Smoky Canyon Mine
Panels F & G Draft EIS

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Description of Proposed Action and Alternatives

2.1 Introduction

This chapter describes Simplot's existing operations at the Smoky Canyon Mine, Simplot's Proposed Action, and the Alternatives to the Proposed Action. The proposed mining operations would consist of several open pits in Panels F and G, topsoil stockpiles, mine equipment-parking areas, access and haul roads, a power line extension, pit backfills, external overburden disposal areas, and runoff/sediment control facilities. Mining activities would include environmental protection practices to reasonably reduce environmental impacts.

Alternatives considered in the EIS are based on issues identified by the BLM and the USFS, and comments received during the public scoping process. Alternatives developed for consideration in this EIS are intended to reduce potential impacts associated with the Proposed Action.

2.2 Project History

2.2.1 Background

Simplot has been involved in phosphate mining in southeast Idaho since 1945, originally at the Gay Mine on the Fort Hall Indian Reservation. It acquired Anaconda Company's fertilizer operations at Conda in 1959. In 1984, Simplot began extracting phosphate ore from deposits located on federal land at its Smoky Canyon Mine in eastern Caribou County, Idaho. The operation includes mining with standard open pit techniques in five mine panels (A- E) and then concentrating the phosphate content of the ore in an onsite mill. The concentrate is pumped through a buried pipeline to Simplot's existing fertilizer manufacturing plant (Don Plant) in Pocatello, Idaho. Tailings from the Smoky Canyon milling operation are disposed of in two onsite permitted tailings disposal ponds located on private land owned by Simplot.

2.2.2 Past Environmental Impact Reviews

There have been a number of environmental reviews conducted under NEPA for the Smoky Canyon Mine property and operations.

In 1981, the United States Geological Survey (USGS), then in charge of administering phosphate mining, prepared a Draft EIS (DEIS) for mining at the Smoky Canyon Mine in conjunction with the USFS. The Final EIS (FEIS) and the Record of Decision (ROD) for the approval of the mining operations were completed in 1982 and included approval of the following:

- Open pit mining operations in five Panels A through E;
- Onsite disposal of mine overburden in two main disposal sites external to the pits;
- Construction and operation of a mill and associated power line, water supply wells, and access road;
- Tailings pipeline to the tailings ponds and a return water line;
- Two tailings ponds located east of the mine for disposal of mill tailings;

- Installation of the slurry pipeline to Conda; and
- Reclamation of the facilities upon completion of operations.

The conditional permits granted by the BLM and USFS at the beginning of the Smoky Canyon mining operations required that subsequent, site-specific mine plans for the individual mine phases be submitted to the Agencies for their review and that appropriate mitigation measures be developed using further environmental analysis. These additional mine plans were reviewed with environmental assessments (EAs) that tiered off of the information and analyses included in the 1981 DEIS and 1982 FEIS for the Smoky Canyon Mine. These EAs included:

- EA for Smoky Canyon Mine Tailings Pond 2 (USACE 1990)
- EA for Smoky Canyon Mine Panel A-4 (BLM 1991)
- EA for Smoky Canyon Mine Panel D (BLM and USFS 1992)
- EA for Smoky Canyon Mine Panel E (BLM 1997)

Tailings Pond No. 1 was constructed concurrently with the initial mining and milling facilities in 1984. In 1988, plans were completed for construction of an expansion of the tailings pond within the same area identified within the FEIS. In 1990, an EA was prepared by the USACE for three future phases of Tailings Dam No. 2 and the associated tailings pond to contain all tailings from full development of each of the Panels. In this EA, the USACE reviewed the detailed plans for this facility and developed the plans for environmental impact mitigation. Simplot subsequently completed the wetland mitigation for all three phases of the tailings dam and pond.

The mining of Panels B and C was authorized by a 2002 ROD upon the completion of the Final Smoky Canyon Phosphate Mine Supplemental EIS (SEIS). The SEIS evaluated potential effects on threatened, endangered and sensitive species as well as effects from selenium and other constituents of potential concern (COPCs) that were not considered in the 1982 Smoky Canyon FEIS.

Exploration in the Deer Creek and Manning Creek lease areas was analyzed over the last several years through the EAs and EIS listed below and additional Documentations of NEPA Adequacy (DNAs), which authorized continued exploration on these properties.

- EA for Manning Exploration for EIS Leasing (BLM and USFS 1994)
- EA for Phosphate Exploration Program for Lease I-01441 (BLM and USFS 1996)
- EA for I-01441 Lease Modification and Exploration Plan (BLM and USFS 1998)
- Leasing EIS for the Manning and Dairy Syncline Properties (BLM and USFS 1999)
- EA for Manning Creek Exploration Project (BLM and USFS 2003)
- EA for South Manning Creek Exploration Project (BLM and USFS 2005)

2.3 Existing Operations

2.3.1 Location

The Smoky Canyon Mine is located in Caribou County, Idaho approximately ten air miles west of Afton, Wyoming on the east slope of the Webster Range between Smoky Canyon to the north and South Fork Sage Creek to the south. Access to the mine is gained by traveling west from Afton approximately three miles, then north about four miles toward Auburn to the intersection with the Stump-Tygee Creek Road, then approximately eight miles west and southwest to Smoky Canyon.

Overall, the existing operations extend for a length of approximately 5.9 miles north to south along the east flank of the Webster Range (**Figure 2.3-1**). The mill and administrative and maintenance facilities are located in Smoky Canyon near the northern end of the mining operations. Mine Panel A is immediately east of the mill. Panels B and C are located north of the mill, and Panels D and E are toward the south. The tailings ponds are located about 3.2 miles northeast of the mill site in the Tygee Creek drainage. The mill is connected to the tailings ponds with a pipeline down Smoky Canyon.

Elevations in the Smoky Canyon Mine area range from about 6,600 feet above mean sea level (AMSL) at the tailing pond area to about 8,300 feet AMSL along the ridge of unnamed peaks immediately west of the mine.

2.3.2 Land Ownership

The existing mining and milling operations are contained within 2,600 acres of federal phosphate mineral leases administered by the Pocatello Field Office of the BLM and approximately 1,200 acres of Special Use Authorization's (SUAs) administered by the CTNF. The mining operations are located on Federal Phosphate Leases No. I-012890, I-026843, I-027801, I-27512, and I-30369. The federal land surface is administered by the CTNF, Soda Springs Ranger District. The tailings property encompasses 1,680 acres of private land owned by Simplot. **Table 2.3-1** summarizes surface and mineral ownership.

TABLE 2.3-1 LAND AND MINERAL OWNERSHIP

LEASE NUMBER	SURFACE OWNERSHIP	MINERAL OWNERSHIP
I-012890	U.S. Forest Service	Federal
I-015259	Private (Simplot)	Federal
I-026843	U.S. Forest Service	Federal
I-027801	U.S. Forest Service	Federal
I-30369	U.S. Forest Service	Federal
I-27512	U.S. Forest Service	Federal

2.3.3 Facilities Description

Existing facilities at the Smoky Canyon Mine include an access road, office/shop complex, mill, ore stockpiles, open pits, backfilled pits, external overburden disposal sites, tailings ponds, power lines, tailings pipelines, concentrate slurry pipeline, and ancillary facilities such as runoff control ditches and ponds, storage yards, and "Hot Start" (mine equipment fueling, fuel storage, and parking) areas (**Figure 2.3-1**). The office/shop complex consists of a combination shop and office building. This building houses the office, warehouse, and repair shop facilities. Employee parking, site security office, truck wash bay, tire shop, mill, and emergency generators are also located at the office/shop complex. These facilities would continue to be used during the mining activities described as part of the Proposed Action (**Section 2.4**). Detailed descriptions of the major facilities are as follows:

Security Trailer: Security staff provides around the clock (24 hours per day/7 days a week) coverage of the mine facility. Along with security personnel, this facility houses employee lockers.

Office/Warehouse: This facility houses the offices of mine management personnel and warehouse/purchasing personnel. The offices are located upstairs above the shop and adjacent to the warehouse.

Maintenance Shop/Mill: The maintenance shop houses the maintenance staff that work on company mobile equipment. The mill area is housed in the same building where raw phosphate ore is fed from the outside via front-end loaders. The ore is milled into a fine powder/slurry with water through crushing and grinding operations. The phosphate-containing minerals are beneficiated (separated) from the rest of the rock and then are pumped through the concentrate slurry pipeline to the Don Plant in Pocatello for further processing. The tailings slurry (beneficiation waste) from the mill is gravity fed through the pipeline to the tailings ponds for disposal.

Wash-bay: This area is used for steam washing of company mobile equipment. An oil-water separator system for used-oil recovery is connected to the wash bay.

Fuel/Used Oil Containment Area: South of the wash bay building and east of the mill (in the yard), are aboveground storage tanks for anti-freeze, diesel fuel (low-sulfur), gasoline (lead-free), used oil, and used anti-freeze. These tanks are located within secondary containment bermed areas lined either with concrete (used oil and antifreeze), or polyethylene (diesel fuel and gasoline).

Tailings Thickener: Once the ore is beneficiated, the non-ore rock slurry is piped to a thickener, located 1/4 mile north of the mill, and sent in a pipeline to the tailings ponds. Water is then recirculated back to the mill via underground return pipelines.

Industrial and Culinary Wells: The industrial well provides fresh water for the mill operations. The culinary and industrial wells provide potable water for mine personnel and are recognized by the State as public drinking water sources. These wells are located approximately 3/4 mile north of the shop, near Smoky Creek.

Figure 2.3-1 2004 Historic and Existing Operations

Hot Starts: The "Hot Starts" is the name given to the staging area for the mobile equipment used in the mining operations. Service islands for maintenance and fueling of a number of vehicles simultaneously, lubing services and fuel/lube oil tanks (all tanks are protected in a containment area lined with a polyethylene liner) are located here. The Hot Starts are located near the actual mining area for convenience and accessibility. The Hot Starts area is relocated, as needed, to adjust to the mine area location.

Tailings Ponds No. 1 and No. 2: Located approximately 3.2 air miles northeast of the mill area, this area consists of two tailings ponds with associated delivery lines, return lines, and pump houses.

Bone Yard: This is a temporary storage area for large reusable mining equipment, parts, and recyclable materials. Some material located here can be reused in the mining operation. This is not a fixed facility.

Ammonium Nitrate/Fuel Oil (ANFO) Storage: This is a staging area for blasting materials (kept separate from magazines for safety reasons). Ammonium nitrate and emulsion are stored separately, in above ground storage tanks in this area. Ammonium nitrate is not explosive until mixed with the fuel oil. The materials are only mixed when pumped directly into the blast holes. This area is a completely fenced, secured area under video surveillance and equipped with motion detectors. This area is capable of being monitored 24-hours a day through the onsite security office. These surveillance videos are archived for a set amount of time as well.

2.3.4 Mining Operations

The existing mine operations consist of mine Panels A, B, C, D, and E. Each panel consists of one or more open pits and associated external overburden disposal sites. The mining occurs along a southward trending (striking) phosphate deposit that is inclined (dips) to the west. Open pit mining of this deposit continues down-dip until overburden stripping ratios hinder economic operations at which point mining ceases. Mining at Smoky Canyon began with Panel A and proceeded southward through Panels D and E. The extraction phase of mining is currently wrapping up in Panel E and has begun in Panels B and C. As mining progressed southward along the strike of the deposit, the mined out pits have been backfilled with overburden (**Figure 2.3-2**). At the end of 2004, the existing panels were backfilled and reclaimed to the following degrees: Panel A – 35 percent, Panels B and C – 0 percent, Panel D – 100 percent, Panel E – 15 percent. Excess overburden has been disposed of in external overburden disposal sites located east of the mine pits. Inactive areas of the external overburden disposal sites and backfilled pits have been reclaimed with vegetation as specified by the regulatory agencies.

Current operations at the Smoky Canyon Mine include drilling, blasting, loading, and hauling of ore and overburden from Panels E, B, and C using a shovel and truck fleet. Mining proceeds sequentially by opening individual mining pits along the trend (strike length) of the Phosphoria formation outcrop. Mining in Panels B and C is ongoing and is expected to continue until approximately 2006-2007. Reclamation of Panels A, B, and C would be completed in 2009 to 2010. This reclamation occurs concurrently with mining.

The sequential mining of pits along the strike length of the deposit facilitates backfilling open pits with overburden from subsequent pits. When overburden is removed from the ground, it is fractured into particles, which occupy approximately 30 percent more volume than before the

rock was mined. This volume expansion is called “swell” and is one reason why all the overburden cannot be returned to the same open pit from which it came even when considering the ore that is removed from the individual pits. Some overburden must be placed in external overburden disposal sites outside of the open pits.

At the end of 2004, the total disturbed area of the existing operations at the Smoky Canyon Mine was 2,150 acres, of which 756 acres had already been reclaimed. Current reclamation plans for the existing Smoky Canyon Mine indicate almost all of the disturbed acreage involved in the mining will eventually be reclaimed. The following description of mining operations applies to the existing operations. Thus, because the Proposed Action would be an extension of the existing mining operations, the following description of mining operations also applies to the Proposed Action.

The mine is operated 24-hours per day throughout the year with crews working overlapping shifts. Hard rock overburden is drilled with blast hole drills. Each blast hole is loaded with a mixture of ANFO. The loaded blast holes are typically detonated 3 to 4 days a week in the afternoon. On average, 400 blast holes are detonated per week. Softer overburden is ripped with dozers. A number of 15- to 27-cubic-yard diesel-powered hydraulic shovels are used to load ore and overburden into off-road type haul trucks.

Ore and overburden are loaded into 150-ton rear dump haul trucks. Depending on the concentration of phosphate mineral in the rock, the trucks deliver the material to one of the mill ore stockpiles, external overburden disposal areas, or previously mined pits as backfill. Water trucks are used to water haul roads, ancillary roads, and the active pit floors to control dust. Roads are also maintained with motor graders. Other equipment used in the operation includes: pickup trucks, vans, service trucks, maintenance trucks, explosives trucks, and other miscellaneous support equipment.

The typical current mining operation in any mining panel complies with the following general mining sequence:

- A detailed Mining and Reclamation Plan for the next phase of mining is prepared and sent to the BLM and USFS for their review. The mining plan is reviewed by BLM mining engineers and geologists to ensure that the mineral resource is being properly developed. The environmental impacts of the plan are reviewed by BLM and USFS resource specialists who suggest what mitigation is necessary. Appropriate stipulations are decided upon by the Agencies. BLM decides whether or not to approve a Mine and Reclamation Plan (considering input from the USFS), and the USFS decides whether or not to issue any needed Special Use Authorizations for mining activities outside the phosphate lease boundaries.

- The USFS determines the fair value of the timber on the area to be disturbed in the mine plan and issues a timber sale to Simplot, who then pays the USFS the timber sale price. Simplot contracts with another firm for the removal of the timber.

- Small timber roads are built and timber is removed from the proposed disturbance area by a contractor.

- Access and haul roads are built.

Figure 2.3-2 Open Pit Mining at Smoky Canyon

- Fencing, berms, or signs are used as necessary to control public motorized access to active mining areas. Non-motorized crossing of mining areas by the public is not controlled unless there is a safety concern.
- Where grazing water sources are affected by mining operations, alternative water sources are provided to grazing permittees in coordination with the USFS.
- Where grazing allotments are affected by active mining operations, grazing access to the affected areas is temporarily controlled with fencing in coordination with the USFS and grazing permit holders.
- Surface runoff management ditches, culverts, settling ponds, and sediment traps are constructed following approved BMPs and information contained in the Smoky Canyon Storm Water Pollution Prevention Plan (SWPPP). The SWPPP was developed in accordance with EPA National Pollution Discharge Elimination System (NPDES) rules and other regulatory input.
- Simplot crews clear the remaining vegetation from the disturbance area on an as-needed basis. After the vegetation is removed, available topsoil is stripped to the stipulated limits and stockpiled in designated locations. This topsoil is sometimes immediately hauled to previous regraded mine disturbances and spread for reclamation. Topsoil stockpiles are graded and seeded to reduce loss of the soil resource by erosion.
- Upper chert overburden (the term "chert" includes cherty limestone and limestone) is removed down to the first ore beds and is hauled away. The hard chert overburden requires blasting in order to facilitate mining. The blasting procedures followed by Simplot are dictated by the Federal Metal and Nonmetallic Mine Safety and Health Standards (30 CFR 56/57/58). The blasting materials used are controlled by the Federal Explosives Law, Regulation of Explosives (Public Law 91-452) through the Bureau of Alcohol, Tobacco, and Firearms Department of the Treasury. The Smoky Canyon Mine is required by law to apply for and periodically renew a permit for the use of high explosives and a license for the manufacture of blasting agents. Only qualified trained personnel have access to or can handle blasting materials as prescribed by federal rules.
- Overburden is typically used to backfill existing open pits. Chert and limestone overburden is also used for road construction and other civil engineering projects at the mine. Some overburden may be disposed of in external overburden disposal sites. The chert typically does not release elevated concentrations of selenium and is currently used to cap or cover any seleniferous overburden that has been placed in pit backfills or external overburden disposal sites. This was not fully implemented in pre-2000 mining operations but has since been adopted as a management practice for seleniferous overburden. This is possible at Smoky Canyon Mine because the chert sampling/testing has thus far indicated low selenium concentrations.
- Ore from the upper ore zone is removed and hauled to the mill ore stockpile.
- The center waste shale, which lies between the upper and lower ore beds, is removed and hauled to previous open pits for use as backfill or is placed in external overburden disposal sites. Because the middle waste shale is known to contain the highest concentrations of selenium and other COPCs, it is placed deeper in these disposal sites and is covered with chert overburden to isolate it from the surface environment. This was not fully implemented in mining operations prior to 2000 but has since been adopted as a management practice for seleniferous overburden.

- The lower ore zone is removed and hauled to the mill ore stockpile.

- The process of removing upper ore, middle waste, and lower ore is repeated several times within a given pit. Each of these iterations is called a "bench" or "lift".

- The mined out, open pit is then available for backfilling with overburden from subsequent mining operations in a future pit. When the pit backfill reaches the final grade, reclamation of that area is commenced.

- Reclamation of disturbed areas is an ongoing process, concurrent with mining. At closure, ancillary mine facilities, as well as roads deemed no longer necessary for maintenance access or monitoring, are removed. Road removal incorporates removal of road fills and backfilling road cuts to achieve a final profile similar to the original topography.

- Reclamation of completed mine areas commences with regrading to maximum slopes of 3h:1v. Topsoil is hauled and spread on the regraded area to typical depths of 12 to 36 inches. The topsoil is scarified, fertilized, and seeded with drilling or broadcast methods. Mulch is applied as needed. Tree seedlings are also planted as recommended by USFS foresters.

Each mine panel is divided into a number of separate open pits. The above-described physical mining sequence is repeated in each of the separate pit areas within the panel. All the pits within each panel are designed at the same time and reviewed by the Agencies.

2.3.5 Water Management

Simplot has developed a site-wide SWPPP for surface water resources at the Smoky Canyon Mine in compliance with the NPDES General Storm Water Permit issued by the U.S. EPA. The primary purpose of the SWPPP is to prevent any discharges to surface waters associated with the mine disturbance. The SWPPP provides for control of runoff from mine facilities (removal of sediment prior to dispersed discharge to vegetated areas) and designation of water diversions necessary to accommodate mine facilities. The Mine also carries an NPDES General Construction Storm Water Permit to cover the ongoing expansion of the mine each time a new pit is opened. The SWPPP covers the conditions for both permits and is updated as new disturbance areas are added to the mine operations. The existing SWPPP would be modified as needed to accommodate the new disturbance areas included in the Proposed Action.

The SWPPP is implemented in phases over the life of the Smoky Canyon Mine. Depending on the location of mining activity, the SWPPP describes water diversions (ditches) of ephemeral channels and tributaries to the nearest perennial or intermittent creek. In addition to ephemeral stream diversions, Simplot has constructed stream crossings for the major east-flowing creeks that cross the mine footprint. These are built with corrugated metal culverts placed in the stream channels at the base of road fills. Simplot has installed fish ladders in the Sage Creek culvert to allow for upstream fish migration.

New mine pits and external overburden disposal sites are designed to avoid any direct disturbance of the existing main, east-flowing intermittent or perennial stream channels. This is done by establishing a prescribed buffer zone on either side of these stream channels with no disturbance allowed within this buffer zone.

Storm water catch basins are located throughout the mining area to collect, settle, infiltrate, and evaporate runoff water from land disturbed by the mining operation. These ponds are designed to contain runoff from the contributing watershed area that would be produced in a 100-year, 24-hour storm event (3.0 inches of precipitation) plus 2.5 inches of snow melt runoff (USFS 1981:Appendix D). The ponds have engineered outlets to protect the impounding dikes from erosion by discharges. Outlets from ditches and culverts are protected from erosion with rock riprap, as are some of the steeper ditches. Simplot also uses revegetation and other land reclamation techniques to reduce erosion from disturbed areas.

