United States Department of Agriculture | Forest Service | Caribou-Targhee National Forest | 1405 Hollipark Drive Idaho Falls, ID 83401 208-524-7500

UNITED STATES FOREST SERVICE
REGION 4

RECORD OF DECISION

SMOKY CANYON MINE

CARIBOU COUNTY, IDAHO

October 24, 2024

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ABBREVIATIONS AND ACRONYMS

ARARs	Applicable or Relevant and Appropriate Requirements
BLM	Bureau of Land Management
BMP	Best Management Practices
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CIP	Community Involvement Plan
COPC	Contaminant (Chemical) of Potential Concern
DO	Dissolved Oxygen
ECOC	Ecological Contaminant (Chemical) of Concern
EPA	United States Environmental Protection Agency
FBR	Fluidized Bed Reactors
FS	Feasibility Study
gpm	Gallons per Minute
HHCOC	Human Health Contaminant (Chemical) of Concern
HQ	Hazard Quotient
IDEQ	Idaho Department of Environmental Quality
IC	Institutional Controls
ICIAP	Institutional Control Implementation and Assurance Plan
IDAPA	Idaho Administrative Procedures Act
LTM	Long-Term Monitoring
MCL	Maximum Contaminant Level
µg/L	Microgram per Liter
mg/kg	Milligram per Kilogram
mg/L	Milligram per Liter
MNA	Monitored Natural Attenuation
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NOAEL	No Observed Adverse Effect Level
NPK	Nitrogen, Phosphorus, Potassium
NTCRA	Non-Time Critical Removal Action
O&M	Operations and Maintenance
ODA	Overburden Disposal Area
ORP	Oxidation-Reduction Potential
PRB	Permeable Reactive Barrier
PRG	Preliminary Remediation Goals
PRP	Potentially Responsible Party
RAO	Remedial Action Objective
RO	Reverse Osmosis
ROD	Record of Decision
RI	Remedial Investigation
TRV	Toxicity Reference Value

SCM	Smoky Canyon Mine
SSHHRA	Site-Specific Human Health Risk Assessment
SSERA	Site-Specific Ecological Risk Assessment
UF	Ultrafiltration
USDA	United States Department of Agriculture
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
WDEQ	Wyoming Department of Environmental Quality
WTP	Water Treatment Plant

PART 1: THE DECLARATION

1.0 SITE NAME AND LOCATION

The Smoky Canyon Mine (SCM) Site (CERCLIS ID: IDN001002800) is located about 24-road miles due east Soda Springs, Idaho, in Caribou County. The SCM is accessed by traveling 10 miles generally west from Afton, Wyoming (Figure 1). The mining and milling operations are contained within 2,600 acres of federal phosphate mineral leases (Federal Phosphate Leases No. I-012890, I-026843, I-027801, I-27512, and I-30369) administered by the Pocatello Field Office of the United States Bureau of Land Management (BLM) and approximately 1,200 acres of Special Use Permit administered by the Caribou-Targhee National Forest (Figure 2).

2.0 STATEMENT OF BASIS AND PURPOSE

This decision document presents the Selected Remedy for the SCM Site (Figure 3). The Selected Remedy was chosen in accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), 42 United States Code §9601 et seq., as amended by the Superfund Amendments and Reauthorization Act of 1986, and, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 Code of Federal Regulations (CFR) Part 300. The Selected Remedy is a combination of these Alternatives:

- Alternative 2b - water treatment at the Hoopes Springs Water Treatment Plant (WTP), expanded to a 4000 gallons per minute (gpm) capacity, and chert/limestone covers on seeps and ponds,

- Alternative 2c - a permeable reactive barrier (PRB) downgradient of the Pole Canyon overburden disposal area (ODA), and

- Alternative 3c – Enhanced Dinwoody Covers over Target Areas.

These Alternatives are described in detail in Section 19.0 - Selected Remedy of this Record of Decision (ROD).

This decision is based on the Administrative Record for SCM, which was developed in accordance with Section 113 (k) of CERCLA, 42 United States Code §9613(k). This Administrative Record file is available for review at the United States Department of Agriculture (USDA), Forest Service (USFS), Soda Springs Ranger District office in Soda Springs, Idaho. The Administrative Record Index (Appendix A) identifies each of the items comprising the Administrative Record upon which the selection of the Remedial Action is based.

The Idaho Department of Environmental Quality (IDEQ), as a support agency, provided assistance during development of the remedial investigation (RI) and feasibility study (FS). The Wyoming

Department of Environmental Quality (WDEQ) provided comments on the Proposed Plan and expressed the desire for ongoing involvement at SCM. WDEQ provided input on this ROD. The States of Idaho and Wyoming concur with the Selected Remedy.

3.0 ASSESSMENT OF THE SITE

The response action selected in this ROD is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances, pollutants, or contaminants into the environment. Such a release or threat of release may present an imminent and substantial endangerment to public health, welfare, or the environment.

4.0 DESCRIPTION OF THE SELECTED REMEDY

This ROD selects a remedy for SCM. The Selected Remedy for the Site is a combination of treatment, engineered source controls, and other approaches and components that will work together to achieve remedial action objectives (RAOs). A key element of the remedy is treating water emanating from a large springs complex (which is a discharge point for Wells Formation groundwater and a major recharge source to surface water) to reduce contamination in surface water.

The remedy includes several other elements to evaluate and optimize the performance of source controls and treatment technologies and to ensure protectiveness. The combined remedy includes institutional controls (ICs), operation and maintenance (O&M) requirements, monitored natural attenuation (MNA), and long-term monitoring (LTM) requirements to determine the effectiveness of the Selected Remedy.

The selected remedy is a combination of Alternatives 2b (expanded WTP, Chert/Limestone covers on seeps and ponds), 2c (a PRB downgradient of the Pole Canyon ODA), and 3c (Enhanced Dinwoody Covers over Target Areas). The components of the selected alternatives are described in detail in Section 19.0 - Selected Remedy of this ROD. Briefly, the major components of these alternatives are:

- **Expanded WTP at the Hoopes Springs, Chert/limestone covers on seeps and ponds**. A pilot WTP has been operational at the site since 2015 and has demonstrated the ability to remove contamination to below regulatory levels. The capacity of this WTP will be doubled as part of the remedy. This treatment will reduce selenium concentrations in downstream surface water shortly after operation of the expanded WTP commences. It may take some time for the selenium fish tissue criterion element to be met, but water treatment will immediately reduce surface water selenium available for bioaccumulation, thereby reducing exposure to fish and other aquatic organisms. Isolated areas where contaminated water seeps from the ground and ponds in low lying areas will be covered with chert and/or limestone materials. These materials will be cobble and boulder sized and will remove the ability for human receptors to access these waters.

- **PRB downgradient of the Pole Canyon ODA**. Some contaminated water flows out of the toe of the ODA in Pole Canyon. A PRB will be installed there to treat the contaminated water before it flows into the alluvial aquifer.

- **Enhanced Dinwoody Covers over target areas**. Enhanced Dinwoody covers (Figure 4) will be constructed on target areas. Enhanced Dinwoody covers include a barrier layer where natural soils from the Dinwoody formation are amended with bentonite to reduce infiltration of precipitation. Drainage benches are a key component of these covers to remove infiltrated waters from the cover system.

The following actions were part of all alternatives considered, with the exception of the No Action Alternative, and as such will be part of each of the selected Alternatives:

- **O&M**. An O&M plan will be developed and implemented to ensure the integrity, proper functioning and performance of all engineering controls (e.g., cover systems, WTP).

- **MNA**. Monitoring of residual contaminants of potential concern (COPCs) in groundwater and surface water.

- **LTM**. Monitoring will be conducted to assess the effectiveness of various components of the remedy and progress toward achieving RAOs.

- **Institutional and Access Controls**. ICs will be applied to protect the remedy and prevent human exposure by limiting land and resource use. In addition, fences, gates, and physical barriers will be built to prevent damage to engineered and vegetated components of the remedy, and informational signs may be posted. ICs include grazing controls and land-use restrictions as-well-as deed restrictions to prevent use of groundwater as drinking water.

The overall timeline for construction is estimated to be approximately 9 years. The cost of implementing the selected remedy is approximately $163.9 million (Appendix B – Table 21).

The chert/limestone covers will be finished within the first year. The PRB will be designed in the first year and constructed in the second. Pilot studies for the expansion of the WTP will be completed within the first year, design will take 1½ years, and an additional 2 years for construction. Due to the volume of material that will be moved to complete the Enhanced Dinwoody covers, and the short construction season at the site, it is anticipated that approximately 25 acres of cover can be completed each year. The construction of this alternative is anticipated to take 9 years.

5.0 STATUTORY DETERMINATIONS

The Selected Remedy attains the mandates of CERCLA §121, and the regulatory requirements of the NCP. This remedy is protective of human health and the environment, complies with Federal and State requirements that are applicable or relevant and appropriate to the remedial action, is cost- effective, and utilizes permanent solutions.

The remedy does satisfy the statutory preference for treatment as a principal element of the remedy.

Land use restrictions are necessary to protect the integrity of the remedial action. Groundwater restrictions are necessary because the Selected Remedy will initially result in hazardous substances in the groundwater which are above levels that allow for unlimited use and unrestricted exposure. A statutory review will be conducted within five years after completion of the remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment. This review will be conducted not less than every five years after the date of the completion of the remedial action.

6.0 DATA CERTIFICATION CHECKLIST

The following information is included in The Declaration (Part 1) and the Decision Summary (Part 2) of this ROD, while additional information can be found in the Administrative Record file for this Site:

- COPCs (see Section 12.2 – Release and Transport);
- Baseline risk represented by the COPCs (see Section 14.0 –Summary of Site Risks);
- Remediation goals (i.e., cleanup goals) established for the COPCs and the basis for the goals (see Section 15.0 – Remedial Action Objectives);
- Current and reasonably anticipated future land use assumptions and current and potential future beneficial uses of surface water used in the Site-Specific Human Health Risk Assessment (SSHHRA) and this ROD (see Sections 13.1 - Current and Potential Future Land Uses, 13.2 - Current and Potential Future Use of Surface Water, 19.4.1 Available Surface Water and Groundwater Uses);
- Potential land, surface water, and groundwater use that will be available at the Site as a result of the Selected Remedy (see Sections 13.1 - Current and Potential Future Land Uses, 13.2 - Current and Potential Future Use of Surface Water, 19.4.1 Available Surface Water and Groundwater Uses);
- Estimated capital, lifetime O&M, and total present worth costs; discount rates; and the number of years over which the remedy cost estimates are projected (see Sections 17.1.7 - Cost [Surface Water], 17.2.7 - Cost [Alluvial Groundwater], 17.3.7 - Cost [Source Control Covers], 19.3 - Cost Estimate for the Selected Remedy; and Appendix B: Cost Estimate Details for Selected Remedy); and
- Key factor(s) that led to selecting the remedy (see Section 14.3 - Basis for Remedial Action).

7.0 AUTHORIZING SIGNATURE

This ROD documents the Selected Remedy for contaminated soil, surface water, and groundwater at the SCM Site. This remedy was selected by the USFS with the concurrence of the IDEQ and WDEQ (Appendix C). The Regional Forester has been delegated the authority to approve and sign this ROD.

MARY FARNSWORTH Digitally signed by MARY FARNSWORTH Date: 2024.11.22 12:23:44 -07'00'

Date_____

Mary Farnsworth
Regional Forester
USDA Forest Service Intermountain Region

PART 2: THE DECISION SUMMARY

This Decision Summary provides a description of the Site-specific factors and analysis that led to the selection of the surface water and groundwater remedies for the Site. It includes background information about the Site, the nature and extent of contamination found at the Site, the assessment of human health and environmental risks posed by the contaminants at the Site, and the identification and evaluation of remedial action alternatives for the Site.

8.0 SITE NAME, LOCATION, AND BRIEF DESCRIPTION

The SCM (CERCLIS ID: IDN001002800) located in Caribou County, Idaho, is within the Southeast Idaho Phosphate Mining Resource Area (Figure 1). The mine is located approximately 24 miles due east of Soda Springs, Idaho, and is accessed by traveling 10 miles generally west from Afton, Wyoming. The mining and milling operations are contained within 2,600 acres of federal phosphate mineral leases (Federal Phosphate Leases No. I-012890, I-026843, I-027801, I-27512, and I-30369) administered by the Pocatello Field Office of the BLM and approximately 1,200 acres of Special Use Permit administered by the Caribou-Targhee National Forest (Figure 2).

Phosphate ore is extracted from a series of pits, referred to as mine panels, located on the eastern slope of the Webster Range between Smoky Canyon and South Fork Sage Creek (Figure 2). Specific mining and mine-related areas of the Site addressed in this ROD include backfilled Panels A, B, C, D, and E; the external ODAs associated with these mine panels; and the Pole Canyon ODA. The mill and administrative and maintenance facilities are located in Smoky Canyon near the northern end of the mining operations. Mine Panel A is located immediately east of the mill, Panels B and C are north of the mill, and Panels D and E and the Pole Canyon ODA are south of the mill (Figure 2).

The Site is not listed on the National Priorities List. The RI/FS and remedy selection followed the structured process established by the CERCLA and the NCP to guide the cleanup of contaminated sites. As discussed in the Proposed Plan for the Site (USFS, 2023a), the process includes various steps leading from discovery of a site through investigation, remedy selection, and implementation of a remedy. The NCP includes procedures, expectations, and program management principles to guide the process.

The USFS is the lead agency for the Site. The IDEQ, United States Fish and Wildlife Service (USFWS), the United States Environmental Protections Agency (EPA), and the Shoshone-Bannock Tribes are support agencies. The WDEQ provided comments to the Proposed Plan and expressed the desire to be involved with the work at SCM. This ROD incorporates feedback from the WDEQ. The WDEQ is anticipated to be more formally recognized as a support agency going forward. The Potentially Responsible Party (PRP) identified for the Site did participate in

the development of the RI/FS and are anticipated to participate in the remedial action described in this ROD.

9.0 SITE HISTORY AND ENFORCEMENT ACTIVITIES

This section of the ROD provides the history of the Site and a brief discussion of the USFS removal, remedial, and enforcement activities.

9.1 History of Site Activities

Mining activities began at Smoky Canyon in 1983 and are ongoing today. Ore is recovered through open pit mining practices that follow the north-south trending Phosphoria Formation outcrop as it dips to the west. Ore is recovered from the Meade Peak Member of the Phosphoria Formation. Ore recovery occurs until the amount of overburden that must be removed to expose the ore (stripping ratio) becomes uneconomical. The overburden consists of the Dinwoody Formation (comprised of siltstone, shale, and limestone), the Cherty Shale and Rex Chert Members of the Phosphoria Formation, as well as the center waste shale of the Meade Peak Member. Overburden is used to backfill the previously mined pits and has also been placed in external ODAs just east of the pits to maintain efficient material balance as mining has progressed. Reclamation practices have changed over time, in response to the developing understanding of environmental conditions associated with releases from the overburden (primarily from the center waste shale). Current practices entail grading to a 3:1 slope, placement of a cover, application of seed and fertilizer, and sometimes planting of shrubs and trees.

9.2 History of Enforcement and Investigation Actions

Investigations to assess the impacts of phosphate mining in southeastern Idaho on human health and the environment began after several horses were diagnosed with selenosis (i.e., selenium poisoning) in 1996 and were subsequently euthanized.

In 2001, the IDEQ assumed leadership of an area-wide investigation of contamination from phosphate mining, with participation by other state and federal agencies and the mining companies with operations in southeast Idaho. These area-wide investigations led the agencies to conclude that site-specific investigations were warranted on the larger historic and active open-pit mines located in the mining district, including the SCM. These conclusions subsequently led to negotiations with Simplot, to conduct site-specific investigations at the historical mines, including the SCM.

In 2006, Simplot conducted a non-time critical removal action (NTCRA). The Pole Canyon ODA was a cross valley fill which was loading selenium to the underlying shallow alluvial groundwater system and the deeper Wells Formation. This NTCRA consisted of the installation of the Pole Canyon Creek bypass pipeline, infiltration basin, and run-on control channel.

In 2009, IDEQ, USFWS, the USFS, the EPA, the Shoshone-Bannock Tribes, and Simplot (the latter as Respondent) entered into a mine-specific legal agreement calling for Simplot to conduct investigations and develop RI and FS reports for the SCM Site. The USFS was designated the lead agency to oversee this work.

Simplot conducted an additional NTCRA in 2013. This effort capped the Pole Canyon ODA and constructed run-on control structures to minimize infiltration from precipitation and run-off.

Most of the area disturbed by mining is owned by United States and administered by the USFS. Nearby adjoining lands are privately owned ranching and farming properties.

10.0 COMMUNITY PARTICIPATION

This section of the ROD describes the USFS community involvement activities. The USFS has been engaged in dialogue and collaboration with the affected community and strived to advocate and strengthen early and meaningful community participation during the remedial activities at the Site. These community participation activities during the remedy selection process meet the public participation requirements in CERCLA and the NCP.

10.1 Community Involvement Plan

This Community Involvement Plan (CIP) specifies the community involvement activities that the USFS has undertaken, and will continue to undertake, during the remedial activities planned for the Site.

10.2 Community Meeting for the Proposed Plan for SCM

An online community meeting was held on May 2, 2023; approximately eight community members attended. At this meeting, representatives from the USFS answered questions about the Preferred Alternative for the Site. The Preferred Alternative presented at the meeting was a combination of Alternatives 2b, 2c, and 3c. The meeting was recorded and transcribed. The transcript is included as part of the Responsiveness Summary in Appendix D.

Paid notices were placed in the Caribou County Sun (the Soda Springs newspaper), the Star Valley Independent (the Afton, Wyoming, and surrounding area newspaper) and the Idaho State Journal (the Pocatello newspaper) in April 2023 to announce issuance of the Proposed Plan and provide information on public involvement opportunities.

The following reports for the Site were made available to the public during the public comment period for the SCM Proposed Plan:

- RI Report (Formation, 2014)

- SSHHRA (Formation, 2015a)
- Site-Specific Ecological Risk Assessment (SSERA) (Formation, 2015b)
- FS Technical Memo #1 (Formation, 2019)
- FS Technical Memorandum #2 (Formation, 2023)
- The Proposed Plan (USFS, 2023a)

These documents are currently located in the Administrative Record file for the Site. A public comment period was held from April 24, 2023, to May 24, 2023, and extended to June 26, 2023. Responses to the comments received during this period are included in the Responsiveness Summary (Part 3) of this ROD.

10.3 Fact Sheets

Numerous fact sheets were prepared during the planning and implementation of the RI/FS. These fact sheets were placed at the Site's repository and distributed to those community members on the mailing list.

Additionally, The USFS hosts a booth at the Caribou County Fair each year to provide information to the community. This fair is held in Grace, Idaho, around the first week of August each year and these Fact Sheets are available for distribution to the public at that booth.

10.4 Local Site Repository

The purpose of the local Site Repository is to provide the public a location near the community to review and copy background and current information about the Site. The Site's repository is located near the Site at:

Soda Springs Ranger District
410 East Hooper Ave.
Soda Springs, ID 83276-1496
Telephone: (208) 547-4356

11.0 SCOPE AND ROLE OF THE RESPONSE ACTION

In 2009, USFS entered into a settlement agreement with Simplot calling for the production of an RI/FS for the SCM.

This ROD selects a Final Remedial Action for the SCM. The Selected Remedy for SCM is a combination of engineered source controls, surface water treatment technologies, and other approaches and components that will work together to achieve the RAOs. A key element of the remedy is water treatment at the Hoopes WTP, at a 4,000 gpm capacity, to reduce selenium concentrations in downstream surface water in Sage Creek and Crow Creek; surface water would

meet the surface water standards shortly after construction of the expanded WTP. Fish tissue selenium concentrations will be met in the future. Source control is provided by the installation of Enhanced Dinwoody covers at target areas on Panels D and E. The PRB - would improve water quality in alluvial groundwater downgradient of the Pole Canyon ODA in a relatively short time frame.

Two NTCRAs have been performed as part of the Smoky Canyon Mine RI/FS and have resulted in a significant reduction of selenium releases from the Pole Canyon ODA (Figures 3 and 5). O&M and groundwater and surface water monitoring for the 2006 and 2013 NTCRAs at the Pole Canyon ODA (Figure 3) would continue as obligations under the Settlement Agreements (USFS, EPA and IDEQ, 2006; USFS, IDEQ and Tribes, 2013), which were terminated by the USFS (USFS, 2022), effective November 27, 2022, following the submittal of letters for Certification and Notice of Completion Requirements for both NTCRAs (Simplot, 2022a and 2022b). Performance evaluation for the bypass pipeline, infiltration basin, and run-on control features is conducted in accordance with the 2006 NTCRA Post-Removal Site Control (PRSC) Plan (NewFields, 2009). Performance of the 2013 NTCRA Dinwoody/Chert cover system is reviewed/evaluated per the 2013 NTCRA PRSC Plan (Formation, 2016b).

12.0 SITE CHARACTERISTICS

This section of the ROD provides a brief comprehensive overview of the Site's soils, geology, surface water hydrology, and hydrogeology; and the nature and extent of contamination at the Site. Detailed information about the Site's characteristics can be found in the RI Report for SCM (Formation, 2014).

12.1 Overview of the Site

The mining and milling operations at the Smoky Canyon Mine are contained within 2,600 acres of federal phosphate mineral leases, which includes approximately 1,200 acres of Special Use Permit administered by the Caribou-Targhee National Forest (Figure 2). The Site is defined by the 2009 Settlement Agreement and Order on Consent and includes: areas of overburden disposal associated with the mine; the areal extent of contamination associated with those features; and all suitable areas, in very close proximity to the areal extent of contamination, necessary for response action implementation. Specific mining and mine-related areas of the Site include backfilled Panels A, B, C, D, and E; the external ODAs associated with these mine panels; and the Pole Canyon cross-valley fill ODA.

Overburden disposed in backfilled panels and external ODAs is the source of selenium and other COPCs to the environment. Overburden is removed during active mining to access the underlying phosphate ore. The primary sources of selenium and other COPCs within the overburden are the sulfides and organic matter present in the mudstone and center waste shale from the Meade Peak Member of the Phosphoria Formation.

Selenium and other COPCs are released from overburden materials due to precipitation infiltrating into ODAs and leaching contaminants, with subsequent migration of dissolved constituents into groundwater water. Transport to Wells Formation groundwater and discharge to surface water via Hoopes Spring and South Fork Sage Creek springs is considered the primary mechanism for transport of selenium to the environment.

The physical setting of the different backfilled panels and external ODAs at the Site, and the type of reclamation completed on each, influences the relative importance of these sources in terms of selenium and other COPCs released and transported. Less protective covers (including direct revegetation) allow greater infiltration of precipitation resulting in larger contributions of selenium and other COPCs to the underlying groundwater.

Covers used more recently, like the Dinwoody/Chert cover, are more effective in reducing infiltration. The Pole Canyon ODA is distinct from the other ODAs at the Site because of the cross-valley fill setting with Pole Canyon Creek flowing through the ODA prior to the 2006 NTCRA, and the presence of an underlying shallow alluvial groundwater system associated with Pole Canyon Creek.

12.2 Release and Transport

Pathways for transport of selenium identified at the Site are:

- Release from backfilled panels and external ODAs and transport downward to the underlying Wells Formation groundwater at the Site. Transport in the groundwater and discharge to surface water via springs and, when pumping, discharge at the Industrial Well in the northern portion of the Site.

- Release from the Pole Canyon ODA to alluvial groundwater beneath the Pole Canyon Creek channel. This alluvial groundwater continues into northern Sage Valley and likely discharges to downgradient surface water, but the associated selenium load addition is too small to detect.

- Surface water flow through the base of the Pole Canyon ODA and into Pole Canyon Creek prior to implementation of the 2006 NTCRA and during an isolated event in 2011 when the bypass pipeline was operated at less than design capacity. Surface water runoff from other ODAs (i.e., storm water runoff and seeps from ODA toes) is contained in ponds and does not reach Site streams via the surface water pathway.

- Sediment transport from ODAs primarily during active mining and immediately afterwards (before reclamation). Sediment is contained in storm water detention basins and does not reach Site streams. The exception is Pole Canyon ODA where sediment was transported to the Pole Canyon Creek channel, primarily by a slope failure in spring 1996.

- Direct uptake by plants growing on overburden.

During scoping of the RI, as summarized in the RI/FS Work Plan (Formation, 2011), the wind dispersion and air deposition potential pathway was identified as insignificant at the Site based on findings of the Site Inspection (NewFields, 2005). Therefore, this potential pathway was not addressed in the FS.

The following metals were identified as COPCs at SCM:

- Surface water – cadmium and selenium
- Groundwater – aluminum, arsenic, iron, manganese, and selenium.
- Soil – arsenic and selenium.

13.0 CURRENT AND POTENTIAL FUTURE LAND AND WATER USES

This section of the ROD discusses the current and reasonably anticipated future land uses, and current and potential groundwater and surface water uses at the Site. This section also discusses the basis for future use assumptions.

13.1 Current and Potential Future Land Uses

Much of the SCM is on National Forest System land, including the leased areas where mining takes place. Private ranch land owned by Simplot is located in Sage Valley, immediately east of the mine panels. Other private lands (ranches and vacation homes) are located in the Crow Creek Valley south and southeast of the Site. The predominant land uses are associated with agriculture and natural resources and include crop production (primarily hay) on private lands along with cattle and sheep ranching on private and public lands. Phosphate mining, while not a dominant land use in terms of acreage, is economically important.

On USFS lands, recreational activities include hunting, fishing, camping, hiking, skiing, and snowmobiling. Additionally, these lands may be used for Tribal hunting, fishing, and ceremonial activities consistent with the heritage of the Shoshone-Bannock Tribes. No residential use occurs at or adjacent to the Site. The closest population center is the Star Valley community, which includes the town of Afton, Wyoming, and is 10 miles directly east of the Site. The town of Afton has a population of approximately 2,172 (United States Census Bureau 2020). The reasonably anticipated future uses of the land at the Site include seasonal ranching (grazing of cattle), recreation, and Tribal use.

13.2 Current and Potential Future Use of Surface Water and Groundwater

Hoopes Spring is located south of the Pole Canyon ODA and east of Panel D and E ODAs. Flow from Hoopes Springs discharges into Sage Creek downstream of the confluence of Sage Creek and North Fork Sage Creek. South Fork Sage Creek flows into Sage Creek downstream of the

Hoopes Springs inflow. Sage Creek then flows into Crow Creek. Selenium has been detected in Crow Creek.

Current uses of the surface water on and adjoining the Site include seasonal ranching (on adjacent private lands), recreation, and Tribal use of the surface water at the Site. Groundwater is not presently used adjacent to SCM and is not anticipated to be used.

The reasonably anticipated future uses of surface water at the Site include seasonal ranching recreation, and Tribal use. Residential use of the surface water and groundwater at SCM is unlikely because residential use is not allowed on USFS lands. However, future residential use may be possible on adjacent private land.

14.0 SUMMARY OF SITE RISKS

This section of the ROD provides a summary of the Site's human health and ecological risks. A SSHHRA (Formation, 2015a) for the Site was completed in 2015, which estimated the probability and magnitude of potential adverse human health and environmental effects from exposure to contaminants associated with the Site, assuming no remedial action will be taken. A SSERA (Formations, 2015b) for the Site was completed in 2015.

14.1 Summary of Baseline Human Health Risk Assessment

The risk assessment estimates what risks the Site poses if no action is taken. It provides the basis for taking action and identifies the contaminants and exposure pathways that need to be addressed by the remedial action. This section of the ROD summarizes the results of the SSHHRA (Formation, 2015a) for this Site.

Arsenic was identified as a human health chemical of concern (HHCOC) for the seasonal rancher, recreational camper, Native American, and hypothetical resident receptor scenarios, with contributions from several environmental media. For the seasonal rancher, potentially unacceptable current and future risks are from ingestion of beef. Ingestion of beef was the primary contributor of cancer risk for the seasonal rancher and arsenic was the only chemical for which cancer risk estimates exceeded the target cancer risk goal of $1x10^{-5}$. Concentrations of arsenic in vegetation are elevated in areas of the Site that have overburden at the surface, and livestock may be exposed if they graze in those areas. For the seasonal rancher exposed to Site-wide soil, livestock, sediment, surface water, and domestic water supply, thallium via the ingestion of beef accounts for the majority of the non-carcinogenic Hazard Index.

Potentially unacceptable future recreational camper, and current and future Native American risks are from arsenic in surface water. Surface water locations associated with seeps (DS-7 and LP-1) and detention basins (DP-7 and EP-2) (Figure 3) contain arsenic concentrations that exceed the Idaho drinking water standard (0.01 milligrams per liter [mg/L]). These locations contributed to exposure and lifetime cancer risks in excess of $1x10^{-5}$. Arsenic concentrations at all other surface

water and groundwater sampling locations are lower than the drinking water standard. The recreational camper and Native American receptors have a Hazard Index below 1 for non-carcinogenic constituents.

Potentially unacceptable future risks to future residents on private land are from selenium and arsenic in groundwater. Although land use and population statistics indicate that the Site is unlikely to convert to residential use, the hypothetical resident receptor was assessed for private lands in accordance with USFS guidance (USFS, 2013). Potentially unacceptable risks (cancer risks in excess of $1x10^{-5}$, and non-carcinogenic Hazard Index of 1) from selenium and arsenic were estimated for the hypothetical resident scenario in which groundwater is used for domestic drinking water supply. Selenium concentrations in groundwater exceeded the Idaho drinking water standard (0.05 mg/L) at several wells immediately downgradient of the Pole Canyon ODA, but concentrations in groundwater from all other locations were lower than the drinking water standard. These wells also contained arsenic concentrations that exceeded the Idaho drinking water standard (0.01 mg/L). Both locations are immediately downgradient of the Pole Canyon ODA and are known to be affected by past infiltration of water into the ODA, and downgradient transport in alluvial and Wells Formation groundwater. Human health risks were estimated for various exposure scenarios, based on current and reasonably anticipated future land uses, including current and future Native Americans (for example, elk hunting and harvesting vegetation by the Shoshone-Bannock Tribes), current and future maintenance or USFS workers, current and future recreational users, and current and future members of the general population. These scenarios evaluated the exposure to mining-related contaminants in environmental media (soil, sediment, vegetation, surface water, and groundwater) at the Site.

14.2 Summary of Baseline Ecological Risk Assessment

Selenium is the primary risk driver for both current and future aquatic and terrestrial biota (Formation, 2015b). Conclusions for aquatic receptors are presented by media type to reflect the risk analysis organization and regulatory framework for aquatic environments. Terrestrial risk analysis is based on ingestion of ecological chemicals of concern (ECOC) from multiple exposure media within each habitat.

14.2.1 Aquatic

Potentially unacceptable current and future risks for aquatic receptors are in:

- Surface water – selenium
- Fish tissue – selenium

Selenium is the primary risk driver in surface waters across several drainages. Other ECOCs that exceeded Toxicity Reference Values (TRVs) primarily in surface waters included aluminum, arsenic, cadmium, iron, nickel, and zinc (Formation, 2015b). Where elevated, these ECOCs do not likely represent unacceptable risk because of the very limited potential for exposure (e.g.,

seeps or ephemeral habitats) of receptors to these environments. Locations where elevated selenium concentrations exist and pose risk to aquatic receptors correspond to areas of known inputs such as Hoopes Spring and South Fork Sage Creek and their downstream receiving waters, and Pole Canyon Creek.

Selenium in fish tissue is the most reliable measure of exposure and measurement endpoint to assess potential risk for fish and other aquatic receptors in Idaho. Whole body selenium fish tissue concentrations downstream of Hoopes Spring and South Fork Sage Creek springs exceed the Idaho site-specific whole body fish tissue criterion; for Sage Creek, this is 13.6 milligrams per kilogram (mg/kg) (IDEQ, 2022). The cleanup level for selenium in the water column where fish tissue is not available is 16.7 µg/L (IDEQ, 2022) however, since fish tissue data are available, the cleanup goal is based on the fish tissue criterion.

The site-specific whole body fish tissue criterion for Crow Creek, in Idaho, is 12.5 mg/kg, which is currently exceeded at Crow Creek locations downstream of Sage Creek. The cleanup level for selenium in surface water in the water column in Crow Creek, in Idaho, is 4.2 µg/L (IDEQ, 2022). Similar to Sage Creek, fish tissue data for Crow Creek, in Idaho, are available, therefore the cleanup goal is based on the fish tissue criterion.

Crow Creek in Wyoming is subject to the Wyoming Surface Water Quality Standards (Wyoming, 2018). The cleanup standard here is the chronic value for aquatic life of 5 µg/L total recoverable selenium in the water column (Wyoming, 2018). Wyoming does not have a fish tissue clean up criteria.

As described in the SSERA (Formation, 2015b), Pole Canyon Creek at the LP-1 seep poses unacceptable risks to higher trophic level organisms that may obtain food or water from that location; however, the physical habitat does not support any fish due to lack of connectivity to fish bearing waters. North Fork Sage Creek near its confluence with Sage Creek supports fish, but higher in the drainage where the water quality sampling was conducted, habitat was not conducive to fish and tissue levels were not quantified for this stream due to flow limitations during sampling. The effective whole body selenium fish tissue criterion for North Fork Sage Creek and Pole Canyon Creek is 9.5 mg/kg (EPA, 2019). When adopting the site-specific selenium criterion for Sage Creek and Hoopes Spring, EPA disapproved application of the same criteria to North Fork Sage Creek and Pole Canyon Creek due to the lack of data. As part of EPA's disapproval of applying the site-specific selenium criterion for Sage Creek to North Fork Sage Creek and Pole Canyon Creek, EPA used the default whole body tissue value for Idaho Non-Sturgeon waters (9.5 mg/kg) and applied it to North Fork Sage Creek. Since then, additional data have been collected from North Fork Sage Creek. USFS anticipates Simplot will propose a site-specific selenium criterion for North Fork Sage Creek.

Other ECOCs that were elevated in fish tissues where data have been collected included aluminum and essential micronutrients copper, iron, and zinc. The contributions of background to tissue concentrations, as well as the reliability of the TRVs used to assess potential risks

particularly aluminum), were discussed in the Uncertainty Analysis of the SSERA (Formation, 2015b). The key ECOC for fish tissues in this system is selenium.

14.2.2 Sediment

The TRV for selenium in sediments was exceeded at Hoopes Spring, North Fork Sage Creek, and at Pole Canyon Creek. However, the TRVs for selenium in sediments are not based on effects to benthic invertebrates, but rather as potential bioaccumulation effects to organisms that consume those benthic invertebrates. Fish are the most sensitive receptor to selenium in the aquatic environment, therefore selenium in fish tissue is the most appropriate metric to assess selenium in sediments. Selenium in water and sediments is accumulated by algae which is subsequently bioaccumulated by benthic invertebrates. Fish consume these invertebrates and further accumulate selenium. The best evaluation of whether or not a location or stream exceeds the selenium risk criteria should be made relative to site fish tissue versus the tissue criteria applicable for a stream. Literature-derived tissue TRVs for benthic invertebrates, compared to concentrations measured for invertebrate tissues collected from across the Site, indicate selenium in invertebrate tissues potentially poses a risk only in lower Sage Creek. Although sediment in upper Sage Creek (upstream of inflow from Hoopes Spring) was identified as posing a risk, it was clearly a function of a single location (an irrigation ditch) where consistently higher selenium concentrations were found. However, as mentioned above, the pathway for exposure is incomplete, as connectivity to downstream waterbodies is limited and inconsistent. In addition to selenium in sediments, other ECOCs that were elevated above TRVs included barium, cadmium, chromium, nickel, manganese, silver, and zinc.

The concentration of selenium in biotic and abiotic media exceeds TRVs for aquatic receptors at certain locations (Formation, 2015b). ECOCs at the LP-1 seep (Figure 3) and in Sage Creek upstream from Hoopes Spring pose unacceptable risks; however, whether these concentrations represent significant ecological risk is often a function of habitat and connectivity of surface water to source areas or accessibility by terrestrial organisms. The LP-1 seep, at the toe of the Pole Canyon ODA, is isolated and typically disconnected from the mainstream due to installation of the Pole Canyon Creek bypass pipeline (under the 2006 NTCRA). Therefore, the potential for exposure to these concentrations is extremely limited for aquatic ecological receptors. For Sage Creek, the exceedance is located in an irrigation ditch near Sage Creek, downgradient of a detention basin, flow is ephemeral at best and no appreciable aquatic habitat is present. Because permanent aquatic habitat is limited or absent, no adverse effects on aquatic populations is likely due to the lack of exposure.

14.2.3 Terrestrial Upland

Potentially unacceptable current and future risks to terrestrial upland receptors are from selenium contained in food (vegetation, terrestrial invertebrates, and small mammals), soil, and surface water (Panel A Area 2, Panel D North and South) (Figure 6).

Selenium in soils, vegetation, and terrestrial invertebrates and small mammals is the primary risk driver at the Site (Formation, 2015b). Hazard quotients (HQs) based on the geometric mean no observed adverse effect level (NOAEL) ranged from less than 1 to as high as 20 for selenium in upland receptors. Other chemicals identified as posing potentially unacceptable risks in the Tier 1/Tier 2 analysis included cadmium, copper, lead, vanadium, and zinc; however, the risks from these ECOCs were lower than from selenium and were generally co-located with areas of selenium risk. Geometric mean HQs for all other ECOCs were 2 or less.

Elevated concentrations of ECOCs were observed primarily in mined areas with either no cover (i.e., direct revegetation of overburden) or topsoil-only reclamation and elevated concentrations of ECOCs in soils corresponded with higher exposure and risks. Risks are highest in Panel A, Area 2, Panel D North and South, and on the Pole Canyon ODA (prior to construction of the cover system in 2015 under the 2013 NTCRA) which represent areas where exposure to selenium bearing overburden materials is expected to be highest. Exposure and risks were considerably lower for northern Sage Valley, Panel A Area 1, and Panel E (Figure 6). Risks were lowest in the areas with a Dinwoody/Chert cover and highest in the areas with no cover.

Based on the SSERA conclusions, risks to sub-populations of small mammal (deer mouse, eastern cottontail) and bird (northern harrier, northern bobwhite, American robin) receptors inhabiting Panel A Area 2, and Panel D North and South (Figure 6) could not be ruled out using the available data. Exposure to the terrestrial receptors and potential risk is elevated compared to the surrounding areas, but it is unknown whether any actual effects are occurring to the populations inhabiting those areas. The habitats on the ODAs are unlikely to be large enough or of high enough quality to serve as an attractive nuisance which would result in a significant habitat sinks for the populations of the common bird species that may utilize them. However, no data are currently available to address the presence or absence of population-level effects from selenium as predicted in the SSERA (Formation, 2015b).

While no detailed population studies were conducted in those areas, small mammal sampling was successful in both 2010 and 2016, suggesting the presence of a functioning small mammal community (Formation, 2016c). In 2010, a total of seven species of small mammals, dominated by deer mice (*Peromyscus maniculatus)* and, to a lesser extent, three vole species (meadow, long-tailed, and montane), were captured in the upland areas of the mine and in Sage Valley (Formation, 2018). Both male and female deer mice and voles were captured. For the more abundant deer mice, representative animals from the juvenile, sub-adult, and reproductive adult age classes were captured. In limited sampling during 2016, both deer mice and meadow voles were captured that included age classes of both species ranging from juvenile to reproductive adults (Formation, 2018). These data suggest that an adequate source of food and habitat is present on the ODAs to support a small mammal community containing all age classes of animals. This combined with the presence of a small mammal community indicate that risks to small mammal populations at the Site are likely to be low.

14.2.4 Riparian

Potentially unacceptable current and future risks to riparian receptors are from selenium contained in food, soil, and surface water (seeps and springs).

Similar to the upland areas of the Site, selenium is the primary risk driver; however, other ECOCs were identified for riparian receptors including cadmium, chromium, copper, lead, manganese, molybdenum, vanadium, and zinc (Formation, 2015b). HQs based on the geometric mean NOAEL ranged from less than 1 to as high as 108 for selenium in riparian receptors. As indicated for the upland areas, exposure and risk associated with the non-selenium ECOCs is lower than risks predicted from selenium. Geometric mean HQs for all other ECOCs were 1.1 or less.

Elevated selenium concentrations in semi-aquatic habitats at the Site were limited to a few sampling locations. Selenium exposures were much higher than elsewhere at seeps east of Panels D and E, as well as riparian locations in Pole Canyon down gradient of the ODA (Figure 3). As described in the SSERA, wildlife at risk in riparian habitats included mammals (coyote, deer mouse, meadow vole, mink, mule deer, raccoon), waterfowl (belted kingfisher, mallard), raptors (northern harrier), game birds (northern bobwhite), and other birds (American robin, red-winged blackbird, song sparrow) (Formation, 2015b). The habitats represented by the seep and riparian area sampling locations are very small and make risks to receptor populations unlikely.

14.2.5 Livestock Receptors

Potentially unacceptable current and future risks to livestock are from:

- Vegetation – selenium
- Surface water – selenium

Selenium is the primary risk driver for livestock (Formation, 2016a). While exposure to several other COPCs, including barium, iron, manganese, and molybdenum exceeded risk benchmarks in some areas, the elevated concentrations coincided with selenium background conditions. Potentially unacceptable risks to livestock from selenium were calculated for vegetation, surface water, and groundwater (if used for stock watering in the future) and were found not to be a concern.

The greatest potential for adverse effects from vegetation is from sample locations in mine disturbance areas in the Pole Draney and Sage Valley grazing allotments where selenium concentrations exceeded the acute TRV (Formation, 2016a). Of the five grazing allotments that overlap the Site (Figure 7), only the Sage Valley Allotment contained average concentrations that exceeded the chronic TRV. Site-specific risks from selenium in surface water are restricted to seep and spring locations immediately downgradient of the Pole Canyon ODA and Panel D; however, these seep areas are typically fenced to prevent access. Overall chronic and acute risks from selenium are unacceptable primarily due to surface water and vegetation associated with

backfilled pits and ODAs in the Sage Valley and Pole Draney grazing allotments. Exposure in other allotments was within acceptable levels.

14.3 Basis for Remedial Action

The response action selected in this ROD is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances, pollutants, or contaminants into the environment. Such a release or threat of release may present an imminent and substantial endangerment to the public health, welfare, or the environment. The response action is necessary for the Site because of the following:

- **Human Health Risk**: The concentration of HHCOC exceeded their respective human health value for contaminants in, surface water and groundwater.

- **Ecological Risk**: Fish tissue selenium concentrations exceed the Idaho site-specific selenium tissue criterion element and water column selenium concentrations exceed the Wyoming Surface Water Quality Standards chronic value for aquatic life, therefore selenium in surface water may pose an unacceptable risk to fish and other aquatic organisms. Soil individual receptor-specific HQ estimates greater than 1 were associated with terrestrial birds.

15.0 REMEDIAL ACTION OBJECTIVES

The RAOs for SCM provide a general description of what the Superfund cleanup is designed to accomplish. These goals serve as the design basis for the Selected Remedy identified in this ROD.

15.1 RAOs for the Site

15.1.1 Groundwater RAOs

For groundwater, the RAOs are*:*

- Prevent future use of alluvial or Wells Formation groundwater with selenium concentrations above the maximum contaminant level (MCL) as a drinking water source.

- Reduce or eliminate concentrations of selenium in contaminated alluvial or Wells Formation groundwater to below the MCL within a reasonable time frame, given the circumstances of the Site.

- Reduce or eliminate loading of selenium from groundwater to surface water so that it does not result in concentrations that represent an unacceptable risk to aquatic life and complies

with Applicable or Relevant and Appropriate Requirements (ARARs) (i.e., Idaho Administrative Procedures Act (IDAPA) 58.01.02 – Water Quality Standards; Wyoming. Water Quality Rules and Regulations, Chapter 1: Wyoming Surface Water Quality Standards (Reference # 020.0011.1.03232015)) in the lower Sage Creek and Crow Creek watersheds.

15.1.2 Surface Water RAOs

For surface water, the RAOs are:

- Reduce or eliminate unacceptable risks to Recreational Campers or Native Americans from ingestion of non-regulated surface water (seeps and detention ponds) due to arsenic and cadmium.

- Reduce selenium concentrations in lower Sage Creek and Crow Creek watersheds to below levels that pose unacceptable risks for aquatic life and comply with ARARs (i.e., IDAPA 58.01.02 – Water Quality Standards; Wyoming. Water Quality Rules and Regulations, Chapter 1: Wyoming Surface Water Quality Standards (Reference # 020.0011.1.03232015)).

15.1.3 Soil RAOs

For soils, the RAO is to reduce or eliminate unacceptable risks to birds from overburden with elevated selenium concentrations in soil on the southern portion of Panel A.

15.2 Basis and Rationale for Remedial Action Objectives

The basis for the RAOs for the groundwater, surface water, and soil is to clean up the Site to multiple use standards (the anticipated future land use for the Site). Multiple use includes recreation, grazing, wildlife, and tribal uses.

The basis for the RAOs for the groundwater and surface water is to reduce infiltration of water on the surface of the SCM ODAs, which will reduce the load of selenium and other hazardous substances released into Pole Canyon Creek, Hoopes Spring, and South Fork Sage Creek. This will reduce selenium concentrations in downstream surface water in Sage Creek and Crow Creek which will protect aquatic life.

Most of the source control alternatives would reduce infiltration of water into the overburden, which represents a source of contamination to groundwater. These source control alternatives also allow drainage of stormwater and snowmelt to run off the ODA. This would reduce selenium concentrations in Wells Formation groundwater downgradient of the Pole Canyon ODA, Panel D and Panel E, and reduce loading of selenium from groundwater to surface water. The source control alternative for soils would prevent direct contact with or ingestion by birds of overburden

soil with elevated selenium concentrations. The water treatment alternatives would reduce selenium concentrations in downstream surface water in Sage Creek and Crow Creek.

Construction and maintenance of a stable cover system will prevent exposure of human and ecological receptors to hazardous substances in soil on the surface of the ODAs. Minimizing infiltration on the surface of the ODAs will reduce the load (concentration multiplied by volume) of selenium and other hazardous substances into Hoopes Spring and South Fork Sage Creek springs from groundwater.

15.3 Risks Addressed by the RAOs

Table 1 presents the cleanup levels for surface water and groundwater; these are based primarily on the ARARs. By setting cleanup levels for surface water and groundwater to ARARs, the remedy will reduce Site-related risks for selenium and other hazardous substances to levels acceptable for human and ecological receptors.

16.0 DESCRIPTION OF ALTERNATIVES

This section summarizes and presents the remedial alternatives evaluated in detail in the FS. Cleanup methods and technologies were evaluated for each of the following media: soils and waste rock, surface water, and groundwater.

The first alternative is the No Further Action alternative, which is required by the NCP and is used as a baseline for comparison to other alternatives. The remaining alternatives consist of water treatment and source control options.

With the exception of Alternative 1 (the No Action Alternative), all other alternatives are expected to be protective of human health and the environment and to comply with ARARs.

16.1 Common Elements of Each Remedial Alternative

Many of the remedial alternatives share basic remediation elements. While the No Further Action alternative does not include remediation, the remaining alternatives have a range of ICs in common, and the containment-based engineered cover system remedies have additional engineered elements in common.

This section describes the various common elements that are included in each action alternative. The common elements are:

- ICs
- Access Controls
- Revegetation

- O&M
- MNA
- LTM

16.1.1 Institutional Controls

Specific types of ICs that were analyzed are grazing controls and land-use controls, deed restrictions, administrative orders or consent decrees, and informational tools.

Grazing controls and land-use controls (e.g., restrictions on timing and duration of grazing or closure of grazing allotments and land-use controls to restrict access to cover areas during construction and while vegetation matures) would be implemented by the USFS on National Forest System land managed by the Caribou-Targhee National Forest as needed to restrict access to areas where a cover was installed, while the cover vegetation matures to protect the integrity of the remedial action. Grazing controls and land-use controls are included as ICs for all the source control cover alternatives.

Deed restrictions would be included in the ROD and then specified as restrictions on the property deed for private land held by the PRP in Sage Valley, to prevent access to or use of alluvial or Wells Formation groundwater as a drinking water source until cleanup levels are met. ICs would require preparation of an IC Implementation and Assurance Plan (ICIAP) that would specify how the deed restrictions would be implemented, maintained, and enforced. Deed restrictions would not be needed on USFS lands because residential use is not allowed under the Revised Forest Plan for the Caribou National Forest (USFS, 2003). The Tribes have treaty protected hunting, fishing, and gathering rights on USFS lands at the Site; however, there is no exposure pathway for the use of Wells Formation groundwater as a domestic water supply and no risk was identified for ingestion of selenium in surface water by Native Americans on public land. Deed restrictions are included as ICs for all the action alternatives.

A Consent Decree would be negotiated with the USFS, Support Agencies participating in the RI/FS process at SCM, and Simplot to conduct the remedial design/remedial action pursuant to the ROD as determined by the Agencies.

Existing State of Idaho informational tools (e.g., Idaho Department of Health & Welfare's Idaho Fish Consumption Advisory Program at fishadvisory.dhw.idaho.gov) could be used to notify recreational users of any fish advisories in streams in the vicinity of SCM and inform the public in local communities that residual contamination remains at the Site, as needed.

16.1.2 Access Controls

Signs to notify people that drinking the water is potentially unsafe could be installed at seeps (DS-7 and LP-1) and detention ponds (DP-7 and EP-2). Fencing and gates could also be used to limit access to the seep and pond areas. Because fencing and signs are temporary in nature, they are not specifically included in any of the alternatives. Instead, chert/limestone covers would be

implemented. These covers would be large sized rocks that will allow the seeps to flow while preventing access to the seeps. Access to the active mine site and areas where construction for the remedial actions is occurring would also be limited.

16.1.3 Revegetation

Revegetation would be used to limit soil erosion and to increase evapotranspiration at the surface of target areas on Panels D and E (D-1, D-ODA, and E-1n) and on a portion of Panel A. The areas to be revegetated would be properly prepared to receive seeds by ripping or scarifying the surface and drilling or broadcasting seed onto the area. All revegetation efforts would be conducted either in the spring or the fall to take advantage of high ground moisture conditions and would be conducted during the first planting season following placement of the cover to reduce the time a cover area would be exposed to erosion. Revegetation areas would be seeded with native seed mixes and plant species that are known to not be selenium accumulators. This may include the seed mix currently approved for reclamation on mitigation covers at the Mine. Seed mixes would undergo final selection and approval by the USFS during the remedial design process.

Simplot complies with the USFS Strategy for Noxious and Non-Native Invasive Plant Management (USFS, 1999), Idaho's Strategic Plan for Managing Noxious Weeds (ISDA, 1999), the Revised Forest Plan (USFS, 2003), and Executive Order 13112 – Invasive Species (USDA, 1999). The current weed control program at the SCM follows guidelines established by the USFS. Noxious weed control would be conducted in revegetated areas on cover areas and would follow current practices that include annual weed monitoring activities and annual noxious weed treatments. Simplot also complies with USFS requirements that weed-free seed, mulch, and straw bales are to be used at the Mine. Revegetation and weed-free seed, mulch and straw bales would be used for all source control cover alternatives.

16.1.4 Operations and Maintenance

Periodic O&M of the covers would be implemented to ensure their effectiveness over the long term. Inspections of covers, stormwater control systems and any fencing would be performed annually. Inspections would monitor the covers and the vegetation composition and growth. The covers would be inspected for settlement and signs of erosion and possible zones of water pooling. Vegetation growth would be monitored for indications of nutrient deficiencies, and the soil would be tested for nitrogen, phosphorous, and potassium (NPK) if signs of nutrient deficiencies are observed. Vegetation on the soil cover system would be monitored for the establishment of selenium accumulators (e.g., astragalus, aster, alfalfa, yellow sweet clover) as well as infestations of state-listed noxious weeds to prevent the formation of seed sources for unwanted plant species and promote successful growth of native grasses.

Maintenance of the covers would be performed annually, or as needed, to provide for long-term performance and integrity of the remedy. Erosion rills or low spots where water pools would be filled with Dinwoody Formation material from a borrow area or other source at the Mine. These

areas and any bare areas on the covers would be graded or raked as needed and then re-seeded with the approved seed mix. Maintenance would include reapplication of fertilizer if needed, based on agronomic analyses. If selenium accumulator or noxious weed plant species are identified on the soil cover system, herbicide spot application would be performed in accordance with the existing noxious weed control program at the Mine.

Inspections of stormwater control systems associated with the cover systems would include examining vegetated ditches, swales, and berms to ensure that there is vegetation coverage and that erosion, debris accumulation, and/or settlement have not compromised the function of the drainage structures. Riprap in drainages would be inspected for rock displacement, undercutting, erosion of the edges of the rock placement areas, weathering of riprap rock, and damage to the underlying geotextile. Inlets and outfalls would be inspected for stability, distortion, and cracking, as well as the presence of vegetation that could promote instability or impede discharge. Inspection of sedimentation, infiltration, and detention basins would include observation of the basin embankments for cracks, seepage, and/or sloughing that may be indicative of instability and for excess sediment. Spillways would be inspected for debris that would restrict flow to ensure that they are maintained in a clear, free-flowing condition.

O&M would be required to maintain the effectiveness and permanence of stormwater controls associated with the covers and would involve removal of sediment and any vegetation or woody debris and repair or replacement of riprap in drainage ditches. Geotextile and compacted fill would be added, as necessary. Embankments of sedimentation and infiltration basins would be repaired using compacted fill material. Debris and sediment would be removed from the basins and from overflow spillways.

Any fencing installed as part of a remedial alternative would be inspected to ensure that the posts and wires are stable and in working order. Damaged fencing would be repaired using posts and wire materials similar to the original fencing to restore the original, uninterrupted fence line. O&M of covers and stormwater controls would be used for all source control cover alternatives.

16.1.5 Monitored Natural Attenuation

All the alternatives, with the exception of Alternative 3e, which is a soil-only alternative, would include some level of MNA in groundwater, which relies on natural physical, geochemical, or biological processes to reduce contamination in alluvial and Wells Formation groundwater in conjunction with other source control and/or water treatment alternatives and ICs. The MNA elements of dilution and dispersion are present at the Site and would result in a reduction of selenium concentrations and a corresponding reduction in exposure pathways and risks (Hay et al., 2016). As described in EPA guidance documents (EPA, 1999, 2007, 2015), long-term performance monitoring would be required to track MNA progress over time.

The performance monitoring program would consist of a network of existing wells that provide adequate areal and vertical coverage to verify that the selenium plume in alluvial and Wells Formation groundwater remains static or shrinks and provide the ability to monitor groundwater

chemistry throughout the zones where selenium attenuation is occurring. The need for additional wells would depend on the final remedy and would be determined as part of the remedial design. The frequency of monitoring would be adequate to detect potential changes in Site conditions and the monitoring program would enable a determination of the rate(s) of attenuation and how that rate changes with time. Monitoring would focus on continued verification of contaminant removal from groundwater, but also would include tracking trends in other reactants that are part of the attenuation reaction (e.g., pH, alkalinity, ferrous iron, oxidation-reduction potential and sulfate). Performance monitoring would continue until RAOs have been achieved. MNA is included as a common element for all the action alternatives except Alternative 3e.

16.1.6 Long-Term Monitoring

Groundwater and surface water monitoring would be required to evaluate the effectiveness of the action alternatives. The LTM results would be used to support the protectiveness evaluations during the CERCLA 5-year review process.

O&M and groundwater and surface water monitoring for the 2006 and 2013 NTCRAs at the Pole Canyon ODA (Figures 3 and 5) would continue as obligations under the Settlement Agreements (USFS, EPA and IDEQ, 2006; USFS, IDEQ and Tribes, 2013), which were terminated by the USFS (USFS, 2022), effective November 27, 2022. Performance evaluation for the bypass pipeline, infiltration basin, and run-on control features is conducted in accordance with the 2006 NTCRA Post-Removal Site Control (PRSC) Plan (NewFields, 2009). Performance of the 2013 NTCRA Dinwoody/Chert cover system is reviewed/evaluated per the 2013 NTCRA PRSC Plan (Formation, 2016b). In accordance with Effectiveness Monitoring Plan Revision No. 6 (Formation 2022), semiannual surface water monitoring is conducted at 5 locations, and semiannual groundwater monitoring is conducted at 4 locations. Performance and effectiveness monitoring data would continue to be reported annually as required.

Except for the No Further Action alternative, additional Site-wide LTM would be required to evaluate the performance and effectiveness of the source control and water treatment alternatives, and the results would be used to support the protectiveness evaluations during the CERCLA 5-year review process. The monitoring network for the Mine outside of Pole Canyon would likely be a combination of existing locations (e.g., existing monitoring wells and historical surface water sampling stations) and additional locations depending on the nature and requirements of the selected remedy. Monitoring locations for fish tissue would likely be the same as those utilized in the RI (Figure 8).

16.2 Distinguishing Features of Each Remedial Alternative

No Action Alternative

The No Action alternative is required by the NCP and is used as a baseline for comparison to other alternatives. Because removal actions (i.e., the NTCRAs at the Pole Canyon ODA) have been implemented at SCM, this alternative becomes No Further Action.

16.2.1 Alternative 1 - No Action

Under Alternative 1, the No Action alternative, the in-situ biological water treatment system pilot study at Hoopes Spring would be terminated and the Hoopes WTP would be dismantled and removed. No remedial actions would be implemented. O&M and groundwater and surface water monitoring for the 2006 and 2013 NTCRAs at the Pole Canyon ODA would continue as obligations under the Settlement Agreements (USFS, EPA, and IDEQ, 2006; USFS, IDEQ, and Tribes, 2013), which were terminated by the USFS (USFS, 2022), effective November 27, 2022.

Water Treatment Alternatives

The water treatment remedial alternatives entail: (1) treatment of water emanating at the Spring Complex (to reduce selenium concentrations in surface water in Sage Creek and Crow Creek); and (2) treatment of seep water from the Pole Canyon ODA in a PRB before it infiltrates into alluvial groundwater. Three water treatment alternatives have been developed and are described below.

16.2.2 Alternative 2a – Water Treatment at the Hoopes WTP (2,000 gpm), ICs, Chert/Limestone Covers on Seeps and Ponds, O&M, MNA, LTM

Alternative 2a consists of treatment of contaminated water emanating from the Spring Complex to reduce the concentration of selenium in surface water downstream in Sage Creek and Crow Creek. This alternative would entail continued operation of the existing 2,000 gpm capacity Hoopes WTP, which was constructed in 2015 for a biological water treatment pilot study and expanded to a full-scale treatment plant in 2017.

The Hoopes WTP consists of pumping stations located at the Spring Complex that pump spring water with elevated selenium concentrations to the Hoopes WTP. The treatment system uses two treatment trains, which consist of ultrafine filtration (UF) to remove particulate material and reverse osmosis (RO) and fluidized bed reactors (FBRs) to remove selenium at a maximum design flow rate of approximately 2,000 gpm. Polishing steps used in the existing treatment system are aeration, clarification, sand filtration, and iron coprecipitation. The FBR effluent is treated using an activated sludge post-treatment system prior to discharge to the outfall.

