CHAPTER 2
PROPOSED ACTION AND ALTERNATIVES

CHAPTER 2 TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

Chapter 2 Proposed Action and Alternatives

2.1 Introduction

This chapter describes and compares the Proposed Action, one action alternative, and the No Action Alternative, in compliance with 40 CFR 1502 14. The details of the proposed mine development are summarized from Newmont Mining Corporation's (Newmont) Plan of Operations (Plan) (Newmont, 2012a). Each component or area of activity is described in sufficient detail to facilitate understanding of each alternative. Figures are included that clearly show the components of the proposed mine plan.

In addition to the Proposed Action, one action alternative is evaluated in detail in this Environmental Impact Statement (EIS). This alternative was developed to address issues identified by Bureau of Land Management (BLM) resource specialists and from comments received during the public scoping process. The alternative was evaluated for its potential to reduce or minimize impacts associated with the Proposed Action. The action alternative is described in Section 2.3. A No Action Alternative (Section 2.4) is also considered, as required in the Code of Federal Regulations (CFR) (40 CFR 1502.14(d)). As discussed in Section 2.5, several additional potential alternatives were considered, but were eliminated from detailed consideration in this EIS when it was determined that they were not reasonable or economically feasible or would not substantially reduce potential impacts associated with the Proposed Action.

2.2 Proposed Action

The description of the Proposed Action is based on the Plan submitted by Newmont to the BLM on March 22, 2012 (Newmont, 2012a). The Plan includes more detailed information. Readers desiring greater detail can review the additional descriptions, maps, and drawings available in the Plan, which is available at the BLM Elko District Office, located at 3900 East Idaho Street, Elko, Nevada 89801 or on the Internet at: http://www.blm.gov/nv/st/en/fo/elko_field_office.html.

2.2.1 Project Area

The project area and project components are shown on Figure 2.2-1. The Long Canyon Project would generally include the following components and facilities, which are described in more detail in following sections:

- Access from Interstate 80 (I-80) at Exit 378 (Oasis/Montello Exit) via Elko County Road 790;
- An open pit that accesses oxide gold ore;
- A west access gate in Long Canyon, which would be closed to the public;

- Ore beneficiation methods (to remove the metal value from the ore) include cyanide heap leaching (to beneficiate lower grade oxide ore) and a cyanide leach mill (to beneficiate higher grade oxide ore);

- Waste rock storage facility (WRSF) to contain all net neutralizing or non-potential acid generating waste rock generated in the mine;

- Synthetic-lined tailings storage facility (TSF) to receive tailings slurry from the mill from which reclaimed water would be recycled back to the mill;

- Mine haul and access roads between the open pit and WRSF, heap leach, and mill facility. No public access would be allowed on the roads within the Plan boundary due to Mine Safety and Health Administration (MSHA) regulations. Public access to the lower Goshute Valley would be via the Shafter exit from I-80 (see Sections 3.13 and 4.13 for greater details on public access);

- Internal service and access roads with no public use on these internal roads;

- A water supply well or wells and a supply system for drinking water, water for dust control, ore beneficiation activities, and fire protection;

- Support facilities for temporary ore storage, truck scale, administration office, first aid and safety related facilities, parking, maintenance shop, warehouse, fuel storage, ammonium nitrate and explosives storage, communications facilities, landfill, contractor/construction laydown and office area, and assay lab/sample preparation facility;

- Power supply utilizing the existing electric distribution line and infrastructure owned by Wells Rural Electric Company (WREC) to the Oasis substation, and from Oasis substation, a new power line to the mine site to provide power for the heap leach facility, and other applications;

- Power supply for the mill operations consisting of a gas-turbine electric generating plant and a gas pipeline constructed to bring natural gas from the Ruby Pipeline to the site;

- Alternative water supply and associated facilities for Wendover, Utah and West Wendover, Nevada (Cities) to replace that portion of their current water supply, which comes from Big Springs;

- Growth medium (soil) stockpiles and construction material borrow pits; and

- Exploration to further delineate ore zones and target potential mineralized resource areas within the Plan boundary. Exploration disturbance is previously approved and not included as new disturbance in Table 2.2-1.

The amount of disturbance by project component is presented in Table 2.2-1. Herein, the project area refers to the Plan boundary, power supply pipeline corridor, and Cities water supply. All mine features in Table 2.2-1 represent disturbances for the duration of the project. The exception to this is the power supply pipeline corridor, which would be considered a short-term (5 to 6 months) disturbance because it would be reclaimed as soon as practicable after construction.

Figure 2.2-1 Proposed Action

Table 2.2-1 Proposed Action Disturbances

Surface Area Disturbance – Life of Project	Duration[7]	Acres[1]		
		Public	Private	Total
Mine Pit Area	P	693	43	736
Haul Roads[2]	LOM	155	136	291
Waste Rock Storage Facility	P	386	711	1,097
Mine Office, Shop, and Mill Facilities	LOM	0	84	84
Tailings Storage Facility	P	173	474	647
Heap Leach Facility	P	118	148	266
Construction Borrow Sites	P	25	390	415
Growth Medium Stockpiles	LOM	157	37	194
Main Site Access Roads[3]	P	28	42	70
Miscellaneous Site Access and Service Roads[4]	P	8	10	18
Bulk ANFO (ammonium nitrate & fuel oil) Storage Area	LOM	0.01	0	0.01
Explosive Magazines	LOM	0.01	0	0.01
Power Supply Natural Gas Pipeline[5]	P	103	172	275
Facility Water Supply Well, Storage Tanks, and Pipelines	P	1	9	10
Miscellaneous[6]	Varies	18	50	68
Water Supply to the Cities and Associated Facilities	P	9	14	23
	Total	**1,874**	**2,320**	**4,194**

[1]Surface disturbance acreage is the total footprint for the Proposed Action. There are several locations which consist of overlapping elements of the mine features (i.e., pit, mill facilities, leach facilities, TSF, roads and the proposed pipeline) overlapping in several locations. The disturbance acreage provided is the true surface disturbance without the duplicative disturbance of these overlapping elements.
[2]Assume average disturbance width for haul roads is 225 feet; this includes cuts, fills, safety berms, and ditching.
[3]Assume average disturbance width for County Road 790 and main access road is 60 feet; this includes cuts, fills, and ditching. Assume average disturbance width for other mine site access roads is 44 feet; this includes cuts, fills, safety berms, and ditching.
[4]Assume average disturbance width for miscellaneous site access and service roads is 24 feet.
[5]Short-term disturbance (approximately 5-6 months) (reclaimed after construction) 50-foot wide corridor by the length of the proposed natural gas pipeline (approximately 42 miles).
[6]This includes the lime silo, septic system, fencing, storm control features for a 25-year, 24-hour event, landfills, power line ROW, and service roads from WREC Oasis substation for power line. Stormwater control structures include diversion ditches, fences, septic system, and stormwater basins.
[7]P = permanent (with reclamation except mine pit); LOM = life of mine (facilities removed & land reclaimed)