Haul roads and access roads at the Smoky Canyon Mine site are designed and constructed to provide proper surface drainage. Use of culverts, roadside sediment traps, and berms allows Simplot to control erosion from roadways and subsequent sedimentation. Snow removal from roadways involves placement of snow where eventual melting will not cause erosion or increase sediment delivery to potential receiving waters.

2.3.6 Mill and Tailings Operations

The following description of the mill and tailings operations is for the existing facilities, which would continue to be used during the mining operations described in the Proposed Action. The existing mill and tailings operations are already in place and fully permitted to accommodate the tailings produced in the Proposed Action and all the mining action alternatives. The mill and tailings facilities are not considered to be connected actions for this EIS because the Proposed Action does not justify or act as a prerequisite for the currently authorized mill and tailings facilities. The Proposed Action also does not trigger any additional mill or tailings pond permitting not already authorized. For these reasons, the tailings ponds are not included within the Proposed Action or Alternatives for Panels F and G, and the environmental impacts for the tailings ponds are evaluated as part of the Cumulative Effects analysis in this EIS.

Ore is fed from the mill stockpile into two hoppers. The hoppers feed a trommel washing system where water is added and the ore is screened, crushed and then ground to a fine consistency in grinding mills. The ground ore slurry is beneficiated to separate the material with the highest phosphate content (ore concentrate) from the low-grade material (tailings).

The ore concentrate slurry (a 60:40 ore to water ratio by weight) is introduced into a buried eight-inch pipeline. A 1,000 HP pump at Smoky Canyon pumps the concentrate slurry 27 miles to Conda, Idaho, crossing the Webster Range and Dry Ridge. At Conda, two 1,200 HP booster pumps provide additional power to push the slurry another 60 miles, crossing Inman Pass and ending up at the Simplot Don Plant fertilizer manufacturing facility near Pocatello. The slurry is then processed into various grades of both liquid and dry fertilizer. The Simplot ore-slurry pipeline safely transports over 1.5 million tons of phosphate concentrate over the mountainous terrain annually.

The tailings slurry leaving the mill passes through a tailings thickener. The underflow solids from this thickener discharge into the existing tailings line at a maximum rate of 550 gallons per minute (gpm) and 35 percent solids. The clarified water from the thickener is pumped back to the mill at about 3,500 gpm for reuse in the milling operation.

Simplot currently operates two tailings ponds (No. 1 and No. 2) on private property located about 3.2 air miles northeast of the mill. Tailings slurry is discharged in a controlled manner with a system of piping and valves into tailings pond No. 2. As the slurry flows from the

discharge points into the Tailings Pond No. 2, they settle out and sink to the bottom. Tailings Pond No. 1 was built at the start up of the mine and is considered full of tailings. Clarified water is collected on top of Tailings Pond No.1 and pumped with high pressure, high volume pumps back to the mill via the underground reclaim water pipeline.

By design, there is no discharge of tailings solids or water from the tailings ponds. Approximately 2,500 gpm of reclaimed water is recycled back to the mill. Additional water is added to the tailings ponds, as needed, from the production well and from Roberts Creek, under existing water rights, in order to maintain the water level in the ponds at the proper operating levels. Depending on production requirements, the Smoky Canyon mill produces approximately 500,000 tons of tailings solids per year.

The tailings ponds were built to be no-discharge facilities under a permit issued by the USACE and IDWR. They are located on private land owned by Simplot in a topographically low area along Tygee Creek. Geotechnical investigations of both tailings pond sites prior to their construction indicated that the entire area of both impoundments is underlain by low-permeability clayey soils that provide control of seepage from the impoundments. The tailings dams were also constructed from these low permeability soils, designed to prevent seepage of tailings water through them. Piezometers in the tailings dams are monitored to ensure that any seepage is detected and controlled before any surface discharge past the dams could occur. Roberts and Tygee Creeks were diverted around the tailings ponds in open channels designed to safely pass the design storm runoff required by the IDWR.

2.3.7 Reclamation Activities and Mine Closure

Reclamation of disturbed areas at the Smoky Canyon Mine is an ongoing process, concurrent with mining and would continue in a similar manner for the Proposed Action. Backfilling is completed by placing the higher selenium concentration overburden in the pit first and capping with chert. The area is rough graded and drainage configurations are established. Topsoil is directly placed from active soil salvaging operations or from nearby stockpiles and spread over the graded surface. Topsoil is spread to a thickness of 1 to 3 feet. The seedbed is prepared by fine grading followed by placement of fertilizer and seed. Revegetation is implemented when mine activities in an area are completed. The detailed planning for each phase of mining has been separately reviewed by the BLM and USFS and different revegetation practices and seed mixes have been specified at different points of time by the Agencies, which incorporate lessons learned at the Smoky Canyon Mine and other phosphate mines. In addition to erosion protection, reclamation is intended to meet the final CTNF multiple land use goals of wildlife habitat, recreation, hunting, and grazing. An example of the overall reclamation process is shown in **Figure 2.3-2**.

At closure, ancillary mine facilities, as well as roads deemed no longer necessary for maintenance access, monitoring, or public access, would be removed. Offices, buildings, shops, mill facilities, and utilities would be removed. The sites of these facilities would then be regraded and revegetated.

Public motorized access to reclaimed mine areas is controlled until the reclamation is deemed successful by the BLM and USFS. Public motorized access to reclaimed areas is then re-established in concurrence with USFS management plans. Public, non-motorized access to reclaimed areas is not restricted.

Grazing of reclaimed areas is restricted until the reclamation is deemed successful by the BLM and USFS, and it is determined that grazing can be re-established on the reclaimed areas.

The tailings ponds have been designed to remain upon abandonment and closure after the tailings storage volume is filled. At that time, the reclaimed water pumping facilities would be removed. The proposed closure plan, filed with the IDWR and conditionally approved on March 28, 2005, indicates that an overflow spillway would be excavated into one abutment of both tailings dams (NewFields 2005). These spillways would be designed to pass the peak flow from a 100-year, 24-hour storm event. The peak flow was calculated from the entire 8.6-square mile watershed directly upgradient of the tailings dams. The spillway for Tailings Dam No. 1 would discharge to the Tailings Pond No. 2. The spillway for Tailings Dam No. 2 would be connected to the Tygee Creek diversion channel downstream of the dam. The spillways would be designed to be open channels with bottom widths 30 to 35-feet wide, 3h:1v side slopes and 5-foot depths.

The existing Roberts Creek/Tygee Creek diversion channel was designed to safely carry runoff from a 100-year, 24-hour storm event around both tailings impoundments and route the flow to Tygee Creek below Tailings Dam No.2. It is proposed that the channel be left in place after reclamation of the tailings facility to handle normal runoff flows from the watershed above the tailings facility. A second diversion channel is proposed to be constructed along the north side of the Tailings Pond No. 2 to further reduce runon into the tailings impoundment area after reclamation. This also is designed to safely pass the peak flow from the 100-year, 24-hour storm event.

The tailings impoundments would be allowed time to dry out to the maximum extent feasible. The grades of the final tailings solids surface will depend on the total tailings deposited in the impoundments, the pattern of deposition, and the amount of water stored in the impoundments. It is intended that the final grades on the dried tailings would be toward the spillways so the tailings areas would not impound water. The finished tailings surface would be amended with organic materials to reduce plant uptake of selenium and revegetated by broadcasting or drilling seed. At this time, soil cover is not considered essential for reclamation success. The seed chosen for reclamation would be selected in concert with the regulatory agencies to provide perennial cover and to reduce biological uptake of selenium and other contaminants from the tailings. Fertilizer and mulch may be used to enhance revegetation success. Studies are underway to determine the most effective approach for revegetating the tailings and minimizing the uptake of selenium by plants used for revegetation. Annual inspections and maintenance of the reclamation would continue for five years after completion of closure. Institutional controls on grazing have already been implemented for the tailings facility, and other controls as necessary would be determined at the time of final closure.

Actual cost bonding by Simplot for the Smoky Canyon Mine is approximately 8.6 million dollars for existing and planned reclamation. This amount is an estimate of the actual cost for the state and federal governments to close and reclaim the currently approved facilities at the mine in the event Simplot abandoned operations before completing reclamation. This amount does not yet include any of the proposed disturbance related to Panels F and G. An estimate would be made and approved for the proposed new disturbance, and if the Project is authorized, Simplot would adjust the current bond amount accordingly. Based upon the anticipated land disturbance, bond calculations are made yearly at the BLM Pocatello Field Office, and the bond amounts are adjusted as necessary. Simplot must complete reclamation of federal lands at the mine to the BLM's and USFS' satisfaction. As reclaimed areas are approved for release by the BLM and CTNF, a lower bond amount for these areas may be requested by Simplot.

2.3.8 Hazardous Materials

The Smoky Canyon Mine operations comply with both state and federal hazardous materials regulations and would continue to do so during the Proposed Action. The term "hazardous materials" is defined in 49 CFR 172.101 (U.S. Department of Transportation (DOT) regulations governing transportation of hazardous materials). The principal hazardous materials that are transported, stored, or used at the Smoky Canyon Mine are summarized in **Table 2.3-2**.

The primary route for transporting hazardous materials to the mine is via U.S. Interstate Highway 15 and U.S. Highway 30 to Soda Springs. From Soda Springs, the principal hauling routes are U.S. Highway 30 to U.S. Highway 89 to Afton, Wyoming. An alternate route is from Interstate Highway 80 at Evanston or Little America, Wyoming to Highway 30 to Border and then Highway 89 to Afton. Another alternate route is Interstate 15 to Idaho Falls and then Highway 26 to Alpine and then south on Highway 89 to Afton. From Afton, access to the site is via the Afton to Auburn road to the Stump-Tygee Road to the Smoky Canyon Road. Transportation of hazardous materials is not allowed across the CTNF via the Blackfoot Narrows, Diamond Creek, or Georgetown Canyon roads. U.S. DOT-regulated transporters are used for shipping regulated hazardous materials. Hazardous materials are stored at designated locations onsite in tanks or DOT-approved containers. Spill containment structures are provided as appropriate for all liquid hazardous materials.

2.3.9 Petroleum Management

Simplot has implemented a Spill Prevention Control and Countermeasures Plan (SPCC) (Simplot 2000) for managing aboveground petroleum product tanks and vessels and potential spills, in accordance with the Clean Water Act (40 CFR Part 112). The plan describes types of containment structures at the facility to prevent petroleum products from reaching surface water and groundwater receptors and the procedures to be followed in the event of a spill or release.

The plan is amended when there is a change in facility design, construction, operation, or maintenance that materially affects the potential for a release of oil or other petroleum products into the environment. The SPCC Plan would be amended as required to accommodate the petroleum storage facilities that are part of the Proposed Action.

All liquid petroleum products and antifreeze are stored in aboveground containers as described in **Table 2.3-2**. The bulk storage areas are bermed and lined to contain spills. All bermed containment areas are of sufficient capacity to hold the entire contents of the largest tank and allow sufficient freeboard for precipitation. The shop building provides containment for all tanks located in that structure. The SPCC Plan states that tanks, pumps, and pipelines will be visually inspected for leaks. Inspections are conducted and recorded on a routine basis by mine personnel. The SPCC Plan also requires that Simplot's operating and maintenance personnel be trained in the proper use and maintenance of all equipment containing petroleum products. The training is necessary to educate employees as to environmental consequences, thus minimizing the chance of a spill due to operator error. Any petroleum-contaminated soil is treated onsite at a land-farm.

TABLE 2.3-2 HAZARDOUS MATERIALS MANAGEMENT, SIMPLOT SMOKY CANYON PROJECT

SUBSTANCE	AREA USED/ STORED	ANNUAL RATE OF USE (GALLONS)	ONSITE STORAGE CAPACITY	STORAGE METHOD	SHIPMENT QUANTITIES (GALLONS)
Diesel (Hi & Lo Sulfur)	Yard	3,000,000	(1) 10,300 gallon tank	Above-ground bulk tanks	10,000
	Stockpile		(1) 7,400 gallon tank		
	Hot Start		(1) 50,000 gallon tank (1) 11,700 gallon tank		
Gasoline	Yard	48,000	(1) 10,000 gallon tank	Above-ground bulk tank	10,000
10W Oil 15-40W Oil HD 30W 50W Oil 5-30W Oil	Shop	100,000	(1) 4,000 gallon tank (1) 2,000 gallon tank (1) 2,000 gallon tank (1) 2,000 gallon tank (1) 300 gallon tank	Above-ground bulk tanks	2,000
Used Oil 80-90W Oil	Yard		(1) 10,000 gallon tank (1) 500 gallon tank		
10W Oil 15W-40 Oil ATF 50W TO4 40W Oil 40W TO4 40W Oil 30W Oil 10W Oil 15W-40 Oil Used Oil	Hot Start		(1) 7,800 gallon tank (1) 7,800 gallon tank (1) 500 gallon tank (1) 2,300 gallon tank (1) 2,100 gallon tank (1) 3,000 gallon tank (1) 500 gallon tank (1) 500 gallon tank (1) 500 gallon tank (1) 500 gallon tank (1) 8,500 gallon tank		
Antifreeze Used Coolant	Yard		(2) 500 gallon tanks (1) 5,000 gallon tank	Above-ground bulk tanks	2,000
Antifreeze	Hot Start		(1) 300 gallon tank		

2.3.10 Hazardous Waste

Hazardous waste is regulated under the Federal Resource Conservation and Recovery Act (RCRA) regulations (40 CFR Part 260 et. seq.). Generators of hazardous waste must follow strict rules regarding the generation, storage, handling, and disposal of their wastes. The Smoky Canyon Mine is considered a *Conditionally Exempt Small Quantity Generator* because it generates less than 100 kilograms of hazardous waste per month. These wastes are generated and temporarily stored at the mill and mine maintenance shops. The only specific hazardous waste generated at the facility is paint-related waste including waste paint and thinner (Waste Code D001). The off-site disposal facility for this waste is a permitted hazardous waste incinerator. The existing hazardous waste status for the mine is not anticipated to change for the Proposed Action.

The mine complies with applicable state and federal hazardous waste regulations. All hazardous wastes are accumulated and shipped in proper containers that are normally closed except when wastes are added or removed. These containers are properly labeled and marked according to the hazardous waste and U.S. DOT hazardous materials transportation regulations. Employees at the mine are trained to properly handle and dispose of hazardous wastes in accordance with mine procedures.

2.3.11 Safety

The Smoky Canyon Mine is subject to the Federal Mine Safety and Health Act of 1977 (MSHA), which sets mandatory safety and health standards for surface metal and nonmetal mines, including open-pit operations. The purpose of these standards is the protection of life, promotion of health and safety, and prevention of accidents. Regulations promulgated under MSHA are codified under 30 CFR.

Simplot maintains site-specific safety procedures and policies. These include procedures for operating equipment, requirements for wearing personal protective equipment, lockout-tagout procedures, fire suppression, housekeeping, proper use and storage of explosives, first aid, hazardous materials handling, and other operation or production related health and safety scenarios.

Shipping and receiving personnel and the facility health and safety coordinator receive applicable training in handling and care of hazardous materials in accordance with the DOT regulations (40 CFR 172.704). Simplot personnel also receive hazard communication and recognition training in accordance with the MSHA regulations.

The safety procedures and policies for the mine would also apply to the operations included in the Proposed Action.

2.4 Proposed Action

Overview

The Proposed Action would consist of two new mine panels, Panels F and G (sometimes referred to as Manning Creek and Deer Creek leases or tracts, respectively), topsoil stockpiles, mine equipment parking and service areas, access and haul roads (Panel F Access/Haul Road and Panel G West Access/Haul Road on **Figure 2.4-1**), a 25kV power line extension from the existing Smoky Canyon loop, permanent external overburden storage areas, and runoff/sediment control facilities. All of the mining activities under the Proposed Action would be located on federal leases and land administered by the BLM and USFS, respectively. The proposed mining would occur in existing Federal phosphate leases No. I-27512 and I-01441 held by Simplot. Simplot has also proposed to modify (expand) lease I-27512 on its north and south ends to accommodate mining in currently unleased federal land for Panel F (**Figure 2.4-1**). Special use authorizations would be needed from the CTNF for required mine-associated uses and surface disturbances outside of BLM administered lease boundaries.

Figure 2.4-1 Proposed Action Ultimate Pit Map

If approved, mining is proposed to begin in Panel F in 2006-2007, toward the end of mining in the existing Panel B. At full ore production rate, the mine life of Panel F, including both lease modifications, would be about 7 years. If the lease modifications were not approved, mining in Panel F would be completed in about 4.5 years. Mining in Panel G would take between 6 and 8 years, at full ore production rate. Concurrent reclamation work is proposed and would continue for approximately 2 years following completion of mining in each panel. The conceptual time line for the Proposed Action is shown in **Table 2.4-1**. The actual time line for the proposed mining operations could be different than shown due to a number of factors including: mining technology, markets and economic constraints, company planning, natural site conditions, and government approvals.

TABLE 2.4-1 ESTIMATED CONCEPTUAL TIMELINE FOR PANELS F & G PROPOSED ACTION

ACTIVITY	START (MO)	DURATION (MO)	END (MO)
Start Project	0	0	0
Initial Timber Removal Panel F	1	3	4
Panel F Haul/Access Rd Construction	1	4	5
Mining in Panel F	6	76	82
Reclamation in Panel F	24	76	100
Initial Timber Removal Panel G	70	3	73
Panel G Haul/Access Rd & Power Line Construction	66	12	78
Mining in Panel G	78	96	174
Reclamation in Panel G	96	96	192
Reclamation of Panels F and G Haul/Access Roads	180	12	192

The proposed mine panels would be operated 24-hours per day throughout the year with crews working overlapping shifts. Hard (chert and limestone) overburden would be drilled with a blast hole drill. The blast holes would be loaded with a mixture of ammonium nitrate and fuel oil (ANFO) and then typically detonated once every two to three days. Blasting would take place during daytime hours only. Softer (shale) overburden would be ripped with tracked dozers. Excavators would load ore and overburden into off-road-type haul trucks at the active mining face in the pits. Ore and overburden would be loaded into 150-ton rear dump haul trucks. Depending on the concentration of phosphate mineral in the rock, the trucks would deliver the material to the mill ore stockpile, external overburden disposal areas, or previously mined pits as backfill.

Water trucks would be used to water haul roads, ancillary roads, and the pit floors as needed to control dust. Roads would also be maintained with road graders. Other equipment used in the operation would include: pickup trucks, service trucks, maintenance trucks, explosives trucks, and other miscellaneous support equipment. The mining operations proposed for Panels F and G would include the general mining sequence described in **Section 2.3.4**.

Haul/Access Roads

Initially under the Proposed Action, a new haul/access road would be constructed from the existing roads in the south end of Panel E approximately 2.5 miles to the proposed Panel F (Panel F Haul/Access Road) (**Figure 2.4-1**). Before operations begin in Panel G, another haul road (Panel G West Haul/Access Road on **Figure 2.4-1**) would be built to transport ore from the southwestern end of Panel G to Panel F where it would join the haul road in that panel. Portions of these roads would be constructed within USFS IRAs outside of the existing Simplot leases. These roads would be used for general mine access from the existing Smoky Canyon Mine and to haul ore and overburden in 150-ton haul trucks. A typical cross section of these roads is shown in **Figure 2.4-2**. During road construction, topsoil would be removed from the disturbance area and stockpiled in windrows along the margins of the disturbance area and in discrete topsoil piles as shown on **Figure 2.4-1**. Cut slopes along the haul/access roads would vary to a maximum slope of 1h:1v. Fill slopes would be constructed at the angle of repose, approximately 1.5h:1v. The total disturbance width of the haul/access roads would vary from about 100 to 500 feet. The road disturbance statistics are shown in **Table 2.4-2**:

TABLE 2.4-2 PROPOSED ACTION HAUL/ACCESS ROAD DISTURBANCE

FEATURE	PANEL F HAUL/ ACCESS ROAD	PANEL G WEST HAUL/ ACCESS ROAD
Total Length (driving miles)	2.6	7.8
Total Disturbance (acres, outside of pits)	66.5	217.3
Acres on Lease	5.1	20.6
Acres off Lease	61.4	196.72
Acres Outside of IRAs	42.3	117.7
Total Acres in IRAs	24.2	99.6
Acres in IRAs off Lease	19.2	96.4

Note: Includes all disturbance in the road corridor including cut and fill slopes, and topsoil stockpiles.

