

OU3

Photo 93 - Pictured is Butterfield Creek Channel downgradient of the SLCO Wild Burro Center access road at the mouth of Butterfield Canyon. The Channel is shallow in this location with large flat floodplain. No signs of recent erosion were observed.

Photo 94 - Pictured is the vegetated (grasses) floodplain of Butterfield Creek (Butterfield Creek is to the right running under the tree canopy). A Kennecott groundwater monitoring well along the upper-lower left quadrant is visible (the yellow vertical casing). Often during high flows, Butterfield Creek floods the depicted parcel.

OU3

Photo 95 - Pictured is the Butterfield Creek Channel about 75 feet east of the SLCO Wild Burro Center access road. Flow in Butterfield Creek is slow enough during most of the year that erosional cuts are rare. No signs of recent erosion were observed.

Photo 96 - Pictured is the western extent of Herriman Agricultural Lands beginning with parcel HAG001. Butterfield Creek (red arrow) generally parallels the SLCO road, crossing it as diverted to be used for irrigation further east (view is to the east). No land use changes were observed on the Herriman Agricultural (HAG) parcel #001.

OU3

Photo 97 - Pictured is the eastern portion of HAG001 where RTKC performed removal action due to the release of waste rock sediment from a 2013 intense storm event. The ground surfaces were observed to be prepared for planting alfalfa during the inspection. HAG001 is part of a planned development, Olympia Hills, project.

Photo 98 - Pictured is a diversion gate (lower left quadrant, behind the white metal fencing) for Butterfield Creek on parcel HAG007. The Creek is diverted into the Herriman Pipeline Company irrigation system for downstream customers use.

OU3

Photo 99 - Pictured is the western portion of HAG007 (behind the fencing to the left of the SLCO road). Though redevelopment has not been initiated here, HAG007 is undergoing redevelopment converting the agricultural land into residential lots under the oversight of the City of Herriman and their contaminated soils ordinance.

Photo 100 - Pictured is another segment of parcel HAG007. A portion of Butterfield Creek water is diverted into the ditch (red arrow) for irrigation use.

OU3

Photo 101 - Pictured is the northwestern corner of parcel HAG010. HAG010 is being redeveloped under the oversight of the City of Herriman and their contaminated soils ordinance.

Photo 102 - Pictured is a northeast portion of parcel HAG010. Soil surfaces have been disturbed, evidence of the redevelopment work that is currently in progress.

OU3

Photo 103 - Pictured is the eastern portion of HAG007 that is currently being redeveloped for residential use as part of the Hidden Oaks project. The redevelopment is under the oversight of the City of Herriman. Surfaces were disturbed, there were no distinctive soil stockpiles observed. A re-aligned Butterfield Creek was not yet distinguishable from the surrounding disturbed surfaces. Under the ordinance, soils with elevated arsenic and lead are being managed.

Photo 104 - Pictured is an eastern access point on HAG007, which is the proposed access point for the removal of the Bastian Ditch (OU5) located on a northern portion of HAG0007 under the SLCO Health Department oversight and their contaminated soils ordinance.

OU3

Photo 105 - Pictured is the neighborhood park created in the Blackhawk subdivision constructed in the early 2000s. Management of soils above the City of Herriman residential action level for arsenic and lead was done in compliance with the City of Herriman's contaminated soils ordinance. Some soils were encapsulated here in the park, as approved by the City of Herriman. Park surfaces were well vegetated and did not show any evidence of disturbance.

Photo 106 - Pictured is a portion of the established Blackhawk residential subdivision and park trail constructed while managing soils in compliance with the City of Herriman's contaminated soils ordinance. North of the fence line, parcel HAG007 is being redeveloped in compliance with the City of Herriman ordinance.

OU3

Photo 107 - As noted in Photo 106, north of the Blackhawk subdivision parcel HAG007 is being redeveloped. Soils are managed in compliance with the City of Herriman's ordinance. Surfaces and soils have been prepared to support the planned residential development, Hidden Oaks.

Photo 108 - Pictured is an example of a "pasture lot" in the historic residential section of Herriman. During the late 1990s removal action, EPA did not perform removal action on pasture lots. Pasture lots were determined by EPA not to have any exposure risk based on the then current land use. EPA determined that these pasture lots should be subject to the City of Herriman's contaminated soils ordinance if proposed for redevelopment.

OU3

Photo 109 - Pictured is the western extent of the Tuscany Estates soils repository constructed (in the early 2000s) by the developer to manage soils removed from the residential development at Tuscany Estates (out of view to the south, current view is to the north). Soils on the Tuscany Estates site had lead concentrations greater than 1200 mg/kg and arsenic greater than 100 mg/kg. The repository parcel is subject to compliance with the City of Herriman ordinance if redeveloped. No signs of recent erosion were observed. The southern portion of the developed HAG031 parcel is located behind the white vinyl fence depicted in the background, north of the repository.

Photo 110 - Pictured is the eastern extent of Tuscany Estates soils repository. The repository parcel is subject to compliance with the City of Herriman ordinance if redeveloped. No signs of recent erosion were observed. The white sided homes to the right (east) are part of the Garbett Homes development on the adjacent parcel.

OU4

Photo 111 - Pictured is an aerial overview of the Bingham Reservoir complex (looking west). The Large Bigham Reservoir is the white-liner lined cells in the upper left quadrant of the photo. The Small Bingham Reservoir is to the right in the upper right quadrant of the photo. Both reservoirs are divided by 1960s DRG Rail Corridor (red arrow). The Cemetery Pond (OU1) is in the lower right quadrant. At the base of Large Bingham Reservoir is the Waste Water Disposal Pump Station (red circle).

Photo 112 - Pictured is an aerial overview of the three cell Large Bingham Reservoir. Zone 2 (in the foreground), and Zone 1 are the principal holding cells while the Settlement Basin (third cell, black lined, furthest west) is used to remove large debris in flow from Bingham Canyon. The Large Bingham Reservoir has three liners (clay, 40-mil, and 60-mil HDPE) with leak detection and was reconstructed in the mid-1990s).

OU4

Photo 113 - Pictured is an outlet into Zone 2 from the Water Collection System (OU12). Staining is due to concentrations of iron in water managed in Large Bingham Reservoir. The liner did not have any observable tears.

Photo 114 - Pictured is the Settlement Basin with its High-density polyethylene (HDPE) liner over a concrete base. The Settlement Basin captures debris and sediments from storm water runoff from Bingham Canyon to the west, and requires periodic maintenance to “muck out” the debris. Sediment is removed to RTKC’s onsite disposal areas around the Bingham Mine Waste Rock Dumps. The Town of Copperton is located to the north in the upper right quadrant of the photo.

OU4

Photo 115 - Pictured is an aerial view of Zone 1 of the Large Bingham Reservoir.

Photo 116 - Pictured is an aerial view of Zone 2 of the Large Bingham Reservoir. Water storage was observed below the high water line, indicative of smaller volumes of acid mine drainage and other waters from mine requiring storage prior to disposal. Water from the two zones is sent to the Waste Water Disposal Pump Station for conveyance to RTKC's North Tailings Impoundment for disposal.

OU4

Photo 117 - Pictured is an aerial view of the Large Bingham Reservoir spillway in Zone 2. Since the 2016 FYR, the overflow channel has not been used. Bingham Creek (OU1) initiates east of the spillway. The spillway is cement lined and has an energy dissipater at its base. The dam for Zone 2 showed no signs of erosion or other destabilization.

Photo 118 - Pictured is a collection box where captured alluvial groundwater from Bingham Canyon directed to the Large Bingham Reservoir can be routed to the Settlement Basin or one of the other two zones. The water here is a combination of circumneutral water and acid mine drainage.

OU4

Photo 119 - Pictured is a section of the 60-mil HDPE liner on Zone 2. The liner has welded seams. Located between the 60-mil and 40-mil liner is the leak detection system. The DWQ GWPP specifies maintenance and best management practices to ensure the integrity of the two HDPE liners and the underlying clay liner.

Photo 120 - Pictured is an example of leak detection equipment at the surface on Zone 1. The three portals on left can provide access to spaces between each of liners to assess for potential leaks with transducers. The box on the right along the fence houses a meter that provides data from strategically located probes between the liners.

OU4

Photo 121 - Pictured is the metering equipment provides data from the probes located in sumps between the liners. The probes allow for the measurement of pressure and water levels in sumps.

Photo 122 - Pictured are Mule Deer above the Large Bingham Reservoir. Keeping deer out of Reservoir is a high chain link fence. Sometimes deer breech the fence and have been observed in the Reservoir which then requires RTKC to inspect the upper liner on the surface for tears.

OU4

Photo 123 - Pictured is an aerial view of the lined Small Bingham Reservoir. Mine water is directed here which is more suitable for operational use. Soils around the Reservoir have a potential to have elevated arsenic and lead concentrations and other metals as observed by the iron staining between the two reservoirs (the white liner is Zone 2 of the Large Bingham Reservoir).

Photo 124 - Pictured is the surface of the water retained at the Small Bingham Reservoir. American Coots were observed on the water surface. Use by waterfowl is difficult to deter at this facility.

OU4

Photo 125 - Pictured is the eastern slope of Large Bingham Reservoir dam. At the base, is the Waste Water Disposal Pump Station (WWDPS, white sided building). The red circle surrounds the 1-acre parcel owned by ARCO-BP which is part of OU5. Secured by RTKC, the parcel has a soil pile with potential elevated metals concentrations. Bingham Creek (OU1) begins opposite the paved access road (red arrow).

Photo 126 - Pictured is the interior of the WWDPS where the pumps to lift water to the Tailings Pipeline (OU15) are located. No leaks were detected.

OU4

Photo 127 - Pictured is another view of the interior of WWDPS. No leaks were detected though there is evidence of past leaks which were observed during the last FYR. Mine water collected around the Kennecott South Zone is directed here and pumped to RTKC's Tailings Pipeline and North Tailings Impoundment (OU15) for disposal or recycling.

OU5

Photo 128 - Pictured at the base of RTKC's Zone 2 Large Bingham Reservoir, is a 1-acre parcel owned by ARCO-BP with a soil pile (red circle) that potentially contains lead and arsenic above the site KUALs. The parcel has not been characterized. RTKC secures access to the parcel by the general public. The soil pile is vegetated and is not eroding into Bingham Creek which is located out of frame to the right.

Photo 129 - Pictured is an aerial overview of the OU5 ARCO Tails Repository. South of dirt road (red arrow), the ARCO Tails site includes approximately 90-acres, on which is the depicted 41-acre ARCO Tails Repository. The Repository is well vegetated and stable, nothing has changed since the last FYR.

OU5

Photo 130 - Pictured is an aerial view of the 41-acre ARCO Tails Repository. Around the base on the southern side of the Repository is a rip-rap armored drainage ditch (red arrow) which directs storm water away from Repository surface to the west (red arrow). A similar channel on the eastern half of the Repository directs runoff east. No changes to the area were observed since last FYR. The red star denotes the site of Progressive Nursery which leases land north of Bingham Creek from Kennecott for their operations.

Photo 131 - Pictured is an aerial view of the ARCO Tails Repository's northern embankment. Concrete cribbing (above the red arrow) is used at the base to stabilize the embankment. No changes to the area were observed since last FYR. The land to the south is owned by RTKC.

OU5

Photo 132 - Pictured from SH-111 is the storm water retention basin ARCO-BP maintains to manage storm water runoff from the Repository on its eastern end (red star). The basin appeared vegetated and stable with no erosion evidence. Along the hillside in the background is the historic footprint of the Bastian Ditch (red arrow) which was removed by ARCO-BP and placed into the 41-acre Repository. The hillside appeared to be vegetated and stable.

Photo 133 - Pictured south of the ARCO-BP land holding, Pronghorn Antelope were observed on RTKC's property in an area where RTKC previously removed the Bastian Ditch. This area is well vegetated with grasses, thistle, sage brush and rabbit brush. RTKC's property is generally secured with three, five and ten strand barbed-wire fencing with no trespassing signs as depicted.

OU5

Photo 134 - The small herd of Pronghorn Antelope were observed during the inspection from SH-111. Except for the immediate shoulder of SH-111, the pictured surface of RTKC's property where they removed the Bastian Ditch is well vegetated. RTKC's perimeter fence is secure with no slack along the wires.

Photo 135 - Pictured from 11800 South is the southeast corner of South Valley Water Reclamation's facility, Lark Monofill. The eastern half of facility (behind the fence) includes portions of Bastian Ditch Drainage Area below surface. The land to the right of the fence is part of the planned Daybreak Community Western Village. South Valley Water Reclamation's Lark Monofill is undergoing redevelopment, which requires the management of mine waste (under the SLCO Health Department ordinance) associated with the Bastian Ditch. The Bastian Ditch historically traversed (north to south) the western portion of the facility.

OU5

Photo 136 - Pictured is the eastern perimeter fence for the Lark Monofill facility, and the Western Village of the Daybreak Community. The fence line and adjacent land overlie the Bastian Ditch Drainage Area. Lead and arsenic concentrations in soils along the fence are above the site KUALs. Management of mine waste during the Lark Monofill redevelopment and Daybreak Communities West Village development is or will be done under the SLCO Health Department ordinance.

Photo 137 - Pictured from the southwest corner of the Lark Monofill facility and 11800 South (in the background) are stockpiles of biosolids being removed under oversight by the DWQ Biosolids program. The Bastian Ditch underlies the property north of the fence, which will be removed under the SLCO Health Department ordinance.

OU5

Photo 138 - Pictured from the northern portion of the Lark Monofill facility the biosolids being removed are undergoing drying prior to land application on site, under the oversight of DWQ. The biosolids are the piles of dark material in the background.

OU6

Photo 139 - Pictured is an aerial overview of the Lark Tails and Waste Rock site (OU6) east of SH-111 and south of 11800 South. In the upper right quadrant of the photo is the Bingham Mine Waste Rock Dumps. Generally, the OU6 area is undeveloped, with various vegetation types and variable surface topographies.

Photo 140 - Pictured is an aerial overview of OU6 west of SH-111. In the upper right quadrant is the Bingham Mine Waste Rock Dumps. Generally, the area is undeveloped, the land is owned by RTKC.

OU6

Photo 141 - Pictured is an aerial view of Midas Creek (red arrow) just east of SH-111 and its floodplain and the area comprising the Lark Tails (blue line) site which is where copper tailings are buried, the view is southeast. Edge Homes LLC is developing lands east and south of OU6 (visible in the upper left quadrant) more specifically east of the Southeast Tails Area. Soils and mine waste in OU6 can exceed the site KUALs for lead and potentially arsenic.

Photo 142 - Pictured is an aerial view of Midas Creek (red arrow) as it traverses east from SH-111. To the south of Midas Creek is the Lark Tails area. The Creek extends east from SH-111 and was crossed by the historic footprints of the Mascotte Ditch (OU6) and Bastian Ditch (OU5). The fence line (blue arrow) in the lower right quadrant encircles the new Herriman City water tank.

OU6

Photo 143 - Pictured is the Midas Creek Channel and floodplain south of the Herriman City water tank. Visible from the Channel is RTKC's perimeter fence around the Lark Tails area south of the Creek Channel. The fence is stable and comprised of ten strings of barbed-wire. The observable surfaces are well vegetated and stable, vegetation includes grasses, sage brush, rabbit brush and other weedy species. No erosion was observed.

Photo 144 - Pictured is a section of the eastern perimeter fence securing the Lark Tails area. Soils are stable and well vegetated. No erosion was observed.

OU6

Photo 145 - Pictured is an example of some of the scrub oak, with clusters of sage and rabbit brush habitat located on portions of the western Lark Tails area. Perched in this scrub oak during the inspection was a Marsh Hawk.

Photo 146 - Pictured is the southern portion of the Lark Waste Rock - Long Dump footprint which was previously remediated. In addition, Copper Creek Channel traverses west to east from SH-111 just south of the Long Dump. The Copper Creek Channel was fairly shallow if not flat. The area is well vegetated and has not changed since the last FYR. No erosion was observed.

OU6

Photo 147 - Pictured is a section of the current surface grade in the area of the historic footprint of the motorcycle park once located in the Lark Tails area. The current surface is predominantly vegetated with grasses, is not eroding and has not changed since last FYR.

Photo 148 - Pictured is a section of the current surface in the area of the historic footprint of the motorcycle park once located in the Lark Tails area. The current surface is predominantly vegetated with grasses, is not eroding and has not changed since last FYR.

OU6

Photo 149 - Pictured is a section of the current surface in the eastern area of the historic footprint of the motorcycle park once located in the Lark Tails area. The current surface is predominantly vegetated with grasses, is not eroding and has not changed since last FYR. An access can be seen cut through the surface vegetation along its length, it is not frequently traversed.

Photo 150 - Pictured is another aerial view of the Midas Creek Channel (red arrow) and floodplain, the Lark Tails area south of the Channel, the Herriman City water tank and further east Bullfrog Spas manufacturing plant in the upper left quadrant. The Herriman Water Tank and Bullfrog facility are the two most recent development projects in the area. Between these two facilities is the footprint of the historic Mascotte Ditch and Pond.

OU6

Photo 151 - Pictured is the western segment of the Midas Creek Channel (red arrow) with the intersection of 11800 South and SH- 111 in the upper right quadrant. In this general area, the Bastian Ditch (OU5) historically crossed Midas Creek. Midas Creek Channel is well vegetated along with its floodplain. It is stable and no erosion was observed.

Photo 152 - Pictured is an aerial view of the Herriman City water tank and the area between the Herriman tank site and Bullfrog Spas. The road to the north is 11800 South where Jordan Valley Water Conservancy District constructed a pipeline under the SLCO Health Department IC.