2.2.2 Roads

Access to the Long Canyon Mine would be from I-80 at Exit 378, also known as the Oasis/Montello Exit. The road is officially known as Elko County Road 790, which was authorized as BLM Right-of-Way (ROW) Grant number NVN 046998. A typical design for this access road is shown on Figure 2.2-2. With the consent of Elko County and BLM, Newmont would upgrade County Road 790 from Exit 378 on I-80 into the Long Canyon surface facilities as follows:

- Widen to a 32-foot road surface width;
- Place sub-base material and gravel as required to ensure a stable long-term roadway;

- Install asphalt paving on County Road 790 from the I-80 exit to the main entrance of the mine;
- Install side ditching and culverts, where necessary; and
- Install cattle guards and fencing as needed to keep livestock out of the Plan boundary and off public roads.

Mine haul roads within the Plan boundary would be constructed and operated in compliance with MSHA regulations. Haul road grades would generally be limited to overall gradients of 10 percent or less. Drainage channels would be incorporated with roadway construction to direct drainage along the inside edge of the roadway to route precipitation and stormwater runoff to sediment control structures. A typical design for a haul road is shown on Figure 2.2-3.

A haul road would parallel the tailings pipeline and reclaim water pipeline between the mill and the TSF. This haul road would allow access from the mine and the mill to the TSF. Another access road would connect the TSF with the on-site borrow sources (Figure 2.2-1). These access roads would be used to haul material for embankment construction and pipeline maintenance, as required.

Culverts would be installed where roads cross drainages. Culvert inlets would be protected with rock riprap to prevent erosion. Culverts would be placed at a grade of approximately one percent to facilitate drainage. Each culvert would be constructed to convey stormwater flows in accordance with Nevada Division of Environmental Protection (NDEP) requirements. The combination of rock riprap and channels would lessen sediment transport during runoff associated with high precipitation events.

Internal service and access roads would be constructed and maintained at the Long Canyon Project to facilitate access to miscellaneous sites and facilities. These roads would typically be 24 feet wide. Some would be graveled or covered with rock aggregate to provide all weather access, while others would be dirt two-track roads. There would be no public use on these internal roads due to MSHA regulations and Newmont safety policy.

2.2.3 Site Preparation

An early phase of project construction would include removal of existing trees and other vegetation from the areas to be disturbed by the Proposed Action. Trees would be removed as required ahead of mining operations by a commercial logging contractor during the early construction phase of the project. The logs would be hauled to a designated area near the front gate where they would be either bucked up or hauled off-site by the logging contractor. All slash would be removed from the logging site as soon as practicable to minimize attracting beetles and other forest pests to adjacent tree stands. Once the trees are removed, any remaining vegetation would be grubbed and combined with tree slash; the resulting material would then be available to augment growth medium material (soil), suitable for reclamation.

Figure 2.2-2 Typical Access Road Sections

Figure 2.2-3 Typical Haul Road Sections

Typically, a bulldozer would be used to salvage the growth medium material. The material would be loaded onto trucks and hauled to a designated stockpile (early in the mining process) or, later during the life of the mine, to an available site that is ready for reclamation where it can be spread as part of concurrent reclamation activities. Stockpiled growth medium material would be used for future reclamation activities (Section 2.2.17). To limit the total area of surface disturbance at any one time during the life of the mine, soil salvage would be delayed as long as practicable.

Stormwater diversions would be constructed upgradient of each growth medium stockpile and berms would be constructed around their perimeters to retain transported sediments from the stockpiles. Growth medium stockpiles would be revegetated on an interim basis as soon as practicable to minimize erosion and noxious and/or invasive weed infestations.

Two borrow pits in the southern portion of the Plan boundary would be used to obtain clay and fines for construction of several facilities and a third borrow pit in the northern portion would be used as a gravel source for other facilities. The gravel pit would not penetrate the water table. The operation and reclamation of the clay borrow pits is described in Section 2.2.17, Reclamation.

2.2.4 Open Pit Mine

The Long Canyon Project would include an open pit with a series of benches from which waste rock and ore would be extracted. The final pit floor would be excavated to an elevation of approximately 5,700 feet above mean sea level (AMSL), which is approximately 14 feet above the local water table and Big Springs as verified by observation (Golder, 2012). Pit slopes would consist of benches that are approximately 32 feet wide spaced approximately 40 feet vertically. The overall pit slopes would be approximately 44 degrees in rock and 35 degrees in alluvium material.

Newmont would use conventional open-pit, surface mining techniques and equipment including blast-hole drills, hydraulic shovels, front-end loaders, and off-highway trucks. Other related mining equipment includes dozers, rubber-tired loaders, motor graders, water trucks, and other mobile support equipment. Mining operations would move 5,000 to 10,000 tons of ore and 125,000 to 175,000 tons of waste rock per day.

Most of the rock to be extracted at the Long Canyon Project consists of carbonate and siliciclastic (silica-bearing) rocks. Drilling and blasting (use of explosives) would be required to break the rock into loose fragments suitable for hydraulic mining shovels and/or front-end loaders to dig and remove rock material. Before blasting, holes would be drilled into the rock. The holes would then be loaded with blasting agents. It is planned that ammonium nitrate and fuel oil (ANFO) would be used, and this bulk explosive would be placed down each hole around a cast primer and detonating cord.

With blasting and ore control work completed, the area with the blasted material would be loaded with hydraulic shovels and/or front-end loaders into off-highway end dump trucks that would transport this material from the pit on haul roads. Typical haul road design information is shown on Figure 2.2-3.

