

1.0 INTRODUCTION

The J.R. Simplot Company (Simplot) owns and operates the Smoky Canyon phosphate mine in southeastern Idaho (Figure 1-1). The Smoky Canyon mine is the subject of an Administrative Order on Consent (AOC) entered into by the State of Idaho Department of Environmental Quality (IDEQ), the U.S. Forest Service (USFS), the U.S. Environmental Protection Agency (EPA), and Simplot (IDEQ, USFS and EPA, 2003). The AOC, and its accompanying Scope of Work (SOW), provide a mechanism to investigate the potential environmental effects of phosphate mining and milling operations at the Smoky Canyon mine and develop remedies to address any environmental conditions that represent a risk to human health or the environment.

The AOC divides the Smoky Canyon Mine into two areas of study, Area A and Area B. Area A (referenced as “the Site” in this report) consists of the extent of the mine at the time the AOC was signed (mine panels A, D and E) and related facilities located on National Forest system land (Figure 1-2). Area B is the Smoky Canyon mine tailings ponds area, which is located on Simplot-owned property (Figure 1-2).

In accordance with the AOC, a Site Investigation (SI) and Engineering Evaluation/Cost Analysis (EECA) are being conducted to evaluate and address environmental conditions within Area A. The purpose of the Area A SI is to identify existing conditions that either represent unacceptable risks to ecological and human receptors or do not meet applicable standards for environmental quality. Such conditions are to be addressed through removal actions¹ developed and evaluated in this EECA. Specifically, Simplot is to conduct an EECA to develop and evaluate removal action alternatives to address any unacceptable environmental conditions for the historical (inactive) portions of the Site. The Site conditions evaluated through the SI and EECA are those that exist as a result of the past mining activities performed under the original Bureau of Land Management (BLM) and USFS-approved mine plan.

The USFS is the lead agency for Area A studies with IDEQ, the BLM, U.S. Fish and Wildlife Service (USFWS), EPA, the Bureau of Indian Affairs (BIA) and Shoshone-Bannock Tribes designated as support agencies.

The SI was performed during 2003 and 2004 in accordance with the scope of work presented in the Area A Site Investigation Work Plan (MFG, 2003a) and procedures described by the Field Sampling Plan (FSP) for the SI (MFG, 2003b). The findings of the investigation, including the nature and extent of contamination, the fate and transport of constituents of potential concern

¹ “Removal Actions” is the regulatory label given to remedial actions identified through the EECA process. Removal actions include the full range of source control, treatment, and institutional controls.

(COPCs) and resultant risks to human and ecological receptors, were detailed in the SI Report (NewFields, 2005).

The findings presented in the SI report serve as the basis for identifying the removal action goals (RAGs) and support the evaluation of removal actions designed to achieve the objectives and goals presented in this EECA.

1.1 Background Information

Beginning in 1996, isolated livestock deaths associated with excessive selenium intake in the vicinity of historic phosphate mines in southeast Idaho (i.e., South Maybe Canyon, Wooley Valley and Conda mines) prompted concerns within various state and federal agencies regarding potential human health and ecological effects from the past mining operations. In response to these concerns, the primary mine operators in the region formed the Idaho Mining Association (IMA) Selenium Committee to jointly and voluntarily investigate and address any mining-related environmental and public health issues associated with the past operations. Similarly, an interagency and industry group, the Selenium Working Group, was formed to facilitate voluntary collaboration among the participating federal, state and tribal agencies as well as other stakeholder groups, including the phosphate mine operators. In 2000, many of these same parties entered into an AOC, known as the Area-Wide AOC, to formalize their agreement to evaluate and address both area-wide and site-specific human health and ecological risks related to past phosphate mining practices in southeastern Idaho. Parties to the Area-Wide AOC include IDEQ, USFS, BLM, EPA, USFWS and five mining companies, including the J.R. Simplot Company. The Area-Wide AOC establishes the process used to conduct investigations and characterize risks associated with historic and active mining at an "Area-Wide" scale. The Area-Wide AOC required Simplot to enter into the previously described AOC to conduct a SI/EECA specifically for Area A of the Smoky Canyon Mine.

Area A consists of the mine and related facilities located on National Forest system land under lease and special-use permit to Simplot (Figure 1-2), and it also includes the areal extent of contamination beyond those leases and the special-use permit area, as identified through the SI. As such, Area A comprises all areas of the Site developed to date, except for the tailings impoundments (Area B), ongoing mining at the E Panel, and recently permitted activities specifically associated with the Panels B and C 2002 Mine Plan, including backfilling of the A Panel pit with B & C Panel overburden (BLM and USFS, 2002).

1.2 Historical and Current Mining Activities and Relationship to the EECA

Mining at E Panel and the newly opened Panels B and C is occurring under the current Mine Plan (BLM and USFS, 2002), which includes requirements for reclamation of mining features once activities are complete. Reclamation procedures and operations have been modified since

the beginning of mining in 1983 (BLM and USFS, 1981), and in particular, since the potential for selenium releases to the environment and associated risks were more recently identified. Reclamation has included simple contouring and seeding for the first panels mined through the current best management practices (BMPs). Recent and current closure and reclamation practices have been designed to be effective for addressing COPC releases at the Site. Current BMPs include management of mine materials to leave backfilled pits and external overburden disposal areas (ODAs) with a layer of chert over the seleniferous overburden prior to top-soiling and seeding the surface. Covering will isolate the seleniferous overburden from surface weathering, erosion and offsite transport in runoff. The soil cover will retain moisture and support vegetation which will reduce net infiltration. The underlying chert layer will minimize root penetration into the selenium overburden and prevent bioaccumulation of selenium by the reseeded grasses and herbaceous plants.