The small volumes of treatment residuals from the Hoopes WTP would continue to be removed and disposed. Waste generated by the biological water treatment process includes bioreactor

substrate, used filter media, chemical waste, dewatered sludge, and dewatered backwash sludge from the FBR. FBR solids are currently comingled with the post treatment solids and dewatered together via centrifuge and a similar procedure would be used. Dewatered sludge from the post-treatment system is currently transported offsite to a Subtitle D landfill for disposal because the sludge solids are classified as non-hazardous waste. Sludge solids would be tested as needed prior to offsite disposal.

O&M of the Hoopes WTP would involve optimization and monitoring of the treatment system. During operation, a carbon source, micronutrients, ammonium sulfate, and phosphoric acid would be added to the RO concentrate water before it is delivered to the FBRs based on the initial nutrient dosages and dose rates for other chemicals determined during the pilot study. Nutrient dosage would be optimized during system operation based on oxidation reduction potential (ORP), pH, and dissolved oxygen (DO) measurements. Influent water would be monitored for flow, pressure, temperature, pH, ORP, turbidity, and DO. The UF and RO skids would be monitored for pressure, turbidity, and flow. The FBR effluent would be monitored for pH, ORP, and DO. Pump run status indicators would monitor system hydraulic function and accurate nutrient and chemical dosing. Flow adjustment, chemical selection and dose rates, system optimization monitoring, and maintenance operations would be conducted as part of normal O&M. Performance monitoring would be conducted when the system is running under steady state conditions to accurately reflect operational parameters. Water samples would be collected from the waste stream (influent) and treatment process (effluent and UF backwash). Specific monitoring locations and frequencies and reporting requirements would be specified as part of the remedial design.

Chert/limestone covers (rock covers) would be placed on seep areas (DS-7 and LP-1) and detention ponds (DP-7 and EP-2) (Figure 3) to prevent the ingestion of surface water with arsenic and cadmium concentrations above than the MCL by recreational campers and Native Americans. The covers would consist of run-of-mine chert or limestone from active mining operations that would be hauled to the seep or pond in Mine dump trucks, dumped on the seep or pond, and then spread using a backhoe to a minimum depth of 2 feet. The run-of-mine chert or limestone material typically ranges from 4 inches to 2 feet in diameter.

In seep areas, the chert/limestone rock would be placed within the drainage path and sufficiently on each side to cover areas impacted by overland flow during spring runoff. No grading or other earth moving would be required and the chert/limestone covers would not be vegetated. At detention ponds, any standing water present would be pumped out and allowed to infiltrate into the ground and the earthen berms would be graded or removed to eliminate the detention ponds before placement of the chert/limestone rock. Weed-free silt fences and straw bales would be used downgradient of the seeps and ponds during implementation of the remedial action to minimize sediment transport from the work area.

Common elements for this alternative would include ICs (i.e., deed restrictions), MNA with associated performance monitoring, and LTM of Site-wide groundwater and surface water.

16.2.3 Alternative 2b – Water Treatment at the Hoopes WTP (4,000 gpm), ICs, Chert/Limestone Covers on Seeps and Ponds, O&M, MNA, LTM

Alternative 2b consists of treatment of contaminated water from the Spring Complex to reduce the concentration of selenium in surface water at the Spring Complex and downstream in Sage Creek and Crow Creek. This alternative would use the existing Hoopes WTP which was installed for a biological water treatment pilot study but would entail doubling the size of the WTP by adding additional treatment to increase the maximum design flow rate to approximately 4,000 gpm. O&M of the Hoopes WTP would involve optimization and monitoring of the treatment system as described for Alternative 2a. Alternative 2b would also include placement of chert/limestone covers (rock covers) on seep areas (DS-7 and LP-1) (Figure 3) and detention ponds (DP-7 and EP-2) as described for Alternative 2a.

Common elements would be the same as for Alternative 2a.

16.2.4 Alternative 2c – PRB Downgradient of Pole Canyon ODA, ICs, O&M, MNA, LTM

Alternative 2c consists of a subsurface PRB, downgradient of the Pole Canyon ODA, to treat LP-1 seep water (Figure 3) before it reaches alluvial groundwater. The PRB technology is an in-situ permeable system that uses reactive media to passively treat intercepted contaminated water.

The type of reactive material selected for the PRB depends on local hydrogeologic conditions and types of contaminants in the water. The reactive media is placed in a trench and seep water flows through the media to be treated. Biological and chemical reactions between the reactive media and contaminated water flowing through the media result in transformation or immobilization of the contaminants.

The PRB would be designed based on tested PRBs at P4's South Rasmussen Mine since 2012 and Simplot's Conda/Woodall Mountain Mine. A trench would be excavated for the PRB downgradient of the ODA where no overburden is present in the Pole Canyon Creek channel and aligned perpendicular to flow to intercept Pole Canyon ODA toe seep water at LP-1. The PRB would be filled with structural backfill (e.g., silica sand), a short-term carbon source (e.g., alfalfa hay or grass hay), and a long-term carbon source (e.g., wood chips) to passively treat contaminated seep water using biodegradation. The reactive media would use chemical and microbial processes to chemically reduce and transform selenium from selenate to selenite and ultimately to elemental selenium.

If the PRB operates for an extended period, the treatment media may need to be removed and disposed (on-site or off-site, depending on the characteristics) and replaced with clean media. The treatment media would be excavated using a backhoe and the PRB trench would be backfilled with clean media. Samples of spent treatment media would be collected and analyzed for hazardous waste characteristics. If results exceed regulatory limits, then the treatment media

would be disposed as hazardous waste. Otherwise, the treatment media would be disposed as non-hazardous waste.

O&M of the PRB would involve visual inspections, optimization, and monitoring of the treatment system. The PRB and associated features would be inspected for operation as intended. Diversion channel berms, culverts, and channels would be inspected for integrity. In addition, the ground surface in the vicinity of the PRB would be surveyed for expressions of moisture, which would indicate disruption of flow through the reactive media.

LTM to evaluate the performance and determine the effectiveness of the PRB would be conducted using existing and/or new wells or piezometers. Existing and/or new wells upgradient and downgradient of the PRB would be used to sample groundwater at discrete intervals to evaluate the effectiveness of the treatment system. Specific monitoring locations, frequencies and reporting requirements would be specified as part of the remedial design.

Common elements for this alternative would include ICs (i.e., deed restrictions), revegetation, MNA with associated performance monitoring, and LTM of groundwater and surface water.

Source Control Cover Alternatives

Four different covers are assessed for additional source control related to reducing infiltration of precipitation into overburden. The four cover types (Geomembrane, Enhanced Dinwoody, Dinwoody/Chert, and Capillary) would be constructed on the target cover areas on Panels D and E. One cover system (Dinwoody) is assessed for additional source control on the southern portion of Panel A and is focused on preventing contact with seleniferous materials to protect birds, rather than reducing infiltration. If this alternative is selected, the area of Panel A that would be covered would be determined by soil sampling during remedial design (Figure 5). Five cover types are described below and shown on Figure 4.

16.2.5 Alternative 3a – Dinwoody/Chert Covers Over Target Areas, ICs, O&M, MNA, LTM

Under Alternative 3a, Dinwoody/Chert covers would be constructed on the target cover areas (194 acres) at Panels D and E (D-1, D-ODA, and E-1n) (Figure 3). From surface to base, the Dinwoody / Chert cover consists of:

- 2 feet of loose Dinwoody Formation
- 1 foot of compacted Dinwoody Formation
- 2 feet of chert or limestone
- Graded overburden (Figure 4)

Target areas would be graded to a maximum 3:1 slope to provide a uniform surface for cover construction and to promote drainage. Slope stabilization methods (e.g., buttresses or retaining walls), would be used in steeper areas to reduce the grade of the slope. Erosion protection (e.g.,

riprap and geosynthetic fabrics) would be used to reduce or eliminate erosion of solid media by stormwater runoff and would be installed after the surface has been regraded. The covers would consist of an approximately 2-foot layer of chert or limestone overlain by an approximately 3-foot soil layer of Dinwoody Formation (or Salt Lake Formation material, or equivalent depending on the availability and geotechnical properties of the materials). Efforts would be made to utilize cover materials from the active mine, but it is uncertain if the required volumes will be available. The lower 1-foot of Dinwoody material would be compacted, and the upper 2-foot layer would be loose (not compacted) (Figure 4). The covers would be revegetated with native low-selenium-accumulating grass/forb species to control erosion, as described in the common elements. Erosion control measures (e.g., wattles, silt fences, etc.) would be used to prevent damage to the cover due to snowmelt and surface runoff.

Stormwater run-on and runoff controls would be used to convey water off or around the backfilled pits and ODAs in the target cover areas at Panels D and E (D-1, D-ODA, and E-1n) (Figure 3) via channels, spillways, sedimentation basins, and/or infiltration basins. Channels and spillways on overburden would be constructed of low permeability materials and lined with geosynthetic fabrics and riprap as needed to prevent infiltration and erosion.

Common elements for this alternative would include ICs (i.e., deed restrictions, grazing controls, and land use controls), revegetation, O&M of the covers and stormwater control components, MNA with associated performance monitoring, and LTM of Site-wide groundwater and surface water.

16.2.6 Alternative 3b – Capillary Covers Over Target Areas, ICs, O&M, MNA, LTM

Under Alternative 3b, capillary covers would be constructed on the target areas (194 acres) at Panels D and E (D-1, D-ODA, and E-1n) (Figure 3). A key component of a capillary cover system are drainage benches, which remove infiltrated water from the cover system at the capillary interface and promote lateral flow of clean water off the cover to original ground.

From surface to base, the capillary cover would consist of:

- 2 feet of loose Dinwoody Formation (with drainage benches)
- Filter fabric
- 1 foot of screened chert or limestone (drainage layer)
- 6 inches of graded Dinwoody Formation
- Graded overburden (Figure 4)

Target areas at Panels D and E would be graded to a maximum 3:1 slope for cover construction. Slope stabilization methods (e.g., buttresses or retaining walls) and erosion protection (e.g., riprap and geosynthetic fabrics) would be used where appropriate. The covers would consist of an approximately 6-inch barrier layer of graded Dinwoody (or Salt Lake Formation material, or equivalent, depending on the availability and geotechnical properties of the materials), overlain by a 1-foot drainage layer of either screened chert or limestone to remove infiltration as interflow,

or lateral percolation. This would be overlain by filter fabric that would act as a root barrier. The filter fabric would be overlain by a 2-foot uncompacted soil layer of Dinwoody Formation material. Sources of cover material would be the same as for Alternative 3a. Graded Dinwoody Formation would be screened and compacted to a minimum 6-inch thickness above the overburden material to provide a working base layer for the construction. Chert/limestone would be screened/crushed in the field (size between 1-inch and 4-inches) and would be placed in one lift to minimize segregation and compaction. A filter layer would be placed between the chert drainage layer and loose Dinwoody layer. Two (2) feet of Dinwoody Formation material would be placed loosely following installation of the filter fabric in either two 1-foot lifts, or one 2-foot lift (Figure 4).

Testing specifications for the filter geotextile and cover layers would be stipulated in the remedial design. Revegetation and erosion control measures (e.g., wattles, silt fences, etc.) would be the same as for Alternative 3a.

Drainage benches, which are a key component of a Capillary cover, remove infiltrated water, that accumulates as lateral flow (or interflow) at the capillary interface (e.g., between the Dinwoody and screened chert), from the cover system and moves the clean water off the reclaimed slope to original ground. This alleviates the amount of water the cover system must limit/prevent from infiltrating into the overburden. The drainage benches would also collect surface run-on water. Both the interflow water and surface run-on water would be managed as clean stormwater. This clean water could be directed to key areas for infiltration to improve groundwater and subsequently surface water quality. A geomembrane liner would be placed at the bottom of the bench below the drainage material. Spacing of drainage benches would vary with the slope of the reclamation cover. In general, the flatter the slope the closer the bench spacing. Stormwater run-on and runoff controls and common elements would be the same as for Alternative 3a.

16.2.7 Alternative 3c – Enhanced Dinwoody Covers Over Target Areas, ICs, O&M, MNA, LTM

Alternative 3c consists of Enhanced Dinwoody covers that would be constructed on the target areas at Panels D and E (D-1, D-ODA, and E-1n) (Figure 3). As with capillary covers, drainage benches are a key component of Enhanced Dinwoody covers, as well as the addition of a bentonite amended Dinwoody barrier layer.

The Enhanced Dinwoody covers would consist of (from surface to base):

- 1 foot of topsoil
- 2 feet of loose Dinwoody Formation (with drainage benches)
- Filter fabric
- 1 foot of screened chert or limestone (drainage layer)
- 6 inches of enhanced Dinwoody (screened Dinwoody with 5% bentonite)
- 6 inches of screened Dinwoody (3-inch screened material)
- Graded overburden (Figure 4)

As with the other source control alternatives, the target areas would be graded to a maximum 3:1 slope to provide a uniform surface for cover construction and to promote drainage. Slope stabilization methods and erosion protection would be used where needed. Graded Dinwoody Formation would be screened and compacted to a minimum 6-inch thickness above the overburden material to provide a working base layer for the construction. The enhanced Dinwoody layer would consist of screened Dinwoody (3-inch minus) amended with 5% bentonite.

Chert/limestone would be screened or crushed in the field (size between 1-inch and 4-inches) and would be placed in one lift to minimize segregation and compaction. A filter layer would be placed between the chert drainage layer and loose Dinwoody layer. Two (2) feet of Dinwoody Formation material would be placed loosely following installation of the filter fabric in either two 1-foot lifts, or one 2-foot lift (Figure 4). Testing specifications for the filter geotextile and various cover layers would be stipulated in the remedial design. Sources of cover material are the same as for Alternative 3a. Revegetation and erosion control measures (e.g., wattles, silt fences, etc.) would be the same as for Alternative 3a.

Drainage benches would be the same as for Alternative 3b. Stormwater run-on and runoff controls and common elements would be the same as for Alternative 3a.

16.2.8 Alternative 3d – Geomembrane Covers Over Target Areas, ICs, O&M, MNA, LTM

Alternative 3d involves construction of Geomembrane covers on the target areas at Panels D and E (D-1, D-ODA, and E-1n) (Figure 3). Geomembrane covers include drainage benches.

The Geomembrane covers would consist of (from surface to base):

- 1 foot of topsoil
- 2 feet of loose Dinwoody Formation (with drainage benches)
- 6 inches of screened chert or limestone (drainage layer)
- Geosynthetic layer (geomembrane)
- 1 foot of weathered Dinwoody Formation (protective subgrade)
- Graded overburden (Figure 4)

Target areas would be graded to a maximum 3:1 slope for cover construction. Slope stabilization methods (e.g., buttresses or retaining walls) and erosion protection (e.g., riprap and geosynthetic fabrics) would be used where appropriate. A minimum 1-foot thickness of weathered soil material would be placed above the overburden material to provide a protective subgrade for the geomembrane. A geomembrane would be placed between the chert drainage layer and loose Dinwoody layer. Installation of the geomembrane would be performed by a qualified geotextile installer. Chert/limestone would be screened or crushed in the field (size between 1-inch and 4-inches) and would be placed in one lift to minimize segregation and compaction. Two (2) feet of Dinwoody Formation material would be placed loosely following installation of the filter fabric

in either two 1-foot lifts, or one 2-foot lift (Figure 4). Testing specifications for the geomembrane and various cover layers would be stipulated in the remedial design. Sources of cover material are the same as for Alternative 3a. Revegetation and erosion control measures (e.g., wattles, silt fences, etc.) would be the same as for Alternative 3a.

Drainage benches would be the same as for Alternative 3b. Stormwater run-on and runoff controls and common elements would be the same as for Alternative 3a.

16.2.9 Alternative 3e – Dinwoody Cover Over a Portion of Panel A, ICs, O&M, LTM

Alternative 3e involves construction of a 2-foot thick Dinwoody cover over a portion of the Panel A overburden. The actual area would be determined by sampling during remedial design. The cover would be intended to lower the selenium concentrations at the surface to reduce the potential risk to birds and would not require surface-water controls other than to protect the cover from erosion.

From surface to base, the cover would consist of:

- 2 feet of loose Dinwoody Formation
- Graded overburden (as necessary) (Figure 4)

A portion of Panel A would be graded as necessary to support cover construction. Slope stabilization methods and erosion protection would be used if needed. Sources of cover material, revegetation, and erosion control measures during construction (e.g., wattles, silt fences, etc.) would be the same as for Alternative 3a.

Periodic O&M of the remedy would be implemented to ensure its effectiveness over the long term. Inspections of covers would be performed annually and would monitor the cover systems and the vegetation composition and growth. Maintenance of the covers would be performed as needed to provide for long-term performance and integrity of the remedy.

Common elements would include ICs (e.g., grazing controls to restrict the timing and duration of grazing or closure of grazing allotments and land-use controls to restrict access to cover areas during construction and while the cover vegetation matures). LTM would be limited to soil and vegetation sampling once every five years to assess the protectiveness of the cover system.

17.0 COMPARATIVE ANALYSIS OF ALTERNATIVES

No screening step was employed in the FS because the number of viable or appropriate alternatives for addressing site problems were limited. All the alternatives developed were carried through to the detailed analysis.

The USFS used the nine remedy selection criteria outlined in the NCP to evaluate remedial alternatives for the cleanup of a release. These nine criteria are categorized into three groups: threshold, balancing, and modifying. The threshold criteria must be met in order for an alternative to be eligible for selection. The threshold criteria are overall protection of human health and the environment and compliance with ARARs. The balancing criteria are used to weigh major tradeoffs among alternatives. The five balancing criteria are: long-term effectiveness and permanence; reduction of toxicity, mobility or volume through treatment; short-term effectiveness; implementability; and cost. The modifying criteria are state acceptance and community acceptance. Table 2 (Evaluation Criteria for Superfund Remedial Alternatives) briefly describes the nine evaluation criteria.

Tables 3-5 (Comparison of Water Treatment Alternatives, Comparison of Source Control Cover Alternatives [Panels D and E], and Comparison of Source Control Cover Alternatives [Panel A]) summarizes how these alternatives comply with the nine evaluation criteria specified in the NCP §300.430(t)(5)(i). Following is a comparative analysis of the remedial alternatives.

17.1 Water Treatment Alternatives (Surface Water)

This section provides the comparative analysis using the seven primary CERCLA evaluation criteria of the alternatives that address elevated selenium concentrations in Wells Formation groundwater and in surface water in Sage Creek and Crow Creek.

These alternatives are:

- Alternative 1 – No Further Action
- Alternative 2a – Water Treatment at the Hoopes WTP (2,000 gpm), ICs, Chert/Limestone Covers on Seeps and Ponds, O&M, MNA, LTM
- Alternative 2b – Water Treatment at the Hoopes WTP (4,000 gpm), ICs, Chert/Limestone Covers on Seeps and Ponds, O&M, MNA, LTM

The primary differences among the alternatives are time required to meet the RAO for surface water for overall protection of the environment and the associated costs.

17.1.1 Overall Protection of Human Health and the Environment

Overall protection of human health and the environment addresses whether each alternative provides adequate protection of human health and the environment and describes how risks posed through each exposure pathway are eliminated, reduced, or controlled, through treatment, engineering controls, and/or ICs.

All the action alternatives protect human health by deed restrictions to prevent use of Wells Formation groundwater with selenium concentrations above the MCL as a domestic water supply on Simplot's land in Sage Valley and by chert/limestone covers to prevent people drinking non-

regulated surface water at seeps and detention ponds with arsenic or cadmium concentrations above their respective MCLs.

Ecological risks are related to surface water with selenium concentrations above Idaho and Wyoming water quality standards for aquatic life. Predicted selenium concentrations in surface water in Sage Creek and Crow Creek for the alternatives are shown in Figure 9. Those monitoring points are shown on Figure 10. Low flow conditions result in the highest concentrations because there is less clean water for dilution. Alternative 2b (4,000 gpm capacity WTP) provides the highest level of performance with respect to protection of the environment. It provides an immediate reduction of selenium concentrations in surface water and is predicted to meet water quality standards in the shortest time frame (by approximately 2030, when the load reduction resulting from the Pole Canyon NTCRAs arrives at the Spring Complex).

Alternative 2a (2,000 gpm capacity WTP) provides a lower level of performance with the surface water standard being met later than for Alternative 2b (4,000 gpm capacity WTP).

17.1.2 Compliance with ARARs

Section 12l(d) of CERCLA and the NCP §300.430(t)(l)(ii)(B) require that remedial actions at CERCLA sites at least attain legally applicable or relevant and appropriate Federal and State requirements, standards, criteria, and limitations which are collectively referred to as "ARARs," unless such ARARs are waived under CERCLA §12l(d)(4).

Applicable requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under Federal environmental or State environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at a CERCLA site. Only those State standards that are identified by a state in a timely manner and that are more stringent than Federal requirements may be applicable. Relevant and appropriate requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under Federal environmental or State environmental or facility siting laws that, while not "applicable" to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well-suited to the particular site.

The primary difference between Alternatives 2a and 2b is the time frame for them to meet chemical-specific ARARs (Idaho surface water standards in Sage Creek and Crow Creek, Wyoming surface water standards in Crow Creek, and MCLs in Wells Formation groundwater). Surface water standards are discussed under protection of the environment, above. There are no significant differences in performance relative to action-specific and location-specific ARARs.

17.1.3 Long-Term Effectiveness and Permanence

Long-term effectiveness and permanence refer to expected residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup levels have been met. This criterion includes the consideration of residual risk that will remain on-site following remediation and the adequacy and reliability of controls.

The primary differences between the alternatives relate to the residual ecological risk and the time frame to provide protection, which is discussed under overall protection of human health and the environment, above.

17.1.4 Reduction of Toxicity, Mobility, or Volume Through Treatment

Reduction of toxicity, mobility, or volume through treatment refers to the anticipated performance of the treatment technologies that may be included as part of a remedy.

Alternatives 2a and 2b satisfy the statutory preference for treatment. Alternative 2b is ranked highest for reduction of toxicity, mobility, or volume through treatment by implementation of a 4,000 gpm capacity WTP at Hoopes Spring. Alternative 2a provides a lower reduction of toxicity, mobility, or volume through treatment with the existing 2,000 gpm capacity WTP.

17.1.5 Short-Term Effectiveness

Short-term effectiveness addresses the period of time needed to implement the remedy and any adverse impacts that may be posed to workers, the community, and the environment during construction and operation of the remedy until cleanup levels are achieved.

There are minimal potential risks to the community because of the relatively remote location of the actions, and standard health and safety protocols and best management practices (BMP) would protect workers and the environment during implementation. The primary differences between the alternatives for short-term effectiveness are the differences in the time until the surface water RAO is achieved.

Alternative 2b is ranked higher because it includes a 4,000 gpm treatment system that would achieve the RAO in downstream surface water around 2030 compared to Alternative 2a which includes 2,000 gpm treatment and would meet the RAO by around 2050.

17.1.6 Implementability

Implementability addresses the technical and administrative feasibility of a remedy from design through construction and operation. Factors such as availability of services and materials, administrative feasibility, and coordination with other governmental entities are also considered.

There are no significant differences between the alternatives relative to implementability. The 2,000 gpm WTP (Alternative 2a) has already been implemented at the Site (a high performance against the criterion of implementability) and expansion of the capacity to 4,000 gpm for Alternative 2b would be straight-forward to implement.

17.1.7 Cost

Total present worth of construction and operations, maintenance and monitoring costs were calculated for each remedial alternative.

Alternative 2a entails continued operation of the 2,000 gpm capacity WTP at Hoopes Spring and has a present worth cost of $64.6 Million. For Alternative 2b, the existing WTP would be expanded to 4,000 gpm capacity at a present worth cost of $106.8 Million.

17.2 Water Treatment Alternatives (Alluvial Groundwater)

This section provides the comparative analysis using the seven primary CERCLA evaluation criteria of the alternatives that address elevated selenium concentrations in alluvial groundwater.

These alternatives are:

- Alternative 1 – No Further Action
- Alternative 2c – PRB Downgradient of Pole Canyon ODA, ICs, O&M, MNA, LTM

The only source of selenium to alluvial groundwater is the Pole Canyon ODA. Two NTCRAs (Figure 5) have been performed as part of the Smoky Canyon Mine RI/FS and have resulted in a significant reduction of selenium releases from the Pole Canyon ODA. Concentrations of selenium in alluvial groundwater are above the MCL but are decreasing as a result of the NTCRAs. There are two distinct alternatives for remediation of alluvial groundwater: Alternative 1 – No Further Action, which includes the benefits of the NTCRAs implemented at the Pole Canyon ODA, and Alternative 2c – PRB Downgradient of Pole Canyon ODA, which includes the benefits of the NTCRAs and also includes construction of a PRB for treatment of seep water at the base of the Pole Canyon ODA (Figure 3).

Because they would be part of a comprehensive Site-wide alternative which provides measures to protect human health and the environment, the alluvial groundwater alternatives are evaluated in this comparative analysis solely on their effect on selenium concentrations. Other actions, such as ICs to protect human health by preventing use of groundwater as a drinking water source are not considered in this analysis but are evaluated elsewhere. The key differences between the alternatives are how long it takes to meet the MCL and whether implementation of a PRB at the Pole Canyon ODA toe seep (LP-1) (Alternative 2c) provides additional cost-effective benefit over the effects of the NTCRAs alone (Figure 3). The comparative analysis using the seven primary CERCLA evaluation criteria is as follows:

17.2.1 Overall Protection of Human Health and the Environment

There are no significant differences between the alternatives for this criterion. Human health risks are mitigated by deed restrictions, which are a common element. There are no environmental risks directly associated with alluvial groundwater.

17.2.2 Compliance with ARARs

Alternative 2c is ranked higher than Alternative 1 for compliance with ARARs. The predicted selenium concentration in alluvial groundwater for the NTCRAs (i.e., no additional covers) and for the NTCRAs plus a PRB (Alternative 2c) are shown in Figure 11 (The points referenced in Figure 11 are shown on Figure 3). As shown, the selenium concentrations in alluvial groundwater are predicted to decrease over time for the No Further Action alternative, such that by 2060, the area with concentrations above the MCL would be limited to a small area in Pole Canyon, immediately downgradient of the ODA. When a PRB is implemented, it is predicted that concentrations will sharply decline resulting in MCLs being met outside Pole Canyon within 1 to 2 years. Concentrations are predicted to remain above the MCL in a small area in Pole Canyon with the PRB.

No Further Action would not trigger any action-specific or location-specific ARARs. Construction of a PRB in Pole Canyon would trigger laws or regulations associated with testing and proper disposal of solid waste and laws intended to protect wetlands and streams; however, compliance with these ARARs would be achieved.

17.2.3 Long-Term Effectiveness and Permanence

There are no significant differences between the alternatives for this criterion. Residual risks related to the potential use of alluvial groundwater would be lower for Alternative 2c than for Alternative 1; however, other components would be similar.

17.2.4 Reduction of Toxicity, Mobility, or Volume Through Treatment

Alternative 2c meets the statutory preference for treatment. Therefore, Alternative 2c is ranked higher than the No Further Action alternative for reduction of toxicity, mobility, or volume through treatment.

17.2.5 Short-Term Effectiveness

There are no significant differences between the alternatives for this criterion. Construction of a PRB would entail minimal environmental impacts and any risks to workers would be mitigated using standard BMPs. The RAO for alluvial groundwater would be met sooner for Alternative 2c than for Alternative 1.

17.2.6 Implementability

No construction or O&M would be implemented under the No Further Action alternative and this alternative ranks high against the implementability criterion. PRBs have been constructed and tested at other similar sites and use readily available equipment and water treatment media so a PRB would be relatively straight-forward to implement. Alternative 2c has a moderate-high ranking against the implementability criterion.

17.2.7 Cost

There are no costs associated with Alternative 1, and the present worth cost of Alternative 2c is estimated at $2.3 Million.

17.3 Source Control Cover Alternatives (Wells Formation Groundwater and Surface Water)

This section provides the comparative analysis using the seven primary CERCLA evaluation criteria of the alternatives that address source control for Wells Formation groundwater and surface water.

These alternatives are:

- Alternative 1 – No Further Action
- Alternative 3a – Dinwoody/Chert Covers Over Target Areas, ICs, O&M, MNA, LTM
- Alternative 3b – Capillary Covers Over Target Areas, ICs, O&M, MNA, LTM
- Alternative 3c – Enhanced Dinwoody Covers Over Target Areas, ICs, O&M, MNA, LTM
- Alternative 3d – Geomembrane Covers Over Target Areas, ICs, O&M, MNA, LTM

Source control Alternatives 3a, 3b, 3c, and 3d are similar in that they involve construction of covers over the target areas on Panels D and E and include the same common elements (i.e., deed restrictions grazing controls, land-use controls, revegetation, O&M and monitoring of the cover system, MNA, and LTM of groundwater and surface water). The primary differences are the cover profiles and materials used to construct the covers and whether the cover systems incorporate drainage benches. Alternative 3a is a Dinwoody/Chert cover without drainage benches. The other three covers, Alternative 3b (Capillary cover), Alternative 3c (Enhanced Dinwoody cover), and Alternative 3d (Geomembrane cover) include drainage benches to remove infiltrated water (interflow) and surface run-on water prior to it reaching run-of-mine overburden.

17.3.1 Overall Protection of Human Health and the Environment

All the source control alternatives protect human health by deed restrictions to prevent use of Wells Formation groundwater with selenium concentrations above the MCL as a domestic water supply on Simplot's land in Sage Valley.

Additional source control through construction of covers on the target areas would further reduce selenium concentrations in surface water in Sage Creek and Crow Creek (Figures 12, 13, and 14 - the points referenced in these figures are shown on Figure 10), which would reduce risks to aquatic life. As shown, the covers are predicted to begin to have an effect on selenium concentrations in surface water starting around 2035 (due to the travel time in Wells Formation groundwater to the Spring Complex). All covers result in reductions in predicted selenium concentrations after this time. The Enhanced Dinwoody and Geomembrane covers provide an equivalent and relatively high reduction in predicted selenium concentrations and would provide protection slightly earlier than the other covers, the Capillary cover provides a relatively moderate reduction, and the Dinwoody/Chert cover provides the least reduction.

17.3.2 Compliance with ARARs

The alternatives provide similar performance in terms of compliance with ARARs. The primary difference between the alternatives is the time frame for them to meet chemical-specific ARARs (Idaho surface water standards in Sage Creek and Crow Creek, Wyoming surface water standards in Crow Creek, and MCLs in Wells Formation groundwater) which are relatively minor. There are no differences in performance relative to action-specific and location-specific ARARs for Alternatives 3a through 3d.

Alternative 1 would not trigger action-specific or location-specific ARARs.

17.3.3 Long-Term Effectiveness and Permanence

On a relative basis, the Enhanced Dinwoody and Geomembrane covers provide the highest reductions in selenium concentrations in Wells Formation groundwater at well GW-25 (i.e., compared to the Dinwoody/Chert and Capillary covers). Human health risks are mitigated by ICs and all covers are reliable over the long term.

17.3.4 Reduction of Toxicity, Mobility, or Volume Through Treatment

There are no significant differences between the cover alternatives and the No Further Action alternative for the reduction of toxicity, mobility, or volume through treatment because none of the cover alternatives include a treatment component. However, the mobility of selenium would be reduced by installation of covers. The Geomembrane and Enhanced Dinwoody covers would reduce long-term average percolation to less than 1 inch per year (in/yr) resulting in infiltrations of 0% and 3%, respectively. The Capillary cover would reduce the long-term average percolation to about 5.7 in/yr resulting in an estimated infiltration of 24%. Whereas the long-term average

percolation into the Dinwoody/Chert cover would reduce to about 10 in/yr resulting in estimated infiltration of 42%. Alternative 1 would not reduce the mobility of selenium.

17.3.5 Short-Term Effectiveness

There are no significant differences between the cover alternatives for short term effectiveness. Any potential risks to workers or the community or the environment would be mitigated by standard engineering practices. Alternative 3a (Dinwoody/Chert cover) is ranked slightly higher than the other cover alternatives because any environmental impacts would be over a period of years rather than 8 years (the time to construct the other cover types). There would be no risks to communities or workers and no environmental impacts due to construction related to Alternative 1; however, it would take longer for RAOs to be achieved.

17.3.6 Implementability

Alternatives 3a (Dinwoody/Chert cover) and 3c (Enhanced Dinwoody covers) would be constructed using standard equipment and are ranked high for implementability. Alternatives 3b (Capillary cover) is unproven and 3d (Geomembrane cover) can be constructed with specialty equipment and both are ranked slightly lower for implementability (moderate to high). A simple (capillary) cover has been constructed at the Blackfoot Bridge Mine as a field-scale test section on the East Overburden Pile and testing of the cover system is ongoing.

Constructability issues are related to the drainage layer. Slope angles must be steep enough to allow lateral interflow in the drainage layer within the cover system and the drainage benches must be constructed at frequent intervals (e.g., every 100 to 150 feet) along the slope in order to remove this water. Geomembrane covers have been installed at South Maybe Canyon Mine (a CERCLA action on a cross-valley fill). Temperature fluctuations during installation can make welding of seams difficult and can result in wrinkles in the fabric. During cover installation on slopes, instability results from slippage at the interface between the geosynthetic layer and the overlying or underlying material. Geomembrane cover systems can be unstable over long steep slopes which could result in sliding of the liner and the topsoil downslope. For slopes of 3:1, additional anchoring of the geomembrane is required, and angular gravel or rock is required above a geotextile for stability of this layer.

Alternative 3a (Dinwoody/Chert cover) can be constructed over a larger area per year (approximately 75 acres/year on average) than Capillary, Enhanced Dinwoody and Geomembrane covers (approximately 25 acres/year on average). As a result, construction of the Dinwoody/Chert cover on the target areas would require approximately 3 years to complete, while construction of the Capillary, Enhanced Dinwoody, and Geomembrane covers would require approximately 8 years. No construction would be implemented for Alternative 1.

17.3.7 Cost

There are no costs associated with Alternative 1. Dinwoody/Chert and Capillary cover alternatives would entail relatively lower costs ($18.9 and $17.5 Million, respectively). Enhanced Dinwoody covers would entail a cost of $30.8 Million and Geomembrane covers would entail the highest cost at $39.1 Million.

17.4 Source Control Cover Alternatives (Soils)

This section provides the comparative analysis using the seven primary CERCLA evaluation criteria of the alternatives that address source control for soils. Because they would be part of a comprehensive Site-wide alternative which provides measures to protect human health and the environment, the soils alternatives are evaluated in this comparative analysis solely on their effect on potential risks to birds on Panel A.

These alternatives are:

- Alternative 1 – No Further Action
- Alternative 3e – Dinwoody Cover Over a Portion of Panel A, ICs, O&M, LTM

17.4.1 Overall Protection of Human Health and the Environment

There are no human health risks associated with Panel A soils. The key issue addressed by these alternatives is the potential for risk to birds at Panel A due to elevated selenium concentrations in surface soils (overburden). The Panel A habitat is unlikely to be large enough or of high enough quality to serve as an attractive nuisance which would result in a significant habitat sinks for the regional populations of the common bird species that may utilize them. Coupled with the relatively small number of birds that would use the habitats on Panel A relative to the number of birds required to support a self-sustaining population, the limited number of samples that exceeded the bird preliminary remediation goal (PRG) and the significant effect of the single outlier selenium concentration that drives the 95% upper confidence limit of the mean concentration above the bird PRG; risks to bird populations at the Site from selenium in surface soils are likely to fall under the No Action Alternative. Installation of a soil cover on a portion of Panel A (Alternative 3e) would not result in a meaningful change in the magnitude of potential risks.

17.4.2 Compliance with ARARs

There are no chemical specific ARARs associated with soils. No Further Action would not trigger any action-specific or location-specific ARARs. Construction of covers would trigger laws and regulations for reclamation of mined areas and control of fugitive dust during construction activities. Requirements would be met by remedial design.

17.4.3 Long-Term Effectiveness and Permanence

There are no significant differences between the remedial alternatives in terms of long-term effectiveness and permanence. Alternatives 1 and 3e provide protection, and the magnitude of residual risk is similar under both alternatives.

17.4.4 Reduction of Toxicity, Mobility, or Volume Through Treatment

Neither of the remedial alternatives include treatment and therefore there is no difference in performance against this criterion.

17.4.5 Short-Term Effectiveness

Alternative 1 performs the highest against the short-term effectiveness criterion. Alternative 3e would entail higher risks to workers during construction of covers. Also, habitat at the Dinwoody borrow area would be negatively affected. The soil RAO is met immediately by both alternatives.

17.4.6 Implementability

There is no significant difference between the remedial alternatives in terms of implementability. Alternatives 3e is implementable using standard construction methods and materials and there are no administrative obstacles.

17.4.7 Cost

There is no cost associated with Alternative 1. Alternative 3e would have a present worth cost of $1.6 Million.

17.5 State and Tribal Acceptance – Modifying Criterion

The State of Idaho, represented by the IDEQ, agrees with the USFS's decision to implement Alternatives 2b (expanded WTP), 2c (a PRB downgradient of the Pole Canyon ODA), and 3c (Enhanced Dinwoody Covers over Target Areas). The IDEQ acknowledged their support for this decision by letter to the USFS dated September 23, 2024 (Appendix C). The IDEQ provided technical support to the USFS during the implementation of the RI and FS, Proposed Plan, and this ROD.

The State of Wyoming, represented by the WDEQ, also agrees with the USFS's decision to implement the selected alternatives. The WDEQ acknowledged their support for this decision by letter to the USFS dated October 16, 2024 (Appendix C). The WDEQ provided comments to the Proposed Plan and this ROD (Appendix D).

The USFS provided the Proposed Plan for SCM to the Shoshone-Bannock Tribes in April 2023 and offered to meet with them. No meeting was held at that time and no objections were provided by the Tribes. On September 26, 2023, the USFS met with the Shoshone-Bannock Tribes in a staff-to-staff meeting and on November 16, 2023, in a government-to-government meeting. The information from the Proposed Plan (USFS, 2023a) was presented at both meetings. On January 4, 2024, the Tribes, via email, provided notification that they would not have any comments on the remedial alternatives selected for the Site.

17.6 Community Acceptance – Modifying Criterion

The USFS conducted a public meeting on May 2, 2023, to present the Proposed Plan (USFS 2023b) to the public. The USFS presented Alternatives 2b, 2c, and 3c as the preferred alternative for the Site.

The 30-day public comment period for the Proposed Plan began on April 26, 2023. A request for a 30-day extension to the public comment period was granted so the public comment period concluded on June 26, 2023. The USFS received comments from six different entities. These included the Respondent, a governmental agency (WDEQ), and four different environmental groups. The comments were generally in acceptance of the selected alternatives. All comments were accepted and did not change the proposed remedy. Responses to the comments are provided in the Responsiveness Summary (Appendix D).

18.0 PRINCIPAL THREAT WASTES

The NCP establishes an expectation that SCM will use treatment to address the principal threats posed by a site wherever practicable (NCP §300.430(a)(l)(iii)(A)). Identifying principal threat wastes combines concepts of both hazard and risk. In general, principal threat wastes are those source materials considered to be highly toxic or highly mobile which generally cannot be contained in a reliable manner or would present a significant risk to human health or the environment should exposure occur. Conversely, non-principal threat wastes are those source materials that generally can be reliably contained and that would present only a low risk in the event of exposure. The manner in which principal threats are addressed generally will determine whether the statutory preference for treatment as a principal element is satisfied.

There are no principal threat wastes at the SCM.

19.0 SELECTED REMEDY

The USFS's Selected Remedy for this Site is Alternatives 2b (expanded WTP), 2c (a PRB downgradient of the Pole Canyon ODA), and 3c (Enhanced Dinwoody Covers over Target Areas). Under these alternatives, selenium will be removed from surface water by the operation

of an expanded WTP, almost immediately reducing concentrations in the water column and in time reducing concentrations in fish tissue. Alluvial groundwater will be treated by the construction of the PRB in Pole Canyon, removing additional selenium from the shallow groundwater system and potentially reducing loading to the surface water. Enhanced Dinwoody Covers installed on Panels D and E will virtually eliminate infiltration to overburden which is a source of selenium loading to Wells Formation groundwater. Additionally, common elements of ICs, O&M, MNA, LTM, will be part of each alternative selected.

19.1 Summary of the Rationale for the Selected Remedy

These alternatives (2b, 2c, and 3c) are protective of human health and the environment and meet Federal and State ARARs. These alternatives also meet the RAOs through attainment of cleanup levels for selenium in surface water. These alternatives were selected over the other alternatives because the methods are proven, easily implemented, and are expected to achieve long-term permanence and risk reduction by reducing selenium concentration in surface water by 95%, preventing infiltration in source areas, and are expected to allow the property to be used for the reasonably anticipated future land use, which is recreational, wildlife, grazing, and tribal. O&M activities and five-year reviews of the remedy will be required.

19.2 Description of the Selected Remedy

Following is a description of each component of the Selected Remedy. Although the USFS does not expect significant changes to this remedy, it may change slightly as a result of the remedial design and construction processes. Any changes to the remedy described in this ROD would be documented using a technical memorandum in the Administrative Record, an Explanation of Significant Differences, or a ROD Amendment, as appropriate and consistent with the applicable regulations.

19.2.1 Expanded WTP and Chert/Limestone Covers on Seeps and Ponds

This would entail using the existing Hoopes WTP, which was constructed in 2015 for a biological water treatment pilot study and expanded to a full-scale treatment plant in 2017. The present capacity of the WTP is 2,000 gpm, but this remedy entails doubling the size by adding additional treatment capacity to increase the maximum design flow rate to 4,000 gpm. The treatment of contaminated water from the Spring Complex will reduce the concentration of selenium in surface water at the Spring Complex and downstream in Sage Creek and Crow Creek.

The existing Hoopes WTP consists of pumping stations located at the Spring Complex that pump spring water with elevated selenium concentrations to the Hoopes WTP. The treatment system uses two treatment trains, which consist of UF to remove particulate material, and RO and FBRs to remove selenium. Polishing steps used in the existing treatment system are aeration, clarification, sand filtration, and iron coprecipitation. The FBR effluent is treated using an activated sludge post-treatment system prior to discharge to the outfall.

The small volumes of treatment residuals from the Hoopes WTP would continue to be removed and disposed. Waste generated by the biological water treatment process includes bioreactor substrate, used filter media, chemical waste, dewatered sludge, and dewatered backwash sludge from the FBR. FBR solids are currently comingled with the post treatment solids and dewatered together via centrifuge and a similar procedure would be used. Dewatered sludge from the post-treatment system is currently transported offsite to a Subtitle D landfill for disposal because the sludge solids are classified as non-hazardous waste. Sludge solids would be tested as needed prior to offsite disposal. Due to the time elapsed since construction of the 2015 WTP, Simplot is evaluating new technologies during remedial design as noted in Section 4.0.

O&M of the Hoopes WTP would involve optimization and monitoring of the treatment system. During operation, a carbon source, micronutrients, ammonium sulfate, and phosphoric acid would be added to the RO concentrate water before it is delivered to the FBRs based on the initial nutrient dosages and dose rates for other chemicals determined during the pilot study. Nutrient dosage would be optimized during system operation based on ORP, pH, and DO measurements. Influent water would be monitored for flow, pressure, temperature, pH, ORP, turbidity, and DO. The UF and RO skids would be monitored for pressure, turbidity, and flow. The FBR effluent would be monitored for pH, ORP, and DO. Pump run status indicators would monitor system hydraulic function and accurate nutrient and chemical dosing. Flow adjustment, chemical selection and dose rates, system optimization monitoring, and maintenance operations would be conducted as part of normal O&M. Performance monitoring would be conducted when the system is running under steady state conditions to accurately reflect operational parameters. Water samples would be collected from the waste stream (influent) and treatment process (effluent and UF backwash). Specific monitoring locations and frequencies and reporting requirements would be specified as part of the remedial design.

Chert/limestone covers (rock covers) would be placed on seep areas (DS-7 and LP-1) and detention ponds (DP-7 and EP-2) (Figure 3) to prevent the ingestion of surface water with arsenic and cadmium concentrations above than the MCL by recreational campers and Native Americans. The covers would consist of run-of-mine chert or limestone from active mining operations that would be hauled to the seep or pond in Mine dump trucks, dumped on the seep or pond, and then spread using a backhoe to a minimum depth of 2 feet. The run-of-mine chert or limestone material typically ranges from 4 inches to 2 feet in diameter.

In seep areas, the chert/limestone rock would be placed within the drainage path and sufficiently on each side to cover areas impacted by overland flow during spring runoff. No grading or other earth moving would be required and the chert/limestone covers would not be vegetated. At detention ponds, any standing water present would be pumped out and allowed to infiltrate into the ground and the earthen berms would be graded or removed to eliminate the detention ponds before placement of the chert/limestone rock. Weed-free silt fences and straw bales would be used downgradient of the seeps and ponds during implementation of the remedial action to minimize sediment transport from the work area.

19.2.2 PRB Downgradient of Pole Canyon ODA

A subsurface PRB, downgradient of the Pole Canyon ODA, to treat LP-1 seep water (Figure 3) before it reaches alluvial groundwater. The PRB technology is an in-situ permeable system that uses reactive media to passively treat intercepted contaminated water.

The type of reactive material selected for the PRB depends on local hydrogeologic conditions and types of contaminants in the water. The reactive media is placed in a trench and seep water flows through the media to be treated. Biological and chemical reactions between the reactive media and contaminated water flowing through the media result in transformation or immobilization of the contaminants.

The PRB would be designed based on tested PRBs at P4's South Rasmussen Mine since 2012 and Simplot's Conda/Woodall Mountain Mine. A trench would be excavated for the PRB downgradient of the ODA where no overburden is present in the Pole Canyon Creek channel and aligned to intercept Pole Canyon ODA toe seep water at LP-1. The PRB would be filled with structural backfill (e.g., silica sand), a short-term carbon source (e.g., alfalfa hay or grass hay), and a long-term carbon source (e.g., wood chips) to passively treat contaminated seep water using biodegradation. The reactive media would use chemical and microbial processes to chemically reduce and transform selenium from selenate to selenite and ultimately to elemental selenium.

If the PRB operates for an extended period, the treatment media may need to be removed and disposed of (on-site or off-site, depending on the characteristics) and replaced with clean media. The treatment media would be excavated using a backhoe and the PRB trench would be backfilled with clean media. Samples of spent treatment media would be collected and analyzed for hazardous waste characteristics. If results exceed regulatory limits, then the treatment media would be disposed as hazardous waste. Otherwise, the treatment media would be disposed as non-hazardous waste.

O&M of the PRB would involve visual inspections, optimization, and monitoring of the treatment system. The PRB and associated features would be inspected for operation as intended. Diversion channel berms, culverts, and channels would be inspected for integrity. In addition, the ground surface in the vicinity of the PRB would be surveyed for expressions of moisture, which would indicate disruption of flow through the reactive media.

19.2.3 Enhanced Dinwoody Covers Over Target Areas

Enhanced Dinwoody covers would be constructed on the target areas at Panels D and E (D-1, D-ODA, and E-1n) (Figure 3). Drainage benches are a key component of Enhanced Dinwoody covers, as well as the addition of a bentonite amended Dinwoody barrier layer.

The Enhanced Dinwoody covers would consist of (from surface to base):

- 1 foot of topsoil (likely amended Dinwoody)

- 2 feet of loose Dinwoody Formation (with drainage benches)
- Filter fabric
- 1 foot of screened chert or limestone (drainage layer)
- 6 inches of enhanced Dinwoody (screened Dinwoody with 5% bentonite)
- 6 inches of screened Dinwoody (3-inch screened material)
- Graded overburden

The target areas would be graded to a maximum 3:1 slope to provide a uniform surface for cover construction and to promote drainage. Slope stabilization methods (e.g., buttresses or retaining walls), would be used in steeper areas to reduce the grade of the slope. Erosion protection (e.g., riprap and geosynthetic fabrics) would be used to reduce or eliminate erosion of solid media by stormwater runoff and would be installed after the surface has been regraded.

Graded Dinwoody Formation would be screened and compacted to a minimum 6-inch thickness above the overburden material to provide a working base layer for the construction. The enhanced Dinwoody layer would consist of screened Dinwoody (3-inch minus) amended with 5% bentonite. Chert/limestone would be screened or crushed in the field (size between 1-inch and 4-inches) and would be placed in one lift to minimize segregation and compaction. A filter layer would be placed between the chert drainage layer and loose Dinwoody layer. Two (2) feet of Dinwoody Formation material would be placed loosely following installation of the filter fabric in either two 1-foot lifts, or one 2-foot lift. Efforts would be made to utilize materials from the active mine. Testing specifications for the filter geotextile and various cover layers would be stipulated in the remedial design.

The covers would be revegetated with native low-selenium-accumulating grass/forb species to control erosion, as described in the common elements. Erosion control measures (e.g., wattles, silt fences, etc.) would be used to prevent damage to the cover due to snowmelt and surface runoff.

Stormwater run-on and runoff controls would be used to convey water off or around the backfilled pits and ODAs in the target cover areas at Panels D and E (D-1, D-ODA, and E-1n) via channels, spillways, sedimentation basins, and/or infiltration basins. Channels and spillways on overburden would be constructed of low permeability materials and lined with geosynthetic fabrics and riprap as needed to prevent infiltration and erosion.

Periodic O&M of the covers would be implemented to ensure their effectiveness over the long term. Inspections of covers, stormwater control systems and any fencing would be performed annually. Inspections would monitor the covers and the vegetation composition and growth. The covers would be inspected for settlement and signs of erosion and possible zones of water pooling. Vegetation growth would be monitored for indications of nutrient deficiencies, and the soil would be tested for NPK if signs of nutrient deficiencies are observed. Vegetation on the soil cover system would be monitored for the establishment of selenium accumulators (e.g., astragalus, aster, alfalfa, yellow sweet clover) as well as infestations of state-listed noxious weeds to prevent the formation of seed sources for unwanted plant species and promote successful growth of native grasses.

Maintenance of the covers would be performed annually, or as needed, to provide for long-term performance and integrity of the remedy. Erosion rills or low spots where water pools would be filled with Dinwoody Formation material from a borrow area or other source at the Mine. These areas and any bare areas on the covers would be graded or raked as needed and then re-seeded with the approved seed mix. Maintenance would include reapplication of fertilizer if needed, based on agronomic analyses. If selenium accumulator or noxious weed plant species are identified on the soil cover system, herbicide spot application would be performed in accordance with the existing noxious weed control program at the Mine.

Inspections of stormwater control systems associated with the cover systems would include examining vegetated ditches, swales, and berms to ensure that there is vegetation coverage and that erosion, debris accumulation, and/or settlement have not compromised the function of the drainage structures. Riprap in drainages would be inspected for rock displacement, undercutting, erosion of the edges of the rock placement areas, weathering of riprap rock, and damage to the underlying geotextile within the drainage benches. Inlets and outfalls would be inspected for stability, distortion, and cracking, as well as the presence of vegetation that could promote instability or impede discharge. Inspection of sedimentation, infiltration, and detention basins would include observation of the basin embankments for cracks, seepage, and/or sloughing that may be indicative of instability and for excess sediment. Spillways would be inspected for debris that would restrict flow to ensure that they are maintained in a clear, free-flowing condition.

O&M would be required to maintain the effectiveness and permanence of stormwater controls associated with the covers and would involve removal of sediment and any vegetation or woody debris and repair or replacement of riprap in drainage ditches. Geotextile and compacted fill may be added, as necessary. Embankments of sedimentation and infiltration basins would be repaired using compacted fill material. Debris and sediment that prevent a free-flowing condition would be removed from the basins and from overflow spillways.

19.2.4 ICs, MNA, LTM, and O&M

19.2.4.1 ICs

ICs include grazing controls and land-use controls (e.g., restrictions on timing and duration of grazing or closure of grazing allotments and land-use controls to restrict access to cover areas during construction and while vegetation matures) would be implemented by the USFS on National Forest System land managed by the Caribou-Targhee National Forest as needed to restrict access to areas where a cover was installed, while the cover vegetation matures to protect the integrity of the remedial action.

Deed restrictions would be specified as restrictions on the property deed for private land, held by the PRP, in Sage Valley to prevent access or use of alluvial or Wells Formation groundwater as a drinking water source until cleanup levels are met. ICs would require preparation of an ICIAP that would specify how the deed restrictions would be implemented, maintained, and enforced. Deed restrictions would not be needed on USFS lands because residential use is not allowed

under the Revised Forest Plan for the Caribou National Forest (USFS, 2003). The Tribes have treaty protected hunting, fishing, and gathering rights on USFS lands at the Site; however, there is no exposure pathway for the use of Wells Formation groundwater as a domestic water supply and no risk was identified for ingestion of selenium in surface water by Native Americans on public land.

Existing State of Idaho informational tools (e.g., Idaho Department of Health & Welfare's Idaho Fish Consumption Advisory Program at fishadvisory.dhw.idaho.gov) could be used to notify recreational users of any fish advisories in streams in the vicinity of SCM and inform the public in local communities that residual contamination remains at the Site, as needed.

19.2.4.2 MNA

MNA in groundwater relies on natural physical, geochemical, or biological processes to reduce contamination in alluvial and Wells Formation groundwater in conjunction with other source control and/or water treatment alternatives. The MNA elements of dilution and dispersion are present at the Site and would result in a reduction of selenium concentrations and a corresponding reduction in exposure pathways and risks. Long-term performance monitoring would be required to track MNA progress over time.

The performance monitoring program would consist of a network of existing wells that provide adequate areal and vertical coverage to verify that the selenium plume in alluvial and Wells Formation groundwater remains static or shrinks and provide the ability to monitor groundwater chemistry throughout the zones where selenium attenuation is occurring. The need for additional wells would depend on the final remedy and would be determined as part of the remedial design. The frequency of monitoring would be adequate to detect potential changes in Site conditions and the monitoring program would enable a determination of the rate(s) of attenuation and how that rate changes with time. Monitoring would focus on continued verification of contaminant removal from groundwater, but also would include tracking trends in other reactants that are part of the attenuation reaction (e.g., pH, alkalinity, ferrous iron, oxidation-reduction potential and sulfate). Performance monitoring would continue until RAOs have been achieved.

19.2.4.3 LTM

LTM of groundwater and surface water would be required to evaluate the effectiveness of the remedy. The LTM results would be used to support the protectiveness evaluations during the CERCLA 5-year review process.

19.2.4.4 O&M

O&M and groundwater and surface water monitoring for the 2006 and 2013 NTCRAs at the Pole Canyon ODA (Figure 3) would continue as obligations under the Settlement Agreements (USFS, EPA and IDEQ, 2006; USFS, IDEQ and Tribes, 2013)), which were terminated by the USFS (USFS, 2022), effective November 27, 2022. Performance evaluation for the bypass pipeline, infiltration basin, and run-on control features is conducted in accordance with the 2006 NTCRA

Post- Removal Site Control (PRSC) Plan (NewFields, 2009). Performance of the 2013 NTCRA Dinwoody/Chert cover system is reviewed/evaluated per the 2013 NTCRA PRSC Plan (Formation, 2016b). In accordance with Effectiveness Monitoring Plan Revision No. 6 (Formation, 2022), semiannual surface water monitoring is conducted at 5 locations, and semiannual groundwater monitoring is conducted at 4 locations. Performance and effectiveness monitoring data would continue to be reported annually as required.

Additional Site-wide LTM would be required to evaluate the performance and effectiveness of the source control and water treatment alternatives, and the results would be used to support the protectiveness evaluations during the CERCLA 5- year review process. The monitoring network for the Mine outside of Pole Canyon would likely be a combination of existing locations (e.g., existing monitoring wells and historical surface water sampling stations) and additional locations depending on the nature and requirements of the selected remedy. Monitoring locations for fish tissue would likely be the same as those utilized in the RI.

19.3 Cost Estimate for the Selected Remedy

Appendix B (Cost Estimate Details for the Selected Alternatives) details the estimated costs to implement and construct Alternatives 2b, 2c, and 3c. The estimated total cost to implement and construct the Selected Remedy presented in this ROD is $163.9 million (Appendix B – Table 21). The information in this cost estimate for the Selected Remedy is based on the best available information regarding the anticipated scope of the remedial alternative.

Changes in the cost elements are likely to occur as a result of new information and data collected during the engineering design of the remedial alternative. Major changes may be documented in the form of a technical memorandum in the Administrative Record file, an Explanation of Significant Differences, or a ROD amendment. This cost estimate is an order-of-magnitude engineering estimate that is expected to be within +50 to -30 percent of the actual project cost.

19.4 Expected Outcomes of the Selected Remedy

Following are the expected outcomes of the Selected Remedy in terms of surface water and groundwater uses. The cleanup levels and the risk reduction achieved because of the remedial action, and the anticipated community impacts are also discussed.

19.4.1 Available Surface Water and Groundwater Uses

The remedy will be protective of surface water because contaminants will be removed by the WTP. This removal of contaminants will, in time, result in the reduction of selenium concentrations in fish tissue and the water column. Covers on seeps will prevent exposure to contaminated water.

Groundwater will be protected because targeted source areas will be covered with a cover system limiting infiltration of water into mining waste. Alluvial groundwater will be treated by the PRB downgradient of the Pole Canyon ODA. Additionally, MNA will reduce groundwater concentrations after construction is complete. ICs will prevent use of contaminated groundwater in the vicinity of SCM as drinking water.

19.4.2 Final Cleanup Levels

Table 1 (Cleanup Levels by Media) shows the cleanup levels for surface water and groundwater. Reduction of contaminant concentrations in the surface water to below the site-specific selenium criterion and for other contaminants below the drinking water MCL will return the surface water to beneficial use. The reduction of contaminant concentrations in alluvial and Wells Formation groundwater will prevent loading of those contaminants to surface water.

Cleanup levels for soil/overburden were not selected because potential risk so ecological receptors were marginal.

19.4.3 Anticipated Community Impacts

The Selected Remedy will benefit downstream communities because it will remove selenium from Sage Creek and Crow Creek and reduce selenium concentrations in fish tissue. Additionally, the Selected Remedy is the remedy preferred by the public.

20.0 STATUTORY DETERMINATIONS

Under CERCLA §121 and the NCP §300.430, the USFS must select remedies that are protective of human health and the environment, comply with ARARs, are cost-effective, and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. In addition, CERCLA includes a preference for remedies that employ treatment that permanently and significantly reduces the volume, toxicity, or mobility of hazardous wastes as a principal element and a bias against off-site disposal of untreated wastes. The following sections discuss how the Selected Remedy meets these statutory requirements.

20.1 Protection of Human Health and the Environment

The Selected Remedy will treat contaminated water emanating from the Hoopes Spring Complex to reduce selenium concentrations in Sage Creek and Crow Creek. It is anticipated that this action will reduce selenium surface water contamination and meet the site-specific selenium criterion in treated water shortly after construction of the expanded WTP. It will likely take some time for the

selenium to be reduced in the system in order for the selenium tissue criterion element to be met but water treatment immediately lessens exposure to fish and other aquatic organisms.