Lower grade ore would be beneficiated in the heap leach and higher grade in the mill. The heap leach facility would be constructed first followed by the mill at a later date, approximately 18 to 30 months after the mining commences, depending on the quantity of high-grade ore mined in the initial period. Until the on-site mill is constructed, Newmont may either stockpile higher grade ore on-site in a temporary ore storage pile located adjacent to the primary crusher at the mill site or haul the initial high-grade ore 115 miles west on I-80 to Newmont's existing ore processing facilities at Gold Quarry near Carlin, Nevada. Transportation of ore from the Long Canyon Project to Gold Quarry would be a connected action. Newmont estimates that it would transport approximately 400 tons of ore per day (10 loads of 40 tons per load). The ore material stockpile area would have sufficient capacity to store approximately 250,000 tons of ore. If off-site, high-grade ore processing is utilized, this activity would be short-lived, extending until the on-site mill is commissioned.

Waste rock would be hauled and disposed of at the WRSF east of the mine pit area, while ore would be hauled to the on-site mill stockpiles or the on-site heap leach facility depending on the ore grade. Waste rock at the Long Canyon Project consists of rock material removed during mining that contains such low gold concentrations as to be uneconomic to process. Waste rock removal and storage would be an integral and necessary part of the mining operation, occurring throughout the life of the mine.

The major mobile equipment to be used at the mine is listed in Table 2.2-2. This equipment list may be modified during the project depending on site-specific conditions and needs.

Table 2.2-2 Projected Mine Mobile Equipment List

Equipment Type	Estimated Number of Units
Blast-Hole Drills (Atlas Copco Pit Viper 271 or equivalent)	2-5
Hydraulic Shovels (Hitachi EX 5500 or equivalent with 30-35 yd^3 bucket)	1-3
Front-End Loader (Cat 994 or equivalent with 20-25 yd^3 bucket)	2
Haul Trucks (Cat 793F with 250 ton capacity)	13-29
Dozers (Cat D10 or equivalent)	5-6
Rubber-Tired Dozers (Cat 854 or equivalent)	2-3
Water Trucks (Cat 785 D chassis or equivalent)	2-3
Motor Graders (Cat 160M or equivalent)	2-3
Excavator (Cat 365 or equivalent)	1
LowBoy Tractor (Cat 777 chassis or equivalent)	1
Vibratory Compactor (Cat CS76 or equivalent)	1
Mobile Light Plants	6-10
Fuel Service Truck	1

Equipment Type	Estimated Number of Units
ANFO Explosive Truck	1-2
Mechanics Service Truck	2
Lube Service Truck	1
Welding Service Truck	2
Boom Truck	1
Skid Steer Truck	1
Tire Handler Truck	1-2
Crew Vans and Buses	4-8
Pickups	15-25

-The range in the number of equipment units is due to the gradual build-up of operations over the first three years of operations. Haul trucks would continually be added throughout the life of the project as haul distances increase.
-Newmont would utilize miscellaneous earthmoving contractors and their equipment on an as-needed basis to handle small or short (time duration) projects.
-Also see Table 4 in the Plan, Projected Mill Mobile Equipment List.

Open pit mining methods would include drilling, blasting, loading, and hauling. Ore and waste rock would be extracted from 20- to 40-foot-high benches. The mining sequence would include the following:

- Site preparation;
- Blast-hole drilling;
- Loading blast holes;
- Blasting;
- Ore control;
- Ore and waste rock loading and haulage; and
- Clean-up and bench preparation.

2.2.5 Ore Processing

Heap Leaching

Newmont plans to heap leach low-grade ore at the Long Canyon Project. The heap leach facility would be constructed in an area south of the mill facilities (Figure 2.2-1). The general design of the heap leach facility is shown on Figure 2.2-4.

The heap leach facility (and the TSF) is designed to accommodate the maximum amount of the identified gold resource. Since processing economics (ore cut-off grades, operational understanding of the ore body, and process recovery) largely dictate the method of processing, the heap leach facility was designed to allow for greater operational flexibility and management. The heap leach facility would be constructed in incremental stages to minimize the disturbance footprint and capital expenditures.

Construction of the heap leach facility would begin with removal of vegetation and growth medium. The excavated surfaces would be graded and compacted to produce a final foundation surface with a maximum slope of 5H:1V (Horizontal:Vertical) and a minimum slope of approximately two percent. The graded subsurface material would be configured to drain to a central collection point on the east side of the facility.

Twelve inches of selected clay subgrade material, obtained from on-site borrow pits (Figure 2.2-1), would be placed over the facility rough grade and compacted to attain a low-permeability ($\leq 1x10^{-6}$ centimeters per second) layer. This subgrade layer would provide a low permeability barrier and protect the synthetic liner system from possible puncture from underneath.

A leak detection system would be installed at areas of concentrated flow, such as the solution collection headers, to monitor potential seepage through the liner system. Perforated pipe would be installed in 80-mil high density polyethylene (HDPE)-lined trenches that would be cut into the subgrade material beneath key areas in the leach pad liner system. The leak detection system piping would flow to a collection tank or sump, which Newmont would monitor.

An 80-mil, HDPE geomembrane liner would be placed over the clay subgrade layer. This synthetic liner would be anchored at the perimeter in a trench excavated in natural ground or in a constructed anchor berm. A containment berm would be constructed around the facility to contain any precipitation runoff or solution not captured in collection piping. This berm would also be lined with the 80-mil HDPE liner. Twelve inches of a fine-grained protective layer would be placed over the geomembrane surface. The protective layer would consist of sand or fines obtained from an on-site borrow source or generated from crushing and screening waste rock. A portable crusher would be sited near the mill and raw ore stockpile area to produce crushed rock for both the heap leach and tailing protective and drainage layers. All foundation preparation, embankment construction, and liner installation would be completed under a quality control and quality assurance program.

A leach solution collector and header pipe system would be placed over the surface of the protective layer consisting of a network of four-inch diameter perforated pipes spaced at regular intervals, where the interval spacing is based on minimizing the hydrostatic head on the geomembrane liner. The smaller diameter pipes would feed into larger diameter header pipes that would direct flow to the outer limits of the leach pad and ultimately to the pregnant solution tank. A drainage layer of crushed rock would be placed over the collector pipes to produce a high-permeability layer, which, in concert with the drainage pipes would facilitate drainage of leach solution from the heap leach. Newmont would process lower-grade “run-of-mine” oxide ore at the heap leach facility. A haul road would connect the mine pit with the heap leach facility (Figure 2.2-1). Haulage of ore destined for the heap leach facility would be on this road, and the run-of-mine ore material would be end-dumped onto the lined facility. En route to the facility, haul trucks carrying this ore would pass beneath a silo where lime (CaO) would be added to maintain elevated pH for the cyanide solution used in the heap leach process.