OU6

Photo 153 - Pictured is a section of the Midas Creek Channel located between Herriman City water tank and the Bullfrog Spa facility. The Channel shows some evidence of soils which could contain lead and arsenic above the KUALs (red circle). Generally, the Channel is shallow and narrow with a shallow high-water line (about 1 foot) based on surrounding vegetation.

Photo 154 - Pictured is the Midas Creek Channel looking west from the location in photo 153. Soils comprising the bottom of the Creek Channel are silty-sand with some gravel, and stable. No undercutting of the embankment was observed, no erosion was observed. The floodplain is more extensive and well vegetated compared to the Channel itself.

OU6

Photo 155 - Pictured is the Historic Midas Creek Silos removed since the last FYR. The Silos were used for storage by local farmers. Recently they became an attractive nuisance on RTKC's property as observed by the graffiti. RTKC removed the Silos between 2019-2020.

Photo 156 - Pictured is the post removal surface after the removal of the Midas Creek Silos and management of surrounding soils. The removal surface was contoured and ripped to facilitate revegetation efforts.

OU6

Photo 157 - Pictured is the post removal surface where the Midas Creek Silos once stood. Grasses and thistle have vegetated the surface soils.

Photo 158 - Pictured is the Midas Creek Channel south of Midas Creek Silos removal area. The hillside to the right is the Lark Tails area. The Creek Channel is barely noticeable (red arrow).

OU6

Photo 159 - Pictured south of the Lark Waste Rock area is the Copper Creek Channel. Barely observable, Copper Creek (red arrow) is an almost flat Channel which rarely has flowing water due to the limited precipitation that this area receives. Most precipitation infiltrates before it can flow on the surface.

Photo 160 - Pictured is an aerial view near the northeast corner of the Lark Tails area and Midas Creek Channel. The red star denotes the historical location of the Southeast Tails area at OU6. Edge Homes is constructing a residential development east of the Southeast Tails area. The property east of OU6 prior to being transferred to SLR by RTKC was accessed to determine if soils exceed the site KUALs, RTKC did perform some further removal work for soils above the KUALs.

OU6

Photo 161 - Pictured is an aerial view of the eastern extent of OU6, east of the Lark Tails area and in the distance the Lone Tree historic area where soils had lead and arsenic concentrations greater than KUALs. East of RTKC's land holdings, SLR (Suburban Land Reserve) owns the land south of 11800 South and east of 6000 West, with a few land holdings more recently purchased by other third parties. This area is primed for redevelopment as noted by the homes in the distance (part of the Edge Homes LLC development).

Photo 162 - Pictured is the Edge Homes subdivision located south of approximately 12600 South. This is the first of a series of housing developments planned for the area east of OU6 and RTKC's property.

OU6

Photo 163 - Pictured west of 6000 West (Mustang Way) and south of 11800 South (the road pictured) is the planned Teton Village development underway by SOJO118 LLC. The Teton Village includes a planned trail along a portion of Midas Creek, west of 6000 West. The building in the upper right quadrant is an Advantage Arts Academy facility developed in compliance with the SLCO Health Department ordinance.

Photo 164 - Pictured is the parcel undergoing development by SOJO118 LLC as part of their Teton Village development. In the distance, south of Midas Creek, is the Edge Homes LLC development south of 12600 South.

OU6

Photo 165 - Pictured from 11800 South (and west of Advantage Arts Academy) is the Bullfrog Spa manufacturing plant located north of the Midas Creek Channel. The facility was constructed (prior to 2013) in the vicinity of the historic Mascotte Ditch and Mascotte Pond (which were previously removed by RTKC as part of their response work in OU6).

Photo 166 - Pictured is a gentleman and his dog trespassing on RTKC property, making use of an RTKC access road near the Herriman City water tank previously depicted. The access road crosses Midas Creek Channel. This photo is used to demonstrate some of the trespassing activity that takes place on RTKC's property.

OU6

Photo 167 - Pictured from the western terminus of 12600 South is the OU6 Southeast Tails area (upper left quadrant), west of the pictured rip-rap armored storm water channel in the foreground. The armored channel directs storm water toward the Copper Creek Channel. The Bullfrog Spa facility is the large white sided building in the distance in the upper right quadrant.

Photo 168 - Pictured is the site of a proposed development, Creek Ridge North, by Edge Homes LLC which is working through a site characterization as Copper Creek historically traversed the property. In the far distance is the Daybreak Communities development north of 11800 South.

OU6

Photo 169 - Pictured is the Midas Creek Channel east of Mustang Way (6000 West). The Channel has had improvements made along its length. Previous characterization efforts over 20 years ago west of here detected some concentrations of lead and arsenic above the site KUALs. Previously no response action under CERCLA for OU6 was required east of 6000 West along Midas Creek because soils on average complied with the applicable land use action levels for open space in OU6.

Photo 170 - Pictured is the Midas Creek Channel (red arrow) west of Mustang Way (6000 West). The Channel forms the southern boundary of the Teton Village development which includes a trail path for recreational use along the northern perimeter of the Channel. The development project was underway at the time of the inspection, and is subject to compliance with the SLCO Health Department ordinance.

OU6

Photo 171 - Pictured is another view of the Teton Village development, north of the Midas Creek Channel. A storm water basin structure is under construction (red star) and will direct localized storm water into Midas Creek.

Photo 172 - Pictured is the outlet structure from the Teton Village storm water basin pictured in photo 171.

OU6

Photo 173 - Pictured are the ASARCO historic buildings north of the historic town of Lark, Utah. The green water tank used to provide water to the town. The Historic Lark Hospital (red star) is located adjacent to the new Bingham Tunnel portal. A Portion of the Bingham Mine Waste Rock Dumps are in the background. As observed, in the lower draw Mule Deer (red circle) find refuge among the scrub oak below the mine facilities.

Photo 174 - Approximately 360 feet west of SH-111 (as pictured) were a small herd of Mule Deer foraging among the scrub oaks and grasses in the draw below Lark, Utah.

OU6

Photo 175 - A lone buck was observed (as pictured) foraging along with the does. Some of the historic waste rock dumps in OU6 were previously removed about 1000 feet northwest of this location.

OU10

Photo 176 - Pictured is the historic Yellow Cake Plant footprint which now is the site of an RTKC materials warehouse (red arrow). The Hillside it is located on (red star) could potentially contain mine tailings with lead and arsenic concentrations above the site KUALs due to past mining operations.

Photo 177 - Pictured is the eastern extent of the historic KCC Copperton Rail Yard where slag, ore, tailings and soils contain lead and arsenic concentrations above the site KUALs. Bedding material and soils, though devoid of vegetation, appeared stable.

OU10

Photo 178 - Pictured is the western extent of the historic KCC Copperton Rail Yard with rail lines extending west into Bingham Canyon. The surrounding hillside and surfaces in the Yard could have soils, slag and other mine waste with lead and arsenic concentrations above the site KUALs. The Yard and rail lines are located below the Town of Copperton, which is out of frame to the right. The old Bingham Mine Ore Conveyor is in the background,

Photo 179 - Pictured is one of the tailings deposit areas (red star) evaluated previously by EPA in the Town of Copperton. The low topography area in the background past the rails could have soils and mine waste with lead and arsenic concentrations above the site KUALs. The area is undeveloped, partially vegetated and surfaces appeared stable. Previous sampling supported EPA' s conclusion that soil did not exceed an applicable land use action level for open space.

OU11

Photo 180 - Pictured below the historic Yellow Cake Plant and hillside is the western portion of the historic KCC Precipitation Plant.

Photo 181 - Pictured in the foreground is the eastern portion of the historic KCC Precipitation Plant. Underlying this facility and the hillside to the north are soils associated with historic Lead Mine Mill which are known to have concentrations of lead and arsenic above the site KUALs. There is a about 20 vertical feet of metals impacted soils underneath the remaining active and decommissioned portions of the KCC Precipitation Plant.

OU12

Photo 182 - Pictured is the pump and mechanical house for the Bingham Canyon Cutoff Wall. Of the 27 drainages where the Bingham Mine Waste Rock Dumps are located, RTKC constructed cutoff walls, French drains, sediment basins comprising the Water Collection System. The Bingham Canyon Cutoff Wall is the largest. The vertical concrete cut-off wall extends vertically through the alluvium to bedrock (approx. 100 Feet) and is keyed into bedrock across Bingham Canyon (horizontal distance is approx. 400 feet. There are two sumps associated with the cutoff wall, one in the alluvium and the other in bedrock.

Photo 183 - Pictured is the hand railing running the length of the surface extent of the Bingham Canyon Cutoff Wall (red arrow). A cutoff wall typically has an upgradient sump to collect storm water runoff. However, due to the runoff potential in Bingham Canyon, storm water is directed to the Settlement Basin at the Large Bingham Reservoir (OU4).

OU12

Photo 184 - Pictured is the metering and electric panels inside the Bingham Canyon Cutoff Wall pump house. RTKC can assess depth of water in the two collection sumps, check flow rates on the pumps, and track total water capture over time.

Photo 185 - Pictured is the daily log book where RTKC staff can record flow rates, depth to water and total water volume to date captured at the Bingham Canyon Cutoff Wall.

OU12

Photo 186 - Pictured is the sump shaft for the alluvial aquifer sump at the Bingham Canyon cutoff wall, inside the pump house. Pipes extend to depth of water and pumps extract the water from the sump then the water is gravity fed to the Large Bingham Reservoir (OU4).

Photo 187 - Pictured is the Bluewater 1 drainage below the Bingham Mine Eastside Waste Rock Dumps and RTKC's Bluewater Repository operated in compliance with the DWQ GWPP for the Water Collection System. The red arrow denotes the lower Bluewater I Cutoff Wall while the blue arrows denotes the upper wall. The majority of cutoff walls in the drainages further south extend on average a depth of 20-30 feet through alluvium to bedrock.

OU12

Photo 188 - Pictured upgradient of the Bluewater Repository is another view of the Bluewater 1 Upper Cutoff Wall. The Bluewater I Upper Cutoff Wall is used to capture alluvial groundwater prior to it flowing below the surface through the Bluewater Repository.

Photo 189 - Pictured is a section of one of the lower rail dumps of the Bingham Mine Eastside Waste Rock Dumps located in the Bluewater 1 Drainage. The rail dump was constructed in a manner that can facilitate erosional gullies along the dump's slope as depicted here. RTKC periodically repairs the erosional gullies.

OU12

Photo 190 - Pictured is another view of the Upper Bluewater 1 Cutoff Wall. The red arrow denotes the location of the surface sump where storm water runoff is captured and directed into collection pipes below surface that directs water to the Large Bingham Reservoir via the Water Collection Pipeline.

Photo 191 - Pictured is a closeup of the Lower Bluewater 1 Cutoff Wall. Both cutoff walls in Bluewater I were observed to be free of debris and no sediment buildup. The red arrow denotes the storm water runoff sump for the lower wall.

OU12

Photo 192 - Pictured is an aerial view of the Midas Drainage along the Bingham Mine Eastside Waste Rock Dumps. During the East Waste Rock Extension (EWRE) project RTKC constructed the new bench of waste rock (shown here with a down drain) and then relaxed the slope. The down drain is armored, constructed of concrete mats, and used to direct storm water off the top of bench to collection basins and the cutoff walls below. Revegetation of the relaxed bench slope is underway in Midas. Midas 1 and Midas 2 cutoff walls are denoted by the red arrows.

Photo 193 - Pictured is the Midas Drainage, the newly constructed down drain channel on the relaxed slope of the new waste rock bench, and the sediment basin above the Midas 2 Cutoff Wall. The Sediment basins are designed to retain storm water flow from a 100-year 24-hour storm event and discharge to the downgradient cutoff wall.

OU12

Photo 194 - Pictured is the sediment basin above the Midas 1 Cutoff Wall located at the base of reconstructed sediment basin as part of EWRE project. The Midas 1 Cutoff Wall and sediment basin embankment appeared to be in good condition with no sediment buildup.

Photo 195 - Pictured is the Midas 2 Cutoff Wall located in the northern portion of the Midas drainage. The gravel bed is used to help dissipate the energy of storm water runoff from the upgradient sediment basin and to facilitate drainage to the cutoff wall surface water sump. The Midas 2 Cutoff Wall appeared to be in good condition.

OU12

Photo 196 - Pictured is an aerial view of the Water Collection Pipeline (an HDPE pipe running along the bottom of the cement lined canal) located east and north of the Midas Drainage. Along the cement lined canal, no evidence of leaks was detected from along the pipeline.

Photo 197 - Pictured is a close up of the cement lined canal and the Water Collection System HDPE pipe. Water and sediment in the canal tend to be indicative of localized storm water runoff. RTKC has not reported any operational issues with pipeline.

OU12

Photo 198 - Pictured is the secure portal to the Old Bingham Tunnel. The Tunnel was observed to have a mine pool of contact water since the last FYR. Situated below the surrounding topography, the mine pool at the Tunnel will not drain across the surface of Lower Midas but rather the water will either be pumped from the Tunnel and delivered to the Water Collection Pipeline, or the water will infiltrate into the alluvium and be captured by the Midas 1 Cutoff Wall.

Photo 199 - Pictured is an aerial overview of the Keystone Drainage sediment basin and cutoff wall. Keystone drainage has been redesigned like the rest of the Bingham Mine Eastside Waste Rock Drainages as part of the EWRE project to contain a 100-year 24-hour storm event. Notice the riprap armoring and the basin drainage box located upgradient of the Keystone Cutoff Wall. The box is designed to drain the basin to the Water Collection Pipeline quickly.

OU12

Photo 200 - Pictured is a close up of the Keystone Drainage cutoff wall located just below the spillway of the lower sediment basin depicted in photo #199. The Cutoff Wall appeared to be in good condition with no sediment buildup on the upgradient side of wall (left). The spillway is well armored. Notice the bedrock outcrop at the north end of the wall (red arrow) that the wall is keyed into.

Photo 201 - Pictured is the surface storm water sump box at the Keystone Cutoff Wall. No water was observed and there is limited sediment buildup in the bottom of sump box.

OU12

Photo 202 - Pictured is an aerial overview of the Copper 1 Cutoff Wall and upgradient sediment basin constructed as part of RTKC's EWRE project. Both the basin and cutoff wall were recently reconstructed and appeared to be in good condition. Revegetation efforts have been successful.

Photo 203 - Pictured upgradient of the Copper 1 Cutoff Wall is the Copper drainage and the historic Bingham Mine Eastside Waste Rock Dump. At the time of the photo, the EWRE project had not extended the new bench of waste rock from the north (view is north).

OU12

Photo 204 - Pictured is a closeup of the downgradient side of the Copper 1 Cutoff Wall. No sediment buildup or evidence of overtopping of the wall is apparent. The sediment basin spillway and wall are both in great condition having recently been constructed.

Photo 205 - Pictured is a closeup of the upgradient sediment basin above the Copper 1 Cutoff Wall. The vegetation and rip-rap are indicators that the basin is stable.

OU12

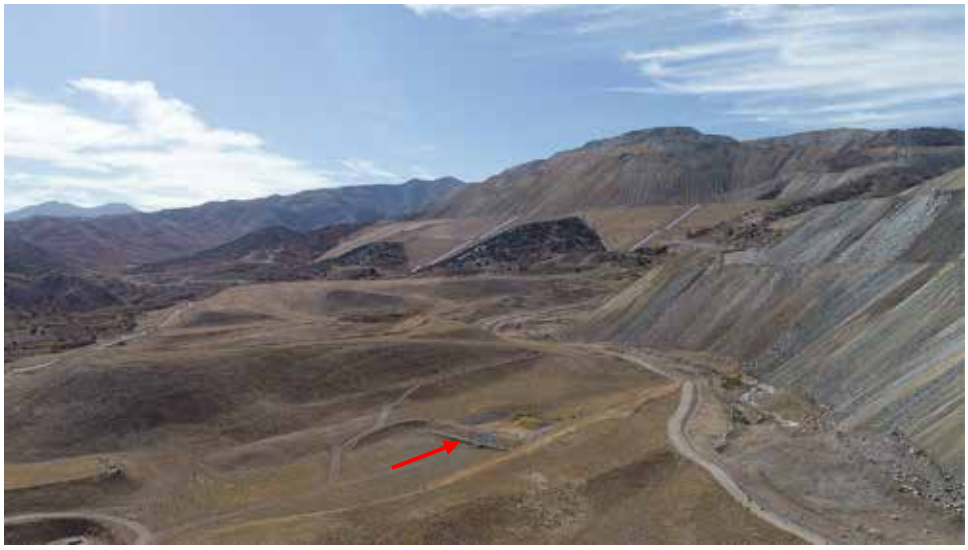

Photo 206 - Pictured is an aerial view of the reconstructed Copper 3 Cutoff Wall (red arrow). Observe the lateral distance from toe of Copper Drainage Eastside Waste Rock Dump (west, right, of the Copper 3 Cutoff Wall). No apparent erosion between the dump and the Wall is observable.

Photo 207 - Pictured is the Copper 2 Cutoff Wall (red arrow) and sediment basin recently reconstructed as part of the EWRE project. The Copper 3 Cutoff Wall is visible to the left in the background (blue arrow). Surfaces appear stable and revegetation efforts look good. No erosion is apparent.

OU12

Photo 208 - Pictured is the reconstructed Copper 4 Cutoff Wall. The Copper Drainage contains the south extension of Bingham Mine Eastside Waste Rock Dumps. The Copper 4 Cutoff Wall appears to be in good condition with no evidence of over toping or recent storm water runoff issues. The waste rock dump in the background (red arrow) is the Yosemite Dump of the Bingham Mine Southside Waste Rock Dumps, located in the Yosemite Drainage above Butterfield Canyon.

Photo 209 - Pictured is the storm water basin in the Copper 4 Drainage upgradient of the Copper 4 Cutoff Wall. Surfaces appear stable and well vegetated.