The Selected Remedy for the alluvial and Wells Formation groundwater at this Site will also be protective of human health and the environment. The cover system will prevent precipitation from coming in contact with contaminated middle waste shale material in the ODAs. The PRB will treat waters that emanate from the Pole Canyon ODA before they recharge the alluvial aquifer.

ICs will be implemented to protect the integrity of the remedy and to prevent the use of groundwater as drinking water to protect human health over the short term.

20.2 Compliance with ARARs

The NCP §300.430(f) require that a ROD describe the Federal and State ARARs that the Selected Remedy will attain or provide justification for any waivers. ARARs include substantive provisions of any promulgated Federal or more stringent State environmental standards, requirements, criteria, or limitations that are determined to be legally ARARs for a CERCLA site or action. Applicable requirements are those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under Federal or State law that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at a CERCLA site. Relevant and appropriate requirements are requirements that, while not legally "applicable" to circumstances at a particular CERCLA site, address problems or situations sufficiently similar to those encountered at the Site that their use is well-suited.

The Selected Remedy of an expanded WTP to treat water from Hoopes Springs, chert/limestone covers on seeps and ponds, a PRB downgradient of the Pole Canyon ODA, and Enhanced Dinwoody covers on Panels D and E, comply with all Federal and any more stringent State ARARs that are applicable to the Site. The location-specific, chemical-specific, and activity-specific ARARs applicable to the Site are presented in Appendix E and summarize how the selected remedy complies with ARARs.

20.3 Cost-Effectiveness

The Selected Remedy is cost-effective because the remedy's costs are proportional to its overall effectiveness (see 40 CFR §300.430(f)(l)(ii)(D)). This determination was made by evaluating the “overall effectiveness” of those alternatives that satisfied the threshold criteria (i.e., that are protective of human health and the environment and comply with all Federal and any more stringent State ARARs, or as appropriate, waive ARARs). Overall effectiveness was evaluated by assessing three of the five balancing criteria in combination (long-term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment; and short-term effectiveness). The overall effectiveness of each alternative was then compared to each

alternative's costs to determine cost-effectiveness. The relationship of the overall effectiveness of this remedial alternative was determined to be proportional to its costs and hence represents a reasonable value for the money to be spent.

The estimated present worth cost of the Selected Remedy is $163.9 million (Appendix B – Table 21). Alternative 3c is higher in costs than alternatives 3a and 3b but provides much greater protection. Alternative 3c provides similar protection to 3d, but at 21% lower cost. These alternatives were evaluated in the FS. Construction to expand the WTP from 2,000 gpm to 4,000 gpm increases the cost by $30M. The benefits of the Selected Remedy compared to the other alternatives are much higher than the increase in costs.

20.4 Utilization of Permanent Solutions to the Maximum Extent Practicable

The USFS has determined that the Selected Remedy represents the maximum extent to which permanent solutions and treatment technologies can be utilized in a practicable manner at the Site. Of those alternatives that are protective of human health and the environment and comply with ARARs, the USFS has determined that the Selected Remedy provides the best balance of trade-offs in terms of the five balancing criteria, while also considering the statutory preference for treatment as a principal element, bias against off-Site treatment and disposal, and considering State and community acceptance.

The Selected Remedy treats selenium-contaminated surface water at SCM. The Selected Remedy satisfies the criteria for long-term effectiveness by reducing selenium concentrations in treated surface water. The Selected Remedy does not present short-term risks different from the other treatment alternatives. There are no special implementability issues that sets the Selected Remedy apart from any of the other alternatives evaluated.

20.5 Preference for Treatment as a Principal Element

The USFS has determined that the principal waste at the site is the selenium contaminated surface water emanating from the Hoopes Springs Complex. The WTP at Hoopes Springs meets the statutory preference for the selection of a remedy that involves treatment as a principal element, thereby reducing the toxicity of surface water.

20.6 Five-Year Review Requirements

Section 12l(c) of CERCLA and the NCP §300.430(f)(5)(iii)(C) provide the statutory and legal bases for conducting five-year reviews. Because this remedy will result in hazardous substances remaining on-site in the groundwater and in the ODAs above levels that allow for unlimited use and unrestricted exposure, a statutory review will be conducted no less often than each five years after initiation of the remedial action to ensure that the remedy is, or will continue to be, protective of human health and the environment.

21.0 STATE ROLE

The IDEQ, on behalf of the State of Idaho, has reviewed the various alternatives and has indicated its support for the Selected Remedy. No Comments from the State of Idaho were received during the public comment period. The State of Idaho concurs with the Selected Remedy for the Site (Appendix C).

The WDEQ, on behalf of the State of Wyoming, has reviewed the various alternatives and has indicated its support for the Selected Remedy. Comments were received from WDEQ during the public comment period on the Proposed Plan and WDEQ provided comments during the review of this ROD (Appendix D). The State of Wyoming concurs with the Selected Remedy for the Site (Appendix C).

PART 3: RESPONSIVENESS SUMMARY

22.0 RESPONSIVENESS SUMMARY

The Responsiveness Summary (Appendix D) summarizes information about the views of the public and the support agency regarding both the remedial alternatives and general concerns about the Site submitted during the public comment period. This summary also documents, in the record, how public comments were integrated into the decision-making process.

The Administrative Record file for the Site, located at the Soda Springs Ranger District office, contains all of the information and documents supporting this ROD.

The 30-day public comment period for the Proposed Plan began on April 26, 2023. A request for a 30-day extension to the public comment period was granted so the public comment period concluded on June 26, 2023. The USFS received comments from six different entities. These included the Respondent, a governmental agency (WDEQ), and four different environmental groups. The comments were generally in acceptance of the selected alternatives. All comments were accepted and did not change the proposed remedy. Responses to the comments are provided in the Responsiveness Summary (Appendix D).

An online community meeting was held on May 2, 2023 (USFS, 2023b); approximately eight community members attended. At this meeting, representatives from the USFS answered questions about the Preferred Alternative for the Site. The meeting was recorded and transcribed. The transcript is included as part of the Responsiveness Summary in Appendix D.

The USFS provided the Proposed Plan for SCM to the Shoshone-Bannock Tribes in April 2023 and offered to meet with them. No meeting was held at that time and no objections were provided by the Tribes. On September 26, 2023, the USFS met with the Shoshone-Bannock Tribes in a staff-to-staff meeting and on November 16, 2023, in a government-to-government meeting. The information from the Proposed Plan (USFS, 2023a) was presented at both meetings. On January 4, 2024, the Tribes, via email, provided notification that they would not have any comments on the remedial alternatives selected for the Site.

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TABLES

Table 1: Cleanup Levels by Media

Media	Cleanup Level
Non-Regulated Surface Water (Seeps and Ponds)[1]	Arsenic: 0.01 mg/L Cadmium: 0.05 mg/L
Groundwater[1]	Selenium: 0.05 mg/L
Regulated Surface Water (Hoopes Spring and Sage Creek)[2]	Selenium (egg/ovary): 20.5 mg/kg[4] Selenium (whole body fish tissue): 13.6 mg/kg Selenium (water): 0.0167 mg/L
Regulated Surface Water (Crow Creek in Idaho)[3]	Selenium (egg/ovary): 20.5 mg/kg[4] Selenium (whole body fish tissue): 12.5 mg/kg Selenium (water): 0.0042 mg/L
Regulated Surface Water (Crow Creek in Wyoming)[5]	Selenium, total recoverable (water): 0.005 mg/L

Notes: (1) EPA National Primary Drinking Water Regulations, Maximum Contaminant Level (MCL)
(2) Idaho Water Quality Standards (IDAPA 58.01.02.287.03)
(3) Idaho Water Quality Standards (IDAPA 58.01.02.287.04)
(4) Tissue criterion elements take precedence over the water element when data for either tissue are available. Egg/ovary data takes precedence over whole body data when both tissue data types are available.
(5) Wyoming. Water Quality Rules and Regulations, Chapter 1: Wyoming Surface Water Quality Standards (Reference # 020.0011.1.03232015)

Table 2: Evaluation Criteria for Superfund Remedial Alternatives

Category		Criteria	General Description	Factors to Consider
Threshold Criteria	1	Overall Protection of Human Health and the Environment	Evaluates how the alternative, as a whole, achieves and maintains protection of human health and the environment.	Effectiveness for elimination, reduction, or control of site risks posed through each exposure pathway. Consider whether unacceptable short-term or cross-media impacts would occur.
	2	Compliance with ARARs	Evaluates how the alternative complies with ARARs, or if a waiver is required and how it is justified	Compliance with action-specific, location-specific, and chemical-specific ARARs. Compliance with other criteria, advisories, and guidance.
Balancing Criteria	3	Long-Term Effectiveness & Permanence	Evaluates the long-term effectiveness of alternatives in maintaining protection of human health and the environment after the response objectives have been met.	Magnitude of residual risk. Adequacy and reliability of controls.
	4	Reduction of Toxicity, Mobility, and Volume through Treatment	Evaluates the anticipated performance of the specific treatment technologies than an alternative may incorporate.	• Treatment process used and materials treated • The amount of hazardous materials destroyed or treated • Degree of expected reductions in toxicity, mobility, and volume • Degree to which treatment is irreversible • Type and quantity of residuals remaining after treatment • Degree to which treatment reduces principal threats
	5	Short-Term Effectiveness	Examines the effectiveness of alternatives in protecting human health and the environment during construction and implementation of a remedy until the response objectives have been achieved.	• Protection of the local community during remedial actions • Protection of workers during remedial actions • Environmental impacts of remedial action activities • Time until remedial action objectives are achieved
	6	Implementability	Evaluates the technical and administrative feasibility of alternatives and the availability of services, equipment, and skilled manpower	• Ability to construct and operate the technology • Reliability of the technology • Ease of undertaking additional remedial actions if necessary • Ability to monitor effectiveness of the remedy • Coordination with other agencies • Availability of offsite treatment, storage, and disposal services and capacity • Availability of necessary equipment and specialists • Availability of prospective technologies
	7	Cost	Assesses the capital, maintenance, and repair costs of each alternative.	• Capital costs • Maintenance and repair costs • Present worth costs • Accuracy of cost estimates: +50% to -30% • Performance period
Modifying Criteria	8	State Acceptance	Assesses the state's or support agency's preferences among or concerns about the alternatives	Sought from the regulatory stakeholders.
	9	Community Acceptance	Assesses the community's preferences among or concerns about the alternatives	Sought through the public review period for the Proposed Plan

ARAR – Applicable or Relevant and Appropriate Requirements
Sources: National Contingency Plan 300.430
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Table 3 - Comparison of Water Treatment Alternatives

	Alternative 1 No Further Action	Alternative 2 Water Treatment Alternatives (Surface Water) Alternative 2a Water Treatment at the Hoopes WTP (2,000 gpm), ICs, Chert/Limestone Covers on Seeps and Ponds, O&M, MNA, LTM	Alternative 2 Water Treatment Alternatives (Surface Water) Alternative 2b Water Treatment at the Hoopes WTP (4,000 gpm),ICs, Chert/Limestone Covers on Seeps and Ponds, O&M, MNA, LTM	Alternative 2 Water Treatment Alternative (Alluvial Groundwater) Alternative 2c PRB Downgradient of Pole Canyon ODA, ICs, O&M, MNA, LTM
Threshold Criteria				
1. Protection of Human Health and the Environment				
Detailed Analysis	***Low***	***Moderate***	***High***	***Low/Moderate***
Protection of Human Health and the Environment for Surface Water and Alluvial Groundwater (Yes/No)	No	Yes	Yes	Yes
Protection of Human Health				
- Ingestion of Wells Formation Groundwater	Alternative 1 would not prevent the use of Wells Formation groundwater with selenium concentrations above the MCL as a source of drinking water on Simplot-owned land in Sage Valley in the future.	ICs (deed restrictions) would prevent the use of Wells Formation groundwater with selenium concentrations above the MCL as a source of drinking water on Simplot-owned land in Sage Valley. Future residential development and use of Wells Formation groundwater is not a potential land use for Forest Service land.	Same as Alternative 2a	Human health risks related to ingestion of Wells Formation groundwater are not addressed by this alternative. The PRB is predicted to reduce selenium load to Wells Formation groundwater in lower Pole Canyon by approximately 83%. Selenium concentrations in alluvial groundwater are estimated to reduce below the MCL within 15 years.
- Ingestion of Surface Water in Seeps and Detention Ponds	There are potential unacceptable future risks to human receptors (Recreational Campers or Native Americans) and potential unacceptable current risks to human receptors (Native Americans) from ingestion of surface water where arsenic and cadmium concentrations exceed the Idaho surface water standard in seeps (DS-7 and LP-1) and detention ponds (DP-7 and EP-2).	Recreational Campers and Native Americans would be protected from risks due to ingestion of surface water where arsenic and cadmium concentrations exceed their respective MCLs in seeps (DS-7 and LP-1) and ponds (DP- 7 and EP-2) by chert/limestone covers on seeps and ponds.	Same as Alternative 2a	Non-regulated surface water in seeps and ponds is not addressed by this alternative.
- Ingestion of Alluvial Groundwater	Alternative 1 would not prevent the use of alluvial groundwater with selenium concentrations above the MCL as a source of drinking water on Simplot-owned land in Sage Valley in the future.	Human health risks related to ingestion of alluvial groundwater are not addressed by this alternative.	Same as Alternative 2a	ICs (deed restrictions) would prevent the use of alluvial groundwater with selenium concentrations above the MCL as a source of drinking water on Simplot-owned land in Sage Valley.
Protection of the Environment	There are no ecological risks associated directly with alluvial or Wells Formation groundwater. However, there are risks to aquatic life where Wells Formation groundwater discharges to surface water at Hoopes Spring and continues downstream. Under current conditions, selenium concentrations in surface water in the Sage Creek/Crow Creek watershed downstream of Hoopes Spring are above the surface water standards (0.0167 mg/L dissolved for Sage Creek, 0.0042 mg/L dissolved for Crow Creek in Idaho, and 0.005 mg/L total recoverable for Crow Creek in Wyoming), which represents an unacceptable ecological risk. Selenium concentrations are anticipated to reduce over time as the load from Wells Formation groundwater discharge decreases and are predicted to be in the range of the surface water standard around 2060 (the limit of the modeling). Risks to bird populations from selenium in surface soils on Panel A are likely to be low.	Continued water treatment at the Hoopes WTP would immediately reduce selenium concentrations in surface water downstream of Hoopes Spring in the Sage Creek/Crow Creek watershed. Selenium concentrations would still be above the surface water standards in the short term but are predicted to reduce in the future and are predicted to be below the water quality standards by 2050. Risk to bird populations from selenium in Panel A surface soils is not addressed under this alternative.	Expansion of the Hoopes WTP and continued water treatment would immediately reduce selenium concentrations in surface water downstream of Hoopes Spring in the Sage Creek/Crow Creek watershed. Selenium concentrations would immediately be reduced below the surface water standard in Sage Creek but would remain above the surface water standards in Crow Creek in the short term - predicted to be below the standards by 2030. Risk to bird populations from selenium in Panel A surface soils is not addressed under this alternative.	There are no ecological risks associated directly with alluvial or Wells Formation groundwater. The PRB downgradient of the Pole Canyon ODA would capture seep water before it infiltrates and quickly reduce selenium concentrations in local groundwater. The consequent reduction in selenium load at the Spring Complex would be relatively minor and arrive approximately 20 to 25 years after PRB construction. Risk to bird populations from selenium in Panel A surface soils is not addressed under this alternative.

Table 3 - Comparison of Water Treatment Alternatives (continued)

	Alternative 1 No Further Action	Alternative 2 Water Treatment Alternatives (Surface Water) Alternative 2a Water Treatment at the Hoopes WTP (2,000 gpm), ICs, Chert/Limestone Covers on Seeps and Ponds, O&M, MNA, LTM	Alternative 2 Water Treatment Alternatives (Surface Water) Alternative 2b Water Treatment at the Hoopes WTP (4,000 gpm),ICs, Chert/Limestone Covers on Seeps and Ponds, O&M, MNA, LTM	Alternative 2 Water Treatment Alternative (Alluvial Groundwater) Alternative 2c PRB Downgradient of Pole Canyon ODA, ICs, O&M, MNA, LTM
Threshold Criteria (continued)				
2.Compliance with ARARs				
Detailed Analysis	***Low***	***Moderate***	***Moderate/High***	***Moderate***
Compliance with ARARs (Yes/No)	No	Yes	Yes	Yes
Chemical-Specific ARARs [1]	Compliance with ARARs for surface water in Sage Creek and Crow Creek would be the same as for protection of the environment, as described above. In Wells Formation groundwater selenium concentrations are predicted to be in the range of the MCL at GW-25 (downgradient of Panel E) and to be above the MCL at GW-16 (downgradient of the Pole Canyon ODA) in 2060 (the limit of the model). Concentrations are also predicted to remain above the MCL in alluvial groundwater in Pole Canyon, immediately downgradient of the Pole Canyon ODA.	Compliance with ARARs for surface water in Sage Creek and Crow Creek would be the same as for protection of the environment, as described above. The surface water standards are predicted to be met around 2050. For Wells Formation groundwater the performance would be the same as Alternative 1. Alluvial groundwater is not addressed under this alternative.	Compliance with ARARs for surface water in Sage Creek and Crow Creek would be the same as for protection of the environment, as described above. The surface water standards are predicted to be met around 2030. For Wells Formation groundwater the performance would be the same as Alternative 1. Alluvial groundwater is not addressed under this alternative.	Compliance with ARARs for surface water in Sage Creek and Crow Creek would be the same as for protection of the environment, as described above. The PRB would have a small effect on selenium concentrations in Sage Creek and Crow Creek in approximately 25 years. For Wells Formation groundwater downgradient of the Pole Canyon ODA the PRB is predicted to result in a significant reduction in selenium concentrations at GW- 16, resulting in the MCL being met in approximately 10 years. The PRB is predicted to reduce selenium concentrations in downgradient alluvial groundwater by approximately 85% over a period of 2 to 3 years. Selenium concentrations are predicted to remain above the MCL only in Pole Canyon, immediately downgradient of the ODA.
Action-Specific ARARs [1]	No further action would not trigger any action-specific ARARs	Operation of the Hoopes WTP would trigger point source discharge requirements for treated water and disposal of solid waste generated at the treatment system. The requirements would be met by remedial design.	Laws or regulations concerning the control of fugitive dust during construction, point source discharges of treated water, and disposal of solid waste generated at the Hoopes WTP would be triggered by the remedial action (expansion of the WTP). The requirements would be met by remedial design.	Construction of a PRB in Pole Canyon would trigger laws or regulations associated with testing and proper disposal of solid waste. Compliance with these ARARs would be expected to be straightforward and would be addressed during remedial design.
Location-Specific ARARs [1]	No further action would not trigger any location-specific ARARs	Would meet requirements for protection of wetlands.	Expansion of the Hoopes WTP would trigger laws or regulations for the protection of wetlands, natural streams and waterbodies. The requirements would be met by remedial design.	Construction of a PRB in Pole Canyon would trigger laws or regulations intended to protect wetlands, natural streams and waterbodies. The requirements would be met by remedial design.

1 - See Appendix E for specific ARARs

Table 3 - Comparison of Water Treatment Alternatives (continued)

	Alternative 1 No Further Action	Alternative 2 Water Treatment Alternatives (Surface Water) Alternative 2a Water Treatment at the Hoopes WTP (2,000 gpm), ICs, Chert/Limestone Covers on Seeps and Ponds, O&M, MNA, LTM	Alternative 2 Water Treatment Alternatives (Surface Water) Alternative 2b Water Treatment at the Hoopes WTP (4,000 gpm),ICs, Chert/Limestone Covers on Seeps and Ponds, O&M, MNA, LTM	Alternative 2 Water Treatment Alternative (Alluvial Groundwater) Alternative 2c PRB Downgradient of Pole Canyon ODA, ICs, O&M, MNA, LTM
Balancing Criteria				
3. Long-Term Effectiveness and Permanence				
Detailed Analysis	***Low***	***Moderate***	***High***	***Moderate***
Magnitude of Residual Risk				
- Ingestion of Wells Formation Groundwater	Residual risks would remain for potential use of Wells Formation groundwater as a drinking water source on Simplot-owned land in Sage Valley in the future.	The potential for use of Wells Formation groundwater as a drinking water source would be eliminated by ICs.	Same as Alternative 2a.	The potential for use of Wells Formation groundwater as a drinking water source is not addressed by this remedy.
- Ingestion of Surface Water in Seeps and Detention Ponds	All current and potential future risks to Native Americans and Recreational Campers from arsenic and cadmium in surface water would remain.	Potential risks to Native Americans and Recreational Campers would be eliminated immediately upon installation of chert/limestone covers on seeps and detention ponds.	Same as Alternative 2a.	The potential for ingestion of surface water in seeps and ponds is not addressed by this remedy.
- Ingestion of Alluvial Groundwater	Residual risks would remain related to the potential for use of alluvial groundwater as a drinking water source on Simplot-owned land downgradient of the Pole Canyon ODA. The remaining source of risk is residual contamination in the Pole Canyon ODA that discharges selenium to the LP-1 seep or releases selenium to alluvial groundwater.	The potential for use of alluvial groundwater as a drinking water source is not addressed by this remedy.	Same as Alternative 2a.	The potential for use of alluvial groundwater as a drinking water source would be eliminated by ICs.
- Ecological Receptors	There are risks to aquatic life in Sage Creek and Crow Creek. Under current conditions, selenium concentrations in surface water in the Sage Creek/Crow Creek watershed downstream of Hoopes Spring are above the surface water standard (0.0167 mg/L dissolved for Sage Creek, 0.0042 mg/L dissolved for Crow Creek in Idaho, and 0.005 mg/L total recoverable for Crow Creek in Wyoming), which represents an unacceptable ecological risk. Selenium concentrations are anticipated to reduce over time as the load from Wells Formation groundwater discharge decreases and are predicted to be in the range of the surface water standards around 2060 (the limit of the modeling).	Continued water treatment at the Hoopes WTP would immediately reduce selenium concentrations in surface water downstream of Hoopes Spring in the Sage Creek/Crow Creek watershed. Selenium concentrations would still be above the surface water standards in the short term but are predicted to reduce in the future and are predicted to be below the surface water standards by 2050.	Expansion of the Hoopes WTP and continued water treatment would immediately reduce selenium concentrations in surface water downstream of Hoopes Spring in the Sage Creek/Crow Creek watershed. Selenium concentrations would immediately be reduced below the surface water standard in Sage Creek but would remain above the standards in Crow Creek in the short term - predicted to be below the surface water standards by 2030.	The PRB downgradient of the Pole Canyon ODA would capture seep water before it infiltrates and quickly reduce selenium concentrations in local groundwater. The consequent reduction in selenium load at the Spring Complex would be relatively minor and arrive approximately 20 to 25 years after PRB construction.
Adequacy and Reliability of Controls	No controls would be implemented.	The WTP has operated for multiple years and has been demonstrated to be reliable. Long-term O&M of the treatment system and monitoring of the influent, effluent and ultrafiltration backwash would continue to evaluate the effectiveness of the system. Downstream surface water monitoring would also be required. Technical components of the treatment system (e.g., biosolids, mechanical parts, etc.) would likely need to be replaced from time to time. Posttreatment sludge would be disposed in a Subtitle D landfill.	Same as Alternative 2a.	The PRB technology is adequate, reliable, and would require a moderate degree of O&M and long-term monitoring to evaluate and maintain performance. PRB treatment materials will eventually become exhausted and would need to be replaced. If spent treatment materials are removed from the system they would be tested to determine appropriate disposal.
Need for 5-Year Review	CERCLA 5-year reviews would be required to ensure adequate protection of human health and the environment is maintained.	CERCLA 5-year reviews would be required.	CERCLA 5-year reviews would be required.	CERCLA 5-year reviews would be required.

Table 3 - Comparison of Water Treatment Alternatives (continued)

		Alternative 2 Water Treatment Alternatives (Surface Water)		Alternative 2 Water Treatment Alternative (Alluvial Groundwater)
	Alternative 1 **No Further Action**	**Alternative 2a** **Water Treatment at the Hoopes WTP (2,000 gpm), ICs, Chert/Limestone Covers on Seeps and Ponds, O&M, MNA, LTM**	**Alternative 2b** **Water Treatment at the Hoopes WTP (4,000 gpm),ICs, Chert/Limestone Covers on Seeps and Ponds, O&M, MNA, LTM**	**Alternative 2c** **PRB Downgradient of Pole Canyon ODA, ICs, O&M, MNA, LTM**
Balancing Criteria (continued)				
4. Reduction of Toxicity, Mobility, or Volume Through Treatment				
Detailed Analysis	***Low***	***Moderate/High***	***High***	***Moderate***
Treatment Process Used and Materials Treated	None.	The Hoopes treatment system uses ultrafiltration (UF) to remove particulate material and reverse osmosis (RO) and fluidized bed reactors (FBRs) to remove selenium from surface water pumped from Hoopes Spring and South Fork Sage Creek springs. Polishing steps used in the existing treatment system include aeration, clarification, sand filtration, and iron co-precipitation. The WTP also uses an activated sludge post treatment system.	Same as Alternative 2a, except that the WTP would be expanded to twice its current capacity.	Selenium in water at the LP-1 seep would be treated insitu using a PRB that would allow water to passively flow though reactive treatment media installed in a trench positioned immediately downgradient of the seep in Pole Canyon. The media placed in the PRB would have a permeability appropriate for the hydraulic conductivities of surrounding materials and with adequate retention times. It is likely that the PRB design would be based on the PRB installed and being pilot tested at the Conda Mine.
Amount of Hazardous Materials Destroyed or Treated	None.	The Hoopes WTP operates at a maximum design flow rate of approximately 2,000 gpm.	The Hoopes WTP would be expanded under Alternative 2b to operate at a maximum design flow rate of approximately 4,000 gpm.	PRBs are demonstrated to be effective at removing selenium. The reactive media use chemical and microbial processes to chemically reduce and transform selenium from selenate to selenite and ultimately to elemental selenium.
Degree of Expected Reductions in Toxicity, Mobility, and Volume	Alternative 1 provides no reduction in toxicity, mobility, or volume through treatment.	The existing WTP is currently removing approximately 94-96% of the selenium in the influent. It is estimated that for current conditions, the WTP is removing 3.2 lbs/day of the 7.2 lbs/day of selenium emanating in water at the Spring Complex. This reduces the concentrations of selenium in surface water by approximately 44%.	Expansion of the Hoopes WTP would result in increased selenium reductions. Selenium removal would be expected to remain at 95% with a doubling of the treatment flow rate. However, the influent selenium concentration would be reduced by approximately 12% as more lower concentration water would be treated. It is estimated that for current conditions, the expanded WTP would remove 5.2 lbs/day of the 7.2 lbs/day of selenium emanating in water at the Spring Complex. This would reduce the concentrations of selenium in surface water by approximately 80%.	Properly designed, constructed and maintained PRB would be expected to remove approximately 95% of the selenium in the influent resulting in a reduction in selenium concentrations in downgradient alluvial groundwater at GW-15 and downgradient Wells Formation groundwater at GW-16.
Degree to Which Treatment is Irreversible	No treatment.	Treatment of surface water by UF/RO FBR is irreversible.	Same as Alternative 2a.	PRB treatment is irreversible for the relatively unchanging conditions found in LP-1 seep water. Pilot studies are being performed at Conda Mine to evaluate the treatment performance over time but there are no data to estimate actual performance over time. It is expected that complete treatment media removal would be needed every 10 to 20 years. Selenium could potentially be released from spent treatment media, but this would be evaluated during O&M and the media would be removed if necessary.
Type and Quantity of Treatment Residuals Remaining After Treatment	None.	Sludge generated from the post-treatment system is trucked to a Subtitle D landfill for disposal. The sludge solids are analyzed using TCLP and meet RCRA guidelines to be classified as non-hazardous waste.	Same as Alternative 2a.	Once treatment was complete, treatment media could be left in place or removed, depending on its characteristics. If spent treatment materials would be removed from the system they would be tested to determine appropriate disposal.
Statutory Preference for Treatment as a Principal Element	Alternative 1 does not satisfy the statutory preference for treatment.	Alternative 2a satisfies the statutory preference for treatment.	Alternative 2b satisfies the statutory preference for treatment.	Alternative 2c satisfies the statutory preference for treatment.

Table 3 - Comparison of Water Treatment Alternatives (continued)

		Alternative 2 Water Treatment Alternatives (Surface Water)		Alternative 2 Water Treatment Alternative (Alluvial Groundwater)
	Alternative 1 **No Further Action**	**Alternative 2a** **Water Treatment at the Hoopes WTP (2,000 gpm), ICs, Chert/Limestone Covers on Seeps and Ponds, O&M, MNA, LTM**	**Alternative 2b** **Water Treatment at the Hoopes WTP (4,000 gpm),ICs, Chert/Limestone Covers on Seeps and Ponds, O&M, MNA, LTM**	**Alternative 2c** **PRB Downgradient of Pole Canyon ODA, ICs, O&M, MNA, LTM**
Balancing Criteria (continued)				
5. Short-Term Effectiveness				
Detailed Analysis	***Moderate***	***Moderate/High***	***High***	***Moderate/High***
Protection of Community During Remedial Actions	There would be no additional risks to local communities because no additional actions would be implemented.	There would be no increased risk to local communities related to construction and implementation of this alternative. The site is distant from any residences and minimal increase in road traffic would occur.	Same as Alternative 2a.	Same as Alternative 2a.
Protection of Workers During Remedial Actions	There would be no additional risks to workers because no additional actions would be implemented.	There would be no increased risk to construction workers related to construction of a remedy for the continued use of the existing Hoopes WTP.	Risk of construction worker exposure to dust and seep water during remedial construction activities would be mitigated using standard health and safety protocols and BMPs. Construction associated with the WTP would pose low risk to workers, because they are performed with standard construction techniques and have a demonstrated high level of safety when performed with appropriate safety precautions and procedures. Workers would be protected by having OSHA and HAZWOPER training, wearing appropriate PPE, and by following established health and safety procedures and protocols. O&M activities are routine and would present a low risk to workers.	Construction associated with the PRB would pose low risk to workers because construction would be performed with standard construction techniques and a demonstrated high level of safety when performed with appropriate safety precautions and procedures. Workers would be protected by having OSHA and HAZWOPER training, wearing appropriate PPE, and by following established health and safety procedures and protocols. O&M activities are routine and would present a low risk to workers.
Environmental Impacts Expected with Construction and Implementation of Remedial Actions	No additional remedial actions would be implemented so there are no environmental impacts due to construction.	There would be no additional environmental impacts associated with Alternative 2a because the treatment system has already been constructed.	Potential adverse environmental impacts related to construction of the expanded treatment system at the Hoopes WTP include dust generation and stormwater runoff. These impacts would be mitigated using standard BMPs for dust control and to prevent transport of sediment to streams.	Potential environmental impacts associated with the construction and operation of a PRB would be minimal. The PRB would be constructed in a relatively narrow canyon. Dust generation and stormwater runoff would be mitigated using standard BMPs for erosion and dust control during excavation of the trench to prevent transport of sediment to Pole Canyon Creek. Proper O&M would address any potential issues.
Time Until Remedial Objectives Are Achieved	RAOs for non-regulated surface water in seeps and ponds would not be achieved. With no remedial action, the RAO to reduce selenium concentrations in surface water in Sage Creek and Crow Creek is predicted to be achieved in approximately 35 years. Selenium concentrations in Wells Formation groundwater at GW-25 (downgradient of Panel E) are predicted to be in the range of the MCL by 2060 (the limit of the Groundwater Model analysis) and still decreasing, and at GW-16 (downgradient of the Pole Canyon ODA) concentrations are predicted to be approximately 0.2 mg/L by 2060 and continuing to decrease. In alluvial groundwater selenium concentrations are predicted to decline below the MCL at GW-15 within 20 years and at GW-22 within approximately 40 years. Concentrations are predicted to remain above the MCL at GW-26 for the modeling time period to 2060.	Selenium concentrations in alluvial and Wells Formation groundwater would be the same as Alternative 1. The existing 2,000 gpm Hoopes WTP would continue reducing selenium concentrations in spring water. Selenium concentrations in Sage Creek and Crow Creek are predicted to meet RAOs by around 2050.	Selenium concentrations in alluvial and Wells Formation groundwater would be the same as Alternative 1. The expanded 4,000 gpm Hoopes WTP would reduce selenium concentrations in spring water. Selenium concentrations in Sage Creek and Crow Creek are predicted to meet RAOs by around 2030.	Deed restrictions would be effective immediately. Construction of the PRB would take 1 year and would reduce selenium concentrations in alluvial groundwater in 1 to 2 years (except in a small area in Pole Canyon). Wells Formation groundwater is expected to meet RAOs in 15 years downgradient of the Pole Canyon ODA. The time to reduce selenium concentrations in Wells Formation groundwater downgradient of Panel E (GW-25) and in surface water in Sage Creek and Crow Creek would be similar to Alternative 1.

Table 3 - Comparison of Water Treatment Alternatives (continued)

		Alternative 2 Water Treatment Alternatives (Surface Water)		Alternative 2 Water Treatment Alternative (Alluvial Groundwater)
	Alternative 1 **No Further Action**	**Alternative 2a** **Water Treatment at the Hoopes WTP (2,000 gpm), ICs, Chert/Limestone Covers on Seeps and Ponds, O&M, MNA, LTM**	**Alternative 2b** **Water Treatment at the Hoopes WTP (4,000 gpm),ICs, Chert/Limestone Covers on Seeps and Ponds, O&M, MNA, LTM**	**Alternative 2c** **PRB Downgradient of Pole Canyon ODA, ICs, O&M, MNA, LTM**
Balancing Criteria (continued)				
6. Implementability				
Detailed Analysis	***High***	***High***	***Moderate/High***	***Moderate***
Ability to Construct and Operate Technology	No construction or O&M would be implemented.	The existing Hoopes treatment system was constructed as a pilot study in 2014 and treated 200 to 250 gpm of comingled flow from the Spring Complex. A second FBR was added in 2017 to increase the treatment capacity to 2,500 gpm. No additional construction is planned as part of this alternative.	Expansion of the Hoopes WTP would be implemented using the same equipment and technologies used to construct the pilot study to increase the capacity to 4,000 gpm. The facility could be constructed in 1 year.	Construction of the PRB would be conducted using readily available excavation and/or trenching equipment and readily available treatment media. PRB O&M is routine (e.g. water quality monitoring and water level measurements). Installation of a PRB would require Remedial Design (RD), a Remedial Action Work Plan (RAWP), and a Post-Removal Site Control (PRSC) Plan. The RD/RAWP would include PRB installation procedures, depths, and materials; design of temporary roads, a site restoration plan, stormwater management plan, and a health and safety plan. Periodic O&M and long-term monitoring would be outlined in the PR
Reliability of the Technology	No technology would be implemented.	Technical problems leading to schedule delays are not expected during implementation of this alternative because the Hoopes treatment system is already up and running.	Technical problems leading to schedule delays are not expected during construction of this alternative because the technology has already been implemented and is readily available.	PRB treatment is an EPA-recognized remedial alternative for groundwater. The PRB technology is being pilot tested at Simplot's Conda Mine and has been demonstrated to be reliable and effective at P4's South Rasmussen Mine.
Ease of Undertaking Additional Remedial Action, if Necessary	No additional actions would be implemented.	Additional remedial actions (for example modifications to the treatment system) would be easy to implement.	Same as Alternative 2a.	Future remedial actions are not likely to be implemented in Pole Canyon. Two NTCRAs have already been completed at the Pole Canyon ODA, and the PRB would be constructed immediately downstream of the Pole Canyon ODA. The PRB would be beneath the ground surface and would not affect the implementation of any additional remedial actions.
Ability to Monitor Effectiveness of Remedy	No monitoring would occur other than monitoring of the Pole Canyon NTCRAs under existing Settlement Agreements.	The effectiveness of the treatment system is easily monitored using standard surface water monitoring techniques, laboratory analyses and data evaluation processes. Because the effluent from the treatment system and stream locations immediately downstream of the Hoopes WTP would be monitored, exposure risks due to treatment system failure would be unlikely.	Same as Alternative 2a.	The effectiveness of PRBs is easily monitored using standard groundwater monitoring techniques, laboratory analyses and data evaluation processes. Because well locations immediately downgradient of the PRB would be monitored, exposure risks due to treatment system failure would be unlikely.
Ability to Obtain Approvals and Coordinate with Other Agencies	No approval or coordination necessary.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.
Availability of Treatment, Storage, and Disposal Services and Capacity	None required.	Sludge generated from the post-treatment system would be trucked to a Subtitle D landfill for disposal. Because the quantity of sludge that requires disposal is small, the capacity of the landfill would be adequate.	Same as Alternative 2a.	If spent treatment materials would need to be removed from the system they would be tested to determine appropriate disposal. There are Subtitle C and Subtitle D landfills in Idaho where material could be disposed.

Table 3 - Comparison of Water Treatment Alternatives (continued)

		Alternative 2 Water Treatment Alternatives (Surface Water)		Alternative 2 Water Treatment Alternative (Alluvial Groundwater)
	Alternative 1 No Further Action	**Alternative 2a Water Treatment at the Hoopes WTP (2,000 gpm), ICs, Chert/Limestone Covers on Seeps and Ponds, O&M, MNA, LTM**	**Alternative 2b Water Treatment at the Hoopes WTP (4,000 gpm),ICs, Chert/Limestone Covers on Seeps and Ponds, O&M, MNA, LTM**	**Alternative 2c PRB Downgradient of Pole Canyon ODA, ICs, O&M, MNA, LTM**
Balancing Criteria (continued)				
6. Implementability (continued)				
Availability of Necessary Equipment and Specialists	None required.	Simplot has trained personnel and the necessary equipment to operate and maintain the existing Hoopes WTP. Simplot personnel also perform routine monitoring of the influent and effluent and the surface water downstream of the treatment system discharge. Current vendors are available if additional equipment is needed.	Similar to Alternative 2a. Current vendors are available for the equipment for the additional treatment trains.	PRB construction would require skilled workers, construction equipment and treatment media. PRB operation would require field technicians to perform periodic O&M activities and collect environmental data, and environmental scientists to evaluate performance. These resources are readily available.
Availability/Demonstrated Effectiveness of Prospective Technologies	None required.	The UF/RO FBR technologies used in the existing Hoopes treatment system are readily available and have been proven effective during the pilot treatability study at Hoopes Spring. The UF/RO system was tested as a mini-pilot before it was brought on for full-scale treatment. Vendors selected for the pilot study would continue to be used as needed for equipment replacement and upgrades.	Similar to Alternative 2a. Current vendors would continue to be used for new equipment for the additional treatment trains and for equipment replacement and upgrades.	PRBs are demonstrated to be effective at removing selenium. The PRB installed at the Conda Mine uses well graded sand, alfalfa hay and wood chips to promote microbial processes for selenium reduction.
7. Cost				
Detailed Analysis	***Low***	***Moderate/High***	***High***	***Low***
30-year Present Worth Total Cost	$0	$64.6 million	$106.8 Million	$2.3 Million
Modifying Criteria				
8. State Acceptance	**Refer to Section 17.5**			
9. Community Acceptance	**Refer to Section 17.5**			

Notes:

ARARs - Applicable or Relevant and Appropriate Requirements
BMPs - Best Management Practices
CERCLA - Comprehensive Environmental Response, Compensation and Liability Act
gpm - gallons per minute
HAZWOPER - Hazardous Waste Operations and Emergency Response
ICs - Institutional Controls
LTM - Long-Term Monitoring
MCL - maximum contaminant level
mg/L - milligrams per liter
MNA - Monitored Natural Attenuation
O&M - Operation and Maintenance
ODA - Overburden Disposal Area
OSHA - Occupational Safety and Health Administration
PPE - Personal Protective Equipment
PRB - Permeable Reactive Barrier
RAOs - Remedial Action Objectives
RCRA - Resource Conservation and Recovery Act
UF/RO FBR - Ultrafiltration/Reverse Osmosis Fluidized Bed Reactor

Table 4 - Comparison of Source Control Cover Alternatives (Panels D and E)

		Alternative 3 - Source Control Cover Alternatives (Wells Formation Groundwater and Surface Water)			
	Alternative 1 **No Further Action**	**Alternative 3a** **Dinwoody / Chert Covers Over Target Areas, ICs, O&M, MNA, LTM**	**Alternative 3b** **Capillary Covers Over Target Areas, ICs, O&M, MNA, LTM**	**Alternative 3c** **Enhanced Dinwoody Covers Over Target Areas, ICs, O&M, MNA, LTM**	**Alternative 3d** **Geomembrane Covers Over Target Areas, ICs, O&M, MNA, LTM**
Threshold Criteria					
1. Protection of Human Health and the Environment					
Detailed Analysis	***Low***	***Moderate***	***Moderate***	***Moderate***	***Moderate***
Protection of Human Health and the Environment for Wells Formation Groundwater and Surface Water	No	Yes	Yes	Yes	Yes
Protection of Human Health					
- Wells Formation Groundwater Ingestion	Alternative 1 would not prevent the use of Wells Formation groundwater with selenium concentrations above the MCL as a source of drinking water on Simplot-owned land in Sage Valley in the future.	ICs (deed restrictions) would prevent the use of Wells Formation groundwater with selenium concentrations above the MCL as a source of drinking water on Simplot-owned land in Sage Valley. Future residential development and use of Wells Formation groundwater is not a potential land use for Forest Service land.	Same as Alternative 3a.	Same as Alternative 3a.	Same as Alternative 3a.
- Ingestion of Surface Water in Seeps and Detention Ponds	There are potential unacceptable future risks to human receptors (Recreational Campers or Native Americans) and potential unacceptable current risks to human receptors (Native Americans) from ingestion of surface water where arsenic and cadmium concentrations exceed the Idaho surface water standard in seeps (DS-7 and LP-1) and detention ponds (DP-7 and EP-2).	Non-regulated surface water in seeps and ponds is not addressed by this alternative.	Same as Alternative 3a.	Same as Alternative 3a.	Same as Alternative 3a.
- Alluvial Groundwater Ingestion	Alternative 1 would not prevent the use of alluvial groundwater with selenium concentrations above the MCL as a source of drinking water on Simplot-owned land in Sage Valley in the future.	Alluvial groundwater is not addressed by this alternative.	Same as Alternative 3a.	Same as Alternative 3a.	Same as Alternative 3a.
Protection of the Environment	There are no ecological risks associated directly with alluvial or Wells Formation groundwater. However, there are risks to aquatic life where Wells Formation groundwater discharges to surface water at Hoopes Spring and continues downstream. Under current conditions, selenium concentrations in surface water in the Sage Creek/Crow Creek watershed downstream of Hoopes Spring are above the surface water standard (0.0167 mg/L dissolved for Sage Creek, 0.0042 mg/L dissolved for Crow Creek in Idaho, and 0.005 mg/L total recoverable for Crow Creek in Wyoming), which represents an unacceptable ecological risk. Selenium concentrations are anticipated to reduce over time as the load from Wells Formation groundwater discharge decreases and are predicted to be in the range of the surface water standard around 2060 (the limit of the modeling). Risks to bird populations from selenium in surface soils on Panel A are likely to be low.	Same as Alternative 1 for Wells Formation groundwater. Additional source control through construction of covers on the target areas would further reduce selenium concentrations in surface water in Sage Creek and Crow Creek, which would reduce risks to aquatic life. The covers are predicted to begin to have an effect on selenium concentrations in surface water starting around 2035 (due to the travel time in Wells Formation groundwater to the Spring Complex). Risk to bird populations from selenium in Panel A surface soils is not addressed under this alternative.	Same as Alternative 3a.	Same as Alternative 3a.	Same as Alternative 3a.

Table 4 - Comparison of Source Control Cover Alternatives (Panels D and E) (continued)

		Alternative 3 - Source Control Cover Alternatives (Wells Formation Groundwater and Surface Water)			
	Alternative 1 **No Further Action**	**Alternative 3a** **Dinwoody / Chert Covers Over Target Areas, ICs, O&M, MNA, LTM**	**Alternative 3b** **Capillary Covers Over Target Areas, ICs, O&M, MNA, LTM**	**Alternative 3c** **Enhanced Dinwoody Covers Over Target Areas, ICs, O&M, MNA, LTM**	**Alternative 3d** **Geomembrane Covers Over Target Areas, ICs, O&M, MNA, LTM**
Threshold Criteria (continued)					
2. Compliance With ARARs					
Detailed Analysis	***Low***	***Low/Moderate***	***Low/Moderate***	***Low/Moderate***	***Low/Moderate***
Compliance with ARARs (Yes/No)	No	Yes	Yes	Yes	Yes
Chemical-Specific ARARs [1]	Compliance with ARARs for surface water in Sage Creek and Crow Creek would be the same as for protection of the environment, as described above. In Wells Formation groundwater selenium concentrations are predicted to be in the range of the MCL at GW-25 (downgradient of Panel E) and to be above the MCL at GW-16 (downgradient of the Pole Canyon ODA) in 2060 (the limit of the model). Concentrations are also predicted to remain above the MCL in alluvial groundwater in Pole Canyon, immediately downgradient of the Pole Canyon ODA.	Selenium concentrations are anticipated to reduce over time as the load from Wells Formation groundwater discharge decreases and are predicted to be in the range of the surface water standard in Sage Creek and Crow Creek around 2060 (the limit of the modeling). In Wells Formation groundwater selenium concentrations are predicted to be in the range of the MCL at GW-25 (downgradient of Panel E) and to be above the MCL at GW-16 (downgradient of the Pole Canyon ODA) at 2060 (the limit of the model). Alluvial groundwater is not addressed by this alternative.	Same as Alternative 3a.	Same as Alternative 3a.	Same as Alternative 3a.
Action-Specific ARARs [1]	No further action would not trigger any action-specific ARARs.	Construction of covers would trigger laws and regulations for reclamation of mined areas and control of fugitive dust during construction activities. Requirements would be met by remedial design.	Same as Alternative 3a.	Same as Alternative 3a.	Same as Alternative 3a.
Location-Specific ARARs [1]	No further action would not trigger any location-specific ARARs.	Construction of covers would trigger laws and regulations for protection of public lands and wetlands and streams. Requirements would be met by remedial design.	Same as Alternative 3a.	Same as Alternative 3a.	Same as Alternative 3a.

1 - See Appendix E for specific ARARs

Table 4 - Comparison of Source Control Cover Alternatives (Panels D and E) (continued)

		Alternative 3 - Source Control Cover Alternatives (Wells Formation Groundwater and Surface Water)			
	Alternative 1 **No Further Action**	**Alternative 3a** **Dinwoody / Chert Covers Over Target Areas, ICs, O&M, MNA, LTM**	**Alternative 3b** **Capillary Covers Over Target Areas, ICs, O&M, MNA, LTM**	**Alternative 3c** **Enhanced Dinwoody Covers Over Target Areas, ICs, O&M, MNA, LTM**	**Alternative 3d** **Geomembrane Covers Over Target Areas, ICs, O&M, MNA, LTM**
Balancing Criteria					
3. Long-Term Effectiveness and Permanence					
Detailed Analysis	***Low***	***Moderate***	***Moderate***	***Moderate***	***Moderate***
Magnitude of Residual Risk					
- Wells Formation Groundwater Ingestion	Residual risks would remain for potential use of Wells Formation groundwater as a drinking water source on a portion of Simplot-owned land in Sage Valley in the future.	The potential for use of Wells Formation groundwater as a drinking water source would be eliminated by ICs.	Same as Alternative 3a.	Same as Alternative 3a.	Same as Alternative 3a.
- Ingestion of Surface Water in Seeps and Detention Ponds	All current and potential future risks to Native Americans and Recreational Campers from arsenic and cadmium in surface water would remain.	The potential for ingestion of surface water in seeps and ponds is not addressed by this alternative.	Same as Alternative 3a.	Same as Alternative 3a.	Same as Alternative 3a.
- Alluvial Groundwater Ingestion	Residual risks would remain related to the potential for use of alluvial groundwater as a drinking water source on Simplot-owned land downgradient of the Pole Canyon ODA. The remaining source of risk is residual contamination in the Pole Canyon ODA that discharges selenium to the LP-1 seep or releases selenium to alluvial groundwater.	The potential for ingestion of alluvial groundwater is not addressed by this alternative.	Same as Alternative 3a.	Same as Alternative 3a.	Same as Alternative 3a.
- Ecological Receptors	There are risks to aquatic life in Sage Creek and Crow Creek. Under current conditions, selenium concentrations in surface water in the Sage Creek/Crow Creek watershed downstream of Hoopes Spring are above the surface water standard (0.0167 mg/L dissolved for Sage Creek, 0.0042 mg/L dissolved for Crow Creek in Idaho, and 0.005 mg/L total recoverable for Crow Creek in Wyoming), which represents an unacceptable ecological risk. Selenium concentrations are anticipated to reduce over time as the load from Wells Formation groundwater discharge decreases and are predicted to be in the range of the surface water standards around 2060 (the limit of the modeling).	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.
Adequacy and Reliability of Controls	No controls would be implemented.	Installation of covers over the target areas would be an adequate and reliable containment system that would be viable over the long term. Cover construction is straightforward and the covers would be likely to meet performance specifications. Covers would require inspections and long-term O&M. The cover would be constructed of natural materials that would be viable and long lasting nd would not likely need to be replaced. Long-term monitoring of Wells Formation groundwater would be required.	The adequacy and reliability of capillary covers is uncertain. Although Capillary covers are being tested, they have not been constructed as part of a full-scale remedial action at mines in southeast Idaho.	Enhanced Dinwoody covers have been constructed successfully at the Smoky Canyon Mine (Panel F) and are reliable.	A Geomembrane cover has been constructed at the South Maybe Canyon Mine (a CERCLA action at a cross valley fill) and has been shown to be reliable; however, there would be a potential for leakage if the geomembrane is damaged during construction.
Need for 5-Year Review	CERCLA 5-year reviews would be required to ensure adequate protection of human health and the environment is maintained.	CERCLA 5-year reviews would be required.	CERCLA 5-year reviews would be required.	CERCLA 5-year reviews would be required.	CERCLA 5-year reviews would be required.

Table 4 - Comparison of Source Control Cover Alternatives (Panels D and E) (continued)

		Alternative 3 - Source Control Cover Alternatives (Wells Formation Groundwater and Surface Water)			
	Alternative 1 **No Further Action**	**Alternative 3a** **Dinwoody / Chert Covers Over Target Areas, ICs, O&M, MNA, LTM**	**Alternative 3b** **Capillary Covers Over Target Areas, ICs, O&M, MNA, LTM**	**Alternative 3c** **Enhanced Dinwoody Covers Over Target Areas, ICs, O&M, MNA, LTM**	**Alternative 3d** **Geomembrane Covers Over Target Areas, ICs, O&M, MNA, LTM**
Balancing Criteria (continued)					
4.Reduction of Toxicity, Mobility, or Volume Through Treatment					
Detailed Analysis	***Low***	***Low/Moderate***	***Low/Moderate***	***Moderate***	***Moderate***
Treatment Process Used and Materials	None.	None.	None.	None.	None.
Amount of Hazardous Materials	None.	None.	None.	None.	None.
Degree of Expected Reductions in Toxicity, Mobility, and Volume	Alternative 1 provides no reduction in toxicity, mobility, or volume through treatment.	The volume and toxicity of selenium in overburden material would not be reduced. However, the mobility of selenium would be reduced through capping by reducing long-term averge percolation to about 10 inches per year (in/yr). The infiltration relative to precipitation for the Dinwoody/Chert cover is estimated at 42%[2].	The volume and toxicity of selenium in overburden material would not be reduced. However, the mobility of selenium would be reduced through capping by reducing long-term averge percolation to about 10 inches per year (in/yr). The infiltration relative to precipitation for the Dinwoody/Chert cover is estimated at 24%[2].	The volume and toxicity of selenium in overburden material would not be reduced. However, the mobility of selenium would be reduced through capping by reducing long-term averge percolation to about 10 inches per year (in/yr). The infiltration relative to precipitation for the Dinwoody/Chert cover is estimated at 3%[2].	The volume and toxicity of selenium in overburden material would not be reduced. However, the mobility of selenium would be reduced through capping by reducing long-term averge percolation to about 10 inches per year (in/yr). The infiltration relative to precipitation for the Dinwoody/Chert cover is estimated at 0%[2].
Degree to Which Treatment is	No Treatment.	No Treatment.	No Treatment.	No Treatment.	No Treatment.
Type and Quantity of Treatment	None.	None.	None.	None.	None.
Statutory Preference for Treatment as a Principal Element	Alternative 1 does not satisfy the statutory preference for treatment.	Alternative 3a does not satisfy the statutory preference for treatment.	Alternative 3b does not satisfy the statutory preference for treatment.	Alternative 3c does not satisfy the statutory preference for treatment.	Alternative 3d does not satisfy the statutory preference for treatment.

2 - Refer to Table A-2 in Appendix A of Smoky Canyon Mine Remedial Investigation/Feasibility Study (RI/FS) Final Feasibility Study Technical Memorandum #2: Detailed Analysis of Remedial Alternatives

Table 4 - Comparison of Source Control Cover Alternatives (Panels D and E) (continued)

		Alternative 3 - Source Control Cover Alternatives (Wells Formation Groundwater and Surface Water)			
	Alternative 1 **No Further Action**	**Alternative 3a** **Dinwoody / Chert Covers Over Target Areas, ICs, O&M, MNA, LTM**	**Alternative 3b** **Capillary Covers Over Target Areas, ICs, O&M, MNA, LTM**	**Alternative 3c** **Enhanced Dinwoody Covers Over Target Areas, ICs, O&M, MNA, LTM**	**Alternative 3d** **Geomembrane Covers Over Target Areas, ICs, O&M, MNA, LTM**
Balancing Criteria (continued)					
5. Short-Term Effectiveness					
Detailed Analysis	***Moderate***	***Moderate***	***Low/Moderate***	***Low/Moderate***	***Low/Moderate***
Protection of Community During Remedial Actions	There would be no additional risks to local communities because no additional actions would be implemented.	There would be no increased risk to local communities during remediation activities because it is anticipated that borrow materials needed to construct the covers are available at or near the mine.	Same as Alternative 3a.	Same as Alternative 3a.	Same as Alternative 3a.
Protection of Workers During Remedial Actions	There would be no additional risks to workers because no additional actions would be implemented.	Risk of construction worker exposure to dust and overburden material during remedial construction activities would be mitigated using standard health and safety protocols and BMPs. Construction associated with the covers would pose low risk to workers, because it is performed with standard techniques that have a demonstrated high level of safety. Workers would be protected by having OSHA and HAZWOPER training, wearing appropriate PPE and by following established health and safety procedures and protocols. O&M activities are routine and would present a low risk to workers.	Same as Alternative 3a.	Same as Alternative 3a.	Same as Alternative 3a.
Environmental Impacts Expected with Construction and Implementation of Remedial Actions	No additional remedial actions would be implemented so there are no environmental impacts due to construction.	Potential adverse environmental impacts related to construction of cover systems include dust generation and uncontrolled stormwater runoff. These impacts would be mitigated using standard BMPs for dust control during grading and cover installation and to control stormwater runoff and prevent transport of sediment to streams. Surfaces would be graded and covers would be placed over the exposed overburden surfaces in a timely and efficient manner in order to limit environmental impacts. Construction is expected to take 3 years.	Adverse environmental impacts would be similar to Alternative 3a, but would occur over a longer time period because the cover is expected to take 8 years to construct.	Same as Alternative 3b.	Same as Alternative 3b.
Time Until Remedial Objectives Are Achieved	RAOs for non-regulated surface water in seeps and ponds would not be achieved. With no remedial action, the RAO to reduce selenium concentrations in surface water in Sage Creek and Crow Creek is predicted to be achieved in approximately 35 years. Selenium concentrations in Wells Formation groundwater at GW-25 (downgradient of Panel E) are predicted to be in the range of the MCL by 2060 (the limit of the Groundwater Model analysis) and still decreasing, and at GW-16 (downgradient of the Pole Canyon ODA) concentrations are predicted to be approximately 0.2 mg/L by 2060 and continuing to decrease. In alluvial groundwater selenium concentrations are predicted to decline below the MCL at GW-15 within 20 years and at GW-22 within approximately 40 years. Concentrations are predicted to remain above the MCL at GW-26 for the modeling time period to 2060.	Deed restrictions would be effective immediately. Construction of the cover would take 3 years. The cover is predicted to result in reductions of selenium concentrations in downgradient Wells Formation groundwater and in surface water in Sage Creek and Crow Creek over the No Further Action alternative, which includes substantial areas of reclamation covers at all panels. RAOs for surface water in Sage Creek and Crow Creek are predicted to be achieved around 2050.	Deed restrictions would be effective immediately. Construction of the cover would take 8 years. The cover is predicted to result in reductions of selenium concentrations in downgradient Wells Formation groundwater and in surface water in Sage Creek and Crow Creek over the No Further Action alternative, which includes substantial areas of reclamation covers at all panels. RAOs for surface water in Sage Creek and Crow Creek are predicted to be achieved around 2050.	Same as Alternative 3b.	Same as Alternative 3b.