Figure 2.2-4 Heap Leach Facility Layout

Ore would be placed in lifts (layers) on the heap leach pad. Lifts would range from 15 to 50 feet in height depending on topography and processing needs. The overall outer slope of the heap leach would be 3H:1V and the maximum height would be approximately 300 feet. A dozer with a ripper attachment would rip the top surface of each lift to facilitate percolation of the process solution into the ore. A weak cyanide solution would be applied to the surface of each lift of ore using drip tubes, emitters, or sprinklers.

The cyanide solution would migrate downward through the stacked ore, dissolve gold contained in the ore, and flow via the previously described solution collection pipes to a central collection tank (called the "pregnant solution tank") that would be located at the downgradient edge of the heap leach pad. The solution containing dissolved gold, known as a "pregnant solution", would be pumped from the pregnant solution tank via a dual-containment pipeline to a central carbon-in-column (CIC) recovery system at the processing facilities, where the precious metals would be adsorbed onto the carbon. The pregnant solution tank would handle normal solution flows from the heap leach pad. An HDPE-lined heap leach events pond located downgradient of the pregnant solution tank would contain any excess water flowing from the pad. This would be a temporary condition and solution from this pond would be pumped back to the pregnant solution tank so the events pond would normally be empty. The heap leach facility flow sheet is included on Figure 2.2-5.

The solution exiting the CIC columns (referred to as "barren solution") would be conditioned with sodium cyanide reagent as needed and recirculated via a dual-containment pipeline back to the heap leach facility. The heap leach facility, like the mill, would be operated as a closed circuit (zero discharge) facility. The loaded carbon (carbon containing gold) from the CIC columns would be transported in a closed tank on a truck off-site to Newmont's existing carbon handling system and gold refinery located at the Gold Quarry facilities for final processing into doré (i.e., bars comprised of mostly gold with some other metals and materials). Newmont estimates 208 truckloads of loaded carbon per year would be transported to Newmont's Gold Quarry facilities for processing and an equal number of truckloads of reactivated carbon would be transported back to the Long Canyon site. Each truck would carry six to 12 tons of carbon.

An all-weather service road would encircle the perimeter of the heap leach facility. This road would provide access for Newmont personnel to the drain piping used to collect pregnant solution and would serve as the access to the perimeter ditching that would surround the heap leach facility. A wildlife exclusion fence would encircle the heap leach facility.

<u>Milling</u>
Milling is an ore processing technique that involves the separation of gold from undesired or non-economic matter. The milling process must be tied to the mineralogy and the economics of the deposit. At the Long Canyon Project, higher grade ore would be milled, as this allows for higher gold recoveries. This process would involve the following steps:

- Crushing;
- Grinding;
- Leaching and carbon adsorption using CIP (carbon-in-pulp) and CIC (carbon-in-column) processes;
- Gold recovery (off-site);
- Counter-current decantation; and
- Cyanide destruction.

The process flow sheet for the mill circuit and the CIC circuit used for the heap leach facility is shown on Figure 2.2-5. The proposed physical plan of the mill and associated support infrastructure is shown on Figure 2.2-6.

Crushing would reduce run-of-mine ore from the mine pit to a consistent size of six inches or less. The run-of-mine ore would be hauled from the mine pit and either dumped directly into the crusher pocket, where the ore would be fed into the crusher via an apron feeder, or stockpiled adjacent to the crusher.

The ore stockpile adjacent to the crusher would have the capacity for approximately 250,000 tons of ore material, with sufficient area available for separate stockpiles to account for differing ore grades. Having separate stockpiles would allow Newmont to blend different ore grades from the stockpiled ore when a front-end loader is used to feed the crusher. Feed rates to the crusher would typically range from 5,000 to 10,000 tons per day. Water sprays and a baghouse-type dust collection system would control dust at the crusher. Crushing operations would be scheduled for 24 hours per day, 365 days per year. The crushed ore would be conveyed to a crushed ore stockpile and then to the grinding circuit for further size reduction. The crushed ore stockpile would be capable of storing approximately 50,000 tons.

Crushed ore would be conveyed to the grinding circuit, where ore would be ground until reaching its desired product size (80% passing 200 mesh – similar to very fine sand). Grinding is required so that the ore is more amenable for gold leaching in the carbon adsorption circuit. Lime would be added to the grinding feed conveyor to control circuit pH. Dry lime would be supplied from a silo adjacent to the feed conveyor.

Grinding would be conducted in an enclosed steel frame building to reduce noise levels and to eliminate weather impacts (freezing, wind, etc.). Initial grinding would be conducted in a semi-autogenous grinding (SAG) mill. Ore, water, and steel grinding balls would be tumbled in this large-diameter, rotating, and cylindrical mill to reduce the ore to a finer size. The term semi-autogenous means that larger ore material assists the grinding media in combination with steel balls.

The SAG mill would discharge to a vibratory screen. The undersize material passing through the screen would report to secondary grinding and screen over-sized material would be returned to the SAG mill via a belt conveyor.

Figure 2.2-5 Mill and Heap Leach Flow Sheet

Figure 2.2-6 Mill Site, Office and Shop Layout

Secondary grinding would be performed in a ball mill that uses water and steel balls in a rotating cylindrical mill. The ore that is ground fine enough for subsequent beneficiation would be routed to a pre-leach thickener tank, where solids would settle to the bottom of the thickener tank to be pumped as a slurry, with approximately 45 to 65 percent solids by weight to the leach and absorption circuit for the gold recovery process. Decanted water from the pre-leach thickener would be pumped to the CIC circuit for gold recovery and then reused in the grinding circuit.

Gold leaching would be conducted in a series of steel tanks located within concrete secondary containment. Sodium cyanide solution would be added to the tanks to dissolve the gold from the ore. The leach tanks would be agitated with compressed air to provide oxygen for the leaching reaction. Slurry lime would be added to the leach circuit, as required, to control alkalinity.

Several tanks at the end of the series of tanks would contain granular activated carbon. Gold that is dissolved from the ore would be adsorbed on the activated carbon in these tanks. This part of the leaching circuit is known as CIP. In-tank screens in the CIP tanks allow the slurry to pass from tank to tank, but the carbon granules would remain in each tank. The carbon would be periodically transferred from tank to tank, counter current to the ore slurry flow. As the carbon particles are moved through the tanks, they become progressively “loaded” with gold. Fresh or regenerated carbon would be added to the final (or downgradient) tank while the carbon from the first (upgradient) tank, loaded with gold, would be pumped to a carbon load-out circuit. The loaded carbon would be shipped to an existing Newmont facility at Carlin, Nevada to recover the gold.