Plans for construction of the Panel F Haul/Access Road include the use of low selenium overburden and material from road cuts. The maximum road grade would be 9.5 percent, as dictated by Simplot's safety policy concerning maximum ascent/descent grade of a loaded haul truck. A crossing is proposed at the intermittent channel of South Fork Sage Creek with a, circular culvert approximately 230 feet long. This and other stream crossings in areas of known fish and amphibian habitat would be designed with circular culverts placed to pass fish and amphibians in accordance with CTNF requirements. The selection of circular culverts for this Project followed an evaluation of stream crossing designs for fish passage based on available literature and monitoring data obtained from the existing Sage Creek haul/access road culvert at the Smoky Canyon Mine (**Appendix 2A**).

Design, construction, operation, and reclamation of the haul/access roads planned for the Panels F and G Project would be in accordance with applicable state and federal requirements for protection of water quality. Detailed designs for the haul/access roads that are eventually selected by the Agencies would be provided by Simplot for review and approval before construction. To support the environmental analyses in this EIS, Simplot provided the Agencies with the Haul and Access Roads Environmental Commitments and BMPs document included in **Appendix 2B**.

Figure 2.4-2 Typical Haul/Access Road

The Panel F Haul/Access Road would cross and cut off the existing dirt road in South Fork Sage Creek Canyon for the duration of the Proposed Action. This haul/access road would be used for mine personnel access and hauling ore from Panel F to the existing mill stockpile, approximately 4.6 miles to the north. This road crosses USFS land outside of the existing Panel F lease boundary and enters the north end of the Panel F lease at a specific location to allow ore extraction down to this elevation. This haul/access road could be authorized with approval of a USFS SUA, or with the combination of the North Lease Modification and a SUA. As Panel F is developed from north to south, this haul road would be extended approximately 2.6 miles to the south end of the panel.

Construction of the Panel G West Haul/Access Road is planned to provide access from Panel F to Panel G. It too would be built of low selenium overburden and material from road cuts. Where it crosses Meade Peak Shale, seleniferous shale excavated in full-face road cuts would be hauled to overburden fills at the mine panels. No seleniferous shale would be used in road fills. The road would be constructed west from Panel F along an existing, reclaimed timber sale road corridor on the south slope of South Fork Sage Creek Canyon to the Sage Meadow area. From this point, the road would be built over a pass to the east side of the summit between Deer Creek (to the south) and Diamond Creek (to the north). From this point, it would be routed south on the east side of Deer Creek to South Fork Deer Creek. It would cross the perennial Deer Creek and South Fork Deer Creek with culverts that are 280 and 260 feet long, respectively (refer to **Figure 2.4-1**). The haul road would also cross the existing USFS road approximately at the same point it crosses South Fork Deer Creek. The haul/access road would then be routed east in the South Fork Deer Creek Canyon uphill (south) of the existing USFS road in this canyon and cross the USFS road approximately at the Panel G staging area. Due to safety concerns, the Panel G West Haul/Access road would be restricted to mine traffic only. Sections of this road would fall within the existing Conda Partnership Phosphate Lease I-07942 and accommodations would be made by Simplot with the lease owners for any ore grade material excavated during construction of this road.

Where the haul road crosses the existing USFS access road near the Georgetown turnoff the routes would cross at grade. There may be temporary road closures in order to place and grade material during construction, but it is anticipated that this would normally be a matter of hours or at the most, a day or two. Signs, road cones, barriers and construction personnel would be used to warn and redirect traffic during these construction-period road closures. Once the “at grade” intersection is completed, warning signs would alert drivers of the haul truck traffic and direct them not to turn onto the haul road but to proceed with caution across the haul road. Haul trucks would have the right of way at these crossings.

The existing USFS access road across the planned staging area, located southwest of the proposed Panel G pit, would also have to be rerouted. The depth of the access road chert cover over the existing topography at this location would be 50 feet or less. This rerouting of the USFS access road can be completed and in place prior to the staging pad construction. There may be temporary road closures in order to place and grade material during construction, but it is anticipated that this would normally be a matter of hours or at the most, a day or two. Signs, road cones, barriers and construction personnel would be used to warn and redirect traffic during these construction period road closures. During the placement of overburden fill material for the completion of the staging area, berms would be in place on either side of the USFS access road to keep vehicles of the general public from straying into the active mine site area. Signs would be posted along this portion of the access road reroute to indicate that this is an

active mine area and that no stopping or parking would be allowed. The berms along the rerouted USFS road would also be high enough to keep the haul trucks from entering the USFS public access road. The haul trucks would only be able to cross the USFS public access route within the staging area at one point. This point would be a gated, attendant-operated crossing, whose purpose would be to stop the general public momentarily in order to allow mine traffic to access either side of the staging area.

During construction of the haul/access roads, topsoil would be stockpiled in windrows along the uphill edge of the road disturbance or in discrete topsoil stockpiles. These additional disturbances have been included in the overall acreages shown for the haul/access roads in this EIS.

Facilities

The existing Smoky Canyon Mine, maintenance, administrative, and milling facilities would continue to be used for the Proposed Action. However, because Panels F and G lie several miles south of the current maintenance and fuel facilities, proposed new mine support facilities at the new panels would include: equipment ready lines, electrical substations, warehouse and storage areas, lunch rooms, repair shops, restrooms, fuel and lubricant storage and dispensing facilities (hot starts), and blasting supplies storage.

Water for dust control for the Panel F operations would be hauled from the existing source at the Smoky Canyon Mill. Because of the longer distance to Panel G, a water supply well with an annual average pumping rate of 100 gpm would be installed at the facilities area to supply water necessary for mining operations.

Electric power for the proposed mining operations would be provided with a 25kV power line extending southward from the existing power system in Panel E across South Fork Sage Creek Canyon through Panel F along the western edge of the proposed pit limits. The power line would then cross the North Fork and Main Fork of Deer Creek into the southwestern portion of Panel G (**Figure 2.4-1**). The total length of this new power line from Panel E to Panel G would be approximately 6 miles, of which about 4.6 miles would cross undisturbed areas, and the rest would be within the mine panel disturbance. The power line would consist of approximately 30-foot tall, single wooden poles with an average conductor span of approximately 330 feet. Approximately 16 structures per mile would be needed. All creeks would be spanned and a 50-foot wide corridor (25 feet on either side of the center of the power line) would be maintained in order to prevent trees from falling on the line. Any cut down trees would be left in place. A helicopter would be used to install all power poles situated off existing lease areas under a SUA issued by the USFS. All pole holes off lease would be dug by hand or with the aid of airlifted equipment. A total of four conductors would be installed on the poles and cross arms. Staging and pulling stations would only be situated on existing lease areas. The 50-foot wide corridor would result in a maximum corridor footprint total of approximately 28 acres, although actual ground surface disturbance from installation of the line would be much less. Assuming a 25-foot radius circular area of temporary surface disturbance around each pole location, actual surface disturbance for the approximately 4.6 mile line located outside of the Panel F and G mine disturbance areas would total approximately 3.0 acres of new surface disturbance (74 poles).

Pits and Overburden

The development of the full Panels F and G (including both lease modifications for Panel F) would require removal and handling of over 100 million (MM) in-place or Bank Cubic Yards (BCY) of overburden. Of this total, 89 percent would be used to backfill the mined out Panels E, F, and G pits, and 11 percent would be placed external to the pits.

Salvageable topsoil would be removed from the proposed mine disturbance areas and temporarily placed in stockpiles shown on **Figure 2.4-1** or immediately moved to previous, mined-out areas that have been regraded and are ready to receive topsoil for reclamation.

A total of four individual pits are proposed for Panel F (**Figure 2.4-1**). The proposed sequence for Panel F mining would be Pit 1, 2, 3, and 4. Approximately 6.1 Million Loose Cubic Yards (MM LCY) of overburden generated from Pit 1 in Panel F would be trucked to the existing Panel E open pit to backfill an area of about 29 acres in Pit E-0 of Panel E (**Figure 2.4-3**). Another 0.5 MM LCY of Panel F chert overburden would be used to build the haul road between Panels E and F. Approximately 1.3 MM LCY of chert overburden would be used to build the haul road between Panels F and G. The volume of LCY is greater than BCY because of the 30 percent swell caused by breaking up the rock. Panel E is currently permitted to be completed with a remaining open pit (E-0) in its south end, but the Panel F overburden would be used to backfill this open pit. The total overburden volume (backfill and external) and area of Panel E is 66.9 MM LCY and 465 acres, so the amount of overburden contributed by Panel F would be relatively small in comparison, but would complete the reclamation of Panel E. In addition, backfilling of the E-0 pit reduces the potential volume of the external overburden fill at Panel F by 6.1 MM LCY.

Approximately 4.8 MM LCY of excess overburden from the remainder of Pit 1 in Panel F would be permanently placed on a 38-acre external overburden fill area on-lease (Panel F External Overburden Fill on **Figure 2.4-1**). The overburden placed in this fill would include seleniferous material. This overburden disposal area would also be used as the location for mining equipment staging, a hot start facility, and other temporary mine support facilities. As designed, most of the surface on which this external fill is placed would drain back into the pit. Remaining overburden from subsequent pits in Panel F would be placed as backfill in Panel F.

Only one large pit is proposed for Panel G. Overburden generated from mining Panel G would be largely used as backfill in the Panel G open pit. Excess overburden would be permanently placed in two external overburden fills adjacent to the open pit area. One external overburden fill would hold 4.1 MM LCY of mixed run-of-mine (ROM) overburden on 64 acres east of the Panel G pit (Panel G East External Overburden Fill on **Figure 2.4-1**). The other external overburden fill would hold 4.3 MM LCY of chert overburden on 74 acres southwest of the pit (Panel G South External Overburden Fill on **Figure 2.4-1**). This southern overburden disposal area would be used as the location for mining equipment staging, a hot start facility, and other temporary mine support facilities. A water supply well would also be installed at Panel G to provide water for mining operations. This well would have an instantaneous pumping capacity of 500 gpm and an annual average withdrawal rate of 100 gpm.

The Panel G East External Overburden Fill would be too large to fit within the existing Deer Creek Lease and would extend off the existing lease onto USFS land. To enable this, the BLM and USFS would need to issue appropriate land use authorizations to cover the approximately 18 acres of overburden fill extending off lease shown on **Figure 2.4-1**.

Disturbance Areas and Reclamation Activities
The disturbance areas for the Proposed Action are shown in **Table 2.4-3**.

TABLE 2.4-3 PROPOSED ACTION DISTURBANCE AREAS (IN ACRES)

AREA	ROADS	PITS	EXTERNAL OVERBURDEN FILLS	OTHER*	TOTAL
Panel F on lease (roads acreage outside of pit limits)	5	295	38	28	366
Panel F Off Lease (Special Use Authorization)	39	0	0	20	59
North Lease Modification	23	2	0	0	25
South Lease Modification	0	138	0	4	142
Panel G on lease (roads acreage outside of pit limits)	21	328	120	4	473
Panel G Off Lease (Special Use Authorization) Includes haul road stockpiles for road	196	0	18	61	275
Total	284	763	176	117	1,340

* Settling ponds and ditches, topsoil stockpiles, and power line

Disturbed lands directly resulting from the Proposed Action would total 1,340 acres. New pits would disturb approximately 763 acres, of which approximately 717 acres would be backfilled and reclaimed. Forty-six acres of highwall and pit bottoms would remain after reclamation is complete. Approximately 29 acres of the Panel E open pit (currently approved and active) would be backfilled and reclaimed with overburden from Panel F. The rest of the disturbed acreage would consist of approximately 284 acres of roads, 176 acres of overburden disposal areas, 117 acres of runoff management facilities, power line, and topsoil piles for the mine pits (topsoil stockpiles for roads are included in the road disturbance figures), all of which would be reclaimed, with the exception of portions of haul/access roads that would not be reclaimed (see explanation below).

The design of the Panel F and G pits is such that the maximum vertical height of any highwall is 350 feet or less. Because of the 20 years of mining experience at the Smoky Canyon Mine, Simplot is confident they would be able to mine to these depths. Slope stability aspects would be closely monitored during mining to adjust maximum mining depths if significant slope instability becomes a concern. The disturbance area boundary for permitting is purposely placed 50 feet beyond the designed pit limits and other disturbances to allow for tree removal above a highwall and to remove unconsolidated materials per MSHA regulations.

Public and Tribal member motorized access to the active mining areas (including mining roads) would be controlled by Simplot for the duration of the active mining operations. Non-motorized access across active mining areas would typically be unrestricted but may be restricted by Simplot if necessary for public safety. This motorized access would be re-established to reclaimed mined areas, in concert with the USFS, when reclamation activities are judged to be completed by the Agencies.

Grazing would be controlled by Simplot in active mining areas with fencing and coordination with the USFS and grazing permittees. Grazing controls would be practiced until reclaimed areas are deemed ready for grazing by the USFS.

Figure 2.4-3 Pit E-0 Area to be Backfilled from Panel F

At the end of mining operations, Panels F and G would be largely backfilled with overburden and the pit areas would resemble natural contours (**Figure 2.4-4**). However, a 38-acre portion of Panel F would not be backfilled, which would leave part of the pit footwall and two remaining highwalls exposed; one would be 2,200 feet long with a maximum height of 250 feet, and the other would be 2,600 feet long with a maximum height of 175 feet. The remaining footwall of this open pit would be approximately 400 feet high and 1,000 feet long (measured up and down the slope). An 8-acre portion of the Panel G highwall 2,600 feet long and up to 250 feet high would be left exposed in the final configuration of this pit. These highwalls would be benched and have overall slope angles of 49 degrees (0.9h:1v).

Certain portions of the haul/access roads are proposed to be built across some areas of natural slopes that are steeper than 33 percent (3h:1v). In these areas, some lower portions of road fill slopes would be beyond the reach of an excavator to bring the fill material back up into the cut and would not be reclaimed. In addition, final reclaimed road areas would have maximum slopes of 3h:1v, which is the practical limit of safe operation for reclamation construction equipment working on sloping surfaces. It also provides a stable reclamation slope that would not be an erosion problem and meets the intent of RFP guidelines. Where road cuts would be necessary in natural slopes greater than 3h:1v, the upper portions of the road cuts would not receive backfill or be reclaimed. Basically, this means that for road disturbances across natural slopes, less than 33 percent, there would be full recontouring and reclamation, and for original slopes greater than 33 percent there would not be full recontouring or reclamation. The areas of the haul/access roads that would not be reclaimed are shown on **Figure 2.4-4**.

If the Panel G West Haul/Access Road was selected by the Agencies and eventually constructed, it would not be fully reclaimed like the other haul/access roads. The CTNF has requested that Simplot leave a 20-foot wide, public access road along the portion of the haul/access road from Panel G to the summit between Deer Creek and Diamond Creek (**Figure 2.4-4**). This new road would be turned over to the USFS to replace the existing USFS road between Panel G and the mouth of South Fork Deer Creek (Wells Canyon Road, FR 146) and the existing USFS road between the Georgetown Canyon road and the summit between Deer Creek and Diamond Creek (Diamond Creek Road, FR 1102).

The existing USFS roads that would be replaced by this new road are, in places, narrow, steep, and/or located in Aquatic Influence Zones (AIZs). The replacement road would have a uniform width, maximum grades of 9.5 percent, and be located higher on the slopes above South Fork Deer Creek and Deer Creek to avoid paralleling these stream channels in the drainage bottoms like the existing road. When the new road is ready for public access, connections between the new public access road and the existing Wells Canyon, Diamond Creek, and Georgetown Canyon roads would be constructed. Simplot would then reclaim the portions of the existing USFS roads that would no longer be required. Along these reclaimed access roads, all drainage features, i.e. culverts, would be removed, and any fill across natural drainages would also be removed. The old road surface would then be ripped, and the fill portion of the old road template would be pulled back into the road. The final surface would then be graded and revegetated.

At stream crossings, the haul/access roadway width would also be reduced from 100 feet to 20 feet. The width of the fill crossing the streams would be reduced by an equal amount, and the culverts would be cut back and removed accordingly. The road grade for the public access road would not be altered from the haul/access road at these stream crossings.

Following regrading activities, topsoil would be applied to a thickness of 1 to 3 feet, scarified, fertilized and seeded with the specified revegetation seed mix.

The revegetation of the reclaimed areas related to the mine panels and haul/access roads would primarily be with quick establishing, short-lived native and introduced grass species along with long-lived native bunch grasses and forbs. **Table 2.4-4** provides a list of grasses and forbs that could potentially be used in the seed mix. A goal of the revegetation would be to establish healthy native bunch grass communities that are structurally diverse and would allow for succession over time. The forb component would be seeded at a low rate of approximately 1 - 8 seeds per square foot.

Other native forbs, shrubs and trees would be seeded or planted in clusters where they are most likely to establish (i.e. appropriate aspect, soil depths and soil maturity for the given species) and where there are little or no concerns relative to the integrity of the overburden caps or potential selenium uptake. These areas of more diverse seeding and planting can be referred to as "islands of diversity". The individual plants can act as mother plants by producing seed for the gradual increase in diversity of the disturbed areas overtime.

TABLE 2.4-4 PROPOSED LIST OF APPROPRIATE REVEGETATION SPECIES

SPECIES	SUGGESTED RELEASES[1]
GRASSES	
Big Bluegrass	Sherman
Bluebunch Wheatgrass	P-7
Bottlebrush Squirreltail	Sand Hallow
Great Basin Wildrye	Magnar, Trailhead
Idaho fescue	Joseph, Nezpurs
Junegrass	Currently no released cultivars or selected class germplasm
Mountain Brome	Bromar, Garnet
Sandberg Bluegrass	Canbar, High Plains Germplasm
Slender wheatgrass	Primar, Pryor, Revenue, San Luis
Western Wheatgrass	Rosana
Sterile or cover crop grain (species not specified)	Example: Regreen, annual rye, Quickguard (sterile triticale), etc.
FORBS	
Blue Flax	Appar, Maple grove
Showy Goldeneye	Currently no released cultivars or selected class germplasm
Western Yarrow	Locally adapted ecotypes
Sticky geranium	Currently no released cultivars or selected class germplasm
Silky lupine	Currently no released cultivars or selected class germplasm
Clover	Releases with shallow or no taproot

[1]Listed are currently available cultivars and selected class germplasm that are relatively adapted to the site. Additional cultivars and other releases may become available in the future that are more adapted and genetically appropriate for the site.

Figure 2.4-4 Proposed Action Final Configuration Map

Disturbance and reclaimed areas for the Proposed Action are shown in **Table 2.4-5**.

TABLE 2.4-5 COMPARISON OF DISTURBANCE AND RECLAMATION AREAS FOR THE PROPOSED ACTION

AREA	ROADS		PITS		EXTERNAL OVERBURDEN		OTHER*		TOTAL	
	DIST	RECL	DIST	RECL	DIST	RECL	DIST	RECL	DIST	RECL
Panel F on lease	5	4	295	257	38	38	28	28	366	327
Panel F Off Lease (SUA)	39	39	0	0	0	0	20	20	59	59
North Lease Mod.	23	20	2	2	0	0	0	0	25	22
South Lease Mod.	0	0	138	138	0	0	4	4	142	142
Panel G on lease	21	20	328	320	120	120	4	4	473	464
Panel G Off Lease (SUA)	196	176	0	0	18	18	61	61	275	255
Total	284	259	763	717	176	176	117	117	1,340	1,269

* Settling ponds and ditches, topsoil stockpiles, and power line.

2.5 Proposed Action Environmental Protection Measures

The Proposed Action is an extension of the existing Smoky Canyon Mine operations and the environmental and safety protection measures already being implemented and employed at the existing mining operations (see **Sections 2.3.4** to **2.3.11**) would be utilized in the new Panels F and G and associated haul/access roads. Applicable Standards and Guidelines, as outlined in the USFS RFP, have been evaluated by resource and considered for incorporation into the environmental protection measures for the Proposed Action. Specific environmental protection measures that would apply to the Proposed Action include the following:

2.5.1 Cultural Resources (including Paleontological Resources)

The proposed disturbance areas for the Proposed Action and haul/access road alternatives were inventoried for cultural resources during recent baseline surveys. Reports on these investigations, including descriptions of any discovered historic site or cultural materials, were provided to the regulatory agencies. State Historic Preservation Office (SHPO) concurrence has been received and/or requested by the USFS for all areas that have been inventoried. If unanticipated cultural materials, historic sites, or vertebrate macro-fossils (exclusive of disarticulated fish parts) are encountered during mining, the USFS and the BLM would be notified, and operations would be halted in the vicinity of the discovery until inspected by a professionally trained archaeologist or paleontologist, and a mitigation plan developed, if necessary. Vertebrate macrofossils would be avoided to the extent possible until the USFS or BLM conduct field surveys as needed to determine the significance of the fossils. At the discretion of the USFS or BLM, these fossils would be avoided for a length of time that is reasonable to allow Agency personnel to conduct the field surveys.

2.5.2 Air Quality

Dust from drilling activities would be controlled with dust collectors mounted on the drill rigs or with water. Fugitive dust from traffic on unpaved haul and access roads would be controlled with dust suppressant water applied by water trucks. Dust suppressing chemicals such as magnesium chloride and calcium chloride would also be used on roads as needed.