Table 4 - Comparison of Source Control Cover Alternatives (Panels D and E) (continued)

		Alternative 3 - Source Control Cover Alternatives (Wells Formation Groundwater and Surface Water)			
	Alternative 1 **No Further Action**	**Alternative 3a** **Dinwoody / Chert Covers Over Target Areas, ICs, O&M, MNA, LTM**	**Alternative 3b** **Capillary Covers Over Target Areas, ICs, O&M, MNA, LTM**	**Alternative 3c** **Enhanced Dinwoody Covers Over Target Areas, ICs, O&M, MNA, LTM**	**Alternative 3d** **Geomembrane Covers Over Target Areas, ICs, O&M, MNA, LTM**
Balancing Criteria (continued)					
6. Implementability					
Detailed Analysis	***High***	***High***	***Moderate/High***	***High***	***Moderate/High***
Ability to Construct and Operate Technology	No construction or O&M would be implemented.	Covers are constructed using conventional grading and earthmoving equipment. Constructability issues can occur with soil and multi-layer covers. The cover could be constructed at approximately 75 acres per year - requiring 3 years to complete. Construction of covers would require Remedial Design (RD), a Remedial Action Work Plan (RAWP), and a Post-Removal Site Control (PRSC) Plan. The RD/RAWP would include grading and cover installation procedures and materials; design of temporary roads, a site restoration plan, stormwater management plan, and a health and safety plan. Periodic O&M and long term monitoring would be outlined in the PRSC Plan.	Constructability issues can occur with soil and multilayer covers. Because the technology has not been proven, there are additional uncertainties related to construction of a capillary cover. Slope angles must be steep enough to allow lateral interflow in the drainage layer within the cover system and the drainage benches must be constructed at frequent intervals (e.g., every 100 to 150 feet) along the slope in order to remove this water. A Simple 1 (capillary) cover has been constructed at the Blackfoot Bridge Mine as a field-scale test section on the East Overburden Pile and testing of the cover system is ongoing. The Capillary cover could be constructed at approximately 25 acres per year - requiring 8 years to complete.	Enhanced Dinwoody covers have been constructed and operated successfully at the Smoky Canyon Mine. The cover could be constructed at approximately 25 acres per year - requiring 8 years to complete.	Geomembrane covers are constructed using specialized construction techniques but can have constructability issues. Geomembrane covers have been installed at South Maybe Canyon Mine (a CERCLA action on a cross-valley fill). Temperature fluctuations during installation can make welding of seams difficult and can results in wrinkles in the fabric. During cover installation on slopes, instability results from slippage at the interface between the geosynthetic layer and the overlying or underlying material. Geomembrane cover systems can be unstable over long steep slopes which could result in sliding of the liner and the topsoil downslope. For side slopes of 3:1, additional anchoring of the geomembrane is required and angular gravel or rock is required above a geotextile for stability of this layer. The cover could be constructed at approximately 25 acres per year - requiring 8 years to complete.
Reliability of the Technology	No technology would be implemented.	Technical problems leading to schedule delays are not expected during implementation of this alternative.	Same as Alternative 3a.	Same as Alternative 3a.	Technical problems leading to schedule delays are possible during implementation of this alternative due to potential constructability issues.
Ease of Undertaking Additional Remedial Action, if Necessary	No additional actions would be implemented.	Future remedial actions at target areas are not anticipated. Implementation of this alternative would not significantly affect access to Panels D and E. Therefore, implementation of additional remedial actions would not be more difficult.	Same as Alternative 3a.	Same as Alternative 3a.	Additional actions could be difficult to implement. If the geosynthetic layer becomes compromised, removal of the overlying soil layer to inspect and repair the liner would be difficult without potential further damage to the liner.
Ability to Monitor Effectiveness of Remedy	No monitoring would occur other than monitoring of the Pole Canyon NTCRAs under existing Settlement Agreements.	Annual inspections, monitoring and maintenance procedures would be implemented to provide for long term performance and integrity of the cover system. The effectiveness of cover systems is easily monitored using standard groundwater monitoring techniques, laboratory analyses and data evaluation processes.	Same as Alternative 3a.	Same as Alternative 3a.	Same as Alternative 3a.

Table 4 - Comparison of Source Control Cover Alternatives (Panels D and E) (continued)

		Alternative 3 - Source Control Cover Alternatives (Wells Formation Groundwater and Surface Water)			
	Alternative 1 No Further Action	**Alternative 3a Dinwoody / Chert Covers Over Target Areas, ICs, O&M, MNA, LTM**	**Alternative 3b Capillary Covers Over Target Areas, ICs, O&M, MNA, LTM**	**Alternative 3c Enhanced Dinwoody Covers Over Target Areas, ICs, O&M, MNA, LTM**	**Alternative 3d Geomembrane Covers Over Target Areas, ICs, O&M, MNA, LTM**
Balancing Criteria (continued)					
6. Implementability (continued)					
Ability to Obtain Approvals and Coordinate with Other Agencies	No approval or coordination necessary.	No approval or coordination necessary.	Same as Alternative 3a.	Same as Alternative 3a.	Same as Alternative 3a.
Availability of Treatment, Storage, and Disposal Services and Capacity	None required.	None required.	Same as Alternative 3a.	Same as Alternative 3a.	Same as Alternative 3a.
Availability of Necessary Equipment and Specialists	None required.	Environmental construction contractors are readily available. Construction of covers would rely on readily available grading and earthmoving equipment.	Same as Alternative 3a.	Same as Alternative 3a.	Specialized companies that install geomembrane covers are available and these types of covers have been successfully installed at phosphate mines in southeast Idaho.
Availability/Demonstrated Effectiveness of Prospective Technologies	None required.	A Dinwoody/Chert cover has been successfully constructed for the 2013 NTCRA at the Pole Canyon ODA. The technology does not require further development before it can be applied to the overburden material at the target areas. Because cover systems constructed of Site materials are widely used, more than one vendor would likely be available to provide a competitive bid.	Inclined covers with a capillary barrier effect (CCBE) is an alternative to a conventional soil cover design. The CCBE concept has been developed based on lysimeter observations from the Simple 1 cover at the Blackfoot Bridge Mine. Analysis would be required during remedial design to assess the effectiveness of the components relative to specific material properties and conditions at the Site. Because cover systems constructed of Site materials are widely used, more than one vendor would likely be available to provide a competitive bid.	Enhanced Dinwoody covers are currently being installed at Panel F as construction covers. The technology does not require further development before it can be applied to the overburden material at the target areas. Because cover systems constructed of Site materials are widely used, more than one vendor would likely be available to provide a competitive bid.	A Geomembrane cover is an available technology that has been constructed as a full-scale cover system at the South Maybe Canyon Mine (a CERCLA action at a cross valley fill). The technology does not require further development before it can be applied to the overburden material at the target areas. Because geosynthetic cover systems are widely used, more than one vendor would likely be available to provide a competitive bid.
7. Cost					
Detailed Analysis	***Low***	***Low/Moderate***	***Low/Moderate***	***Moderate***	***Moderate***
30-year Present Worth Total Cost	$0	$18.9 Million	$17.5 Million	$30.8 Million	$39.1 Million
Modifying Criteria					
8. State Acceptance	**To be evaluated after public comment period**				
9. Community Acceptance	**To be evaluated after public comment period**				

Notes:

ARARs - Applicable or Relevant and Appropriate Requirements
BMPs - Best Management Practices
CERCLA - Comprehensive Environmental Response, Compensation and Liability Act
HAZWOPER - Hazardous Waste Operations and Emergency Response
ICs - Institutional Controls
LTM - Long-Term Monitoring
mg/L - milligrams per liter
MNA - Monitored Natural Attenuation
O&M - Operation and Maintenance
ODA - Overburden Disposal Area
OSHA - Occupational Safety and Health Administration
PPE - Personal Protective Equipment
RAOs - Remedial Action Objectives

Table 5 - Comparison of Source Control Cover Alternatives

		Alternative 3 - Source Control Cover Alternatives (Soils)
	Alternative 1 **No Further Action**	**Alternative 3e** **Dinwoody Cover Over a Portion of Panel A, ICs, O&M, LTM**
Threshold Criteria		
1. Protection of Human Health and the Environment		
Detailed Analysis	***Low***	***Low***
Protection of Human Health and the Environment for Soils (Yes/No)	Yes	Yes
Protection of Human Health		
- Wells Formation Groundwater Ingestion	Alternative 1 would not prevent the use of Wells Formation groundwater with selenium concentrations above the MCL as a source of drinking water on Simplot-owned land in Sage Valley in the future.	Wells Formation groundwater is not addressed by this alternative.
- Ingestion of Surface Water in Seeps and Detention Ponds	There are potential unacceptable future risks to human receptors (Recreational Campers or Native Americans) and potential unacceptable current risks to human receptors (Native Americans) from ingestion of surface water where arsenic and cadmium concentrations exceed the Idaho surface water standard in seeps (DS-7 and LP-1) and detention ponds (DP-7 and EP-2).	Non-regulated surface water in seeps and ponds is not addressed by this alternative.
- Alluvial Groundwater Ingestion	Alternative 1 would not prevent the use of alluvial groundwater with selenium concentrations above the MCL as a source of drinking water on Simplot-owned land in Sage Valley in the future.	Alluvial groundwater is not addressed by this alternative.
Protection of the Environment	There are no ecological risks associated directly with alluvial or Wells Formation groundwater. However, there are risks to aquatic life where Wells Formation groundwater discharges to surface water at Hoopes Spring and continues downstream. Under current conditions, selenium concentrations in surface water in the Sage Creek/Crow Creek watershed downstream of Hoopes Spring are above the surface water standard (0.0167 mg/L dissolved for Sage Creek, 0.0042 mg/L dissolved for Crow Creek in Idaho, and 0.005 mg/L total recoverable for Crow Creek in Wyoming), which represents an unacceptable ecological risk. Selenium concentrations are anticipated to reduce over time as the load from Wells Formation groundwater discharge decreases and are predicted to be in the range of the surface water standard around 2060 (the limit of the modeling). Risks to bird populations from selenium in surface soils on Panel A are likely to be low. Panel A habitat is unlikely to be large enough or of high enough quality to serve as an attractive nuisance which would result in a significant habitat sink for the regional populations of the common bird species that may utilize them. Coupled with the relatively small number of birds that would use the habitats on Panel A relative to the number of birds required to support a self-sustaining habitat, the limited number of samples that exceeded the bird PRG and the significant effect of the single outlier selenium concentration that drives the 95UCL concentration above the bird PRG; risks to bird populations at the Site from selenium in surface soils are likely to be low for current conditions.	Surface water is not addressed by this alternative. Selenium concentrations in surface soil would be reduced by installation of a cover over a portion of Panel A and birds would be protected.
2. Compliance With ARARs		
Detailed Analysis	***Low***	***Low***
Compliance with ARARs (Yes/No)	No	Yes
Chemical-Specific ARARs [1]	Compliance with ARARs for surface water in Sage Creek and Crow Creek would be the same as for protection of the environment, as described above. In Wells Formation groundwater selenium concentrations are predicted to be in the range of the MCL at GW-25 (downgradient of Panel E) and to be above the MCL at GW-16 (downgradient of the Pole Canyon ODA) in 2060 (the limit of the model). Concentrations are also predicted to remain above the MCL in alluvial groundwater in Pole Canyon, immediately downgradient of the Pole Canyon ODA. There are no chemical-specific ARARs for soils.	There are no chemical-specific ARARs for soils.
Action-Specific ARARs [1]	No further action would not trigger any action-specific ARARs.	Construction of a cover would trigger laws and regulations for reclamation of mined areas and control of fugitive dust during construction activities. Requirements would be met by remedial design.
Location-Specific ARARs [1]	No further action would not trigger any location-specific ARARs.	Construction of a cover would trigger laws and regulations for protection of public lands and wetlands and streams. Requirements would be met by remedial design.

1 - See Appendix E for specific ARARs

Table 5 - Comparison of Source Control Cover Alternatives (continued)

		Alternative 3 - Source Control Cover Alternatives (Soils)
	Alternative 1 **No Further Action**	**Alternative 3e** **Dinwoody Cover Over a Portion of Panel A, ICs, O&M, LTM**
Balancing Criteria		
3. Long-Term Effectiveness and Permanence		
Detailed Analysis	***Low***	***Moderate***
Magnitude of Residual Risk		
- Wells Formation Groundwater Ingestion	Residual risks would remain for potential use of Wells Formation groundwater as a drinking water source on a portion of Simplot-owned land in Sage Valley in the future.	The potential for ingestion of surface water in seeps and ponds is not addressed by this alternative.
- Ingestion of Surface Water in Seeps and Detention Ponds	All current and potential future risks to Native Americans and Recreational Campers from arsenic and cadmium in surface water would remain.	The potential for ingestion of surface water in seeps and ponds is not addressed by this alternative.
- Alluvial Groundwater Ingestion	Residual risks would remain related to the potential for use of alluvial groundwater as a drinking water source on Simplot-owned land downgradient of the Pole Canyon ODA. The remaining source of risk is residual contamination in the Pole Canyon ODA that discharges selenium to the LP-1 seep or releases selenium to alluvial groundwater.	The potential for ingestion of alluvial groundwater is not addressed by this alternative.
- Ecological Receptors	There are risks to aquatic life in Sage Creek and Crow Creek. Under current conditions, selenium concentrations in surface water in the Sage Creek/Crow Creek watershed downstream of Hoopes Spring are above the surface water standard (0.0167 mg/L dissolved for Sage Creek, 0.0042 mg/L dissolved for Crow Creek in Idaho, and 0.005 mg/L total recoverable for Crow Creek in Wyoming), which represents an unacceptable ecological risk. Selenium concentrations are anticipated to reduce over time as the load from Wells Formation groundwater discharge decreases and are predicted to be in the range of the surface water standards around 2060 (the limit of the modeling). Risks to bird populations at the Site from selenium in surface soils are likely to be low for current conditions.	Risks to aquatic life in Sage Creek and Crow Creek would be the same as Alternative 1. Residual risks to birds would be reduced upon installation of a Dinwoody cover system.
Adequacy and Reliability of Controls	No controls would be implemented.	Installation of a Dinwoody cover over a portion of Panel A would be an adequate and reliable containment system that would be viable over the long term. Soil cover construction is straightforward. Covers would require inspections and long-term O&M. The cover would be constructed of natural materials that would be viable and long lasting and would not likely need to be replaced.
Need for 5-Year Review	CERCLA 5-year reviews would be required to ensure adequate protection of human health and the environment is maintained.	CERCLA 5-year reviews would be required.
4.Reduction of Toxicity, Mobility, or Volume Through Treatment		
Detailed Analysis	***Low***	***Low***
Treatment Process Used and Materials Treated	None.	None.
Amount of Hazardous Materials Destroyed or Treated	None.	None.
Degree of Expected Reductions in Toxicity, Mobility, and Volume	Alternative 1 provides no reduction in toxicity, mobility, or volume through treatment.	None.
Degree to Which Treatment is Irreversible	No Treatment.	No Treatment.
Type and Quantity of Treatment Residuals Remaining After Treatment	None.	None.
Statutory Preference for Treatment as a Principal Element	Alternative 1 does not satisfy the statutory preference for treatment.	Alternative 3a does not satisfy the statutory preference for treatment.

Table 5 - Comparison of Source Control Cover Alternatives (continued)

		Alternative 3 - Source Control Cover Alternatives (Soils)
	Alternative 1 **No Further Action**	**Alternative 3e** **Dinwoody Cover Over a Portion of Panel A, ICs, O&M, LTM**
Balancing Criteria (continued)		
5. Short-Term Effectiveness		
Detailed Analysis	***Moderate***	***Moderate***
Protection of Community During Remedial Actions	There would be no additional risks to local communities because no additional actions would be implemented.	There would be no increased risk to local communities during remediation activities because it is anticipated that borrow materials needed to construct the covers are available at or near the mine.
Protection of Workers During Remedial Actions	There would be no additional risks to workers because no additional actions would be implemented.	Risk of construction worker exposure to dust and overburden material during remedial construction activities would be mitigated using standard health and safety protocols and BMPs. Construction associated with the covers would pose low risk to workers, because it is performed with standard techniques that have a demonstrated high level of safety. Workers would be protected by having OSHA and HAZWOPER training, wearing appropriate PPE and by following established health and safety procedures and protocols. O&M activities are routine and would present a low risk to workers.
Environmental Impacts Expected with Construction and Implementation of Remedial Actions	No additional remedial actions would be implemented so there are no environmental impacts due to construction.	Adverse environmental impacts related to construction of a cover include dust generation and uncontrolled stormwater runoff. These impacts would be mitigated using standard BMPs for dust control and to prevent transport of sediment to streams. Surfaces would be graded and covers would be placed over the exposed overburden surfaces in a timely and efficient manner in order to limit environmental impacts. Construction would take 1 year.
Time Until Remedial Objectives Are Achieved	RAOs for non-regulated surface water in seeps and ponds would not be achieved. With no remedial action, the RAO to reduce selenium concentrations in surface water in Sage Creek and Crow Creek is predicted to be achieved in approximately 35 years. Selenium concentrations in Wells Formation groundwater at GW-25 (downgradient of Panel E) are predicted to be in the range of the MCL by 2060 (the limit of the Groundwater Model analysis) and still decreasing, and at GW-16 (downgradient of the Pole Canyon ODA) concentrations are predicted to be approximately 0.2 mg/L by 2060 and continuing to decrease. In alluvial groundwater selenium concentrations are predicted to decline below the MCL at GW-15 within 20 years and at GW-22 within approximately 40 years. Concentrations are predicted to remain above the MCL at GW-26 for the modeling time period to 2060.	Construction of the cover would take 1 year and the cover would be effective once construction is completed. With no other remedial actions, the RAO to reduce selenium concentrations in surface water in Sage Creek and Crow Creek is predicted to be achieved in approximately 35 years.
6. Implementability		
Detailed Analysis	***High***	***High***
Ability to Construct and Operate Technology	No construction or O&M would be implemented.	Covers are constructed using conventional grading and earthmoving equipment. The cover could be constructed at approximately 25 acres per year - requiring 1 year to complete. Construction of covers would require Remedial Design (RD), a Remedial Action Work Plan (RAWP), and a Post-Removal Site Control (PRSC) Plan. The RD/RAWP would include grading and cover installation procedures and materials; design of temporary roads, a site restoration plan, stormwater management plan, and a health and safety plan. Periodic O&M and long term monitoring would be outlined in the PRSC Plan.
Reliability of the Technology	No technology would be implemented.	Technical problems leading to schedule delays are not expected during implementation of this alternative.
Ease of Undertaking Additional Remedial Action, if Necessary	No additional actions would be implemented.	Future remedial actions at Panel A are not anticipated. Implementation of this alternative would not significantly affect access to Panel A. Therefore, implementation of additional remedial actions would not be difficult.
Ability to Monitor Effectiveness of Remedy	No monitoring would occur other than monitoring of the Pole Canyon NTCRAs under existing Settlement Agreements.	Annual inspections, monitoring and maintenance procedures would be implemented to provide for long-term performance and integrity of the cover system. No monitoring would occur other than monitoring of the Pole Canyon NTCRAs under existing Settlement Agreements.
Ability to Obtain Approvals and Coordinate with Other Agencies	No approval or coordination necessary.	No approval or coordination necessary.
Availability of Treatment, Storage, and Disposal Services and Capacity	None required.	None required.

Table 5 - Comparison of Source Control Cover Alternatives (continued)

		Alternative 3 - Source Control Cover Alternatives (Soils)
	Alternative 1 No Further Action	Alternative 3e Dinwoody Cover Over a Portion of Panel A, ICs, O&M, LTM
Balancing Criteria (continued)		
6. Implementability (continued)		
Availability of Necessary Equipment and Specialists	None required.	Environmental construction contractors are readily available. Construction of covers would rely on readily available grading and earthmoving equipment.
Availability/Demonstrated Effectiveness of Prospective Technologies	None required.	A Dinwoody cover is a straightforward technology that does not require further development before it can be applied to the overburden material at Panel A. Because cover systems constructed of Site materials are widely used, more than one vendor would likely be available to provide a competitive bid.
7. Cost		
Detailed Analysis	***Low***	***Low***
30-year Present Worth Total Cost	$0	$1.6 Million
Modifying Criteria		
8. State Acceptance	**To be evaluated after public comment period**	
9. Community Acceptance	**To be evaluated after public comment period**	

Notes:

ARARs - Applicable or Relevant and Appropriate Requirements
BMPs - Best Management Practices
CERCLA - Comprehensive Environmental Response, Compensation and Liability Act
HAZWOPER - Hazardous Waste Operations and Emergency Response
ICs - Institutional Controls
LTM - Long-Term Monitoring
mg/L - milligrams per liter
MNA - Monitored Natural Attenuation
O&M - Operation and Maintenance
ODA - Overburden Disposal Area
OSHA - Occupational Safety and Health Administration
PPE - Personal Protective Equipment
RAOs - Remedial Action Objectives

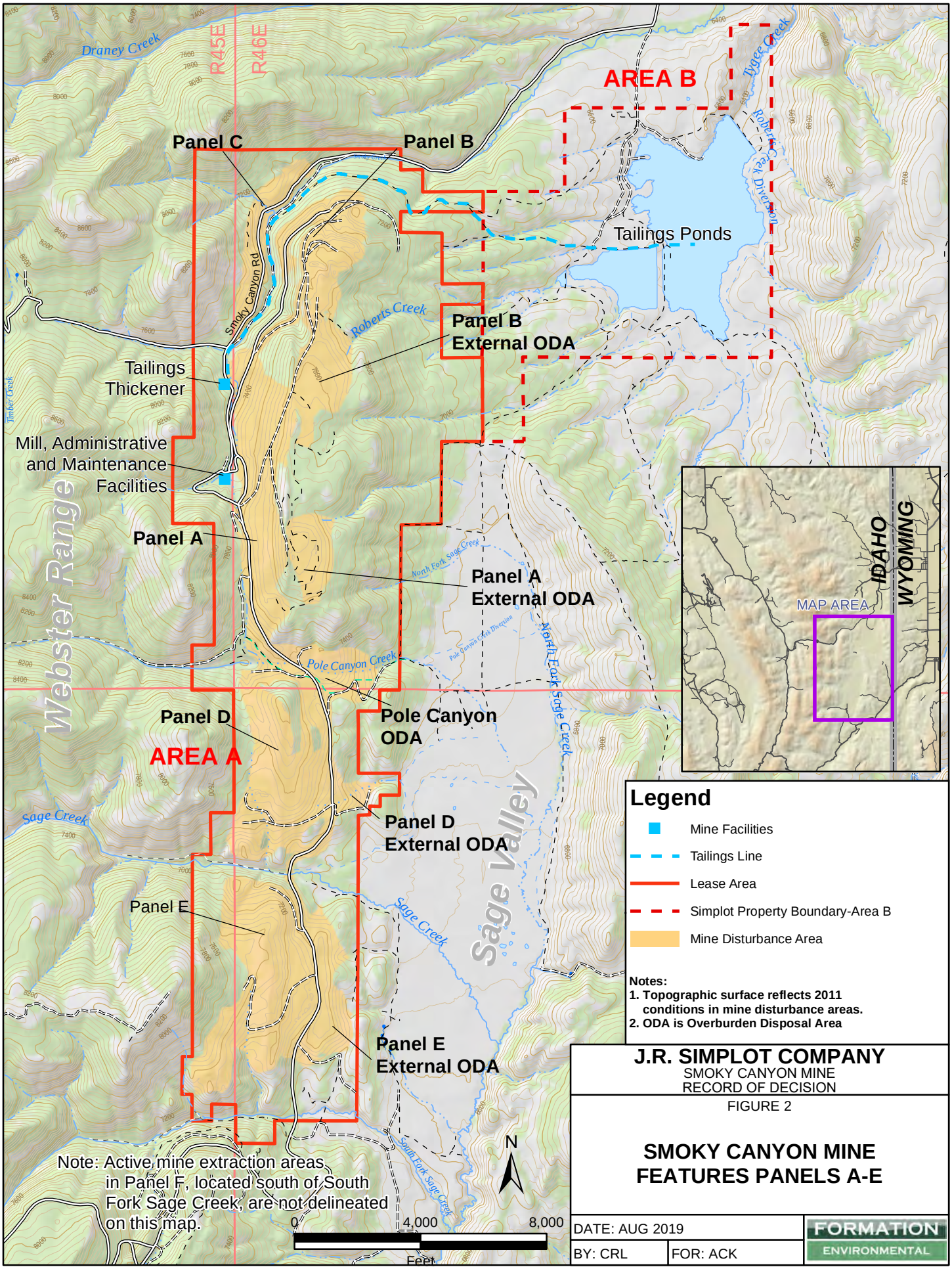
FIGURES

J.R. SIMPLOT COMPANY
SMOKY CANYON MINE
RECORD OF DECISION

FIGURE 1

LOCATION OF THE SMOKY CANYON MINE

DATE: AUG 2019	FORMATION ENVIRONMENTAL
BY: CRL	FOR: ACK


Draney Creek
R45E
R46E
AREA B
Tygee Creek
Panel C
Panel B
Roberts Creek Diversion
Tailings Ponds
Smoky Canyon Rd
Roberts Creek
Panel B
External ODA
Tailings
Thickener
Timber Creek
Mill, Administrative
and Maintenance
Facilities
Webster Range
Panel A
North Fork Sage Creek
Panel A
External ODA
IDAHO
WYOMING
MAP AREA
Pole Canyon Creek
Pole Canyon Creek Diversion
North Fork Sage Creek
Panel D
Pole Canyon
ODA
AREA A
Sage Creek
Panel D
External ODA
Sage Valley
Panel E
Sage Creek
Legend
Mine Facilities
Tailings Line
Lease Area
Simplot Property Boundary-Area B
Mine Disturbance Area
Notes:
1. Topographic surface reflects 2011 conditions in mine disturbance areas.
2. ODA is Overburden Disposal Area
Panel E
External ODA
South Fork Sage Creek
Note: Active mine extraction areas in Panel F, located south of South Fork Sage Creek, are not delineated on this map.
N
0
4,000
8,000
Feet
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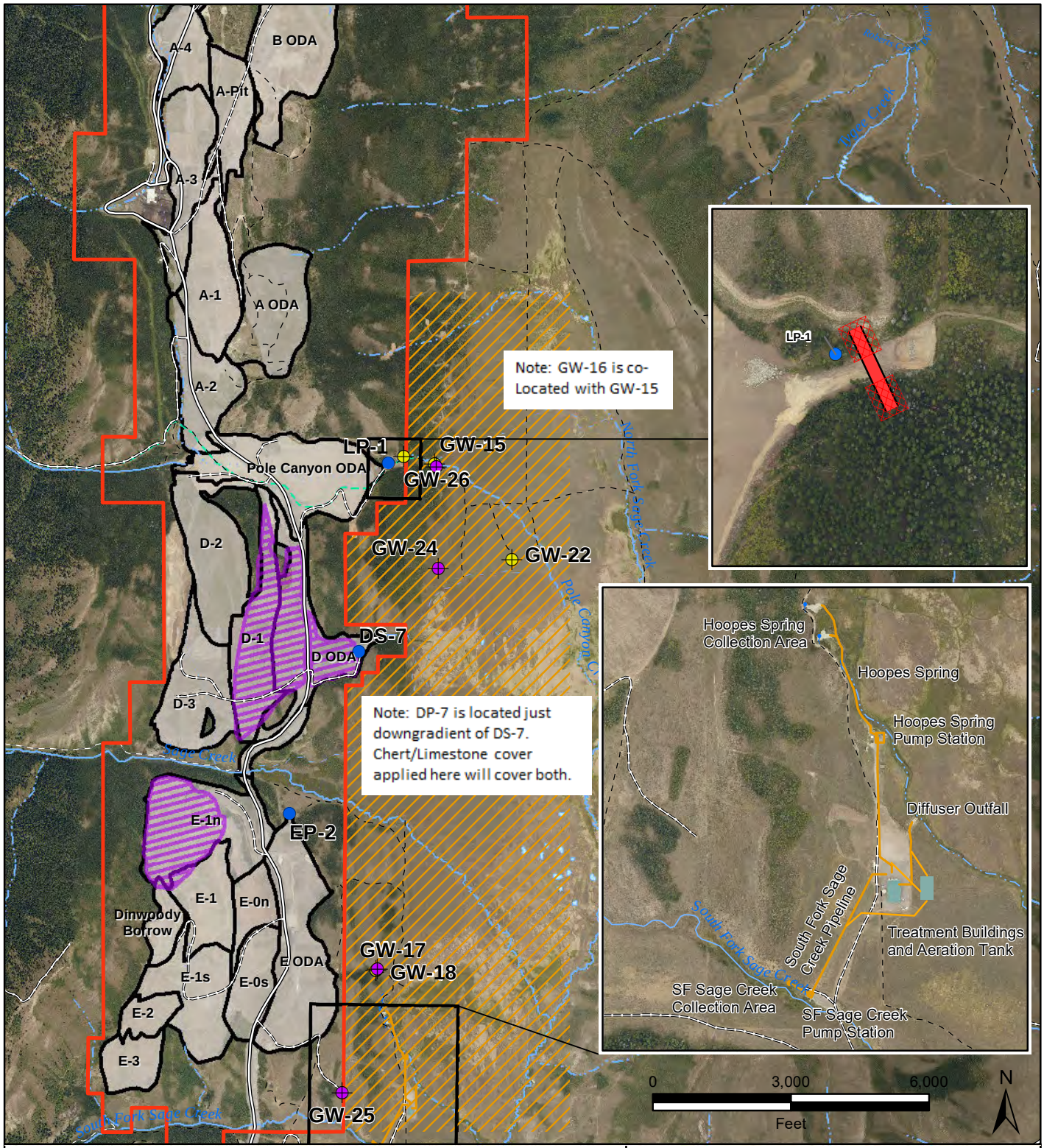
SMOKY CANYON MINE
RECORD OF DECISION
FIGURE 2
SMOKY CANYON MINE
FEATURES PANELS A-E
DATE: AUG 2019
BY: CRL
FOR: ACK
FORMATION
ENVIRONMENTAL



Legend

- Wells Formation Groundwater Effectiveness Monitoring Location
- Alluvial Groundwater Effectiveness Monitoring Location
- Chert/Limestone Covers on Seeps and Ponds
- Deed Restrictions
- Lake/Pond
- Mine Disturbance Area
- Reclamation Cover Area
- Lease Area
- Water Treatment Plant Pipeline

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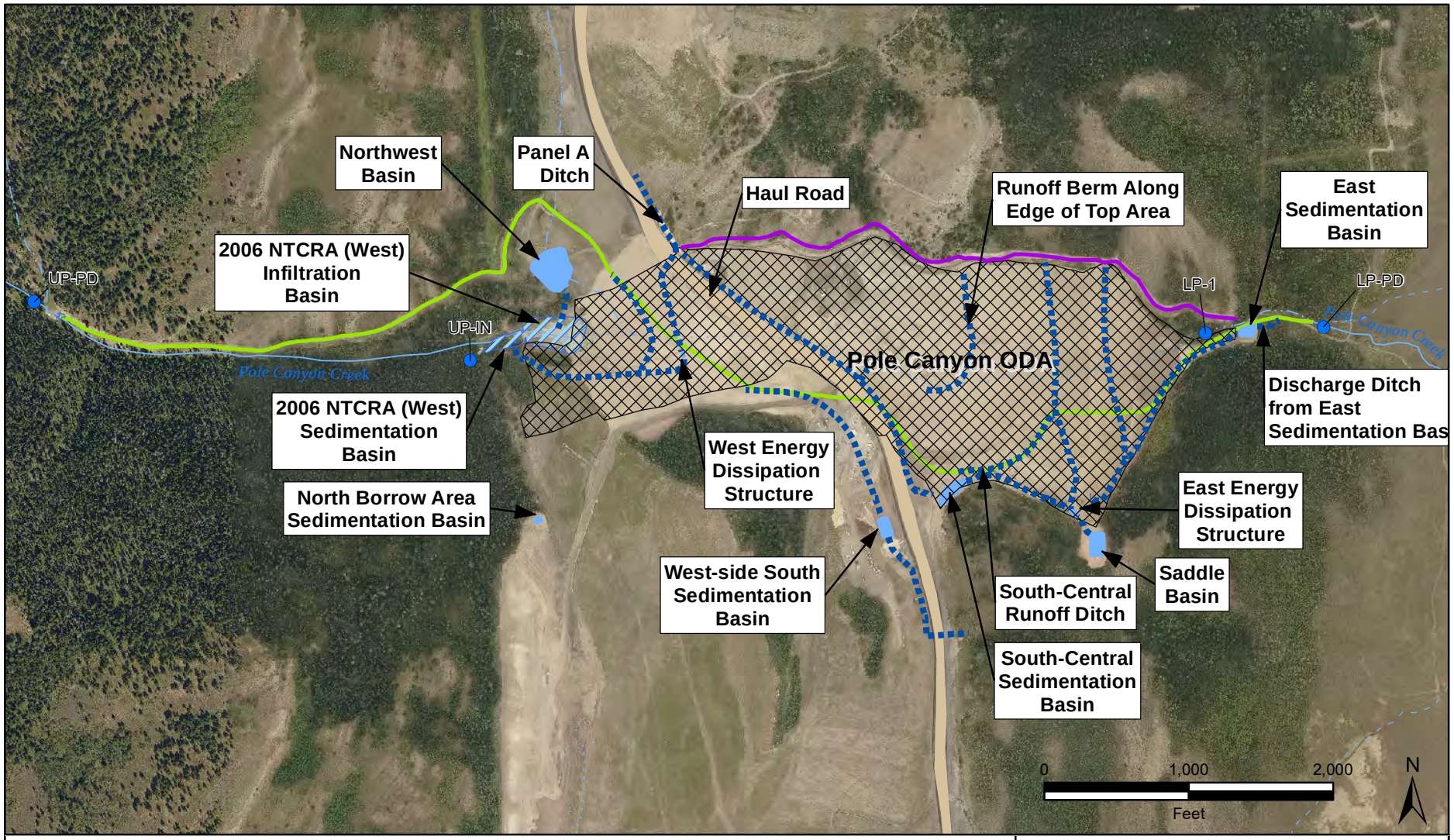
RECORD OF DECISION

FIGURE 3

RECOMMENDED SITE-WIDE REMEDY

DATE: FEB 02, 2023
BY: CRL | FOR: ACK

FORMATION ENVIRONMENTAL



Legend

- Surface Water Monitoring Locations
- Pre-ODA Creek Flow Path
- Irrigation Ditch
- Intermittent Stream
- Perennial Stream
- Pole Canyon Creek Bypass Pipeline
- Run-on Control Channel
- Haul Road
- 2013 NTCRA Basin Footprints
- 2006 NTCRA Basin Footprints

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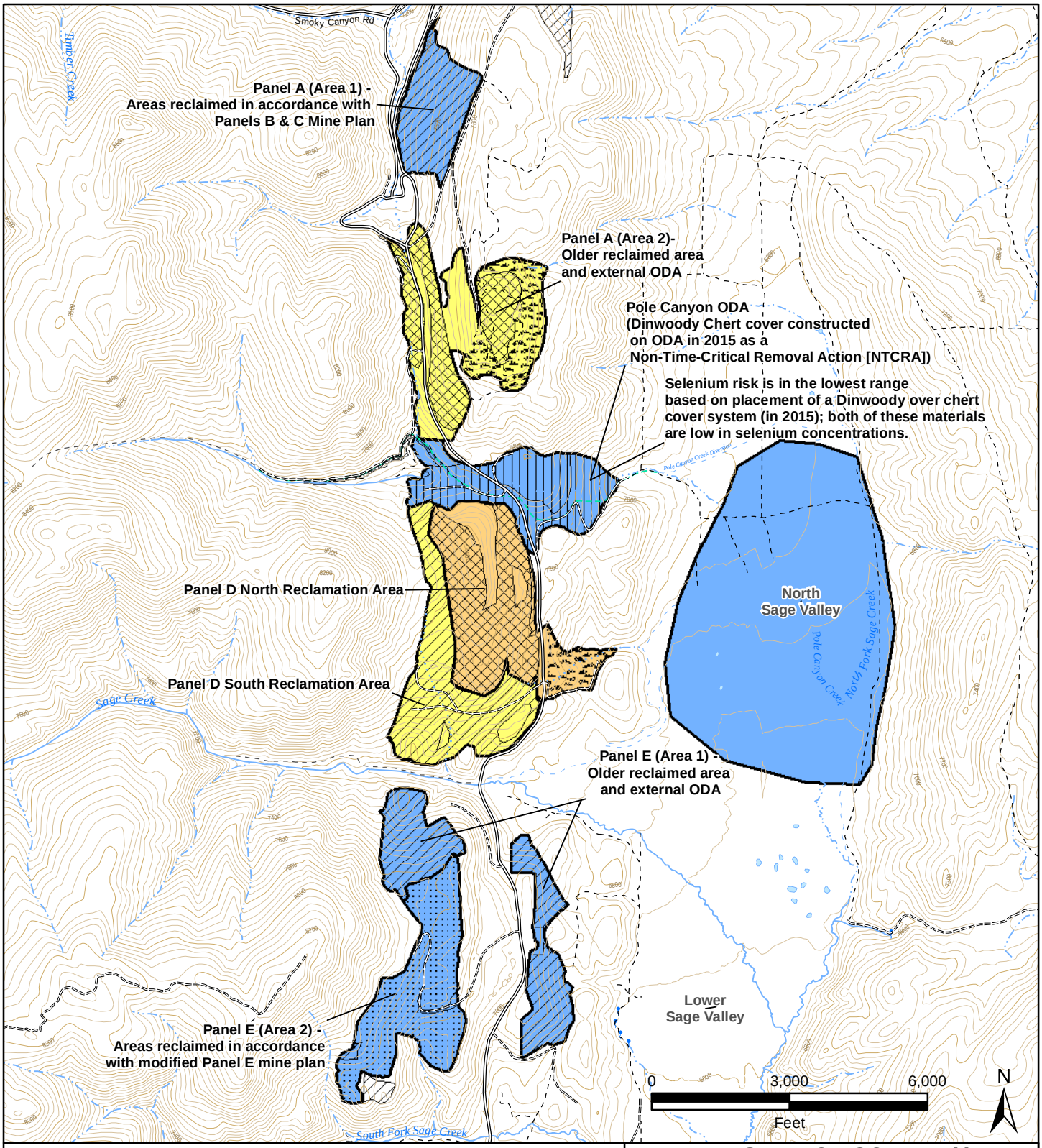
SMOKY CANYON MINE
RECORD OF DECISION

FIGURE 4

COMPONENTS OF POLE CANYON NTCRAS

DATE: FEB 02, 2023
BY: CRL
FOR: ACK

FORMATION ENVIRONMENTAL



Legend

Cover Type

- DINWOODY CHERT (2015)
- TOPSOIL DINWOODY CHERT
- NO TOPSOIL NO CHERT
- TOPSOIL OVER CHERT
- TOPSOIL NO CHERT

Selenium Risk

- Lowest Risk
- Moderate - High Risk
- Highest Risk

- Minor Road
- Unimproved Road
- Trail (4WD)
- Trail (Other than 4WD)
- Index Contour (200 ft)
- Intermediate Contour (40 ft)

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SMOKY CANYON MINE
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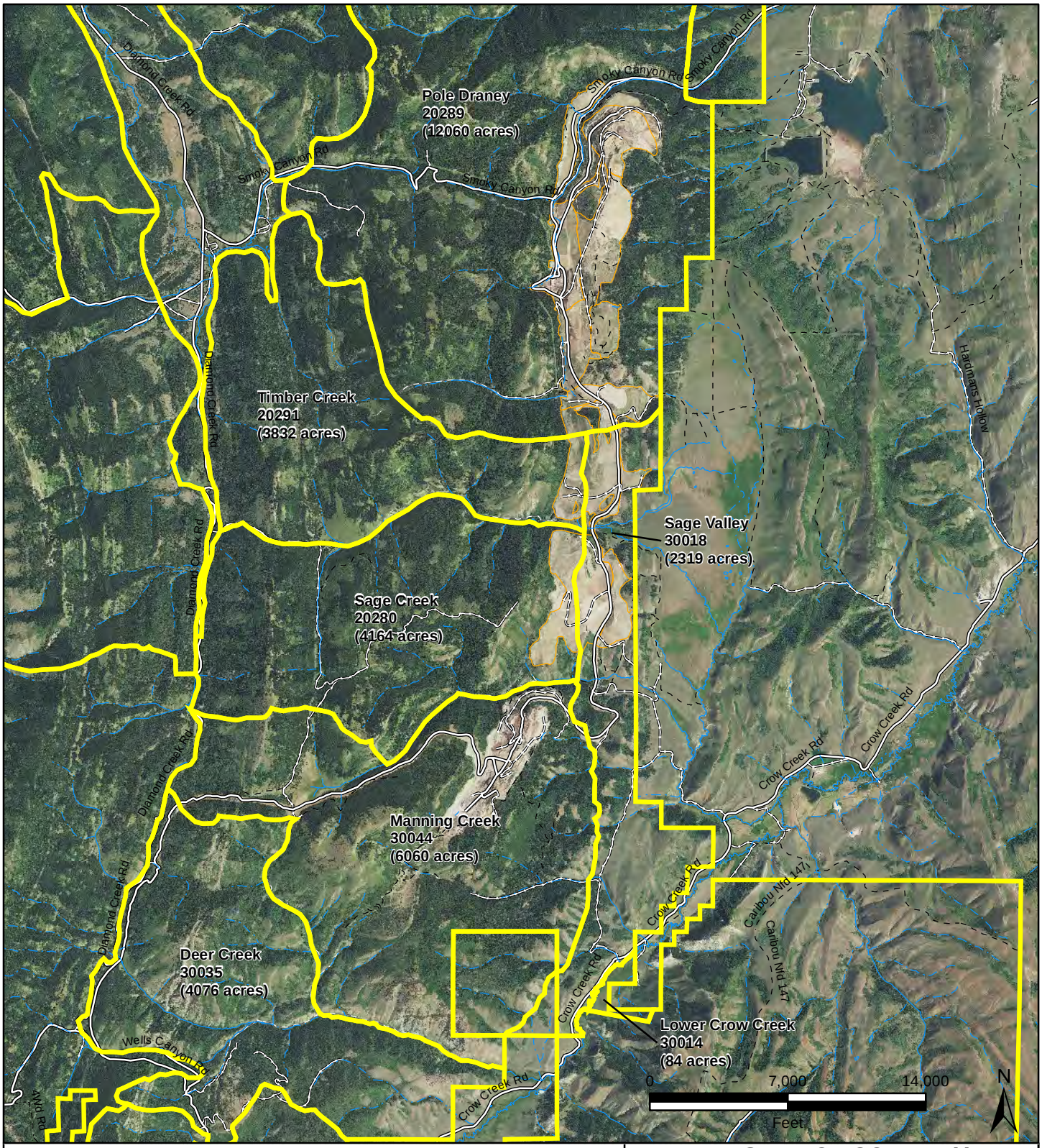
FIGURE 5

SUMMARY OF SELENIUM RISK TO TERRESTRIAL BIOTA

DATE: AUG 2019		FORMATION ENVIRONMENTAL
BY: CRL	FOR: ACK	



Legend

- Grazing Allotment
- Mine Disturbance Area (Panels A-E)
- Perennial Stream
- Intermittent Stream

Allotments in vicinity of Smoky Canyon Mine are labeled.
Source: U.S. Forest Service (USFS). 2008. Range allotments shapefile - in Geographic Information System (GIS) coverages provided by Caribou National Forest, via e-mail. April 2008.
Aerial Source: 2013 NAIP photo from USDA

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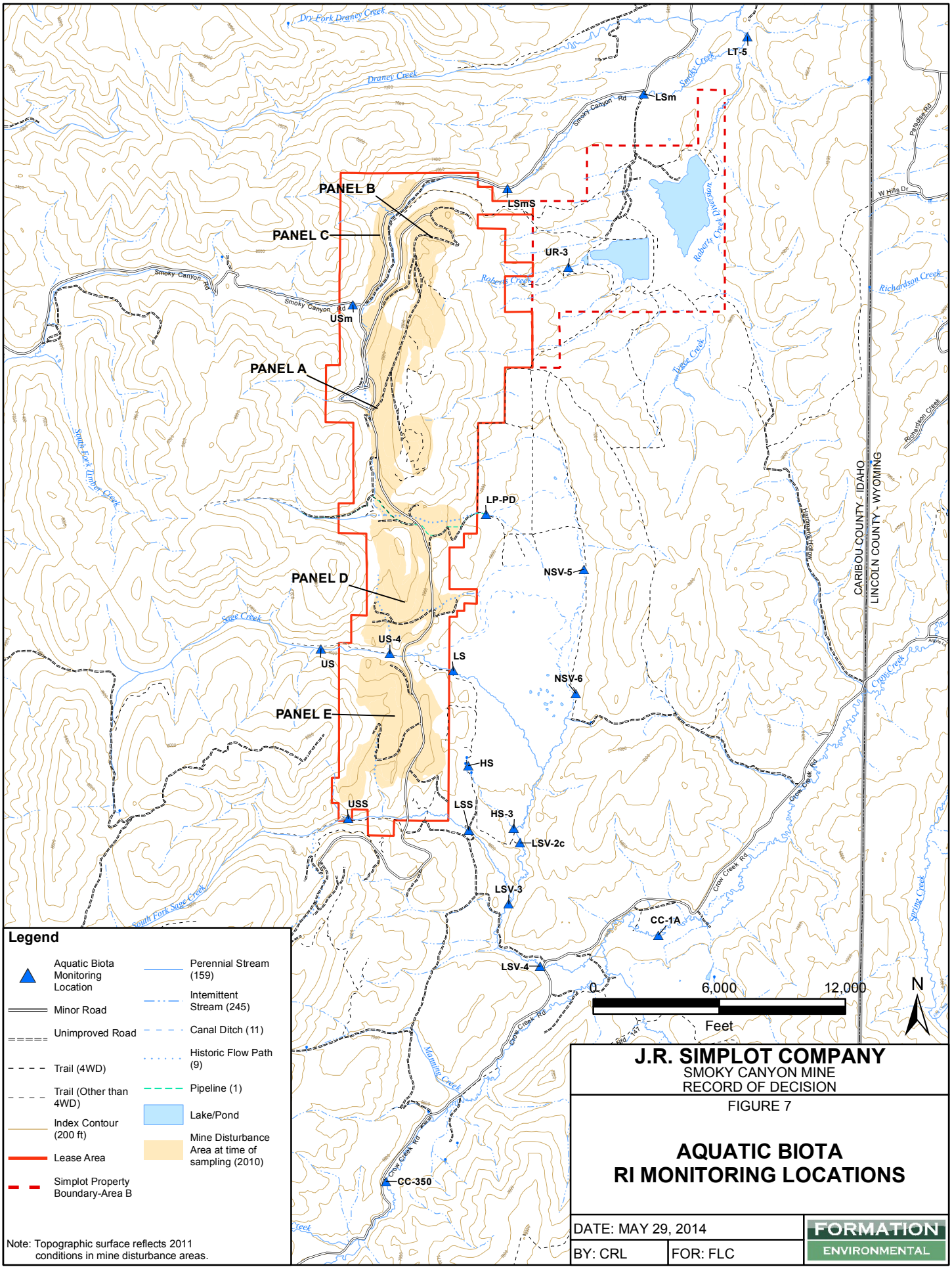
FIGURE 6

USFS GRAZING ALLOTMENTS - WITH SATELLITE IMAGERY

DATE: AUG 2019		FORMATION ENVIRONMENTAL
BY: CRL	FOR: ACK	



Legend

- Aquatic Biota Monitoring Location
- Minor Road
- Unimproved Road
- Trail (4WD)
- Trail (Other than 4WD)
- Index Contour (200 ft)
- Lease Area
- Simplot Property Boundary-Area B
- Perennial Stream (159)
- Intemittent Stream (245)
- Canal Ditch (11)
- Historic Flow Path (9)
- Pipeline (1)
- Lake/Pond
- Mine Disturbance Area at time of sampling (2010)

Note: Topographic surface reflects 2011 conditions in mine disturbance areas.

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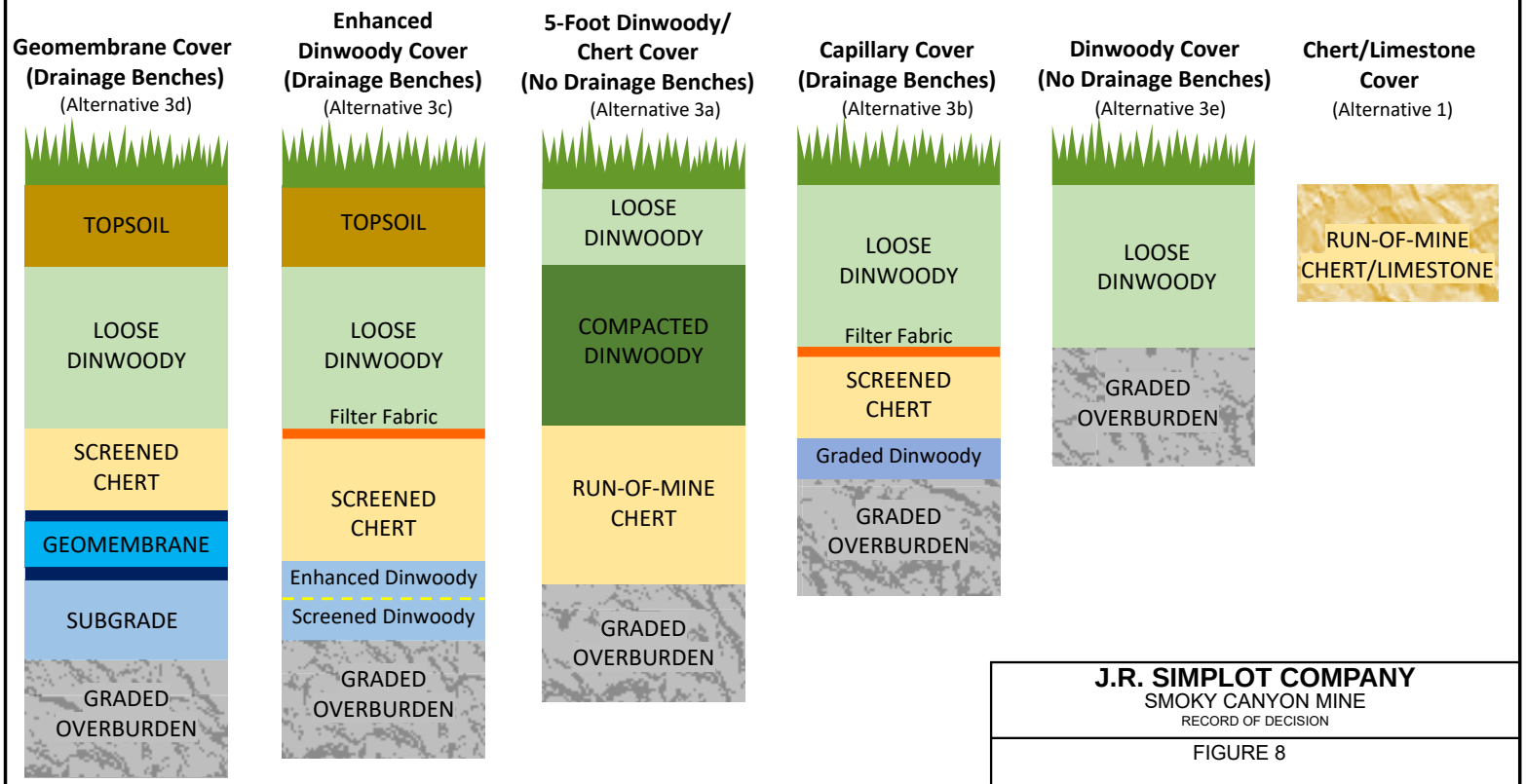
FIGURE 7

AQUATIC BIOTA
RI MONITORING LOCATIONS

DATE: MAY 29, 2014	FORMATION ENVIRONMENTAL
BY: CRL	FOR: FLC



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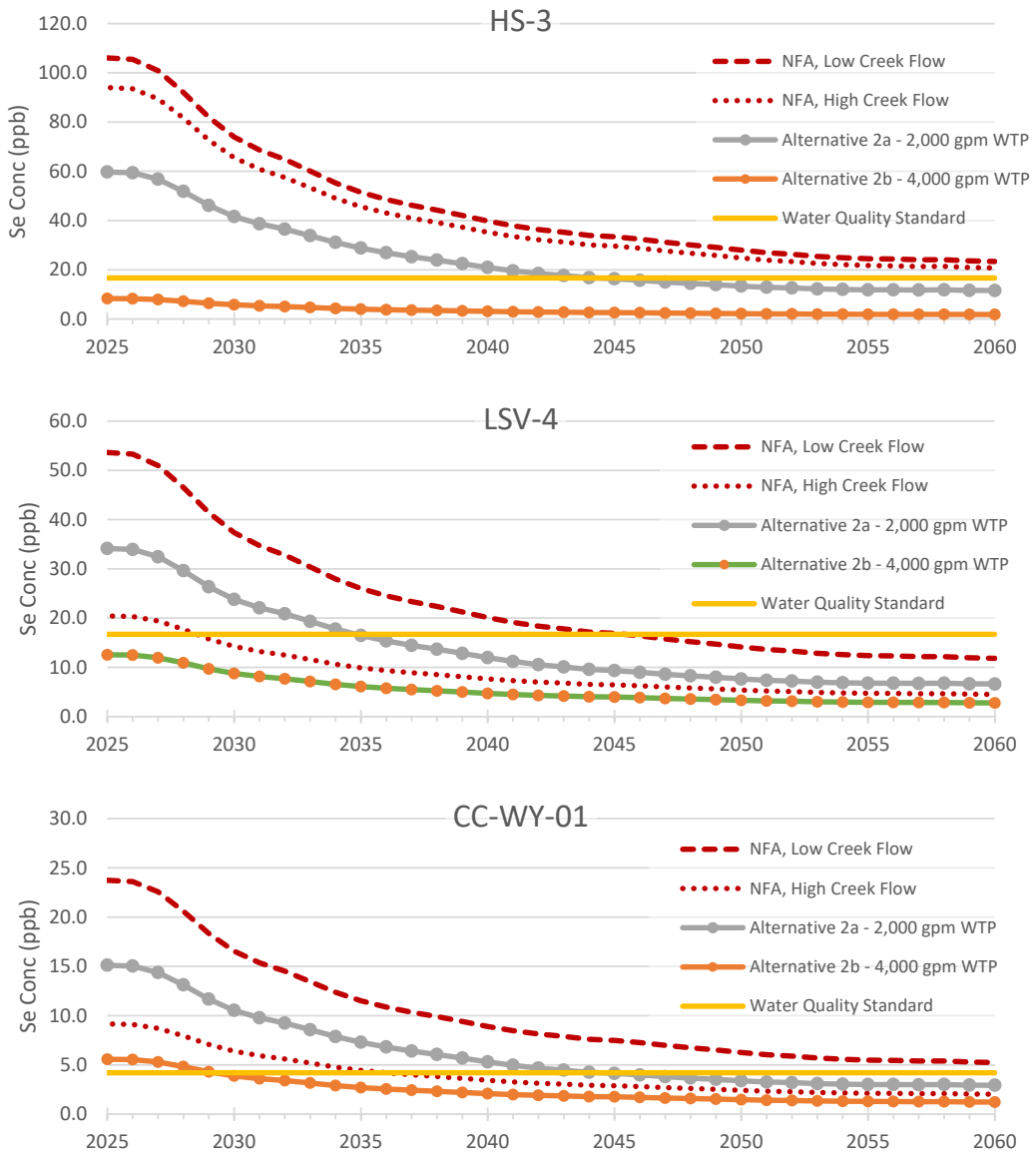
SMOKY CANYON MINE
RECORD OF DECISION

FIGURE 8

PROFILES OF COVER ALTERNATIVES

DATE: FEBRUARY 2023
BY: ASF/DLV | FOR: ACK

FORMATION ENVIRONMENTAL



Notes:
1. ppb = micrograms per liter
2. NFA No Further Action

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SMOKY CANYON MINE
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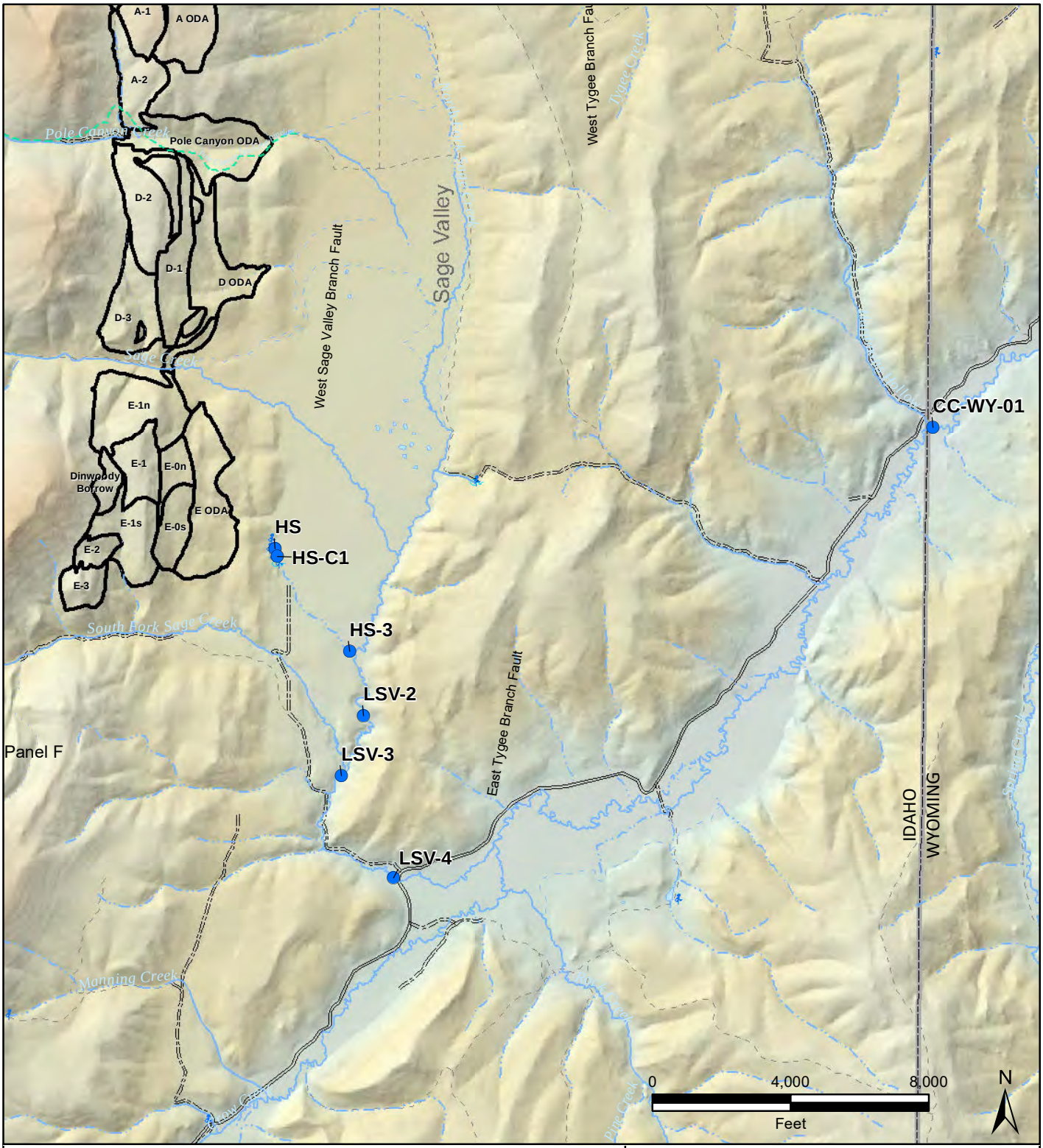
FIGURE 9

PREDICTED SELENIUM CONCENTRATIONS IN SURFACE WATER IN SAGE CREEK AND CROW CREEK – ALTERNATIVES 1, 2a and 2b

DATE: FEBRUARY 2023	FORMATION ENVIRONMENTAL
BY: PHT	FOR: ACK



Legend

- Surface Water Monitoring Locations
- Mine Disturbance

Notes:
1. Mine disturbance area boundary includes a 50-foot buffer.