Ore slurry from the CIP circuit would pass through a carbon safety screen to remove any remaining carbon and then report to a counter-current decantation (CCD) circuit to wash cyanide and residual gold values in solution from the slurry. The CCD circuit would consist of two thickeners in series. The ‘wash water’ would be introduced to the second thickener and the subsequent overflow pumped counter-current to the slurry thickener underflow. Over-flow from the first thickener would be recycled to grinding to reuse the contained cyanide and enhance gold recovery. Thickened slurry underflow from the second thickener (tailings) would be pumped to the cyanide destruction circuit.

Slurry from the CCD circuit reports to the cyanide destruction circuit. In the cyanide destruction step, the residual cyanide is neutralized using Caros Acid (H_2SO_5), a mixture of sulfuric acid and hydrogen peroxide. The Caros Acid oxidizes the residual cyanide rendering it inert. A treated cyanide concentration, as measured by weak acid dissociable (WAD), would be targeted to protect wildlife. Once neutralized, the tailings slurry would be piped to the lined TSF.

2.2.6 Tailings Management

Tailings are the finely ground rock materials that remain after precious metals have been extracted at the mill. Tailings slurry from the mill would be pumped via a secondarily-contained pipeline to a synthetically-lined TSF (Figures 2.2-1 and 2.2-7). Newmont plans to mine and process approximately 5,000 to 10,000 tons of ore per day at the Long Canyon Project mill. As a result, over the projected life of the operation, approximately 20 to 30 million tons of tailings would be generated. The tailings slurry would contain approximately 50 to 70 percent solids by weight. After the slurry is deposited in the TSF, solids would settle out in the tailings basin and supernatant water would collect on the surface of the settled solids. Newmont would reclaim this water by pumping it back to the mill for reuse. The entire TSF and associated conveyances are designed to ensure no discharge of tailings solids or water to the environment.

Tailings slurry from the mill would be treated at the mill to reduce the cyanide concentration to levels that are non-toxic. Tailings slurry would be conveyed to the TSF though a contained overland slurry pipeline. Water reclaimed from the TSF would be conveyed back to the mill in a pipeline located next to the tailings slurry pipeline. The tailings slurry and reclaim water pipelines would be high-strength steel or HDPE, with welded joints to ensure long-term operational integrity. The pipelines would be secondarily contained in an HDPE-lined channel that would parallel the upper haul road (Figure 2.2-1).

At road crossings, the process pipelines would be sleeved within a larger diameter pipe (pipe-in-pipe) and culverts (pipe-in-pipe) would be installed for continuous conveyance through the HDPE-lined channel areas in the event of a leak in either pipeline. The gradient on the channel would be such that low points are avoided and positive drainage maintained to an outlet point at the TSF or at a lined containment pond at the mill.

A stormwater diversion channel would be installed on the upgradient (west) side of the haul road to the TSF. This diversion channel is designed to direct the stormwater runoff from the probable maximum precipitation (PMP) event to the south and away from the TSF.

The TSF would consist of an earth/rock embankment that would create a basin for tailings storage. The basin would be fully lined with a synthetic membrane liner. The location of the TSF is shown on Figure 2.2-1 and the construction details, including the liner system, are shown on Figure 2.2-7.

TSF Construction

Growth medium material would be removed from beneath the footprint of the TSF. Waste rock from the mine pit would be used to construct the embankment that would contain the tailings impoundment. Newmont would construct an initial embankment adequate to retain the tailings produced during the first few years of operation and would continue to expand the embankment using downstream construction techniques, thereby increasing the capacity of the facility over time. Downstream embankment construction means that, during expansions of the embankment, new fill material is placed on the downhill side away from the tailings. Newmont would use waste rock from the mine pit for future expansions of the embankment. The general design of the TSF embankment is shown on Figure 2.2-7.

Figure 2.2-7 Tailings Storage Facility

Newmont plans to construct the embankment in three separate stages during the course of operations. The initial embankment would have a capacity to hold approximately 10 million tons of tailings or about three to five years of tailings production, depending on the production rate. Two subsequent embankment raises during the remaining life of the operation would each add another 10 to 15 million tons of tailings capacity. The TSF (like the heap leach facility) is designed to accommodate the maximum amount of total gold resource identified.

Adequate embankment height would be maintained at all times to contain the design tailings solids and water capacity as well as capacity for the design stormwater event. The dam safety regulations of the Nevada Division of Water Resources (NDWR) require that at least three feet of freeboard be maintained at the TSF. In addition, these NDWR regulations require containment of precipitation and run-on from the PMP, as projected by the National Oceanic and Atmospheric Administration (NOAA). The estimated PMP for the Long Canyon Project area is 13.35 inches in a six-hour time period.

After vegetation and growth medium material is removed, the basin area subgrade (geomembrane bedding layer) would be prepared either by using native alluvial material or using fine-grained material from one of the borrow sources shown on Figure 2.2-1. After the subgrade is completed, a seal zone would be constructed by placing a 12-inch thick, low-permeability compacted soil layer that would serve as both a secondary liner and a smooth sub-base for the synthetic liner membrane. The general design of the TSF embankment and the liner system is shown on Figure 2.2-7.

An 80-mil HDPE geomembrane (or equivalent) would be installed over the prepared low permeability soil layer surface. The synthetic geomembrane is shipped in rolls that are deployed over the TSF area and welded together to form water-tight joints. The synthetic geomembrane would be anchored around the perimeter of the facility in trenches excavated in natural ground or at the top of the embankment.

All foundation preparation, embankment construction, and liner installation would be completed under a quality control and quality assurance program. Instrumentation would be installed as part of the TSF installation to monitor the operation and functionality of the system. These would include piezometers and water sampling points.

A tailings under-drain system would be installed over the geomembrane. This would consist of a 24- to 36-inch layer of crushed gravel material produced from an on-site borrow source or from mine pit-run waste rock (Figure 2.2-7). Contained within this gravel layer would be a herringbone configuration of perforated HDPE piping to collect and transport water that infiltrates through the tailings to a central collection tank on the downgradient side of the TSF. The pipeline would traverse beneath the embankment in a concrete-encased trench to a collection tank. The reasons for the under-drain system are:

- Minimize water pressure and hydraulic head on the liner system;
- Facilitate drainage of water from the tailings slurry;

- Assist in consolidating the tailings to maximize the facility's storage capacity; and
- Drain and convey water for recycle and re-use in the mill.