2.5.3 Soil

Available and suitable topsoil resources in the proposed mining disturbance areas have been described with baseline surveys. Suitable topsoil and growth medium would be salvaged during pre-stripping from proposed disturbed areas for use in reclamation. Soil suitability would be determined by US Department of Agriculture (USDA) Forest Service Soil Salvage guidelines (USDA 2003a). Soil that is salvaged would either be transported directly to areas being reclaimed or would be temporarily stockpiled.

Soil stockpiles would be protected from erosion by seeding and establishment of short-term vegetation cover. They would be built with as little compaction as possible and located out of traffic areas to minimize compaction from equipment.

Reclamation of disturbed areas that are no longer required for active mining operations would be conducted concurrent with other mining operations. Soil that is applied to reclaimed areas would be applied to a thickness of 1 to 3 feet with minimal compaction and protected from erosion through revegetation and use, as necessary, of: run-on controls, mulch, swales, terraces, silt fences, and other erosion control measures. Areas that are left unreclaimed due to equipment restraints would be stabilized using approved BMPs.

2.5.4 Vegetation

Timber would be cruised and then harvested from proposed disturbance areas as directed by the USFS. Simplot would purchase all cruised timber at the market value appraised at the time of harvest. Non-commercial timber, brush and slash would be stockpiled for use as runoff and sediment control brush barriers along the downhill margins of disturbed areas. Small brush and slash would be incorporated in the topsoil when it is salvaged.

Revegetation of disturbed areas would be conducted during reclamation activities by seeding and planting with the vegetation species mix approved by the USFS. Seeding of the approved reclamation seed mix would proceed no later than the first fall after a regraded area is covered with topsoil.

In order to control and prevent the spread of noxious weeds, Simplot would comply with the CTNF Integrated Pest Management Strategy approved in 1996, and also all off-road vehicles would be cleaned prior to entering the Project Area for the initial time.

Revegetation would be conducted to stabilize reclaimed surfaces with perennial vegetation communities and restore a post-mining land use for multiple use management. Potential species selected for revegetation have been previously identified in **Table 2.4-4**.

Livestock grazing in reclaimed areas would be controlled until the areas have become stabilized and are deemed ready for grazing by the USFS.

2.5.5 Surface Water

Simplot has submitted a set of BMPs for Erosion, Sedimentation and Selenium Control that would apply to the design, construction, operation and reclamation of the Panels F and G mine extension (**Appendix 2C**). Part of that BMP document applies to protection of surface water resources.

Drainage and diversion channels would be constructed to divert run-on water around disturbance areas and collect runoff from disturbed areas to route it to settling ponds and other sediment control features.

Runoff from disturbed areas would be directed to sediment ponds or silt traps to contain sediment in the runoff water. Sediment ponds would be designed for the runoff from the 100-year, 24-hour storm event in the control area, plus a snow melt event. They would be located outside and off of seleniferous overburden fills.

Erosion of channels and fills would be controlled by use of erosion control blankets, vegetation, chert, or limestone riprap or gabions filled with chert or limestone. Culverts would be properly designed for water flow and fish passage and installed for road crossings of waterways.

Snow removal would be practiced to prevent the soil contained in the removed snow from being released outside of the runoff control area and to reduce man-made entrainment of snow in external overburden fills to the extent practicable.

Perennial and significant intermittent drainages would be avoided in location of overburden disposal areas to the extent possible.

Drainage channels that are routed over overburden would be designed to reduce infiltration of channel flow into underlying seleniferous overburden.

Fills for road and parking area surfaces would be constructed of chert and would be designed with slopes and temporary vegetation, as applicable, to stabilize slopes and reduce generation of sediment in runoff from these areas.

Seleniferous overburden would be placed in approved fills and capped with chert and topsoil.

The bottom layer of seleniferous overburden fills would be constructed to reduce the potential for formation of overburden seeps. Low permeability layers of soil or shale in foundations of external overburden disposal area slopes would be modified or removed to avoid the perching of water leading to the formation of overburden seeps.

Surface water resources would be monitored in accordance with an agency-approved Monitoring Plan for the preferred alternative.

2.5.6 Wetlands

Boundaries and characteristics of wetlands and riparian areas in the disturbance footprints of the Proposed Action and Alternatives have been described during recent baseline studies. Disturbance of these areas would be minimized through design efforts. Wetland disturbances would be permitted and mitigated, and/or restored as directed by the USACE.

Runoff from planned disturbances upgradient of wetlands and riparian areas would be controlled to reduce transport of sediment and other contaminants into the wetlands and riparian areas.

2.5.7 Wildlife and Fisheries/Aquatics

Construction in stream channels would be planned in advance to occur during low flows, and the channels and banks would be stabilized against erosion as part of the initial construction.

Culverts in stream channels that are known fisheries would be designed for the passage of migrating fish. Pipes (bypass pipes left in place or installed independently) would also be placed for passage of amphibians in known and/or suspected amphibian habitat areas and near Sage Meadows.

Biological surveys would be conducted in areas planned for disturbance to identify any active nests for TEPCS bird species. Avoidance plans would be developed as necessary before these areas are disturbed.

Drivers would be required to report all collisions on the mine property involving wildlife, and these incidents would be reported to the appropriate agencies. If necessary, mitigation measures would be developed for areas with high collision rates to reduce the collision frequency and vehicle damage.

Aquatic habitat monitoring would be conducted in accordance with the requirements of the Record of Decision and an agency-approved Monitoring Plan for the preferred alternatives.

2.5.8 Groundwater

Simplot has submitted a set of BMPs for Erosion, Sedimentation and Selenium Control that would apply to the design, construction, operation and reclamation of the Panels F and G mine extension (**Appendix 2C**). Part of that BMP document applies to protection of groundwater resources.

Covering natural seeps and springs with overburden would be avoided to eliminate introduction of water into seleniferous overburden from these sources.

Overburden final slopes would be graded to promote runoff and avoid ponding to reduce infiltration from precipitation and snowmelt.

Runoff and sediment control facilities would be located off overburden fills to the extent feasible to reduce infiltration of collected water into seleniferous overburden.

South- and west-facing aspects have been incorporated into final overburden fill slopes as possible to enhance evapotranspiration and reduce infiltration. Topsoil and vegetation would be re-established on overburden disposal areas to enhance evapotranspiration of precipitation.

Runoff from haul road drainage ditches onto external seleniferous overburden fills would be avoided.

Stockpiled areas of snow would be controlled and placed in areas to reduce infiltration or mixing of snow or snow melt into/with external overburden to the extent practicable.

Seleniferous overburden would be mined and disposed of in a timely manner to reduce exposure of this material to surface weathering and oxidation, the process that liberates soluble

selenium compounds. Overburden has been characterized to determine selenium containing (seleniferous) lithologic units that can generate problematic leachate or promote bioaccumulation. Overburden from these lithologic units would be selectively handled to reduce its exposure to surface environments. Surface area of seleniferous overburden fills would be reduced by design to the extent practicable to limit the amount of water infiltration and potential release.

Seleniferous overburden fills would be capped with chert and topsoil to reduce exposure of the overburden to vegetation roots, to protect them from erosion, and to promote evapotranspiration from the cap (**Section 2.5.9**).

A vertical drain of low selenium chert would be constructed along the base of the remaining highwall in Panel G to convey surface runoff that would collect there through the pit backfill in low selenium chert instead of allowing it to percolate through run of mine (ROM) overburden. This would reduce the selenium content in this percolating water.

Groundwater would be monitored in accordance with the requirements of the Record of Decision and an agency-approved Monitoring Plan for the preferred alternative.

2.5.9 Overburden Cap

Selenium and other COPCs contained in the seleniferous shale overburden can be mobilized to the environment through a number of pathways including: erosion and transportation as sediment in air or water, dissolution and washing away in surface runoff, dissolution and infiltration in percolating water, vegetative uptake by plant roots, and ingestion of plants subject to selenium bioaccumulation by wildlife and livestock.

Pre-1999 practices in design of the overburden disposal facilities at the Smoky Canyon Mine and other mines typically consisted of handling overburden material as a mixture as it came from the mine pit, sometimes purposely handling it so as to cover the entire surface of the overburden disposal facility with a layer of shale which would presumably weather into a topsoil substitute growth medium. These past practices placed shales, now known to have high selenium concentrations, on the surface of waste piles. The selenium was available for mobilization to the environment in one or more of the release pathways listed above. This practice is no longer in use.

The current technique to reduce the exposure of seleniferous overburden to the surface environment is the placement of topsoil and low selenium chert as a cover (**Figure 2.5-1**). The term “chert” as used in this document refers to overburden with a low selenium concentration and can include chert, cherty limestone, and limestone. Chert of sufficient depth and coarse texture would deter deep root penetration into underlying seleniferous overburden reducing bioaccumulation in reclamation vegetation. Separation of vegetation roots from the seleniferous overburden would be accomplished by the thick chert and topsoil cap. Rooting depths for the grass and forb vegetation mix proposed for reclamation are typically up to about 4 feet, which is less than the thickness of the chert and topsoil cap.

The proposed cap would control erosion by covering all seleniferous overburden on the tops of the overburden fills with at least 4 feet of chert material resistant to weathering and erosion and approximately 1 to 2 feet of topsoil over the chert for a total cover thickness of 5 to 6 feet. All areas of the chert/topsoil cover would also be revegetated to further protect the reclaimed

surface from erosion and provide evapotranspiration. Simplot would monitor the reclaimed areas after revegetation is complete to identify erosion potential or problems. Identified problems would be addressed.

Infiltration of precipitation and snow melt into the seleniferous overburden shales would be reduced by a number of features including: 1) producing a final grade on reclaimed surfaces to shed runoff instead of letting it pond and infiltrate; 2) establishing a perennial vegetation cover which would consume soil moisture during the growing season; and 3) providing adequate thickness of topsoil and chert subsoil to retain quantities of annual infiltration in the chert cap, making it available for plants to remove through evapotranspiration during the growing season.

2.5.10 Management of Hazardous Materials

Management of hazardous materials, hazardous wastes, and petroleum products would be in compliance with applicable federal and state requirements and would be the same as currently practiced at the Smoky Canyon Mine (see **Sections 2.3.8** through **2.3.10**).

2.5.11 Inspections, Records and Monitoring

During operations, daily inspections would be made by mine supervisory staff of all active mine operations to ensure they are conducted in compliance with conditions of approvals, applicable permits, and regulations. Records of these observations would be kept in the mine records.

Regular SWPPP and SPCC inspections would be conducted to observe compliance with these plans and detect any conditions requiring modification to maintain compliance with the requirements and operating conditions included in the plans. Necessary maintenance or repair actions would be completed and filed in mine records.

Samples of storm water, groundwater, soil, sediment, aquatic biota, vegetation and surface water would be taken by mine staff and contractors as required in compliance with permits and conditions of approvals.

Simplot has submitted a set of BMPs for Erosion, Sedimentation, and Selenium Control that would apply to the design, construction, operation and reclamation of the Panels F and G mine extension (**Appendix 2C**). Part of that BMP document applies to the types of monitoring that are proposed to track the effectiveness of the various mitigative measures.

2.6 Alternatives to the Proposed Action

The need for a wide, objective review of potential alternatives stems from 40 CFR 1500.2(e), which states that the NEPA process must “identify and assess the reasonable alternatives to proposed actions that will avoid or minimize adverse effects of these actions upon the quality of the human environment,” and also as directed under 40 CFR 1501.2(c) which states that agencies need to “study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved resource conflicts concerning alterative uses of available resources...”.

Figure 2.5-1 Overburden Cap Design

The Alternatives proposed for detailed analysis in this EIS meet the following definitions of a "reasonable alternative":

- Generally meets the Purpose and Need and is needed to address one or more significant issues,
- Would not require significant changes in government policy or legislation (Case Law Natural Resources Defense Council v. Callaway 524 F.2d 79 2cd Circuit, 1975),
- Would avoid or minimize adverse effect of the actions upon the quality of the human environment; and
- Would be subject to the "rule of reason," with the alternative being in proportion to the significance of the environmental impacts related to the proposed action. Reasonable alternatives include those that are practical or feasible from the technical and economic standpoint and using common sense. An alternative that is outside the jurisdiction of the lead agency must still be analyzed if it is reasonable.

A range of alternatives has been considered for this analysis. There are six alternatives for the mining activities, called Alternatives A through F. There are also eight alternatives for the transportation of ore, personnel, and materials, called Alternatives 1 through 8. Finally, the No Action Alternative is also being considered. These mining and transportation alternatives are discussed in the following sections and are evaluated in Chapter 4 along with the Proposed Action. In addition to the alternatives that are being considered in detail, four other mining alternatives and nine transportation alternatives were considered but eliminated from this analysis for reasons described in **Section 2.7**.

The description of existing mine and mill operations contained in **Sections 2.3.4** through **2.3.11** would also apply to the mining and transportation alternatives evaluated in this document. The activities and conditions included in the description of the Proposed Action (**Section 2.4**) would apply to the alternatives, except where specific differences are identified in the descriptions of the alternatives. Finally, the environmental protection measures described for the Proposed Action (**Section 2.5**) would also apply to the alternatives.

When choosing a preferred alternative, the Agencies may choose one or a combination of the alternative components presented here.

2.6.1 Mining Alternatives

The following mining alternatives have been designed in response to scoping input and Agency concerns. Comparisons of the disturbance characteristics for these alternatives are listed in **Table 2.6-1**.

TABLE 2.6-1 SUMMARY OF DISTURBANCE AND RECLAMATION AREAS FOR THE MINING ALTERNATIVES (ACRES)

ALTERNATIVE	A*	B	C	D	E	F
Disturbed Area	1,054 / 918	1,056	1,056	1,193	1,028	1,028
Reclaimed Area	1,008 / 901	1,018	1,056	1,147	982	982
Unreclaimed Area	46 / 17	38	0	46	46	46

* Two values are provided for No North Lease Modification / No South Lease Modification

Alternative A – No South and/or North Panel F Lease Modifications – This alternative analyzes not mining the ore within the north and/or south Panel F Lease modification areas. It addresses scoping concerns about allowing new leases and mining in IRAs. Simplot has applied for a two-part lease modification to expand Federal Phosphate Lease I-27512 for the Panel F operations: a smaller 120-acre lease modification on the northern edge of the lease (North Lease Modification), and a larger 400-acre lease modification on the southern edge of the lease (South Lease Modification) (**Figure 2.4-1**). The Proposed Action assumes both lease modifications would be approved and includes mining plans for these areas. The change in environmental impacts from not issuing these lease modifications and not mining these areas are evaluated in this mining alternative to the Proposed Action.

This alternative addresses the scoping concerns over mining within portions of the Sage Creek IRA that are currently not under lease. Approximately 22 percent of the ore in the Panel F Proposed Action mine plan is situated within the south lease modification area alone (Simplot Mine and Reclamation Plan). The north lease modification is intended to allow mining of phosphate ore while building the Proposed Action haul/access road north of the existing lease, but more importantly, allows mining of the phosphate ore topographically lower than could be accessed from above. Approximately 6 percent of recoverable phosphate reserves in Panel F would be lost without the approval of the Proposed Action Panel F Haul/Access Road. If this alternative were fully adopted, there would be no Panel F mining disturbance outside of the existing Lease I-27512 boundaries. The mining disturbances included in the Proposed Action for the north and south lease modifications would not occur and would be subtracted from the total disturbance included in the Proposed Action, with the exception of the Proposed Action power line that would remain in the same location regardless of this alternative.

If the north lease modification were not approved, the Proposed Action Panel F Haul/Access Road might also not be constructed because it occurs in the North Lease Modification Area and would cross part of the Sage Creek IRA (see Transportation Alternative 1). In this event, the CTNF could possibly issue a SUA for the Proposed Action haul/access road across unleased federal land. If the Proposed Action Panel F Haul/Access Road were not approved, it would be replaced by the Alternate Panel F Haul/Access Road (Transportation Alternative 1), which would enter Panel F south of the Proposed Action road.

If this mining alternative was selected, the pit boundaries for the Panel F operations would be changed on the north and south ends as shown in **Figure 2.6-1**. The main difference between this mine area and the Proposed Action (**Figure 2.4-1**) is that the area of Pit 3 would be greatly reduced and the mine disturbance would not cross over the topographic divide into the Deer Creek drainage. In addition to mining less ore, the reduced mining plan would also involve handling less overburden so the final reclamation contours would be different (**Figure 2.6-2**). The main difference in the final configuration of this alternative and the Proposed Action would be that the remaining highwall would be located in the south end of Pit 1 and the north end of Pit 2 instead of in the north end of Pit 4. The remaining highwall would be approximately 2,400 feet long compared to the 4,800 feet of remaining highwall proposed for Pit 4 in the Proposed Action.

The design of open pit phosphate mines is a balance between recovery of the phosphate ore, and the revenue that ore will produce, with the overall costs of mining and milling the ore.

Figure 2.6-1 Alternative A-Panel F Ultimate Pit Map without Lease Modifications

Figure 2.6-2 Alternative A-Panel F Final Configuration Map without Lease Modifications

Removing and handling the overburden from on top of the buried ore beds is the largest cost of the mining operation. The phosphate ore beds are inclined (dip) in the ground, and mining them proceeds down-dip until the cost of removing the overburden is roughly balanced with the revenue derived from the ore that is removed. The ratio of the overburden handled to the ore removed is called the "stripping ratio". The lower the overall cost of mining and the higher the economic stripping ratio, the deeper the ore can be mined, which results in a larger open pit and more overburden to handle. When mining and processing costs significantly increase for any reason, the cost of mining the ore can be reduced by reducing the stripping ratio, which results in less overburden being removed, less ore being recovered, and smaller open pits. The BLM requires that phosphate ore from federal leases should be mined to the maximum extent practicable, within economic limits that apply to each specific mining operation.

For this alternative and mining alternatives B, C, D, and F, the increased operating costs inherent to each alternative could be balanced by redesign of the open pits to reduce stripping ratios. This would reduce the size of the open pits and the amount of phosphate ore extracted from the mining operations, shortening the life of the mine. The reduction in recovered ore could mean that Simplot would potentially begin mining operations at another location in Southeastern Idaho earlier than currently planned. The amount of new surface disturbance required at a different mine to obtain the same amount of ore left in the pits at Panels F and G under this alternative would likely be greater because of the new access and ancillary disturbances necessary for the new mine. The detailed mine planning for the redesigned mine pits at Panels F and G, as well as the design for the new mine at another location, is beyond the scope of this EIS. The specifics of these effects are discussed in Chapter 4 of this EIS.

The disturbed areas for the Panel F mining operations under this alternative would be reduced (as compared to the Proposed Action) as shown in **Table 2.6-2**.

TABLE 2.6-2 ALTERNATIVE A DISTURBANCE AREAS FOR PANEL F ON LEASE (IN ACRES)

AREA	ROADS	PITS	EXTERNAL OVERBURDEN FILLS	OTHER	TOTAL
Proposed Action Panel F Total (includes lease modifications)	28	435	38	28	529
North Lease Modification	-23*	-2	0	NC	-25
South Lease Modification	0	-138	0	NC	-138
Revised Panel F Total **	5	295	38	28	366

NC = No change would occur to settling ponds and ditches, topsoil stockpiles, and power line.
* Assumes the Alternate Panel F Haul/Access Road would be selected.
**Acreage may be less because disturbance boundaries do not conform to lease boundaries.

Alternative B - No External Seleniferous Overburden Fills – This alternative addresses scoping concerns about potential selenium contamination from external overburden fills. In this alternative, all the overburden initially proposed for disposal in the external overburden fills would still be placed there during mining; however, 4.7 MM BCY of seleniferous overburden would subsequently be removed from the external fills and placed back in the pit backfills. The duration of reclamation work would increase in this alternative because of the need to double handle more of the overburden material than under the Proposed Action. This would result in a delay in reclamation of approximately 6.5 months.

This alternative would have the same initial disturbance footprint as the Proposed Action because the full external overburden disturbance areas would be needed to temporarily store seleniferous overburden, which would then be relocated to a pit backfill during final stages of mining. The volume of overburden permanently disposed of in the external overburden fills would be less, changing the final contours of these areas compared to the Proposed Action (**Figure 2.6-3**).

The area potentially requiring a cap to reduce releases of COPCs from seleniferous overburden would be less than the Proposed Action because all seleniferous overburden would be consolidated to a smaller footprint area than the Proposed Action. The area of seleniferous overburden disposal in this alternative would be approximately 725 acres compared to 819 acres for the Proposed Action.

The remaining highwalls in Panel F would remain the same as in the Proposed Action because the seleniferous overburden relocated from the external overburden fill would be placed into Pits 1 and 2 and not in Pit 4. However, the remaining highwall in Panel G would be completely backfilled in this alternative.