OU12

Photo 210 - Pictured is the Yosemite Drainage and the Bingham Mine Southside Waste Rock Dump. The South Waste Rock Reclamation (SWRR) project has resulted in a new waste rock bench Yosemite which is relaxed and revegetated in front of the older Southside Waste Rock Dump. The storm water down drain and new sediment basins are in place and appear to be in good condition. The SWRR project has expanded RTKC's ability to manage a 100-year 24-hour storm event.

Photo 211 - Pictured is the reconstructed Yosemite Drainage Upper Cutoff Wall near the base of last newly constructed sediment basin in the Upper Drainage. The new cutoff wall has a higher vertical extension above the surface to assist with capturing storm water runoff. The Cutoff Wall, the debris/energy dissipater upgradient of Wall and the Wall's storm water sump all appear to be in good condition. Surfaces around wall are being revegetated.

OU12

Photo 212 - Pictured is a close up of the Yosemite Drainage Upper Cutoff Wall. The ground surface is being revegetated. The new Wall is more robust compared to the previous cutoff wall which has been buried under the SWRR project's new bench of waste rock.

Photo 213 - Pictured is the downgradient side of the new Yosemite Drainage Upper Cutoff Wall and the SWRR project's relaxed bench of waste rock which has been revegetated. This view is helpful to understand the slopes of the Bingham Mine Southside Waste Rock Dumps. Even when relaxed the bench slopes are steep, so down drains and sediment basins are critical to prevent the release events as observed in 2013.

OU12

Photo 214 - Pictured is the Saints Rest Drainage and the SWRR project's new waste rock bench that has been relaxed and revegetated. The down drain from the top of the SWRR project's waste rock bench will prevent runoff erosion. The older Bingham Mine Southside Waste Rock Dump is located above the new SWRR project's bench. The SWRR project will stabilize the upper older dumps, minimize storm water infiltration and reduce the generation of acid mine drainage, and contain higher volumes of storm water.

Photo 215 - Pictured at the base of the down drain in the Saints Rest Drainage is an energy dissipater in front of the Saints Rest Cutoff Wall storm water sump box. The down drain is constructed of interlocking concrete matts which limit vegetation growth. Revegetation efforts on the surrounding slopes appears to be successful. The SWRR project's new bench of waste rock and each down drain are constructed the same way.

OU12

Photo 216 - Pictured is the Saints Rest Cutoff Wall (red arrow) and secondary storm water basin down gradient of the Wall. Further in the distance is the Water Collection Pipeline Road (black arrow) which forms a secondary basin to prevent storm water runoff from migrating off site. Surfaces are well vegetated.

Photo 217 - Pictured is the Saints Rest Drainage Cutoff Wall. The SWRR project did not require the replacement of the Saints Rest Cutoff Wall.

OU12

Photo 218 - Pictured is a portion of the Butterfield 1 Drainage with a remnant of the local mining history. The dilapidated structure (visible on the hillside) has been described as everything from a remnant of a boarding house to a clandestine moonshine still. It is an interesting historical artifact of local mining history rarely seen.

Photo 219 - Pictured is an aerial overview of the Butterfield 1 Drainage looking southeast toward Butterfield Canyon. The series of newly constructed sediment basins will contain a 100-year 24-hour storm water runoff event. The disturbed surface on the south embankment (right side of the photo) has had vegetation removed to prepare the surface for the relaxation of the SWRR project's new waste rock bench.

OU12

Photo 220 - Pictured is the SWRR project's new bench of waste rock in the Butterfield I Drainage. Once relaxed, the bench will have a down drain installed and be revegetated. The new bench of waste rock is distinguished by the grey color of the un-oxidized waste rock.

Photo 221 - Pictured from the adjacent drainage, the SWRR project's new bench of waste rock in the Butterfield 1 Drainage is distinctly visible (grey rock) in comparison to the older Bingham Mine Southside Waste Rock Dump upgradient. The new bench will stabilize the upper dump and the sediment basins below will help contain debris.

OU12

Photo 222 - Pictured from the reconstructed Butterfield 1 Cutoff Wall, the spillways of the newly constructed storm water runoff basins are visible. The slopes of the basins appear to be stable and are being revegetated.

Photo 223 - Pictured is the new Butterfield I Drainage Cutoff Wall. Designed to receive storm water from the upgradient sediment basin, the new Wall, the storm water sump box and energy dissipator all appear to be in good condition as does the armored spillway of the lower sediment basin.

OU12

Photo 224 - Pictured is an aerial overview of the Olsen Drainage and the SWRR project's new bench of waste rock (grey, un-oxidized rock). The new bench of waste rock has yet to be relaxed and revegetated. Below the bench, as denoted by the individual armored spillways, are a series of newly constructed sediment basins to capture storm water runoff.

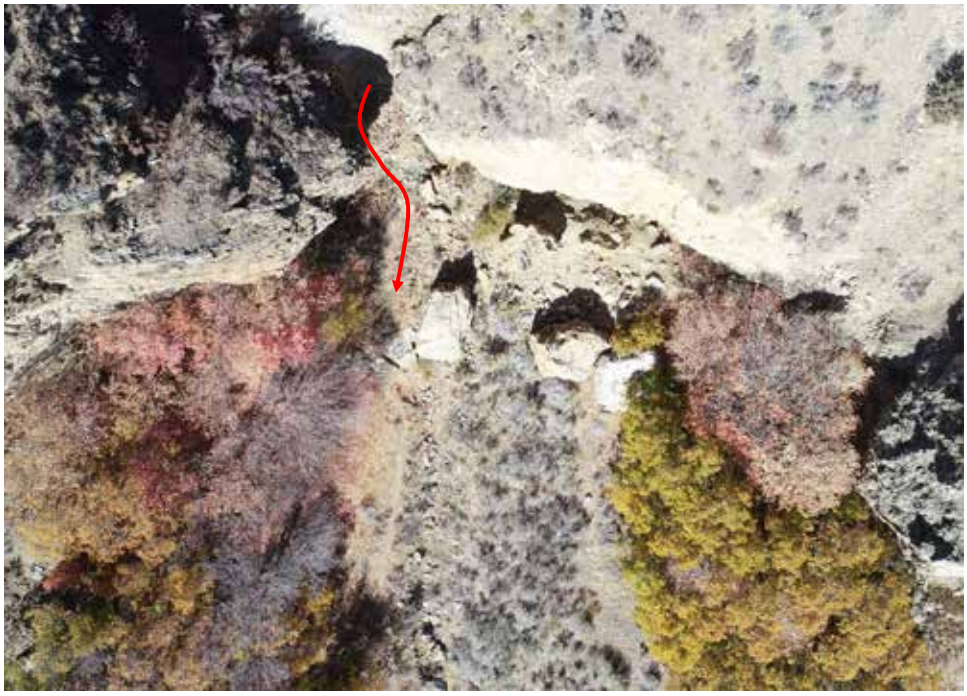

Photo 225 - Pictured is an aerial view of the Olsen Drainage outlet into Butterfield Canyon. From above, the drainage appears to have minimal stormwater runoff sediment along the drainage channel (red arrow).

OU12

Photo 226 - Pictured is the new Olsen Drainage Cutoff Wall. The Wall and sediment basin spillway all look good and the surrounding surfaces are revegetating well.

Photo 227 - Pictured from above the sediment basins in the upper Olsen Drainage is the SWRR project's new bench of waste rock. Above the bench is the older Southside Waste Rock Dump in Olsen that will be stabilized by the new bench. Once relaxed, the new bench will be revegetated and have a down drain constructed to direct storm water runoff away from vegetated slopes of the bench.

OU12

Photo 228 - Pictured is an aerial over of the Queen Mine and Blackjack Gulch Drainage and the new upper cutoff wall (red arrow). Upper portions of Blackjack Gulch have waste rock deposits associated with the Queen Mine.

Photo 229 - Pictured is the downgradient slope of the Blackjack Gulch or Queen Cutoff Wall. Established for some time, the surfaces around the Wall are well vegetated. The Queen Cutoff Wall captures alluvial groundwater flow in the Blackjack Gulch Drainage as do all the cutoff walls.

OU12

Photo 230 - Pictured is the upper reach of Blackjack Gulch with an upgradient view of the Queen Cutoff Wall. The Cutoff Wall appears to be in good condition with no evidence of sediment buildup around the storm water sump box. The Blackjack Gulch Drainage around the Queen Cutoff Wall is narrow, constricting and steep.

Photo 231 - Pictured below the Queen Mine and waste rock dumps are the newly constructed sediment basins in upper Blackjack gulch. The basins are designed with robust dams and energy dissipaters to capture and manage storm water runoff from a 100-year 24-hour storm event. Surfaces have been revegetated.

OU12

Photo 232 - Pictured is the new Blackjack Gulch Upper Cutoff Wall situated between the first and second new sediment basins. The new cutoff wall is located closer to the Queen Mine Waste Dumps and will capture alluvial groundwater and storm water runoff before the lower and original Queen Cutoff Wall.

Photo 233 - Pictured is the first of a series of waste rock dumps located around the historic Queen Mine and Mill, and Tunnel footprints. This western dump in upper Blackjack Gulch is the site of Queen Mine Mill (historically located on top of the dump). The waste rock dump has historically shown evidence of erosion.

OU12

Photo 234 - Pictured from the Queen Mine footprint is the Blackjack Gulch Drainage looking south toward Butterfield Canyon. Blackjack Gulch is the last drainage of the Bingham Mine Southside Waste Rock Dump drainages. The SWRR project is enhancing the management of alluvial groundwater and storm water runoff in these drainages to prevent release events like the high intensity storm in 2013.

Photo 235 - Pictured is the New Bingham Tunnel portal. The Tunnel extends west into the Bingham Mine underground workings. As part of the EWRE project, RTKC increased stability of structural supports along the Tunnel to ensure it could support the weight of the new bench of waste rock placed as part of EWRE project. The Tunnel portal is secured by RTKC.

OU12

Photo 235 - Pictured is the Mascotte Tunnel portal below the Keystone Drainage. The Mascotte Tunnel is secured by RTKC. Water from the Tunnel is piped to the Water Collection Pipeline and directed to the Large Bingham Reservoir (OU4).

Photo 236 - As an overview of the SWRR project, pictured are the Yosemite and Saints Rest drainages and respective benches of waste rock that have been relaxed and revegetated. Comparative to the older, angle of repose waste rock dumps located above the new bench, the new bench is designed to minimize water infiltration and stabilize the historic upper dumps.

OU18

Photo 237 - Pictured is an aerial overview of the Bingham West Dip Tunnel and rock dump located on the western face of the Oquirrh Mountains south of Pine Canyon, in Tooele County. The Tunnel portal has collapsed and the rock dump is not well vegetated and showing evidence of erosion. The Tunnel is well inside RTKC's property line and the site is not easily accessible by the general public.

Photo 238 - Pictured is the Bingham West Dip Tunnel and rock dump which shows evidence of erosion along its surface. The material in the rock dump has sloughed to the base of the dump, but has not migrated past the base onto the surrounding downgradient surface. The collapsed Tunnel portal is marked by the red star.

OU18

Photo 239 - Pictured north of the rock dump is an HDPE pipe used to convey water from the Tunnel around the dump to prevent further erosion. The pipe is delineated by the red arrow. Also pictured is a closeup of the fairly incised erosional gully on the dump surface.

Photo 240 - Pictured is the Bingham West Dip Tunnel sump box located outside of the collapsed Tunnel. Water collected along the Tunnel is directed to the sump and piped downgradient of the rock dump (visible in the upper left quadrant). The rock dump contains a gravelly mixture of angular rock, silts and sands. Concentrations of arsenic and potentially lead are above the site KUALs.

OU18

Photo 241 - Pictured is the Copper Boy Tunnel portal located just below the Oquirrh Mountain ridgeline crest. The Tunnel was drilled into the surrounding rock outcrop. Tunnel discharge appears to support localized grasses. Surrounding soils and rock can have arsenic and lead concentrations above the site KUALs.

Photo 242 - Pictured is the Copper Boy Tunnel portal from a downgradient vantage point. The Tunnel is located well inside RTKC's property, in an inaccessible location. The Tunnel area is unlikely to be redeveloped based on slope grades and location.

OU18

Photo 243 - Pictured above the Copper Boy Tunnel is another portal (red star) which is higher up the drainage. This second portal is similar to the first as it's in a secure area, well within RTKC's property and unlikely to be developed or trespassed upon.

Photo 244 - Pictured is the Helen B Tunnel and rock dump located below the visible Oquirrh Mountain ridgeline. The rock dump has some evidence of erosional gullies. The rock dump is not well vegetated which may be due to its angular rock composition, limited water, chemical composition or a combination of all three.

OU18

Photo 245 - Pictured is the collapsed Helen B Tunnel portal. Soils around The Tunnel and rock dump can have concentrations of arsenic and lead above the site KUALs.

Photo 246 - Pictured is an aerial overview of the Middle Canyon Tunnel Dump. The Dump is comprised of rock from drilling the Middle Canyon Tunnel and does have concentrations of lead and potentially arsenic above the site KUALs. The Dump is located approximately 4-miles up Middle Canyon from its mouth outside of Tooele City.

OU18

Photo 247 - Pictured is an aerial view of the top surface and embankments of the Middle Canyon Tunnel Dump. The southwest slope (black arrow) has historically been prone to erosion by runoff from the Dump's top surface. Storm water is now redirected by berms (blue arrow) to an armored down drain on the western slope (red arrow). Voluntary revegetation efforts have not been successful because of the rocky substrate of the Dump and limit water.

Photo 248 - Pictured is a portion of the upper portion of the southwest embankment of the Middle Canyon Tunnel Dump. Angular rock composition, relatively steep slope, limited water and higher elevation have made it difficult to revegetate this Dump. RTKC will have to continue annual inspections of the Dump, address stability issues and erosional gullies into the future.

OU18

Photo 249 - Pictured is the Middle Canyon Tunnel portal. The Tunnel and Dump are accessible to the general public by foot traffic. Historical trespassing caused RTKC to install the secure metal bulkhead inside the portal and install concrete Jersey barriers (visible to the left of the portal) to keep kids out of the tunnel and vehicle traffic off the Dump's top surface. Tunnel water is piped to the Middle Canyon Irrigation Company's collection sump located at base of Dump's western slope.

Photo 250 - Pictured from above is the southwest embankment of the Middle Canyon Tunnel Dump. Erosional gullies cut into the slope surface. At the base of Dump, prior to Middle Canyon Road, is Middle Canyon Creek (red arrow), which rarely has water. RTKC is tasked to ensure the Dump does not slough into Creek. The Dump contains lead concentrations characterized as high as 2,000 mg/kg.

OU18

Photo 251 - Pictured is the base of the Middle Canyon Tunnel Dump, and Middle Canyon Creek Channel (red arrow) adjacent to the Middle Canyon Tooele County road. Due to proximity of the Creek Channel and the Dump, RTKC is required to ensure the Dump's stability and prevent it from eroding into the Channel. RTKC will be requested to verify that material observed in the Channel is not from the Dump.

OU20

Photo 252 - Pictured is an aerial view of Pine Canyon. Terraced sediment basins are visible extending up from the mouth of Pine Canyon. The upper reaches of Pine Canyon split northeast and southeast into side canyons. The upper reach of Pine Canyon where the Anaconda Carr Fork workings are located, is approximately 2.5 miles east of the mouth of Pine Canyon.

Photo 253 - Pictured from the Anaconda Carr Fork workings is Pine Canyon looking west. The grey rock along the south slope of Pine Canyon (lower left quadrant) is waste rock potentially subject to the reclamation requirements of DOGM. Soils and mine waste in the Canyon can exceed the site KUALs for arsenic and lead.

OU20

Photo 254 - Pictured is an aerial view of the head shaft of the Anaconda Carr Fork underground mine. Grey waste rock is observed along the base of the north slope of Pine Canyon (lower left quadrant). Pine Canyon Tunnel Discharge is conveyed by pipe to a cement lined canal from Pine Canyon Tunnel. The cement line canal (red arrow) conveys the water to the sediment basins located in the Canyon. Storm water runoff from the upper reaches is conveyed by a channel located near base of Pine Canyon's south slope (blue arrow).

Photo 255 - Pictured is RTKC's pump house and adit to the underground Carr Fork mine workings. The pump and associated pipes are used to dewater the Carr Fork workings.

OU20

Photo 256 - Pictured is a close up of RTKC Carr Fork deep well pump house. The pump is functional and maintained by RTKC but currently is not being used.

Photo 257 - Pictured is the flow meter on the Carr Fork deep well pump to measure extraction rates from the Carr Fork workings. As it depicts the well was not being pumped at the time of the inspection.

OU20

Photo 258 - Pictured in the lower to middle section of Pine Canyon was a flock of Rio Grande or Merriam's Turkeys. Turkeys have become abundant in the Oquirrh Mountains likely due in part to limited hunting on RTKC’s property.

Photo 259 - Pictured is the Pine Canyon Rail and Tunnel and the HDPE discharge pipe directing water to the historic cement lined canal. The HDPE pipe is actually located in the canal, and is sized above the water production capacity of the Tunnel. Observed at the Tunnel portal, the rail line extends into the Tunnel, but it is far from operational. The Tunnel portal and surrounding surfaces were stable.

OU20

Photo 260 - Pictured above the south slope of Pine Canyon is a support structure for the historical aerial crane which was used to convey ore from the Carr Fork workings and the Bingham Mine District to the International Smelter located at the mouth of Pine Canyon. The south slope is relatively steep with erosional gullies.

Photo 261 - Pictured at the lower portion of the southeast side canyon in in upper Pine Canyon is a foundation of an unknown structure. What operations this structure supported has yet to be determined.

OU20

Photo 262 - Pictured from a lower section is the southeast side canyon where the Star Mill footprint is suspected to be located. The southeast side canyon is narrow with steep side walls. The bottom is filled with loose rock and uneven ground. Evidence of the Star Mill (OU25) was not readily apparent.

