EXPLANATION OF SIGNIFICANT DIFFERENCES

FOR THE

WHITE KING/LUCKY LASS SUPERFUND SITE
LAKEVIEW, OREGON

LAKE COUNTY

September 2006
EXPLANATION OF SIGNIFICANT DIFFERENCES

White King/Lucky Lass Mines Site
Lakeview, Oregon
CERCLIS ID: OR712230765

INTRODUCTION AND STATEMENT OF PURPOSE

The U.S. Environmental Protection Agency (EPA) is issuing this Explanation of Significant Differences (ESD) to document two modifications to EPA's Record of Decision, which selected the final remedial action for the Fremont National Forest/White King and Lucky Lass Uranium Mines (USDA) NPL site, referred to as the White King/Lucky Lass Uranium Site or Mines site. The Oregon Department of Environmental Quality (ODEQ), Oregon Department of Energy (ODOE) and The U.S. Department of Agriculture Forest Service (USFS or Forest Service) support the need for this ESD. This ESD makes the following changes to the final remedy:

1. During the course of construction of the selected remedy at the Lucky Lass stockpile, a greater volume of contaminated material near the surface was identified. This ESD provides for additional grading and cover of this area to achieve the cleanup goals rather than removal of all material above cleanup levels as described in the ROD.

2. During the course of construction of the selected remedy at the Lucky Lass stockpile construction equipment was unable to access the offpile area near the toe of the Lucky Lass Stockpile. These materials will be covered in place rather than removed as described in the ROD.

3. Inspections and maintenance of the LL stockpile, in accordance with the Inspection and Maintenance plan for the White King mine waste repository, will be required since constituents of concern above cleanup levels will remain at the Lucky Lass stockpile

These modifications maintain the protectiveness of the remedy.

STATUTORY AUTHORITY

EPA is issuing this ESD in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Section 117(c), and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), Section 300.435(c)(2)(i), which authorize changes to the selected remedial action after the issuance of a Record of Decision (ROD). This ESD is supported by an Administrative Record.
The Administrative Record for this ESD is available for review at the Superfund Records Center, EPA Region 10, 1200 Sixth Avenue, 7th floor, Seattle Washington.

EPA is the lead regulatory agency for the Mines site and the Forest Service, ODE and ODEQ are the respective Federal and state support agencies.

SITE HISTORY, CONTAMINATION, AND SELECTED REMEDY

BACKGROUND

The White King/Lucky Lass Mines site consists of two former uranium mining areas located in south-central Oregon, approximately 17 miles northwest of Lakeview, Oregon. The Mines site encompasses approximately 140 acres affected by uranium mining activities. The major features at the White King Mine include a water-filled excavation pit covering 13.4 acres (pond), a protore stockpile covering 17 acres, an overburden stockpile covering 24 acres, areas where overburden and ore were dumped or spilled during the mining operations including haul roads, and Augur Creek which flows adjacent to the two White King stockpiles. The stockpiles contain soil and mineralized rock that were removed from the mine pit. The major features at the Lucky Lass Mine include a 5 acre water-filled excavation pit (pond), a 14 acre overburden stockpile, and an adjacent meadow. The Record of Decision (ROD) addresses contaminated soils, waste rock, and ground water at the White King and Lucky Lass Mines, and contaminated water and sediments at the water filled excavation pit (pond) located at the White King Mine. The selected remedy includes consolidating and covering of the most highly contaminated soils from both mines at the White King Mine area and continued neutralization of the acidity in the White King pond.

Remedial Action Objectives and Selected Remedy for Lucky Lass Stockpile

RAOs

Section 12 of the ROD established Remedial Action Objectives (RAOs) for the White King/Lucky Lass Site under current and future use scenarios. The RAOs for the Lucky Lass site are as follows:

Lucky Lass Soils

• Prevent direct contact with the contaminated soils to reduce potential risks from incidental soil ingestion and threat from external radiation exposure.

• Prevent any future use of stockpile soils with contaminant concentrations in excess of protective levels.

Lucky Lass Mine Groundwater
• Monitoring ground water upgradient and downgradient of the stockpile to ensure that the potential beneficial uses of groundwater (discharge to surface water) meet applicable standards (Oregon's State water quality standards (OAR 340-41-925) at the boundary of the waste management area with Augur Creek and/or to establish a trend toward background concentrations.

• Prevent any human exposure and future use of ground water beneath the stockpile with contaminant concentrations in excess of Federal and State drinking water standards or protective levels.

The Selected Remedy achieves RAOs through a combination of consolidation and capping of contaminated soils, and institutional controls. Monitoring will be conducted on ground water to insure the remedy is protective.