Alternative C - No External Overburden Fills at All – This alternative addresses scoping concerns related to environmental effects from any external overburden fills. In this alternative, all the overburden initially proposed for disposal in the external overburden fills would still be placed there during mining, however all this overburden (10.1 MM BCY) would subsequently be removed from the external fills and placed back in the pit backfills. Operations would need to be extended by 12.5 months to allow time for all this overburden to be relocated back to the open pits.

This alternative would also have approximately the same initial disturbance footprint as the Proposed Action because the full external overburden disturbance area would be needed to temporarily store the overburden, which would all then be relocated to the pits during final stages of mining.

This alternative would result in higher pit backfill final contours than in the Proposed Action or Alternative B. The footprints of the external overburden fills would be restored to approximate original contours. The remaining highwalls would be eliminated in this alternative compared to the Proposed Action or Alternative B because more overburden would be relocated to the pits where it would be used to completely bury all highwalls (**Figure 2.6-4**).

The area potentially requiring a cap to reduce releases of COPCs from seleniferous overburden would be less than the Proposed Action, and 38 acres greater than Alternative B. This is because all seleniferous overburden would be removed from the external overburden fills in Alternative B, so moving all the remaining non-seleniferous overburden from the external overburden fills back to the pit backfills in this alternative does not further reduce the area of potential cap. The final area of seleniferous overburden requiring a cap in this alternative would be the pit backfills, 763 acres.

Alternative D - Infiltration Barriers on Overburden Fills – This alternative addresses concerns over groundwater impacts from infiltration of precipitation into seleniferous overburden, which could then percolate out the bottoms of the overburden fills and eventually enter the groundwater beneath these sites. Use of synthetic infiltration barriers at the Smoky Canyon Mine site was evaluated for the Panels B and C SEIS and found to be unreasonable for

Figure 2.6-3 Alternative B-Final Configuration without Seleniferous External Overburden

Figure 2.6-4 Alternative C-Final Configuration without Any External Overburden

technical and cost factors (BLM and USFS 2002). In that application, use of clay infiltration barriers was also not feasible, primarily for cost reasons because the only available clay was too expensive to haul to the overburden sites. In the case of Panels F and G, there is Dinwoody formation reasonably available that could be used to construct a low-permeability, infiltration barrier, or its equivalent, over all areas of seleniferous overburden fills. This infiltration barrier would be built on top of the outer edges of each lift of external overburden fills and over the sloping tops of pit backfills and external overburden fills (**Figure 2.6-5**). The overlapping nature of each level of the infiltration barrier with levels above and below it would provide continuous coverage of the seleniferous overburden fills. The infiltration barrier would be built concurrently with placing the overburden and would be covered with the chert cap material to protect it. The total thickness of the Dinwoody/chert/topsoil cap over the seleniferous overburden on the reclaimed overburden fills would be at least as much as the Proposed Action. The thickness, material properties, and hydraulic functions of the cap would be determined through detailed designs provided by Simplot at a later time. Water infiltrating into the growth medium of the cap would largely be removed by evapotranspiration. Remaining water in the chert layer of the cap would impinge on the top of the infiltration barrier and drain laterally to the edge of each level of the infiltration barrier where it would then flow down through the chert to the next level and so on to the outer margins of the overburden fill, thus reducing percolation of this water into the underlying overburden. Final designs, to be provided by Simplot, may be different than described here but will still provide the level of percolation reduction required to protect quality of groundwater and surface water to levels in concert with applicable regulatory requirements and the environmental analyses included in this EIS.

The construction material to be used for the infiltration barrier cap occurs in the lower shale member of the Dinwoody formation. Sufficient quantities of this material are available within the Panel F and G leases (**Figure 2.6-6**). Exploration drilling in the Panel F area indicates there would be sufficient Dinwoody resources within the overburden intended for removal from the existing pit plan. If additional Dinwoody resources are required for this panel, more Dinwoody is available on approximately 86 acres immediately west of the pit highwall and could be accessed by laying back the proposed pit highwalls along this area. Dinwoody would be excavated from this borrow pit during the life of the Panel F mining activity. The same safety and environmental protection measures proposed for the phosphate mining operations would also apply to the Dinwoody formation borrow pits.

The Dinwoody material necessary for Panel G would be obtained on lease within the proposed boundaries of the open pit or the South External Overburden Fill and within two borrow pits totaling 25-acres to the south and west of the open pit (**Figure 2.6-6**). Dinwoody would be mined from the borrow areas with standard open-pit methods. The vegetation would be removed, and the suitable topsoil would be stockpiled for future reclamation of the borrow pits. Where the Dinwoody resources occur in the overburden that would be stripped prior to mining, stockpile areas in Panel F (18 acres) and Panel G (8 acres) have been situated on lease as displayed on **Figure 2.6-6**. The Dinwoody material would be mined, temporarily stockpiled as necessary, and hauled to the construction sites where it would be spread to a loose thickness of about 18 inches. The foundation for the infiltration barrier would be compacted ROM overburden on the top of designated portions of each lift of overburden fill. The Dinwoody material would be conditioned with moisture by water trucks, if necessary, to the required moisture content indicated by geotechnical design studies and compacted to a minimum thickness of 12 inches. Quality control measures would, among other observations, include physical and permeability testing conducted in the field to ensure the infiltration barrier had the specified characteristics to reduce annual infiltration through the infiltration barrier to the amounts indicated in the groundwater impact analysis for this alternative (see **Section 4.3**).

The infiltration barrier would be covered with the chert layer shortly after being compacted to preserve moisture and protect it from frost and roots. When no longer required, the Dinwoody borrow pit areas would be regraded to maximum slopes of 3h:1v, topsoiled and revegetated.

Alternative E –Power Line Connection from Panel F to Panel G Along Haul/Access Road In this alternative, electric power for the proposed mining operations would be provided with a 25kV, single-pole structure, power line extending southward along the selected haul/access roads from the existing power line in Panel E. The power line would be constructed within the footprint of the agency-preferred haul/access roads (**Figure 2.6-7**). The power line would consist of approximately 30-foot tall single, wooden structures with a nominal span of approximately 330 feet. Approximately 16 pole structures per mile would be needed for straighter sections of the line, and more poles would be required to route the line around sections of the road having curvature.

Alternative F – Electrical Generators at Panel G – With the consideration of a separate power line corridor from Panel F to Panel G (under the Proposed Action and Alternative E), the Agencies decided to evaluate an alternative that would negate the need for any power line at all to Panel G through the use of generators located at the hot starts area of Panel G. The required generator capacity would be 1,100 to 1,200 kW. It would be powered by a 1,500 HP motor running continuously and using about 63 gallons of fuel oil per hour. For continuity of electrical service during normal maintenance and/or break downs, two such generator sets would be required, with one on automatic standby status at all times.

A separate oil tank would be added to the hot starts tank farm to hold the fuel for the generators and would be included within the secondary containment and SPCC procedures that would apply to the rest of the tanks.

The stationary exhaust emissions from these generators would be a significant increase over the current stationary air emissions for the Smoky Canyon Mine, and a Title V air emissions permit issued by the State of Idaho would be required.

The new electrical generators would cause an increase in vendor truck traffic to the Panel G mine compared to the other alternatives for the delivery of the extra fuel and lubricants required by the generators. The generators would also produce more used lubricating oil and coolant, which would be added to the mine's waste disposal activities.

2.6.2 Transportation Alternatives

The following transportation alternatives have been designed in response to scoping input and Agency concerns (**Figure 2.6-8a**). Comparisons of the disturbance characteristics for these alternatives are listed in **Table 2.6-3**. As described for the Proposed Action haul/access roads, portions of the alternative transportation corridors may be aligned across natural slopes steeper than 33 percent necessitating leaving portions of these corridors unreclaimed as indicated on **Figure 2.6-8b** and in **Table 2.6-3**.

Figure 2.6-5 Alternative D-Crest-lined Slope

Figure 2.6-6 Alternative D-Dinwoody Shale Borrow Pits and Stockpiles

Figure 2.6-7 Alternative E-Power Line Along Haul/Access Road

Figure 2.6-8a Transportation Alternatives

Figure 2.6-8b Unreclaimed Areas for Transportation Alternatives

TABLE 2.6-3 SUMMARY COMPARISON OF TRANSPORTATION ALTERNATIVE DIMENSIONS

#	ALTERNATIVE	LENGTH (MILES)	TOTAL ACRES	UNRECLAIMED ACRES	MILES IN IRAS *	ACRES IN IRAS *
1	Alternate Panel F Haul/Access Road	2.1	46	5	0.4	10
2	East Haul/Access Road	7.4	216	7	2.8	75
3	Modified East Haul/Access Road	8.4	276	21	4.5	141
4	Middle Haul/Access Road	6.4	192	34	6.2	189
5	Alternate West Haul/Access Road	8.0	226	28	4.7	131
6	Conveyor	6.1	61	0	5.3	53
7	Crow Creek/Wells Canyon Access Road*[1]	15.1	114	0	0.4	5
8	Middle Access Road	5.9	99	0	5.8	97

*Note: Miles and Acres in IRAs are only for the portions of the roads outside of existing lease boundaries, also includes topsoil stockpile areas.
*[1] New disturbance only

Also similar to the Proposed Action, the alternative haul/access roads would have the same general road cross-section as described for the Proposed Action (**Figure 2.4-2**). The environmental protection measures and BMPs described for the Proposed Action haul/access roads would equally apply to each of the alternate haul/access roads.

Alternative 1 – Alternate Panel F Haul/Access Road - This road alternative would follow the same alignment as the Proposed Action from Panel E across South Fork Sage Creek to a point southeast of the creek crossing. From this point, this alternative alignment would be further to the west and south than the Proposed Action Panel F Haul/Access road connecting Panels E and F in order to completely avoid crossing any of the Sage Creek IRA outside existing leases (**Figure 2.6-9**). This alternative addresses scoping input that an alignment alternative should be considered for a road that avoids the IRA. A USFS SUA would be required for this alternative. It is shorter than the Proposed Action Panel F Access/Haul Road and would have 21 acres less disturbance. Because this road would enter the Panel F lease at a higher elevation than in the Proposed Action Panel F Haul/Access Road, the ore could not be extracted to as great a depth, and this alternative would result in the recovery of approximately 1.2 MM tons less phosphate ore than the Proposed Action.

Alternative 2 –East Haul/Access Road - This haul/access road alternative would connect Panels F and G via a route out of the south end of Panel G and then northward up the unnamed drainage immediately east of Panel G to a summit from which it would turn eastward down the north slope of Nate Canyon to the mouth of Deer Creek and then generally northward along the east face of the mountain range to join the access road between Panels E and F (**Figure 2.6-8a**). This haul/access road alternative would have the least amount of disturbed area in the Sage Creek IRA of the haul/access roads under consideration but would be the closest to the residents and visitors in the Crow Creek area (**Figure 2.6-8a**). This alternative has the fewest number of creek crossings of any of the alternatives.

Alternative 2 would require a 300-foot long culvert crossing of perennial Deer Creek, which is also a fishery, and would also require culvert crossings of the ephemeral drainage upstream of Quakie Hollow and Manning Creek.

The road corridor would extend along the entire east side of the Webster Range from Panel G to Panel E. This road would cross private land in the lower Deer Creek Canyon area, and a private landowner easement would be required for construction in this area.

Alternative 3 – Modified East Haul/Access Road – This alternative would avoid building the East Haul/Access Road (Alternative 2) on private land. This would be possible by installing switchbacks in the road within Deer Creek Canyon and crossing Deer Creek about one mile upstream of the Crow Creek Road stream crossing. The rest of this alignment would be the same as the East Haul/Access Road. Compared to the East Haul/Access Road, this modified road alignment would be less visible to persons along Crow Creek Road. It would also reduce the overall climb of the loaded haul trucks out of Deer Creek Canyon. Under this alternative, the crossing of Deer Creek would be accomplished with a 390-foot long culvert. It would involve constructing road cuts and fills in Deer Creek Canyon, which, although designed to minimize direct physical impacts to the stream, would also be difficult to fully reclaim (**Figure 2.6-8b**). The section of this road that would be located up Deer Creek Canyon would be constructed on steep (60+ percent), rocky side slopes that would require full bench (cut) construction and end hauling of material. This road would also have a greater length in the IRA compared to the East Haul/Access Road (**Table 2.6-3** and **Figure 2.6-9**).

Alternative 4 - Middle Haul/Access Road - This alternative would connect Panels F and G with a haul/access road along the eastern slope of Freeman Ridge in the middle Deer Creek watershed area (**Figure 2.6-8a**). It would require road fills and culverts that are 440 and 510 feet long to cross the main and south forks of Deer Creek, respectively. Constructing this road in the steep sandstone slopes in this area would result in large road cuts and fills that would be more difficult to reclaim than the Proposed Action West Haul/Access Road and Alternative 2, the East Haul/Access Road. The sections of this road that would be located on steep (60+ percent) rocky side slopes would require full bench (cut) construction and end hauling of material. It is the shortest of the five haul/access roads from Panel G but has a disturbed area in the Sage Creek IRA greater than either the East or West Haul/Access roads (**Table 2.6-3**). It would be more isolated from the general public than the other two haul road routes but would impact the perennial North Fork Deer Creek watershed more than either of the other haul/access roads.

Alternative 5 –Alternate Panel G West Haul/Access Road – This would be an alternative alignment to the northern portion of the Proposed Action Panel G West Haul/Access Road. It would extend from the south end of Panel F along the north slope of North Fork Deer Creek and cross over into upper South Fork Sage Creek Canyon at Sage Meadow where it would join the Proposed Action Panel G West Haul/Access Road from Panel G. It would then course south through the Deer Creek and South Fork Deer Creek drainages to Panel G on the same corridor as the Proposed Action Panel G West Haul/Access Road. The main difference between this route and the Proposed Action Panel G West Haul/Access Road is that this alignment would disturb less of the South Fork Sage Creek watershed and eliminate the long, north-aspect road section in this area, allowing for easier winter maintenance (**Figure 2.6-8a**).

Alternative 6 - Conveyor from Panel G to Mill - This alternative would eliminate construction of a haul road connecting Panels F and G and would transport ore from Panel G to the mill with a conveyor along a 50-foot wide corridor (**Figure 2.6-8a**). This conveyor would be built from the staging area at Panel G down along the west edge of the Panel G pit, then down the south slope of Deer Creek Canyon to its bottom where it would span the creek, then course up the north slope of the canyon to Panel F. The conveyor would follow along the east side of Panel F and span South Fork Sage Creek upstream of the haul/access road from Panel E to F. It would then enter the Panel E disturbance area and generally follow the existing haul/access road from Panel E all the way to a crushed ore stockpile at the existing Smoky Canyon mill. A service road would be needed in conjunction with the conveyor; it would be a graded surface one-lane

Figure 2.6-9 Transportation Alternatives with IRAs

road, just wide enough for a service truck and would parallel the conveyor. The service road would not cross Deer Creek or South Fork Sage Creek; rather it would terminate on either side of these creeks. The conveyor structure would span these creeks. The characteristics of this conveyor and its right of way are shown on **Figure 2.6-10**.

The Panel G ore would need to be dry crushed at Panel G before being placed on the conveyor. This crushing facility would consist of a ROM ore stockpile, a grizzly/hopper, and the crusher. Electric power for the Panel G facilities would be provided with a high voltage cable fixed to the conveyor support structure along the conveyor right-of- way. This alternative would have less surface disturbance than any of the haul/access road alternatives but would also require implementation of either the Wells Canyon/Crow Creek access road (Alternative 7) or the Middle Access Road (Alternative 8).

One of these access roads (described below) would be required in conjunction with this alternative in order to transport equipment to Panel G and allow for employee, supply, and vendor access.

Alternative 7 - Crow Creek/Wells Canyon Access Road – Building the conveyor from Panel G would also require construction of either this alternative or Alternative 8. This is because, in addition to hauling ore to the mill on the conveyor, equipment, personnel, and supplies would need to be transported to and from Panel G. This access function provided by any of the haul/access roads would be lost if the conveyor was built instead of a haul/access road. The Crow Creek/Wells Canyon Access Road would involve upgrading the existing Crow Creek county road from the mouth of Crow Creek Valley near Fairview, Wyoming to the mouth of Wells Canyon, a distance of approximately 15 miles (**Figures 2.6-11a and 2.6-11b**). Coordination and approvals from both county road departments in Wyoming and Idaho would be required. Upgrading the existing road would involve general grading, widening, and straightening the sharpest curves. Existing culverts would also need to be replaced with longer culverts. The final road surface would be 30 feet wide and covered with crushed rock for all-weather use. A new 30-foot wide access road would be built up Wells Canyon to the Panel G staging area from the Crow Creek road. This new road would be located on the north side of the canyon above the ephemeral stream channel in the canyon bottom, where much of the existing USFS road is currently located. Both Wells Canyon and Crow Creek Roads would remain open to public traffic under this alternative. Easements, rights-of-way, or private property acquisitions may be necessary to accommodate portions of the Crow Creek Road re-alignment and the east end of the Wells Canyon Road. After mining is completed, the Wells Canyon Road would be reclaimed back to a lower standard (20-24 feet wide), and the existing Wells Canyon Road would be decommissioned and reclaimed. The partially reclaimed, lower standard would serve as the permanent Forest Route 146. Portions of the Crow Creek Road that would be cut off during the realignment and upgrade would also be decommissioned and reclaimed following the construction of the new road.

Alternative 8 – Middle Access Road – Building the conveyor would require construction of either this alternative or Alternative 7. This alternative would involve building an access road from Panel G northward across South Fork Deer Creek, Deer Creek, and North Fork Deer Creek to enter Panel F on its south end (**Figure 2.6-8a**). It would then join the haul/access road along the length of Panel F. The final surface of this access road would be 50 feet wide and would be covered with crushed rock for all-weather use. The width of the road corridor disturbance would vary depending on the amount of cut and fill. The road would cross the various stream channels with culverts including a 580- and 360-foot long culvert, respectively,

for the crossings of the main and south forks of Deer Creek. It would eliminate the impacts of road construction along Crow Creek and in Wells Canyon but, unlike the Crow Creek/Wells Canyon Access Road, would impact environmental resources of the Deer Creek watershed.

2.6.3 No Action Alternative

Under this alternative, Panels F and G would not be approved for mining, and none of the transportation or mining alternatives would be needed or implemented. This would eliminate the local environmental impacts from the mining of Panels F and G. The existing, approved mine panels would be mined and reclaimed as previously permitted. The Smoky Canyon Mine staff would decrease as operations cease due to lack of regulatory permit approval. This would require mining, processing, and supporting administrative employees to seek alternate employment. These employees are located not only at the Smoky Canyon Mine and the Don Plant processing plant in Pocatello, but also in company headquarters located in Boise, Idaho.

Under the No Action, Simplot would consider other means to maintain ore production, which are described below. It should be noted that none of the following are considered economically feasible in order to maintain processing capability at the associated Don Plant in Pocatello. As such, the most likely scenario of the No Action alternative would be the closure of the mine and plant. The impacts of a closure would mimic the recent closing of the Astaris Mine and phosphorus processing plant, and total economic losses to the area could be measured in the hundreds of millions of dollars.

Purchase Ore Elsewhere for the Don Plant – If mining at the Smoky Canyon Mine did not continue, the operation of the Don Plant would be terminated unless suitable ore was obtained from alternate sources and shipped to the plant. Simplot currently does have other phosphate reserves, but they are not permitted or as ready to mine as those at Panels F and G. It would take years to permit and construct a new mine and associated infrastructure to replace the Smoky Canyon Mine. Replacement sources of feedstock for the plant could not be readily purchased on the open market because:

- The Don Plant is designed to receive beneficiated ore concentrate and not raw ore. This limits the potential suppliers to only those able to provide beneficiated ore concentrates. The Don Plant would need to construct a rail-based ore delivery and handling system and a new mill and tailings pond for beneficiating raw ore.

- The processing systems at the Don Plant are specifically designed to only handle ore from the Smoky Canyon Mine. Other sources of ore in southeast Idaho would not be as compatible with the Don Plant process. Therefore, the process may have to be modified.

- The few other phosphate mines in southeast Idaho are also vertically integrated operations with their own milling and processing facilities. Large quantities of additional phosphate ore are not readily available on the open market for purchase by Simplot.

- If Simplot could locate an alternate source of ore at a competitive cost for the Don Plant, then the Don Plant would remain in operation, maintaining the current level of staffing.

Figure 2.6-10 Conveyor Characteristics

Figure 2.6-11a Crow Creek/Wells Canyon Access Road-South Half

Figure 2.6-11b Crow Creek/Wells Canyon Access Road-North Half

Mine Other Simplot Leases Instead of Panels F and G – Although this action may reduce environmental impacts at Panels F and G, it may not be significantly better environmentally on a regional basis. Simplot currently holds leases in the Sulfur Canyon/Swan Lake Gulch and Dairy Syncline Project Areas, but currently has no existing mining, milling or transportation infrastructure in place at either lease area. Development of either of these leases would require new and extensive construction of mining operation and support facilities, haul roads, and ore processing or transportation systems; these operations would have their own set of environmental impacts. In addition, it would be impossible to permit these leases in a time frame that would not result in an idling or potential closure of the Don Plant in Pocatello.