Photo 263 - Pictured a little further up is the upper reaches of the southeast side canyon. Side walls are steep, the base is filled with loose angular rock and uneven ground. The southeast side canyon is not easily accessible by the general public. There appears to be outcrops of quartz and granite, among other sedimentary rock.

OU20

Photo 264 - Pictured is the upper reach of Pine Canyon from the historical foundation seen in photo 261. Canyon surfaces are stable and well vegetated, except right around the Pine Canyon Tunnel portal and Carr Fork adit. Storm water runoff has not been observed to carry sediment, and is managed under a storm water permit in the downgradient sediment basins. Side slopes in Pine Canyon remain steep with variable vegetation. Soils can exceed the arsenic, and potentially the lead site KUALs.

OU24

Photo 265 - Pictured is an aerial view of Bingham Canyon documenting the location of the KCC Precipitation Plant (red polygon), RTKC's South Facilities Water Management Operations Center (blue star), Tunnel 5490 and the old Bingham Mine Ore Conveyor (red arrow). The Bingham Canyon Waste Rock Dump is in the background.

Photo 299 - Pictured are the scavenger cells of the KCC Precipitation Plant which are still in use. Acid mine drainage from the Bingham Mine Waste Rock Dumps is directed through scrap iron and copper is recovered. This ongoing operation is scaled down from original the KCC Precipitation Plant operations. The overall Facility footprint is located about a 0.5 miles upgradient of the Bingham Canyon Cutoff Wall (OU12).

OU24

Photo 300 - Pictured are the KCC Precipitation Plant scavenger cells. Though the historic leach circuit on the waste rock dumps has been shut down since 2000, meteoric water is still collected as acid mine drainage and RTKC finds it is still cost effective to run the scavenger cells.

Photo 301 - Pictured are stockpiles of soil and other unknown material. Much of the KCC Precipitation Plant facility was demolished and encapsulated on site in the early 2000s. The historic Lead Mine Mill footprint is also buried in the area depicted along the base of the northern hillside (upper right quadrant). The area depicted has over approximately 20 feet of soil with concentrations of lead and arsenic above the site KUALs.

OU24

Photo 302 - Pictured are stockpiles of soils and scavenger cell material which RTKC is managing onsite.

Photo 303 - Pictured is a female Mule Deer and two older fawns pictured at KCC Precipitation Plant. Mule deer are often spotted around the RTKC land holdings where there is less use. The surface soils in Bingham Canyon around the KCC Precipitation Plan have different vegetative covers but soils onsite appear stable.

OU24

Photo 304 - Pictured is an aerial view of the historic Bingham & Garfield (B&G) Rail Corridor north of Clay Hollow where a historical ore dump (red polygon) was located. Since the last FYR, the ore dump has been removed by RTKC. A report on the characterization of the B&G Rail corridor and removal of ore dump is still pending.

Photo 305 - Pictured prior to removal is the ore dump situated alongside the historic B&G Rail corridor. The dump consisted on angular rock of variable sizes and was not supportive of vegetative growth along much of its surface.

OU24

Photo 306 - Pictured prior to removal is another section of the B&G Rail Corridor ore dump. Some angular rock and large rock fragments were oxidized and green in color, indicative of a higher copper or manganese content.

Photo 307 - Pictured prior to removal is another section of the ore dump along the B&G Rail Corridor. The dump averaged about five feet in depth.

OU24

Photo 308 - Pictured is the ore dump during the removal action. Clay Hollow is in the background past the vehicle in the upper left quadrant. The vehicle is located on the B&G Rail Corridor.

Photo 309 - Pictured is another section of the ore dump during the removal action. RTKC personnel are in the background (upper left quadrant) for scale.

OU24

Photo 310 – Pictured is an aerial view of the B&G Rail Corridor north of Clay Hollow (red arrow). Surrounding surfaces are well vegetated with grasses, sage and rabbit brush. The B&G Rail Corridor crosses drainages on earthen trestles comprised of native borrow material or waste rock.

Photo 311 - Pictured is another aerial view of the B&G Rail Corridor and the post removal surface of the historic ore dump (red arrow). Revegetation will take time since the area is not actively irrigated.

OU24

Photo 312 - Pictured is the hillside below the historic B&G Rail Corridor (red arrow) south of Little Valley Canyon and the Big Cut. This section of the B&G Rail Corridor supports RTKC's Tailings Pipelines.

Photo 313 - Pictured is an aerial view of the B&G Rail (red arrow), Copperton High Line Rail (black arrow), and Copperton Low Line Rail (green arrow) corridors and the hillsides between, as each corridor enters the Kennecott North Zone operational area. The Copperton Low Line Rail Corridor still supports rail operations, while the High Line and B&G corridors are in various stages of removal. The community pictured in the upper right quadrant is the Town of Magna.

OU24

Photo 314 - Pictured is the Copperton High Line Rail Corridor near 4800 South. The Copperton High Line Rail Corridor has been removed in some locations pursuant to an approved soil management work plan under CERCLA oversight

Photo 315 - Pictured is the Copperton High Line Rail Corridor at the crossing of Clay Hollow where its earthen trestle is comprised in part of waste rock. The Copperton High Line Rail Corridor is on RTKC property, east (behind) the Corridor is the Sycamores development in West Jordan.

OU24

Photo 316 - Pictured is an aerial view of the Copperton High Line Rail Corridor (red arrow) and SH-111 (blue arrow) in the vicinity of approximately 4000 South. The slope between the rail and road has some evidence of runoff erosion (evidenced by the runoff gullies, green arrow).

Photo 317 - Pictured is the Copperton High Line Rail Corridor running parallel to the southern boundary of Gateway-Little Valley development site. The development will reportedly not encroach onto the Rail Corridor.

OU24

Photo 318 - Pictured is a section of the Copperton High Line Rail Corridor near 7800 South. Notice the rail bed material (which is slag). The Copperton High Line Rail Corridor (in areas where it was removed) had slag, slag sediment and soils with arsenic and lead concentrations above the site KUALs.

Photo 319 - Pictured from Clay Hollow, the Copperton High Line Rail Corridor (red arrow) is located just west of RTKC's property line. The Sycamores residential development is located just east of RTKC's property line. A fence line along RTKC's property secures access to the Rail Corridor.

OU24

Photo 320 - Pictured is an aerial view of the Copperton High Line Rail Corridor paralleling the Sycamores development. The Copperton High Line Rail Corridor is stable and no signs of erosion were observed. The RTKC property line is approximately half the distance between the Sycamores development and the Rail Corridor.

Photo 321 - Pictured is the Copperton Low Line Rail Corridor crossing of SH-111 south of Magna, Utah. Notice that rail bedding material. Soils and and slag have been sampled and concentrations of lead and arsenic can be above the site KUALs. This crossing was subsequently removed under an approved soil management plan submitted by RTKC.

OU24

Photo 322 - Pictured is another view of the Copperton High Line Rail Corridor located along the southern perimeter of the Gateway-Little Valley Development project. The Rail Corridor is intact through this section.

Photo 323 - Pictured is a section of the 1960s Denver Rio Grande (DRG) Rail Corridor on RTKC property east of the Town of Copperton, UT. Typical of many of the site rail corridors, the rail bed is comprised of slag. Soils and slag can have concentrations of arsenic and lead above the site KUALs.

OU24

Photo 324 - Pictured is another section of the 1960s DRG Rail Corridor on RTKC property near SH-111 outside of the Town of Copperton, Utah. The 1960s DRG Rail Corridor is stable as is the surrounding vegetated surface soils. Soils and slag can have concentrations of arsenic and lead above the site KUALs.

Photo 325 - Pictured is an aerial view of the 1960s DRG Rail corridor (red arrow) west of SH-111 running parallel to Old Bingham Highway. From SH-111, the 1960s DRG Rail Corridor extends east to 5600 West, where left in place, and can have soils and slag with concentrations of arsenic and lead above the site KUALs. Also pictured is the historic site of the Proler Facility (OU6, red star) which was a processing facility for lead lined tin cans which were scrapped as a source of scrap metal for the historical precipitation launders at Kennecott. The historic footprint was previously cleaned up but potentially not to the site KUALs.

OU24

Photo 326 - Pictured is a section of the 1960s DRG Rail Corridor at approximately 7000 West and Old Bingham Highway (looking east). The historic rail bed (slag) is in place and contains concentrations of arsenic and lead above the site KUALs. The historic rail bed has been converted into the alignment of Rocky Mountain Power's Mona transmission line.

Photo 327 - Pictured is a section of the 1960s DRG Rail Corridor at approximately 7000 West and Old Bingham Highway (looking west). The historic rail bed (slag) is in place and contains concentrations of arsenic and lead above the site KUALs. The historic rail bed has been converted into the alignment of Rocky Mountain Power's Mona transmission line as evidence by the poles.

OU24

Photo 328 - Pictured is the eastern extent of the 1960s DRG Rail Corridor in place near 5600 West. The rail bed is vegetated here, perhaps indicative of soil being placed over the rail bed since typically rail bedding material (slag) is not supportive of vegetation.

Photo 329 - Pictured is the sound barrier/soils repository UTA constructed from 4700 West to 4500 West along the Mid Jordan Trax Line. The repository is where they placed slag and soils in excess of the OU1 Commercial Lead Land Use Action Level of 2000 mg/kg excavated during the conversion of the 1960s DRG Rail Corridor into the UTA Mid Jordan Trax Line. The pictured section of the repository was recently reconstructed to support the installation of sidewalk, along Wasatch Meadows Drive, in compliance with the City of West Jordan's contaminated soils ordinance.

OU24

Photo 330 - Pictured is a closeup of UTA's Mid Jordan Trax Line Repository west of Wasatch Meadows Drive. Repository material was excavated from the area of new sidewalk and pulled back onto the Repository. The disturbed surface is still undergoing revegetation efforts but is fenced off and secure against public access.

Photo 331 - Pictured behind the locked gate is the continuation of UTA's Mid Jordan Trax Line Repository south the Mid Jordan Trax Line. The view is east from Wasatch Meadows Drive. The Repository is well vegetated and the storm water runoff canal (red arrow) located south of the Repository is intact and functional. No evidence of recent erosion was observed. Access is controlled by UTA.

OU24

Photo 332 - Pictured is the west end of the UTA Repository east of Wasatch Meadows Drive. This west end of the repository is stable but vegetation has not been successful. The lack of vegetation may be a function of the gravelly composition of the encapsulated material, or the lack of water. UTA will be contacted to discuss their revegetation efforts on this portion of the Mid Jordan Trax Line Repository.

Photo 333 - Pictured from Wasatch Meadows Drive is the north side of UTA's Mid Jordan Trax Line paralleling 9000 South. The Trax line is stable and the northern slope of Repository is well vegetated (red arrow).

OU24

Photo 334 - Pictured is the overall eastern extent of UTA's Repository near 4500 West. As noted, the Repository is where all the slag and soils from converting the 1960s DRG Rail Corridor into the Mid Jordan Trax Line (that exceeded the OU1 Commercial Lead Land Use Action Level of 2000 mg/kg) was placed. The Work was performed under DERR oversight as it predated the SLCO Health Department and the City of West Jordan contaminated soil ordinances. The eastern extent of the Repository appeared stable and well vegetated.

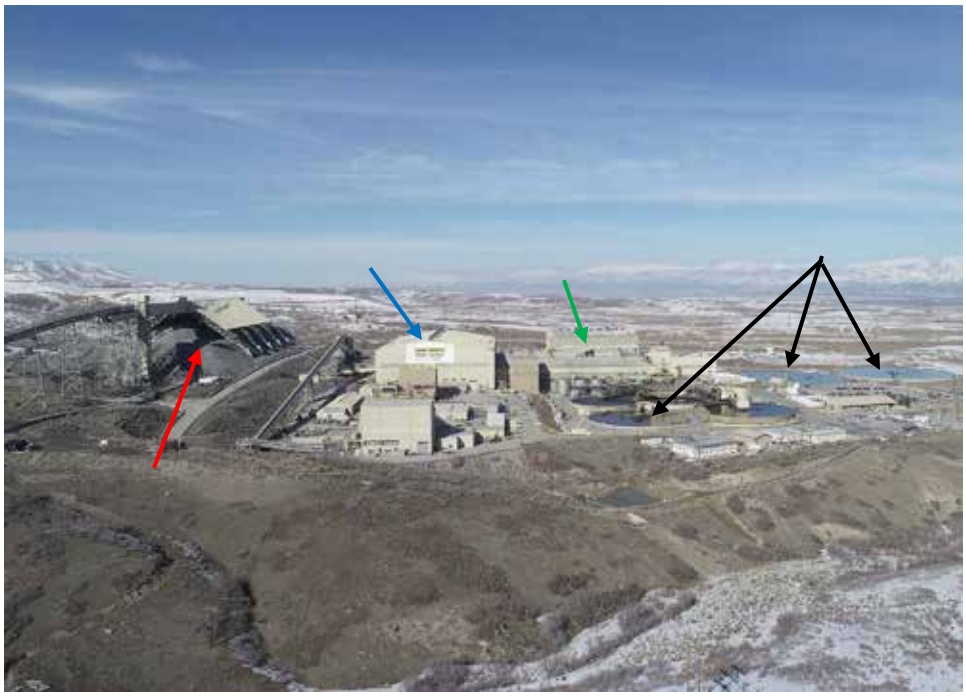

Photo 335 - Pictured is an aerial view of the Copperton Concentrator, including the facility's ore storage A-frame shed (red arrow), the drum mill (blue arrow), and the floatation mill (green arrow), and the tailings thickeners (black arrows). The Copperton Mill is operated in compliance with a DWQ GWPP and storm water permit.

OU24

Photo 336 - Pictured is drop box NP-5 located along the tailings conveyance infrastructure. This is the first of two drop boxes where lime can be added to the tailings slurry to neutralize aqueous pH.

Photo 337 - Pictured is drop box NP-6 located below the taillings thickeners and drop box NP-5. The slurry observed here is tailings throughput from the thickeners being conveyed to the Tailings Pipeline. No spills were observed. NP-6 is the second location that lime can be added to neutralize aqueous pH.

OU24

Photo 338 - Pictured is the southern drainage located below the Copperton Concentrator and downgradient of the Process Water Reservoirs. The drainage surfaces appeared stable and well vegetated. No evidence of recent erosion impacts was observed.

APPENDIX E – STATE PERMIT REVIEW & RTKC SUPPORTING INFORMATION

MEMORANDUM

TO: Douglas Bacon, Utah Division of Environmental Response and Remediation

FROM: Brian Hamos, Utah Division of Water Quality

DATE: December 24, 2020

SUBJECT: Compliance Summary of South End Kennecott Ground Water Discharge Permits

Introduction

Mr. Douglas Bacon (Project Manager – Kennecott Facility, Division of Environmental Response & Remediation, DERR) contacted me requesting an assessment of Kennecott Utah Copper LLC's (KUC) compliance with the Ground Water Discharge Permits (permits) for KUC's operations on the South End for evaluation as part of his 5-year review under CERCLA authorities (U.S. Environmental Protection Agency (EPA) Region 8 and DERR).

Under a 1995 Memorandum of Understanding the CERCLA authorities and KUC agreed to use State authorities as appropriate to manage active operations which might contribute to mining waste issues being addressed under CERCLA selected remedies. The four permits issued by the Division of Water Quality (DWQ) that regulate activities on the south end of the KUC mining operation are:

- UGW350010 Bingham Canyon Mine and Water Collection System
- UGW350017 Copperton Concentrator
- UGW350006 Large & Small Bingham Reservoir System
- UGW350001 Kennecott Barneys Canyon Mining Company

It is worth emphasizing that each of these permits has been written to regulate potential discharges to ground water such that there is no impairment of present and future beneficial uses of the ground water. As such, ground water protection levels under R317-6-4 are the appropriate standards enforceable by DWQ. Soil contamination, when present, can be addressed by the ground water rules under an R317-6-6.15 Corrective Action, but defining procedures to identify, characterize, and remediate soil contamination is not the primary objective of the rules.

Permit Compliance Summary

Bingham Canyon Mine and Water Collection System, UGW350010 (permit expires July 25 2025):

This permit includes the Bingham Canyon Mine and associated facilities. A total of 43 monitoring wells are sampled under this permit. Wells screened in alluvium are sampled quarterly and wells screened in bedrock are sampled semi-annually. The following monitoring wells are or have been out of compliance with permit parameters:

- ECG907 and ECG1187 are out of compliance for total dissolved solids (TDS) and sulfate,
- ECG1100A is out of compliance for sulfate, TDS, pH, and zinc, and
- ECG925 is out of compliance for TDS.

ECG907 and ECG1187 have been out of compliance dating back to 2006. ECG1187 is down-gradient of ECG907 and both wells are believed to be impacted by the same source. A source investigation was conducted in 2007 and it is believed a crack in a canal up-gradient of these wells was the cause of the contamination. The canal has been repaired and the monitoring wells continued to be observed for increasing trends that could warrant further action.

ECG1100A is within a known ground water contaminant plume originating in Dry Fork Canyon. This ground

water contamination is being controlled through the use of extraction well ECG2787.

ECG925 is located adjacent to and down gradient of a mine access road. High chloride in ECG925 is the cause of the TDS compliance exceedance, and is believed to have been caused by poor drainage on the access road pooling water (and road salt) up gradient of the monitoring well. The road drainage issue has been fixed and TDS concentrations in the well are expected to decrease over time.

Copperton Concentrator, UGW350017 (permit expires December 28, 2022):

This permit covers a variety of facilities operated as part of the concentrator processes such as the tailings thickeners, clarifier, process water reservoir, flotation plant, etc. Best Available Technology (BAT) performance standards designed to minimize the discharge of process fluids from each facility are described in the permit.