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SMOKY CANYON MINE
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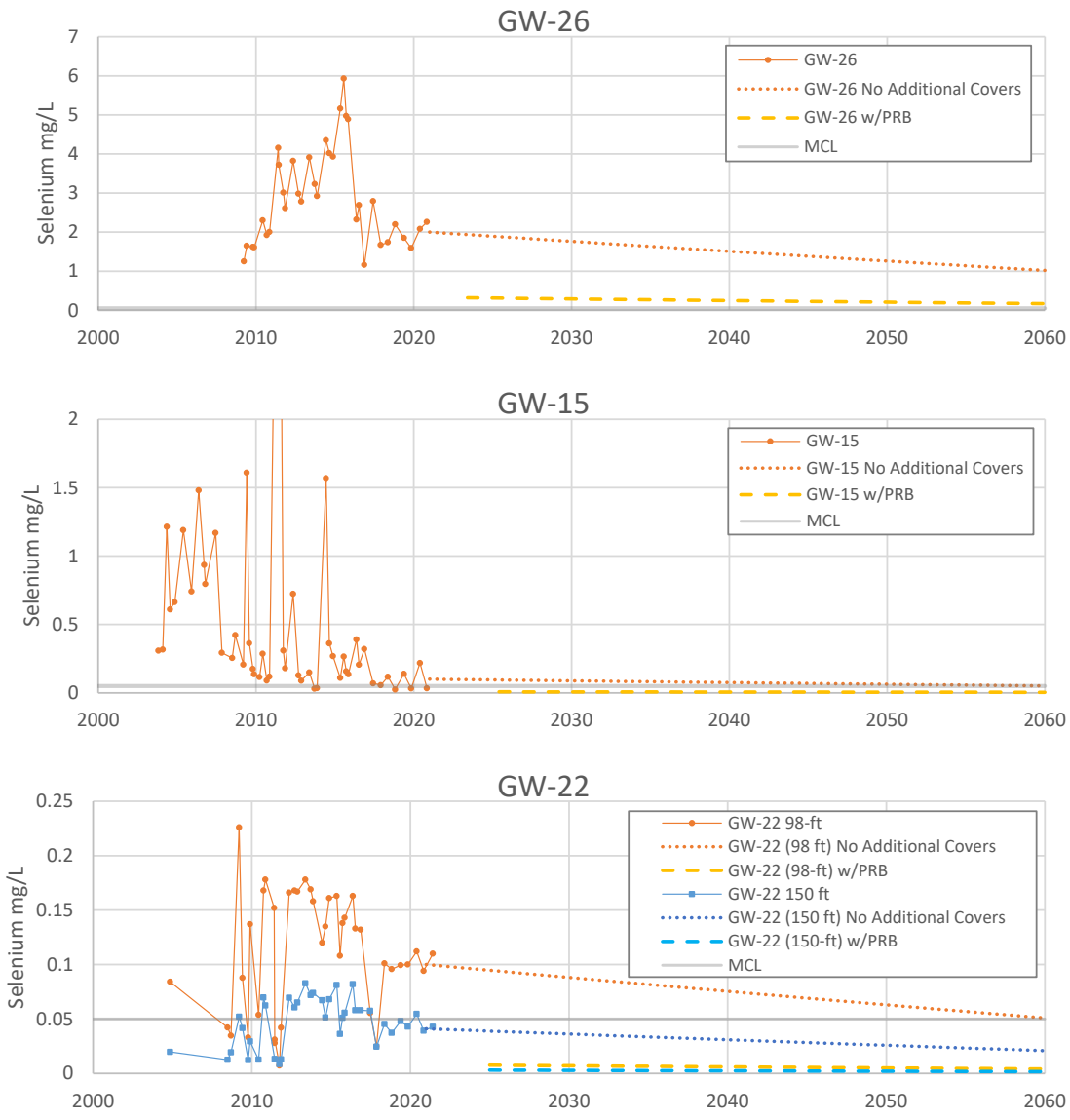
FIGURE 10

SURFACE WATER MONITORING LOCATIONS IN SAGE CREEK AND CROW CREEK

DATE: FEB 02, 2023	FORMATION ENVIRONMENTAL
BY: CRL	FOR: ACK



Notes:
1. mg/L = milligrams per liter
2. PRB assumed active year 2023

J.R. SIMPLOT COMPANY
SMOKY CANYON MINE
RECORD OF DECISION

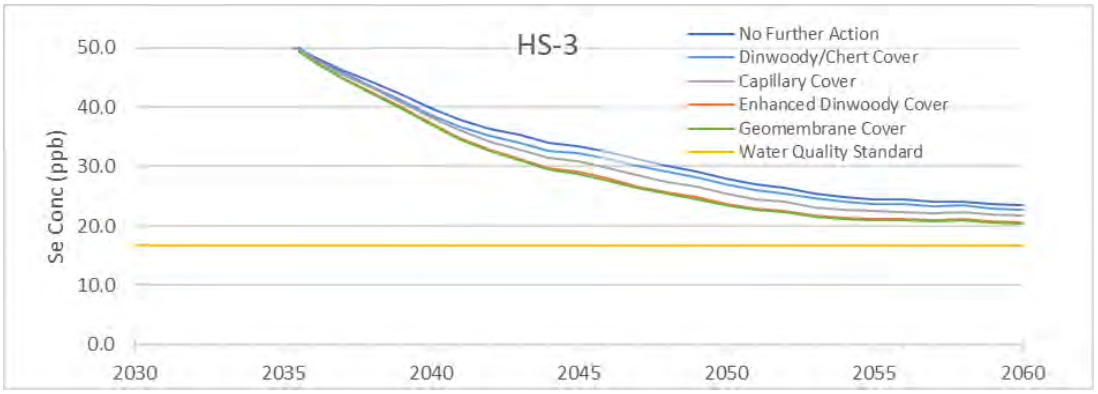
FIGURE 11

PREDICTED SELENIUM CONCENTRATIONS IN ALLUVIAL GROUNDWATER DOWNGRADIENT OF POLE ODA – NO COVERS AND PERMEABLE REACTIVE BARRIER

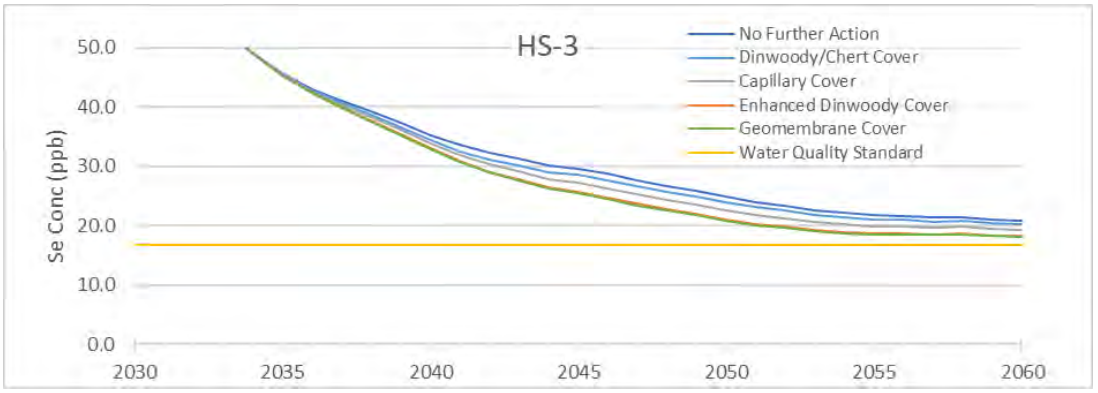
DATE: FEBRUARY 2023
BY: PHT | FOR: ACK

FORMATION ENVIRONMENTAL

Low Flow Conditions in the Creeks



High Flow Conditions in the Creeks



Notes:
1. ppb = parts per billion
2. Site-Specific Selenium Aquatic Life Criterion = 16.7 ppb (IDAPA 58.01.02.287.03)

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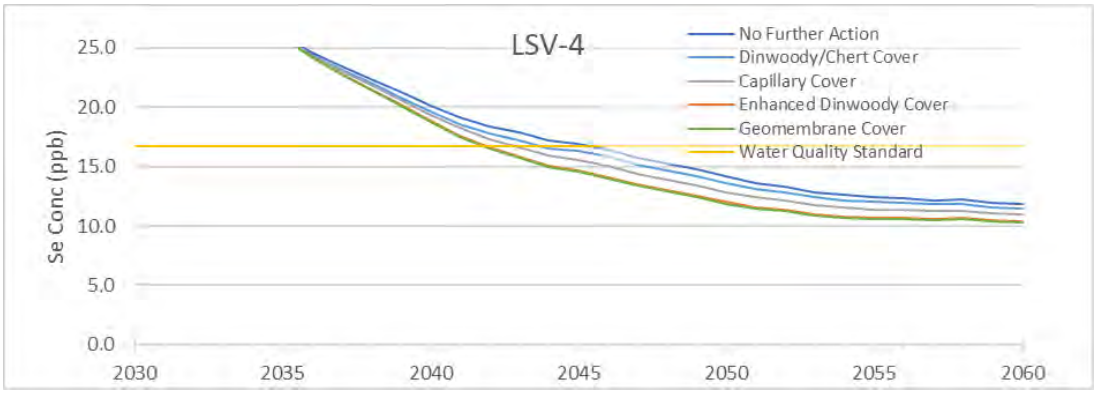
FIGURE 12

PREDICTED SELENIUM CONCENTRATIONS IN SURFACE WATER AT HS-3 FOR COVERS ON TARGET AREAS

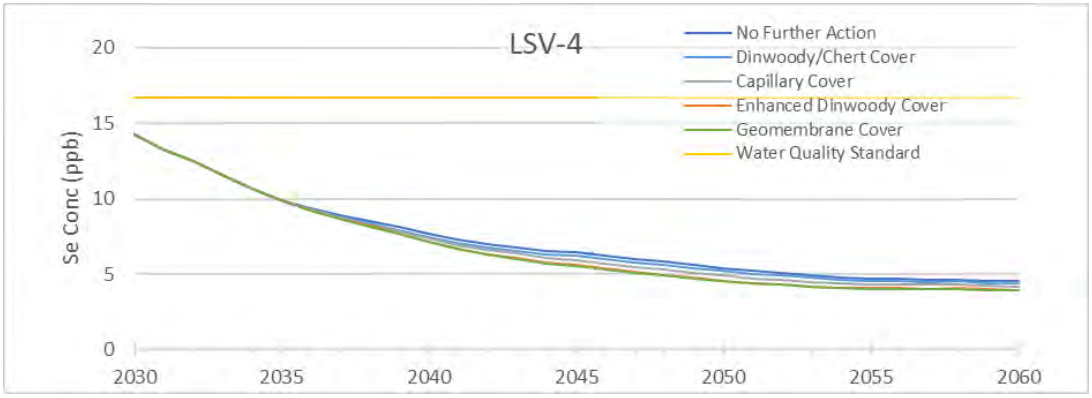
DATE: FEBRUARY 2023	
BY: PHT	FOR: ACK

FORMATION ENVIRONMENTAL

Low Flow Conditions in the Creeks



High Flow Conditions in the Creeks



Notes:
1. ppb = part per billion
2. Site-Specific Selenium Aquatic Life Criterion = 16.7 ppb (IDAPA 58.01.02.287.03)

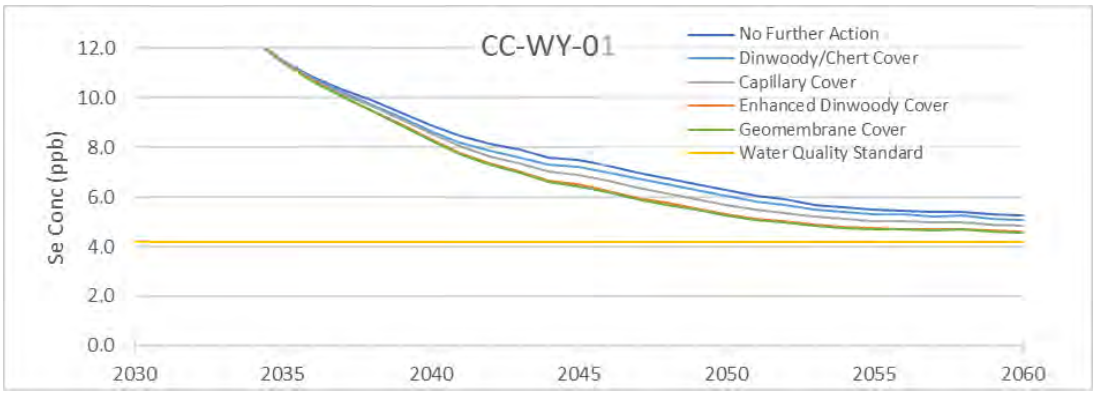
J.R. SIMPLOT COMPANY
SMOKY CANYON MINE
RECORD OF DECISION

FIGURE 13

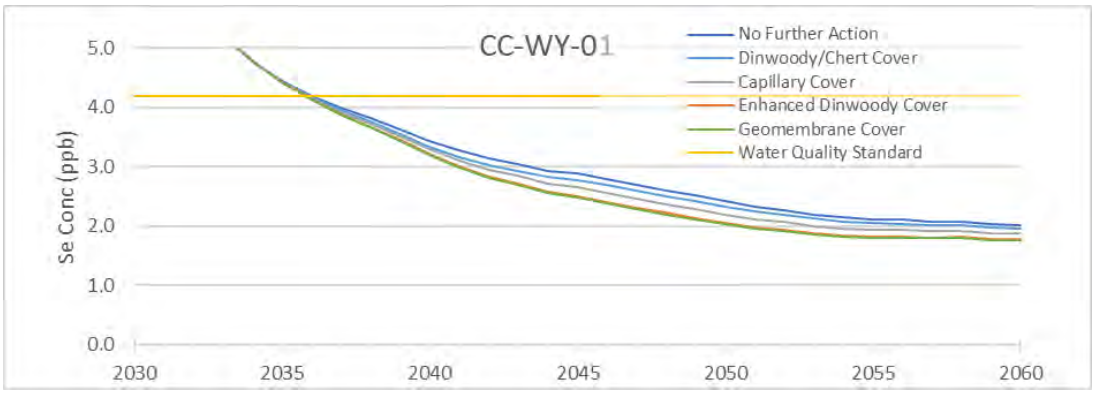
PREDICTED SELENIUM CONCENTRATIONS IN SURFACE WATER AT LSV-4 FOR COVERS ON TARGET AREAS

DATE: FEBRUARY 2023		FORMATION ENVIRONMENTAL
BY: PHT	FOR: ACK	

Low Flow Conditions in the Creeks



High Flow Conditions in the Creeks



Notes:
1. ppb = part per billion
2. Site-Specific Selenium Aquatic Life Criterion = 4.2 ppb (IDAPA 58.01.02.287.04)

J.R. SIMPLOT COMPANY
SMOKY CANYON MINE
RECORD OF DECISION

FIGURE 14

PREDICTED SELENIUM CONCENTRATIONS IN SURFACE WATER AT CC-WY-01 FOR COVERS ON TARGET AREAS

DATE: FEBRUARY 2023	
BY: PHT	FOR: ACK

FORMATION ENVIRONMENTAL

APPENDIX A

Administrative Record Index

40 CFR Section 300. The National Contingency Plan Regulations (the statutory requirements of CERCLA—especially Section 121 of CERCLA, 42 U.S.C. Section 9621—are the mandatory requirements that the USFS must follow in selecting a remedy).

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EPA. 1990. The Feasibility Study: Detailed Analysis of Remedial Action Alternatives. OSWER 9355.3-01FS4. March.

EPA. 1990. A Guide to Selecting Remedial Superfund Actions. OSWER No. 9355.0-27FS. April.

EPA. 1991. Incorporating Citizen Concerns into Superfund Decision Making. OSWER No. 9230.0-18. January.

EPA. 1991. A Guide to Principal Threat and Low Level Threat Wastes. OSWER No. 9380.3-06FS. November.

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EPA. 1997 Rules of Thumb for Superfund Remedy Selection," OSWER No. 9355.0-69. August.

EPA. 1999. A Guide to Preparing Superfund Proposed Plans, Records of Decision, and other Remedy Selection Decision Documents. OSWER 9200.1-23P. July.

EPA. 2003. Five-Year Review Process in the Superfund Program. EPA/540-F-02-004, OSWER 9355.7-09FS. April.

Formation. 2011. Final RI/FS Work Plan (Rev 03), Smoky Canyon Mine, Caribou County, Idaho. Prepared for J.R. Simplot Company. May.

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Formation. 2015. Final Smoky Canyon Mine Remedial Investigation/Feasibility Study Site-Specific Human Health Risk Assessment Report. Prepared for J.R. Simplot Company, Afton, Wyoming, and Boise, Idaho. November.

Formation. 2015. Final Site-Specific Ecological Risk Assessment Report, Smoky Canyon Mine Remedial Investigation/Feasibility Study. Prepared for J.R. Simplot. December.

Formation. 2016. Final Smoky Canyon Mine Remedial Investigation/Feasibility Study Site-Specific Livestock Risk Assessment Report. Prepared for J.R. Simplot Company, Afton, Wyoming and Boise, Idaho. January.

Formation. 2016. Pole Canyon Overburden Disposal Area 2015 NTCRA Post-Removal Site Control Plan. Prepared for J.R. Simplot Company. August 2015 (replacement pages in February 2016).

Formation. 2023. Final Feasibility Study Technical Memorandum #2: Detailed Analysis of Remedial Alternatives. Smoky Canyon Mine RI/FS. Prepared for J.R. Simplot Company. February.

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NewFields. 2005. Final Site Investigation Report for Smoky Canyon Mine – Area A, Caribou County, Idaho. Prepared for J.R. Simplot Company, July.

NewFields. 2009. Smoky Canyon Mine Pole Canyon Water Management Removal Action Post-Removal Site Control Plan. Prepared for the J.R. Simplot Company. September.

USFS. 2003. Revised Forest Plan for the Caribou National Forest. Prepared by the USDA Forest Service, Caribou-Targhee National Forest, Idaho Falls, ID. February 2003.

USFS. 2013. Agency Comments on the Draft Screening Levels, Exposure Factors, and Toxicity Factors for the Smoky Canyon Mine Site-Specific Human Health Risk Assessment, dated February 14, 2013. Letter from Mary Kauffman (USFS) to Alan Prouty (Simplot). March 26, 2013.

USFS. 2023a. Proposed Plan, Smoky Canyon Mine. April.

USFS. 2023b. Notes from May 2, 2023, Public Meeting, Smoky Canyon Mine.

USFS, EPA, and IDEQ. 2006. Administrative Settlement Agreement and Order on Consent/Consent Order (Settlement Agreement/CO) for a Non-Time Critical Removal Action, with J.R. Simplot Company, Respondent. Effective October 18, 2006.

USFS, IDEQ, and Tribes (Shoshone-Bannock Tribes). 2013. Administrative Settlement Agreement and Order on Consent/Consent Order for Non- Time Critical Removal Action, Smoky Canyon Phosphate Mine. J.R. Simplot Company Respondent. Signed November 27, 2013.

APPENDIX B

Cost Estimate Details for the Selected Remedy

Appendix B - Table 1
Present Value of Alternative 1: No Further Action

Item	Notes	Start Year	End Year	Estimated Cost	Present Value[1]
Capital Costs					
N/A		0	0	$0	$0
Total				**$0**	**$0**
Annual O&M Costs					
N/A		0	0	$0	$0
Total				**$0**	**$0**
Periodic Costs					
N/A		0	0	$0	$0
Total				**$0**	**$0**
Net Present Value					**$0**

Notes
1 7% Discount rate used for Present Value

Appendix B - Table 2
Common Elements

Item	Notes	Quantity	Unit	Total Cost
Capital Costs				
INSTITUTIONAL CONTROLS				
IC Implementation and Assurance Plan (ICIAP)		1	LS	$50,000
- Closure orders				
- Grazing Restrictions				
- Deed Restrictions				
Total Capital Costs				**$50,000**
Monitoring				
Monitored Natural Attenuation (MNA) and Long-Term Performance Monitoring				
- Groundwater Monitoring	a, b	1	LS/year	$15,000
- Surface Water Monitoring	a, b	1	LS/year	$45,000
Total Monitoring Costs				**$60,000**
Periodic Costs				
5-Year Review	c	1	LS	$100,000
Total Periodic Costs				**$100,000**

Notes

[a] Costs provided by Simplot based on costs from similar projects at the mine

b Assuming 4 sampling locations for groundwater monitoring, and 10 sampling locations for surface water monitoring. Sampling conducted by a 2-person crew. Includes field sampling activities, laboratory costs (including QA/QC samples), data validation, and data summary report preparation.

[c] Based on Ballard and Henry FS Reports - "Assumed level of effort for summarizing inspection findings, summarizing operation and maintenance activities completed, preparing presentation graphics for US Forest Service lead 5-year review meetings"

Appendix B - Table 3
Water Treatment Remedial Alternatives Cost Summary (Present Value)

Cost Item Description	Alternative 1	Alternative 2a	Alternative 2b	Alternative 2c
Capital Costs	$0	$38,307,800	$76,531,700	$466,000
Annual O&M Costs	$0	$25,872,800	$30,060,900	$1,506,400
Periodic Costs	$0	$451,400	$216,000	$312,300
Total Present Value	**$0**	**$64,632,000**	**$106,809,000**	**$2,285,000**

Appendix B - Table 4

Present Value of Alternative 2a: Water Treatment at the Hoopes WTP (2,000 gpm)

Item	Notes	Start Year	End Year	Estimated Cost	Present Value[1]
Capital Costs					
2,000 gpm WTP	a	0	0	$38,257,780	$38,257,800
Institutional Controls	a, c	0	0	$50,000	$50,000
Total				**$38,307,780**	**$38,307,800**
O&M Costs					
WTP	a	1	30	$2,025,000	$25,128,300
Monitoring	a, b	1	30	$60,000	$744,500
Total				**$2,085,000**	**$25,872,800**
Periodic Costs					
Chert Cover Maintenance	d	5	30	$4,000	$18,100
5-Year Reviews	a, c	5	30	$100,000	$451,400
Total				**$100,000**	**$451,400**
Net Present Value					**$64,632,000**

Notes

1 7% Discount rate used for Present Value

[a] Present value calculated according to EPA "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study" Chapter 4

[b] Assuming 10 sampling locations being sampled by a 2-man crew. Includes field sampling activities, laboratory costs (including QA/QC samples), data validation, and data summary report preparation.

[c] Refer to Common Elements Table 2 for details.

[d] Based on approximately 20% replacement of material every 5 years.

Appendix B - Table 5
Alternative 2a - Water Treatment at the Hoopes WTP (2,000 gpm)

Item	Notes	Quantity	Unit	Unit Cost	Total Cost
Capital Costs					
Direct Construction					
Construct 2000 gpm WTP	e	1	LS	$22,000,000	$22,000,000
Chert/Limestone Covers on Seeps (DS-7, LP-1) and Ponds (DP-7, EP-2)					
2-FT Chert	g	3	acre	$6,500	$19,500
Total					**$22,019,500**
Indirect Construction					
Mobilization/Demobilization	a	5%			$1,100,975
Water/Sediment Control	a	5%			$1,100,975
Total					**$2,201,950**
Construction Subtotal					**$24,221,450**
Contingency	b	10% Scope + 25% Bid		35%	$8,477,508
Construction Subtotal + Contingency					**$32,698,958**
Remedial Design	b	6%			$1,961,937
Project/Construction Management	b	11%			$3,596,885
Total					**$5,558,823**
Total Capital Costs					**$38,257,780**
Initial Annual O&M Costs					
O&M for Startup of 2,000 gpm WTP	h				$0
Total Initial Annual O&M Costs					**$0**
Subsequent Annual O&M Costs					
Annual O&M for 2,000 gpm WTP	c, d	1	LS	$1,500,000	$1,500,000
Contingency	b	35%			$525,000
Total Subsequent Annual O&M Costs					**$2,025,000**
Periodic Costs					
Chert Cover Maintenance	f				
5-Year Reviews	f				
Total Periodic Costs					**(refer to Table 4)**

Notes

[1] Calculated using 2019 cost index information from RSMeans site for Pocatello. https://www.rsmeans.com/rsmeans-city-cost-index

[a] Determined from EPA (2000) "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study", Page 5-11 and Exhibit 5-6

[b] Determined from EPA (2000) "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study", Chapter 5

[c] Costs provided by Simplot based on similar projects at the mine.

[d] Based on the Hoopes Water Treatment Plant pilot study O&M costs for a 2,000 gpm system.

[e] Cost based on actual construction costs of the existing Hoopes Water Treatment Plant that have been adjusted using online cost index information from 2019 RSMeans (see footnote 1).

[f] Periodic costs include chert cover maintenance (i.e., replacement of chert) and the 5-year reviews included on Table 4. Refer to Common Elements Table 2 for details.

[g] Based on actual Pole Canyon NTCRA costs.

[h] Initial costs for startup and O&M of the full-scale pilot treatment system included in subsequent costs. Simplot provided an inclusive cost for the 2,000 gpm system.

Appendix B - Table 6

Present Value of Alternative 2b: Water Treatment at the Hoopes WTP (4,000 gpm)

Item	Notes	Start Year	End Year	Estimated Cost	Present Value[1]
Capital Costs					
4,000 gpm WTP	a	0	0	$76,481,680	$76,481,700
Institutional Controls	a, c	0	0	$50,000	$50,000
Total				**$76,531,680**	**$76,531,700**
O&M Costs					
2,000 gpm WTP	d	0	1	$2,025,000	$3,917,500
4,000 gpm WTP	a	1	30	$2,362,500	$29,316,400
Monitoring	a, b	1	30	$60,000	$744,500
Total				**$2,422,500**	**$30,060,900**
Periodic Costs					
Chert Cover Maintenance	e	5	30	$4,000	$18,100
5-Year Reviews	a, c	5	30	$100,000	$216,000
Total				**$100,000**	**$216,000**
Net Present Value					**$106,808,600**

Notes

1 7% Discount rate used for Present Value

[a] Present value calculated according to EPA "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study" Chapter 4

[b] Assuming 10 sampling locations being sampled by a 2-man crew. Includes field sampling activities, laboratory costs (including QA/QC samples), data validation, and data summary report preparation.

[c] Refer to Common Elements Table 2 for details.

[d] O&M for the continued operation of the 2,000 gpm WTP during the year when the second treatment train is being constructed.

[e] Based on approximately 20% replacement of material every 5 years.

Appendix B - Table 7
Alternative 2b - Water Treatment at the Hoopes WTP (4,000 gpm)

Item	Notes	Quantity	Unit	Unit Cost 2019[1]	Total Cost
Capital Costs					
Direct Construction					
Construct 2,000 gpm WTP	e	1	LS	$22,000,000	$22,000,000
Expand treatment system to 4,000 gpm	e	1	LS	$22,000,000	$22,000,000
Chert/Limestone Covers on Seeps (DS-7, LP-1) and Ponds (DP-7, EP-2)					
2-FT Chert	g	3	acre	$6,500	$19,500
Total					**$44,019,500**
Indirect Construction					
Mobilization/Demobilization	a	5%			$2,200,975
Water/Sediment Control	a	5%			$2,200,975
Total					**$4,401,950**
Construction Subtotal					**$48,421,450**
Contingency	b	10% Scope + 25% Bid		35%	$16,947,508
Construction Subtotal + Contingency					**$65,368,958**
Remedial Design	b	6%			$3,922,137
Project/Construction Management	b	11%			$7,190,585
Total					**$11,112,723**
Total Capital Costs					**$76,481,680**
Initial Annual O&M Costs					
Annual O&M for Existing 2,000 gpm WTP	c, d	1	LS	$1,500,000	$1,500,000
Contingency	b	35%			$525,000
Total Initial Annual O&M Costs					**$2,025,000**
Subsequent Annual O&M Costs					
Annual O&M for Expanded 4,000 gpm WTP	c, d	1	LS	$1,750,000	$1,750,000
Contingency	b	35%			$612,500
Total Subsequent Annual O&M Costs					**$2,362,500**
Periodic Costs					
Chert Cover Maintenance	f				
5-Year Reviews	f				
Total Periodic Costs					**(refer to Table 6)**

Notes

[1] Calculated using 2019 cost index information from RSMeans site for Pocatello. https://www.rsmeans.com/rsmeans-city-cost-index

[a] Determined from EPA (2000) "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study", Page 5-11 and Exhibit 5-6

[b] Determined from EPA (2000) "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study", Chapter 5

[c] Costs provided by Simplot based on similar projects at the mine.

[d] Based on the Hoopes Water Treatment Plant pilot study O&M costs for a 2,000 gpm system.

e Cost based on actual construction costs of the existing Hoopes Water Treatment Plant that have been adjusted using online cost index information from 2019 RSMeans (see footnote 1).. For the purposes of the cost estimate it is assumed that the increase in capacity would be achieved by construction of two additional treatment trains, identical to the existing system.

[f] Periodic costs include chert cover maintenance (i.e., replacement of chert) and the 5-year reviews included on Table 6. Refer to Common Elements Table 2 for details.

[g] Based on Pole Canyon NTCRA actual costs.

Appendix B - Table 8

Present Value of Alternative 2c: PRB Downgradient of Pole Canyon ODA

Item	Notes	Start Year	End Year	Estimated Cost	Present Value[1]
Capital Costs					
Permeable Reactive Barrier Construction	a, b, c, d	0	0	$416,030	$416,000
Institutional Controls	a, e	0	0	$50,000	$50,000
Total				**$466,030**	**$466,000**
O&M Costs					
Permeable Reactive Barrier O&M	a, b	1	30	$8,100	$100,500
Monitoring	a, e	1	30	$60,000	$744,500
Monitoring (PRB)	a, d	1	5	$60,000	$246,000
Monitoring (PRB)	a, d	6	30	$50,000	$415,400
Total				**$178,100**	**$1,506,400**
Periodic Costs					
Media Replacement (Year 20)	a, b, f	20	20	$369,130	$95,400
Carbon Amendment (Year 10)	a	10	10	$1,000	$500
Carbon Amendment (Year 20)	a	20	20	$1,000	$300
Carbon Amendment (Year 30)	a	30	30	$1,000	$100
5-Year Reviews	a, e	5	30	$100,000	$216,000
Total				**$472,130**	**$312,300**
Net Present Value					**$2,284,700**

Notes

1 7% Discount rate used for Present Value

a Present value calculated according to EPA "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study" Chapter 4

b Used estimate based on 2x flow

c Construction time for Conda PRB was ~3 weeks

d Assuming 10 sampling locations for the PRB for monitoring performance (5 wells and 5 surface water locations separate from routine monitoring). Higher frequency of sampling in first 5 years, reduced frequency thereafter. Sampled by a 2-person crew, includes field sampling activities, laboratory costs (including QA/QC samples), data validation, and data summary report preparation.

e Refer to Common Elements Table 2 for details.

f Complete media replacement will occur between 10 and 20 years post-construction. This will involve complete removal of old treatment media.

Appendix B - Table 9
Alternative 2c - PRB Downgradient of Pole Canyon ODA

Item	Notes	Quantity	Unit	Unit Cost (Conda)	Total Cost
Capital Costs					
Materials					
Chopped alfalfa	a, f	370	CY	$50	$18,500
Wood shavings, delivered	a, f	1200	CY	$13	$15,600
Sand, no delivery	a, f	1500	CY	$11	$17,000
8 oz/yd2 geotextile	a, h	1000	SY	$1	$700
Piping, misc. materials	a	1	LS	$15,000	$15,000
Total					**$66,800**
Direct Construction					
Excavate PRB	a, i	3080	BCY	$10	$30,800
Blend treatment media	a	3080	CY	$9	$27,500
Haul media to site	a	900	Ton	$15	$13,500
Place treatment media	a	3080	CY	$5	$15,000
Treatment cell Dinwoody cover	a, i	250	CY	$5	$1,400
Additional monitoring wells	a	5	each	$3,610	$18,100
Total					**$106,300**
Indirect Construction					
Mobilization/Demobilization	a	5%			$5,315
Water/Sediment Control	a	5%			$5,315
As-built drawings & completion report	a	1	Est.	$16,000	$16,000
Sampling Plan	a	1	Est.	$32,000	$32,000
Total					**$58,630**
Construction Subtotal					**$231,730**
Contingency	b	10% scope + 25% bid		35%	$81,100
Construction Subtotal + Contingency					**$312,830**
Remedial Design	c	15%			$46,900
Project/Construction Management	c	18%			$56,300
Total					**$103,200**
Total Capital Costs					**$416,030**
Initial Annual O&M Costs					
NA					$0
Total Initial Annual O&M Costs					**$0**
Subsequent Annual O&M Costs					
PRB O&M	a, d	1	LS	$6,000	$6,000
Contingency	c	35%			$2,100
Total Subsequent Annual O&M Costs					**$8,100**
Periodic Costs					
Carbon Amendment	g, j	1	LS	$1,000	$1,000
Replacement of Media	e, j	1	each		$369,130
5-Year Reviews	k				
Total Periodic Costs					**(refer to Table 8)**

Notes

[a] Based on estimates for PRB at Conda/Woodall Mountain Mine, assumed same quantity needed.

[b] Determined from EPA (2000) "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study", Page 5-11 and Exhibit 5-6

[c] Determined from EPA (2000) "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study", Chapter 5

[d] Based on DS-7 treatment system costs, with less sampling.

[e] Based on PRB at Conda/Woodall Mountain Mine, assuming replacement would need to occur around the 20 year mark. PRB would need to be excavated and media replaced. Cost includes all capital costs except for the design.

[f] Treatment media consists of 50% well-graded sand, 37.5% wood chips/shavings, and 12.5% chopped alfalfa

[g] Carbon amendment means periodic replenishment of carbon source (sugar) for bacteria

[h] Assumes fabric only covering top of PRB, not lining interior of trench. Top PRB dimensions 20'x200' + 50% safety factor

[i] PRB dimensions 20'x20'x200' with a 1.5' cover.

[j] Carbon amendment and media replacement are on separate periodic schedules. Refer to Table 8 for combined periodic costs.

[k] Additional periodic costs include the 5-year reviews on Table 8. Refer to Common Elements Table 2 for details.

Appendix B - Table 10

Source Control Remedial Alternatives Cost Summary (Present Value)

Cost Item Description	Alternative 1	Alternative 3a	Alternative 3b	Alternative 3c	Alternative 3d	Alternative 3e
Capital Costs	$0	$17,485,800	$16,463,900	$29,479,300	$36,992,900	$1,017,000
Annual O&M Costs	$0	$1,014,200	$702,100	$952,600	$1,765,000	$32,400
Periodic Costs	$0	$451,400	$359,400	$359,400	$359,400	$541,700
Total Present Value	**$0**	**$18,952,000**	**$17,526,000**	**$30,792,000**	**$39,118,000**	**$1,592,000**

Appendix B - Table 11

Present Value of Alternative 3a: Dinwoody/Chert Covers Over Target Areas

Item	Notes	Start Year	End Year	Estimated Cost	Present Value[1]
Capital Costs					
Cover	a, b	0	2	$21,327,000	$17,435,800
Institutional Controls	a, c	0	0	$50,000	$50,000
Total				**$21,377,000**	**$17,485,800**
Annual O&M Costs					
Cover (Initial)	a	1	2	$118,800	$100,400
Cover (Subsequent)	a	3	30	$26,200	$277,700
Monitoring	a, c	3	30	$60,000	$636,100
Total				**$86,200**	**$1,014,200**
Periodic Costs					
5-Year Reviews	a, c	5	30	$100,000	$451,400
Total				**$100,000**	**$451,400**
Net Present Value					**$18,951,400**

Notes

1 7% Discount rate used for Present Value

a Present value calculated according to EPA "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study" Chapter 4

b Assumes that 80 acres can be constructed per year, 3 years to complete covers on target areas (based on the approximate time required to complete the Pole Canyon NTCRA cover).

c Refer to Common Elements Table 2 for details.

Appendix B - Table 12
Alternative 3a - Dinwoody/Chert Covers Over Target Areas

Item	Notes	Quantity	Unit	Cost/Acre	Total Cost
Capital Costs					
PREPARE SLOPE FOR COVER					
Regrade/Compact/Strip	d		acre	$3,500	
3rd Party Survey/CQC/Design	d		acre	$1,000	
PREPARE MATERIALS					
Construct Haul Road to Dinwoody Borrows	d		acre	$15,000	
Haul Loose Dinwoody to Project Area	d		acre	$13,310	
Haul Coarse Material to Project Area	d		acre	$13,310	
MISC. LAYERS					
2-FT Coarse Chert/Limestone	d		acre	$6,500	
3-FT Dinwoody (loose over compacted)	d		acre	$9,000	
VEGETATION					
Seeding and Fertilizer	d		acre	$4,000	
Bonded Fiber Matrix Hydromulch	d		acre	$1,500	
EROSION CONTROL					
Purchase and Install Silt Fence	d		acre	$200	
Purchase and Install Wattles	d		acre	$2,000	
MOBILIZATION/DEMOBILIZATION					
Equipment Mobilization and Training	d		acre	$250	
Total Cost Per Acre				**$69,600**	
Acreage	a	194	acre		
Construction Subtotal					**$13,502,400**
Contingency	b	10% Scope + 25% Bid		35%	$4,725,800
Construction Subtotal + Contingency					**$18,228,200**
Remedial Design	c	6%			$1,093,700
Project/Construction Management	c	11%			$2,005,100
Total					**$3,098,800**
Total Capital Costs					**$21,327,000**
Initial Annual O&M Costs					
O&M Costs - Year 1	a, e	80	acre	$500	$40,000
O&M Costs - Year 2	a, e, f	160	acre	$500 / $100	$48,000
Contingency	c	35%			$30,800
Total Initial Annual O&M Costs					**$118,800**
Subsequent Annual O&M Costs					
O&M of Cover System	a, e	194	acre	$100	$19,400
Contingency	c	35%			$6,800
Total Subsequent Annual O&M Costs					**$26,200**
Periodic Costs					
5-Year Reviews	g				
Total Periodic Costs					**(refer to Table 11)**

Notes

a Acreage calculated using GIS

b Determined from EPA (2000) "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study", Page 5-11 and Exhibit 5-6

c Determined from EPA (2000) "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study", Chapter 5

d Costs provided by Simplot based on costs from similar projects at the mine. Approximately 2,686,000 cy of Dinwoody Formation and Chert material would be required for this alternative.

e Based on Pole Canyon NTCRA actual costs. Refer to the "Final Removal Action Report" (Formation 2022) for additional details.

f Annual maintenance cost per acre higher for first year after construction, and lower thereafter.

g The only periodic costs associated with this alternative are the 5 year reviews included on Table 11. Refer to Common Elements Table 2.

Appendix B - Table 13

Present Value of Alternative 3b: Capillary Covers Over Target Areas

Item	Notes	Start Year	End Year	Estimated Cost	Present Value[1]
Capital Costs					
Cover	a, b	0	7	$33,001,700	$16,413,900
Institutional Controls	a, c	0	0	$50,000	$50,000
Total				**$33,051,700**	**$16,463,900**
Annual O&M Costs					
Cover (Initial)	a	1	7	$189,000	$97,000
Cover (Subsequent)	a	8	30	$26,200	$183,900
Monitoring	a, c	8	30	$60,000	$421,200
Total				**$275,200**	**$702,100**
Periodic Costs					
5-Year Reviews	a, c	10	30	$100,000	$359,400
Total				**$100,000**	**$359,400**
Net Present Value					**$17,525,400**

Notes

1 7% Discount rate used for Present Value

[a] Present value calculated according to EPA "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study" Chapter 4

[b] Based on time for Pole Canyon cover, and scaled to account for more complicated construction requirements. Assumes 25 acres can be constructed per year. Approximately 8 years to complete construction.

[c] Refer to Common Elements Table 2 for details.

Appendix B - Table 14
Alternative 3b - Capillary Covers Over Target Areas

Item	Notes	Quantity	Unit	Cost/Acre	Total Cost
Capital Costs					
PREPARE SLOPE FOR COVER SYSTEM					
Regrade/Compact/Strip	d		acre	$3,500	
3rd Party Survey/CQC/Design	d		acre	$5,000	
PREPARE MATERIALS					
Construct Haul Road to Dinwoody Borrows	d		acre	$15,000	
Process and Stockpile Drainage Material (1" x 4")	d		acre	$14,850	
Haul Coarse Material for Drainage Benches to Stockpile	d		acre	$8,640	
Haul Loose Dinwoody to Project Area	d		acre	$19,965	
Purchase and Install Geotextile for Filter Fabric	d		acre	$10,000	
Screen Material for 6-in Dinwoody	d		acre	$4,000	
MISC. LAYERS					
1-FT Chert/Limestone	d		acre	$3,250	
2-FT Dinwoody (loose)	d		acre	$6,000	
SCREENED DINWOODY LAYER					
Haul and Place 6-inch screened Dinwoody	d		acre	$4,000	
DRAINAGE SYSTEM					
Haul (from stockpile), Place, and Compact Coarse Material for Drainage Benches	d		acre	$2,000	
Haul and Place drainage material for Drainage Benches	d		acre	$2,000	
Install D50 6-inch Riprap in Drainage Benches	d		acre	$500	
Excavate and grade outlet ponds	d		acre	$750	
Install D50 6-inch Riprap in outlet ponds	d		acre	$250	
VEGETATION					
Seeding and Fertilizer	d		acre	$4,000	
Bonded Fiber Matrix Hydromulch	d		acre	$1,500	
EROSION CONTROL					
Purchase and Install Silt Fence	d		acre	$200	
Purchase and Install Wattles	d		acre	$2,000	
MOBILIZATION/DEMOBILIZATION					
Equipment Mobilization and Training	d		acre	$250	
Total Cost Per Acre				**$107,700**	
Acreage	a	194	acre		
Construction Subtotal					**$20,893,800**
Contingency	b	10% Scope + 25% Bid		35%	$7,312,800
Construction Subtotal + Contingency					**$28,206,600**
Remedial Design	c	6%			$1,692,400
Project/Construction Management	c	11%			$3,102,700
Total					**$4,795,100**
Total Capital Costs					**$33,001,700**
Initial Annual O&M Costs					
O&M Costs - Year 1	a, e	25	acre	$500	$12,500
O&M Costs - Year 2	a, e, f	50	acre	$500 / $100	$15,000
O&M Costs - Year 3	a, e, f	75	acre	$500 / $100	$17,500
O&M Costs - Year 4	a, e, f	100	acre	$500 / $100	$20,000
O&M Costs - Year 5	a, e, f	125	acre	$500 / $100	$22,500
O&M Costs - Year 6	a, e, f	150	acre	$500 / $100	$25,000
O&M Costs - Year 7	a, e, f	175	acre	$500 / $100	$27,500
Contingency	c	35%			$49,000
Total Initial Annual O&M Costs					**$189,000**
Subsequent Annual O&M Costs					
O&M of Cover System	a, e	194	acre	$100	$19,400
Contingency	c	35%			$6,800
Total Subsequent Annual O&M Costs					**$26,200**
Periodic Costs					
5-Year Reviews	g				
Total Periodic Costs					**(refer to Table 13)**

Notes

[a] Acreage calculated using GIS

[b] Determined from EPA (2000) "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study", Page 5-11 and Exhibit 5-6

[c] Determined from EPA (2000) "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study", Chapter 5

[d] Approximately 1,880,000 cy of Dinwoody Formation and Chert material will be required for this alternative.

[e] Based on Pole Canyon NTCRA actual costs. Refer to the "Final Removal Action Report" (Formation 2022) for additional details.

[f] Annual maintenance cost per acre higher for first year after construction, and lower thereafter.

[g] The only periodic costs associated with this alternative are the 5 year reviews included on Table 13. Refer to Common Elements Table 2 for details.

Appendix B - Table 15

Present Value of Alternative 3c: Enhanced Dinwoody Covers Over Target Areas

Item	Notes	Start Year	End Year	Estimated Cost	Present Value[1]
Capital Costs					
Cover	a, b	0	7	$59,170,300	$29,429,300
Institutional Controls	a, c	0	0	$50,000	$50,000
Total				**$59,220,300**	**$29,479,300**
Annual O&M Costs					
Cover (Initial)	a	1	7	$318,950	$163,600
Cover (Subsequent)	a	8	30	$52,400	$367,800
Monitoring	a, c	8	30	$60,000	$421,200
Total				**$431,350**	**$952,600**
Periodic Costs					
5-Year Reviews	a, c	10	30	$100,000	$359,400
Total				**$100,000**	**$359,400**
Net Present Value					**$30,791,300**

Notes

1 7% Discount rate used for Present Value

[a] Present value calculated according to EPA "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study" Chapter 4

[b] Based on time for Pole Canyon cover, and scaled to account for more complicated construction requirements. Assumes 25 acres can be constructed per year. Approximately 8 years to complete construction.

[c] Refer to Common Elements Table 2 for details.

Appendix B - Table 16
Alternative 3c - Enhanced Dinwoody Covers Over Target Areas

Item	Notes	Quantity	Unit	Cost/Acre	Total Cost
Capital Costs					
PREPARE SLOPE FOR COVER SYSTEM					
Regrade/Compact/Strip	d		acre	$3,500	
3rd Party Survey/CQC/Design	d		acre	$15,000	
PREPARE MATERIALS					
Construct Haul Road to Dinwoody Borrows	d		acre	$15,000	
Process and Stockpile Drainage Material (1" x 4")	d		acre	$22,500	
Process and Stockpile D50 6-inch Riprap (4" to 9")	d		acre	$1,500	
Haul Coarse Material for Drainage Benches to Stockpile	d		acre	$7,200	
Haul Loose Dinwoody to Project Area	d		acre	$35,493	
Haul Topsoil to Project Area	d		acre	$13,310	
Purchase Geomembrane for Drainage Ditch	d		acre	$4,500	
Purchase and Install Geotextile for Filter Fabric	d		acre	$10,000	
SCREENED DINWOODY LAYER					
Screen Dinwoody	d		acre	$4,000	
Haul, Place, and Compact 6-inch Screened Dinwoody	d		acre	$4,000	
ENHANCED DINWOODY LAYER					
Screen Dinwoody, Pugmill Mix Bentonite into Screened Dinwoody	d		acre	$16,500	
Purchase Bentonite (@ 7%)	d		acre	$6,000	
Haul and Place Bentonite to Site	d		acre	$6,500	
Haul, Place, and Compact 6-inch Enhanced Dinwoody	d		acre	$4,000	
DRAINAGE LAYER					
Haul and Place 12-inch Drainage Layer	d		acre	$3,300	
LOOSE DINWOODY LAYER					
Haul and Place 2-FT Loose Dinwoody	d		acre	$4,800	
TOPSOIL LAYER					
Haul and Place 1-FT Topsoil Layer	d		acre	$2,500	
DRAINAGE SYSTEM					
Haul (from stockpile), Place, and Compact Coarse Material for Drainage Benches	d		acre	$2,000	
Haul and Place drainage material for Drainage Benches	d		acre	$2,000	
Install D50 6-inch Riprap in Drainage Benches	d		acre	$500	
Excavate and grade outlet ponds	d		acre	$750	
Install D50 6-inch Riprap in outlet ponds	d		acre	$250	
VEGETATION					
Seeding and Fertilizer	d		acre	$4,000	
Bonded Fiber Matrix Hydromulch	d		acre	$1,500	
EROSION CONTROL					
Purchase and Install Silt Fence	d		acre	$200	
Purchase and Install Wattles	d		acre	$2,000	
MOBILIZATION/DEMOBILIZATION					
Equipment Mobilization and Training	d		acre	$250	
Total Cost Per Acre				**$193,100**	
Acreage	a	194	acre		
Construction Subtotal					**$37,461,400**
Contingency	b	10% Scope + 25% Bid		35%	$13,111,500
Construction Subtotal + Contingency					**$50,572,900**
Remedial Design	c	6%			$3,034,400
Project/Construction Management	c	11%			$5,563,000
Total					**$8,597,400**
Total Capital Costs					**$59,170,300**
Initial Annual O&M Costs					
O&M Costs - Year 1	a, e	25	acre	$750	$18,750
O&M Costs - Year 2	a, e, f	50	acre	$750/$200	$23,750
O&M Costs - Year 3	a, e, f	75	acre	$750/$200	$28,750
O&M Costs - Year 4	a, e, f	100	acre	$750/$200	$33,750
O&M Costs - Year 5	a, e, f	125	acre	$750/$200	$38,750
O&M Costs - Year 6	a, e, f	150	acre	$750/$200	$43,750
O&M Costs - Year 7	a, e, f	175	acre	$750/$200	$48,750
Contingency	c	35%			$82,700

Item	Notes	Quantity	Unit	Cost/Acre	Total Cost
Total Initial Annual O&M Costs					**$318,950**
Subsequent Annual O&M Costs					
O&M of Cover System	a, e	194	acre	$200	$38,800
Contingency	c	35%			$13,600
Total Subsequent Annual O&M Costs					**$52,400**
Periodic Costs					
5-Year Reviews	g				
Total Periodic Costs					**(refer to Table 15)**

Notes

a Acreage calculated using GIS

b Determined from EPA "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study", Page 5-11 and Exhibit 5-6

c Determined from EPA "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study", Chapter 5

d Approximately 2,686,000 cy of Dinwoody Formation and Chert material would be required for this alternative.

e Based on Pole Canyon NTCRA actual costs. Refer to the "Final Removal Action Report" (Formation 2022) for additional details.

f Annual maintenance cost per acre higher for first year after construction, and lower thereafter.

g The only periodic costs associated with this alternative are the 5 year reviews included on Table 15. Refer to Common Elements Table 2 for details.

Appendix B - Table 17

Present Value of Alternative 3d: Geomembrane Covers Over Target Areas

Item	Notes	Start Year	End Year	Estimated Cost	Present Value[1]
Capital Costs					
Cover	a, b	0	7	$74,277,000	$36,942,900
Institutional Controls	a, c	0	0	$50,000	$50,000
Total				**$74,327,000**	**$36,992,900**
Annual O&M Costs					
Cover (Initial)	a	1	7	$826,900	$424,200
Cover (Subsequent)	a	8	30	$131,000	$919,600
Monitoring	a, c	8	30	$60,000	$421,200
Total				**$1,017,900**	**$1,765,000**
Periodic Costs					
5-Year Reviews	a, c	10	30	$100,000	$359,400
Total				**$100,000**	**$359,400**
Net Present Value					**$39,117,300**

Notes

1 7% Discount rate used for Present Value

a Present value calculated according to EPA "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study" Chapter 4

b Based on time for Pole Canyon cover, and scaled to account for more complicated construction requirements. Assumes 25 acres can be constructed per year. Approximately 8 years to complete construction.

c Refer to Common Elements Table 2 for details.

Appendix B - Table 18
Alternative 3d - Geomembrane Covers Over Target Areas

Item	Notes	Quantity	Unit	Cost/Acre	Total Cost
Capital Costs					
PREPARE SLOPE FOR COVER SYSTEM					
Regrade/Compact/Strip	d		acre	$4,500	
3rd Party Survey/CQC/Design	d		acre	$15,000	
PREPARE MATERIALS					
Construct Haul Road to Dinwoody Borrows	d		acre	$15,000	
Process and Stockpile Drainage Material (1" x 4")	d		acre	$22,500	
Process and Stockpile D50 6-inch Riprap (4" to 9")	d		acre	$1,500	
Haul Coarse Material for Drainage Benches to Stockpile	d		acre	$7,200	
Haul Loose Dinwoody to Project Area	d		acre	$19,965	
Haul Topsoil to Project Area	d		acre	$13,310	
Purchase Geomembrane for Drainage Ditch	d		acre	$4,500	
Purchase and Install Geotextile for Filter Fabric	d		acre	$10,000	
MISC. LAYERS					
Geomembrane Layer Purchase and Install	d		acre	$52,577	
Geocomposite Purchase and Install	d		acre	$52,953	
PROTECTIVE SUBGRADE LAYER					
Haul and Place 1-FT Protective Subgrade	d		acre	$2,400	
TOPSOIL LAYER					
Haul and Place 2-FT Dinwoody and 1-FT Topsoil Layer	d		acre	$7,500	
DRAINAGE SYSTEM					
Haul (from stockpile), Place, and Compact Coarse Material for Drainage Benches	d		acre	$1,999	
Haul and Place drainage material for Drainage Benches	d		acre	$2,000	
Install D50 6-inch Riprap in Drainage Benches	d		acre	$500	
Excavate and grade outlet ponds	d		acre	$750	
Install D50 6-inch Riprap in outlet ponds	d		acre	$250	
VEGETATION					
Seeding and Fertilizer	d		acre	$4,000	
Bonded Fiber Matrix Hydromulch	d		acre	$1,500	
EROSION CONTROL					
Purchase and Install Silt Fence	d		acre	$200	
Purchase and Install Wattles	d		acre	$2,000	
MOBILIZATION/DEMOBILIZATION					
Equipment Mobilization and Training	d		acre	$250	
Total Cost Per Acre				**$242,400**	
Acreage	a	194	acre		
Construction Subtotal					**$47,025,600**
Contingency	b	10% Scope + 25% Bid		35%	$16,459,000
Subtotal					**$63,484,600**
Remedial Design	c	6%			$3,809,100
Project/Construction Management	c	11%			$6,983,300
Total					**$10,792,400**
Total Capital Costs					**$74,277,000**
Initial Annual O&M Costs					
O&M Costs - Year 1	a, e	25	acre	$2,000	$50,000
O&M Costs - Year 2	a, e, f	50	acre	$2,000/$500	$62,500
O&M Costs - Year 3	a, e, f	75	acre	$2,000/$500	$75,000
O&M Costs - Year 4	a, e, f	100	acre	$2,000/$500	$87,500
O&M Costs - Year 5	a, e, f	125	acre	$2,000/$500	$100,000
O&M Costs - Year 6	a, e, f	150	acre	$2,000/$500	$112,500
O&M Costs - Year 7	a, e, f	175	acre	$2,000/$500	$125,000
Contingency	c	35%			$214,400

Item	Notes	Quantity	Unit	Cost/Acre	Total Cost
Total Initial Annual O&M Costs					**$826,900**
Subsequent Annual O&M Costs					
O&M of Cover System	a, e	194	acre	$500	$97,000
Contingency	c	35%			$34,000
Total Subsequent Annual O&M Costs					**$131,000**
Periodic Costs					
5-Year Reviews	g				
Total Periodic Costs					**(refer to Table 17)**

Notes

[a] Acreage calculated using GIS

[b] Determined from EPA "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study", Page 5-11 and Exhibit 5-6

[c] Determined from EPA "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study", Chapter 5

[d] Based on previous Simplot projects. Approximately 2,149,000 cy of Dinwoody Formation, Chert and topsoil material would be required for this alternative.

[e] Based on Pole Canyon NTCRA actual costs. Refer to the "Final Removal Action Report" (Formation 2022) for additional details.

[f] Annual maintenance cost per acre higher for first year after construction, and lower thereafter.

[g] The only periodic costs associated with this alternative are the 5 year reviews included on Table 17. Refer to Common Elements Table 2 for details.

Appendix B - Table 19

Present Value of Alternative 3e: Dinwoody Cover Over a Portion of Panel A

Item	Notes	Start Year	End Year	Estimated Cost	Present Value[1]
Capital Costs					
Cover	a, b	0	2	$1,182,800	$967,000
Institutional Controls	a, c	0	0	$50,000	$50,000
Total				**$1,232,800**	**$1,017,000**
Annual O&M Costs					
Cover (Initial)	a	1	2	$10,800	$9,100
Cover (Subsequent)	a	3	30	$2,200	$23,300
Total				**$13,000**	**$32,400**
Periodic Costs					
5-Year Reviews	a, c	5	30	$100,000	$451,400
Soil and Vegetation Monitoring	d	5	30	$20,000	$90,300
Total				**$120,000**	**$541,700**
Net Present Value					**$1,591,100**

Notes

1 7% Discount rate used for Present Value

a Present value calculated according to EPA "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study" Chapter 4

b Assumes that 80 acres can be constructed per year, 3 years to complete covers on target areas (based on the approximate time required to complete the Pole Canyon NTCRA cover).

c Refer to Common Elements Table 2 for details.

d Assuming 1 sampling event every 5 years to collect soil and vegetation (separate from routine monitoring). Sampled by a 2-person crew, includes field sampling activities, laboratory costs (including QA/QC samples), data validation, and data summary report preparation.

Appendix B - Table 20
Alternative 3e - Dinwoody Cover Over a Portion of Panel A

Item	Notes	Quantity	Unit	Cost/Acre	Total Cost
Capital Costs					
PREPARE SLOPE FOR COVER					
Regrade/Compact/Strip	d		acre	$3,500	
3rd Party Survey/CQC/Design	d		acre	$1,000	
PREPARE MATERIALS					
Construct Haul Road to Dinwoody Borrows	d		acre	$15,000	
Haul Loose Dinwoody to Project Area	d		acre	$13,310	
MISC. LAYERS					
2-FT Dinwoody (loose)	d		acre	$6,000	
VEGETATION					
Seeding and Fertilizer	d		acre	$4,000	
Bonded Fiber Matrix Hydromulch	d		acre	$1,500	
EROSION CONTROL					
Purchase and Install Silt Fence	d		acre	$200	
Purchase and Install Wattles	d		acre	$2,000	
MOBILIZATION/DEMOBILIZATION					
Equipment Mobilization and Training	d		acre	$250	
Total Cost Per Acre				**$46,800**	
Acreage	a	16	acre		
Construction Subtotal					**$748,800**
Contingency	b	10% Scope + 25% Bid		35%	$262,100
Construction Subtotal + Contingency					**$1,010,900**
Remedial Design	c	6%			$60,700
Project/Construction Management	c	11%			$111,200
Total					**$171,900**
Total Capital Costs					**$1,182,800**
Initial Annual O&M Costs					
O&M Costs - Year 1	a, e	16	acre	$500	$8,000
Contingency	c	35%			$2,800
Total Initial Annual O&M Costs					**$10,800**
Subsequent Annual O&M Costs					
O&M of Soil Cover	a, e	16	acre	$100	$1,600
Contingency	c	35%			$600
Total Subsequent Annual O&M Costs					**$2,200**
Periodic Costs					
5-Year Reviews	g				
Soil and Vegetation Monitoring	g				
Total Periodic Costs					**(refer to Table 19)**

Notes

a Acreage calculated using GIS

b Determined from EPA (2000) "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study", Page 5-11 and Exhibit 5-6

c Determined from EPA (2000) "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study", Chapter 5

d Costs provided by Simplot based on costs from similar projects at the mine. Approximately 52,000 cy of Dinwoody Formation material would be required for this alternative.

e Based on Pole Canyon NTCRA actual costs. Refer to the "Final Removal Action Report" (Formation 2022) for additional details.

f Annual maintenance cost per acre higher for first year after construction, and lower thereafter.

g Periodic costs associated with this alternative are the 5-year reviews (refer to Common Elements Table 2) and soil and vegetation monitoring included on Table 19.