2.7 Alternatives Eliminated from Detailed Analysis

This section describes alternatives to the Proposed Action that were considered but were not adopted for consideration or detailed review. A range of alternatives to be evaluated in an EIS should meet certain key principles derived from NEPA case law including:

- The overall range of alternatives should be governed by the "rule of reason". When there are potentially a large number of alternatives, only a reasonable number of examples, covering a full spectrum should be analyzed.
- All alternatives considered must achieve the objectives of the Purpose and Need.
- Alternatives must be "reasonable," i.e. they must be technically and economically feasible.
- Alternatives that are speculative and geographically remote need not be considered.
- Alternatives with environmental impacts that are obviously worse than the Proposed Action or other alternatives under consideration can be eliminated.

The following alternatives that were removed from further evaluation in the EIS were eliminated for one or more of the above-listed principles. These alternatives and the reasons why they were eliminated from further consideration are briefly discussed in the following sections. If economic or technological considerations were to change significantly before certain portions of the ultimately selected alternative are implemented, then alternatives which are presently considered infeasible may become feasible and could be reevaluated in the future in a separate NEPA document.

2.7.1 Eliminated Mining Alternatives

Underground Mining – Use of underground mining methods offers the potential benefit of eliminating the development of open pits and the associated overburden disposal issues. However, underground mining of phosphate ore has not been practiced in southeast Idaho or northeast Utah since 1976, and there are no underground phosphate mines currently operating in the United States. Additionally, Simplot's entire operation is set up to conduct surface mining. Underground mining would require outlays of capital for all new machinery. Extensive retraining would be required or new hiring of professional, technical, and labor personnel. The economics of modern open pit mining practices, by using more cost-efficient mining methods and equipment, allows for increased recovery of the phosphate resource compared to underground methods.

Underground mining is not without its own set of potential impacts that are not shared with open pit methods including:

- Increased safety hazards to mine workers,
- Increased mine worker population,
- Replacing surface miners with underground miners,
- Increased electrical power needs for mine ventilation and other equipment,
- Increased mining costs per ton of ore extracted,
- Potential long-term subsidence (caving) of ground over the mined out areas, and
- Interception of groundwater in underground openings.

This alternative was eliminated from further consideration because it is not considered to be economically feasible or practical and did not meet the Purpose and Need for continued economically viable development of federal phosphate resources.

Relocation of the Smoky Canyon Mill to Panel G – The need for transportation of Panel G ore across public land all the way to the existing Smoky Canyon mill drives the need for the proposed ore transportation routes across the Sage Creek and Meade Peak IRAs. If the Panel G ore could be mined and milled locally at the mine panel, this would negate the need for the transportation of the ore north, and haul/access roads or conveyor across the IRAs could be eliminated. In addition, diesel fuel and other ore haulage costs would be conserved, and air emissions from this haul traffic would be eliminated. Some drawbacks of this alternative include:

- Off site transportation impacts from the Crow Creek/Wells Canyon access road would be greater for this alternative than Alternative 7 because mill employees and mill vendor deliveries would be added to the mine traffic.
- A larger power line (115 kV) would be needed to satisfy the electric motor horsepower of the relocated mill. This would require a currently unneeded new power line right of way from the Fairview substation to the Panel G location.
- Pipelines for water supply, beneficiated ore slurry, and tailings would have to be extended from the existing Smoky Canyon mill site to the new Panel G mill. Thus, a pipeline transportation corridor between Panel G and the existing mill site would still be required.
- A new tailings pond would need to be located near Panel G with connecting tailings and reclaim water pipelines. It is unlikely that such a new tailings pond site would be readily available in the area. Because there is capacity in the currently operating, permitted ponds, this would result in unnecessary disturbance for relocating a tailings pond area.
- There would be an interruption in beneficiated ore delivery to the Don Plant while the Smoky Canyon mill was relocated from Smoky Canyon to Panel G. This would result in a temporary shutdown of the Don Plant with consequent socioeconomic impacts.
- The capital expenditure necessary to relocate the mill and tailings impoundment is not economically feasible when compared with the amount of ore available in the Panel G lease.

This alternative was eliminated from further evaluation because it did not reasonably expand the range of alternatives already under consideration and did not comply with the Purpose and Need.

Enhanced Anoxic Attenuation in Pit Backfills - This alternative addresses scoping concerns over groundwater impacts from infiltration of precipitation into seleniferous pit backfills. Evidence from other mining locations and laboratory testing by Simplot indicates a potential for lower release rates of dissolved selenium in phosphate pit backfills where certain conditions of moisture content, atmospheric gas flux with low oxygen content (anoxic), and selenium-reducing microbial communities can be developed. At the present time, this type of contaminant attenuation is not considered likely in external overburden fills because of the lack of anoxic conditions.

Research is currently being conducted by Simplot and other companies to determine if such conditions can be developed and naturally maintained in the backfills of future phosphate pits. If this could be accomplished, the groundwater impacts of this mining approach could be lessened because the seepage being released from the pit backfills would contain a lower concentration of dissolved selenium. Adoption of this mitigative measure would not affect surface disturbance areas at the mine panels.

Although preliminary results of the research to date indicate attractive theoretical characteristics and benefits for this backfilling approach, the work has not progressed to the point where the effectiveness of this measure is predictable enough to be relied upon for environmental impact analyses. The Agencies have decided to not evaluate this alternative in detail in this document but retain the option to consider this approach in the future if and when the technology has developed to an appropriate point.

2.7.2 Eliminated Transportation Alternatives

Tunnel from Panel F to Panel G – This alternative would involve construction of a tunnel from Panel F to Panel G for a conveyor to transport ore. Such a long tunnel would be prohibitively expensive to construct and would expose mine workers to hazards from underground mining. This action would also have significant groundwater quantity impacts because the tunnel would be lower than the water table under Deer Creek, and the dewatering of the tunnel could remove significant amounts of groundwater from this area. Such dewatering could reduce natural groundwater discharge in lower Deer Creek Canyon. This is not considered to be an economically feasible alternative for many of the same reasons as the Underground Mining Alternative discussed above.

Haul/Access Road Down and Back Up Deer Creek – This alternative would require building a haul/access road down the south-facing slope of Deer Creek Canyon from Panel F, crossing lower Deer Creek with a road fill, and then building the haul/access road back up the north slope of Deer Creek Canyon to Panel F. This route was conceptually evaluated by Simplot and is discussed in their April 21, 2003 mine plan submittal. The extensive road cuts produced by this road alignment would be in solid rock on the extremely steep canyon slopes on both sides of Deer Creek Canyon and would affect much of the length of the canyon. Such road cuts and fills would have major visual impacts and would be practically impossible to reclaim back to topographic and aesthetic values. Extensive road fills would expose much of Deer Creek to sedimentation impacts from erosion of disturbed surfaces. This alternative was eliminated from further evaluation because it did not reasonably expand the range of alternatives already under consideration, and it had obvious environmental and operational impacts that were worse than the Proposed Action and the other alternatives already under evaluation.

1400-Foot Culvert Haul/Access Road from Panel E to Panel F – This alternative would involve building a haul/access road up the north side of South Fork Sage Creek Canyon to the north end of the pit in Panel F. This alternative was conceptually evaluated in the April 21, 2003 Simplot mine plan. The steep and rocky canyon walls would require large cuts and fills to construct the road. The road cuts would be practically impossible to reclaim close to original contour. Approximately 1400 feet of South Fork Sage Creek would need to be placed in a culvert under the road fill, which would negatively impact stream hydrological functions in this long reach during mine operations. Reclamation of this road would be extremely difficult because of the amount of fill and cut that would need regrading and revegetation treatment. Approximately 1400 feet of culvert would be removed, and the stream channel in this reach would need to be reconstructed. This alternative was eliminated from further evaluation because its environmental impacts were obviously worse than the Proposed Action road connecting Panels E and F or the alternative already under consideration for this road.

Conveying Ore from Panel F to Mill – This alternative was discussed in the April 21, 2003 Simplot mine plan submittal. This action would eliminate the need for a haul road from Panel E to Panel F, but a conveyor corridor and access road would still need to be constructed. The conveyor would increase capital costs for the Project and also eliminate the ability to backfill Panel E with Panel F overburden because overburden cannot be transported on the conveyor. A larger external overburden disposal site would be required for the initial pits in Panel F that is not required if this overburden is hauled back to Panel E for backfilling purposes. This alternative was eliminated from further evaluation because its main environmental impacts (not backfilling Panel E and a larger external overburden fills) were obviously worse than the Proposed Action or other alternatives already under consideration.

Hauling Ore from Panel G with Commercial Trucks on Public Roads – This alternative requires the use of a contractor to operate highway-legal trucks and trailers to haul ore down a new Wells Canyon haul/access road, out a widened Crow Creek road to Star Valley, north up Star Valley to the Stump Creek road, along the existing access road in Tygee Valley and up the Smoky Canyon road to the Smoky Canyon mill. Such trucks are now widely used in Nevada to transport large quantities of gold ore over large public roads. This alternative could be less costly in capital but more costly in operating costs for Simplot than any of the other haulage alternatives. It would have less disturbance-type environmental impacts than any of the haul road alternatives that cross the Sage Creek IRA because it would not require building roads across the Forest. There would be new disturbance from widening and re-aligning the existing roads along the haulage route. It would have greater air emission impacts from the exhaust of the greater number and longer truck trips needed to move the ore with lower efficiency and greater fuel consumption than using 150-ton mining trucks as included in the Proposed Action and Panel G transportation alternatives evaluated. It would have the greatest off-site (i.e., on public roads) transportation impacts (noise, dust, safety, and road maintenance) of any of the transportation alternatives and would also require construction of the Wells Canyon haul/access road and a much wider Crow Creek road to accommodate all the truck traffic. This alternative would have the greatest impacts on residents and the public along Crow Creek and would add considerable transportation impacts to residents and the public in Star Valley, along Stump Creek road, and in Tygee Valley that would not be present in any of the other transportation alternatives. This alternative was eliminated from further evaluation because its environmental impacts (primarily to public transportation and safety) were obviously worse than the Proposed Action or other alternatives already under consideration.

Haul/Access Road East of Sage Creek IRA from Panel G – This alternative would involve building a haul/access road down Wells Canyon, north parallel to the Crow Creek road to approximately Deer Creek where it would join the already proposed East Haul/Access road alignment. It would have less environmental impacts on the Sage Creek IRA than any of the other mine truck haulage alternatives and addresses concerns related to road building within the IRA. It would have greater impacts on the residents and public in the southern portion of Crow Creek Valley than the other East Haul/Access Road alternatives already under consideration. This road would cross more private land with multiple owners than the other East Haul/Access Road alternatives, and landowner permission would be required. This alternative was eliminated from further evaluation because its environmental impacts to residents and the public in Crow Creek Valley were obviously worse than the Proposed Action or other alternatives already under consideration.

Haul/Access Road in Upper North Fork of Deer Creek Canyon from Panel G – This alternative would consist of a road built from the south end of Panel F roughly west into the upper watershed of North Fork Deer Creek and through the unnamed topographic pass across Freeman Ridge to join the West Haul/Access Road. This route would present major disturbance impacts in the upper portion of the North Fork Deer Creek watershed and would require construction of a high-elevation crossing of the south end of Freeman Ridge where no road access currently exists. This alternative was eliminated from further evaluation because its environmental impacts to the North Fork Deer Creek watershed were obviously worse than the Proposed Action or other alternatives already under consideration.

Slurry Pipeline From Panel G to the Mill - This alternative would involve transporting ore from Panel G to the existing Smoky Canyon mill facility with a buried slurry pipeline similar to that currently used to transport phosphate concentrate from the mill to Pocatello. A slurry pipeline would consist of an 8 to 10-inch diameter steel pipe buried 4-feet deep in a trench along the pipeline corridor. Pipeline construction would temporarily disturb the pipeline corridor, but most of this disturbance would immediately be reclaimed. Pipeline construction activities would be confined to a 50-foot wide right of way. A new 115kV power line would need to be built into Panel G from Fairview, Wyoming. This power line would extend from the existing substation near Fairview, Wyoming to Panel G, along an undetermined route.

One pipeline route that was considered went down Wells Canyon from Panel G to the Crow Creek Road then along that road to the Manning Canyon road and north along an existing USFS road to South Fork Sage Creek Canyon where it would cross the creek and follow existing haul roads to the Smoky Canyon mill. A second route considered went west from Panel G along the existing USFS road in South Fork Deer Creek Canyon then north along the Diamond Creek Road to Timber Creek, and then east over the summit between Timber and Smoky Creeks to the Smoky Canyon Mill. Finally, a third route was considered that crossed the Sage Creek IRA between Panels F and G and then followed the haul road from Panel F to the mill.

Ore from Panel G would be ground in a mill located at Panel G. The ore/water slurry would be pumped into agitated slurry surge tanks at the grinding mill and then into the head end of the slurry pipeline. Slurry would exit the pipe at the existing Smoky Canyon mill into a set of slurry surge tanks. Slurry would be introduced from these tanks into the existing Smoky Canyon mill for beneficiation. Water would be pumped from a 1,000-gpm well at Panel G to the Panel G SAG mill facility. Water from a surge tank at Panel G would be introduced into the mill to mix with ore as it is ground. Approximately 750 gpm of water would be used to grind and slurry the

ore. This water would be shipped to the Smoky Canyon mill with the ore slurry and would replace an equal amount of water in the water balance for that facility. There would be no planned discharge of either slurry or water to the environment at any point along the proposed slurry pipeline system.

An access road for mine workers and suppliers would need to be constructed into Panel G for this alternative. Options for this access road would consist of either Transportation Alternative 7 or 8 as previously described in this document.

The environmental benefits of this alternative include: potential minimization of disturbance impacts to IRAs, immediate reclamation of most of the disturbed area along the pipeline corridor, reduction of long-term impacts to streams because the pipeline would be placed under the stream channels, and minimal impacts to persons and wildlife during pipeline operations.

This alternative has the following economic and environmental problems:

- Approximately 10 percent of the phosphate value in the ore would be lost at the Smoky Canyon mill because a fine fraction of the high-grade ore would be lost in the mill circuit and would be discharged to the tailings pond instead of being captured and pumped to Pocatello.

- To compensate for the reduced phosphate recovery at the mill, the Panel G mine plan would need to be redesigned to only mine higher-grade material, resulting in a lower overall ore recovery than the Proposed Action.

- The overall reduction in recovered P_2O_5 from the Panel G mine would be approximately 350,000 tons, which equates to a loss to the economy of $62,000,000.

- Royalties paid to the federal government, and partially distributed to the state and local economies would be reduced.

- Net additional costs for this alternative (after capital and operating costs are considered) over the Proposed Action and other transportation alternatives are approximately $34,000,000.

- The net additional costs stated above do not include approximately $5,000,000 for construction of a 115kV power line.

- The slurry line would require operation of a 1,000 gpm water well at Panel G that would require additional water rights and would remove an average of 750 gpm of groundwater (1,210 acre-feet per year) from the Deer Creek watershed.

Over the relatively short life of this type of development, Simplot would not recover the capital costs of this alternative. Economic analysis of similar projects have shown that a slurry pipeline operation has a greater capital cost in the beginning with lower operational costs over time. Under the right circumstances, the long-term operation of a pipeline is both economically practical and feasible. However, the few years that this mine would operate and with the poorer ore quality in Panel G, it cannot support a slurry alternative. After a detailed economic and technical review by Agency engineers, this alternative was eliminated from further consideration because it was not economically or technically feasible and did not comply with the Purpose and Need.

West Access Road via Timber Creek, Diamond Creek, and SF Deer Creek – This would be an alternative to the Crow Creek/Wells Canyon Access Road or the Middle Access Road for access to Panel G as part of the conveyor ore transportation alternative. It would involve upgrading the existing upper Wells Canyon, Diamond Creek, and Timber Creek roads by widening and straightening for use as year-round access for both vendor delivery and employee vehicles from the existing Smoky Canyon access road. This alternative would reduce transportation impacts to the Crow Creek and Wells Canyon areas, but would dramatically increase public traffic on the Timber Creek, Diamond Creek, and upper Wells Canyon roads that are currently used primarily for recreation. This alternative would not require construction across the Deer Creek drainage within the Sage Creek IRA, but would increase public access to the margins of the IRAs along its route.

The existing USFS roads to be widened under this alternative already border on riparian, wetland, and perennial aquatic habitats along Deer, Diamond Creek, and Timber Creeks. Widening of the roads in these areas would have direct impacts to these resources during road construction. Increased vehicle use of the roads year-round would have the potential for increased sedimentation impacts to the aquatic habitats. A dramatic year-round increase in vehicle traffic on these roads would interfere with the current recreational users and likely increase recreational access to the IRAs along the route. This alternative was eliminated from further evaluation because its environmental impacts (to riparian and aquatic resources and recreation access) were obviously worse than other employee/vendor access routes associated with non-haul truck road related transportation alternatives already under consideration.

2.8 Features Common to the Proposed Action and Action Alternatives

The following features are common to the Proposed Action and all Action Alternatives. Some of these features are not applicable to the No Action Alternative.

- Mining of Panels F and G ore bodies would use the same methods as currently used.
  - Operation of the mill, concentrate slurry pipeline, and tailings ponds would continue in the same manner as currently practiced.
  - Operation of the Smoky Canyon administrative, maintenance and support facilities would continue as currently practiced.
- There would be new stream crossings of South Fork Sage and Deer Creeks and associated tributaries.
- There would be projected continued employment of approximately 214 persons at the mine, not including persons employed at the Pocatello fertilizer plant.
- Consumption of electricity, petroleum, reagents, and supplies would continue at approximately the current rate.
- All surface disturbances would be reclaimed in accordance with federal, state and local regulations.
- Environmental protection measures, BMPs and monitoring activities currently used would be practiced at the new operations.

2.9 Summary Comparison of Alternatives

Table 2.9-1 provides a tabular summary and comparison of impacts from the mining components of the Proposed Action and the mining alternatives (A – F). **Table 2.9-2** provides a tabular summary and comparison of impacts from the transportation components of the Proposed Action and the transportation alternatives (1 – 8). Detailed descriptions of impacts for specific resources are included in Chapter 4.

2.10 Monitoring, Mitigation, and Agency-Preferred Alternative

2.10.1 Required Monitoring and Mitigation

In addition to BMPs, mine and road design features, the Mine and Reclamation Plan, and Environmental Protection Measures (**Section 2.5**) proposed by Simplot, which are already included as part of the Proposed Action and any action alternative, the Agencies have determined that certain monitoring programs and mitigation measures are necessary. These programs and measures are in response to potential environmental impacts identified in Chapter 4 of this EIS. These monitoring programs and mitigation measures described by resource below would apply to the eventual agency-preferred alternative (except the No Action Alternative). If a resource is not listed, no specific monitoring program or mitigation measures have been proposed beyond what has already been included as part of the Proposed Action or action alternative.

Due to the multiple alternatives under consideration in this Draft EIS, preparing detailed monitoring plans for each resource, as necessary, would be excessive at this time. Therefore, the Agencies have determined that a detailed monitoring plan would be prepared for the agency-preferred alternative as a condition of the Record of Decision. The monitoring plan would include all sampling and monitoring programs required for the applicable environmental resources and describe: objectives, compliance thresholds, monitoring locations and frequency, specific data to be collected, field and laboratory methods, quality control and quality assurance practices, reporting, and responses to apparent non-compliance conditions.

Reporting and Review
Simplot would provide monitoring reports to the Agencies on at least an annual (Fiscal Year) basis or other bases as determined by the Agencies. Reports would also be provided if requested, on time intervals consistent with other regulatory agency requirements to meet applicable laws and regulations (e.g. Clean Water Act, Clean Air Act, etc.). Simplot would participate as requested by the Agencies in any annual BMP review and evaluation that may be undertaken. These would be consistent with Table 5.4 of the RFP.

Air
Under Mining Alternative F, IDEQ would require Simplot to use low-nitrogen oxide generators or ‘ignition timing retard” practices to reduce the NOx emissions.

Mitigation to be applied to Transportation Alternative 7 for dust abatement includes providing bus service for Panel G mine employees once per shift.

For all mining and transportation alternatives, dust would be controlled on roads and mining areas with applications of water and/or magnesium chloride.