Effective with the permit renewal dated December 29, 2017 was the inclusion of the 48″ and 60″ tailings pipelines. The tailings lines have been the source of several releases over the years and had previously been considered "permit-by-rule" facilities. As permitted facilities BAT standards, inspection procedures, and release criteria have been better defined.

The latest release from the tailings lines occurred on April 12, 2020 as a result of a transformer failure and subsequent loss of power to the Byron Jackson pumps. Upon restart, the Byron Jackson pumps created a surge of tailings slurry in the tailings pipeline, resulting in a series of relatively small releases from several locations along the length of the tailings lines. DWQ issued a letter of violation and warning (LOV) dated August 13, 2020. Clean-up activities have been completed and KUC is currently working on a proposal to route tailings surges into Sedimentation Pond 4 to prevent overwhelming the tailings lines in the future. This solution will require design modifications to Sedimentation Pond 4 and is also subject to review and approval by the Division of Oil Gas and Mining (DOGM). A submittal from KUC is due on January 29, 2021, and future actions and deadlines will be established following DWQ and DOGM review.

A total of 3 compliance monitoring wells (W31, COG1149 A & B) are sampled quarterly under this permit. Each of the wells is in compliance with permit parameters with no history of exceedances. In addition, 2 new monitoring wells (BCG2860 & WJG2862) have been installed in a down gradient direction along the Barneys Creek drainage as part of activities to investigate past tailings line releases. Also, a double completion monitoring well (HCG2861 A & B) has been installed in Harkers drainage as a result of past releases from the surge basin and pump station 3B. To date, these wells have not shown evidence of contamination.

Large & Small Bingham Reservoir System, UGW350006 (permit expired December 21, 2020):

This permit has expired but continues in effect as per R317-6.7 until it has been renewed. Renewal is in process and should be completed during early 2021.

This permit covers the de-silting basin, large reservoir (2 zones), and small reservoir located just south of the town of Copperton. There are no monitoring wells with established compliance limits associated with this permit due to the presence of historical ground water contamination that makes it impossible to establish background concentrations. Compliance is determined by monitoring the leak detection sumps of the reservoirs. Reports are submitted to DWQ semi-annually documenting the results of weekly inspections at each of the facilities and any maintenance activities resulting from the inspections. The reservoirs are operated in compliance with permit requirements, as leaks are quickly identified and repaired if a leak detection sump is found to exceed the allowable leakage rate defined under BAT requirements.

Kennecott Barneys Canyon Mining Company, UGW350006 (permit expires October 8, 2023):

This site is no longer active and has been undergoing closure activities since 2016. Closure activities have included dismantling structures, characterizing and excavating contaminated soil throughout the site for disposal within the leach pads, constructing buttresses along each of the 5 leach pads to accommodate relaxing the slopes to reduce erosion potential, covering the leach pads with clean soil to prevent the generation of contact water,

grading for storm water drainage, and seeding for final vegetation cover. Closure activities are anticipated to be completed during 2021.

A total of 14 monitoring wells are sampled under this permit. There are 2 up-gradient wells and 12 down-gradient wells that are sampled semi-annually.

Data from the most recent sampling event show monitoring wells BCG848 and BCG851A out of compliance for nitrate. Since the site is no longer active, this is not believed to be a result of mining activities. Significant soil disturbance has occurred during closure activities and is one possible cause. Also, with placement of soil cover over the leach pads, infiltration has been reduced and the water table is dropping. It is believed this may be influencing concentrations in the wells. Sampling frequency for these wells has been increased to quarterly and they will continue to be tracked for ongoing trends to evaluate if additional action is necessary.

MEMORANDUM

TO: Douglas Bacon, Utah Division of Environmental Response and Remediation
FROM: Sarah Ward, Utah Division of Water Quality
Copy: Carl Adams, Utah Division of Water Quality
DATE: February 9, 2021
SUBJECT: Compliance Summary of Kennecott Utah (KUC) UPDES Permit No. UT0000051

Introduction

Mr. Douglas Bacon (Project Manager – Kennecott Facility, Division of Environmental Response & Remediation, DERR) contacted me requesting an assessment of Kennecott Utah Copper LLC's (KUC) compliance with the UPDES Permit No. UT0000051 for KUC's operations as part of his 5-year review under CERCLA authorities (U.S. Environmental Protection Agency (EPA) Region 8 and DERR).

Under a 1995 Memorandum of Understanding the CERCLA authorities and KUC agreed to use State authorities as appropriate to manage active operations which might contribute to mining waste issues being addressed under CERCLA selected remedies. The one permit issued by the Division of Water Quality (DWQ) that regulate activities for eleven outfalls of the KUC mining operation. Those outfalls are:

- 002; Tailings pond outfall to C-7 ditch
- 004; I-80 Culvert to Great Salt Lake
- 007; Toe Ditch Pond to C-7 ditch
- 008; Artesian well water, refinery storm water to the Great Salt Lake
- 009; Pine Canyon Tunnel, Tooele County
- 010; Butterfield Tunnel to Butterfield Creek
- 011; Adamson Springs to the Ritter-Utah Salt Lake Canals
- 012; Tailings discharge to the Great Salt Lake
- 104; Internal discharge from Hydrometallurgical Plant
- SW3; Little Valley Wash
- SW4; Pine Canyon Creek, Tooele County

It is worth emphasizing that limitations, monitoring and reporting requirements for each of these outfalls have been written to regulate potential discharges to surface waters such that there is no impairment of present and future beneficial uses of those surface waters. As such, surface water protection levels under R317-8 are the appropriate standards enforceable by DWQ.

Permit Compliance Summary

Kennecott Utah (KUC) UPDES Permit No. UT0000051 (permit expires January 31, 2022):

This permit includes a total of eleven monitoring outfalls have limitations, monitoring and reporting requirements. The following outfalls are or have been out of compliance with permit parameters:

- Outfall 012 with TSS maximum daily limitation.
- Outfall 010 with a zinc exceedance.

Outfall 012 exceedances for TSS maximum daily limitation date back to March 2018. DWQ received 24 hours notification and a 5-day report from KUC informing DWQ of the parameter exceedances. The exceedances were caused from process conditions and the discharge was terminated immediately. These exceedances were addressed in a Warning Letter for Non-Compliance sent to KUC September 6, 2020.

DWQ was notified by KUC of the Butterfield Tunnel Outfall 010 zinc exceedance within 24 hours and a 5-day report from KUC informing DWQ of the parameter exceedances. The sample was taken on March 25, 2020 which was seven days after the 5.7 earthquake in the Salt Lake Valley. An additional sample was taken in April 2020 to ensure the discharge was back into compliance. This exceedance was addressed in a Warning Letter for Non-Compliance sent to KUC September 6, 2020.

Permit Inspection Summary

Kennecott Utah (KUC) UPDES Permit No. UT0000051 (permit expires January 31, 2022):

A Compliance Evaluation Inspection (CEI) was conducted by DWQ August 6, 2019. There were no observed deficiencies in regards site inspection and document review for outfalls 002, 004, 007, 008, 009, 010, 011, 012 and 104.

An evaluation of data for storm water outfalls SW3 and SW4 show regular quarterly monitoring occurring throughout the last 5 years. A CEI for storm water is scheduled to be completed 2021.

State of Utah

SPENCER J. COX
Governor

DEIDRE M. HENDERSON
Lieutenant Governor

Department of Natural Resources
Division of Oil, Gas and Mining

BRIAN C. STEED
Executive Director

JOHN R BAZA
Division Director

TO: Doug Bacon, Utah Division of Environmental Response and Remediation

FROM: Leslie Heppler, Utah Division of Oil, Gas and Mining

DATE: February 9, 2021

SUBJECT: Compliance Summary of Rio Tinto Kennecott Mining PermitsSouth Zone – East side of the Oquirrh Mountain Range

Introduction

Douglas Bacon from Department of Environmental Quality (DEQ), the Division of Environmental Response & Remediation (DERR) contacted me on February 2, 2021 requesting an assessment of Rio Tinto Kennecott compliance with their 3 mining permits associated with the Bingham Canyon Mine on the east side of the Oquirrh Mountain range in Salt Lake County. Doug requested this data as part of his 5-year review under CERCLAauthorities US Environmental Protection Agency Region 8 and DERR.

Under a 1995 Memorandum of Understanding the CERCLA authorities and KUC (nowRio Tinto Kennecott) agreed to use State of Utah DEQ authorities as appropriate to manage activities.

The DERR defined Kennecott South Zone area overlaps the permits of the Utah Divisionof Oil, Gas and Mining (OGM). The primary responsibility of (OGM) is surface mine reclamation. The following permits overlap the south area of concern:

- M/035/0002 - Bingham Canyon (overlaps M/035/0011)
- M/035/0009 - Barneys Canyon
- M/035/0011 - Copperton Concentrator (overlaps M/035/0002)

In addition, OGM has 2 permits that are related to the above permits but are in theDERR defined Kennecott North Zone.

- M/035/0015 - North Tailing Impoundment (overlaps M/035/0002)
- M/035/0046 - Bonneville Borrow

The authority of OGM's is derived from the Utah Mined Land Reclamation Act, UCA 40-8, and Utah Administrative Code Title R647. All the above Rio Tinto Kennecott permits are in compliance. There are no outstanding compliance issues with any of theabove listed permits at this time.

Permit Compliance Summary

Bingham Canyon, M/035/0002

This permit includes the Bingham Canyon Mine and associated facilities which include, but are not limited to; the mine pit, waste rock piles, excess mine water facilities, ore transfer structures and facilities, equipment support facilities, ore processing facilities, south tailings impoundment and excess process water disposal. A large majority of the south tailings impoundment has been re-vegetated, but no vegetation release has been requested from OGM. The current reclamation bond is a board contract between Kennecott and the Board of Oil, Gas and Mining which was signed on September 28, 1978 and includes 23,000 acres. The Board of Oil, Gas and Mining and the DNR Attorneys General Office is currently reviewing proposed reclamation bond calculationssubmitted by Rio Tinto Kennecott.

There is a current outstanding Division Directive dated September 17, 2013, for a storm event which occurred on September 13, 2013. The stormwater basin capacities were re- established to the minimum of a 10 year/24-hour storm capacity by mid November 2013. The timeline for compliance and a monthly update has been received each month since the event until August 19, 2019. A total of 18 tasks have been completed relating to the 2013 Division Directive. The only item remaining to be completed is the final report regarding the re-establishment of stormwater basins to pre-storm levels. A tentative approval was sent to the Operator August 29, 2019. The South Tailings impoundment, which is part of the Bingham permit, has had recent upgrades to the SE corner, both a de-weighting excavation project has been completed and a dewatering pumping system.

There are no outstanding compliance issues associated with the Bingham Canyon permitat this time.

Barneys Canyon Mine, M/035/0009

This permit includes the Barneys Canyon Mine and associated facilities which include,but are not limited to; 5 mine pits, waste rock piles, equipment support facilities, ore processing facilities and 5 heap leach pads. All mine pits, waste rock piles and equipment support facilities have been reclaimed and the reclamation bond released.
Partial release for the ore processing equipment included the demolition of the crushing, the agglomeration facilities, and ore extraction processing facilities. The buttress and reclamation of the 5 heap leach pads and the ponds has been completed. In addition, theNorth Barneys Drainage Seep capture is complete, the water tunnel adit has been undergoing reconstruction for long term durability, the Barneys Canyon Mine soil characterization East of the B&G grade and associated excavation is completed, the loading and hauling of the sulfide stockpile and the demolition of the process
infrastructure, including the process ponds and piping is complete. The revegetation process has been started for the heap lead areas. The remaining reclamation bond amountis $3,873,466 for 963 acres.

There is a current outstanding Division Directive dated April 9, 2014, pertaining to a sediment release below Leach Pad 5. The timeline for compliance and a monthly update has been received each month since the event. A total of 17 tasks have been completed relating to the 2014 Division Directive. The two remaining items to be completed are theregulatory approval of the post removal report and the continued inspection of the leach pad area on a daily basis.

There are no outstanding compliance issues associated with the Barneys Canyon permitat this time.

Copperton Concentrator, M/035/0011

This permit includes the Copperton Concentrator and associated facilities which include,but are not limited to; the ore transfer structures, including a conveyor system from the Bingham Mine to the concentrator and multiple pipelines from the concentrator to the tailings impoundment north of Magna, Utah. The facilities also include an A-frame structure over the intake area, ball mill crushing and floatation circuits. The reclamation bond amount is $55,031,000 for 756 acres. The bond amount review and escalation was approved and completed in 2019. The next escalation date is September 29, 2021.

There is a current outstanding Division Directive dated April 12, 2020, pertaining to therelease of tailings, from the tailings pipeline. The reportable amount for the event was minimal, but pipeline tailings releases have been a repeating occurrence. A remedial engineering solution is under design and implementation.

There are no outstanding compliance issues or corrective actions associated with theCopperton Concentrator permit at this time.

North Tailings Impoundment, M/035/0015

This permit includes the north tailings disposal site and associated facilities which include, but are not limited to, the tailings impoundment area, access roads and water management system. The top surface of the north tailings impoundment is currently active and reclamation has not been started. A large majority of the side slopes of thenorth tailings impoundment have been re-vegetated; and concurrent reclamation continues with the revegetation on the upper lifts as the slopes are constructed. No vegetation release has been requested from OGM. The reclamation bond amount is
$22,166,333 for 3334 acres.

There are no outstanding compliance issues or corrective actions associated with theNorth Tailings Impoundment permit at this time.

Bonneville Borrow, M/035/0046

This permit includes a borrow source for engineered materials used for construction. Most of this site is undisturbed. There are no facilities at this site. The reclamation bondamount is $5,290,096 for 118 acres. The bond amount is current. The Division is currently working with the Operator for the escalation adjustment with an escalation date of 2025.

There are no outstanding compliance issues or corrective actions associated with theBonneville Borrow permit at this time.

State of Utah

SPENCER J. COX
Governor

DEIDRE M. HENDERSON
Lieutenant Governor

Department of Natural Resources
Division of Oil, Gas and Mining

BRIAN C. STEED
Executive Director

JOHN R BAZA
Division Director

TO: Doug Bacon, Utah Division of Environmental Response and Remediation

FROM: Kim Coburn, Utah Division of Oil, Gas and Mining

DATE: February 11, 2021

SUBJECT: Compliance Summary of Rio Tinto Kennecott Mining Permits – West side of the Oquirrh Mountain Range

Introduction

Douglas Bacon from Department of Environmental Quality (DEQ), the Division of Environmental Response & Remediation (DERR) contacted the Division of Oil, Gas andMining (Division) on February 2, 2021 requesting an assessment of Rio Tinto Kennecottcompliance with their permits associated with the Bingham Canyon Mine.

Mr. Bacon requested this data as part of his 5-year review under CERCLA authorities US Environmental Protection Agency Region 8 and DERR. Under a 1995 Memorandum of Understanding the CERCLA authorities and KUC (now Rio Tinto Kennecott) agreed to useState of Utah DEQ authorities as appropriate to manage activities.

The DERR defined Kennecott South Zone area overlaps the permits of the Division where the east side (Salt Lake County) of the Oquirrh Mountain Range is summarized inanother memo done by Leslie Heppler of the Division. The purpose of this memo is to summarize the West Side (Tooele County) of the Oquirrh Mountain Range which is primarily composed of Carr Fork/Pine Canyon Mine (M/045/0004).

The primary responsibility of the Division is surface mine reclamation. The authority of Division is derived from the Utah Mined Land Reclamation Act, UCA 40-8, and Utah Administrative Code Title R647. The above Rio Tinto Kennecott permit is currently in compliance with the Division. There are no outstanding compliance issueswith any of the above listed permits at this time.

Permit Compliance Summary

Carr Fork/Pine Canyon Mine, M/045/0004

This mine was original operated by The Anaconda Company and is now operated by Rio Tinto to drain the Bingham Canyon Pit (M/035/0002) where the water is pumped from old underground mine workings to be utilized in Tooele Valley. While there are pumps in this permit area are associated with the Bingham Canyon Pit Permit, the remaining Carr Fork/PineCanyon Facilities consist of several post law structures associated previous mining endeavorsincluding but not limited to fencing, buildings, and powerlines. Much of the site has been reclaimed from the previous operator such as at the mouth of the Canyon. These structures areinspected by the Division on an annual basis and the bond (held separately from the BinghamCanyon Pit) is reviewed on a 5-year basis per R647-4-113-6.12.

There are no outstanding compliance issues associated with the Carr Fork/Pine Canyon Mining permit at this time. It should be noted that on July 9, 2019 the Division had to return a duplicate surety check that was received from the Operator due to double payment.

O:\M045-Tooele\M0450004-PineCanyonMine\Draft\RTMemo02112021KMC.docx

Rio Tinto Kenneoctt
4700 Daybreak Parkway
South Jordan, Utah 84009
T 801-204-2000
F 801-204-2888

February 25, 2021

To: Ken Wangerud, US EPA Region 8 and Doug Bacon, Utah DERR

Subject: Five Review for Operable Unit #2 (OU2); Post-Mining Water Management Plan

From: Brian Vinton, Principal Advisor, Rio Tinto/Kennecott, Water Quality

Date: February 2021

Introduction

Kennecott Utah Copper LLC (RTKC) is working with Utah Division of Environmental Response and Remediation (DERR) and the US Environmental Protection Agency (EPA), Agencies, on a five-year review (2021) of OU2, specifically reporting on any changes to the post-mining OU2 Water Management Plan, submitted to the Agencies in 2002. Requirements for post- mining water management and disposal of treatment residuals are to be updated formally as part of the 5-Year Reviews (as required under the Operation, Maintenance and Replacement Plan, OM&R Plan, 2009). At least three years prior to closure, RTKC will prepare a preliminary engineering design for all aspects of post-closure acid plume water treatment (OM&R Plan, 2009). Prior to mine closure a replacement treatment system and repository for treatment residuals will be designed and constructed. Also, as part of the five-year review, RTKC is to provide relevant information for current Zone A remedial activities.