Appendix B - Table 21

Present Value of Recommended Combined Site-Wide Remedy: Water Treatment at the Hoopes WTP (4,000 gpm) + Enhanced Dinwoody Covers Over Target Areas + PRB Downgradient of Pole Canyon ODA

Item[1]	Notes	Start Year	End Year	Estimated Cost	Present Value[2]
Capital Costs					
4,000 gpm WTP	a	0	0	$76,481,680	$76,481,700
Enhanced Dinwoody Cover	a	0	7	$59,170,300	$29,429,300
Pole Canyon PRB	a	0	0	$416,030	$416,000
Institutional Controls	a, b	0	0	$50,000	$50,000
Total				**$136,118,010**	**$106,377,000**
O&M Costs					
4,000 gpm WTP	a	1	30	$4,387,500	$54,444,700
Enhanced Dinwoody Cover (Initial)	a	1	7	$318,950	$163,600
Enhanced Dinwoody Cover (Subsequent)	a	8	30	$52,400	$3,600
Pole Canyon PRB	a	1	30	$8,100	$100,500
Monitoring (PRB)	a, c	1	5	$60,000	$300,000
Monitoring (PRB)	a, c	6	30	$50,000	$1,250,000
Monitoring (General)	a, b	1	30	$60,000	$744,500
Total				**$4,936,950**	**$57,006,900**
Periodic Costs					
Media Replacement (Year 20)	a, d	20	20	$369,130	$95,400
Carbon Amendment (Year 10)	a	10	10	$1,000	$500
Carbon Amendment (Year 20)	a	20	20	$1,000	$300
Carbon Amendment (Year 30)	a	30	30	$1,000	$100
5-Year Reviews	a, b	5	30	$100,000	$451,400
Total				**$472,130**	**$547,700**
Net Present Value					**$163,931,600**

Notes

1 For additional details refer to Tables 6 and 7 for the 4,000 gpm Water Treatment Plant Alternative 2b, Tables 8 and 9 for the Pole Canyon PRB Alternative 2c, and Tables 15 and 16 for the Enhanced Dinwoody Cover Alternative 3c.

2 7% Discount rate used for Present Value

a Present value calculated according to EPA "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study" Chapter 4

b Refer to Common Elements Table 2 for details.

c Refer to PRB specific monitoring requirements for Alternative 2c on Table 8.

d Complete media replacement would occur between 10 and 20 years post-construction. This would involve complete removal of old treatment media.

APPENDIX C

State Concurrence with the Selected Remedy

1410 N Hilton Street
Boise, ID 83706 • (208) 373-0502

Brad Little, Governor
Jess Byrne, Director

September 23, 2024

Electronic Delivery: Alan.Jones2@usda.gov

Mary Farnsworth
Regional Forester
US Forest Service, Intermountain Region
324 25th Street
Ogden, UT 84401

RE: Idaho Department of Environmental Quality Letter of Concurrence, Smoky Canyon Mine, 2024 Record of Decision (ROD) Issued by the United States Forest Service

Dear Ms. Farnsworth:

The Idaho Department of Environmental Quality (DEQ) has reviewed the Record of Decision for the Smoky Canyon Mine issued by the Unites States Forest Service.

The Idaho Department of Environmental Quality, on behalf of the State of Idaho, has reviewed the various alternatives and supports the combination of selected remedies: Alternative 2b- Water Treatment Plant Expansion, Alternative 2c- a Permeable Reactive Barrier downgradient of the Pole Canyon overburden disposal area, and Alternative 3c- Enhanced Dinwoody Covers over target areas.

The State has also reviewed the Remedial Investigation (Formation, 2014), Human Health and Ecological Risk Assessments (Formation, 2015), and Final Feasibility Study Technical Memorandum #1 (Formation, 2019) and Technical Memorandum #2 (Formation, 2023), to determine if the selected remedy complies with applicable or relevant and appropriate State environmental and facility siting laws and regulations. The State of Idaho concurs with the Selected Remedy identified within the ROD.

Sincerely,

Jess Byrne
Director
Idaho Department of Environmental Quality

c: Alan Jones, OSC, Intermountain Region, USFS
Michael McCurdy, Dana Swift, DEQ State Office
Katy Bergholm, Stan Christensen, Nick Nielsen, DEQ Pocatello Regional Office
Sam Heinrich, Deputy Attorney General

Mark Gordon, Governor

Department of Environmental Quality

To protect, conserve and enhance the quality of Wyoming's environment for the benefit of current and future generations.

Todd Parfitt, Director

October 16, 2024

Alan Jones
USDA Forest Service
Remote
Layton, UT 84041
Submitted via: alan.jones2@usda.gov

Re: Concurrence with Final Record of Decision for Smoky Canyon Mine CERCLA

Dear Mr. Jones,

The Wyoming Department of Environmental Quality - Water Quality Division (WDEQ-WQD) has reviewed the revisions and responses provided by the USDA Forest Service to address our concerns regarding the Draft Record of Decision (ROD) for the Smoky Canyon Mine site under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). We appreciate the collaborative efforts between our agencies to resolve issues related to selenium contamination in Crow Creek, which affects water quality in Wyoming.

Based on the changes made to the ROD, including the incorporation of Wyoming's total recoverable aquatic life chronic selenium criterion of 5 µg/L as an Applicable or Relevant and Appropriate Requirement (ARAR) and the clarified monitoring approach, WDEQ-WQD concurs with the Final ROD. The updated plan now provides a better framework for ensuring compliance with Wyoming Surface Water Quality Standards and addresses the potential impacts of legacy selenium contributions in the 15.6-mile segment of Crow Creek in Wyoming where selenium concentrations exceed Wyoming's selenium aquatic life criteria.

We acknowledge the incorporation of our request for additional monitoring in Crow Creek, including downstream areas beyond the Idaho-Wyoming state line, as well as the commitment to adaptively manage the monitoring protocols through the remedial design process. These measures will help ensure that selenium levels in Crow Creek remain protective of aquatic life and meet Wyoming's water quality criteria.

WDEQ-WQD appreciates the opportunity to serve as a support agency during the implementation of the Selected Remedy and looks forward to continued cooperation with the Forest Service to ensure the success of the remedial action. Should you have any questions or require further assistance, please contact Ron Steg at ron.steg@wyo.gov or 307-335-6980.

Thank you for your commitment to protecting the water quality of Wyoming's Crow Creek and for working with our agency throughout this process.

Sincerely,

Jennifer Zygmunt,
Water Quality Administrator

APPENDIX D

Responsiveness Summary

The following table tabulates the comments received during the Public Comment Period (April 26 to June 26, 2023) for the Proposed Plan, and the USFS response to those comments.

No.	Commenter	Comment	Response
1	Simplot	Thirty samples were collected at Panel A, which is approximately 1 per 10 acres and APL-10 is the farthest south sample location on Panel A near the Pole Canyon ODA. Because the sample density in this area is low, the Forest Service determined that collection of a few additional samples near APL-10 is warranted to confirm that the selenium result from APL-10 is an outlier. Simplot doesn't agree this additional sampling is necessary based upon the lines of evidence provided.	Collection of additional samples during the remedial design phase will provide additional data to determine the need for a cover on a portion of Panel A, specifically to reduce the potential risk to birds. If the additional data show that the 95UCL of the mean selenium concentration is above the PRG then a cover will be installed on a portion of Panel A, as needed to reduce the average concentrations. The extent of the cover would be determined in remedial design. If the average concentration is below the PRG then no action is warranted on Panel A to protect birds.
2	Simplot	The Enhanced Dinwoody cover system does not result in significant reductions of predicted selenium concentrations in surface water in Sage Creek or in Crow Creek over the No Further Action alternative, which includes substantial areas of reclamation covers and the NTCRA cover at the Pole Canyon ODA. The Enhanced Dinwoody cover is cost effective when compared to the Geomembrane cover ($8.3 Million less for a similar, high level of performance) but is not cost effective when compared to the Dinwoody/Chert cover or the No Action Alternative ($11.9 Million and $30.8 Million more for slightly higher performance, respectively). A lesser cover alternative (i.e., Dinwoody/Chert cover) or no cover may be reasonable as well, particularly in light of the predicted selenium reduction from the Hoopes Springs WTP, and would be more cost effective than the Preferred Alternative.	Additional source control through construction of Enhanced Dinwoody covers on the target areas (D-1, D-ODA, and E-1n) will reduce selenium concentrations in surface water in Sage Creek and Crow Creek. The effect of these covers on selenium concentrations are predicted to begin around 2035 (due to the travel time in Wells Formation groundwater), and result in reductions in predicted selenium concentrations in surface water after 2035. The Forest Service believes that source control is a necessary component of the remedy.
3	Simplot	Enhanced Dinwoody covers are a reliable permanent solution. A lesser cover alternative (i.e., Dinwoody/Chert cover) or no cover may be reasonable as a permanent solution as well.	The Forest Service concurs that the Enhanced Dinwoody covers are a reliable permanent solution. The Forest Service believes that source control is a necessary component of the remedy.
4	Idaho Conservation League	We support moving forward with the preferred alternative. However, we are concerned that selenium concentrations in Sage Creek have increased significantly from 2021 to 2022. The Forest Service should establish enforceable deadlines, closely review the monitoring results and use adaptive management to better meet the Remedial Action Objectives as soon and as efficiently as possible.	CERCLA and the NCP do not require the level of specificity as to when clean up levels are to be met. The actions will be monitored to measure progress toward meeting the cleanup levels, and there will be a review of the remedy every five years after the remedy is constructed. If progress is not being made, then the five-year reviews gives an opportunity to look at doing something different. For some media, such as groundwater, it may take some time to achieve cleanup goals after the remedy is constructed. Fish tissue levels will also likely take some time to be reduced. For the effluent that is discharged from the water treatment plant, the water column values should be met shortly after the WTP is operational. The Forest Service is also concerned with the increase in selenium concentrations between 2021 and 2022. Monitoring during the remedial phase will see if this trend continues. Remedial design will address this issue if the trend continues.
5	Idaho Rivers United	Continued water treatment must be a focal point in the final ROD. In particular, we fully support the selection of Alternative 2b, which calls for an increased water filtration capacity to 4,000 gpm at the Hoopes Water Treatment Plant.	No further response required. Comment in support of selected alternative.
6	Idaho Rivers United	We would also request that in the final ROD, updated data and maps be presented to help visualize the issues at hand. In particular, in reviewing analysis documents, it is clear that selenium within fish tissue samples far exceeds Idaho site-specific whole-body fish tissue criterion (IDAPA 58.01.02 - Water Quality Standards), however, it would be extremely beneficial to have access to any data that shows any trends in sampling that have been conducted up to this point. Additional sampling will also be required to track the potential impacts of the proposed remedy.	The analytical data and associated maps are available in the Remedial Investigation and Feasibility Study as well as through periodic monitoring reports that Simplot provides to the USFS and support agencies. The ROD is a decision document and is not intended to present additional analytical data. Once the ROD is signed, remedial design will begin and monitoring plans will be developed to meet the requirements of the remedial action work plans. The actions will be monitored, through sampling, to measure progress meeting the cleanup levels, and these results will be presented in interim reports that will be available to the public. The five-year review process will further analyze the effectiveness of the remedy.
7	Idaho Rivers United	Given that the proposed remedies can reduce selenium concentrations in surface and groundwater in a short time horizon, it is critical that implementation of the Preferred Alternative is not unnecessarily delayed.	No further response required. Comment in support of selected alternative.
8	Idaho Rivers United	We also recommend monitoring and reporting requirements that include the following. 1) Annual monitoring of selenium in water and in fish throughout affected waters with results reported to the Idaho Department of Environmental Quality before February of the year following the sampling. 2) Fish size measurements and population estimates to be conducted once every two years where selenium in fish tissue is less than two times ARARs and annually where selenium in fish tissue is more than two times ARARs. Fish population estimate results should be reported to the Idaho Department of Fish and Game before February of the year following the sampling. Fish population monitoring is important to document any fish population recruitment failures. 3) Continuation of participation with the selenium working group to maintain communications and share data with affected stakeholders.	Presently, Simplot is monitoring selenium in the water bi-monthly. They are collecting and analyzing fish tissue for selenium concentrations annually. They are also collecting fish measurements and populations annually. These data are reported to the Fish Sampling Protocol Technical Team which is facilitated by IDEQ. Simplot also reports these measurement and population data to the Idaho Department of Fish and Game as a condition of holding a scientific collection permit.
9	Idaho Rivers United	In the Plan, the established RAOs for groundwater, surface water, and soils help guide this process. These objectives do help create a framework to gauge effectiveness, they also lack strong and discrete timelines to help further guide the process. We strongly recommend that in the final ROD, immediate action is taken to work towards implementing the selected remedies, clear deadlines are established, and monitoring and reporting requirements are clearly outlined.	The ROD is a decision document that outlines the remedy. Timelines for the selected remedies and monitoring and reporting requirements are determined through remedial design process.

No.	Commenter	Comment	Response
10	Idaho Rivers United	While current and future phosphate mining in the Smoky Canyon Mine complex is touched on in the Plan, how this activity and subsequent release of COPCs into waters and soil in the area will influence the efficacy of remediation work needs to be investigated. In relation to selenium, where bioaccumulation in fish represents a “time bomb” scenario of irreversible damage at a population level, discussion in the Plan of how ongoing mining may alter the timeline of Preferred Alternative actions in meeting RAOs and moving selenium towards compliance with ARARs is certainly warranted.	Investigations under CERCLA evaluate current site conditions for the release or threat of release of hazardous substances or pollutants or contaminants which may present an imminent and substantial danger. The ongoing mining activities are addressed in a mine plan which is outside of the auspices of CERCLA. The geologic unit that contains selenium has been identified throughout the region and is now managed to eliminate the release of selenium. This management, is part of the mine plan.
11	WDEQ-WQD	Although the Proposed Plan and preferred alternative may achieve compliance with Wyoming’s Surface Water Quality Standards, WDEQ-WQD requests the Proposed Plan describe the exceedances of Wyoming’s surface water quality standards in Crow Creek and also include Wyoming’s surface water quality standards as a RAO and ARAR.	At this point, editing the Proposed Plan to describe the exceedances of Wyoming's surface water quality standards in Crow Creek is not feasible. The USFS acknowledges that exceedances of Wyomings surface water quality standards in Crow Creek have and continue to occur. Wyoming's surface water quality standard (0.005 mg/L total recoverable selenium) has been included as an RAO and an ARAR in the ROD.
12	WDEQ-WQD	WDEQ-WQD also recommends the Proposed Plan clarify whether water column selenium concentrations are for “total recoverable” or “dissolved” selenium, consistent with both Idaho’s and Wyoming’s surface water quality standards.	Collected samples are analyzed for total selenium and dissolved selenium. To meet the respective ARARs, the dissolved results will be used to meet the Idaho standards and the total recoverable selenium concentrations will be used to meet the Wyoming standards. Again it is not feasible to edit the Proposed Plan to capture this but it has been addressed in the ROD.
13	WDEQ-WQD	WDEQ-WQD requests to be included as a support agency in future discussions regarding the CERCLA process for Smoky Canyon Mine.	Wyoming DEQ will be given the opportunity to review and provide comments on the draft ROD. Wyoming DEQ will be included as a support agency going forward. This will either be formalized during the negotiations for the Consent Decree or less formally through a memorandum of understanding, depending on the degree of involvement Wyoming DEQ desires.
14	Earthworks/CCCA	According to section 2.1.2, the FSTM#1 RAO for surface water is to reduce or eliminate unacceptable risks to human receptors from ingestion of non-regulated surface water (seeps and detention ponds) due to arsenic. The RAO should specify that the RAO for non-regulated surface water is to eliminate, not simply reduce, unacceptable risks to human receptors. If the human health risk is unacceptable, then that unacceptable risk must be eliminated.	There is no section 2.1.2 in the Proposed Plan. This comment is specific to Feasibility Study Technical Memorandum #1 (FSTM#1) and not the Proposed Plan. For clarification: Section 2.1.2 of the FSTM#1 is titled "Land Use" and makes no reference to RAOs. The quote on RAO cited here is contained in Section 3.3 of FSTM#1. The RAOs are referenced in section 2.1.2 of FSTM#2. As arsenic is a natural occurring element, found in the geologic media at and surrounding the Smoky Canyon Mine, the elimination of it, and its associated risk, is unlikely. Therefore the verbiage is to reduce the risk.
15	Earthworks/CCCA	Section 2.1.2. also states that RAO for surface water is to “Reduce selenium concentrations in lower Sage Creek and Crow Creek watersheds to below levels that pose unacceptable risks for aquatic life and comply with ARARs (IDAPA58.01.02 – Water Quality Standards). This RAO seems to imply that selenium concentrations in the upper reaches of these watersheds (e.g., South Fork Sage Creek, North Fork Sage Creek and/or Hoopes Springs) will not be reduced to levels that pose unacceptable risks for aquatic life or comply with water quality standards.	There is no section 2.1.2 in the Proposed Plan. This comment is specific to Feasibility Study Technical Memorandum #1 (FSTM#1) and not to the Proposed Plan. The "upper reaches" of the North Fork Sage Creek and South Fork Sage Creek are upgradient of the area of influence. The selenium concentrations in these "upper reaches" meet water quality standards and do not pose a risk to aquatic life. Hoopes Springs are specifically being addressed by the Water Treatment Plant to ensure that unacceptable risk to aquatic life is removed and that the discharged water complies with water quality standards. There is no implication as this comment suggests.
16	Earthworks/CCCA	Please clarify where the standards must be met, and what stations will be used to determine compliance. The final remedy should clarify that water quality standards and fish tissue standards will be met throughout the Hoopes Springs watershed, beginning at the outlet from the water treatment plant, and throughout the Sage Creek and Crow Creek watersheds.	The "Hoopes Spring watershed" is not a term that appears in the Proposed Plan. Hoopes Springs is an element of the Sage Creek watershed and the Sage Creek watershed is part of the Crow Creek watershed. The Proposed Plan states, for Surface Water RAOs, the remedial action will "reduce selenium concentrations in lower Sage Creek and Crow Creek watersheds to below levels that pose unacceptable risks for aquatic life and comply with ARARs". As lower Sage Creek and Crow Creek are down stream of Hoopes Spring, compliance would necessarily be at all stations downstream of the outlet from the water treatment plant and will be formalized in the remedial design process.
17	Earthworks/CCCA	According to the 2023 Final Tech Memo, the RAO for groundwater is to reduce or eliminate concentrations of selenium in contaminated alluvial or Wells Formation groundwater to below the MCL within a reasonable time frame given the circumstances of the Site. This RAO is unacceptably vague. The Remedy must specify the amount of time that constitutes a “reasonable time frame,” and the specific measures that will be taken if this time frame is not met.	This comment is specific to the FSTM#2 and not the Proposed Plan. CERCLA and the NCP do not require the level of specificity as when clean up levels are to be met. The actions will be monitored to measure progress toward meeting the cleanup levels, and there will be a review of the remedy every five years after the remedy is constructed. If progress is not being made, then the 5 year reviews gives an opportunity to look at doing something different.
18	Earthworks/CCCA	The draft CERCLA remedy must include an aggressive implementation remediation schedule with hard deadlines. An expedited schedule for the water treatment plant is particularly crucial. We recommend a deadline of 2025 for achieving ARARs in surface water, given the rapidly escalating selenium fish tissue concentrations in Sage Creek.	CERCLA and the NCP do not require the level of specificity as when clean up levels are to be met. That said, it is anticipated that the WTP will be implemented as soon as possible and this is anticipated to almost immediately reduce the selenium concentrations in the water column. The actions will be monitored to measure progress toward meeting the cleanup levels, and there will be a review of the remedy every five years after the remedy is constructed. If progress is not being made, then the five-year reviews gives an opportunity to address deficiencies in the remedy.

No.	Commenter	Comment	Response
19	Earthworks/CCCA	We also recommend that the agencies add Alternative 3e (a cover for Panel A) to the preferred alternatives to address risks to birds in that area. According to the 2023 Tech Memo, Panel A had an HQ greater than 1 (HQ = 2) indicating that potentially unacceptable risks to bird populations are possible due to exposure to selenium in surface soils if it is assumed that the area with elevated concentrations has sufficient amounts of habitat available to support a population of small birds. Furthermore, it finds that surface soil selenium concentrations in Panel A ranged from 0.25 to 245 mg/kg and an average concentration equal to 15.1 mg/kg and a 95 UCL of the mean concentration equal to 50.8 mg/kg, which exceeds the PRG for the protection of birds (23.5mg/kg). The memo points to one sample as an outlier sample, but it doesn't provide any data to demonstrate that this sample is in error. Based on the existing data, the CERCLA remedy should add Alternative 3e to the remedy to provide adequate protection for birds or conduct additional sampling to demonstrate that the concentrations are below the PRG.	The presence of a single sample (APL-10) at a selenium concentration of 245 mg/kg, which is more than five times higher than all the other soil selenium concentrations within Panel A significantly skews the soil exposure estimation for the panel by predicting a much higher average selenium exposure than would be predicted throughout the majority of the bird habitat within Panel A. EPA's ProUCL guidance document (2022) states that "The inclusion of outliers in the computation of the various decision statistics tends to yield inflated values of those decision statistics . . . Often statistics that are computed for a data set which includes a few outliers tend to be inflated and represent those outliers rather than representing the main dominant population of interest". This appears to be the case here. Collection of additional samples during the remedial design phase will provide additional data to determine the need for a cover on a portion of Panel A, specifically to reduce the potential risk to birds. If the additional data show that the 95UCL of the mean selenium concentration is above the PRG then Alternative 3e will be instituted, to reduce the average concentrations. The extent of the cover would be determined in remedial design but at this time Alternative 3e is not selected.
20	Earthworks/CCCA	Alternative 2a does not meet the CERCLA criteria for overall protection of human health and the environment. Alternative 2a would leave roughly half of the contaminated water untreated. Furthermore, selenium concentrations in fish tissue have increased to unacceptable levels under the existing treatment scenario of 2,000 gpm. The recent rapid increase in selenium concentrations in fish tissue in Lower Sage Creek from 2021 – 2022 (See (Fish, 2023)) demonstrates that this alternative is failing to reduce selenium concentrations to adequately protect fish. Selenium concentrations in Sage Creek have already surpassed even the highest concentration at which recruitment failure in trout is predicted. According to the East Smoky FEIS, recruitment failure is the logical population-level consequence of reproductive impairment.	Alternative 2a was not selected for implementation. No further response required.
21	Earthworks/CCCA	Alternative 2a also doesn't meet the statutory preference for selecting remedial actions that employ treatment technologies that permanently and significantly reduce toxicity, mobility, or volume of waste materials. As noted above, this alternative does not permanently and significantly reduce toxicity since it leaves half of the contaminated flows untreated, and results in unacceptable impacts to fish.	Alternative 2a was not selected for implementation. No further response required.
22	Earthworks/CCCA	Further, Alternative 2a doesn't meet the statutory preference for short-term effectiveness for the same reasons as noted above. As demonstrated by the most recent fish tissue concentrations in Sage Creek (2021-2022), selenium concentrations far exceed the EPA and site-specific criteria, and there is no indication that these concentrations will level off, let alone decline in the short term.	Alternative 2a was not selected for implementation. No further response required.
23	Earthworks/CCCA	Alternative 2a allows half of the contaminated flows to go untreated, thus it does not meet the Clean Water Act Section 301(b) and Section 402, which are specified as ARARs (Tech Memo2023, Table 4-1), and which require the best treatment and control technology to meet effluent limitations prior to discharge (40 CFR 125.3).	Alternative 2a was not selected for implementation. No further response required.
24	Earthworks/CCCA	Alternative 3a and 3b are unacceptable. According to the draft CERCLA remedy, all covers result in reductions in predicted selenium concentrations in surface water after 2035.	Alternatives 3a and 3b were not selected for implementation. No further response required.
25	Earthworks/CCCA	According to the report, "Although selenium concentrations are anticipated to reduce over time as the load from Wells Formation groundwater discharge decreases and are predicted to be in the range of the surface water standard around 2060 (the limit of the modeling)." However, the model includes considerable uncertainty, and "in the range of the surface water quality standard" isn't the same as demonstrating compliance with surface water standards. Additional source controls are necessary to increase the certainty that water quality standards will be met and ARARs and RAOs achieved in a timely manner.	The statement in the comment describes the No Further Action alternative. This alternative was not selected. For Alternative 2b (which was selected), the modeling demonstrates that concentrations will be reduced sufficiently to comply with applicable standards. Selenium concentrations in surface water in the Sage Creek/Crow Creek watershed downstream of Hoopes Spring would be immediately reduced by water treatment at Hoopes Spring and are predicted to immediately be below surface water standards in Sage Creek and to be below the standard in Crow Creek except for low flow conditions. Selenium concentrations are anticipated to reduce over time as the load from Wells Formation groundwater discharge decreases and are predicted to be below the surface water standard at all locations and for all flows around 2030.
26	Earthworks/CCCA	Additional source controls are also necessary because modeling predictions at this mine have consistently been wrong, resulting in significantly greater impacts than predicted.	No further response required. Comment in support of selected alternative.
27	Earthworks/CCCA	Once again, additional source controls are necessary to provide greater certainty that the remedial actions will achieve ARARs and RAOs.	No further response required. Comment in support of selected alternative.

No.	Commenter	Comment	Response
28	Earthworks/CCCA	In terms of CERCLA criteria, the cover systems will reduce mobility of selenium. As stated in the 2023 Tech Memo, “The Geomembrane and Enhanced Dinwoody covers would reduce long-term average percolation to less than 1 inch per year (in/yr.) resulting in infiltrations of 0% and 3%, respectively (Table 4-3 and Table A-2 in Appendix A). Alternative 3a and 3b are substantially less effective: The Capillary cover would reduce the long-term average percolation to about 5.7 in/yr. resulting in an estimated infiltration of 24%. Whereas the long-term average percolation into the Dinwoody/Chert cover would reduce to about 10 in/yr. resulting in estimated infiltration of 42%. Alternative 1 would not reduce the mobility of selenium. The cover systems will also reduce the volume and toxicity of selenium in surface water by substantially reducing infiltration. According to Figure 4-23, predicted selenium concentrations in surface water at LSV-4 for covers (geomembrane and enhanced dinwoody) on target areas indicates that water column standards will be met during low flow conditions years before the no action alternative or the other cover system alternatives. This is important, given the rapidly increasing selenium concentrations in fish tissue at that location. Similarly, Figure 4-24 indicates that selenium concentrations will be much closer to standards at CC-WY-01 at year 2060.	No further response required. Comment in support of selected alternative.
29	Earthworks/CCCA	The model should have been continued until it demonstrates that concentrations will be reduced sufficiently to comply with applicable standards.	For Alternative 2b (the 4000-gpm WTP), which is a key component of the selected remedy, the modeling demonstrates that concentrations will be reduced sufficiently to comply with applicable standards. Concentrations would be immediately reduced by water treatment at Hoopes Spring and are predicted to immediately be below surface water standards in Sage Creek and to be below the standard in Crow Creek except for low flow conditions. Selenium concentrations are predicted to be below the surface water standard at all locations and for all flows around 2030.
30	Earthworks/CCCA	The draft remedy should clarify that the ARARs include compliance with fish tissue concentrations and water column concentrations. Please specify how and when the ARARs will be enforced. How often and where will monitoring occur? What are the protocols that will apply?	The Remedial Action Objectives and Goals section of the Proposed Plan state that they will ". . . comply with ARARs", and then specifically list "IDAPA 58.01.02 - Water Quality Standards" as the ARAR to be complied with. This ARAR very specifically gives fish tissue concentrations and water column concentrations that must be met in Sage Creek and Crow Creek. No further clarification needed. CERCLA and the NCP do not require the level of specificity as when clean up levels are to be met. The actions will be monitored to measure progress toward meeting the cleanup levels. The monitoring intervals and protocols will be determined through the remedial design process. Also, the CERCLA process requires that a statutory review will be conducted within no less often than each five years after initiation of the remedial action to ensure that the remedy is, or will continue to be, protective of human health and the environment.
31	Earthworks/CCCA	The ARARs should also require that if water column standards for selenium are met, but fish tissue standards continue to stay elevated, then water column targets must be revised downward.	The surface water standards for Idaho, and specifically the site-specific criteria for Hoopes Spring and Sage Creek are clear on the application and precedence of the fish tissue criteria and surface water elements of the criteria. The fish tissue criteria supersede the water column elements, unless a new discharge occurs, which may create non-steady state conditions. In the event of a new or increased discharge of selenium, and until steady state conditions can be established, the water element of the criterion is applicable. However, under a treatment plant discharge scenario, the "new" discharge will result in a lower selenium concentration. None the less, equilibrium between the reduced selenium and fish tissue will take time to achieve a steady state condition, therefore the applicable criterion element until this occurs will be the water criterion element. Once steady state conditions are achieved in fish tissues, then the fish tissue element of the selenium criteria will be in effect and take precedence over the water criteria element.
32	Earthworks/CCCA	Selenium concentrations exceed the water quality standard at the Idaho/Wyoming border (CC-WY-01). The CERCLA remedy identifies Idaho regulations (IDAPA 58.01.02) for water quality standard compliance. Please specify what ARARs will apply in Crow Creek in Wyoming. Where will that be monitored, and how will it be enforced?	Wyoming Water Quality Rules (Wyoming Water Quality Rules, Chapter 1, Wyoming Surface Water Quality Standards, specifically the aquatic life chronic total recoverable selenium criteria of 0.005 mg/L, applicable to Crow Creek) has been included as an ARAR in the ROD. Through the remedial design process, USFS will work with Simplot and Wyoming DEQ to establish a sampling protocol for the 15.6-mile impared stretch of Crow Creek, to monitor and ensure that remedial actions meet Wyoming's standards.
33	Earthworks/CCCA	The remedy should be more specific about how these standards [ARARs] will be implemented and enforced and which protocols will apply. According to IDAPA 58.01.02, the standard will be based on a “single measurement of an average or composite sample of at least five individuals of the same species where the smallest individual is no less than seventy-five percent (75%) of the total length (size of the largest individual). Not to be exceeded; DEQ will evaluate all representative whole-body or muscle data to determine compliance with this criterion element.” We are concerned that this does not specify that the samples should be taken at the same sampling event, or even in the same year. It doesn’t specify what fish species will be sampled, or specify that the target should be resident fish. We recommend that the remedy adopt the selenium working group protocols to provide consistency with existing data.	The guidance document "Implementation Guidance for the Idaho Selenium Criteria for Aquatic Life Water Quality: Docket No. 58-0102-1701 - Final Rule, September 2022" Defines the protocols which are used for fish sampling and is the method used by the IDEQ Fish Sampling Protocol Technical Team. Specifically, it states: "Samples should be collected at the same time (i.e., collected as close to the same time as possible, but all samples should be collected within a week of each other)." This guidance also states: "Recommended fish for tissue collection in Idaho are salmonids, preferably from the predominant species of trout or char (i.e., Yellowstone Cutthroat Trout, Rainbow Trout, Brook Trout, or Brown Trout). Resident fish should be determined from available fisheries data and other biological surveys." IDAPA 58.02.01 states that the non-native Brown Trout is the most susceptible species to selenium in the Sage Creek watershed, so that is the preferred species. Sampling efforts do not always produce enough Brown Trout so in that situation, Yellowstone Cutthroat Trout, Brook Trout, Paiute Sculpin, and Mottled Sculpin have been collected.

No.	Commenter	Comment	Response
34	Earthworks/CCCA	According to the Draft Remedy (p. 6) Pole Canyon Creek at the LP-1 seep “poses unacceptable risks to higher trophic level organisms that may obtain food or water from that location; however, the physical habitat does not support any fish due to lack of connectivity to fish bearing waters.” The remedy should prevent unacceptable risks to higher trophic level organisms, regardless of whether these higher trophic level organisms are fish.	This is a statement (following up on the previous 3 paragraphs that discuss how "selenium in fish tissue is the most reliable measure of exposure and potential risk for fish and other aquatic receptors") that points out that fish are not available at this location to be sampled. This risk to higher tropic level organisms at this location is being address by the implementation of Alternatives 2b (Chert/limestone cover on seep area LP-1) and 2c (the installation of a permeable reactive barrier to remove or reduce this risk). The progress will have to be measured by selenium concentrations in the water column as fish tissue collection is not possible.
35	Earthworks/CCCA	North Fork Sage Creek (NSV-6) likely supports fish, but tissue levels were not quantified for this stream due to flow limitations during sampling. If NSV-6 likely supports fish, ARARs for water quality and fish tissue should apply, and should be specified. Neither of these monitoring stations (LP-1 or NSV-6) are included on the maps in the document. The final remedy should include maps that specify all of the relevant monitoring stations.	The map in the Proposed Plan (Attachment 4) is not intended to show all sampling locations. Attachment 4 shows those stream locations where elevated selenium concentrations were observed in fish tissue prior to 2019. The remedial actions will be monitored to measure progress toward meeting the cleanup levels. The monitoring locations and protocols will be determined through the remedial design process. North Fork Sage Creek is currently being evaluated for a site-specific criteria and sampling on North Fork Sage Creek locations is still ongoing. ARARs do apply at NSV-6. But IF flow conditions are such that no fish are present then fish tissue is impossible to collect. Captures of fish at NSV-6 are sporadic, but occasional Cutthroat Trout and Paiute Sculpin have been collected there since 2020. Habitat is limited due to low flows and heavy sedimentation. Reproducing populations of cutthroat trout and sculpin are found further downstream at NSV-7 (~1 river mile downstream but upstream of Sage Creek) where habitat is more favorable and flows are more consistent. LP-1 is the seep at the toe of the Pole Canyon ODA. As mentioned previously, ". . . the physical habitat does not support any fish due to lack of connectivity to fish bearing waters.” Hence, the collection of fish tissue is impossible at LP-1.
36	Earthworks/CCCA	The latest data on fish tissue concentrations demonstrate that there has been a sharp increase in selenium concentrations in fish tissue in Lower Sage Creek (LSV-4) from 2021-2022. The latest water quality and fish tissue data should be included as an appendix in the final remedy. This data emphasizes the urgency of the situation, and the need for accelerated implementation of treatment technology. We have included a table of the most recent fish tissue data from the Idaho Department of Environmental Quality (IDEQ) in Fish (2023) attached. However, as noted, updated graphs that document the change in selenium concentrations in water and fish should be provided.	The Forest Service is also concerned with the increase in selenium concentrations between 2021 and 2022. Monitoring during the remedial phase will see if this trend continues. Remedial design will address this issue if the trend continues. The analytical data and associated maps are available in the Remedial Investigation and Feasibility Study as well as through periodic monitoring reports that Simplot provides to the USFS and support agencies. The ROD is a decision document and is not intended to present updated analytical data.
37	Earthworks/CCCA	The 2023 Tech Memo provides inadequate data for surface soil arsenic concentrations to make an adequate determination about safety for future seasonal ranchers. The data outlined in Table 2-2 indicates that only 1 arsenic sample was collected for Panels B, C, and Pole ODA which collectively cover roughly 300 acres. This one sample was collected from Dinwoody Borrow west of D-Panel, and apparently used to represent soils from all three Panels. The Tech Memo says that the PRG is met because the area-weighted 95 UCL mean concentrations is calculated at 11.1 mg/kg: below the PRG of 11.5 mg/kg. However, this conclusion is based on inadequate data. Additional data should be collected to provide an adequate determination of risk. The decision to discontinue any further discussion on this issue is not supported by adequate data.	This comment is specific to Feasibility Study Technical Memorandum #2 (FSTM#2) and not the Proposed Plan. The data were segregated based on ODAs to be consistent with other analyses performed in the Feasibility Study, however, it would be more appropriate for these data to group them by cover material type. Panels B, C, E and the Pole ODA all have Dinwoody/topsoil at the surface. This has been well characterized at the site (a total of 21 samples in Panels B, C, E, and the Pole ODA for arsenic), and the data show low, consistent concentrations of COCs, including arsenic. Therefore, there are adequate data to characterize this cover material that has been placed. Regarding potential risks to future seasonal ranchers, there are a series of conservative assumptions that will overestimate potential risks. Firstly, the table shows concentrations for current conditions. However, the proposed remedy includes placement of a new cover at 194 acres on Panels D and E. Implementation of the remedy will further reduce arsenic concentrations in surface soils. Secondly, the analysis only evaluated data on the ODAs and not other portions of the Site where there are no impacts from mining and arsenic concentrations would be at background levels. The grazing allotments are large (see the attached figure [Figure 2-2 from the approved Human Health Risk Assessment]) and the Site represents a small portion of the allotments. Even if grazing only occurs on the Site, cattle would likely preferentially graze off the ODAs, which have sparse vegetation and steep slopes, further reducing the potential for risk. Given these factors, it was determined that the remedy will be protective of future ranchers and that there are sufficient data to support this conclusion.
38	Earthworks/CCCA	Figure 2-12 and 2-13 provides a graph of cadmium concentrations in surface water in seeps at DS-7 and LP-1, which indicates that cadmium concentrations were increasing, and well over the MCL in 2012 and 2015, respectively. Current data isn’t provided, but it is necessary to understand current conditions and potential risks. There is considerable literature about the toxicity of cadmium to birds, which should be factored into the clean-up plan for seeps. Please specify how this will be addressed.	This comment is specific to Feasibility Study Technical Memorandum #2 (FSTM#2) and not the Proposed Plan. Alternative 2b addresses this specifically. This part of the remedy is the same in alternatives 2a and 2b and is described in detail under alternative 2a. It specifically states: "Chert/limestone covers (rock covers) would be placed on seep areas (DS-7 and LP-1) . . . to prevent the ingestion of surface water with arsenic and cadmium concentrations above than the MCL . . ."

No.	Commenter	Comment	Response
39	Earthworks/CCCA	Although there is a monitoring site on Crow Creek at the Wyoming Border, there are no monitoring sites beyond that location, even though selenium concentrations exceed water quality standards at the border. Without additional downstream monitoring sites, it's impossible to know the extent of selenium pollution in Crow Creek beyond the Idaho/Wyoming border. The CERCLA remedy should include additional monitoring sites to measure water quality concentrations and fish tissue concentrations across the Wyoming border and delineate and monitor the full extent of the impacts. Without this, it is impossible to determine whether mitigation measures are adequately addressing these impacts.	Through the remedial design process, the Forest Service will work with Simplot and Wyoming DEQ to establish a sampling protocol for the 15.6 mile impared stretch of Crow Creek. This sampling protocol will be used to monitor and ensure that remedial actions meet Wyoming's surface water standards, which are included in the ROD as an ARAR. Simplot has collected fish tissue samples with Wyoming Department of Game and Fish downstream of the state line. The sample collection point is near Fairview, Wyoming, is identified as CC-FV (Crow Creek, Fairview), and is reported to the Fish Sampling Protocol Technical Team which is facilitated by IDEQ. Wyoming does not have a standard for fish tissue samples so compliance with the ARAR will be determined from total recoverable selenium in the water column.
40	Earthworks/CCCA	We are concerned about how frequently the water treatment plant has been offline, and the length of time it has taken to bring the facility back online, resulting in significant releases of untreated water while the system isn't operating. According to Simplot, there have been several operation and maintenance issues, including power outages, pump failures, failure of the nutrient delivery device (plugged lance), etc. The final remedy should identify redundancy measures to address these issues, including requirements for backup power sources and equipment.	The water treatment plant as it presently exists is a pilot study. There has been trial and error and experimentation to increase the efficiency of the water treatment plant. Outages and downtime have been part of that learning curve. Redundancy measures (e.g., generator backup, spare parts for key components, etc.) will be addressed, if needed and as appropriate, through the remedial design process.
41	Earthworks/CCCA	The CERCLA remedy should include adequate resources to maintain the multi-stakeholder selenium working group for the duration of the CERCLA clean-up effort, have ready access to annual monitoring data, participate in annual monitoring activities and conduct independent, but coordinated monitoring activities, including the collection of water quality and fish tissue data for selenium-effected streams.	The Forest Service participates in several working groups related to selenium contamination. We assume this comment specifically refers to Fish Sampling Protocol Technical Team which is facilitated by IDEQ, which coordinates sampling efforts and warehouses the collected data. The Forest Service supports this working group, however this is an effort of IDEQ and not part of the CERCLA remedy being implemented under this ROD.
42	Earthworks/CCCA	The federal agencies should require independently guaranteed financial assurance to cover the full cost to the agencies of securing a third party to complete and maintain all aspects of the proposed CERCLA remedy, to ensure that funds are in place if the company files for bankruptcy, or is otherwise unable or unwilling to complete the required remediation and long-term monitoring. Financial assurance should capture indirect costs and long-term costs, such as O&M. The agencies should estimate costs based on the considerable uncertainties associated with model projections and other complexities. The agencies should include the potential cost to maintain the water treatment plant in perpetuity until actual monitoring data demonstrates that fish tissue concentrations are in compliance with ARARs. The agencies should not accept corporate guarantees or corporate financial tests as a source of financial assurance.	Once the ROD is signed, a Consent Decree will be negotiated and entered into with Simplot. Financial assurance will be part of that agreement to ensure that the Responsible Party, and not public funding sources, bears the financial burden of completing the response actions. The specific financial assurance mechanism or mechanisms will be spelled out in that document. In general, the financial assurance provisions in the Consent Decree will require Simplot to demonstrate that adequate financial resources are available to complete required work. Pursuant to CERCLA § 122(d)(A)(2), there will be an opportunity for the public to comment on the consent decree.
43	Earthworks/CCCA	How long does the Forest Service anticipate that long-term water treatment will be required to ensure compliance with ARARs?	The Forest Service has no additional information on this so we anticipate that water treatment will continue until RAOs and ARARs are met as outlined in the RI/FS. The CERCLA process requires that a statutory review will be conducted within no less often than each five years after initiation of the remedial action to ensure that the remedy is, or will continue to be, protective of human health and the environment. These 5-year reviews will provide opportunity to review the operation and effectiveness of the water treatment plant.
44	Earthworks/CCCA	How will the agency address potential damages to, or failures of the water treatment plant in the financial assurance calculation?	Those items will be addressed in the Consent Decree. The 5-year review process will provide opportunity to review this.
45	Earthworks/CCCA	We encourage the Forest Service to include substantial contingencies to fund the replacement of the existing water treatment plant and myriad other repairs/potential costs over the course of the CERCLA remedial action, particularly given the history of problems with the existing water treatment plant.	Those items will be addressed in the Consent Decree. The 5-year review process will provide opportunity to review this.

No.	Commenter	Comment	Response
46	Earthworks/CCCA	Please specify the number of stream miles in each watershed (Hoopes Spring, Sage Creek, Crow Creek, and others) that are exceeding water and/or fish standards.	The Site Specific Criteria, is specific to stream segments and not to specific stream miles so this information is not readily available. Of note, the Sage Creek segment is defined as: 03 – Subsection of Salt Subbasin — Sage Creek. Sage Creek – source to mouth (unit US-9) including, Hoopes Spring channel downstream of the spring complex, South Fork Sage Creek downstream of the spring complex, Sage Creek downstream of the confluence of Hoopes Spring with Sage Creek to its confluence with Crow Creek, and tributaries; excluding North Fork Sage Creek, Pole Canyon Creek, and their tributaries. (IDAPA 58.01.01, Section 287)) And the Crow Creek segment is defined as: 04 - Subsection of Salt Subbasin — Crow Creek. Crow Creek – Downstream of Sage Creek confluence to Wyoming state line (US-8). (IDAPA 58.01.01, Section 287)) Additionally, Wyoming DEQ has noted: Since 2014, a 15.6-mile segment of Crow Creek has been included on Wyoming's 303(d) List of Impaired Waters for not supporting its aquatic life uses due to concentrations of total recoverable selenium that exceed Wyoming's aquatic life chronic criteria of 5 µg/L, as established in Wyoming Water Quality Rules, Chapter 1, Wyoming Surface Water Quality Standards. (see Wyoming's 2020 Integrated Clean Water Act Section 305(b) and 303(d) Report, Wyoming WDEQ/WQD's Report Selenium Concentrations in Crow Creek, Snake River Basin, 2008-2012 and Wyoming Surface Water Quality Standards)
47	Source Environmental Associates (for Earthworks/CCCA)	Organoselenium species are highly relevant in the context of bioavailability and bioaccumulation of selenium in fish tissue and so this is a major gap. Organoselenium species are a class of selenium bearing molecules such asselenocysteine and selenomethionine that tend to be significantly more bioavailable and bioaccumulative than inorganic selenium. The previous 8-10 years of results from other reference sites in the field of selenium water treatment have shown that an appreciation of organoselenium is necessary in order to develop a mine water treatment and management plan that addresses the risk of environmental impacts. While the selenium in the untreated mine contact water is unlikely to contain any significant amount of organoselenium species, inorganic selenium can be converted to organoselenium species through biological mechanisms, such as those employed in biological treatment systems including the existing Smoky Canyon WTP. While the extent of selenium bioaccumulation and toxicity depends on many factors, organoselenium species generally present an order of magnitude higher rates of uptake in the receiving environment and therefore higher toxicity compared to other forms of selenium in water (Baines 2001, Fournier 2006). This difference in bioavailability of the different forms of selenium means that if a WTP removes the majority of selenium from the water but transforms some portion of the remaining selenium into organoselenium species, the net selenium toxicity of the treated effluent can be equal to or greater than of the untreated water because organoselenium species are taken up orders of magnitude more by organisms in the receiving environment. Therefore, it is critical to understand not only how treatment processes change total or dissolved selenium concentrations, but also how they change selenium speciation. Currently, the mass loading of selenium present in the receiving environment in the Smoky Canyon area is very high. With the application of additional mitigation and management measures including expansion of the WTP capacity this mass loading will be reduced significantly, however to avoid the time-consuming and costly experience of other industrial outfits, it is critical that this issue be proactively addressed, with appropriate mitigations incorporated into the expanded WTP as necessary.	Selenium speciation has been considered and monitored as part of the water treatment pilot study. The existing water treatment plant incorporates addition of ferric chloride into the post-treatment process to address this speciation. Speciation testing should be conducted on effluent from the existing, and final water treatment plant and this comment will be incorporated into the final remedial design.
48	Source Environmental Associates (for Earthworks/CCCA)	Elevated levels of selenium in fish tissue monitoring data makes it clear that fish in the downstream area are ingesting and bioaccumulating selenium. This is the direct impact of selenium contamination on downstream aquatic life. However, the remedy report focuses on reduction of selenium levels in the water column. While this is no doubt important and linked to levels of selenium in fish tissue, the relationship between selenium levels in water column and selenium levels in fish tissue is complex and not easy to predict. Focusing on achieving a specific selenium level in the water column downstream may not achieve a reduction in selenium levels in fish tissue to the point where aquatic life is protected.	The Idaho Water Quality Standards (IDAPA 58.01.02), specifically states: "Fish tissue supersedes water column element when both fish tissue (whole-body) and water concentrations are measured." The focus of the effort therefore ultimately is to achieve a reduction in selenium levels if fish tissue to the point where aquatic life is protected. The WTP is expected to almost immediately reduce selenium concentrations in the water column. So long term, the reduction of selenium concentrations in fish tissue is the focus of remedy. Wyoming does not have a standard for fish tissue, so in Crow Creek in Wyoming, the Wyoming water column standard for total recoverable selenium of 0.005 mg/L is the ARAR that must be met.

No.	Commenter	Comment	Response
49	Source Environmental Associates (for Earthworks/CCCA)	The feasibility study refers to a target of 4 µg/L of selenium in water column at Crow Creek at the Wyoming border. This target, based on Idaho regulations, is above the 1.5 and 3.1 µg/L selenium water quality criteria for lentic/lotic environments as set out by the EPA in 2021. As described in comment 1 and 2, there is uncertainty around what level of selenium the water column is required in order to reduce levels of selenium in fish tissue to the point where fish population health is protected. The use of a 4 µg/L target seems unaligned with the scientific/regulatory community's best understanding of protective levels.	This comment is specific to the Feasibility Study and not to the Proposed Plan. The EPA document referenced specifically states: "EPA's water quality criterion for selenium provides *recommendations* [italics added] to states and tribes authorized to establish water quality standards under the Clean Water Act." As this EPA guidance document provides a *recommendation* [italics added]; it is not an ARAR. The Idaho Water Quality Standard (IDAPA 58.01.02) water column dissolved selenium concentration of 0.0042 mg/L, is a requirement, as is the Wyoming Surface Water Quality Standard of total recoverable selenium of 0.005 mg/L. It is difficult to see how the 4 µg/L (0.004 mg/L) target seems unaligned with the regulatory community's best understanding of protective levels, when the regulatory community established targets that are greater.
50	Source Environmental Associates (for Earthworks/CCCA)	The design basis for the expanded WTP is not clear. The remedy report recommends expansion of the WTP from 2,000 gpm to 4,000 gpm. The expansion of the plant is clearly warranted to address the untreated contact water leaving the site, but the basis of selecting 4,000 gpm as the capacity is not clear. Section 1.1 of Appendix C of the 2023 Technical Memo refers to average flows of 4,100 gpm at HS-3, representing the combined discharge of upstream springs. The variability of this flow (i.e., min/max or 95th percentile) is not clear from the report. In any case, the WTP should be designed to have sufficient capacity to handle all practically capturable contact water. From the report, this appears to be a minimum of 4,100 gpm, but further allowance may be warranted if there is additional selenium bearing contact water that can be captured prior to it entering Sage/Crow creek. The technology used in the water treatment plant is highly modular and so additional or increased hydraulic capacity beyond 4,000 gpm is technically feasible. The same ultimate goal of treating all contact water from this area of the mine may also be achieved through a combination of water storage and water treatment (i.e., storing water from high flow events in ponds while treatment catches up).	HS-3 is a monitoring point located approximately 1500 feet down gradient of the WTP (see figure C-3 of Appendix C in the 2023Technical Memo). Sage Creek receives additional loading over this stretch so the 4100 gpm number is not applicable to flows at the WTP. 4000 gpm capacity at the WTP will be able to effectively treat all selenium bearing waters from the Hoopes Spring Complex as well as the Springs on Lower South Sage Creek.
51	Source Environmental Associates (for Earthworks/CCCA)	Any remedy should include improvements related to the reliability of the existing or expanded WTP system to ensure that mine contact water is treated before leaving the site. The existing WTP has been offline on multiple occasions for long periods of time (January 28-April 3, 2019, January 18-March 22, 2021), allowing untreated water to bypass the system. The Simplot team attributed these outages to a variety of issues including a seal failure on the clarifier, power outages, pump failures, and failure of the nutrient delivery device (Lusty 2022). The site has a demonstrated history of struggling to maintain treatment plant uptime that should be addressed in the remedy.	The water treatment plant as it presently exists is a pilot study. There has been trial and error and experimentation to increase the efficiency of the water treatment plant. Outages and downtime have been part of that learning curve. Redundancy measures (e.g., generator backup, spare parts for key components, etc.) will be addressed, as needed and if appropriate, through the remedial design process.
52	Source Environmental Associates (for Earthworks/CCCA)	The Phase 2 Treatability Study Report (Appendix C) states that "In January 2021, the system removed 91% of the influent total selenium load (Simplot 2021). The most recent data indicate that the RO and FBR systems are capable of routinely removing more than 95% of the selenium from the influent water, and ongoing upgrades and optimization of the treatment plant have shown improvement in the amount of selenium reintroduced by the post treatment system, Appendix C". Based on the influent and effluent sampling results shown in Tables C-6 and C-9 of Appendix C, the average influent selenium concentration to the Hoopes WTP between 2018 and 2021 was 0.16 mg/L and the average effluent selenium concentration during this period was 0.024 mg/L. Effluent concentrations were consistently higher than the design basis of 0.007 mg/L and represented only about 85% selenium removal, which is in contrast to the 95% removal rate mentioned in the report. Nevertheless, even at 95% selenium removal the WTP would still be underperforming with respect to the design basis.	The water treatment plant as it presently exists is a pilot study. There has been trial and error and experimentation to increase the efficiency of the water treatment plant. Processes have been refined and as these processes are considered in the remedial design process the 95% threshold should be achieved. The 5-year review process will provide opportunity to review the efficiency of the selenium removal at the water treatment plant.
53	Source Environmental Associates (for Earthworks/CCCA)	The 2023 feasibility study shows predictions of how different mitigations will improve water quality in Crow Creek over time and compares the impact of implementing the expanded water treatment design versus continuing with the existing system. Figure 5-1 of the 2023 Final Technical Memo shows the difference in water quality improvement with a 2,000 gpm WTP and a 4,000 gpm WTP. These scenarios lead to achieving the 4 µg/L target in 2043 and 2029 respectively. Both water treatment plant sizes achieve a 4 µg/L target, though the smaller plant takes much longer to get there. Based simply on the delay in achieving this water quality target as stated, the implementation of the 4,000 gpm WTP is warranted.	No further response required. Comment in support of selected alternative.

No.	Commenter	Comment	Response
54	Source Environmental Associates (for Earthworks/CCCA)	Source is concerned that the timeline for meeting the RAOs appears to be longer than necessary and has been drawn out already more than may be appropriate. Source suggests that every effort be made to define clear timelines that must be met within the minimum timeframe possible. For example, the timeline for meeting fish tissue levels that are protective should be defined. In addition, a risk reduction approach should be taken to reduce uncertainty by aiming to achieve targets in fish tissue that are lower than the site-specific standards. The Forest Service states that data trends for individual remedy components will be evaluated every 5 years and if they are not achieving the RAOs within a “reasonable time frame”, other remedial actions will be considered. However, this approach lacks clarity as a “reasonable timeframe” for one party may be different for another party. Less ambiguity in the requirements is recommended, and shorter timeframes are recommended. Otherwise, remediation actions will be unnecessarily delayed in a process that has already taken considerable time. Source recommends a continuous improvement framework whereby clear objectives and timelines to meet objectives are outlined within short timeframes, based on remediation planning. For example, the ROD should specify the need to meet surface water goals resulting from increased treatment by 2025 and improved goals by 2035 based on construction and implementation of the cover system. Clear timelines/deadlines for building the expanded WTP and a timeline for constructing covers over the different panels of mine waste is required. The feasibility study states that construction and commissioning of the expanded WTP could be achieved in one year. In Source’s professional opinion, this is a reasonable timeline for executing this work.	CERCLA and the NCP do not require the level of specificity as when clean up levels are to be met. The actions will be monitored to measure progress toward meeting the cleanup levels. The monitoring intervals and protocols will be determined through the remedial design process. The timelines specified in the feasibility study are reasonable and are the anticipated timeframes that we suspect the WTP will be online.
55	Source Environmental Associates (for Earthworks/CCCA)	Recognizing that arsenic is also a contaminant of concern for the project, Source recommends assessing design changes to the PRB for the Pole Canyon ODA that addresses the risk of anaerobic water releasing arsenic. For example, incorporation of zero-valent iron into the PRB media may improve mobilization of arsenic by encouraging iron co-precipitation with arsenic. Alternatively, if water downstream from the PRB can be directed to surface before entering arsenic bearing mine wastes, then re-oxygenation of the water will occur and this water will be less likely to mobilize arsenic. Evaluation and testing of alternative media or amendments to the existing media for PRB operations is recommended to avoid mobilization of arsenic and other contaminants. These could for example include iron amendments such as Zero Valent Iron (ZVI)or changes to the PRB design to allow some degree of re-oxygenation prior to flowing over other arsenic bearing mine waste.	This recommendation is appreciated and will be considered in the remedial design of the PRB.
56	Source Environmental Associates (for Earthworks/CCCA)	The Forest Service’s Proposed Plan summary describes how the CERCLA process may involve 5-year reviews of operations and maintenance if necessary. Given the uncertainty and long duration for remediative actions to improve water quality in Crow/Sage Creeks, Source strongly recommends that periodic reviews of operating data be conducted, with minimum frequency of every 5 years. A key aspect of such reviews should be the comparison of predicted versus actual water quality data to track how contact water quality and volumes change over time, how treatment performs, and how water quality in the environment and selenium levels in fish tissue improve/change over time. The trajectories for improvement laid out in the feasibility study are subject to uncertainty and so this type of reconciliation between predictions and actual results is required to ensure that the project is on track. It may be necessary to make changes or improvements to site remediation activities and mitigation measures if designs do not perform as intended or if site contact water quality worsens unexpectedly. Such periodic reviews should be transparent and should involve engagement with community groups and other stakeholders to improve public trust that the site is being managed appropriately and that remediation actions are actually solving the problem as intended. Further, the learnings from these periodic reviews should then be incorporated into future mine and reclamation/remediation planning for other parts of the site.	Five year reviews are required under CERCLA §121(c). The statement in this comment that " . . . the CERCLA process may involve 5-year reviews of operations and maintenance if necessary", is not correct. Under CERCLA §121(c) a review the remedies at Superfund sites is required where hazardous substances remain at levels that potentially pose an unacceptable risk. Such reviews must be conducted every five years or may be conducted more frequently if necessary to ensure the protectiveness of the remedy. The Five-Year Review requirement applies to remedial actions selected under CERCLA §121 upon completion of which, hazardous substances, pollutants, or contaminants will remain on site. The lead agency, in this case the Forest Service, has primary responsibility for conducting the Five-Year Review, while the support agencies provide information and review support. The Five-Year Review process integrates information taken from decision documents and operational data with the experiences of those responsible for and affected by actions at the site. There are six components to the Five-Year Review process: 1) community involvement and notification, 2) document review, 3) data review and analysis, 4) site inspection, 5) interviews and 6) protectiveness determination. Together, the reviewer uses these components to assess the remedy’s performance, and, ultimately, to determine the protectiveness of that remedy.