<u>TSF Operations</u>
Tailings slurry would be discharged from spigots that surround the perimeter of the active tailings areas to form a "beach" using thin-layer, sub-aerial deposition techniques (Figure 2.2-7). Slurry would be deposited along the perimeter of the facility by rotating deposition zones periodically to promote drying and increased density of the tailings. This would allow for thin deposition and time for tailings consolidation between discharge times. The tailings distribution pipeline and deposition drop bars would be located around the embankment and the supernatant pond would be directed back toward the existing ground slope. The reclaim water pool would be managed to maintain a small operating pond.

Water from the collection tank located on the outside toe of the tailings embankment would be pumped back to the mill and recycled. In the event of a power loss or other upset condition, back-up collection tanks or a lined pond would be installed to contain overflow. Any water entering these back-up facilities would also be pumped back to the tailings supernatant pool or to the mill.

2.2.7 Waste Rock Storage Facility
The WRSF would be 1,104 acres in size. Newmont estimates that 60 million tons of waste rock per year would be generated, amounting to a total of approximately 600 million tons over the planned mine life. The WRSF (Figure 2.2-1) has been designed to contain this material.

The principal objectives for siting the WRSF included:

- Maintain a minimum 500-foot corridor between the mine pit and the WRSF to allow for wildlife migration, in addition to reclaiming the WRSF in a manner suitable for wildlife migration;
- Locate the facility as close as possible to the mine pit and ensure the site is easily accessible via haulage roads and ramps;
- Ensure the facility is capable of storing the projected total amount of waste rock to be generated by the operation;
- Minimize uphill haulage (once waste rock is removed from the mine pit);
- Confirm that the WRSF and the resulting facility are stable;
- Ensure that geochemical properties of the waste rock would not degrade waters of the United States (WOUS) or the waters of the State;
- Avoid placement of waste rock over areas that could later be deemed feasible for open pit mining; and
- Provide sufficient area for shaping and grading to meet post-mining reclamation and land use objectives.

Newmont would construct the WRSF in a series of levels where the haul trucks would "end-dump" the material horizontally across the storage area. The individual lifts would be maintained at an overall angle of repose or the steepest slope to which waste rock naturally conforms. For the Long Canyon Mine, the angle of repose would average approximately 35 degrees.

Newmont would reclaim portions of the WRSF while actively mining. Performing concurrent reclamation on the west side of the WRSF would widen the area of the wildlife corridor. Slope ratios would be designed to accommodate mule deer passage. The graded WRSF slope could be used by wildlife to travel between the mine pit and the active portion of the WRSF. In addition, concurrent reclamation would help reduce fugitive dust impacts, allow time to test and optimize revegetation procedures, and take advantage of equipment and personnel already on site.

As part of concurrent and permanent reclamation work, flatter slopes would be obtained by grading with a bulldozer. At mine closure, overall out-slopes of the WRSF would be 2.5-3H:1V, although slopes at the toe of the WRSF may be shallower to produce concave features to mimic natural topography. One of the most important goals for waste rock grading and contouring would be to produce a final topography of the WRSF that would conform to and blend with the surrounding terrain, as well as produce a permanent and stable landform. This would be achieved by matching slopes, aspect ratios, drainage densities, and drainage channel forms to those of the adjacent natural landscape.

2.2.8 Facilities

Newmont would construct and maintain surface support facilities. The Long Canyon Project would require surface infrastructure and miscellaneous facilities to support the mine and ore processing operations. Such surface facilities are shown on Figure 2.2-1 and Figure 2.2-6.

This section generally describes and provides information on additional support infrastructure.

Truck Scale

Trucks hauling material for off-site processing would be weighed. Similarly, supply trucks bringing consumables to the site would also be weighed. The truck scale would be located adjacent to the guard house at the main entrance to the project site.

Mine Administrative Office

The administration building would either be of modular or steel construction and be placed on a concrete foundation. The building would have offices for management, administration, engineering, geology, information-technology, supply chain, environmental, and health, safety, and loss prevention (HSLP) personnel, along with a reception area, conference and training rooms, utility room, men's and women's wash rooms, and miscellaneous storage space.

Employee and Visitor Parking

During construction work, there would be a parking lot in the project area for worker buses and 30 to 50 personal vehicles expected to transport workers to the site. Some additional parking spaces would be provided for vendors and other visitors. The parking area would be located at the main entrance near the administrative offices, but it would be fenced to prevent unauthorized vehicular access to the mine, heap leach, and mill area.

As the project transitions from construction to full-scale mining and ore processing operations, this parking area would be maintained for buses and miscellaneous vehicles for employees, contractors, vendors, and visitors.

Maintenance Shop and Warehouse Facility

Mobile mine equipment would require regular maintenance. Therefore, Newmont would construct a maintenance shop with bays for equipment maintenance and repair, along with areas for electrical maintenance and a wash bay. A warehouse would be part of the overall maintenance facility, with the warehouse portion of the building configured for ease of delivery with a loading dock and an outdoor, fenced, partially covered storage area.

A concrete pad would serve as a floor for the shop and warehouse facility. Sufficient space surrounding the maintenance and warehouse facility would be left for equipment parking (mainly mine haul truck parking) and supply storage.

The maintenance shop and warehouse facility would have offices for supervisors and maintenance staff, along with a conference room, utility room, men's and women's wash rooms, and miscellaneous storage space.

Fuel Storage

Above-ground tanks for storage of gasoline, diesel fuel, lubricants, coolants, hydraulic fluids, and propane would be used. The bulk fueling tanks would be located within a concrete or HDPE-lined secondary containment facility that is capable of holding 110 percent of the largest tank volume located at the fueling station and/or would utilize self-contained tanks with built-in secondary containment.

The storage tank facility for gasoline, diesel fuel, and propane would be located near the maintenance shop (Figure 2.2-1 and Figure 2.2-6). Newmont would contract with local or regional suppliers to deliver the required fuel.

The estimated fuel volumes to be stored at the Long Canyon Mine follow:

- Gasoline near maintenance shop, 10,000 gallons;
- Diesel fuel near maintenance shop,10,000 gallons;
- Diesel fuel near the pit, 80,000 to 100,000 gallons; and
- Propane near maintenance shop, 5,000 gallons.