TABLE 2.9-1 COMPARISON SUMMARY OF THE MINING COMPONENTS OF THE PROPOSED ACTION AND THE MINING ALTERNATIVES

	PROPOSED ACTION (PA)				ALTERNATIVE A		ALT. B	ALT. C	ALT. D	ALT. E	ALT. F	
IMPACT	**PANEL F**	**PANEL G**	**DIRECT POWER LINE**	**PA MINING TOTAL**	**NO N. LEASE MOD.**	**NO. S. LEASE MOD.**	**NO SEL. EXTERNAL OVERBDN**	**NO EXT. OVERBDN**	**INFILTRATION BARRIER**	**POWER LINE ON ROADS**	**NO POWER LINE**	**NO ACTION**
GEOLOGY AND TOPOGRAPHY												
Disturbed Acres	515	513	28	1,056	1,054	918	Same as PA Total	Same as PA Total	1,193	1,028	1,028	0
Acres Seleniferous Overburden	435	384	0	819	817	681	725	763	819	Same as PA Total	Same as PA Total	0
External O/B Disposal	Yes	Yes	NA	Yes	Yes	Yes	Yes	No	Yes	Same as PA	Same as PA	No
Acres Not Reclaimed	38	8	0	46	Same as PA Total	17	38	0	Same as PA Total	Same as PA Total	Same as PA Total	0
Chert/Soil Cap	Yes	Yes	NA	Yes	Yes	Yes	Yes	Yes	Yes	Same as PA	Same as PA	NA
AIR AND NOISE												
Tons Total Emission	3,705	4,717	Negligible	8,422	8,413	7,500	8,546	8,695	8,613	Same as PA Total	9,786	0
dBA Noise add to Crow Creek Area	52	50	Helicopter	50 - 52	Same as PA Total	Same as PA Total	Same as PA Total	Same as PA Total	Same as PA Total	Same as PA Total	Same as PA Total	None
WATER RESOURCES												
% Crow Ck. HUC 5 Dist.	0.5	0.5	Negligible	1.0	0.5	0.3	Same as PA Total	Same as PA Total	1.3	Same as PA Total	Same as PA Total	0
% SF Sage Watershed Disturbed	8	0	Negligible	8	Same as PA Total	Same as PA Total	Same as PA Total	Same as PA Total	9	Same as PA Total	Same as PA Total	0
% Manning Watershed Disturbed	6	0	Negligible	6	Same as PA Total	Same as PA Total	Same as PA Total	Same as PA Total	9	Same as PA Total	Same as PA Total	0
% Deer Ck. Watershed Disturbed	2	3	Negligible	5	Same as PA Total	3	Same as PA Total	Same as PA Total	6	Same as PA Total	Same as PA Total	0

TABLE 2.9-1 COMPARISON SUMMARY OF THE MINING COMPONENTS OF THE PROPOSED ACTION AND THE MINING ALTERNATIVES (Cont'd)

	PROPOSED ACTION (PA)				ALTERNATIVE A		ALT. B	ALT. C	ALT. D	ALT. E	ALT. F	
IMPACT	**PANEL F**	**PANEL G**	**DIRECT POWER LINE**	**PA MINING TOTAL**	**NO N. LEASE MOD.**	**NO. S. LEASE MOD.**	**NO SEL. EXTERNAL OVERBDN**	**NO EXT. OVERBDN**	**INFILTRATION BARRIER**	**POWER LINE ON ROADS**	**NO POWER LINE**	**NO ACTION**
WATER RESOURCES												
% Wells Cyn. Watershed Disturbed	0	11	Negligible	11	Same as PA Total	Same as PA Total	Same as PA Total	Same as PA Total	12	Same as PA Total	Same as PA Total	0
Springs Impacted[1]	9	11	0	20	Same as PA Total	16	Same as PA Total	Same as PA Total	Same as PA Total	Same as PA Total	Same as PA Total	0
Exceed GW Standard	Yes	Yes	NA[2]	Yes	Yes	Yes	Yes	Yes	No	NA	NA	No
Exceed SW Standard	Yes	Yes	NA	Yes	Yes	Yes	Yes	Yes	No	NA	NA	No
SOILS												
Acres Soil Disturbance	515	513	28	1,056	1,054	918	Same as PA Total	Same as PA Total	1,193	1,028	1,028	0
Acres Not Reclaimed	38	8	0	46	Same as PA Total	17	38	0	Same as PA Total	Same as PA Total	Same as PA Total	0
VEGETATION												
Acres Forest Disturbed	466	472	21	959	957	841	Same as PA Total	Same as PA Total	1,093	938	938	0
Acres Sage Disturbed	41	30	2	73	Same as PA Total	53	Same as PA Total	Same as PA Total	75	71	71	0
Acres Aspen Disturbed	268	161	17	446	Same as PA Total	345	Same as PA Total	Same as PA Total	540	429	429	0
Acres not Reclaimed	38	8	0	46	Same as PA Total	17	38	0	Same as PA Total	Same as PA Total	Same as PA Total	0
WETLANDS												
Feet Waters of U.S. Dist.	8,750	2,850	0	11,600	Same as PA Total	10,500	Same as PA Total	Same as PA Total	12,470	Same as PA Total	Same as PA Total	0
Acres Wetlands Disturbed	0.60	0.39	0	0.99	Same as PA Total	0.42	Same as PA Total	Same as PA Total	1.39	Same as PA Total	Same as PA Total	0

TABLE 2.9-1 COMPARISON SUMMARY OF THE MINING COMPONENTS OF THE PROPOSED ACTION AND THE MINING ALTERNATIVES (Cont'd)

	PROPOSED ACTION (PA)				ALTERNATIVE A		ALT. B	ALT. C	ALT. D	ALT. E	ALT. F	
IMPACT	PANEL F	PANEL G	DIRECT POWER LINE	PA MINING TOTAL	NO N. LEASE MOD.	NO. S. LEASE MOD.	NO SEL. EXTERNAL OVERBDN	NO EXT. OVERBDN	INFILTRATION BARRIER	POWER LINE ON ROADS	NO POWER LINE	NO ACTION
WILDLIFE												
Acres of Wolf and Lynx Habitat Disturbed	515	513	28	1,056	1,054	918	Same as PA Total	Same as PA Total	1,193	1,028	1,028	0
Acres of Wolverine, Predators, Raptors, Owls, and Big Game Habitat Disturbed	466	472	21	959	957	841	Same as PA Total	Same as PA Total	1,093	938	938	0
Acres of Sage Habitat for Migratory Birds and Grouse Disturbed	41	30	2	73	Same as PA Total	53	Same as PA Total	Same as PA Total	75	71	71	0
Acres of Riparian Habitat for Migratory Birds, Bats and Amphibians Disturbed	0.5	0.4	0.3	1.2	Same as PA Total	0.7	Same as PA Total	Same as PA Total	1.6	0.9	0.9	0
Acres of Disturbance within the Reported Boreal Toad Migration Distance Area	320	0	9	329	329	191	Same as PA Total	Same as PA Total	406	320	320	0

TABLE 2.9-1 COMPARISON SUMMARY OF THE MINING COMPONENTS OF THE PROPOSED ACTION AND THE MINING ALTERNATIVES (Cont'd)

	PROPOSED ACTION (PA)				ALTERNATIVE A		ALT. B	ALT. C	ALT. D	ALT. E	ALT. F	
IMPACT	**PANEL F**	**PANEL G**	**DIRECT POWER LINE**	**PA MINING TOTAL**	**NO N. LEASE MOD.**	**NO. S. LEASE MOD.**	**NO SEL. EXTERNAL OVERBDN**	**NO EXT. OVERBDN**	**INFILTRATION BARRIER**	**POWER LINE ON ROADS**	**NO POWER LINE**	**NO ACTION**
FISHERIES AND AQUATICS												
Feet of Intermittent Channel Disturbed	12,187	5,443	2,719	20,350	20,329	17,202	Same as PA Total	Same as PA Total	22,239	17,631	17,631	0
Acres AIZs Disturbed	30.3	15.0	4.5	49.8	49.7	40.4	Same as PA Total	Same as PA Total	55.6	45.3	45.3	0
SW Standard for Selenium Exceeded	Yes	Yes	NA	Yes	Yes	Yes	Yes	Yes	No	Same as PA	Same as PA	No
LIVESTOCK GRAZING												
Acres of Allotments Disturbed	515	513	28	1,056	1,054	918	Same as PA Total	Same as PA Total	1,193	1,028	1,028	0
Water Sources Impacted	9	8	0	17	Same as PA Total	Same as PA Total	Same as PA Total	Same as PA Total	Same as PA Total	Same as PA Total	Same as PA Total	0
RECREATION												
Acres of RM and SPM ROS Areas Disturbed[3]	515	513	28	1,056	1,054	918	Same as PA Total	Same as PA Total	1,192	1,028	1,028	0
Forest Trails Disturbed	401 402	404	None	401 402 404	Same as PA	Same as PA	Same as PA	Same as PA	Same as PA	Same as PA	Same as PA	0
Big Game Hunt Area Temporarily Reduced	Yes	Yes	No	Yes	Same as PA	Same as PA	Same as PA	Same as PA	Same as PA	Same as PA	Same as PA	0

TABLE 2.9-1 COMPARISON SUMMARY OF THE MINING COMPONENTS OF THE PROPOSED ACTION AND THE MINING ALTERNATIVES (Cont'd)

	PROPOSED ACTION (PA)				ALTERNATIVE A		ALT. B	ALT. C	ALT. D	ALT. E	ALT. F	
IMPACT	**PANEL F**	**PANEL G**	**DIRECT POWER LINE**	**PA MINING TOTAL**	**NO N. LEASE MOD.**	**NO. S. LEASE MOD.**	**NO SEL. EXTERNAL OVERBDN**	**NO EXT. OVERBDN**	**INFILTRATION BARRIER**	**POWER LINE ON ROADS**	**NO POWER LINE**	**NO ACTION**
INVENTORIED ROADLESS AREAS												
Acres On - / Off-lease	355	380	8	743	743	743	Same as PA Total	Same as PA Total	838	722	722	0
Disturbance in SCRA	160	34	13	207	191	69			207	207	207	
Acres On- / Off-lease	0	25	1	26	Same as PA Total	Same as PA Total	Same as PA Total	Same as PA Total	32	25	25	0
Disturbance in MPRA	0	0	0	0					0	0	0	
VISUAL / AESTHETICS												
Acres of Modification and Partial Retention Disturbed	515	513	28	1,056	1,054	918	1,056	1,056	1,192	1,028	1,028	0
Acres of Permanent Disturbance	38	8	0	46	Same as PA Total	17	38	0	Same as PA Total	Same as PA Total	Same as PA Total	0
CULTURAL RESOURCES												
Cultural Sites Impacted	None	Site CB-342	None	Site CB-342	Same as PA	Same as PA	Same as PA	Same as PA	Same as PA	Same as PA	Same as PA	None
Heritage Impacts	Minor - Moderate	Minor - Moderate	Negligible	Minor - Moderate	Same as PA	Same as PA	Same as PA	Same as PA	Same as PA	Same as PA	Same as PA	None
NATIVE AMERICAN CONCERNS												
Acres of Temporary Access Loss	515	513	28	1,056	1,054	918	Same as PA Total	Same as PA Total	1,193	1,028	1,028	0
Acres of Unreclaimed Disturbance	38	8	0	46	Same as PA Total	17	38	0	Same as PA Total	Same as PA Total	Same as PA Total	0

TABLE 2.9-1 COMPARISON SUMMARY OF THE MINING COMPONENTS OF THE PROPOSED ACTION AND THE MINING ALTERNATIVES (Cont'd)

	PROPOSED ACTION (PA)				ALTERNATIVE A		ALT. B	ALT. C	ALT. D	ALT. E	ALT. F	
IMPACT	**PANEL F**	**PANEL G**	**DIRECT POWER LINE**	**PA MINING TOTAL**	**NO N. LEASE MOD.**	**NO. S. LEASE MOD.**	**NO SEL. EXTERNAL OVERBDN**	**NO EXT. OVERBDN**	**INFILTRATION BARRIER**	**POWER LINE ON ROADS**	**NO POWER LINE**	**NO ACTION**
SOCIOECONOMICS												
Years of Potential Employment	NA	NA	NA	16	Same as PA Total	13.7	12.8	8.3	12.3	Same as PA Total	9.5	0
Estimated Ore Reserves Reduction	NA	NA	NA	NA	Same as PA Total	Reduced by 13.7%	Reduced by 19.3%	Reduced by 46%	Reduced by 22%	Same as PA Total	Reduced by 38%	None
Reduction in Royalty Payments[4]	None	None	NA	None	800 to 1,000	2,900 to 3,600	5,100 to 6,400	12,300 to 15,400	6,000 to 7,400	None	10,400 to 13,000	No Royalty Income
Potential Effect on Crow Creek Property Values	Minor	Minor	Negligible	Minor	Minor	Minor	Minor	Minor	Minor	Negligible	Negligible	None
TRANSPORTATION												
Change in Public Traffic Volume	None	None	None	None	None	None	None	None	None	None	Add 50 Vendor Deliveries	None
ENVIRONMENTAL JUSTICE												
	None	None	None	None	None	None	None	None	None	None	None	None

[1] Includes springs that would be physically disrupted, potentially reduced in flow, or affected in water quality.
[2] Not applicable
[3] RM = Roaded Modified, SPM = Semi-primitive Motorized, ROS = Recreation Opportunity Spectrum
[4] $1,000s
AIZ = Aquatic Influence Zone

TABLE 2.9-2 COMPARISON SUMMARY OF THE TRANSPORTATION COMPONENTS OF THE PROPOSED ACTION AND THE TRANSPORTATION ALTERNATIVES

	PROPOSED ACTION (PA)		TRANSPORTATION ALTERNATIVES								
IMPACT	**PANEL F HAUL/ACCESS ROAD**	**PANEL G HAUL/ACCESS ROAD**	**ALT. 1 ALT. PANEL F**	**ALT. 2 EAST PANEL G**	**ALT. 3. MOD. EAST**	**ALT. 4 MIDDLE HAUL**	**ALT. 5 ALT. WEST**	**ALT. 6 CONV.**	**ALT. 7 CROW - WELLS**	**ALT. 8 MIDDLE ACCESS**	**NO ACTION**
GEOLOGY AND TOPOGRAPHY											
Disturbed Acres	67	217	46	216	276	192	226	61	114	99	0
Acres Not Reclaimed	4	21	5	7	21	34	28	0	55	0	0
AIR AND NOISE											
Tons Total Emission	1,207	1,504	960	1,460	1,564	1,358	1,522	661	824	632	0
dBA Noise add to Crow Creek Area	52.4	None	52.4	71.5	71.5	50.6	None	40	70	None	None
WATER RESOURCES											
% Crow Ck. HUC 5 Dist.	0.1	0.2	<0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0
Acres Deer Ck. Watershed Disturbed	0	112	0	23	83	162	155	29	1	79	0
Culverts in Perennial Streams	0	2	0	1	1	0	2	0	4	0	0
Culverts in Intermittent Channels	1	5	3	10	10	14	9	2	21	14	0
Tons / Year Sediment	0.5	8.5	0.7	4.5	5.1	7.8	10.7	0.4	1.0	2.1	0
Acres Meade Pk. Shale Disturbed	0	10	0	3	3	10	10	2	1	9	0
Springs Impacted[1]	0	2	0	1	1	1	2	0	0	2	0

TABLE 2.9-2 COMPARISON SUMMARY OF THE TRANSPORTATION COMPONENTS OF THE PROPOSED ACTION AND THE TRANSPORTATION ALTERNATIVES (CONT'D)

	PROPOSED ACTION (PA)		TRANSPORTATION ALTERNATIVES								
IMPACT	**PANEL F HAUL/ACCESS ROAD**	**PANEL G HAUL/ACCESS ROAD**	**ALT. 1 ALT. PANEL F**	**ALT. 2 EAST PANEL G**	**ALT. 3. MOD. EAST**	**ALT. 4 MIDDLE HAUL**	**ALT. 5 ALT. WEST**	**ALT. 6 CONV.**	**ALT. 7 CROW - WELLS**	**ALT. 8 MIDDLE ACCESS**	**NO ACTION**
SOILS											
Acres Soil Disturbance	67	193	46	216	276	192	226	61	114	99	0
Acres not Reclaimed	4	21	5	7	21	34	28	0	55	0	0
Reveg. Limitation	Slight to Severe	Moderate to Severe	Slight to Severe	Slight to Severe	Slight to Severe	Mod. to Severe	Mod. to Severe	Slight to Severe	Slight to Severe	Mod. to Severe	None
Cut Slope Stability Hazard	Low to Moderate	Low to moderate	Low to Mod.	Low to High	Low to High	Low to Mod.	Low to Mod.	Low to Mod.	Low to Mod.	Low to Mod.	None
VEGETATION											
Acres Forest Disturbed	59	203	44	138	170	152	184	49	8	74	0
Acres Sage Disturbed	7	2	2	55	61	12	4	7	76	5	0
Acres Aspen Disturbed	47	65	35	95	104	114	89	23	8	57	0
Acres not Reclaimed	4	21	5	7	21	34	28	0	55	0	0
WETLANDS											
Feet Waters of U.S. Dist.	230	540	230	300	390	1,200	490	0	162	940	0
Acres of Wetlands Disturbed	0.14	1.43	0.14	0.62	0.67	0.07	1.43	0	20	0.62	0
WILDLIFE											
Possible Habitat Fragmentation	Big Game Amphibians	Big Game Amphibians	B Game Amphibs	B Game Amphibs	B Game Amphibs	B Game Amphibs	B Game Amphibs	B Game	B Game Amphibs	B Game Amphibs	None
Risk of Collisions w/ Wildlife	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No

TABLE 2.9-2 COMPARISON SUMMARY OF THE TRANSPORTATION COMPONENTS OF THE PROPOSED ACTION AND THE TRANSPORTATION ALTERNATIVES (CONT'D)

	PROPOSED ACTION (PA)		TRANSPORTATION ALTERNATIVES								
IMPACT	PANEL F HAUL/ACCESS ROAD	PANEL G HAUL/ACCESS ROAD	ALT. 1 ALT. PANEL F	ALT. 2 EAST PANEL G	ALT. 3. MOD. EAST	ALT. 4 MIDDLE HAUL	ALT. 5 ALT. WEST	ALT. 6 CONV.	ALT. 7 CROW - WELLS	ALT. 8 MIDDLE ACCESS	NO ACTION
WILDLIFE											
Acres of Wolf and Lynx Habitat Disturbed	67	217	46	216	276	192	226	61	114	99	0
Acres of Wolverine, Predators, Raptors, Owls, and Big Game Habitat Disturbed	59	203	44	138	170	152	184	49	8	74	0
Acres of Sage Habitat for Migratory Birds and Grouse Disturbed	7	2	2	55	61	12	4	7	76	5	0
Acres of Riparian Habitat for Migratory Birds, Bats and Amphibians Disturbed	0.7	0.8	0.7	1.9	0.8	0	0.8	1.5	24	0.6	0
Acres of Disturbance within the Reported Boreal Toad Migration Distance Area	0	120	0	0	0	116	119	14	0	72	0

TABLE 2.9-2 COMPARISON SUMMARY OF THE TRANSPORTATION COMPONENTS OF THE PROPOSED ACTION AND THE TRANSPORTATION ALTERNATIVES (CONT'D)

	PROPOSED ACTION (PA)		TRANSPORTATION ALTERNATIVES								
IMPACT	**PANEL F HAUL/ACCESS ROAD**	**PANEL G HAUL/ACCESS ROAD**	**ALT. 1 ALT. PANEL F**	**ALT. 2 EAST PANEL G**	**ALT. 3. MOD. EAST**	**ALT. 4 MIDDLE HAUL**	**ALT. 5 ALT. WEST**	**ALT. 6 CONV.**	**ALT. 7 CROW - WELLS**	**ALT. 8 MIDDLE ACCESS**	**NO ACTION**
FISHERIES AND AQUATICS											
Feet of Intermittent Channel Disturbed	230	450	672	2,684	2,851	3,613	662	1,682	883	2,702	0
Feet of Perennial Channel Disturbed	0	475	0	290	275	0	475	0	2,086	0	0
Acres AIZs[2] Disturbed	0.7	14.9	1.7	4.7	10.1	9.2	15.4	6.2	11	9.7	0
Culverts in Perennial Channels	0	(1) 280' (1) 260'	0	(1) 300'	(1) 390'	0	(1) 280' (1) 260'	0	185', 105', 75, 70'	0	0
Tons / Year Sediment	0.5	8.5	0.7	4.5	5.1	7.8	10.7	0.4	1.0	2.1	0
LIVESTOCK GRAZING											
Acres of FS Allotments Disturbed	67	217	46	123	229	192	226	61	114	99	0
Water Sources Impacted	0	0	0	1	1	0	0	0	0	0	0
Hindrance to Livestock Movement	Low	Low	Low	Mod.	Mod.	Low	Low	Severe	None	Low	None
RECREATION											
Acres of RM and SPM ROS Areas Disturbed[3]	67	217	46	216	276	192	226	61	114	99	0
Forest Trails and Roads Cut or Disturbed	405 FR179	092 093 102 402 403 404 FR146	405 FR179	093 402 FR146 FR740	093 402 FR146 FR740	093 102 402 403 404	093 102 402 403 404	402 404	Old FR146	093 102 402 403 404	None