No.	Commenter	Comment	Response
57	Source Environmental Associates (for Earthworks/CCCA)	Source generally agrees with the Forest Service's analysis and preferred alternative for covers including alternatives 3C or 3D. Alternative 3C and 3D are effective and provide certainty in terms of risk reduction. The preferred alternative (i.e., 3C) is required to meet the water quality goals in a reasonable timeline and with reduced risk and uncertainty. It is not appropriate to assume that the effectiveness of the other alternatives is well characterized, as significant uncertainty exists with infiltration rates and contaminant loadings for alternatives 3A and 3B without the use of bentonite or the geomembrane. It is possible that the mitigation will eventually be limited to covers only, and a more robust, reliable cover system is anticipated to assist with achieving the goal of ceasing to operate the water treatment plant in the long-term, once cover systems are put in place. In the groundwater model presented, the reduction in load attributed to the alternatives is not well supported by data. For the no further action alternative, monitoring data does not support the model predictions. Until such time as monitoring data supports the model predictions with clear downward trends, it is important to maintain a conservative approach to interpretation of model predictions based on simplifying assumptions. Source does not support the other alternatives for cover design (1 / 3A / 3B). This is because 1) these cover alternatives do not adequately reduce the loadings of selenium to the receiving environment within an appropriate timeframe, and 2) these cover alternatives are less certain (include additional risks) for meeting mode predictions and reaching the CERCLA criteria. In particular, the CERLA criteria, compliance with ARARs, has a high risk of not being met with theno further action alternative. This is demonstrated in the existing data set that has a continuous upward trend in selenium loadings and concentrations. To claim a do nothing alterative will be sufficient, a significant data set showing a downward trend should be required. In the absence of such data, the no further action alternative is not reasonable and not supported. The timeline to reach a target, i.e., 2035, is inherently uncertain. Source believes there is a need to reduce risks and ensure CERCLA criteria are achieved.	Alternative 3C is the preferred alternative. No further response required. Comment in support of selected alternative.
58	Source Environmental Associates (for Earthworks/CCCA)	Source disagrees with the statement in the section titled - Compliance with ARARs: "There are no differences in the performance relative to action-specific and location-specific ARARs for Alternatives 3a through 3d." The timeline for reaching targets is not that similar for the cover alternatives and there is uncertainty that CERCLA targets will be reached for the less protective covers proposed. The analysis provided appears to be somewhat biased to lead to a conclusion that bentonite and geomembrane covers are not required. Source strongly supports the use Alternative 3C and 3D cover types as a risk-reduction solution. These alternatives have a much higher certainty of meeting the CERCLA criteria given they have redundancy built in and are proven technologies from numerous mine sites. Source control mechanisms should be evaluated based on realized load reduction, not only model predictions that show a reduction to a target level. This is not a valid or fair comparison of alternatives. The reduction in infiltration capacity for the alternatives 3C and 3D is substantial and critical for success in meeting CERCLA targets.	Alternative 3C is the preferred alternative. No further response required. Comment in support of selected alternative.
59	Source Environmental Associates (for Earthworks/CCCA)	Source concurs with the Forest Service Assessment that action is necessary to protect public health and the environment from releases of hazardous substances. Source supports the preferred alternative (2b, 2c and 3c combined) with the qualifications listed within this technical memorandum including the need to reduce uncertainty by taking more aggressive remediation actions and reducing timeframes to meet goals. Affected stakeholders, such as landowners, expect that targets will be met as soon as possible with as little uncertainty as possible.	No further response required. Comment in support of selected alternative.
60	Source Environmental Associates (for Earthworks/CCCA)	Further information should be provided to explain the large difference in water column selenium concentrations proactive of Sage Creek and Crow Creek as this is not immediately apparent from the information package reviewed. [A table was included with this comment that showed the "Site Specific Whole Body Fish Tissue Criteria (mg/kg)" and "Water Column Selenium Concentration (µg/L)" for Hoopes Spring and Sage Creek (13.6 and 16.7, respectively) vs Crow Creek (12.5 and 4.2, respectively]	These water column selenium concentrations are taken directly from the Idaho Water Quality Standards (IDAPA 58.01.02). They are established by IDEQ and are "Site-specific water column values (30-day average) [that] are based on dissolved total selenium in water and are derived using a performance-based approach from fish tissue values via either the mechanistic modeling or empirical bioaccumulation factor (BAF) method in *Aquatic Life Ambient Water Quality Criterion for Selenium – Freshwater, EPA-822-R-16-006, Appendix K: Translation of a Selenium Fish Tissue Criterion Element to a Site-Specific Water Column Value* (June 2016)."
61	Source Environmental Associates (for Earthworks/CCCA)	Source strongly supports the selection of alternative 2B over the other water treatment alternatives. Reasons for this support include reduced timelines for meeting target water quality and also reduced risk and uncertainty in meeting the targets. Source does not support the selection of no action (alternative 1) or alternative 2a because it does not meet appropriate timeline goals and adds uncertainty with meeting goals at all in future.	No further response required. Comment in support of selected alternative.
62	Source Environmental Associates (for Earthworks/CCCA)	Source supports the use of the PRB (Alternative 2c) to reduce loadings to groundwater and surface water. Source does not support the selection of alt 1 over alt 2c. This is because of the following reasons: timeline to reach goals and certainty of reaching goals.	No further response required. Comment in support of selected alternative.

No.	Commenter	Comment	Response
63	Source Environmental Associates (for Earthworks/CCCA)	Source agrees with the Forest Service's analysis and preferred alternative for covers including 3C or 3D. It is not clear that 3C and 3D are equivalent in terms of effectiveness and risk reduction. Source believes the geomembrane may provide more protection, however the alternative 3C maybe adequate if implemented carefully. Source does not support the other alternatives for cover design (1 / 3A / 3B). This is because 1) these cover alternatives do not adequately reduce the loadings of selenium to the receiving environment within an appropriate timeframe, and 2) these cover alternatives are less certain (include additional risks) for meeting mode predictions and reaching the CERCLA criteria.	Alternative 3C is the preferred alternative. No further response required. Comment in support of selected alternative.

Slide deck presented at the virtual public meeting on the Proposed Plan, held on May 2, 2023.

Smoky Canyon Mine
Proposed Remedial Action

Public Meeting

May 2, 2023

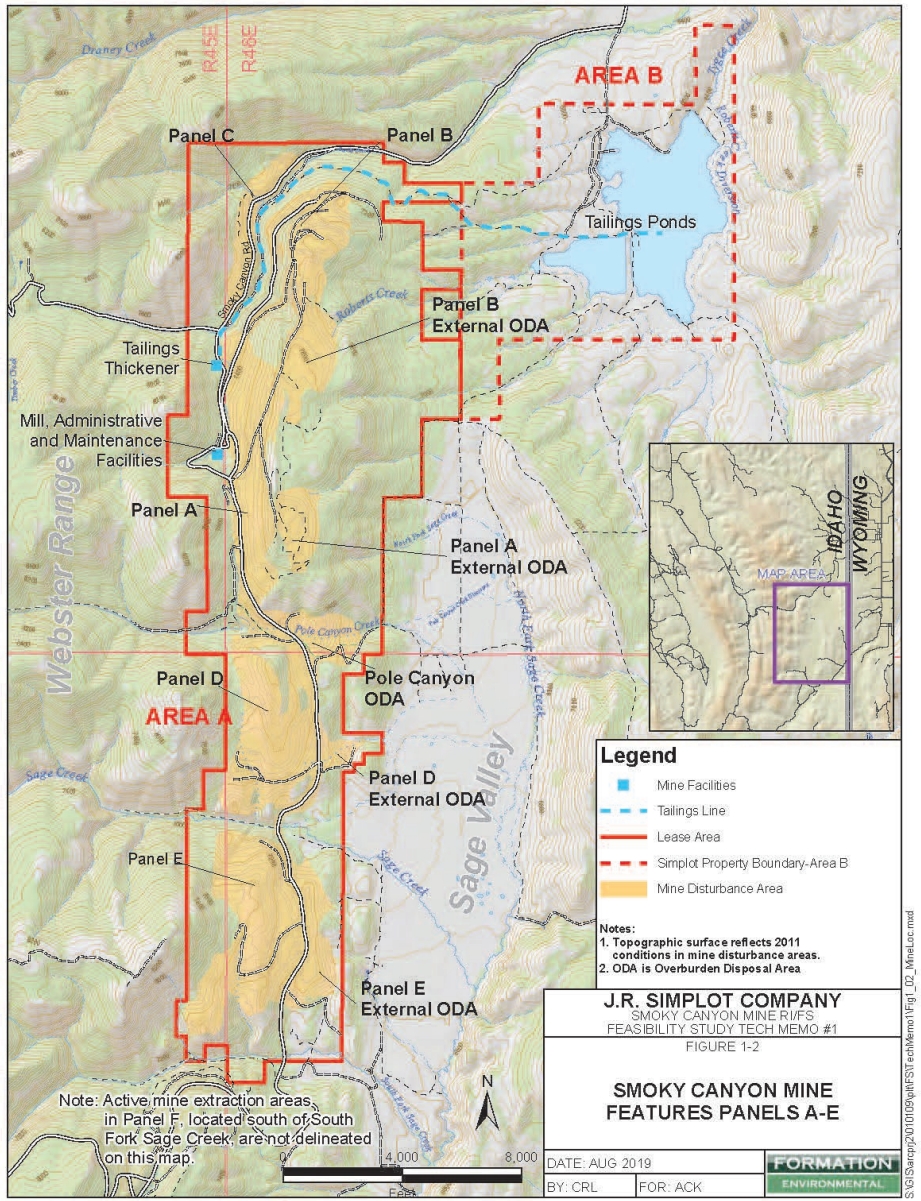
Agenda

- Welcome and Introductions
- Overview of the Proposed Remedial Action for Smoky Canyon Mine
- Questions and Comments
- Closing

Location


Wayan (Unincorp)
Freedom
Thayne
Bedford
Henry
N RESERVOIR RD
GOVERNMENT DAM RD
STATE HWY 34
IDAHO
WYOMING
Stump Ck
Salt River
Grover
Auburn
US HWY 89
Afton
SMOKY CANYON MINE
CARIBOU COUNTY
Conda
Dry Ridge
Freeman Ridge
Crow Ck
Fairview
Osmond Community
Smoot
LINCOLN COUNTY
Alexander
Soda Springs
Rose
Grace
Manson
Meade Peak
Niter
Bench
Nounan
Georgetown
Lago
Giveout
Thatcher
BEAR LAKE COUNTY
Bennington
US HWY 30
Mound Valley
STATE HWY 36
Sharon
Bern
FRANKLIN COUNTY
Liberty
Montpelier
Hellhole
US HWY
Lanark
Ovid
0
6
12
Miles
N
IDAHO
Smoky Canyon Mine
S:\GIS\ARCPRJ\2010109\PLT\POLECANYONNTCRA\PRDR_30PERC\FIGURES\FIG1_1_REGIONLOC_IMGONLY.MXD

Mine Features

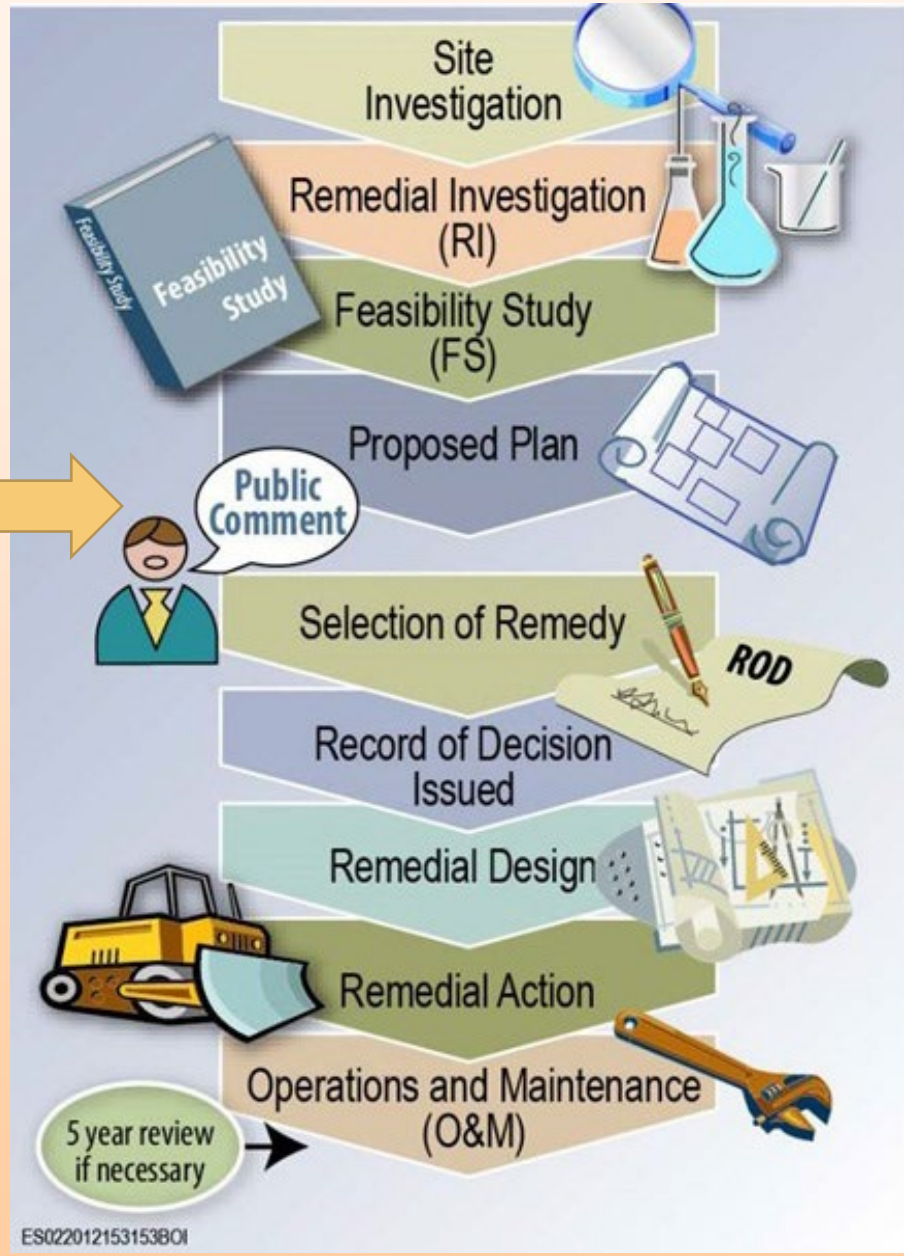


Mine Background

- Phosphate ore is extracted from a series of pits, referred to as mine panels.
- Mining activities began at Smoky Canyon in 1983. Ore is recovered through open pit mining practices that follow the north-south trending Phosphoria Formation outcrop as it dips to the west.
- Selenium is the predominant contaminant of concern associated with phosphate mining in SE Idaho.
- In 2001, IDEQ led an area-wide investigation of contamination from phosphate mining, with participation by other state and federal agencies and mining companies with operations in southeast Idaho.
- Site-specific investigations were warranted on the larger historic and active open-pit mines located in the mining district, including the Smoky Canyon Mine and others.

Remedial Cleanup Process Overview

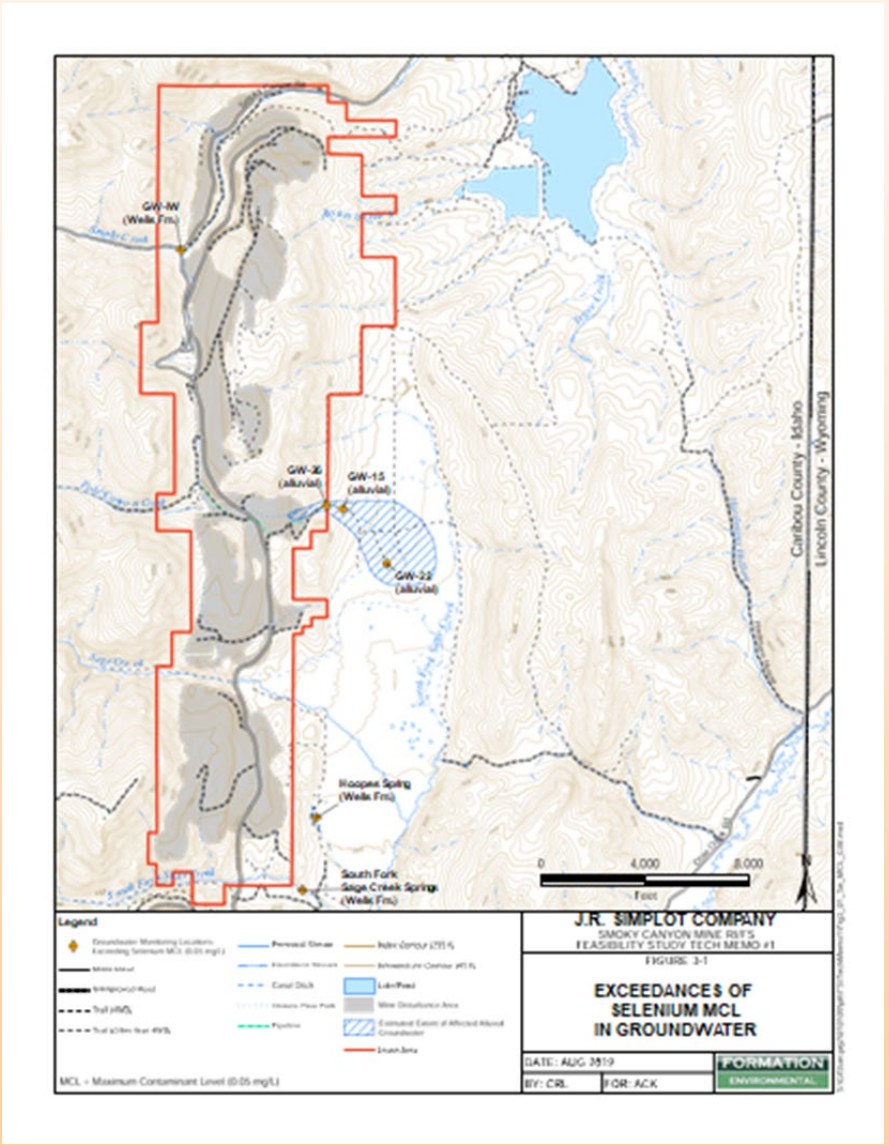
We are here



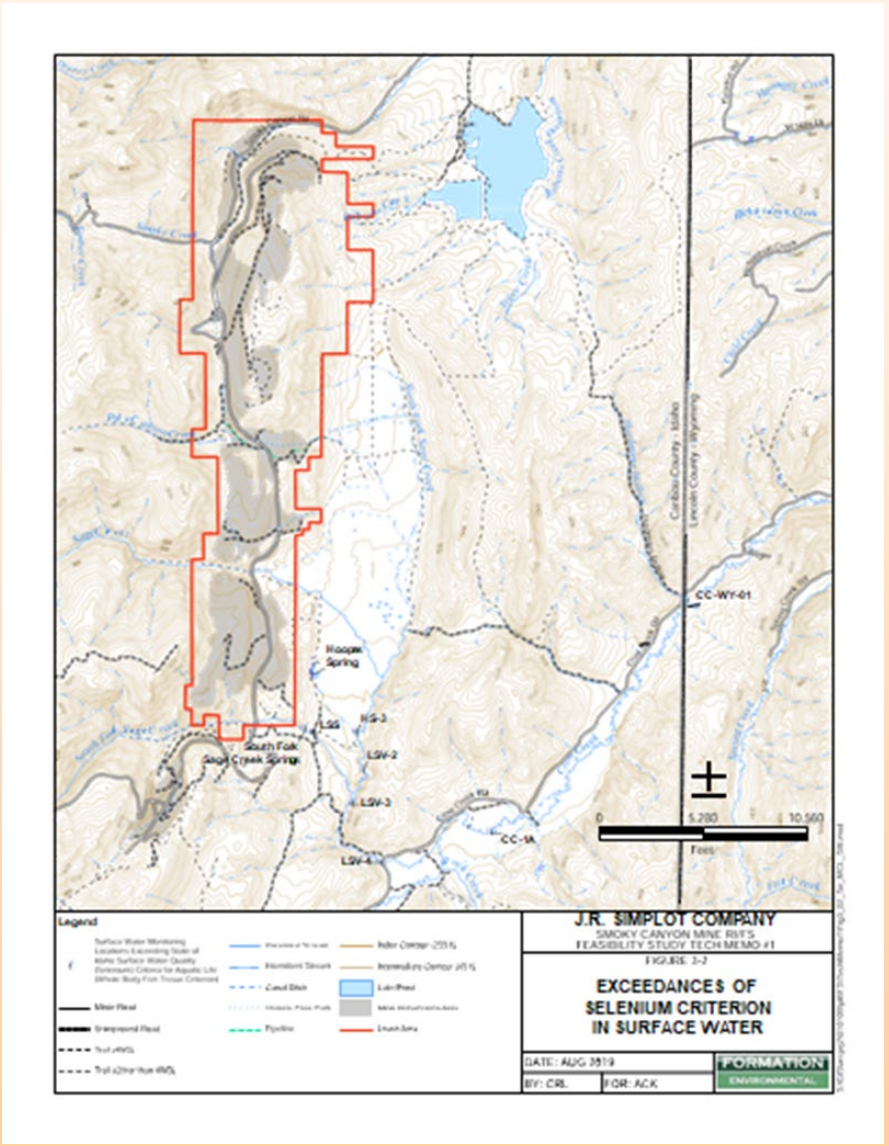
Smoky Canyon Mine
Prior Cleanup Work

- 2003: Site Investigation initiated by JR Simplot Co.
- 2006: Removal Action at Pole Canyon Overburden Disposal Area (ODA)
- 2009: Remedial Investigation / Feasibility Study (RI/FS) initiated
- 2009-2010: Water Treatability Studies
- 2013: Additional removal action was conducted to further address contamination from Pole Canyon ODA (Pole Canyon Cover)
- 2014: Remedial Investigation Report completed
- 2015: Initiation of Pilot Water Treatment Plant (treatability study for innovative technology of fluidized bed reactor (FBR)); still ongoing
- 2015: Risk Assessments completed
- 2023: Feasibility Study completed

Remedial Investigation: Ground Water

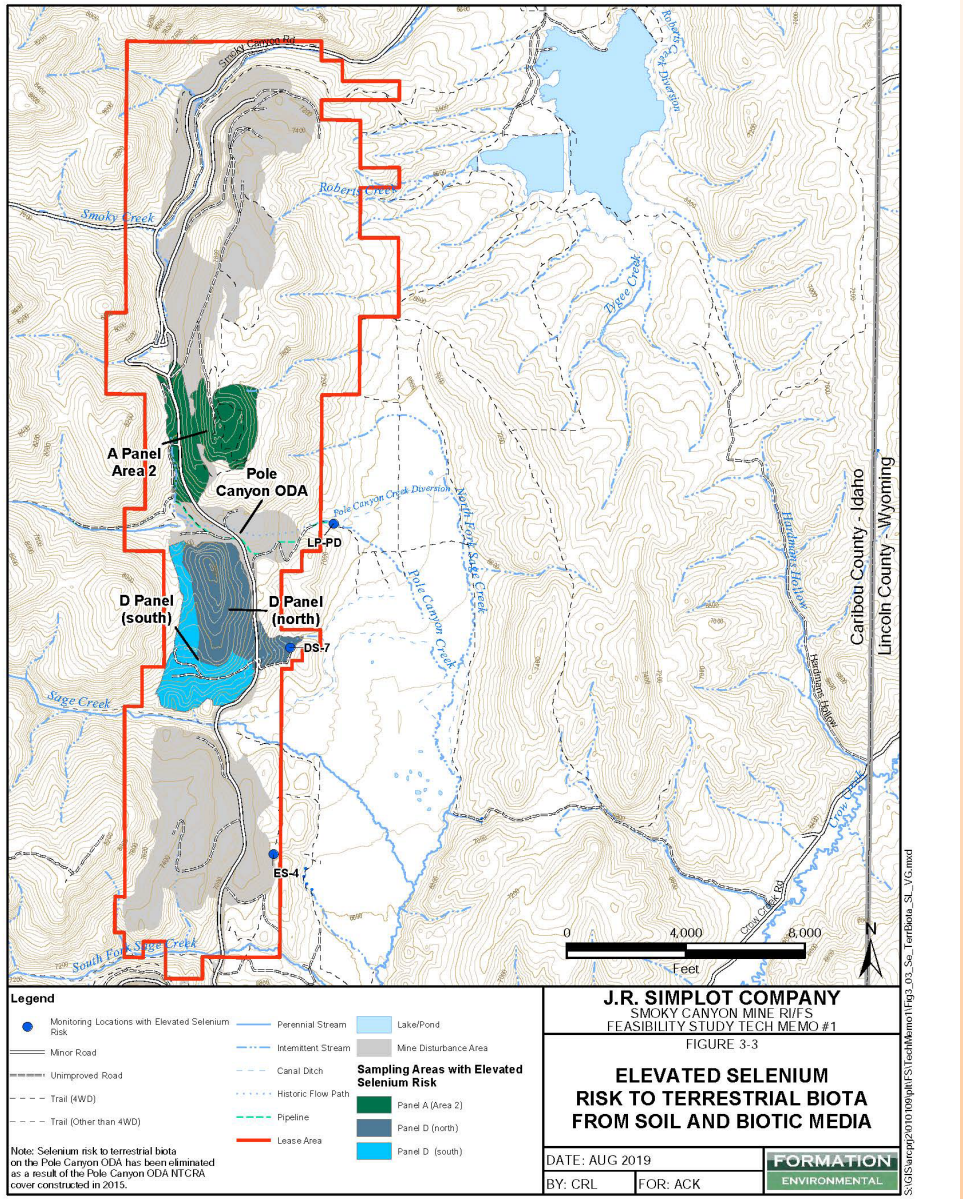


Remedial Investigation: Surface Water



Remedial Investigation: Aquatic

Remedial Investigation: Terrestrial



Feasibility Study

- Feasibility Study began in 2016; completed 2023
- Comprised of two parts
  - Technical Memorandum #1 summarized the results of the Remedial Investigation and Risk Assessments
    - Initial development of technologies to consider and initial screening of those technologies for further consideration based on feasibility, cost and effectiveness
  - Technical Memorandum #2 includes the detailed screening of alternatives against the nine remedy selection criteria outlined in CERCLA

Remedial Action Objectives

For Ground Water, the RAOs are:

- Prevent future use of alluvial or Wells Formation groundwater with selenium concentrations above the MCL as a drinking water source until cleanup levels are met.
- Reduce or eliminate concentrations of selenium in contaminated alluvial or Wells Formation groundwater to below the MCL within a reasonable time frame given the circumstances of the Site.
- Reduce or eliminate loading of selenium from groundwater to surface water so that it does not result in concentrations that represent an unacceptable risk to aquatic life and complies with ARARs (IDAPA 58.01.02 – Water Quality Standards) in the lower Sage Creek and Crow Creek watersheds.

For Surface Water, the RAOs are:

- Reduce or eliminate unacceptable risks to Recreational Campers or Native Americans from ingestion of non-regulated surface water (seeps and detention ponds) due to arsenic and cadmium.
- Reduce selenium concentrations in lower Sage Creek and Crow Creek watersheds to below levels that pose unacceptable risks for aquatic life and comply with ARARs (IDAPA 58.01.02 – Water Quality Standards).

For Soils, the RAO is:

- Reduce or eliminate unacceptable risks to birds from overburden with elevated selenium concentrations in soil on Panel A's ODAs.

Alternatives Analyzed

Surface Water

- Alternative 1 – No Further Action
- Alternative 2a – Water Treatment at the Hoopes WTP (2,000 gpm)
  - Chert/Limestone Covers on Seeps and Ponds
- Alternative 2b – Water Treatment at the Hoopes WTP (4,000 gpm)
  - Chert/Limestone Covers on Seeps and Ponds
- Alternative 2c – PRB Downgradient of Pole Canyon ODA

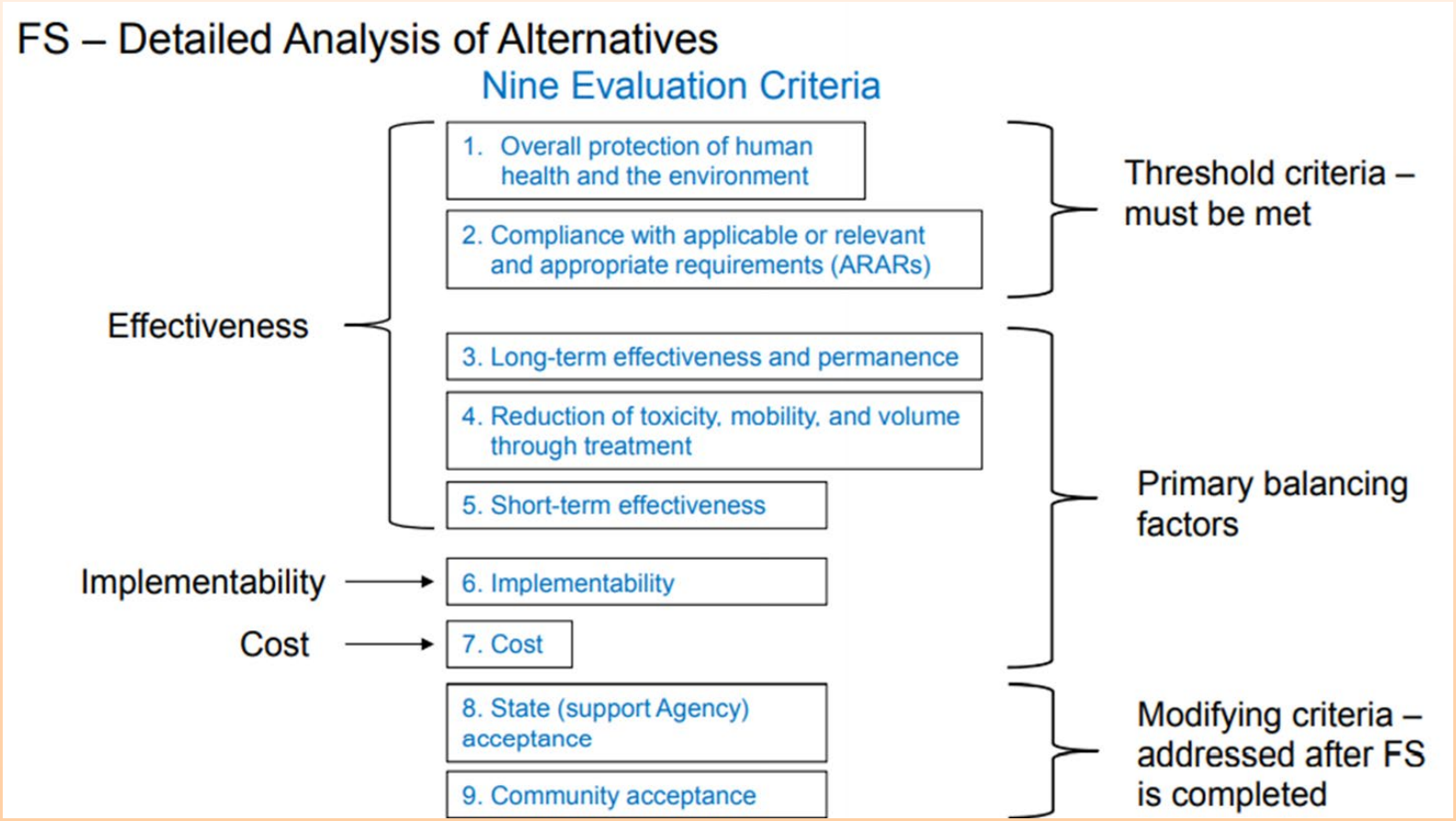
Alternatives Analyzed
Source Control

- Alternative 1 – No Further Action
- Alternative 3a – Dinwoody / Chert Covers Over Target Areas
- Alternative 3b – Capillary Covers Over Target Areas
- Alternative 3c – Enhanced Dinwoody Covers Over Target Areas
- Alternative 3d – Geomembrane Covers Over Target Areas
- Alternative 3e – Dinwoody Cover Over a Portion of Panel A

Elements Common to All Alternatives

- Institutional Controls
- Access Controls
- Revegetation
- Operations and Maintenance
- Monitored Natural Attenuation
- Long-Term Monitoring

CERCLA Nine Remedy Selection Criteria



Surface Water Alternatives Analysis

	Alternative 1 -- No Further Action	Alternative 2a- WTP Hoopes 2000 gpm	Alternative 2b - WTP Hoopes 4000 gpm	Alternative 2c- PRB Pole Canyon
CERCLA Criteria				
Protection of Human Health and the Environment	No	Yes	Yes	Yes
Compliance with ARARs	No	Yes	Yes	Yes
Long-Term Effectiveness and Permanence	Low	Moderate	High	Moderate
Reduction of TMV Through Treatment	Low	Moderate / High	High	Moderate
Short-Term Effectiveness	Moderate	Moderate / High	High	Moderate / High
Implementability	High	High	Moderate/High	Moderate
Cost	Low	Moderate / High	High	Low
State Acceptance	TBD after Public Comment Period	TBD after Public Comment Period	TBD after Public Comment Period	TBD after Public Comment Period
Communtity Acceptance	TBD after Public Comment Period	TBD after Public Comment Period	TBD after Public Comment Period	TBD after Public Comment Period

Source Control Alternatives Analysis

	Alternative 1 -- No Further Action	Alternative 3a- Dinwoody / Chert cover	Alternative 3b - Capillary Break Cover	Alternative 3c - Enhanced Dinwoody	Alternative 3d - Geomembrane Cover	Alternative 3e- Dinwoody Panel A (portion)
CERCLA Criteria						
Protection of Human Health and the Environment	No	Yes	Yes	Yes	Yes	Yes
Compliance with ARARs	No	Yes	Yes	Yes	Yes	Yes
Long-Term Effectiveness and Permanence	Low	Moderate	Moderate	Moderate	Moderate	Moderate
Reduction of TMV Through Treatment	Low	Low / Moderate	Low / Moderate	Moderate	Moderate	Low
Short-Term Effectiveness	Moderate	Moderate	Low / Moderate	Low / Moderate	Low / Moderate	Moderate
Implementability	High	High	Moderate / High	Moderate / High	High	High
Cost	Low	Low / Moderate	Low / Moderate	Moderate	High	Low
State Acceptance	TBD after Public Comment Period	TBD after Public Comment Period	TBD after Public Comment Period	TBD after Public Comment Period	TBD after Public Comment Period	TBD after Public Comment Period
Communtity Acceptance	TBD after Public Comment Period	TBD after Public Comment Period	TBD after Public Comment Period	TBD after Public Comment Period	TBD after Public Comment Period	TBD after Public Comment Period

Summary Results of Nine Criteria Analysis

- For surface water, Alternative 2b, increasing the capacity of the pilot water treatment plant is projected to meet water quality standards in Sage Creek and Crow Creek and provides the greatest level of treatment and long-term effectiveness, although at a higher cost.
- Of the four source control cover alternatives for Wells Formation groundwater and surface water, the Enhanced Dinwoody cover (Alternative 3c) provides the highest level of performance because it provides the greatest level of reduction of selenium concentrations in Wells Formation groundwater and surface water in Sage Creek and Crow Creek at a moderate cost compared to the geomembrane cover which provides a similar level of performance.
- For Panel A, potential risks to birds are marginal for current conditions and installation of a soil cover (Alternative 3e) may have negative impacts to habitat at the borrow area. However, further sampling will be conducted during remedial design.

Preferred Alternative

- The final remedy for the Site will be selected by the Forest Service in consultation with the Support Agencies based on an evaluation of the information.
- The elements of the recommended combined remedy, are:
  - Water Treatment Alternatives (Surface Water) Alternative 2b – Water Treatment at the Hoopes WTP (4,000 gpm), ICs, Chert/Limestone Covers on Seeps and Ponds, O&M, MNA, LTM
  - Water Treatment Alternatives (Alluvial Groundwater) Alternative 2c – PRB Downgradient of Pole Canyon ODA, ICs, O&M, MNA, LTM
  - Source Control Cover Alternatives (Wells Formation Groundwater and Surface Water) Alternative 3c – Enhanced Dinwoody Covers Over Target Areas, Revegetation, ICs, O&M, MNA, LTM
- The total present worth cost of the recommended Site-wide remedy is $139.9 Million

Next Steps

- Public Comment on Proposed Plan (2023) for 30 days (until May 26)
  - *15-day extension request granted (June 10, 2023)*
- Prepare Responsiveness Summary to Public Comments (Summer 2023)
- Record of Decision (Fall 2023)
- Negotiate Consent Decree with Simplot for remedial design and construction (2023-2024)
- Begin implementation (2025)

Questions or Comments

To submit comments on the Proposed Plan:

By Mail:

Attn: Smoky Canyon Mine Comments

Sherri Stumbo

USDA Forest Service

4350 Cliffs Drive

Pocatello, ID 83204

By E-mail: sherri.stumbo@usda.gov and sarah.wheeler2@usda.gov

Transcript from the virtual public meeting on the Proposed Plan, held on May 2, 2023.

WEBVTT

00:00:08.997 --> 00:00:12.087
Good evening and thank you all for attending tonight.

00:00:12.087 --> 00:00:15.207
Individuals from the Intermountain Regional Office and the Caribou.

00:00:15.207 --> 00:00:18.427
Targhee National Forest will be presenting the proposed remedial.

00:00:18.427 --> 00:00:20.697
action for the Smoky Canyon Mine.

00:00:21.347 --> 00:00:24.577
My name is Marshall Thompson. I'll be this evening's facilitator.

00:00:24.577 --> 00:00:27.957
Sherri Stumbo, Deputy director of the Intermountain.

00:00:27.957 --> 00:00:31.157
Region Engineering program. Will be your presenter. And Sarah.

00:00:31.157 --> 00:00:34.377
Wheeler, staff officer for the Caribou Targhee National.

00:00:34.377 --> 00:00:37.027
Forest will assist with the question and answer session.

00:00:37.927 --> 00:00:41.177
Please enter your questions into the Q&A tab at anytime.

00:00:41.177 --> 00:00:44.257
Members of the Intermountain Region Public Affairs program.

00:00:44.257 --> 00:00:47.277
will be reviewing and posting your questions throughout the

00:00:47.277 --> 00:00:50.347
presentation after the presentation is complete.

00:00:50.347 --> 00:00:53.657
they will ask the poster’s questions to the panel members please.

00:00:53.657 --> 00:00:56.797
ensure your questions are clear and appropriate. We would.

00:00:56.797 --> 00:00:59.877
also like to notify all attendees that this teams live.

00:00:59.877 --> 00:01:03.357
event will be recorded. Thank you again for attending.

00:01:03.357 --> 00:01:06.567
and I'd like to now introduce Sherri Stumbo.

00:01:06.567 --> 00:01:06.567

00:01:14.027 --> 00:01:17.917
Thank you, Marshall, and thanks everyone to joining us tonight. Marshall.

00:01:17.917 --> 00:01:20.257
do we have the PowerPoint?

00:01:22.377 --> 00:01:22.707
Right.

00:01:31.227 --> 00:01:33.157
We go to the beginning.

00:01:33.197 --> 00:01:43.197

00:01:43.197 --> 00:01:53.197

00:01:53.197 --> 00:02:03.197

00:02:12.657 --> 00:02:13.017

00:02:13.057 --> 00:02:23.057

00:02:23.057 --> 00:02:33.057

00:02:33.057 --> 00:02:43.057

00:02:43.057 --> 00:02:53.057

00:02:53.057 --> 00:03:03.057

00:03:06.027 --> 00:03:07.767
There we go. Hopefully it stays.

00:03:08.767 --> 00:03:11.827
Hopefully everybody else on the line can see this.

00:03:11.827 --> 00:03:11.827

00:03:13.867 --> 00:03:17.187
If not, please let us know, as I said.

00:03:17.187 --> 00:03:20.257
I want to thank everybody for joining us tonight, the Forest.

00:03:20.257 --> 00:03:23.417
Service working with partner agencies, which is.

00:03:23.417 --> 00:03:26.437
the US Environmental Protection Agency, the Idaho.

00:03:26.437 --> 00:03:29.917
Department of Environmental Quality, the US Fish and Wildlife Service, the BLM.

00:03:29.917 --> 00:03:33.277
Shoshone Bannock Tribes as well as the Jr Simplot Company, we're.

00:03:33.277 --> 00:03:36.287
pleased to share the proposed plan with you all tonight for.

00:03:36.287 --> 00:03:39.307
the clean up at the Smoky Canyon Mine. So let's

00:03:39.307 --> 00:03:42.377
get started. We had a brief agenda and so we're going.

00:03:42.377 --> 00:03:42.607
to do.

00:03:43.927 --> 00:03:47.037
I'll go to the presentation, and we'll open up for Q&A's or.

00:03:47.037 --> 00:03:50.157
questions and then we'll have a quick closing.

00:03:50.157 --> 00:03:53.247
So, for those of you not familiar with the.

00:03:53.247 --> 00:03:56.437
Smokey Canyon mine, it is located about 24 miles.

00:03:56.437 --> 00:03:59.697

east of Soda Springs ID and about 10 miles.

00:03:59.697 --> 00:04:02.737
generally, W from Afton, Wyoming. It is located.

00:04:02.737 --> 00:04:05.897
on the National Forest systems lands on the Caribou Targhee National Forest.

00:04:05.897 --> 00:04:09.437
and it is located on about 2600.

00:04:09.437 --> 00:04:12.847
acres of mineral leases administered.

00:04:12.847 --> 00:04:13.637
by the BLM.

00:04:13.757 --> 00:04:17.647
As well as about 1200 acres, special use permit.

00:04:17.647 --> 00:04:19.647
acres administered by the Forest Service.

00:04:20.607 --> 00:04:21.397
The next slide.

00:04:23.317 --> 00:04:26.567
Delving in a little bit closer to the mine features this.

00:04:26.567 --> 00:04:29.947
straights the different aspects of the Smoky

00:04:29.947 --> 00:04:32.427
Canyon Mine, so let me see if I can get one.

00:04:35.667 --> 00:04:36.457
I don't know if you all.

00:04:37.747 --> 00:04:38.487
can't see?.

00:04:40.767 --> 00:04:41.577
We see.

00:04:42.687 --> 00:04:45.407
Panel A, which is immediately South of the Mill.

00:04:46.667 --> 00:04:49.107
Panel D and panels E are South of that.

00:04:49.917 --> 00:04:53.117
Pole Canyon Overburden Disposal Area is a little.

00:04:53.117 --> 00:04:55.657
bit to the east of Panel D.

00:04:57.917 --> 00:05:00.807
Says Mel and others can't see the PowerPoint.

00:05:00.847 --> 00:05:10.847

00:05:10.847 --> 00:05:20.847

00:05:20.847 --> 00:05:30.847

00:05:30.847 --> 00:05:40.847

00:05:40.847 --> 00:05:50.847

00:05:50.847 --> 00:06:00.847

00:06:00.847 --> 00:06:10.847

00:06:10.847 --> 00:06:20.847

00:06:20.847 --> 00:06:30.847

00:06:30.847 --> 00:06:40.847

00:06:40.847 --> 00:06:50.847

00:06:50.847 --> 00:07:00.847

00:07:00.847 --> 00:07:10.847

00:07:13.947 --> 00:07:15.617
Sure. I'm guessing you can't see it.

00:07:17.397 --> 00:07:20.147
I can't see it now. I did, but I can't see it now.

00:07:21.947 --> 00:07:22.327
OK.

00:07:25.127 --> 00:07:27.737
Sorry everyone, we're having some technical difficulties.

00:07:30.357 --> 00:07:33.507
If they're able to see Sherri, which it looks like they are.

00:07:33.507 --> 00:07:36.667
if Sherri could share her screen with the PowerPoint.

00:07:36.667 --> 00:07:36.667

00:07:37.957 --> 00:07:40.267
That might that. Can we try that?

00:07:43.577 --> 00:07:43.817
So.

00:07:45.307 --> 00:07:46.077
Sherri.

00:07:46.977 --> 00:07:48.167
Yeah, I got. Pull it up. Hang on.

00:07:52.027 --> 00:07:54.057
Now can you let me know if you can see that screen?

00:07:54.117 --> 00:08:04.117

00:08:04.117 --> 00:08:14.117

00:08:14.117 --> 00:08:24.117

00:08:27.917 --> 00:08:29.107
You should be live.

00:08:29.567 --> 00:08:39.567

00:08:43.157 --> 00:08:44.137

Can you see it.

00:08:46.817 --> 00:08:50.247
Sherri, we can see the PowerPoint, but we can't see you, right?

00:08:50.247 --> 00:08:53.217
So that's what I'm trying to figure out. It's like, OK, it's on a.

00:08:57.767 --> 00:08:59.227
OK, they UM.

00:09:00.487 --> 00:09:04.047
The attendees can now the PowerPoint. So Sherri.

00:09:04.047 --> 00:09:07.537
you look lovely tonight, but they can't see you. But it's probably OK.

00:09:07.537 --> 00:09:09.827
to just go through with the PowerPoint, OK?

00:09:12.667 --> 00:09:15.917
Thank you for your patience, everyone. Alright so.

00:09:15.917 --> 00:09:17.477
let's start. Let's go back another.

00:09:19.117 --> 00:09:19.527
All right.

00:09:20.157 --> 00:09:23.397
That let's just start over from the beginning, if that's alright.

00:09:23.397 --> 00:09:26.777
with everybody, so yeah.

00:09:26.777 --> 00:09:30.057
I have this up on a different screen, so just bear with me as I try to get kind of reoriented.

00:09:30.057 --> 00:09:33.087
here. So anyway, again, I was saying we began.

00:09:33.087 --> 00:09:36.207
Welcome everybody to the public meeting tonight.

00:09:36.207 --> 00:09:39.407
to talk about the Smokey Canyon Remedial Act.

00:09:39.407 --> 00:09:42.017
Proposed plan for reclamation at Smokey Canyon Mine.

00:09:44.017 --> 00:09:47.267
Will provide an overview of the proposed plan we'll take.

00:09:47.267 --> 00:09:50.647
questions and comments from folks who are in attendance.

00:09:50.647 --> 00:09:53.797
and they will do a short closing so with.

00:09:53.797 --> 00:09:56.807
that, I want to say thanks for everyone for bearing with us this evening.

00:09:56.807 --> 00:09:59.827
and for joining us before service working.

00:09:59.827 --> 00:10:02.927
with this partner agencies, which is the US EPA.

00:10:02.927 --> 00:10:06.127
the Idaho Department of Environmental Quality, the US Fish and Wildlife.

00:10:06.127 --> 00:10:09.237
Service, the BLM and the Shoshone-Bannock tribes as well.

00:10:09.237 --> 00:10:12.247
as the Jr Simplot Company, we're pleased to share the proposed.

00:10:12.247 --> 00:10:14.727
remediation plan for Smoky Canyon mine with you this evening.

00:10:15.557 --> 00:10:18.107
So without further ado, let's get started.

00:10:19.377 --> 00:10:19.847
See you. Bye.

00:10:21.217 --> 00:10:24.457
So for those folks who are not familiar with the Smoky Canyon.

00:10:24.457 --> 00:10:27.627
mine, it is located about 24 miles east.

00:10:27.627 --> 00:10:31.147
of Soda Springs ID and about 10 miles generally.

00:10:31.147 --> 00:10:34.357
W from Afton, Wyoming. It is located on National Forest.

00:10:34.357 --> 00:10:37.667

system lands on the Caribou Targhee National Forest, and.

00:10:37.667 --> 00:10:40.767
it's situated on the 2600 acres of.

00:10:40.767 --> 00:10:43.867
mineral leases administered by the BLM, as well as about.

00:10:43.867 --> 00:10:45.547
1200 acres of (inaudible)

00:10:47.397 --> 00:10:50.107
about the Forest Service under a special use permit.

00:10:55.947 --> 00:10:59.297
Some of the mine features that we see at the Smokey Canyon mine that.

00:10:59.297 --> 00:11:02.357
are important are you can see the mine and mill.

00:11:02.357 --> 00:11:03.607
administrative facilities.

00:11:04.417 --> 00:11:07.437
We panel a is generally east of that.

00:11:07.437 --> 00:11:07.437

00:11:08.217 --> 00:11:11.287
The panel, a external overburn disposal area.

00:11:11.287 --> 00:11:14.407
is to the east of to the South of that area.

00:11:14.407 --> 00:11:17.707
is panels D panel east and they're.

00:11:17.707 --> 00:11:20.857
associated overburden disposal areas as well as the Pole.

00:11:20.857 --> 00:11:23.887
Canyon Overburden Disposal Area and Pole Canyon is a.

00:11:23.887 --> 00:11:26.967
little bit different than the rest of these ODA in that.

00:11:26.967 --> 00:11:30.087
it is situated over Pole Canyon Creek. So, it is essentially.

00:11:30.087 --> 00:11:33.387
A Cross Valley Fill where mine waste was dumped into the valley and.

00:11:33.387 --> 00:11:36.487
Pole Canyon Creek runs underneath it to the north.

00:11:36.487 --> 00:11:38.657
we see Panel B where there's still some mining.

00:11:38.737 --> 00:11:40.997
Going on and panel see up to the north.

00:11:41.807 --> 00:11:45.177
West area be outlined in that dotted area.

00:11:45.177 --> 00:11:48.197
encompasses the tailing ponds and that is not part of the.

00:11:48.197 --> 00:11:50.427
CERCLA action that we are going to be discussing this evening.

00:11:55.367 --> 00:11:57.517
So a little bit about Smokey Canyon Mine.

00:11:57.957 --> 00:12:01.267
Phosphate ore, which is what we're.

00:12:01.267 --> 00:12:04.417
we're doing at the mine is extracted from a series of pits and we call.

00:12:04.417 --> 00:12:05.157
those mine panels.

00:12:05.877 --> 00:12:08.867
So, they began running phosphate ore in 1983.

00:12:10.407 --> 00:12:13.427
Again, ORE is recovered through the open pit mining practices and.

00:12:13.427 --> 00:12:16.827
it generally falls in north South direction following the Phosphoria Formation.

00:12:16.827 --> 00:12:20.177
which we are mining. Selenium is the predominant.

00:12:20.177 --> 00:12:23.757
contaminant of concern associated with phosphate mining in Southeast Idaho.

00:12:23.757 --> 00:12:23.757

00:12:24.517 --> 00:12:27.837
In the late 1990s, we discovered that Selenium was.

00:12:27.837 --> 00:12:31.107
a concern to the environment in Southeast Idaho, and at that point.

00:12:31.107 --> 00:12:34.767
the DEQ lead an area wide investigation of contamination.

00:12:34.767 --> 00:12:38.607
from phosphate mining with participation with other.

00:12:38.607 --> 00:12:41.847
state and federal agencies, such as the Forest Service and the BLM and DEQ.

00:12:41.847 --> 00:12:44.987
and the Fish and Wildlife Service, as well as those mining companies that.

00:12:44.987 --> 00:12:48.227
have operations in Southeast Idaho. One of the major.

00:12:48.227 --> 00:12:51.617
conclusions from that investigation was that site.

00:12:51.617 --> 00:12:54.787
specific investigations were warranted on those larger.

00:12:54.787 --> 00:12:58.067
historic and active open pit mines located in southeast Idaho.

00:12:58.067 --> 00:12:58.067

00:12:58.407 --> 00:13:01.017
And that includes Smokey Canyon Mine and others in the area.

00:13:01.887 --> 00:13:04.977
And that photo was just a historic photo of mining.

00:13:04.977 --> 00:13:06.157
it Smokey Canyon mine.

00:13:10.237 --> 00:13:13.527
So as a result of those that 2000.

00:13:13.527 --> 00:13:16.187
2001 area wide investigation.

00:13:16.647 --> 00:13:19.737

For service being.

00:13:19.737 --> 00:13:22.777
took over the lead to investigate clean up.

00:13:22.777 --> 00:13:25.837
options for these mines. Since we since the mine is on.

00:13:25.837 --> 00:13:28.927
National Forest system land and so the process that.

00:13:28.927 --> 00:13:31.957
the forest services used is the one outlined.

00:13:31.957 --> 00:13:34.967
in the Comprehensive Environmental Response Compensation.

00:13:34.967 --> 00:13:38.177
and Liability Act known as CERCLA we are using.

00:13:38.177 --> 00:13:41.817
our authorities under CERCLA to go.

00:13:41.817 --> 00:13:44.837
through the investigation and cleanup process at the mine so.

00:13:44.837 --> 00:13:47.057
Generally, that entails is a site.

00:13:47.127 --> 00:13:50.267
Investigation or remedial investigation to look at the nature

00:13:50.267 --> 00:13:53.447
and extent of contamination at the site and then we take.

00:13:53.447 --> 00:13:56.787
that information and if action is warranted to.

00:13:56.787 --> 00:13:59.847
deal with the contamination, we go into a feasibility study.

00:13:59.847 --> 00:14:03.247
to look at different alternatives and then after.

00:14:03.247 --> 00:14:06.287
that we generate a proposed plan which we put out.

00:14:06.287 --> 00:14:09.427
for public comment that identifies our preferred alternative for addressing.

00:14:09.427 --> 00:14:12.437
the issues at Smokey Canyon Mine. And that's kind of where we are

00:14:12.437 --> 00:14:15.637
today. We're in the public comment period of that of this process.

00:14:15.637 --> 00:14:15.637

00:14:16.597 --> 00:14:19.677
What's the public comment period ends? We'll look at the comments that.

00:14:19.677 --> 00:14:22.787
we've received. We'll prepare responsiveness summary and that will inform.

00:14:22.787 --> 00:14:25.867
our selection of remedy that is then codified into a record.

00:14:25.867 --> 00:14:27.857
of decision at that point.

00:14:27.947 --> 00:14:30.987
We will look at going into.

00:14:30.987 --> 00:14:33.507
our remedial design and remedial construction.

00:14:35.657 --> 00:14:38.887
So and then and then go into.

00:14:38.887 --> 00:14:42.017
construction of the process as well as looking then at.

00:14:42.017 --> 00:14:45.087
operation and maintenance of what we have constructed in this.

00:14:45.087 --> 00:14:48.407
case, we will do a 5 year review after the end of construction.

00:14:48.407 --> 00:14:51.667
because we will have a waste left in place at the site.

00:14:51.667 --> 00:14:55.287
that because we will not have unrestricted and.

00:14:55.287 --> 00:14:58.057
unlimited use and exposure at the end of this process.

00:15:05.097 --> 00:15:08.717
Just because we are here today in 2023, looking at proposed.

00:15:08.717 --> 00:15:11.917
remedial actions as Smokey Canyon Mine, I.

00:15:11.917 --> 00:15:13.807
did want to note that there is.

00:15:15.157 --> 00:15:18.507
To see that thing out, the martial.

00:15:18.507 --> 00:15:18.507

00:15:23.527 --> 00:15:23.907

00:15:24.957 --> 00:15:27.987
We do have other work that has been done at Smokey Canyon Mine and.

00:15:27.987 --> 00:15:31.157
I just wanted to know if that here in 2003 JR

00:15:31.157 --> 00:15:34.427
Simplot did actually start in site investigation looking.

00:15:34.427 --> 00:15:38.017
at the contamination at Smokey Canyon Mine in too.

00:15:38.017 --> 00:15:41.087
We did what we call removal action.

00:15:41.087 --> 00:15:44.127
at that Pole Canyon Overburned disposal area as.

00:15:44.127 --> 00:15:47.217
I mentioned, Pole Canyon was situated for the overburden.

00:15:47.217 --> 00:15:50.287
disposal area, was placed on top of Pole Canyon Creek into a.

00:15:50.287 --> 00:15:51.927
valley and so.

00:15:52.787 --> 00:15:56.017
What we have done there early on was to take that.

00:15:56.017 --> 00:15:58.477
Creek and route it around the waste dump.

00:15:59.717 --> 00:16:02.897

And then connect it with the creek at the.

00:16:02.897 --> 00:16:06.207
top of the dump. The issue with selenium is.

00:16:06.207 --> 00:16:09.297
that immobilizes when it comes in contact.

00:16:09.297 --> 00:16:12.807
with water, so things like big built.

00:16:12.807 --> 00:16:15.857
over the Creek and rain and snowmelt mobilizes selenium.

00:16:15.857 --> 00:16:17.537
would leeches out into the environment.

00:16:19.277 --> 00:16:22.347
And so that was a (Inaudible) last successful.

00:16:22.347 --> 00:16:25.387
action to deal with some of the water that.

00:16:25.387 --> 00:16:28.567
was entering into that particular overburden disposal.

00:16:28.567 --> 00:16:31.747
area and those pictures to the right are some photos.

00:16:31.747 --> 00:16:35.427
of the pipeline when it was constructed 15.

00:16:35.427 --> 00:16:36.267
or so years ago.

00:16:37.617 --> 00:16:40.667
In 2009, we did start the larger effort.

00:16:40.667 --> 00:16:44.657
to do remedial investigation feasibility study in

00:16:44.657 --> 00:16:47.767
2010, we started looking at water treatment options and.

00:16:47.767 --> 00:16:51.307
that was a reverse osmosis and 0.

00:16:51.307 --> 00:16:52.727
valent iron exchange.

00:16:53.337 --> 00:16:56.547
And then in 2013

00:16:56.547 --> 00:16:59.727
we also did more work at Pole Canyon, the pipeline.

00:16:59.727 --> 00:17:02.757
didn't solve all of our issues and so we still had an.

00:17:02.757 --> 00:17:05.847
infiltration component that was mobilizing selenium, so.

00:17:05.847 --> 00:17:09.197
there was a cover that was placed on top of that over burned disposal area.

00:17:09.197 --> 00:17:09.197

00:17:09.897 --> 00:17:12.927
In 2014, we finished that remedial investigation report to.

00:17:12.927 --> 00:17:16.007
look at the nature and extent contamination in the

00:17:16.007 --> 00:17:19.247
2015. We started looking at a pilot water treatment plant to treat.

00:17:19.247 --> 00:17:22.457
surface water contaminated with selenium and one of the things.

00:17:22.457 --> 00:17:25.617
Simplot was looking at was looking at an.

00:17:25.617 --> 00:17:29.847
innovative technology of a fluidized bed reactor where we have basically microorganisms.

00:17:29.847 --> 00:17:29.847

00:17:30.427 --> 00:17:30.917

00:17:32.727 --> 00:17:35.847
Addressing the selenium contamination that pilot treatment.

00:17:35.847 --> 00:17:38.897
system is still ongoing in a lot of the work that was done for.

00:17:38.897 --> 00:17:42.437

that did inform some of the information.

00:17:42.437 --> 00:17:45.737
and alternatives in the feasibility study which we.

00:17:45.737 --> 00:17:47.357
finished in 2023.

00:17:47.397 --> 00:17:57.397

00:17:59.287 --> 00:18:02.737
So some of the major findings.

00:18:02.737 --> 00:18:06.137
of our remedial investigation as far as groundwater goes.

00:18:06.137 --> 00:18:06.137

00:18:06.627 --> 00:18:09.717
We do have an alluvial plume of

00:18:09.717 --> 00:18:12.777
groundwater that exits the Pole Canyon overburdened.

00:18:12.777 --> 00:18:16.347
disposal area and goes out into Sage Valley?

00:18:16.347 --> 00:18:16.347

00:18:16.927 --> 00:18:20.147
And we also know that groundwater from.

00:18:20.147 --> 00:18:23.757
these overburden disposal areas and these fine panels actually.

00:18:23.757 --> 00:18:26.837
travel down a fault here and express itself as surface.

00:18:26.837 --> 00:18:30.147
water down at Hoopes Springs and at South Fork Sage Creek Springs.

00:18:30.147 --> 00:18:30.147

00:18:35.787 --> 00:18:39.177
That is that for groundwater, for surface.

00:18:39.177 --> 00:18:42.287
water, the major findings were that the surface.

00:18:42.287 --> 00:18:44.657
water expressed here at Hooped Springs.

00:18:47.957 --> 00:18:51.147
Flows into Sage Creek as well as the surface.

00:18:51.147 --> 00:18:54.607
water expressed from south fork Sage Creek and goes down.

00:18:54.607 --> 00:18:57.667
and travels down Sage Creek and meets up with Crow Creek and.

00:18:57.667 --> 00:18:59.857
travels over towards the Wyoming border.

00:19:01.017 --> 00:19:04.137
Some of the levels of contamination that we're seeing.

00:19:04.137 --> 00:19:07.327
at Hoopes Springs are fairly high. They do exceed any.

00:19:07.327 --> 00:19:09.587
of the surface water criteria that we were looking at.

00:19:09.667 --> 00:19:12.557
(inaudible)

00:19:15.427 --> 00:19:18.597
Some of the concentrations we were looking at, I think last year I saw like 100.

00:19:18.597 --> 00:19:21.817
milligrams per liter in the standard is.

00:19:21.817 --> 00:19:21.817

00:19:23.517 --> 00:19:26.587
five. It's not based on the fish tissue, but at the time we were.

00:19:26.587 --> 00:19:29.807
looking at this, it was five. So it's significantly above.

00:19:29.807 --> 00:19:31.887
So we do know that we have a surface water issue.