At the Lucky Lass Mine stockpile RAOs were to be accomplished through completion of the following actions as established in the ROD:

_Lucky Lass Stockpile_

• All surface soils that exceed the levels shown in Table 12-5 of the ROD will be excavated and placed within the White King mine waste repository. Most of these soils were identified in the Lucky Lass meadow, downhill from the overburden pile and Lucky Lass pit, with the highest uranium activities occurring in the upper 1 to 2 feet of soil. Other soils with elevated radium-226 activity occurred on top of the Lucky Lass stockpile as a reddish-black rock, which contrasts with the lower activity chalk-colored overburden. It is estimated that approximately 3,000 cubic yards of soil exceed a cleanup level of 3.6 pCi/g for radium-226 and 38 mg/kg for arsenic. A field screening methodology for identification of these soils, similar to the approach outlined above for the White King soils, will be developed during the design. The excavated areas will be restored to existing grade including 3 inches of topsoil. The Lucky Lass stockpile material that has been impacted by drainage from the Lucky Lass pond will also be excavated and moved so that there is no further erosion impact from the Lucky Lass pond drainage. The excavated material will be regraded with the Lucky Lass stockpiles and the excavated area will be restored with riprap to reduce erosion.

• Implement institutional controls to prevent removal or residential use of the remaining Lucky Lass stockpile soils and prohibit installation of drinking water wells within the stockpile.

**BASIS FOR THE SIGNIFICANT DIFFERENCES**

The changes to the remedy documented in this ESD will allow continued successful remediation of the Lucky Lass stockpile at little additional cost. Existing institutional
controls and O&M requirements will support the long-term protectiveness of the remedy.

DESCRIPTION OF THE SIGNIFICANT DIFFERENCES

This ESD modifies two elements of the selected remedy as described below. No other elements of the remedy are being changed, nor are the RAOs and cleanup levels identified in the ROD being changed. These changes are already being implemented.

Modification of the Volume of Lucky Lass Soils Removed

Basis for and explanation of the change

The ROD required that all surface soils at LL that exceed the cleanup level be excavated and moved to the consolidated White King mine waste repository. Most of these soils were identified in the Lucky Lass meadow, downhill from the overburden pile and Lucky Lass pit, with the highest uranium activities occurring in the upper 1 to 2 feet of soil. Other soils with elevated radium-226 activity occurred on top of the Lucky Lass stockpile as a reddish-black rock. The excavated areas were to be restored to existing grade including 3 inches of topsoil.

The Lucky Lass stockpile material that had been impacted by drainage from the Lucky Lass pond would also be excavated and moved so that there is no further erosion impact from the Lucky Lass pond drainage. The excavated materials were to be regraded with the Lucky Lass stockpiles and the excavated area restored with riprap to reduce erosion.

The ROD was based on data gathered during the Remedial Investigation/Feasibility Study (RI/FS). For the Lucky Lass (LL) site, soil samples had been collected to determine whether concentrations of constituents of concern (COCs) exceeded local background. Radium-226 (Ra-226) activity (measured in pCi/g) was used as the indicator parameter for all COCs. Background for the LL site was set at 3.6 pCi/g, which was lower than the 6.8 pCi/g background for the White King site. Based on the data at the time of the RI/FS, an estimated 3,000 cubic yards of material at LL exceeded the cleanup level. It was determined that removal of these materials would bring the site into compliance with established cleanup criteria. The 3,000 cubic yards of off-pile soils and black rock would be placed in the White King mine waste repository at the White King site.

As part of the remedial design, a gamma survey method for determining whether the Ra-226 cleanup level had been achieved was developed. The gamma meter measurements were correlated to a known Radium-226 source. At LL, the black rock interfered with the gamma survey because it was significantly above the LL cleanup level of 3.6 pCi/g. During the 2005 construction season, the black rock was picked up and temporarily stockpiled on the western lobe of the LL overburden pile (this material was subsequently moved to the White King mine waste repository). Subsequent gamma surveys showed that average Ra-226 levels still exceeded the LL cleanup level on portions of the LL overburden pile. Test pits were then dug at several locations at the overburden pile to
determine the depth of the elevated readings. While Ra-226 activity dropped with depth, it was determined that significantly more material (at least 8,000 cubic yards) than the originally estimated 3,000 cubic yards would need to be removed from the LL site to achieve the cleanup goals. As a result, a decision was made to close the LL overburden pile in place by providing additional grading and cover of the LL stockpile.