TABLE 2.9-2 COMPARISON SUMMARY OF THE TRANSPORTATION COMPONENTS OF THE PROPOSED ACTION AND THE TRANSPORTATION ALTERNATIVES (CONT'D)

	PROPOSED ACTION (PA)		TRANSPORTATION ALTERNATIVES								
IMPACT	**PANEL F HAUL/ACCESS ROAD**	**PANEL G HAUL/ACCESS ROAD**	**ALT. 1 ALT. PANEL F**	**ALT. 2 EAST PANEL G**	**ALT. 3. MOD. EAST**	**ALT. 4 MIDDLE HAUL**	**ALT. 5 ALT. WEST**	**ALT. 6 CONV.**	**ALT. 7 CROW - WELLS**	**ALT. 8 MIDDLE ACCESS**	**NO ACTION**
INVENTORIED ROADLESS AREAS											
Acres On - / Off-lease	5	2	10	15	15	34	39	31	5	22	0
Disturbance in SCRA[4]	19	64	0	59	125	155	58	22	0	75	
Acres On- / Off-lease	0	2	0	0	0	0	2	0	0	0	0
Disturbance in MPRA[5]	0	32	0	0	0	0	32	0	0	0	
VISUAL AND AESTHETICS											
Acres of Modification and Partial Retention Disturbed	67	217	46	216	276	192	226	61	114	99	0
Acres of Permanent Disturbance	4	21	5	7	21	34	28	0	55	0	0
Disturbance Visible from Trail or Forest Route	092 402 404 FR179	092 093 102 403 404 FR146 FR1102	092 402 404 FR179	093 402 FR111 FR146 FR 740	093 402 FR111 FR146 FR 740	093 102 403 404 FR146	092 093 102 403 404 FR146 FR1102	092 093 402 404 FR146	093 FR111 FR146 FR740	093 102 403 404 FR146	None
CULTURAL RESOURCES											
Cultural Sites Impacted	None	CB-317 CB-342 CB-222	None	CB-342	CB-342	None	CB-317	None	CB-342	None	None
Heritage Impacts	Negligible	Negligible	Same as PA	Minor	Minor	Same as PA	Same as PA	Same as PA	Same as PA	Same as PA	Same as PA

TABLE 2.9-2 COMPARISON SUMMARY OF THE TRANSPORTATION COMPONENTS OF THE PROPOSED ACTION AND THE TRANSPORTATION ALTERNATIVES (CONT'D)

	PROPOSED ACTION (PA)		TRANSPORTATION ALTERNATIVES								
IMPACT	**PANEL F HAUL/ACCESS ROAD**	**PANEL G HAUL/ACCESS ROAD**	**ALT. 1 ALT. PANEL F**	**ALT. 2 EAST PANEL G**	**ALT. 3. MOD. EAST**	**ALT. 4 MIDDLE HAUL**	**ALT. 5 ALT. WEST**	**ALT. 6 CONV.**	**ALT. 7 CROW - WELLS**	**ALT. 8 MIDDLE ACCESS**	**NO ACTION**
NATIVE AMERICAN CONCERNS											
Acres of Temporary Access Loss	67	217	46	216	276	192	226	61	114	99	0
Acres of Permanent Access Loss	4	21	5	7	21	34	28	0	55	0	0
SOCIOECONOMICS											
Potential Effect on Crow Creek Property Values	Unlikely	Unlikely	Unlikely	Likely	Likely	Unlikely	Unlikely	Unlikely	Likely	Unlikely	None
TRANSPORTATION											
Change in Public Traffic Volume	None	None	None	None	None	None	None	None	Increase FR111 FR146 FR1102	None	None
Restrict Traffic on Forest Route	FR179	FR146	FR179	FR740	FR740	None	FR146	None	Increase on FR111 FR146	None	None
ENVIRONMENTAL JUSTICE											
	None	None	None	None	None	None	None	None	None	None	None

[1] Includes springs that would be physically disrupted, potentially reduced in flow, or affected in water quality.
[2] AIZ = Aquatic Influence Zone
[3] RM = Roaded Modified, SPM = Semi-primitive Motorized, ROS = Recreation Opportunity Spectrum
[4] SCRA = Sage Creek Roadless Area
[5] MPRA = Meade Peak Roadless Area

Noise
For either Transportation Alternative 2 or 3 (East Haul/Access Road and Modified East/Haul Access Road), noise mitigation measures that Simplot would implement include: maintaining equipment exhaust systems and engine sound controls to manufacturers' specifications; and preserving forest vegetation noise buffers to the extent possible.

For Transportation Alternative 7 (Crow Creek/Wells Canyon Access Road), noise mitigation would include utilizing a bus service once per shift for Panel G mine employees.

For all mining alternatives, Simplot would not conduct blasting operations during typical sleeping hours.

Water Resources
Where haul/access roads are currently designed close to or over springs, the finally selected road would be rerouted around them, or if that is not feasible, Simplot would install culverts, drains or other mechanisms in the base of the road fills to ensure the natural spring flows would continue to flow.

Springs currently in use that are disrupted by mining or covered by road building would be replaced with alternate, permanent and generally equivalent water sources by Simplot, in accordance with the RFP requirements.

Additional surface water monitoring sites, pertaining to this Project would be added to the current water monitoring program at the Smoky Canyon Mine. An outside consultant would conduct the monitoring. Additional groundwater monitoring sites, pertaining to this Project, would be added to the current water monitoring program at the Smoky Canyon Mine. Monitoring of surface water and groundwater would be conducted in accordance with the requirements of the Record of Decision and an agency-approved, surface water and groundwater monitoring plan.

Regular inspections would be conducted along the outer toes and slopes of all overburden fills to look for indications of seeps or springs discharging from the overburden.

Simplot would conduct infiltration testing within the footprint of the seleniferous overburden disposal sites prior to placing overburden. This testing would be conducted according to a plan that would be reviewed and approved by the Agencies before implementation. The testing would be intended to demonstrate that the vertical percolation rate in the seleniferous interior of the external overburden fills is sufficient to prevent development of seleniferous external overburden seeps.

Record keeping and use of a third party quality control inspector satisfactory to the Agencies would be employed by Simplot to ensure that the external overburden disposal facilities are built as proposed.

Roads would be designed, constructed, and operated to prevent a fuel or oil spill from entering a nearby stream by implementing suitable BMPs to contain such an event.

Monitoring would take place for COPC content analysis of overburden proposed for use as construction material according to an agency-approved geochemical sampling program.

Monitoring of the construction and functioning of Alternative D would be conducted in accordance with the Record of Decision and an agency-approved infiltration barrier construction and operation monitoring plan. This plan would include monitoring of construction to provide data showing the infiltration barrier was built in accordance with agency-approved plans and specifications. It would also include monitoring of the operation of the infiltration barrier to provide data showing the cap is functioning as designed. Operational monitoring would include collection of representative data on saturated and unsaturated soil moisture conditions within each functional layer of the cap and in a number of locations within the overburden under the cap for comparison with assumed/modeled conditions used in design studies. Soil moisture, data collection methods and instruments would allow monitoring of seasonal and daily conditions within the materials and to ensure the materials would be capable of long term use.

Monitoring the formation of erosional rills on the external overburden fills and backfilled pit surfaces and areas below them would be implemented. Corrective actions would be taken to insure that rills do not persist or enlarge into gullies on or below the overburden faces. This is important because formation of gullies would indicate an enlargement of the drainage network or increase in surface drainage density, which could result in enlargement and/or degradation of channel stability in downstream reaches of streams that could be sensitive to these effects.

Soils

Simplot would reduce the loss of soil fertility within the Project Area by incorporating slash into the salvaged growth medium to increase the organic matter content, mixing soil types containing few coarse fragments together with soils containing high coarse fragment content in order to dilute the total coarse fragment percentage, and timing salvage operations to optimize revegetation.

Prior to seeding, applied topsoil would be loosened, if it were compacted during application, to allow unrestricted root growth in the reclamation vegetation.

Monitoring the effectiveness of erosion and sedimentation control measures and other soil resource BMPs would be conducted according to the conditions of the Record of Decision and an agency-approved soil resource monitoring plan.

In addition to monitoring effectiveness of proposed Environmental Protection Measures and BMPs, the soil resource monitoring plan would include:

Monitoring of vegetation germination and growth for assessment of erosion potential based on percentage of ground cover and seedling establishment effectiveness (see monitoring requirement under Vegetation below).

Soil sampling and analysis for initial nutrient amendment assessment for reclamation activities and to evaluate areas of low production after reclamation activities have concluded.

Vegetation

Vegetation monitoring to determine reclamation success on reclaimed sites would be conducted annually and reported to the CTNF by Simplot until reclamation is accepted and the reclamation bond is released (RFP standard under Prescription 8.2.2). The timing, level, and type of monitoring would be conducted in accordance with the requirements of the Record of Decision, agency conditions for release, and an agency-approved plan.

Simplot would use the most adapted and genetically appropriate plant material available for all seeding and planting activities. If feasible, collection of plant material (i.e. seed, transplants, roots) should be practiced to ensure an optimal match between plant material used and site conditions - increasing the likelihood of success.

Records would be kept of items such as seed or tree source, seeding methods, tree planting methods, species used, substrate, date of seeding or planting, etc. The boundaries of seeding or planting areas would be mapped in enough detail so they can be easily located again in the future. Accurate record keeping is necessary in order to determine if revegetation methods have been successful and cost effective, or if changes should be made.

The measurement of selenium and other COPCs in forage is required for any decisions on range management and the ultimate release of mined lands back to multiple use. Sampling would be conducted in accordance with the requirements of the Record of Decision, agency conditions for release, and an agency-approved plan.

Simplot would continue their program of monitoring and controlling noxious weed infestations. Only certified weed-free seed, mulch, straw bales, etc. would be used. Simplot would develop a plan for annual noxious weed treatment.

Wetlands

Jurisdictional channels and wetlands affected by temporary impacts that can be reclaimed would be restored to their approximate pre-construction conditions as mining or uses of affected areas are completed. Any waters and wetlands that would be permanently impacted would be mitigated on- or off-site or through compensatory mitigation, as required by the U.S. Army Corps of Engineers. The Corps may require compensatory mitigation even if the impacts are temporary due to temporal losses. Mitigation for temporal losses usually involves less than 1 to 1 replacement costs since the waters or wetlands would ultimately be restored. The type and amount of mitigation required would be determined in consultation with the Corps and Simplot would adhere to the agreed upon mitigation requirements.

Wildlife

Raptor-nesting surveys would be conducted during the nesting/breeding season prior to any new disturbance during the season to ensure compliance with Executive Order 13186 (protection of migratory birds) and the RFP. Simplot would perform surveys for northern goshawk, flammulated owls, boreal owls, great gray owls, and other raptors prior to any new disturbance to ensure compliance with the RFP protection around nest guidelines. If an active nest(s) were discovered, the CTNF would determine the feasibility of potentially rescheduling the activity until fledgling from the nest had occurred.

Simplot would perform a survey to identify boreal toad populations in any potential toad habitat that would be disturbed, which had not yet been surveyed. This survey would be developed cooperatively by CTNF wildlife or fisheries biologists and Simplot. If boreal toads were discovered during these surveys, potential mitigation measures would be developed. In addition, in the event the West (Proposed Action) or Modified West Haul/Access Road (Transportation Alternative 5) were selected, Simplot would survey the area south of the existing boreal toad breeding site in Sage Meadows to determine whether gradient and topography make migration of toads into this area, including montane habitat south of these roads, possible.

If Transportation Alternative 6 (the conveyor) were selected, Simplot may be required to install additional crossings to provide sufficient clearance for wildlife passage under the conveyor.

Fisheries
Simplot would implement a monitoring program to evaluate impacts to aquatic resources. This program would be developed cooperatively by a CTNF fisheries biologist and Simplot, and would involve aquatic habitat and population monitoring in appropriate locations upstream and downstream of roads and active mining disturbances in fish-bearing streams.

Grazing Management
Water Sources - In the case of springs that are currently used as water sources for grazing livestock, Simplot would establish mitigation protocols satisfactory to the CNF on a case-by-case basis. These protocols may involve hauling or pumping water from outside sources until construction of new stock ponds or improvements of nearby springs can be made.

Trailing - Where haul roads cross existing Forest Trails used for driving livestock, trails up and over any road fills or cuts would be constructed by Simplot to allow safe passage for livestock at these locations across the haul road. In the case of the conveyor, sufficient ground clearance would be constructed where the conveyor crosses designated Forest Trails that would allow locations for livestock passage. If Transportation Alternative 6 (the conveyor) were selected, the Forest Service may require that additional crossings be provided with sufficient clearance for livestock passage under the conveyor.

Livestock would be prevented from grazing on reclaimed mine disturbances until these areas are accepted for grazing management by the CNF.

Recreation and Land Use
Where Forest Trails are disrupted by mining operations, Simplot would post signs along the trails at the margins of the mining areas informing hikers about the mining activities and potential hazards within the mine area. If mine activities were such that travel through the mine area on the trail is not safe, the trail would be posted with signs indicating the trail is temporarily closed.

Trails would be re-established through mine areas as soon as practicable and would be well marked by Simplot to indicate the location of the designated trails through the mine disturbance. At locations where haul/access roads cross existing Forest Trails, trails for non-motorized access would be built across the haul/access roads by Simplot to allow convenient and safe, non-motorized crossing of the haul/access roads. Signs would be posted at these crossings warning visitors how to cross the haul/access roads safely and to avoid lingering or moving along the length of the haul/access roads. Signs would be posted on the haul/access roads at these crossings warning drivers on the haul/access roads to exercise caution.

Where established Forest Trails are crossed by the conveyor in Transportation Alternative 6, hiking, equestrian, and livestock access across the conveyor corridor would be maintained by Simplot with underpasses beneath the conveyor. If Transportation Alternative 6 (the conveyor) were selected, the Forest Service may require that additional crossings be provided with sufficient clearance for passage under the conveyor.

Forest Trail 404 connecting the Wells Canyon Road (FR 146) and the Deer Creek Trail 093 would be rebuilt by Simplot during initial mine development of Panel G a safe distance away from the disturbance limits of Panel G.

Cultural Resources
The known eligible sites near mining activities would continue to be avoided by current mining activities and would be monitored annually, by a professionally trained archaeologist under the supervision of the CTNF Forest Archaeologist, for possible impacts.

Monitoring of CB-222 (Trapper's cabin), under the supervision of the CTNF Forest Archaeologist, is recommended in order to assess the potential for indirect effects of improving a public access road near the site (Panel G West Haul/Access Road).

The two unevaluated ("insufficient information to evaluate") cultural resource sites would require additional study/testing prior to implementation of the Proposed Project if the chosen alternatives would impact them. In order to evaluate the sites and mitigate impacts, the proposed mitigation measures would include:

- An overlay of historic and current grazing allotments with known arborglyphs sites and livestock trails,
- Interviews of current permittees of the seven allotments and possibly local ranchers about current and past corridors and trails (as well as campsites, water sources, etc.),
- Development of a thematic context statement. Research of names in arborglyphs and development of histories on local ranching families, ethnicities, settlement, etc.,
- Core sampling of select trees to support age/dating issues, and
- GPS coordinates for arborglyph group locations.

These mitigation measures would not only provide the needed data to evaluate the sites for the NRHP, but would also mitigate the adverse impacts if the sites were deemed eligible.

Transportation
Where the haul/access roads cut off existing Forest Routes (FR179 and FR740), turnaround areas would be built by Simplot at the temporary termination of the Forest Routes to allow safe and convenient turning of vehicles. At these locations, trails for non-motorized access would be built across the haul/access roads to allow convenient and safe, non-motorized crossing of the haul/access roads (see Recreation and Land Use).

To reduce environmental effects of mine employee traffic under Alternative 7 (Crow Creek/Wells Canyon Access Roads), Simplot would employ a bus service to make one round trip per shift from one or more parking/pickup locations in Star Valley to Panel G.

To reduce the potential for oil spills getting into Crow Creek under Alternative 7, in the event of a fuel tanker accident on the road in this area, Simplot would require all fuel vendors to participate in a spill-response training program and make sure that all vendor trucks carry some spill response materials. Specific Simplot personnel at Panel G would be specially trained in responding to fuel spills along the Crow Creek Road. Spill response supplies and equipment (booms, absorbents, etc.) necessary to respond to a significant fuel spill along Crow Creek would be pre-positioned at Panel G or some location along Crow Creek for ready use.

2.10.2 Agency Preferred Alternative

A preferred alternative for this Project has been selected by the Agencies. However, consideration given to public comments on the DEIS may result in changes to this alternative. The Agencies' preferences currently consist of the following:

- Proposed Action Mining both Panels F and G

Mine plan approval would include mining of both Panel F and Panel G.

- Mining Alternative B – No External Seleniferous Overburden

Mine plan approval would be provided contingent on the application of this alternative. Alternative B as described requires the placement of all seleniferous overburden as backfill in the depleted pits for both Panels F and G and would include both the Panel F North and South Lease Modification Areas.

Selection of this alternative would require Simplot to place seleniferous overburden as pit backfills and in temporary stockpiles adjacent to the pits. At the end of ore removal, seleniferous overburden placed outside the open pits would be returned to the pits and incorporated into the pit backfills. Rehandling seleniferous overburden in Alternative B would reduce the area where a cover/cap would be applied as detailed in Alternative D. Dinwoody formation can provide a local source for material to construct a barrier cap. Implementation of Alternative B in conjunction with Alternative D reduces the quarry size for Dinwoody formation and construction costs to cover seleniferous overburden disposed as backfill and in external piles as proposed by Simplot. While Simplot would incur a cost to rehandle and backfill seleniferous overburden, the additional cost necessary to mine, haul, reclaim, and place Dinwoody formation for cover material on the additional acreage is estimated to offset backfill rehandling costs. External overburden fills containing chert and limestone would remain as a component of Alternative B.

- Mining Alternative D – Infiltration Barrier over Seleniferous Overburden Fills

Impact analysis in Chapter 4 for the Proposed Action predicts State and federal surface and ground water standards for selenium would be exceeded. In order to comply with Clean Water Act standards and the Idaho Groundwater Water Rule, the mine plan, as described in the Proposed Action, would need to be mitigated. Compliance could be achieved through the use of an infiltration barrier over the seleniferous overburden. All areas of seleniferous overburden fills would be covered to reduce infiltration into the overburden. Cap design would be required to perform at a standard established from infiltration models of the overburden fills. Infiltration reduction by the cover would reduce leachate rates to assure compliance with water quality standards. Groundwater impacts would be reduced at the downgradient lease boundaries and emerging surface water in South Fork Sage Creek Spring, Books Spring, lower Deer Creek, and Crow Creek.

Alternative B combined with Alternative D would be expected to reduce the effects on water quality in groundwater and surface water below values shown in this DEIS for Alternative B alone, or Alternative D combined with the Proposed Action.

- Mining Alternative E – Power Line Along Haul/Access Roads

Placing the electric power line along the selected haul/access roads would eliminate the need for a separate right-of-way disturbance to provide electric power to the mine panels.

- Proposed Action Panel F Haul/Access Road

The Panel F Haul/Access Road included in the Proposed Action would allow maximum recovery of the ore reserves in the northern portion of Panel F.

- Transportation Alternative 2 – East Haul/Access Road

The East Haul/Access Road would result in less unreclaimed disturbance than all the other Panel G haul/access road alternatives. It would have only one culvert crossing of a perennial stream (Deer Creek) and would be located the furthest east (downstream) of all the transportation alternatives leaving the greatest portion of the Deer Creek watershed unaffected by the road. Compared to the other Panel G haul/access roads, it would have the least disturbance area to Meade Peak Shale and the lowest annual sediment yield. It would disturb fewer acres of Aquatic Influence Zones (AIZs) than any of the transportation alternatives and would also disturb the least amount of footage of Waters of the U.S. It would share status with the conveyor – Middle Access Road combination of having the second lowest disturbance area of wetlands of all the transportation alternatives. It would have the least amount of disturbed area in the Sage Creek IRA of the haul/access roads under consideration and would also disturb the lowest acreage of USFS grazing allotments. In contrast to the benefits it would be the closest haul/access road to the Crow Creek area and would thus have the highest level of noise, visual, access, and socioeconomics impacts to local residents as described in more detail in **Table 2.9-2** and **Chapter 4**.

As currently described, this alternative crosses private land east of the proposed mine. Implementation of this alternative is contingent on Simplot's ability to secure a right-of-way across the private parcel of land. If Simplot is unable to secure a right-of-way, this transportation alternative may become infeasible. In that case, an alternative on public lands would be selected to replace the Agencies' preferred route.