00:19:36.347 --> 00:19:40.017
Related to surface water, we also looked at the aquatic organisms.

00:19:40.017 --> 00:19:41.467
We know that.

00:19:41.547 --> 00:19:43.497
Slim effects.

00:19:44.147 --> 00:19:47.437
Fish adversely, and as far as their reproduction, so we.

00:19:47.437 --> 00:19:51.047
have been looking at fish for very, very long time down in this area.

00:19:51.047 --> 00:19:51.047

00:19:52.967 --> 00:19:55.997
The State of Idaho has recently adopted a site specific.

00:19:55.997 --> 00:19:59.087
criterion for fish tissue and.

00:19:59.087 --> 00:19:59.737
that is.

00:20:00.877 --> 00:20:04.627
13.6 parts per million of selenium in fish tissue.

00:20:04.627 --> 00:20:07.467
12.5 I believe for the Crow Creek.

00:20:09.587 --> 00:20:10.177
Area.

00:20:11.847 --> 00:20:14.047
We've looked at fish for a long time and.

00:20:15.447 --> 00:20:18.497
LSV 4, which is a little bit downstream of Hoopes.

00:20:18.497 --> 00:20:21.577
springs. We've seen concentrations as high.

00:20:21.577 --> 00:20:25.117
as 50 parts per million in fish. So we know that the.

00:20:25.117 --> 00:20:29.057
fish are adversely affected, and we still have a lot of work to do to.

00:20:29.057 --> 00:20:29.057

00:20:30.177 --> 00:20:31.967
Get fish tissue.

00:20:32.927 --> 00:20:33.297

00:20:34.327 --> 00:20:37.767
Back to where it needs to be in compliance with the new selenium site.

00:20:37.767 --> 00:20:39.177
specific selenium criterion.

00:20:44.207 --> 00:20:47.217
We also looked at terrestrial risks or

00:20:47.217 --> 00:20:48.857
risk to small mammals and birds.

00:20:49.767 --> 00:20:52.837
When we did the risk assessment Pagin 2000.

00:20:52.837 --> 00:20:54.487
5, we.

00:20:55.197 --> 00:20:58.687
Saw these areas deep panel and a panel had some.

00:20:58.687 --> 00:21:00.017
risk to0.

00:21:00.677 --> 00:21:02.647
To buy to terrestrial biota.

00:21:04.197 --> 00:21:07.507
When we looked at this again recently using a different.

00:21:07.507 --> 00:21:10.567
toxicity reference value, that was.

00:21:10.567 --> 00:21:13.697
recently developed for another phosphate mine in.

00:21:13.697 --> 00:21:14.447
the area.

00:21:16.147 --> 00:21:19.047
The risks are really now isolated to panel a.

00:21:20.187 --> 00:21:23.847
And so and it potentially just an outlier.

00:21:25.567 --> 00:21:29.037
In the sampling, we're gonna go back and take a look at that again.

00:21:29.037 --> 00:21:32.137
because we don't really think that there's a potential.

00:21:32.137 --> 00:21:35.837
to risk to small mammals or biota just.

00:21:35.837 --> 00:21:35.837

00:21:36.547 --> 00:21:36.877
No.

00:21:38.097 --> 00:21:42.117
Because we're finding a pretty good functioning population of.

00:21:42.117 --> 00:21:42.117

00:21:43.227 --> 00:21:46.647
Of small mammals and a good food source, so we're not really seeing.

00:21:46.647 --> 00:21:49.977
a lot of population effects to the terrestrial biota.

00:21:49.977 --> 00:21:50.777
at this time.

00:21:53.887 --> 00:21:57.117
So pulling this all together, we do believe there's enough.

00:21:57.117 --> 00:22:00.677
information out there to warrant looking into a feasibility.

00:22:00.677 --> 00:22:04.257
study to develop alternatives to clean up Smokey.

00:22:04.257 --> 00:22:07.717
Canyon Mine. So the feasibility study began in 2016.

00:22:07.717 --> 00:22:10.917
We completed this past January. It comes it's.

00:22:10.917 --> 00:22:14.057
comprised of two parts. We have technical one which.

00:22:14.057 --> 00:22:17.067
really just summarized everything we knew about their media investigation.

00:22:17.067 --> 00:22:20.097
and the risk assessments that we had completed earlier and it looked.

00:22:20.097 --> 00:22:23.897
at developing an initial set of technologies to consider.

00:22:23.897 --> 00:22:23.897

00:22:24.077 --> 00:22:27.207
Into is usually screen those technologies for further consideration.

00:22:27.207 --> 00:22:30.287
and we screened it based on feasibility,

00:22:30.287 --> 00:22:31.637
cost and effectiveness.

00:22:32.297 --> 00:22:35.667
Than technical two took that and did a more detailed.

00:22:35.667 --> 00:22:38.847
analysis and detailed screening of those alternatives against the nine remedy

00:22:38.847 --> 00:22:41.087
selection criteria that's outlined in the law.

00:22:45.607 --> 00:22:48.787
So before we start developing the alternatives and the feasibility.

00:22:48.787 --> 00:22:52.267
study, we need to develop what our objectives.

00:22:52.267 --> 00:22:53.657
are for any remedial action.

00:22:54.617 --> 00:22:57.647
And for groundwater, the remedial action objectives are.

00:22:57.647 --> 00:23:01.047
preventing future use of groundwater {whistling (inaudible)} concentrations.

00:23:01.047 --> 00:23:04.497
above the MCL, which is a health based limit as.

00:23:04.497 --> 00:23:06.677

a drinking source. Until we get clean up levels met.

00:23:07.647 --> 00:23:10.917
Secondly, and in conjunction with that, we do want to reduce for eliminate.

00:23:10.917 --> 00:23:13.987
those concentrations of selenium and contaminated local or.

00:23:13.987 --> 00:23:17.207
wells formation groundwater to below the MCL within a reasonable.

00:23:17.207 --> 00:23:20.307
time frame. Just so that we can at some point.

00:23:20.307 --> 00:23:22.347
use the ground water in the future.

00:23:24.537 --> 00:23:28.047
Another goal is to reduce or eliminate the leeching and the loading of selenium.

00:23:28.047 --> 00:23:31.247
from that groundwater to surface water so it doesn't result.

00:23:31.247 --> 00:23:34.717
in concentrations that represent unacceptable risk to aquatic life.

00:23:34.717 --> 00:23:34.717

00:23:36.727 --> 00:23:37.837
For surface water.

00:23:38.537 --> 00:23:41.547
We also want to eliminate some unacceptable risk to recreational.

00:23:41.547 --> 00:23:44.607
campers or Native Americans from ingestion of nonregulated.

00:23:44.607 --> 00:23:48.067
surface water. Forgot to mention that we have some seeps and detention.

00:23:48.067 --> 00:23:51.247
ponds that are a little bit high as far as arsenic and cadmium.

00:23:51.247 --> 00:23:54.317
so we do want to address those from a human health perspective and.

00:23:54.317 --> 00:23:57.807
those detention ponds and seeps are around.

00:23:57.807 --> 00:23:57.807

00:23:58.517 --> 00:24:00.727
Panel there or around the?

00:24:01.907 --> 00:24:05.077
Overburdened disposal area so the panel D and as well as.

00:24:08.257 --> 00:24:11.387
We also want to reduce the surface selenium concentrations in.

00:24:11.387 --> 00:24:14.487
lower Sage Creek and Crow Creek to below those

00:24:14.487 --> 00:24:17.607
levels that pose unacceptable risks to aquatic life and also comply.

00:24:17.607 --> 00:24:19.987
with the water quality standards from the State of Idaho.

00:24:21.337 --> 00:24:24.587
And for soils, we're looking to reduce or eliminate unacceptable risks.

00:24:24.587 --> 00:24:28.007
to birds from overburden with selenium elevated.

00:24:28.007 --> 00:24:30.707
selenium concentrations on mainly panel a.

00:24:36.327 --> 00:24:39.557
So what were the alternatives that we analyzed for surface water?

00:24:39.557 --> 00:24:42.977
Well, the first one is a no further action alternative and.

00:24:42.977 --> 00:24:44.147
that is required by law.

00:24:45.037 --> 00:24:48.127
The second alternative we looked at was to take that water treatment.

00:24:48.127 --> 00:24:51.247
plant at the Hoopes springs. The Hoopes Springs water treatment plant.

00:24:51.247 --> 00:24:54.327
that we built for Simplot, built as an innovative.

00:24:54.327 --> 00:24:57.487
pilot, it's treating about 2000 gallons per minute.

00:24:57.487 --> 00:25:00.667
And so that we would codify that and just leave it as is.

00:25:00.667 --> 00:25:03.747
So we would, so we basically.

00:25:03.747 --> 00:25:03.747

00:25:04.327 --> 00:25:07.417
Keep things the way they are, or adopt.

00:25:07.417 --> 00:25:10.477
those. We'll also put chert and limestone covers on.

00:25:10.477 --> 00:25:13.577
seeps and ponds to deal with the recreational and.

00:25:13.577 --> 00:25:15.937
Native American human health risks.

00:25:16.967 --> 00:25:20.097
The other alternative we looked at was we call alternative.

00:25:20.097 --> 00:25:21.987
2 B and that be.

00:25:22.977 --> 00:25:26.327
Expanding that water treatment plant at the Hoopes Springs to.

00:25:26.327 --> 00:25:29.387
4000 gallons per minute, essentially doubling.

00:25:29.387 --> 00:25:32.427
er, almost doubling the capacity of that hopefully.

00:25:32.427 --> 00:25:35.547
treat more water to.

00:25:35.547 --> 00:25:36.327
get to.

00:25:37.467 --> 00:25:40.517
Clean up levels faster again, we.

00:25:40.517 --> 00:25:42.777
put those chert limestone covers on the seeps and ponds.

00:25:43.437 --> 00:25:46.607

And what the other surface wall water alternatives?

00:25:46.607 --> 00:25:49.627
we looked at was to do a permeable reactive barrier at.

00:25:49.627 --> 00:25:52.647
the foot of Pole Canyon. Although we have done.

00:25:52.647 --> 00:25:55.847
the routing of water around the dump.

00:25:55.847 --> 00:25:59.567
and put a cover on the dump, there is still some groundwater.

00:25:59.567 --> 00:26:03.227
coming out of the top of the dump and contaminating.

00:26:03.227 --> 00:26:06.567
the legal groundwater at the top of the dump. So this would be an option.

00:26:06.567 --> 00:26:09.787
to look at trying to clean that last little bit of selenium.

00:26:09.787 --> 00:26:11.227
upcoming out of Pole Canyon.

00:26:16.107 --> 00:26:19.057
For source control, looking at the waste dumps themselves.

00:26:20.257 --> 00:26:23.227
Again, looking at no further action, which is required by law.

00:26:24.987 --> 00:26:28.177
The next alternative be to look at putting some Dinwoody and chert.

00:26:28.177 --> 00:26:31.377
covers over some particular target areas where.

00:26:31.377 --> 00:26:31.377

00:26:32.787 --> 00:26:35.927
The existing covers are a little thin, and that would.

00:26:35.927 --> 00:26:37.937
look like putting 2 feet of loose Dinwoody.

00:26:38.687 --> 00:26:39.987
On top of 1 foot.

00:26:41.447 --> 00:26:44.567
Of compacted Dinwoody formation. We'll have two feet of chert.

00:26:44.567 --> 00:26:46.667
or limestone and then graded overburden.

00:26:48.877 --> 00:26:50.627
That'd be from the surface to the base.

00:26:52.297 --> 00:26:55.327
Next, I'll turn it over. We'd be to look at capillary covers.

00:26:55.327 --> 00:26:57.007
over as the same target areas.

00:26:57.727 --> 00:27:00.877
And that looks like from surface to the base.

00:27:00.877 --> 00:27:00.877

00:27:01.587 --> 00:27:04.477
2 feet of Dinwoody on top filter fabric.

00:27:05.107 --> 00:27:08.277
12 inches of screen, chert or limestone, which is a.

00:27:08.277 --> 00:27:11.437
drainage layer 6 inches of grated Dinwoody.

00:27:11.437 --> 00:27:13.027
and then a grated overburden.

00:27:14.557 --> 00:27:17.607
The next one we looked at are enhanced Dinwoody covers over those.

00:27:17.607 --> 00:27:19.927
same target areas and that.

00:27:20.657 --> 00:27:24.137
Is basically from surface to base 1 foot of top soil.

00:27:24.137 --> 00:27:24.137

00:27:24.857 --> 00:27:28.147
2 feet of loose Dinwoody formation, again with drainage benches.

00:27:28.147 --> 00:27:29.467
Some filter fabric.

00:27:30.217 --> 00:27:32.927
Screen 12 inches of screened chert or limestone

00:27:34.157 --> 00:27:37.287
6 inches of what we call enhanced Dinwoody, and that is some.

00:27:37.287 --> 00:27:40.307
screened Dinwoody that's been amended with about 5%.

00:27:40.307 --> 00:27:43.327
bentonite and six inches of screen. Dinwoody screened.

00:27:43.327 --> 00:27:46.767
Dinwoody material and then graded overburden material.

00:27:46.767 --> 00:27:49.787
And that is very similar to the covers that.

00:27:49.787 --> 00:27:53.267
are being put in place now at the portions.

00:27:53.267 --> 00:27:56.147
of Smoky Canyon Mine that are being actively mined.

00:27:58.267 --> 00:27:58.667
The last.

00:27:59.517 --> 00:28:02.607
Alternative 3D is looking at geomembrane.

00:28:02.607 --> 00:28:05.747
covers over the target areas and that really.

00:28:05.747 --> 00:28:05.747

00:28:07.357 --> 00:28:07.887
Apps.

00:28:08.907 --> 00:28:12.117
Again, from surface to base 1 foot of topsoil.

00:28:12.117 --> 00:28:15.257
2 feet of loose Dinwoody formation 6 inches.

00:28:15.257 --> 00:28:18.777
of screened chert that (inaudible) synthetic

geomembrane. 00:28:18.777 --> 00:28:22.177

layer 1 foot of whether Dinwoody formation as a protective.

00:28:22.177 --> 00:28:23.937
subgrade and then graded overburden.

00:28:25.127 --> 00:28:28.507
And the last alternative is really to look at that portion of panel.

00:28:28.507 --> 00:28:30.197
A too.

00:28:30.937 --> 00:28:33.967
Address the potential (inaudible) be just.

00:28:33.967 --> 00:28:37.347
putting a Dinwoody cover of a portion of panel the.

00:28:37.347 --> 00:28:41.087
previous three covers were really looking at trying to prevent infiltration.

00:28:41.087 --> 00:28:44.117
going into the waste dumps to prevent leaching of (inaudible).

00:28:44.117 --> 00:28:47.407
and into groundwater, and ultimately surface water, whereas.

00:28:47.407 --> 00:28:50.847
panel a does not seem to have selenium.

00:28:50.847 --> 00:28:53.887
which she out of that particular area.

00:28:53.887 --> 00:28:57.867
into the groundwater monitored, we don't see any exceedances.

00:28:57.867 --> 00:29:00.857
And so this is really to do more of a surface.

00:29:01.387 --> 00:29:04.757
Cover to deal with the potential.

00:29:04.757 --> 00:29:05.457
risk to birds.

00:29:06.317 --> 00:29:08.767
The alternative three is a little different than the rest of them.

00:29:12.297 --> 00:29:15.357
And again, elements that are common to all the alternatives would.

00:29:15.357 --> 00:29:18.447
be institutional controls, and that is to prevent current.

00:29:18.447 --> 00:29:21.547
use and future use until clean up levels have been in.

00:29:21.547 --> 00:29:24.567
the groundwater access controls as we're.

00:29:24.567 --> 00:29:27.967
constructing the remedy as well as Smoky.

00:29:27.967 --> 00:29:29.527
Canyon Mine is still an active minw.

00:29:29.847 --> 00:29:32.917
Revegetating those overburden disposal.

00:29:32.917 --> 00:29:36.017
areas where we do the work again.

00:29:36.017 --> 00:29:37.237
operations and maintenance.

00:29:37.917 --> 00:29:41.387
We have a monitored natural attenuation as a polishing.

00:29:41.387 --> 00:29:44.667
step for the groundwater. We'll put the source.

00:29:44.667 --> 00:29:47.747
we'll deal with the source by putting some covers on them, and then we'll.

00:29:47.747 --> 00:29:49.227
look at the groundwater and.

00:29:49.947 --> 00:29:53.397
And monitor it and then long term monitoring.

00:29:53.397 --> 00:29:57.117
just for all the pieces of the remedy, whether it's monitoring.

00:29:57.117 --> 00:30:00.867
the surface water, monitoring, the groundwater, monitoring how the covers perform.

00:30:00.867 --> 00:30:00.877

00:30:06.617 --> 00:30:09.837
The criteria that we use are outlined in CERCLA. They're called the nine remedy.

00:30:09.837 --> 00:30:12.847
selection criteria. So we take a look at all these alternatives.

00:30:12.847 --> 00:30:15.887
and we evaluate them against the criteria themselves.

00:30:15.887 --> 00:30:19.467
And then we look at how the different options.

00:30:19.467 --> 00:30:23.237
perform against each other relative to the 9 criteria and.

00:30:23.237 --> 00:30:26.647
the criteria are overall protection of human healthy.

00:30:26.647 --> 00:30:29.787
environment and compliance with what we call applicable or.

00:30:29.787 --> 00:30:32.837
relevant and appropriate requirements otherwise known.

00:30:32.837 --> 00:30:36.247
as ARARs. And those are threshold criteria that must be met and the.

00:30:36.247 --> 00:30:37.607
ARARS are basically.

00:30:37.807 --> 00:30:39.717
Other requirements under other environmental laws.

00:30:41.787 --> 00:30:45.527
We're looking at long term effectiveness and permanence. How will it function?

00:30:45.527 --> 00:30:48.977
and perform over the long term? We'd like to see reduction.

00:30:48.977 --> 00:30:52.497
of the toxicity, mobility and volume of the contaminant.

00:30:52.497 --> 00:30:55.937
through treatment. We have two criteria, does have a preference for treatment.

00:30:55.937 --> 00:30:59.397
and we're looking at short term effectiveness. How does it perform?

00:30:59.397 --> 00:31:02.457
or how effective are we going to be and how?

00:31:02.457 --> 00:31:04.197

long does it take to reach our goals.

00:31:05.247 --> 00:31:08.537
Implementability can we build it and?

00:31:08.537 --> 00:31:11.767
cost those are the primary balancing.

00:31:11.767 --> 00:31:13.137
factors that we look at.

00:31:13.817 --> 00:31:17.267
The last two factors are called modifying criteria.

00:31:17.267 --> 00:31:20.447
and that's state or support agency acceptance.

00:31:20.447 --> 00:31:23.587
and community acceptance and we will get.

00:31:23.587 --> 00:31:26.727
the information we need to make those assessments during.

00:31:26.727 --> 00:31:27.937
this public comment period.

00:31:32.827 --> 00:31:35.957
So quickly when we look at how the surface water alternatives.

00:31:35.957 --> 00:31:39.087
look against the 9 circular criteria down the left.

00:31:39.087 --> 00:31:42.097
hand side and just sort of matrix of the alternatives.

00:31:42.097 --> 00:31:43.197
across the top.

00:31:43.857 --> 00:31:46.967
I'm not going to go into a whole lot of detail in this.

00:31:46.967 --> 00:31:50.107
other than it kind of depicts where we are looking.

00:31:50.107 --> 00:31:53.207
at. We don't believe that the no further action is going to be.

00:31:53.207 --> 00:31:57.047
protected by human healthy environment or the comply with ARARs so that.

00:31:57.047 --> 00:32:00.587
sort of that just drops off between the two.

00:32:00.587 --> 00:32:03.687
water treatment alternatives that Hoopes Springs we're looking.

00:32:03.687 --> 00:32:06.847
at the 2000 gallons per minute and the 4000 gallons per minute.

00:32:06.847 --> 00:32:06.847

00:32:08.137 --> 00:32:11.227
See that the 4000 gallons per minute?

00:32:11.227 --> 00:32:14.767
rates higher in terms of effectiveness and permanence and

00:32:14.767 --> 00:32:17.927
reduction of toxicity, mobility and volume?

00:32:17.927 --> 00:32:21.017
through treatment as well as short term effectiveness.

00:32:21.017 --> 00:32:24.167
We'll get to our goal sooner, although it does come.

00:32:24.167 --> 00:32:25.097
at a higher cost.

00:32:26.387 --> 00:32:29.507
When we look at alternative to see which is just looking at.

00:32:29.507 --> 00:32:32.527
can we put a PRB or should we put a PRB in the whole?

00:32:32.527 --> 00:32:35.657
Canyon, it does rank higher than looking at it versus doing?

00:32:35.657 --> 00:32:38.777
nothing. And so at a relatively low cost.

00:32:38.777 --> 00:32:41.847
we can get some additional.

00:32:41.847 --> 00:32:41.847

00:32:43.737 --> 00:32:46.747
Clean up at Pole Canyon and to hopefully deal with that would.

00:32:46.747 --> 00:32:47.747
be groundwater or plume.

00:32:52.247 --> 00:32:55.337
When we look at source control alternatives analysis the same thing.

00:32:55.337 --> 00:32:56.347
similar matrix.

00:32:57.557 --> 00:33:00.487
We're really looking at, we focused on.

00:33:01.427 --> 00:33:04.437
The enhanced Dinwoody versus the geomembrane cover.

00:33:04.437 --> 00:33:06.777
the capillary breaks and the Dinwoody Chert covers.

00:33:09.117 --> 00:33:12.197
For more on the reduction of toxicity mobility.

00:33:12.197 --> 00:33:15.227
and volume, although we don't have a treatment component for the.

00:33:15.227 --> 00:33:16.037
source control.

00:33:16.537 --> 00:33:20.287
They were not as effective at minimizing the mobility.

00:33:20.287 --> 00:33:23.467
of the selenium contamination and.

00:33:23.467 --> 00:33:25.947
the enhanced annuity and the GM bring cover.

00:33:27.627 --> 00:33:28.207
Scored.

00:33:28.957 --> 00:33:29.427
Better.

00:33:31.397 --> 00:33:34.567
The difference between the two is generally going to be cost.

00:33:34.567 --> 00:33:37.787
where the enhanced into what he is going to be.

00:33:37.787 --> 00:33:41.207

a little bit lower in cost than the geomembrane cover.

00:33:41.207 --> 00:33:41.207

00:33:44.977 --> 00:33:48.057
And again, we'll look at state and community acceptance after the public comment period.

00:33:48.057 --> 00:33:48.057

00:33:49.267 --> 00:33:53.157
Again, we're looking at the panel a portion for.

00:33:53.157 --> 00:33:53.157

00:33:54.127 --> 00:33:57.397
For the Dinwoody to deal with them, the potential risk to birds.

00:33:57.397 --> 00:34:01.147
and we're kind of looking at that versus the no further action and again.

00:34:01.147 --> 00:34:01.157

00:34:03.057 --> 00:34:06.327
We're looking at and there maybe it's probably.

00:34:06.327 --> 00:34:08.437
marginal effectiveness.

00:34:09.657 --> 00:34:12.507
Compared to no action just because we the risk.

00:34:13.217 --> 00:34:16.657
Seems to be low for birds as it stands.

00:34:16.657 --> 00:34:16.657

00:34:20.457 --> 00:34:23.827
So just to pull this all together and summarize all this.

00:34:23.827 --> 00:34:26.927
for surface water alternative 2B.

00:34:26.927 --> 00:34:30.347
increasing the capacity of that water treatment plant is.

00:34:30.347 --> 00:34:33.447
projected to be water quality standards and Sage Creek and Crow.

00:34:33.447 --> 00:34:36.617
Creek and provides the greatest level of treatment and long.

00:34:36.617 --> 00:34:38.867
term effectiveness. Although it does come at a higher cost.

00:34:40.107 --> 00:34:43.507
Of those four our source control cover alternatives for the Wells Formation.

00:34:43.507 --> 00:34:47.697
groundwater and surface water. The enhanced Dinwoody provides.

00:34:47.697 --> 00:34:50.757
the highest level of performance it provides.

00:34:50.757 --> 00:34:53.867
the greatest level of reduction of selenium concentrations and the.

00:34:53.867 --> 00:34:57.067
Wells Formation, groundwater and surface water added water cost.

00:34:57.067 --> 00:34:58.617
compared to the geomembrane cover.

00:34:59.457 --> 00:35:02.507
Which is much more expensive and provides a similar, similar level.

00:35:02.507 --> 00:35:03.297
of performance.

00:35:04.567 --> 00:35:08.087
For (inaudible), the potential risk of virgin marginal for the current conditions.

00:35:08.087 --> 00:35:11.157
and we're not sure and we believe that the installation.

00:35:11.157 --> 00:35:14.327
of a soil cover may have some negative impacts to habitat.

00:35:14.327 --> 00:35:17.477
at the areas where we need to borrow the material.

00:35:17.477 --> 00:35:18.787
to create that cover.

00:35:19.437 --> 00:35:23.147

The enhanced in what the cover for is.

00:35:23.147 --> 00:35:23.147

00:35:25.337 --> 00:35:28.567
We'll probably what's the Dinwoody that we would use for the enhanced?

00:35:28.567 --> 00:35:31.907
and Dinwoody cover is already being mined. Smokey Canyon Mine is as a result.

00:35:31.907 --> 00:35:34.187
of some other mining activities that are going on so.

00:35:35.447 --> 00:35:38.857
Don't know that they will have a (inaudible), a lot of borrow area associated.

00:35:38.857 --> 00:35:40.657
with the enhanced Dinwoody cover.

00:35:44.617 --> 00:35:47.727
So what we've identified in our proposed plan for the preferred.

00:35:47.727 --> 00:35:49.527
alternative is.

00:35:50.957 --> 00:35:54.067
Looking at that alternative to be the water treatment plant.

00:35:54.067 --> 00:35:56.287
expanding that to 4000 gallons per minute.

00:35:57.157 --> 00:35:59.007
Implementing some institutional controls.

00:35:59.947 --> 00:36:02.747
Placing some chert and limestone covers on seeps and ponds.

00:36:03.397 --> 00:36:06.487
Doing some O&M monitored natural attenuation.

00:36:06.487 --> 00:36:07.587
and long term monitoring.

00:36:09.017 --> 00:36:12.107
Water treatment alternatives the alluvial groundwater looking.

00:36:12.107 --> 00:36:12.817
at installing that.

00:36:13.597 --> 00:36:16.787
Permeable reactive barrier down grading of the Pole Canyon of.

00:36:16.787 --> 00:36:20.327
overburden disposal area. Looking at high three looking.

00:36:20.327 --> 00:36:23.387
at O&M monitor natural attenuation zone and long.

00:36:23.387 --> 00:36:24.197
term monitoring.

00:36:25.827 --> 00:36:29.057
And also looking at alternative 3C that enhanced.

00:36:29.057 --> 00:36:32.247
Dinwoody cover for target areas over the waste dumps.

00:36:32.247 --> 00:36:32.247

00:36:32.677 --> 00:36:34.967
Or overburned disposal areas.

00:36:35.667 --> 00:36:38.517
Doing some revegetation institutional controls.

00:36:39.257 --> 00:36:42.587
O&M monitor, natural attenuation, long term monitoring.

00:36:42.587 --> 00:36:42.587

00:36:43.227 --> 00:36:46.867
The total present worth of the.

00:36:46.867 --> 00:36:49.997
recommended site Sitewide remedy above is just.

00:36:49.997 --> 00:36:51.787
under $140 million.

00:36:52.487 --> 00:36:56.137
The final remedy for the site will be selected by the Forest in consultation.

00:36:56.137 --> 00:36:59.227
with the support agencies, based on the evaluation of.

00:36:59.227 --> 00:37:01.637
the information and any of the comments that we have received.

00:37:04.447 --> 00:37:07.477
So what are our next steps? We're taking public.

00:37:07.477 --> 00:37:11.077
comments on the proposed plan for 30 days originally.

00:37:11.077 --> 00:37:14.997
we looked at May 26 at the end of the 30 day comment period we.

00:37:14.997 --> 00:37:18.047
received a request to extend it by 15.

00:37:18.047 --> 00:37:21.277
days. So we agreed to that. And so the new date.

00:37:21.277 --> 00:37:23.367
for accepting comments by is June 10th.

00:37:24.597 --> 00:37:28.037
We will prepare our response in the summary to the public comments.

00:37:28.037 --> 00:37:31.447
this summer. We hope to have a record of decision in the fall.

00:37:31.447 --> 00:37:34.767
and then we will begin negotiating a consent decree with Simplot.

00:37:34.767 --> 00:37:38.237
for the redesign and construction. Hopefully the end of this year into next year.

00:37:38.237 --> 00:37:38.237

00:37:39.047 --> 00:37:42.077
And like to begin to be to begin implementation.

00:37:42.077 --> 00:37:45.277
in 2025. It's kind of an aggressive schedule but.

00:37:45.277 --> 00:37:48.797
I think the support agencies and Simplot are.

00:37:48.797 --> 00:37:48.797

00:37:50.227 --> 00:37:51.287
Are amenable to that?

00:37:52.947 --> 00:37:56.017

So again, to submit comments on the proposed.

00:37:56.017 --> 00:37:59.057
plan, please send them to me at this address or.

00:37:59.057 --> 00:38:03.217
you can submit them by email to myself and Sarah Wheeler and.

00:38:03.217 --> 00:38:03.217

00:38:04.377 --> 00:38:05.697
Take some questions or comments.

00:38:05.737 --> 00:38:15.737

00:38:19.407 --> 00:38:22.557
Sherri doesn't appear that we're receiving any questions as.

00:38:22.557 --> 00:38:24.667
of right now. We'll give it another.

00:38:26.177 --> 00:38:27.097
Few minutes.

00:38:27.857 --> 00:38:28.617
Or another minute.

00:38:28.657 --> 00:38:38.657

00:38:38.657 --> 00:38:48.657

00:38:48.657 --> 00:38:58.657

00:38:58.657 --> 00:39:08.657

00:39:13.957 --> 00:39:17.247
It doesn't appear that we have any questions coming in we'd.

00:39:17.247 --> 00:39:20.367
like to take this opportunity to thank everybody for.

00:39:20.367 --> 00:39:23.547
joining. We again apologize for the delay.

00:39:23.547 --> 00:39:24.347
at the beginning.

00:39:24.687 --> 00:39:28.377
And thank you all and have a good evening.

00:39:28.377 --> 00:39:28.377

00:39:28.417 --> 00:39:38.417

00:39:38.417 --> 00:39:47.767

Letter from WDEQ with Comments on the Draft ROD, dated July 30, 2024

July 30, 2024

Alan Jones
USDA Forest Service
Remote
Layton, UT 84041

Submitted via: alan.jones2@usda.gov

Re: Draft Record of Decision Smoky Canyon Mine CERCLA

Dear Mr. Jones,

Per your request, the Wyoming Department of Environmental Quality - Water Quality Division (WDEQ-WQD) has reviewed the draft Record of Decision (ROD) for Smoky Canyon Mine developed by the Caribou-Targhee National Forest under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) to identify any significant issues. The draft ROD, which was not substantively changed from the Proposed Plan, describes the remedial action objectives (RAOs) and Applicable or Relevant and Appropriate Requirements (ARARs) associated with contamination of soils, surface water, and groundwater, and the Forest Service's Selected Remedy to achieve the RAOs and ARARs associated with Smoky Canyon Mine in Caribou County, Idaho, the site of a former phosphate mine. WDEQ-WQD appreciates the Forest Service's responses to the June 15, 2023 comments that WDEQ-WQD provided on the 2023 Proposed Plan. However, the responses are inadequate, as the Selected Remedy and draft ROD do not ensure compliance with Wyoming Water Quality Rules, Chapter 1, Wyoming Surface Water Quality Standards (Wyoming Surface Water Quality Standards), specifically Wyoming's aquatic life chronic total recoverable selenium criteria of 5 ug/L. As such, WDEQ-WQD is unable to support the ROD as drafted, nor can it concur with the Selected Remedy.

As provided in our June 15, 2023 comments on the 2023 Proposed Plan, WDEQ-WQD takes considerable interest in the Selected Remedy and ROD because a 15.6-mile segment of Crow Creek downstream of the Idaho state line has been included on Wyoming's 303(d) List of Impaired Waters since 2014 for not supporting its aquatic life uses due to concentrations of total recoverable selenium that exceed Wyoming's chronic aquatic life total recoverable selenium criteria of 5 µg/L, as established in Wyoming Surface Water Quality Standards. It is for this reason WDEQ-WQD requested that Wyoming's total recoverable aquatic life chronic selenium criteria of 5 µg/L be included as a surface water ARAR in the Proposed Plan. WDEQ-WQD continues to request that Wyoming's total recoverable aquatic life chronic selenium criteria of 5 µg/L be included as a surface water ARAR since the response the Forest Service provided to our request is not accurate.

The Forest Service described that compliance with Idaho's site-specific aquatic life criteria for selenium will ensure compliance with Wyoming's aquatic life criteria for selenium because Idaho's site-specific aquatic life water column dissolved selenium criteria is 4.2 µg/L and Wyoming's aquatic life criteria for dissolved selenium is 4.61 µg/L using the conversion factor included in Wyoming's Surface Water Quality

Standards. This rationale is problematic for two reasons. First, although Idaho's site-specific aquatic life criteria for selenium requires dissolved selenium concentrations to be below 4.2 µg/L in Crow Creek, this water column concentration may not be met because it can be superseded by fish tissue elements in circumstances where fish tissue data is available. Compliance with the fish tissue element is described in multiple locations in the draft ROD. For example, page 15 of the draft ROD states, "The site-specific whole body fish tissue criterion for Crow Creek is 12.5 mg/kg, which is currently exceeded at Crow Creek locations downstream of Sage Creek. The cleanup level for selenium in surface water in the water column in Crow Creek is 4.2 µg/L (IDEQ, 2022). Similar to Sage Creek, fish tissue data for Crow Creek are available, therefore the cleanup goal is based on the fish tissue criterion." Second, the footnote in Wyoming's Surface Water Quality Standards that describes the conversion between total selenium and dissolved selenium whereby the 5.0 µg/L total recoverable selenium concentration equates to 4.61 µg/L dissolved selenium was not approved by the United States Environmental Protection Agency (USEPA) and is therefore not a water quality standard effective for Clean Water Act purposes.

WDEQ-WQD would also like to note some inconsistencies and concerns associated with the Forest Service's responses to comments on the 2023 Proposed Plan regarding compliance with Wyoming Surface Water Quality Standards. In one comment, Earthworks/Crow Creek Conservation Alliance (CCCA) inquired as to what ARARs will apply in Crow Creek in Wyoming and where these will be monitored and enforced. The Forest Service described that compliance with the Wyoming standard will be based on meeting the selenium concentrations in surface water at the Wyoming state line (either as total selenium concentration of 5 µg/L or as a dissolved selenium concentration of 4.61 µg/L) and that Simplot currently collects selenium and other water quality data at the Wyoming/Idaho state line and will continue to do so in the future. The Forest Service also notes that Simplot has collected fish tissue samples with the Wyoming Game and Fish Department downstream of the state line and will do so in the future to ensure compliance.

The Forest Service's response is not consistent with the draft ROD, which does not include Wyoming's Surface Water Quality Standards as an ARAR. In addition, as outlined previously, Wyoming's conversion of 5 µg/L total selenium to 4.61 µg/L dissolved selenium is not effective for Clean Water Act purposes because it was not approved by USEPA. Further, compliance with Wyoming's total recoverable chronic aquatic life criteria selenium of 5 µg/L at the state line may not sufficiently address legacy selenium in Crow Creek, including potential leaching of selenium from sediments and groundwater seepage. Finally, collection of fish tissue data in Wyoming will not ensure compliance with Wyoming's Surface Water Quality Standards, as Wyoming's criteria currently do not include any fish tissue elements. To address these issues, WDEQ-WQD recommends the Forest Service revise the response and ROD such that Wyoming's total recoverable aquatic life chronic selenium criteria of 5 µg/L is included as an ARAR and compliance with the ARAR will be met through monitoring Crow Creek in Wyoming where elevated concentrations of selenium have been documented and legacy selenium contributions may be present. At a minimum, monitoring must be conducted over the entire 15.6-mile impaired segment of Crow Creek in Wyoming.

WDEQ-WQD also recommends the Forest Service revise the response to another comment provided by Earthworks/CCCA that inquired about the lack of additional monitoring sites downstream of the state line. In this comment, Earthworks/CCCA questioned how monitoring at the state line would ensure the full extent of the impacts and how it would be possible to determine whether mitigation measures are adequately addressing the impacts. The response provided by the Forest Service described that Simplot collected fish tissue samples with the Wyoming Game and Fish Department in 2022 downstream of the state line near Fairview, Wyoming; remedial actions will be monitored to measure progress toward

meeting cleanup levels; and monitoring locations and protocols will be determined through the remedial design process. As described previously, fish tissue monitoring in Wyoming will not ensure compliance with Wyoming's Surface Water Quality Standards. Also, while WDEQ-WQD understands that the exact monitoring locations and protocols will be determined during the remedial design process, it is essential that the ROD is clear and consistent regarding Wyoming's Surface Water Quality Standard as an ARAR and that monitoring in Crow Creek in Wyoming includes all areas potentially impacted by the contamination.

Given our concerns with the draft ROD and our interest in ensuring Wyoming's Surface Water Quality Standards are met through the CERCLA process, we appreciate the Forest Service's response to our request to be included as a support agency moving forward. It is our understanding that WDEQ-WQD can request that our involvement be formalized either through the Consent Decree or through a Memorandum of Understanding. We will consult with our legal counsel on these options and will provide you with our decision as soon as possible.

WDEQ-WQD notes that the draft ROD describes that the State of Idaho, represented by Idaho Department of Environmental Quality (IDEQ), agrees with the USFS's decision to implement Alternatives 2b, 2c, and 3c and that IDEQ provided technical support to the USFS during the CERCLA process. Given the proximity and impact of the site on Wyoming, the ROD and CERCLA process would benefit if Wyoming, represented by WDEQ, was supportive of the Selected Remedy and ROD. To this end, WDEQ-WQD appreciates the opportunity to review the draft ROD and looks forward to working with the Forest Service to address our concerns.

WDEQ-WQD recognizes the Forest Service's and other stakeholders' efforts to address selenium in Crow Creek in Wyoming. Should you have any questions regarding our comments, please contact Ron Steg at ron.steg@wyo.gov or 307-335-6980.

Sincerely,

Jennifer Zygmunt
Water Quality Division Administrator

cc: David Waterstreet, Watershed Protection Section Manager
Ron Steg, Assessment and TMDL Program Lead
Lindsay Patterson, Surface Water Quality Standards Coordinator
Tori Nye, Environmental Review Coordinator

APPENDIX E

ARARs

Appendix E: Applicable or Relevant and Appropriate Requirements

ARARs	Alternative 1 No Further Action	Alternative 2 Water Treatment (Surface Water) Alternative 2a Water Treatment at the Hoopes WTP (2,000 gpm), ICs, Chert/Limestone Covers on Seeps and Ponds, O&M, MNA, LTM	Alternative 2 Water Treatment (Surface Water) Alternative 2b ater Treatment at the Hoopes WTP (4,000 gpm), ICs, Chert/Limestone Covers on Seeps and Ponds, O&M, MNA, LTM	Alternative 2 Water Treatment (Alluvial Groundwater) Alternative 2c PRB Downgradient of Pole Canyon ODA, ICs, O&M, MNA, LTM	Alternative 3 Source Control (Wells Formation Groundwater and Surface Water) Alternative 3a Dinwoody/Chert Covers Over Target Areas, ICs, O&M, MNA, LTM	Alternative 3 Source Control (Wells Formation Groundwater and Surface Water) Alternative 3b Capillary Covers Over Target Areas, ICs, O&M, MNA, LTM	Alternative 3 Source Control (Wells Formation Groundwater and Surface Water) Alternative 3c Enhanced Dinwoody Covers Over Target Areas, ICs, O&M, MNA, LTM	Alternative 3 Source Control (Wells Formation Groundwater and Surface Water) Alternative 3d Geomembrane Covers Over Target Areas, ICs, O&M, MNA, LTM	Alternative 3 Source Control (Soils) Alternative 3e Dinwoody Covers Over a Portion of Panel A, ICs, O&M, LTM
Chemical Specific									
Selenium - Idaho Public Drinking Water Systems Rules (IDAPA 58.01.08)	Will no meet	Substantive requirements will be met if a public drinking water system is established	See Alternative 2a	Substantive requirements will be met if a public drinking water system is established	Substantive requirements will be met if a public drinking water system is established	See Alternative 3a	See Alternative 3a	See Alternative 3a	--
Selenium - National Primary Drinking Water Regulations (NPDWR) (40 CFR 141) and Idaho Ground Water Quality Rule (IDAPA 58.01.11)	Selenium concentrations in Wells Formation groundwater are predicted to be slightly above the MCL by 2060 (the limit of the modeling) and will continue to decrease after this time. Selenium concentrations in alluvial groundwater are predicted to reduce below the MCL by 2060 except a relatively small area in Pole Canyon; no waiver is justified	Selenium concentrations in Wells Formation groundwater are predicted to be slightly above the MCL by 2060 (the limit of the modeling) and will continue to decrease after this time.	See Alternative 2a	Selenium concentrations in alluvial groundwater are predicted to reduce below the MCL by 2060 except a relatively small area in Pole Canyon; no waiver is justified	Selenium concentrations in Wells Formation groundwater are predicted to be slightly above the MCL by 2060 (the limit of the modeling) and will continue to decrease after this time; no waiver is justified	See Alternative 3a	See Alternative 3a	See Alternative 3a	--
Selenium - Idaho Site-Specific Aquatic Life Criteria (IDAPA 58.01.02.287.03-05) Hoopes Spring/Sage Creek = 20.5 mg/kg egg/ovary, 13.6 mg/kg whole body, 0.0167 mg/L water Crow Creek = 20.5 mg/kg gg/ovary, 12.5 mg/kg whole body, 0.0042 mg/L water	0.0167 mg/L water quality standard will be achieved in lower Sage Creek in approximately 25 years; 0.0042 mg/L water quality standard will not be achieved in Crow Creek by 2060 (the model limit); no waiver justified	0.0167 mg/L water quality standard will be met in Hoopes Spring/Sage Creek in 15 years; 0.0042 mg/L water quality standard will be met in Crow Creek in 30 years	0.0167 mg/L water quality standard will be met in Hoopes Spring/Sage Creek in <1 years; 0.0042 mg/L water quality standard will be met in Crow Creek in 10 years	--	See Alternative 1	See Alternative 1	See Alternative 1	See Alternative 1	--
Selenium - Wyoming Water Quality Rules, Chapter 1, Wyoming Surface Water Quality Standards (Reference Number 020.0011.1.04242018), specifically aquatic life chronic total recoverable selenium criteria of 0.005 mg/L	0.005 mg/L water quality standard will not be achieved in Crow Creek by 2060 (the model limit); no waiver justified	0.005 mg/L water quality standard will be met in Crow Creek in 30 years	0.005 mg/L water quality standard will be met in Crow Creek in 10 years	--	See Alternative 1	See Alternative 1	See Alternative 1	See Alternative 1	--
Resource Conservation and Recovery Act (RCRA) provides for testing of solid wastes for toxicity characteristics to determine proper disposal (40 CFR 261.20 to 261.24)	--	Will meet standards for disposal of treatment residuals and sludge	See Alternative 2a	Will meet standards for disposal of treatment media	--	--	--	--	--
Idaho Rules and Standards for Hazardous Waste establishes criteria for identification, treatment, storage or disposal of hazardous waste (IDAPA 58.01.05)		Will meet standards for disposal of treatment residuals and sludge	See Alternative 2a	Will meet standards for disposal of treatment media	--	--	--	--	--
Clean Water Act (CWA) Section 303(d) streams at Smoky Canyon Mine listed as impaired for selenium include: Crow Creek, North Fork Sage Creek, Pole Canyon Creek, South Fork Sage Creek, Sage Creek (33 USC 1251) (40 CFR 130.7)	Will not meet	Will meet water quality standard for selenium in streams in <1-30 years, depending on segment	See Alternative 2a	--	Will not meet; no waiver is justified	See Alternative 3a	See Alternative 3a	See Alternative 3a	--
Clean Water Act (CWA) Section 301(b) and Section 402 require the best treatment and control technology to meet effluent limitations prior to discharge (40 CFR 125.3)	--	Will meet	See Alternative 2a	--	--	--	--	--	--
Clean Water Act (CWA) Section 401 requires submittal of a Section 401 certification with a Section 402 NPDES permit or a Section 404 permit (13 USC 1341) (40 CFR 124.53)	--	Will meet certification requirements for point-source discharge from Hoopes WTP	See Alternative 2a	--	Will meet certification requirements for discharge of dredged or fill material	See Alternative 3a	See Alternative 3a	See Alternative 3a	See Alternative 3a

ARARs	Alternative 1 No Further Action	Alternative 2 Water Treatment (Surface Water) Alternative 2a Water Treatment at the Hoopes WTP (2,000 gpm), ICs, Chert/Limestone Covers on Seeps and Ponds, O&M, MNA, LTM	Alternative 2 Water Treatment (Surface Water) Alternative 2b ater Treatment at the Hoopes WTP (4,000 gpm), ICs, Chert/Limestone Covers on Seeps and Ponds, O&M, MNA, LTM	Alternative 2 Water Treatment (Alluvial Groundwater) Alternative 2c PRB Downgradient of Pole Canyon ODA, ICs, O&M, MNA, LTM	Alternative 3 Source Control (Wells Formation Groundwater and Surface Water) Alternative 3a Dinwoody/Chert Covers Over Target Areas, ICs, O&M, MNA, LTM	Alternative 3 Source Control (Wells Formation Groundwater and Surface Water) Alternative 3b Capillary Covers Over Target Areas, ICs, O&M, MNA, LTM	Alternative 3 Source Control (Wells Formation Groundwater and Surface Water) Alternative 3c Enhanced Dinwoody Covers Over Target Areas, ICs, O&M, MNA, LTM	Alternative 3 Source Control (Wells Formation Groundwater and Surface Water) Alternative 3d Geomembrane Covers Over Target Areas, ICs, O&M, MNA, LTM	Alternative 3 Source Control (Soils) Alternative 3e Dinwoody Covers Over a Portion of Panel A, ICs, O&M, LTM
Action Specific									
Clean Water Act (CWA) Section 402 requires a permit for pointsource discharges and specifies BMPs for storm water management (13 USC 1342) (40 CFR 122-124)	--	Will meet permit requirements for point-source discharge from Hoopes WTP	See Alternative 2a	--	--	--	--	--	--
Idaho Rules Governing Point Source Discharges and Point Source Wastewater Treatment Requirements provides limits and restrictions on temperature and turbidity of discharges to receiving and downstream waters (IDAPA 58.01.02.400-401)	--	Will meet discharge requirements for effluent from Hoopes WTP to Hoopes Spring drainage and South Fork Sage Creek	See Alternative 2a	--	--	--	--	--	--
Clean Water Act (CWA) Section 404 requires a permit for discharge of dredged or fill material to surface water and compensatory mitigation (33 USC 1344) (40 CFR 230)	--	--	--	Will meet standards for construction in upper Pole Canyon Creek	Will meet standards for construction in Sage Creek	See Alternative 3a	See Alternative 3a	See Alternative 3a	Will meet standards for construction in North Fork Sage Creek and upper Pole Canyon Creek
Idaho Stream Channel Alteration Rules include minimum standards for construction to prevent alterations that will impact stream channels during remedial actions (IDAPA 37.03.07)	--	--	--	Will meet standards for construction in upper Pole Canyon Creek	Will meet standards for construction in Sage Creek	See Alternative 3a	See Alternative 3a	See Alternative 3a	Will meet standards for construction in North Fork Sage Creek and upper Pole Canyon Creek
Resource Conservation and Recovery Act (RCRA) Subtitle C exemption for extraction, beneficiation and processing mining waste (40 CFR 261.4(b)(7))	--	--	--	--	Overburden waste rock is exempt from RCRA Subtitle C requirements	See Alternative 3a	See Alternative 3a	See Alternative 3a	See Alternative 3a
Idaho Solid Waste Management Rules establish requirements for solid waste generated as part of the remedial action (IDAPA 58.01.06)	--	Will meet substantive requirements for solid waste generated at Hoopes WTP	See Alternative 2a	Will meet substantive requirements for solid waste generated at PRB	--	--	--	--	--
Idaho Hazardous and Deleterious Material Storage specifies measures and controls to ensure that hazardous chemicals will not enter state waters (IDAPA 58.01.02.800)	--	Will meet controls for chemical storage at Hoopes WTP	See Alternative 2a	--	--	--	--	--	--
Idaho Well Construction Standards Rules establish requirements for construction of new wells or abandonment of existing wells (IDAPA 37.03.09)	--	Will meet	See Alternative 2a	See Alternative 2a	See Alternative 2a	See Alternative 2a	See Alternative 2a	See Alternative 2a	--
Idaho Uniform Environmental Covenants Act establishes requirements for land use controls on private property (Idaho Code 55-3001 to 3015)	--	--	--	--	Will meet requirements for private lands (e.g., borrow areas) in Sage Valley	See Alternative 3a	See Alternative 3a	See Alternative 3a	See Alternative 3a
Mineral Leasing Act (MLA) includes provisions for reclamation (30 USC 181) (43 CFR 3500 and 3590)	--	--	--	--	Will meet revegetation plans for covers on overburden areas	See Alternative 3a	See Alternative 3a	See Alternative 3a	See Alternative 3a
Surface Mining Control and Reclamation Act (SMCRA) establishes performance standards for reclamation of mined areas (30 USC 1201–1326) (30 CFR 45-47, 111, 784, 816.43)	--	--	--	--	Will meet substantive requirements for design of cover and run-on and runoff controls	See Alternative 3a	See Alternative 3a	See Alternative 3a	See Alternative 3a
Idaho Surface Mining Act provides authority for Rules Governing Mined Land Reclamation which include procedures for reclamation to protect natural resources, reduce soil erosion, and require revegetation to be comparable to premining conditions (Idaho Code 47-15) (IDAPA 20.03.02.140)	--	--	--	--	Will meet substantive requirements for reclamation and revegetation of overburden areas	See Alternative 3a	See Alternative 3a	See Alternative 3a	See Alternative 3a

ARARs	Alternative 1 No Further Action	Alternative 2 Water Treatment (Surface Water) Alternative 2a Water Treatment at the Hoopes WTP (2,000 gpm), ICs, Chert/Limestone Covers on Seeps and Ponds, O&M, MNA, LTM	Alternative 2 Water Treatment (Surface Water) Alternative 2b ater Treatment at the Hoopes WTP (4,000 gpm), ICs, Chert/Limestone Covers on Seeps and Ponds, O&M, MNA, LTM	Alternative 2 Water Treatment (Alluvial Groundwater) Alternative 2c PRB Downgradient of Pole Canyon ODA, ICs, O&M, MNA, LTM	Alternative 3 Source Control (Wells Formation Groundwater and Surface Water) Alternative 3a Dinwoody/Chert Covers Over Target Areas, ICs, O&M, MNA, LTM	Alternative 3 Source Control (Wells Formation Groundwater and Surface Water) Alternative 3b Capillary Covers Over Target Areas, ICs, O&M, MNA, LTM	Alternative 3 Source Control (Wells Formation Groundwater and Surface Water) Alternative 3c Enhanced Dinwoody Covers Over Target Areas, ICs, O&M, MNA, LTM	Alternative 3 Source Control (Wells Formation Groundwater and Surface Water) Alternative 3d Geomembrane Covers Over Target Areas, ICs, O&M, MNA, LTM	Alternative 3 Source Control (Soils) Alternative 3e Dinwoody Covers Over a Portion of Panel A, ICs, O&M, LTM
Action Specific (continued)									
Idaho Hazardous Substance Emergency Response Act requires expedient response and/or containment for release of a hazardous substance (Idaho Code 39-7101 to 7115)	--	--	Will meet substantive requirements if there is a release during remedial actions	See Alternative 2b	See Alternative 2b	See Alternative 2b	See Alternative 2b	See Alternative 2b	See Alternative 2b
Clean Air Act (CAA) establishes air quality standards for particulate matter (40 CFR 50, 40 CFR 52.670)	--	--	Will meet substantive requirements for particulate matter	See Alternative 2b	See Alternative 2b	See Alternative 2b	See Alternative 2b	See Alternative 2b	See Alternative 2b
Idaho Rules for the Control of Air Pollution in Idaho and Rules for Control of Fugitive Dust provide practices for controlling fugitive dust emissions (IDAPA 58.01.01)	--	--	Will meet substantive requirements for fugitive dust emissions	See Alternative 2b	See Alternative 2b	See Alternative 2b	See Alternative 2b	See Alternative 2b	See Alternative 2b
Migratory Bird Treaty Act (MBTA) protects migratory birds and their nests and eggs (16 USC 703)	--	--	Will plan construction schedule to meet	See Alternative 2b	See Alternative 2b	See Alternative 2b	See Alternative 2b	See Alternative 2b	See Alternative 2b
Fish and Wildlife Coordination Act protects fish and fish habitat (50 CFR 10.12)	--	--	Will meet	See Alternative 2b	See Alternative 2b	See Alternative 2b	See Alternative 2b	See Alternative 2b	See Alternative 2b
Idaho Classification and Protection of Wildlife Rule prohibits taking or possessing protected nongame and threatened or endangered species (IDAPA 13.01.06)	--	--	Will meet	See Alternative 2b	See Alternative 2b	See Alternative 2b	See Alternative 2b	See Alternative 2b	See Alternative 2b
Idaho Protection of Animals and Birds prohibits the taking of wildlife, birds or fur-bearing animals, protects wildlife, but allows for control of predators that damage private property (Idaho Code 36-11)	--	--	Will meet	See Alternative 2b	See Alternative 2b	See Alternative 2b	See Alternative 2b	See Alternative 2b	See Alternative 2b
Endangered Species Act (ESA) protects threatened or endangered species and their habitat and requires consultation with USFWS (7 USC 136, 16 USC 460, 16 USC 1531) (50 CFR 402)	--	--	Will consult with FWS if Canada lynx are observed	See Alternative 2b	See Alternative 2b	See Alternative 2b	See Alternative 2b	See Alternative 2b	See Alternative 2b
Bald and Golden Eagle Protection Act provides for protection of bald and golden eagles, their nests, and eggs (16 USC 668) (50 CFR 22)	--	--	Will meet	See Alternative 2b	See Alternative 2b	See Alternative 2b	See Alternative 2b	See Alternative 2b	See Alternative 2b

ARARs	Alternative 1 No Further Action	Alternative 2 Water Treatment (Surface Water) Alternative 2a Water Treatment at the Hoopes WTP (2,000 gpm), ICs, Chert/Limestone Covers on Seeps and Ponds, O&M, MNA, LTM	Alternative 2 Water Treatment (Surface Water) Alternative 2b ater Treatment at the Hoopes WTP (4,000 gpm), ICs, Chert/Limestone Covers on Seeps and Ponds, O&M, MNA, LTM	Alternative 2 Water Treatment (Alluvial Groundwater) Alternative 2c PRB Downgradient of Pole Canyon ODA, ICs, O&M, MNA, LTM	Alternative 3 Source Control (Wells Formation Groundwater and Surface Water) Alternative 3a Dinwoody/Chert Covers Over Target Areas, ICs, O&M, MNA, LTM	Alternative 3 Source Control (Wells Formation Groundwater and Surface Water) Alternative 3b Capillary Covers Over Target Areas, ICs, O&M, MNA, LTM	Alternative 3 Source Control (Wells Formation Groundwater and Surface Water) Alternative 3c Enhanced Dinwoody Covers Over Target Areas, ICs, O&M, MNA, LTM	Alternative 3 Source Control (Wells Formation Groundwater and Surface Water) Alternative 3d Geomembrane Covers Over Target Areas, ICs, O&M, MNA, LTM	Alternative 3 Source Control (Soils) Alternative 3e Dinwoody Covers Over a Portion of Panel A, ICs, O&M, LTM
Location Specific									
National Historic Preservation Act (NHPA) provides for mitigation of impacts to historic properties (54 USC 300101) (36 CFR 60, 63, 800)	--	--	--	--	Will meet if any historic sites are discovered	See Alternative 3a	See Alternative 3a	See Alternative 3a	See Alternative 3a
Idaho Preservation of Historical Sites provides authorization to preserve historic sites (Idaho Code 67-41 and 67-46)	--	--	--	--	Will meet if any historic sites are discovered	See Alternative 3a	See Alternative 3a	See Alternative 3a	See Alternative 3a
Archaeological Resources Protection Act (ARPA) establishes procedures for protection of archaeological resources (43 CFR 7)	--	--	--	--	Will meet if any archaeological resources are identified	See Alternative 3a	See Alternative 3a	See Alternative 3a	See Alternative 3a
Native American Graves Protection and Repatriation Act (NAGPRA) establishes procedures for return of cultural items to the Tribes (25 USC 3001-3013) (43 CFR 10)	--	--	--	--	Will meet substantive requirements if cultural items are discovered	See Alternative 3a	See Alternative 3a	See Alternative 3a	See Alternative 3a
National Environmental Policy Act (NEPA) for protection of wetlands (40 CFR 6 Appendix A) (Executive Order 11990 as amended by Executive Order 12608)	--	Will meet	See Alternative 2a	See Alternative 2a	See Alternative 2a	See Alternative 2a	See Alternative 2a	See Alternative 2a	See Alternative 2a
National Forest Management Act establishes goals, requirements and land management plans for national forests, regulates timber harvesting, and sets standards for timber sales (16 USC 1601-1614) (36 CFR 219)	--	--	--	--	Will meet	See Alternative 3a	See Alternative 3a	See Alternative 3a	See Alternative 3a
Revised Forest Plan Caribou National Forest and Revised Forest Plan Targhee National Forest establish management standards for sustainability of watersheds, forests, and rangelands and provide for multiple uses (USFS 2003, 1997)	--	Will meet forest goals and treaty protected hunting, fishing, and gathering rights of the Shoshone-Bannock Tribes	See Alternative 2a	See Alternative 2a	See Alternative 2a	See Alternative 2a	See Alternative 2a	See Alternative 2a	See Alternative 2a
Federal Land Policy and Management Act (FLPMA) provides for management and protection of public lands to prevent undue degradation (43 USC 1701-1785)	--	Will meet	See Alternative 2a	See Alternative 2a	See Alternative 2a	See Alternative 2a	See Alternative 2a	See Alternative 2a	See Alternative 2a
Rules for Fences in General provides specifications for erection of lawful fences and establishment of gates around seeps and ponds, if needed (Idaho Code 35-1)	--	Will Meet if fencing is required	See Alternative 2a	See Alternative 2a	See Alternative 2a	See Alternative 2a	See Alternative 2a	See Alternative 2a	See Alternative 2a

Notes:
ARAR - Applicable or Relevant and Appropriate Requirement
FWS - United States Fish and Wildlife Service
IDAPA - Idaho Administrative Procedures Act
WTP - Water Treatment Plant