Diesel fuel, gasoline, and propane would be delivered to the site on a routine basis.

Mobile off-highway mining and support equipment would use diesel fuel, while certain mobile (primarily non-highway licensed) vehicles used solely at the operation site would use gasoline.

Newmont light vehicles would be fueled at the site. These vehicles include the vans and buses used to transport employees to the mine.

Propane would be used to provide building heat and hot water for the site's facilities.

Explosives Storage

Blasting agents would be used in the mining process, with ANFO being the primary material used.

Ammonium nitrate (AN) would be stored in silos within a remote and fenced (locked) site away from the main surface facility site, but adjacent to the main haul road that connects the office, shop, and mill facility area with the mine pit. Similarly, explosive magazines for detonating cord, cast primers, and blasting caps would also be located in a separate, remote, and fenced (locked) site away from the AN area and other mine surface facilities.

AN storage facilities and explosive magazines would be sized and designed to meet the regulations of MSHA and the United States Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATFE). Explosives would be handled and used in accordance with MSHA regulations by trained and certified personnel.

The fuel oil (diesel) that would be mixed with ammonium nitrate to create ANFO would be stored in the mine's primary fuel storage area, and then delivered by fuel truck when required for mixing.

MSHA and ATFE regulate explosives storage, transport, and use at surface metal mines. Explosives would be transported to the site by contract transporters approved by the United States Department of Transportation (USDOT).

Communications Facilities

Newmont would contract with the local service provider to install telephone and internet communications. Newmont would also maintain two-way radio communications in mobile equipment at the operation. Two communications towers would be installed and used for operation. One tower would be located near the pit and the other near the processing facilities (Figure 2.2-1). The towers would be of a lattice type construction without support wires. The tower near the pit will be up to 80 feet high and the one near the plant site will be up to 190 feet high.

Landfill

Newmont would maintain a solid waste landfill on private ground at the Long Canyon Project for non-hazardous wastes (such as scrap metals, untreated wood wastes, paper products, empty bags, thoroughly drained containers, office and lunch room wastes). The landfill would be a Class III waivered facility as regulated by the NDEP Bureau of Waste Management.

The Class III landfill would initially be located on private land in the southeast quarter of Section 34, T36N, R66E. Another permitted landfill would be established on the WRSF in year two or three of operations, when sufficient room is available in the WRSF for the landfill.

Contractor/Construction Laydown and Office Area

Newmont would contract for the construction of the office, shop, warehouse, ore processing, and other miscellaneous mine support facilities. An area would be made available for temporary contractor office trailers, with adjacent laydown areas. The contractor trailers and storage areas would be located adjacent to the area for administration facilities.

Newmont expects that 15 to 20 temporary trailers would be placed on temporary wood-cribbed foundations (or equivalent) and skirted with sheeting. Electricity would be supplied by existing service to the Big Springs Ranch or small portable generators. A propane tank may also be placed central to the trailers to facilitate the heating systems of these temporary facilities. In addition, temporary portable sanitary facilities would be located throughout the area.

The contractor trailers would be phased out and removed as construction is completed and the permanent facilities are commissioned, which is estimated to be approximately 12 to 18 months. Upon removal, the area on which the temporary contractor trailers were placed would be used for permanent mine supply storage.

Sample Preparation Facility

Newmont would construct a sample preparation facility adjacent to the shop/warehouse and mill buildings. This facility would prepare blast-hole samples for assay and analysis. The prepared samples would be transported to Newmont's Gold Quarry laboratory at Carlin for assay and analysis. Samples from milling and heap leach operations would similarly be prepared at the on-site facility for off-site analysis.

The sample preparation facility would consist of a building with sample receiving capabilities, equipment to dry, crush, and pulverize the samples, separate the samples into smaller aliquots, ship samples, and store sample residues. Equipment to prepare milling samples includes filters to separate slurry samples into solid and liquid components, drying equipment, and pulverizing equipment.

2.2.9 Power Supply

Newmont would require electricity for the Long Canyon Project. The largest consumer of power at the site would be the mill facility, but electric power would also be needed for the heap leach facility and the day to day operations in offices and shops for lights, computers, power tools, and other applications.

The initial power demand at the Long Canyon Project would be approximately 10 megawatts (MW) to support mine and mill start-up. Energy demand is projected to reach 15 to 20 MW as the operation reaches full production.

Newmont would initially use the existing electric distribution line that currently services the Big Springs Ranch to supply electricity for construction activities.

Power supply to the Long Canyon Project at full production (15-20 MW) would involve self-generation of electricity by Newmont with an on-site, natural gas-fired turbine generator facility. This requires delivery of natural gas to the site. A natural gas pipeline spur would be constructed from the existing Ruby Pipeline Project located approximately 42 miles north of the Long Canyon Project. Figure 2.2-8 shows the pipeline route, from the Ruby Pipeline south along County Road 765 to Montello, then west along State Route 233 to Oasis, and along other ROWs to the project site. Natural gas-fired turbines are modular, with variable generating capacities. Newmont would use turbines of 5 to 10 MW capacity each. As future load increases, Newmont would add more turbines of similar size to meet the power demand.

2.2.10 Water Supply and Management

Newmont would develop and maintain a water supply system dedicated to the project. Water rights permits have been acquired for the industrial and potable uses at the site. Water for the Long Canyon Project would be obtained from a well field in Section 3, T35N, R66E, on Newmont property (Figure 2.2-1). Useable quantities of groundwater are found in this area, and pump tests show that the well field is capable of producing 3,000 gallons per minute (gpm) on a sustained basis.

Water would be pumped from the wells into a 15,000- to 20,000-gallon water tank adjacent to the well field during construction. Water from the wells or this tank facility would be delivered via a buried or surface pipeline parallel to a mine service access road to the main 600,000-gallon capacity fresh/fire water storage tank facility located near the office, shop, and mill complex. Both tank facilities would have the potential to supply water trucks used for exploration drilling, development drilling, and road dust control. Capacity would be made available in the total system for adequate water storage in the case of a fire.

The majority of the water use at the Long Canyon Project would be for ore processing (milling and heap leaching) and then dust control/suppression. Other uses would include potable use and fire protection. Water would be needed for every phase of the project, starting with construction and development, continuing through mine and ore processing operations, and concluding with closure and reclamation activities. Water management is an important component of the Long Canyon Project. Given the remote location of the operation, Newmont would develop and maintain a water well supply system dedicated to the project that furnishes potable water, along with water for mining (dust control), ore processing activities (milling and heap leach activities), tailings disposal, drilling and exploration activities, and fire protection. A range of estimated water usage for the project is shown in Table 2.2-3.