Post-Mine Water Management Plan for OU2

The Record of Decision (ROD) issued in December 2000 regarding the KUC South Facilities Groundwater Plume documented the preferred remedial alternative as containment and extraction of the acid plume, followed by treatment. Neutralization of acidic mine-related waters was and is generally accomplished by mixing with tailings from the Copperton Concentrator, which has historically contained excess neutralization capacity. Lime treatment would be used in post-mining and the residuals from treatment would be conveyed through existing infrastructure to the North Tailings Impoundment. In the 2002 plan other alternative locations were discussed to receive and store the residuals and these alternative locations can be carried forward for purposes of this 5-year review.

RTKC has continued to investigate alternative treatment technologies, particularly ones that have the potential to decrease both lime consumption and sludge volumes. The treatment of acidic water from the Zone A area also includes the inclusion of acid rock drainage (ARD) water from the Bingham Mine area (mine water). The Bingham Mine area contains more than five billion tons of waste rock and much of this rock will generate acid for many years and likely will need treatment into perpetuity. Post mine life, treatment of Bingham mine related water along with Zone A water will take place at a common lime treatment facility, configured at the current site of the Copperton Concentrator. This replacement strategy

has not changed since the conceptual post-mining plan was first submitted in 2002.

Past and Current Water Quality

Kennecott carried out lime testing of Acid Well #1 (ECG1146) and mine water in 2002 to come up with the conceptual lime treatment system for the acidic flows from the Kennecott South Zone. Since the original testing, RTKC has conducted high density sludge (HOS) lime precipitation testing (in 2008) and evaluated infrastructure, including how and where to store residuals, completed in 2014.

Since the original testing in 2002 RTKC added Acid Well #2 (BSG1201), #3 (BSG2784), and has observed over time chemical changes in the plume and in the mine water. The acidity in both the wells and the mine water has decreased significantly and will require less lime to be neutralized than when the 2002 calculations were made.

Acidity concentrations are measured by titrating water with a strong base and reported in calcium carbonate equivalents and used to calculate the lime demand for the water treatment system. Acidity measurements since 2002 for the Zone A wells and the mine water are included in Table 1 below. The average annual acidity is derived for each sample location per year by adding respective data and dividing by the number of samples. The overall average acidity for all water can be calculated by using the weighted average for each of the source water. In each of the Zone A acid extraction wells and the commingled plume water and mine water (as measured at RTKC's Waste Water Disposal Pump Station, WWDPS), sample ID BYP2538, is denoted.

Table 1: Average Annual Acidity (mg/I) since 2002 for Zone A wells and Mine Water

Year	ECG1146	BSG1201	BSG2784	All Combined Acidic Flows from RTKC South End (BYP2538) at WWDPS
2002	13320	Not in production	Not in production	10955
2003	11867	4533	Not in production	9467
2004	10652	3620	Not in production	8139
2005	8900	3240	Not in production	7508
2006	8705	2893	Not in production	7438
2007	6587	2618	3280	5491
2008	7716	3453	3052	6078
2009	6000	2463	2885	5284
2010	4677	2130	1863	6007
2011	4050	1598	1578	3977
2012	4860	2058	1828	4758
2013	4788	1935	1900	4519
2014	4300	1808	1763	3811
2015	4145	1670	1645	2861
2016	3902	1616	1512.5	3032
2017	3762	1612	1525	2638
2018	3640	1570	1432	2588
2019	3575	1348	1173	2493
2020	3042	1430	1175	2328

Acid wells are sampled quarterly and the WWDPS is sampled monthly.

RTKC continues to pump all three acid wells in Zone A and the combined flow rate in 2020 averaged 1325 gallons per minute (gpm). The wells are pumped on a year-round basis. All water from WWDPS, which represents all acidic flow from RTKC's south area, is routed to RTKC's tailings lines.

RTKC has developed a Post-Closure Acidic Water Treatment Cost Model and periodically updates assessments of lime demand for current and future demands. The model is a spreadsheet that considers flows, acidity content and calcium to calculate lime demand. It also contains all facets for costs associated with the lime treatment including but not limited to labor, reagents (lime and soda ash), handling and sludge disposal. For the lime demand updates, flows, acidity and calcium numbers are updated in the spreadsheet for each acidic flow at Kennecott. Alkalinity in the form of calcium is also included for concentrate flow from the Zone A RO Plant since it is and will continue to be comingled with the treated water post mine life. Since the analytical data for the various acidic flows, mainly effluent from the waste rock and acid well extraction, is available from regular sampling, the model results for lime demand can be kept current and without limitations. Based upon acidity trends, as presented in Table 1, the model's predictability is considered to be reliable.

There are a number of variables that affect the lime demand. The lime demand is dependent on concentration of acidity and volume of water. From 2002 to present, the acidity concentration has decreased approximately 75 percent in the acid plume and continues to decline. In addition, after all three acid extraction wells were in production with the main purpose of reducing and/or containing the acid plume, the volume of water pumped has decreased due to water table decline and the plume size and acidity has continued to decrease. The decrease of acidity in the plume water has followed the predicted curve. As the highest concentrations decrease rapidly from the most transmissive portion of the aquifer during pumping, less transmissive portions of the aquifer are drawn on and peripheral cleaner water is pulled to the extraction wells and with a resulting decreased acidity.

Lime Demand Comparison

In 2002, only acid well ECG1146 was being pumped at about 1000 gpm and the acidity in 2002 was 13,320 mg/I. 80 tons per day of lime was determined by the model to adjust the aqueous pH to 7. For comparison in 2002, the WWDPS average acidity was 10,955 mg/I and total acidic flows averaged 3200 gpm, necessitating 210.6 tons per day of lime.

In 2020, the combined flow from the acid extraction wells was 1325 gpm, and the weighted average of acidity was 1993 mg/I equivalent CaC03. 15.9 tons per day of lime would require be required to adjust the aqueous pH to 7. For comparison in 2020, the WWDPS average acidity (representing all acidic flows, 12 samples) was 2328 mg/I equivalent CaCo3 and total average acidic flow was 3800 gpm. This would necessitate 53.1 tons per day of lime to adjust the aqueous pH to 7.

Comparatively, the average daily lime demand for extracted acid plume water has dropped approximately 80%. The average daily lime demand for all acidic flows has dropped approximately 75%. These successive reductions in lime demand over 18 years suggest that lime neutralization of acidic flows post mine closure are currently not a limiting factor to the ongoing treatment of acidic flows in the tailings circuit.

Conclusion

Management of acidic flows, treatment of acidic plume water will continue as is in the tailings pipeline as designed. RTKC will continue (as noted in the OM&R Plan, 2009) to update the planning for post-mining water management and update the Agencies if substantial changes are made to the current conceptual plan.

APPENDIX F – PRESS RELEASE & INTERVIEW FORMS

PUBLIC NOTICE
Kennecott South Zone Site
Five Year Review
Salt Lake County, Utah

The Utah Department of Environmental Quality (UDEQ), in cooperation with the U.S. Environmental Protection Agency (EPA), is conducting a Five-Year Review of the Kennecott South Zone (Site). The Site is located in Salt Lake County about 10 miles southwest of Salt Lake City, and in Tooele County about 6 miles southeast of Tooele City. Portions of the Kennecott South Zone include the municipalities of West Jordan, South Jordan, Riverton, Herriman, and unincorporated areas of Salt Lake and Tooele Counties.

The site is composed of historic mining areas contaminated with mine wastes, down gradient areas where wastes have migrated, and groundwater affected by acidic water discharges associated with mine activities. Response actions were performed at Operable Units (OUs): OU-1: Bingham Creek, OU-2: Southwest Valley Groundwater Plumes, OU-3: Butterfield Mine & Canyon /Creek, Herriman Residential & Agricultural Lands, OU-4: Large Bingham Reservoir, OU-5: Arco Tails, OU-6: Lark Waste Rock & Tailings, OU-7: South Jordan Evaporation Ponds, OU-10: Copperton Soils, OU-17: Bastian Sink, OU-18: Acid Mine Drainage (including Tunnel & Dump sites), OU-20: Pine Canyon, OU-24: Precipitation Plant (including Copperton Concentrator, Railroads, and Tunnels) and OU25: Kennecott Historic Facilities.

What is a Five-Year Review? The purpose of a Five Year Review is to determine whether or not cleanup and other actions taken at the site are protective of human health and the environment. The Five-Year Review will include a review of site documents, community interviews, and a site inspection to evaluate all remedy components as well as the status of land-use controls. Upon completion of the review, a report will be made available to the public.

To review previous Five Year Review reports and other site-related files:
The Administrative Record for the Site includes all reports and documents used for the Kennecott South Zone and is available for public review at:

Utah Department of Environmental Quality
Multi Agency State Office Building
195 North 1950 West (First Floor)
Salt Lake City, Utah 84116
Phone: 801-536-4100

Project documents are available online at: HYPERLINK "http://eqedocs.utah.gov/"http://eqedocs.utah.gov using the search phrase "Kennecott South Zone." You can also find information about the Kennecott South Zone site on the EPA Website at: http://www2.epa.gov/region8/kennecott-south-zone-bingham#9

If you would like more information on the Five Year Review or participate in an interview, please contact:

Doug Bacon
UDEQ/DERR Project Manager
Phone: (801) 536-4282
Email: dbacon@utah.gov

Dave Allison
UDEQ/DERR Community Involvement
Phone: (801) 536-4479
Email: dallison@utah.gov

1302141 **UPAXLP**

Kennecott South Zone Superfund Site
Five-Year Review
Interview of Local Agencies

Site Name: Kennecott South Zone EPA ID: UTD000826404	Date: 9 December 2020
Type of Contact: Teleconference	Contact Made By: Dave Allison, UDEQ/DERR Community Involvement Coordinator, and Doug Bacon UDEQ/DERR Project Manager
Person Contacted	
Teresa Cockayne, Remediation Senior Advisor - Environment Jason Hill, Principal Advisor, Land and Remediation Brian Vinton, P.G. Principal Advisor, Water Quality	Rio Tinto Kennecott Copper 4700 Daybreak Parkway South Jordan, Utah 84095 www.riotinto.com

1. Is your organization/department aware of the Kennecott South Zone Superfund site and the actions underway to address environmental contamination? Teresa Cockayne, Remediation Senior Advisor, and Jason Hill, Principal Advisor-Land and Remediation, have worked on South Zone cleanup areas for nine years with Rio Tinto Kennecott. Brian Vinton, Principal Advisor for Water Quality for Kennecott has over 30 years of experience. Project Managers have current responsibilities for remediation and operations and maintenance of CERCLA projects and groundwater cleanup involving the Zone A Plume treatment plant. The Rio Tinto Kennecott Project Managers have a working and institutional knowledge regarding the South Zone cleanup areas and related ongoing mining operations.

2. What's your overall impression (your general sentiment) of the actions performed at the Kennecott South Zone Superfund Site? Rio Tinto managers said the South Zone soils and Zone A plume groundwater areas have progressed within working criteria of EPA and UDEQ. Mitigation plans were completed with UDEQ and EPA with overall progress being made and have accomplished what they set out to do. Institutional Controls (IC's), Storm Water Protection Plans, Land Use Controls are working to meet Quality Assurance Objectives and working with minimal adjustments.

Work has been completed to address stormwater drainage areas and retention basins, as well as enhancing stability with the reinforcing of waste rock pile slopes. These areas were susceptible to large rain events and were made within the last five years. Project managers said what we have is working well to keep remedial areas confined and protective.

3. Does your office conduct routine communications and/or activities (site visits, inspections, reporting activities, participation in meetings, etc.) for the Kennecott South Zone Superfund Site? If so, please briefly summarize the purpose and results of these communications and/or activities over the past several years. As an operating facility, Managers said Rio Tinto Kennecott have a variety of permits regarding land, water, and air to manage environmental cleanup activities at South Zone sites. Mangers said they work within a number of federal and State programs with authority to oversee the work pursued by Kennecott and other third parties (local municipalities with IC's). Rio Tinto managers said there is good reporting, inspections, operations and maintenance, all tied into the Site Management Plan.

Project Managers said they regularly inspect and maintain controls put in place as part of the stormwater protection system to mitigate any potential impacts to surrounding communities. A groundwater annual report and Zone A plume data is shared with the South Zone Technical Review Committee which includes local, State, and EPA representatives. Coordination calls are ongoing with UDEQ to discuss any issues, rising concerns, and assistance moving forward to implement controls.

4. Are you aware of any community concerns regarding the Kennecott South Zone Superfund Site or its operation and administration? If so, please give details. Rio Tinto Project Managers said they were not aware of any community concerns related to South Zone sites and they work to address any area development growth issues and third-party management of undeveloped soils east of the mine. The Herriman soils/developments and potential Daybreak Communities expansion require local land use controls and management plans for construction projects.

In 2016, Rio Tinto Kennecott Managers worked with the Jordan Valley Water Conservancy District and Salt Lake Valley Health Department to address West Jordan water users reporting a colored water issue. Adjustments and treatment for sources of iron and manganese were made to the West Jordan wells to resolve the issue. Unrelated to CERCLA, sometimes the community calls Kennecott on fugitive dust events at the mine which Rio Tinto takes seriously to address when reported.

5. Over the past five years, have there been any complaints, violations, or other incidents (e.g., vandalism, trespassing, or emergency responses) at or related to the Kennecott South Zone Superfund Site requiring your office to respond? If so, please give details of the events and results of the response. Rio Tinto Project Managers could not recall any incidents or emergencies requiring a response. Gates and road barriers keep the public off Kennecott property. Regarding trespassing, a former grain silo structure the public could access needed to be removed for safety reasons. No other incidents related to the management of clean up areas and groundwater management.

6. Do you feel well informed about the site's activities and progress over the last five years? Do you know how to contact the Environmental Protection Agency if you have questions or concerns about the Kennecott South Zone Superfund Site? Rio Tinto Project Managers said the institutional knowledge with the UDEQ and EPA project managers is appreciated and has enabled good communication and working approaches to site management. Regular meetings, work groups, and field trips have provided opportunities to share data, bring items forward, and keep stakeholders involved with current activities.

7. Over the past five years, have there been any changes in your department's policies or regulations that impact the Kennecott South Zone Superfund Site and/or your role? If so, please describe the changes and the impacts. Rio Tinto Project Managers said there were not any notable changes to policies. Management plans have remained straight forward and each area is handled on a case by case basis looking at future resources to evaluate any potential issues.

8. Over the past five years, have there been any changes in land use surrounding the Kennecott South Zone Superfund Site? Are you aware of potential future changes in land use? If so, please describe. Rio Tinto Project Managers said development pressure east of the mine has and continues to grow. Working with cities in joint efforts will need to continue. There are annexation decisions being considered by local communities with undeveloped areas which may involve groundwater and soil disposal decisions.

9. Do you have any comments, suggestions, or recommendations regarding the site's management or

operation (institutional controls)? If so, what types of future problems do you think (1) could occur; or (2) would concern you and/or your department? No recommendations were made as Project Managers said remedy components are in place to manage South Zone sites effectively and groundwater extraction continues to show reduction of sulfate contaminants in the Zone A Plume. With environmental covenants, water protection plans, getting I. C.'s in place, and a need to keep evaluating any risks, Project Managers said they have the resources to keep development and cleanup areas protective.

Kennecott South Zone Superfund Site
Five-Year Review
Interview of Local Agencies

Site Name: Kennecott South Zone EPA ID: UTD000826404	Date: 11 December 2020
Type of Contact: Teleconference	Contact Made By: Dave Allison, UDEQ/DERR Community Involvement Coordinator, and Doug Bacon UDEQ/DERR Project Manager
Person Contacted	
Lizel Allen, Storm Water Construction Supervisor Dan Moore, Manager SLVHD hazardous waste Supervisor	Salt Lake Valley Health Department and Salt Lake County Flood Control Bureau of Water Quality and Hazardous Waste 788 East Woodoak Lane (5380 South) Murray, UT 84107 www.slcohealth.org

1. Is your organization/department aware of the Kennecott South Zone Superfund site and the actions taken/underway to address environmental contamination? Dan Moore, Manager SLVHD hazardous waste Supervisor, has worked eight years for the department. The Salt Lake Valley Health Department (SLVHD), Bureau of Water Quality and Hazardous Waste, maintains approval authority to sign off on building permit applications within Salt Lake County which includes undeveloped properties in Kennecott South Zone areas. Any contaminated properties in Salt Lake County is of interest to the department to protect the public's health, safety, and welfare.

Lizel Allen, Storm Water Construction Supervisor, has worked since 2014 in the permit program. County Flood Control permits and inspections are required for any work occurring within 20 feet of the top of the bank, 120 feet side-to-side of a creek channel. Flood Control works to reduce flooding by protecting streams, drainage channels, absorption areas and floodplains. This includes storm water discharges, installation of structures or bridges, utility line crossings, bank stabilization and landscaping.

2. What's your overall impression (your general sentiment) of the actions taken/underway at the Kennecott South Zone Superfund Site? The SLVHD Staff said the County Soils Ordinance works well and agency coordination with UDEQ and Kennecott are successful to keep the public health and the environment protected. County Staff said the partnership with UDEQ working together goes a long way keeping the public informed on the commercial and mining projects within the South Zone sites. Building trust and value between agencies helps everyone with their roles and responsibilities. County Staff said there is always room for improvement and a heads-up courtesy approach by regulators have enabled the County to stay ahead of any issues.