Actions considered under the EECA relate to features remaining from past mining activities. For features where reclamation activities required by the mine plan are ongoing, the EECA assesses the expected final condition of those areas as the starting point for evaluation of removal action alternatives. The final removal action selected will need to complement the ongoing reclamation activities and leave the Site in a condition that meets removal action objectives (RAOs) over the long term.

The Smoky Canyon Mine currently consists of mine panels A, B, C, D and E, which include open pits, backfilled pits and external ODAs (see Figure 1-3). The following provides a basic description of the operational status of the mine panels and identifies the specific mine features that are addressed in the EECA.

- **A Panel.** The A Panel was mined from 1984 through 1995. A portion of the pit was backfilled during mining and reclaimed with areas of topsoil and vegetation. This area and the remaining open portion of the pit are currently being backfilled with overburden from Panels B and C and reclaimed. The surface of the backfilled pit will be reclaimed in accordance with the 2002 Mine Plan (BLM and USFS, 2002) and is not addressed in the EECA.
- **A Panel External ODA.** Overburden was placed in the external ODA in 1984 and 1985. Some topsoiling and seeding reclamation activities were performed through 1989. The area is evaluated in the EECA.
- **Pole Canyon ODA.** Overburden from mining at A Panel was placed externally, in the eastern portion of Pole Canyon, from 1985 through 1990. The east side was sloped and seeded in 1992 through 1995. Overburden from mining at D Panel was placed on the west side in 1997 and subsequently reclaimed. The area is evaluated in the EECA.

- **D Panel Pit and External ODA.** The D panel was mined from 1992 through 1997. The pit was concurrently backfilled and overburden was also placed in an external ODA in 1993 and 1994. The pit and external ODA have been reclaimed using soil (northern area) or chert and soil (southern area) as cover. The northern area of the backfilled pit and the external ODA are evaluated in the EECA.
- **E Panel Pit and External Overburden Area.** Mining of the E Panel began in 1998. The panel has been mined and backfilled with the exception of E-0 pit, which continues to be mined. Simplot plans to ultimately backfill the E-0 pit with overburden from future mining at the proposed F and G panels to the south. Material was placed in an external ODA from 1998 to 2000. The external ODA has recently been backfilled and reclaimed, consistent with the current BMPs. The E Panel external ODA has a chert cap covered with topsoil and vegetation. The external ODA is evaluated in the EECA.
- **Panels B and C.** Mining is actively occurring in Panels B and C. As described above, some overburden is currently being placed to fill portions of A Panel. The areas disturbed by mining at B and C Panels are not included in Area A, as defined by the AOC, and therefore were not included in the SI investigations. These areas and the future Panels B and C backfilled pits will be reclaimed per the requirements of the 2002 Mine Plan (BLM, USFS, 2002) and are not addressed in the EECA.

1.3 EECA Approach

The EECA presents and evaluates a range of removal action alternatives to address unacceptable environmental conditions identified through the SI. The information is presented by source area and also considered on a Site-wide basis. Consistent with the AOC and the SI Work Plan (MFG, 2003a), principal components of this EECA are:

- Finalization of the RAOs to define the objectives of cleanup actions (preliminary RAOs were identified in Section 11.2.2 of the SI Report);
- Identification of an appropriate range of removal action alternatives;
- Detailed analysis of removal action alternatives against the CERCLA criteria of effectiveness, implementability and cost by source area;
- Comparative analysis of alternatives to evaluate the relative performance of each alternative in relation to each of the CERCLA criteria;
- Identification of the alternative(s) that has the highest relative performance and that is recommended for selection.

This approach is consistent with EPA EECA Guidance (EPA, 1993).

1.4 Report Organization

This report presents the findings of the EECA and is organized as follows:

- Section 2 reviews the screening criteria and applicable or relevant and appropriate requirements (ARARs) identified during the SI and provides goals and objectives for the removal action.
- Section 3 provides a summary of the findings of the SI, with particular focus on the areas and environmental issues that need to be addressed in the EECA.
- Section 4 describes technical information from testing at the Site, at other phosphate mines in the region, and at other sites within the United States that supports identification and development of an appropriate range of removal action alternatives.
- Section 5 identifies the removal action alternatives evaluated in the EECA and includes a discussion of options that were screened out from consideration.
- Section 6 describes the detailed analysis of the removal action alternatives against the EECA criteria of effectiveness, implementability and cost.
- Section 7 describes the comparative analysis, where the alternatives are compared and contrasted to identify the advantages and disadvantages of each alternative relative to one another and any key tradeoffs that would affect the remedy selection.
- Section 8 identifies a preferred group of removal actions that are recommended for comprehensive application at the Site.