**Description of the change**

The actions associated with this change are as follows:

- stabilize the LL overburden pile in place by cutting back the outward slopes to 3.5H:1V and establish 3% to 7% slopes for drainage on the top of the pile,
- place the LL off-pile soils into the LL overburden pile
- Cover 3.5H:1V slopes with 8 inches of cover soil and 4 inches of topsoil/armor rock to establish vegetation and prevent erosion. Cover lesser slopes with 6 inches of cover soils and 4 inches of topsoil/armor rock to establish vegetation and prevent erosion
- construct armored channels in critical drainages on the pile,
- establish a vegetated cover over the stockpile
- move the black rock to the White King mine waste repository (total of 1,140 cubic yards).
- conduct inspections and maintenance of the LL stockpile in accordance with the Inspection and Maintenance plan for the White King mine waste repository, and
- place a fence around the LL stockpile

Due to the generally lower Ra-226 levels at the LL site, the LL cover design differs from the White King design by reducing the thickness of the cover soil layer. However, the same armored rock/soil mulch will be used for the surficial layer to minimize the erosion potential at the site. Based upon previous experience at this site 10 to 12 inches of cover should provide adequate shielding to prevent exposure above cleanup levels.

To ensure that cleanup criteria are achieved, a gamma survey of the final cover will be conducted. If the survey identifies areas that exceed cleanup criteria (per the procedures laid out in the Sampling and Analysis Plan), additional cover material will be placed to bring the elevated levels into compliance.

In addition to the above, a fence will be installed around the perimeter of the overburden pile. Ground water monitoring and site inspections and cover maintenance will be conducted in accordance with the site wide I& M plan to ensure that the remedy remains effective. Institutional controls will be maintained at the LL as per the ROD to protect the cover and prevent unrestricted future use.
Modification of the Volume of Meadow Soils Removed

Basis for and explanation of the change

During construction of the selected remedy construction equipment was unable to access a one acre area near the toe of the Lucky Lass Stockpile. A shallow groundwater table and surface seeps cause the subject area to remain saturated throughout the summer season. Any effort to access this area with a heavy piece of equipment could result in the vehicle getting stuck and doing more damage to this area. Removal of the off-pile material in this area would require the construction of numerous ramps and working pads, and would likely result in the generation of a large quantity of cross-contaminated material. For these reasons, the impacted soils in this area will be covered with topsoil rather than removed. The relatively thin cover soils in this area will enable achievement of cleanup standards and still allow the re-establishment of existing plants in this area. Water tables and surface drainage will not be affected by the addition of this soil.

Description of the change

Clean cover material, consisting of a minimum thickness of 4-inches of topsoil, will be spread over the Lucky Lass Meadow off-pile area near the toe of the re-graded slope of the Lucky Lass Stockpile, approximately to the limits shown on design drawings no. 128, Rev F and 130, Rev F (which are based on the gamma screening cleanup levels). The topsoil layer will be hydroseeded upon completion of placement.

Institutional Controls

Because the Lucky Lass mine area is situated entirely on National Forest System land, institutional controls must be implemented through Forest Service mechanisms. Land use restrictions are required to prevent residential/recreational use at the mine, installation of drinking water wells within the stockpile, and removal of stockpile material. As discussed for the White King stockpile an amendment to the Forest Plan has been made by the Forest Service to prohibit these and other uses. In addition the area of the Lucky Lass Mine has been withdrawn from mining as described for the White King Stockpile remedy. As an informational device the Mines site will be maintained on DEQ’s Environmental Cleanup Site Information Database as long as the institutional controls are required. The changes identified in this ESD do not require any changes to the institutional control requirements in the ROD.

ESTIMATED COSTS

The estimated cost in the ROD for the Lucky Lass stockpiles was $258,000. To date the actual costs for work conducted at Lucky Lass is approximately $347,000.
SUPPORT AGENCY COMMENTS

The Oregon Department of Environmental Quality, Oregon Department of Energy, and Forest Service have had an opportunity to review this ESD and support these changes to the remedy.

PUBLIC PARTICIPATION

CERCLA’s public participation requirements, which are described at 40 CFR 300.435(c)(2)(i), will be met through issuance of this ESD, making this ESD and supporting information available to the public in the administrative record, and publishing a notice of this ESD in a local newspaper.

STATUTORY DETERMINATIONS

The selected remedy, as modified by this ESD, remains protective of human health and the environment, complies with federal and state requirements as identified in the ROD that are applicable or relevant and appropriate to the remedial action, is cost effective, and uses permanent solutions and alternative treatment technologies to the maximum extent practicable. This remedy continues to satisfy the statutory preference for treatment as a principal element of the remedy. Because this remedy will continue to result in hazardous substances remaining on-site above levels that allow for unlimited use and unrestricted exposure, a review will be conducted every five years to ensure that the remedy continues to provide adequate protection of human health and the environment.

Daniel D. Opalski, Director
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EPA Region 10

Date