3. Does your office conduct routine communications and/or activities (site visits, inspections, reporting activities, participation in meetings, etc.) which pertain to or involve the Kennecott South Zone Superfund Site? If so, please briefly summarize the purpose and results of these communications and/or activities over the last five years. County Staff said they are involved in Kennecott South Zone sites with various work groups and meetings respective to UDEQ divisions and filed Rio Tinto Kennecott reports. County Staff said they do not have routine inspections outside of their permitting process for

flood control. The SLVHD participates in respective weekly coordination calls, quarterly Department calls, and annual meetings to stay informed on current activities at Kennecott South Zone areas.

4. Are you aware of any community concerns regarding the Kennecott South Zone Superfund Site, as it pertains to actions taken or underway to address environmental contamination? If so, please give details. No one at SLVHD could recall any specific community health or environmental concerns regarding South Zone cleanup sites and no issues have occurred over the last five years.

5. Over the past five years, have there been any complaints, violations, or other incidents (e.g., vandalism, trespassing, or emergency responses) at or related to the Kennecott South Zone Superfund Site requiring your office to respond? If so, please give details of the events and results of the response. County Staff said they were not aware of or notified of any incidents requiring their response to South Zone Sites regarding flood events or soil removal construction activity.

6. Do you feel well informed about the activities and progress over the last five years at the Kennecott South Zone Superfund Site? Do you know how to contact the Environmental Protection Agency and/or UDEQ – DERR if you have questions or concerns about the Kennecott South Zone Superfund Site? County Staff has good communication and coordination with UDEQ with monthly and quarterly report meetings involving Kennecott related projects. The County Staff can reach project managers and appreciate timely updates, sometimes weekly, with any site development issues.

7. Over the past five years, have there been any changes in your department's policies or regulations that might impact the Kennecott South Zone Superfund Site from a perspective of land use, water rights, redevelopment, and site management? Any changes to your role? If so, please describe the changes and potential impact each might have. County Staff said there has not been any changes regarding managing KUCC South Zone Sites cleanup sites and drainage areas which have environmental health and flood control permits. The SLVHD oversees an institutional control Soils Ordinance (Title 9 Chapter 9.5) which handles construction activities in mapped overlay cleanup areas through required permits ensuring public health procedures are in place. Property owners are responsible for ensuring development or construction permitted by the County. County Staff said development in Kennecott South areas has been extensive and Flood Control is watching stormwater impacts from high density planned communities, open space, and agricultural areas.

8. Over the past five years, have there been any changes in land use surrounding the Kennecott South Zone Superfund Site to your knowledge? Are you aware of potential future changes in land use? If so, please describe including any concerns you and/or your agency might have with land use changes. County Staff said Salt Lake County continues to grow at a rapid pace which places an importance for agency coordination to better manage Kennecott South Zone Sites. Municipal annexation of unincorporated areas and increasing development in the area, both commercial and residential, bring more areas to keep track of for the County. The County created Metro Districts to implement regional planning to manage development which includes areas in the Kennecott South Zone and the soils ordinance. The County said the soils ordinance works well identifying soils management areas however coordination with County planners and regulators is necessary to achieve protectiveness goals.

9. Do you have any comments, suggestions, or recommendations regarding the Kennecott South Zone Superfund Site management (for example, questions pertaining to institutional controls)? If you have questions or are aware of potential problems in the future, what problems might arise? What are your agencies' concerns if such do arise? The County soils ordinance and UPDES requirements are

working well and remain in place safeguarding future development within the Kennecott South Zone areas. The County wants to continue to coordinate with UDEQ and EPA overseeing Kennecott South Zone operations and legacy mine waste on county property.

Kennecott South Zone Site
Five-Year Review
Interview of Local Agencies

Site Name: Kennecott South Zone EPA ID: UTD000826404	Date: 17 December 2020
Type of Contact: Teleconference	Contact Made By: Dave Allison, UDEQ/DERR Community Involvement Coordinator, and Doug Bacon UDEQ/DERR Project Manager
Person Contacted	
Allen Packard, Chief Engineer and Assistant General Manager Shazelle Terry, Assistant General Manager, Operations & Maintenance	Jordan Valley Water Conservancy District (JVWCD) 8215 South 1300 West West Jordan, UT 84088 www.jvwcd.org

1. Is your organization/department aware of the Kennecott South Zone site and the actions taken/underway to address environmental contamination? Alan Packard is chief engineer and assistant general manager since 2007 and his responsibilities include oversight of the Engineering Department, strategic and long-term planning, and new initiatives. Shazelle Terry, Assistant General Manager, oversees employee groups at the District who perform core functions regarding water quality, treatment, and delivery.

The Jordan Valley Water Conservancy District (JVWCD) owns and operates the Jordan Valley Southwest Groundwater Reverse Osmosis (RO) Treatment Plant constructed as part of a Natural Resource Damage Claim agreement (2004) which treats Zone B sulfate contaminated groundwater impacted by historic mining activities. Rio Tinto/KUCC operates a similar reverse osmosis facility near the Bingham Canyon mine to clean up contaminated water in the deep groundwater referred to as Zone A. The JVWCD plant provides drinking quality water to several communities in the Southwestern part of the Salt Lake Valley.

2. What's your overall impression (your general sentiment) of the actions taken/underway at the Kennecott South Zone Site? The JVWCD Engineers said the actions taken to clean up the Zone B sulfate plume are working well. Rio Tinto has been a diligent and good partner to work with and a willingness to share information on the project. Everyone is doing a good job and great to work with and successful so far.

3. Does your office conduct routine communications and/or activities (site visits, inspections, reporting activities, participation in meetings, etc.) which pertain to or involve the Kennecott South Zone Site? If so, please briefly summarize the purpose and results of these communications and/or activities over the last five years. The JVWCD Engineers said they conduct monthly monitoring reports, sampling data, bird egg surveys to UDEQ and other permitting divisions. Regular plant monthly meetings for amounts and issues as well as reverse osmosis operating reports are routine activities. The JVWCD participates in the South Zone Technical Review Committee (TRC) with UDEQ and EPA to evaluate documents for both the CERCLA and Natural Resource Damage (NRD) projects. The JVWCD also provides an annual report to regulators on treatment and operations.

4. Are you aware of any community concerns regarding the Kennecott South Zone Site, as it pertains

to actions taken or underway to address environmental contamination? If so, please give details. The JVWCD Engineers have not heard any negative concerns from the community and are in compliance with all drinking water regulations. The District does apply for a UPDES discharge permit every five years and environmental groups are able to provide comments. The RO treatment plant process requires byproduct water discharged to Gilbert Bay in the Great Salt Lake of which environmental groups have an interest. JVWCD also said there are rare calls from residents moving into South Jordan regarding water questions based upon cleanup history of which there are no reasons for concern.

5. Over the past five years, have there been any complaints, violations, or other incidents (e.g., vandalism, trespassing, or emergency responses) at or related to the Kennecott South Zone Site requiring your office to respond? If so, please give details of the events and results of the response. The JVWCD Engineers said no incidents or vandalism have occurred for any of their facilities. The JVWCD mentioned a rare 12-minute power failure at the treatment plant within the last five years which required a discharge into the Jordan River. The discharge was reported to the State Division of Water Quality as required and modifications were made to prevent a recurrence. There was also a colored water complaint in West Jordan related to the Kennecott RO plant. JVWCD said they received fantastic coordination from Kennecott and the Salt Lake Valley Health Department to quickly resolve a manganese issue causing the problem.

6. Do you feel well informed about the activities and progress over the last five years at the Kennecott South Zone Site? Do you know how to contact the Environmental Protection Agency and/or UDEQ – DERR if you have questions or concerns about the Kennecott South Zone Site? The JVWCD Engineers said they feel well informed and have good communication with UDEQ regulators without any problems getting a hold of project managers at UDEQ.

7. Over the past five years, have there been any changes in your department's policies or regulations that might impact the Kennecott South Zone Site from a perspective of land use, water rights, redevelopment, and site management? Any changes to your role? If so, please describe the changes and potential impact each might have. The JVWCD Engineers said no changes as far as treatment services. The District does adjust planning to accommodate growth issues, operation and maintenance efficiency, repair aging and build new infrastructure and adapt service rates to annexed communities. None of which affects the mission for cleanup of the Zone B sulfate plume.

8. Over the past five years, have there been any changes in land use surrounding the Kennecott South Zone Site to your knowledge? Are you aware of potential future changes in land use? If so, please describe including any concerns you and/or your agency might have with land use changes. The JVWCD Engineers said no changes in land use other than adapting to demands of the water supply to growing communities. Capital projects or construction projects for the District do not involve the movement of soils for any significance. The District said the Zone B plume chemistry is consistent with robust historical data and do not expect conditions to change regarding land use development.

9. Do you have any comments, suggestions, or recommendations regarding the Kennecott South Zone Site management (for example, questions pertaining to institutional controls)? If you have questions or are aware of potential problems in the future, what problems might arise? What are your agencies' concerns if such do arise? The District's managers said operations are working well with solid connectivity in reducing sulfate for the Zone B plume and the aquifer. The District does not see any looming issues or management concerns and the remedy is functioning according to the Record of Decision.

Kennecott South Zone Site
Five-Year Review
Interview of Local Agencies

Site Name: Kennecott South Zone EPA ID: UTD000826404	Date: 12 January 2021
Type of Contact: Teleconference	Contact Made By: Dave Allison, UDEQ/DERR Community Involvement Coordinator and Doug Bacon UDEQ/DERR Project Manager
Person Contacted	
Jonathan Bowers, City Engineer Jory Howell, Engineer	Herriman City 5355 West Herriman Main Street Herriman, UT 84096 herriman.org

1. Is your organization/department aware of the Kennecott South Zone site and the actions taken/underway to address environmental contamination? Jonathan Bowers, Herriman City Engineer, has worked for Herriman City for six years and Jory Howell, Engineer, 16 years. Both have management responsibilities regarding the institutional controls with the cleanup of soils within Herriman City and the Operable Unit (OU) 2- Zone A groundwater plume.

2. What's your overall impression (your general sentiment) of the actions taken/underway at the Kennecott South Zone Site? Herriman Engineering Staff said everything is working fine continuing along the soils management path without any difficulties and the Herriman community has largely accepted the cleanup measures in place. Herriman Engineers said that they're handling things and it's working out well for the community. Herriman is experiencing rapid growth with a number of planned developments which requires regular oversight of contaminated areas. Herriman has mapped the impacted soil areas and has a contractor review all reports regarding, design review, inspections, and building permits.

3. Does your office conduct routine communications and/or activities (site visits, inspections, reporting activities, participation in meetings, etc.) which pertain to or involve the Kennecott South Zone Site? If so, please briefly summarize the purpose and results of these communications and/or activities over the last five years. Herriman Engineering Staff said any inspections or routine activities are related to former and current cleanup of undeveloped areas requiring a remediation plan from developers. Herriman has from the very beginning of the cleanup been in largely development mode for cleanup areas. The floodplain of Butterfield Creek agricultural areas, 85 residential areas in Heriman, land use pasture lands, back or feed lots near homes were mapped by the EPA and used by the City.

Public works Inspectors work as part of any development exercise and visit properties, some of which require cleanup soils activity. City Engineering Staff review all construction plans and reports. In cases where a remediation plan is required the developer has a consultant the City requires for development discussions. Herriman uses the original EPA mapping or foot print detailing areas of concern, what the testing results were, which require a soils assessment and remediation plan.

Early on for any development request, requires a remediation plan and any sensitive soils area stating conditions for soil removal. A construction exercise and a follow-up report is provided from the developer to show how they addressed their plan and any adjustments to meet the Herriman's criteria.

For groundwater, Herriman City participates in the South Zone Technical Review Committee with other local municipalities, state and federal regulators, and Rio Tinto Kennecott project managers. Herriman keeps involved with meetings on extractions and drawdown rates regarding the Zone A plume remediation assessing groundwater cleanup.

4. Are you aware of any community concerns regarding the Kennecott South Zone Site, as it pertains to actions taken or underway to address environmental contamination? If so, please give details. Herriman Engineering Staff said there is very little if any carryover from the end of cleanup efforts in 2001 of what people perceived, with what was, and wasn't done. No general concerns over the last five years for health or the environment and an occasional concern from a developer who may have to go through steps to remediate their soil. The Herriman City Administration has also requested the Engineering Department to provide a background presentation on the cleanup history. Providing information to newly elected officials and City personnel for a better understanding of why cleanup was necessary and what is the path forward as far as development in and around Herriman.

5. Over the past five years, have there been any complaints, violations, or other incidents (e.g., vandalism, trespassing, or emergency responses) at or related to the Kennecott South Zone Site requiring your office to respond? If so, please give details of the events and results of the response. Herriman Engineering Staff could not recall any particular complaints, vandalism, or trespassing incidents. The City is sensitive to any unpermitted construction activities such as retaining walls or sheds, which are pretty rare and hard to get away with in Herriman. Any illegal dumping is hard to do as well with Herriman becoming built in a little tighter. Herriman has a requirement for grubbing or large rough grading land disturbance permit and small piles may not always be caught however larger volumes would be looked at.

6. Do you feel well informed about the activities and progress over the last five years at the Kennecott South Zone Site? Do you know how to contact the Environmental Protection Agency and/or UDEQ – DERR if you have questions or concerns about the Kennecott South Zone Site? Herriman Engineering Staff said they have regular communication with UDEQ and EPA during the year and are included in any related activities. The City knows who to call at both agencies and have a good working relationship with project managers at UDEQ and EPA.

7. Over the past five years, have there been any changes in your department's policies or regulations that might impact the Kennecott South Zone Site from a perspective of land use, water rights, redevelopment, and site management? Any changes to your role? If so, please describe the changes and potential impact each might have. Herriman Engineering Staff said their policies and regulations are working in the same capacity and have not changed from the beginning of managing soils and groundwater. Lot rezones and development do change within Herriman, none of which change the process contaminated soils are dealt with. Herriman staff said any rezones actually kick-in the remediation plan processes to get the results we want.

8. Over the past five years, have there been any changes in land use surrounding the Kennecott South Zone Site to your knowledge? Are you aware of potential future changes in land use? If so, please describe including any concerns you and/or your agency might have with land use changes. Herriman Engineering Staff said land use hasn't changed and development is winding down on properties requiring remediation. Herriman is in continuous cleanup activity all the time and sensitive soils in OU3 are running out.

9. Do you have any comments, suggestions, or recommendations regarding the Kennecott South Zone Site management (for example, questions pertaining to institutional controls)? If you have questions or are aware of potential problems in the future, what problems might arise? What are your agencies' concerns if such do arise? Herriman Engineering Staff said they do not have any recommendations and are generally, pretty happy with everyone involved and the way things are going with Herriman and South Zone Sites. As Herriman City considers annexation outside of OU3, OU5, and OU6 mapping the sensitive areas going forward will be necessary. Proposed development will involve notifying the Salt Lake Health Department and may need EPA shape files for these areas.

Kennecott South Zone Site
Five-Year Review
Interview of Local Agencies

Site Name: Kennecott South Zone EPA ID: UTD000826404	Date: 14 January 2021
Type of Contact: Teleconference	Contact Made By: Dave Allison, UDEQ/DERR Community Involvement Coordinator and Doug Bacon, UDEQ/DERR Project Manager
Person Contacted	
Jed Atherley, P.E. Consultant Chris Clinger, Senior Engineer Shane Greenwood, P.E. Supervising Senior Eng. Brad Klavano, City Engineer Dustin Lewis, Assistant City Manager Ty Montalvo, Building Jeremy Nielson, P.E. Deputy City Engineer Ana Paz, Associate Engineer	South Jordan City 1600 W. Towne Center Dr. South Jordan, Utah 84095 www.sjc.utah.gov

1. Is your organization/department aware of the Kennecott South Zone site and the actions taken/underway to address environmental contamination? South Jordan City Staff are familiar and knowledgeable of the Kennecott South Zone Sites which pertain to the City. Operable Unit (OU) 7-the South Jordan Evaporation ponds and drainage areas of Bingham and Midas creeks as well as the groundwater Zone B plume remediation are within South Jordan City.

2. What's your overall impression (your general sentiment) of the actions taken/underway at the Kennecott South Zone Site? South Jordan City Staff said the City has moved ahead since cleanup were completed without any issues including the last five years. The Daybreak residential development is well established and continues to grow with 25,000 people, the groundwater Zone B plume is shrinking without any impacts to drinking water and creek areas have not had any issues to address.

3. Does your office conduct routine communications and/or activities (site visits, inspections, reporting activities, participation in meetings, etc.) which pertain to or involve the Kennecott South Zone Site? If so, please briefly summarize the purpose. South Jordan City Staff said all capital projects, construction, commercial and residential developments, are 100-percent inspected and require appropriate permits from the City. South Jordan engineering Staff receive yearly groundwater reports from UDEQ and participate on a Technical Review Committee (TRC) for updates on Kennecott South Zone Sites. The TRC also allows for coordination with Salt Lake County, UDEQ, EPA and Kennecott managers to evaluate data and reports for both the CERCLA and Natural Resource Damage Zone B projects.

4. Are you aware of any community concerns regarding the Kennecott South Zone Site, as it pertains to actions taken or underway to address environmental contamination? If so, please give details. South Jordan City Staff have not received any negative concerns from the community over the last five years related to Kennecott South Zone Sites.

5. Over the past five years, have there been any complaints, violations, or other incidents (e.g.,

vandalism, trespassing, or emergency responses) at or related to the Kennecott South Zone Site requiring your office to respond? If so, please give details of the events and results of the response. South Jordan City Staff said there were not any incidents to respond to for the Kennecott South Zone Sites**.**

6. Do you feel well informed about the activities and progress over the last five years at the Kennecott South Zone Site? Do you know how to contact the Environmental Protection Agency and/or UDEQ – DERR if you have questions or concerns about the Kennecott South Zone Site? The South Jordan City Staff feels well informed and has good communication with UDEQ regulators with no problems contacting respective project managers at UDEQ.

7. Over the past five years, have there been any changes in your department's policies or regulations that might impact the Kennecott South Zone Site from a perspective of land use, water rights, redevelopment, and site management? Any changes to your role? If so, please describe the changes and potential impact each might have. South Jordan City has not made any changes to policy regulation of the Kennecott South Zone Sites. City maps and points of contact are updated from time to time and nothing which would impact development or site management of previously cleaned-up areas.

8. Over the past five years, have there been any changes in land use surrounding the Kennecott South Zone Site to your knowledge? Are you aware of potential future changes in land use? If so, please describe including any concerns you and/or your agency might have with land use changes. South Jordan City Staff has not had nor expected any changes to current land use plans. The City is aware surrounding communities are experiencing growth and faced with potential annexation decisions.

9. Do you have any comments, suggestions, or recommendations regarding the Kennecott South Zone Site management (for example, questions pertaining to institutional controls)? If you have questions or are aware of potential problems in the future, what problems might arise? What are your agencies' concerns if such do arise? There are future plans for possibly adding a mountain bike trail in Bingham Creek Park. South Jordan City's Master Plan incorporates information of previous cleanups near Bingham Creek areas. The City has not had any issues in the past and does not expect any issues moving forward with City building plans for the creek areas.

Kennecott South Zone Site
Five-Year Review
Interview of Local Agencies

Site Name: Kennecott South Zone EPA ID: UTD000826404	Date: 2 February 2021
Type of Contact: Teleconference	Contact Made By: Dave Allison, UDEQ/DERR Community Involvement Coordinator and Doug Bacon, UDEQ/DERR Project Manager
Person Contacted	
Duane Green, Water Director Stacie Olson, Assistant Water Director Dan Woodbury, Water Engineer	Riverton City 12830 S Redwood Road Riverton, Utah 84065 rivertonutah.gov

1. Is your organization/department aware of the Kennecott South Zone site and the actions taken/underway to address environmental contamination? Duane Green recently became Water Director and has worked for Riverton City for over 30 years. Stacie Olson, Assistant Water Director, 12 years with the City and Dan Woodbury, Assistant Public Works Director and Water Resources Engineer, with six years at Riverton. All of the managers have a variety of experience regarding the OU2 Kennecott South Zone Sites. Midas Creek is within the city limits and there is development occurring in that area and prior to treatment, Riverton had one drinking water well impacted by the Zone B sulfate concentrations. Riverton switched their seven wells over and now receive water from the Jordan Valley Water Conservancy District (JVWCD). Riverton City uses their wells for secondary water irrigation. The change occurred through a city-wide referendum because of turbidity and hardness not because of the impacts to Zone A & B sulfate plume impacts.

2. What's your overall impression (your general sentiment) of the actions taken/underway at the Kennecott South Zone Site? Riverton City Staff said although they have not had direct involvement with any South Zone cleanup regarding groundwater or soils, the City has not had any issues with their water supply or operations. Riverton City Staff said they have knowledge of the groundwater remediation and have visited the JVWCD Reverse Osmosis treatment facility. The City has not had any issues with their water supply or operations.

3. Does your office conduct routine communications and/or activities (site visits, inspections, reporting activities, participation in meetings, etc.) which pertain to or involve the Kennecott South Zone Site? If so, please briefly summarize the purpose and results of these communications and/or activities over the last five years. Riverton City Staff said they do not have any reporting, inspections, or regular communication regarding the Kennecott South Zone sites. The Zone B groundwater plume is remediated by the JVWCD and they receive very little contribution, if any, supply from this process and other than the Midas Creek drainage area, really no potentially contaminated soils within Riverton.

4. Are you aware of any community concerns regarding the Kennecott South Zone Site, as it pertains to actions taken or underway to address environmental contamination? If so, please give details. Riverton City Staff said they are not aware of any concerns and no problems with water quality or discoloration complaints.

5. Over the past five years, have there been any complaints, violations, or other incidents (e.g., vandalism, trespassing, or emergency responses) at or related to the Kennecott South Zone Site requiring your office to respond? If so, please give details of the events and results of the response. Riverton City Staff said the City works with the developers well and have not had any construction near the Midas Creek area.

6. Do you feel well informed about the activities and progress over the last five years at the Kennecott South Zone Site? Do you know how to contact the Environmental Protection Agency and/or UDEQ – DERR if you have questions or concerns about the Kennecott South Zone Site? Riverton City Staff said recent turnover on the Director level has their staff wanting to know more about the ongoing Zone B plume remediation. The opportunity to participate on the South Zone Technical Review Committee (TRC) and Kennecott South Zone Five Year Review has helped establish interest once relied upon by the previous Director. Riverton City staff and UDEQ exchanged and updated contact information moving forward to address any developing questions.

7. Over the past five years, have there been any changes in your department's policies or regulations that might impact the Kennecott South Zone Site from a perspective of land use, water rights, redevelopment, and site management? Any changes to your role? If so, please describe the changes and potential impact each might have. Riverton City Staff said there are no changes and it is business as usual for City operations.

8. Over the past five years, have there been any changes in land use surrounding the Kennecott South Zone Site to your knowledge? Are you aware of potential future changes in land use? If so, please describe including any concerns you and/or your agency might have with land use changes. Riverton City Staff said they are watching as massive developments continue along the western edge of their city and have not experienced any land use changes or impacts.

9. Do you have any comments, suggestions, or recommendations regarding the Kennecott South Zone Site management (for example, questions pertaining to institutional controls)? If you have questions or are aware of potential problems in the future, what problems might arise? What are your agencies' concerns if such do arise? Riverton City Staff did not have any management recommendations and did ask about well monitoring in place for the Zone B plume. Riverton City Staff as we grow and increase our delivery water, the City may want to turn some of their wells back on to meet demand rather than increase their contract for JVWCD water. Riverton City Staff said they wouldn't want to draw the sulfate plume into their well network and coordinating resources with stakeholders and regulators may be a future consideration to not impact plume movement.

Riverton City Staff said they would like to see the latest TRC annual report and JVWCD to become familiar with the sulfate concentrations and formulate any questions. UDEQ offered to provide those reports.

Kennecott South Zone Site
Five-Year Review
Interview of Local Agencies

Site Name: Kennecott South Zone EPA ID: UTD000826404	Date: 3 February 2021
Type of Contact: Teleconference	Contact Made By: Dave Allison, UDEQ/DERR Community Involvement Coordinator and Doug Bacon, UDEQ/DERR Project Manager
Person Contacted	
Gary Langston, Director, Land Development Rulon Dutson Director, External Relations	Varde Homes - Daybreak Communities 11248 Kestrel Rise. Rd., Suite 201 South Jordan, UT 84009 info@daybreakcommunities.com

1. Is your organization/department aware of the Kennecott South Zone site and the actions taken/underway to address environmental contamination? Gary Langston, Director of Land Development for 16 years with Daybreak Communities and Rulon Dutson Director External Relations, has 14 years and began the development. In July 2016, Varde Partners also purchased the approximately 2,500 acres of remaining undeveloped land from Rio Tinto Kennecott and at that time Daybreak Communities was established. The development includes a 67-acre freshwater Oquirrh Lake, which covers much of the reclaimed area. The Zone B groundwater monitoring well network for the Zone B sulfate plume is located within the development. The Daybreak project transformed a vacant, once-contaminated area into a thriving, sustainable community, and is a reuse model for EPA Superfund sites.

2. What's your overall impression (your general sentiment) of the actions taken/underway at the Kennecott South Zone Site? Varde Homes Managers said they're pleased with the actions being taken. The cleanup actions seem to be appropriate considering all the circumstances, and the issues being addressed and dealing with the groundwater plume.

3. Does your office conduct routine communications and/or activities (site visits, inspections, reporting activities, participation in meetings, etc.) which pertain to or involve the Kennecott South Zone Site? If so, please briefly summarize the purpose and results of these communications and/or activities over the last five years. Varde Homes Managers said they don't have a regular need to inspect or report on areas formerly cleaned up. An Operations and Maintenance (O&M) Plan Kennecott Land put into place with the regulators, the South Jordan Evaporation Ponds and Bastian Sink areas were addressed, and legacy sites have environmental covenants to keep people aware as areas are evaluated for proposed development. Managers said the O&M plan is used for a quick assessment of mapped areas and there are processes in place they rely upon.

Managers said there are a couple of elements that make it pretty clear how we need to operate from an environmental perspective. We know where the monitoring and extraction wells are and we reference them frequently as were pulling together any plans. The areas of concern are pretty well documented with the environmental covenants in the event we ever cross or approach into those areas with our work. If we do encounter any environmental issues on accident or on purpose we have the ability, with qualification, an agreement with Kennecott to take any contaminated materials for disposal to the Bluewater repository. With those elements in place it is very clear what our challenges are with our

development properties as we go on.

4. Are you aware of any community concerns regarding the Kennecott South Zone Site, as it pertains to actions taken or underway to address environmental contamination? If so, please give details.
Varde Homes Managers are not aware of any community concerns. Managers said they are very open in terms with our disclosures. We've had an open, candid, and transparent disclosure process from day one at Daybreak. To anyone looking to acquire a property we have a significant disclosure process and provide assistance any sampling information. We want to make sure everyone is comfortable, and we've met and complied with every standard we've addressed. It's important the community has confidence in what's been done and with the oversight of the agencies, sees we're involved as well.

5. Over the past five years, have there been any complaints, violations, or other incidents (e.g., vandalism, trespassing, or emergency responses) at or related to the Kennecott South Zone Site requiring your office to respond? If so, please give details of the events and results of the response.
Varde Homes Managers could not recall anything over the last five years happening rising to the level of an incident or emergency. Recently, Varde Homes has worked with UDEQ at the South Valley Water Reclamation site. A sample was inadvertently taken on our property that had a high lead elevation and we're working to resolve the issue with UDEQ. Beyond that no issues as expected.

6. Do you feel well informed about the activities and progress over the last five years at the Kennecott South Zone Site? Do you know how to contact the Environmental Protection Agency and/or UDEQ – DERR if you have questions or concerns about the Kennecott South Zone Site?
Varde Homes Managers said they were very comfortable with their communication with regulators. Varde Managers said when in doubt our first calls would be to Doug Bacon at UDEQ, Brian Vinton with Kennecott, and South Jordan City asks us to report any issues.

7. Over the past five years, have there been any changes in your department's policies or regulations that might impact the Kennecott South Zone Site from a perspective of land use, water rights, redevelopment, and site management? Any changes to your role? If so, please describe the changes and potential impact each might have. Varde Homes Managers said Daybreak is pretty well set with land use or water rights requirements. As we look at other projects, changes might be necessary if we moved outside of the Daybreak footprint.

8. Over the past five years, have there been any changes in land use surrounding the Kennecott South Zone Site to your knowledge? Are you aware of potential future changes in land use? If so, please describe including any concerns you and/or your agency might have with land use changes.
Varde Homes Managers said no changes or concerns with land use at Daybreak. There are land use changes occurring adjacent to us as a lot of those properties are zoned for agriculture for residential. We receive notifications and hear through the grapevine of developments moving west of Daybreak are being modified to be to be developed for residential or commercial. We're notified through public hearings or from development partners at South Jordan City, or have a conversation with West Jordan or Herriman or whoever. We're pretty familiar with what's going on around us and what is anticipated for the future.

Varde Managers said they've had general conversations for the near future with South Jordan City recreational or trail systems for Bingham Creek Park. No concerns, as anything typically within Daybreak footprint we're providing some open space parks and recreation and we have a Master Development Plan agreement with them.

9. Do you have any comments, suggestions, or recommendations regarding the Kennecott South Zone Site management (for example, questions pertaining to institutional controls)? If you have questions or are aware of potential problems in the future, what problems might arise? What are your agencies' concerns if such do arise? Varde Homes Managers did not have any additional comments and said the process is pretty clear and straightforward. We have excellent resources to ask questions. Varde Homes were interested in participating in future South Zone Technical Review Committee meetings and requested information to stay informed of the Zone A and B groundwater plume remediation.

Kennecott South Zone Superfund Site
Five-Year Review
Interview of Local Agencies

Site Name: Kennecott South Zone EPA ID: UTD000826404	Date: 8 April 2021
Type of Contact: Teleconference	Contact Made By: Dave Allison, UDEQ/DERR Community Involvement Coordinator, and Doug Bacon UDEQ/DERR Project Manager
Person Contacted	
Lynn de Frietas, Executive Director Joy Emory, Environmental Engineer/Technical Advisor Rob Dubuc, General Counsel	Friends of the Great Salt Lake 150 South 600 East Ste. 5D Salt Lake City, Utah 84102 www.fogsl.org

1. Is your organization/department aware of the Kennecott South Zone Superfund site and the actions underway to address environmental contamination? Yes, FOGSL's mission is to preserve and protect the Great Salt Lake Ecosystem through education, research, and advocacy. Ms. Lynn De Freitas is the Executive Director of Friends of the Great Salt Lake (FOGSL) founded in 1994 and has led the nonprofit organization since 1997. Ms. Joy Emory is an environmental engineer supporting FOGSL missions of environmental protection. Both of which are on the South Zone Technical Review Committee (TRC)which has been an advisory group to EPA and UDEQ under the CERCLA process addressing the Kennecott South Zone. Mr. Rob Dubuc serves as General Counsel and tracks any discharges to the Great Salt Lake. Ms. De Freitas, Ms. Emory, and Mr. Dubuc are very knowledgeable of Kennecott mining impacts and continue to communicate issues to the public to protect and preserve the Great Salt Lake ecosystems.

2. What's your overall impression (your general sentiment) of the actions performed at the Kennecott South Zone Superfund Site? FOGSL Representatives said the plume is contained, remediation is occurring, and goals are being met. We do have some issues and concerns.

3. Does your office conduct routine communications and/or activities (site visits, inspections, reporting activities, participation in meetings, etc.) for the Kennecott South Zone Superfund Site? If so, please briefly summarize the purpose and results of these communications and/or activities over the past several years. Joy Emory represents FOGSL on the South Zone TRC and said I prepare a written summary of each TRC meeting with main topics and key concerns described along with any information of a special nature and share that with Lynn de Freitas. FOGSL works on numerous other issues such as JVWCD and KUCC discharge permit issues (selenium in eggs, for example).

4. Are you aware of any community concerns regarding the Kennecott South Zone Superfund Site or its operation and administration? If so, please give details. FOGSL Representatives said they are aware of a number of community issues and concerns. Numerous pipeline spills are of concern. They seem preventable, some are very large, they take too long to resolve and they have resulted in Notices of Violation and fines. They are so frequent they have necessitated new State regulatory requirements. "No environmental damage" is said to have resulted but since the South Zone acid wells do report to the tailings line (and have their own associated conveyance pipelines) a frequent spill history is a concern.

Another concern is that significant events have occurred related to the South Zone site without notification to the TRC. One early example is the mine landslide of 2013, which was not communicated to us (the mine had to shut down, and the lack of mine tailings required the acid wells to be shut down for a time). Of course, it was in the media, but its impact on the acid well pumping should have been communicated to the TRC. A more recent example is the shutdown of KUCC's Zone A reverse osmosis water treatment plant (I think it is part of the Lost Use component of the NRD). The South Zone barrier wells report to this facility. This 2.5-year shutdown did not impact the remedy (barrier wells continued to be pumped, just not delivered as treated water to JVWCD) but it did cause Kennecott to miss its NRD goals for a year. These are components of the remedy on which TRC members are updated every year, and we would like to be notified when major changes to these occur mid-year.

A third concern is that the 150' drawdown in the aquifer (that has resulted in large part due to South Zone acid well over-pumping) has kept an ordinarily saturated part of the aquifer dry for years, preventing the re-wet/flush necessary to really clean it up.

5. Over the past five years, have there been any complaints, violations, or other incidents (e.g., vandalism, trespassing, or emergency responses) at or related to the Kennecott South Zone Superfund Site requiring your office to respond? If so, please give details of the events and results of the response. FOGSL is one of three parties overseeing the annual monitoring protocol results associated with the JVWCD permit. There have been a number of bird eggs over the last few years showing significantly elevated levels of selenium. JVWCD is continuing to modify its operation in an attempt to reduce those levels.

We exchanged several emails with Brian Hamos (State DEQ – Groundwater) about the State's response to the pipeline spills. The State's response was to regulate the pipeline as a "facility" and I questioned the validity and necessity of that.

6. Do you feel well informed about the site's activities and progress over the last five years? Do you know how to contact the Environmental Protection Agency if you have questions or concerns about the Kennecott South Zone Superfund Site? FOGSL Representatives said they are not always as informed as we'd like to be (see Question 4). Yes, we know how to contact DERR.

7. Over the past five years, have there been any changes in your department's policies or regulations that impact the Kennecott South Zone Superfund Site and/or your role? If so, please describe the changes and the impacts. None known

8. Over the past five years, have there been any changes in land use surrounding the Kennecott South Zone Superfund Site? Are you aware of potential future changes in land use? If so, please describe. FOGSL Representatives said the JVWCD effluent pipeline has discharged into the KUCC impoundment for some time. It may still be adjacent to the KUCC pipeline on their property. Is there a concern if JVWCD's pipeline leaks on KUCC property?

State prison and Inland port will bring more people and vehicles near the impoundment. This means more risk potential and exposure in the event of a breach.

Salt Lake County is currently working on its West-Plan and is seeking public input through online community engagement meetings. Great Salt Lake Shoreline (SLC, Magna + North Salt Lake),

unincorporated areas in the western portion of the County that include landscape at the foot of the Oquirrhs and potentially some of the RTKC land in the Oquirrhs are included in the footprint of this planning process. This plan will be used to prepare for growth and conservation efforts over the next 20-50 years www.slco.org/west-plan.

9. Do you have any comments, suggestions, or recommendations regarding the site's management or operation (institutional controls)? If so, what types of future problems do you think (1) could occur; or (2) would concern you and/or your department? See response to Question 4.