Table 2.2-3 Estimated Water Usage

Project Component	Construction and Start-Up (gpm)	Operations* (gpm)	Closure and Reclamation (gpm)
Milling	800 – 1,000	400 – 500	-
Heap Leach	500 – 800	100 – 150	-
Surface Dust Control	600 – 800	600 – 800	300
Potable or Domestic Use	5 – 10	5 – 12.5	2
Sub-Total Use	**1,905 – 2,610**	**1,105 – 1,462**	**302**
Contingency (10%)	191 – 261	111 – 148	30
Total Estimated Use (gpm)	**2,096 – 2,871**	**1,216 – 1,608**	**332**
Estimated Annual Use (acre-feet)			
Estimated Annual Use (acre-feet)	3,354 – 4,594	1,946 – 2,593	535

(1) 1 gpm = 1.61 acre-feet per year.
(2) Potable water demands are estimated at 35 gallons per day (gpd) per person.

- For construction: $\frac{(\text{Maximum 400 people})\ (35\text{ gpd})}{(24\text{ hr/day})(60\text{ min/hr})} = 9.8$ (assume 10 gpm)
- For operations: $\frac{(\text{Maximum 500 people})\ (35\text{ gpd})}{(24\text{ hr/day})(60\text{ min/hr})} = 12.25$ (assume 12.5 gpm)
- For closure and reclamation: $\frac{(\text{80 people})\ (35\text{ gpd})}{(24\text{ hr/day})(60\text{ min/hr})} = 1.9$ (assume 2 gpm)

(3) Water used for exploration is not included in this table.
*Includes reclaimed water

One of the major water uses would be for mill operations. The mill would be operated as a closed-circuit, zero-discharge facility. Process water would be recycled within the process system rather than allowed to be discharged into the environment. Initially, water would be added to the ore in the grinding process. Following grinding and thickening, the ore would be pumped as slurry through a series of leaching tanks. Once the gold is extracted from the ore, tailings would be pumped as slurry to the TSF, where the decanted reclaim water would be returned to the mill. About half of the total water used in the process would be recycled from uses within the mill and from the tailings impoundment. However, due to the evaporation and retention of residual water within the tailings (approximately 10% to 15%), fresh water makeup would continue to be required in the milling process throughout the life of the project. Seasonal precipitation and temperature would play a role in determining the amount of water recycled to the mill from the TSF and how much makeup water would be required for the mill.

Figure 2.2-8 Proposed Pipeline Route

As the mill approaches the final cessation of operations, as much water as practical would be drawn from the TSF and less fresh makeup water would be added to the system to reduce the size of the supernatant pool at the TSF. At the conclusion of milling operations, any remaining ponded water in the TSF would be evaporated naturally or enhanced through the use of evaporators as part of final closure and reclamation. Another major use of water would be for heap leach purposes. Similar to the mill, the heap leach facility would be operated as a closed-circuit, zero-discharge facility, and process water would be recycled within the process system with no discharge to the environment. Barren solution from the CIC circuit would be applied to the heap leach on a continuous basis. This flow would be augmented as required to wet additional heap leach ore and replenish water stored in the heap and lost to evaporation.

Water would also be used for fugitive dust control on roads and at ore stockpiles, crushers, and conveyor transfer points. In some areas, water volumes used for road dust suppression would be reduced with the use of dust control chemicals. When applied properly and maintained, these products would be capable of providing dust control and lessening the amount of water to be used at the site. Water demand would vary during the year, with peak demand during the summer months when dust suppression and evaporation are greatest. Newmont would employ water conservation measures as part of operations.

Water would be necessary for potable and sanitary use at the mine office, maintenance facility, mill complex, and heap leach facility. It is expected that only chlorination would be required to provide potable water for the site. Newmont would establish a non-transient, non-community drinking water system that complies with the regulations of the NDEP Bureau of Safe Drinking Water.

Perched aquifers within the pit are not anticipated based on extensive exploration drilling. However, accumulation of water may result from precipitation events or snowmelt. Should water management be required within the pit, it would be evacuated and used on-site.

Newmont and the Cities have agreed upon a legal framework for replacement of the Cities' use of Big Springs for municipal water supply. A copy of the Surplus Water Service Agreement is provided in Appendix 2A. Newmont is proposing to construct two wells, each capable of producing two cubic foot per second (cfs) and equipped with pumps capable of one cfs in Section 21, T35N, R66E. The pumps would be connected to the existing pipeline from Big Springs to the Cities' water supply (Figure 2.2-1). A pumphouse, approximately 23 feet by 15 feet, would be constructed in the same location and a 16-foot wide access road would connect the facilities with the existing access road to the Cities' existing water supply. The new water pipeline would tap into the existing pipeline in Section 34, T36N, R66E. As part of the framework, Newmont would lease 0.8 cfs (359 gpm) of surplus water from the Cities for use at the Long Canyon Project and 1.0 cfs (448.83 gpm) of Big Springs surplus water in exchange for a one-time payment. Upon termination of the agreement (i.e., mine closure), Newmont would transfer to the Cities ownership of the project supply well capable of producing up to 4.5 cfs and would return use of Big Springs to the Cities. In the unlikely event that Big Springs flow ceases or is reduced to less than one cfs because of Newmont's groundwater pumping, or the water quality of Big Spring is impacted to the extent that it no longer meets drinking water standards, Newmont would convey ownership of one cfs drinking water quality groundwater to the Cities.

No changes are planned or proposed for agricultural water rights belonging to the Big Springs Ranch. There would be continued use of the stock watering rights and associated points of diversion for the ranch through the life of the mine and beyond.

2.2.11 Materials and Reagents

During operations at the Long Canyon Project, Newmont would use a number of materials, supplies, and chemical reagents, including fuel, explosives, and ore processing reagents. Listed in Table 2.2-4 are the major consumables to be used. This information would be updated on an annual basis as required by the Fire Marshal Hazardous Materials Permit. It should be noted that Homeland Security regulations prohibit public disclosure of the quantity of explosives used or shipped.

Newmont would report chemical use volumes under the Environmental Protection Agency (EPA) Toxic Release Inventory (TRI) program, as required by Section 313 of the Emergency Planning and Community Right to Know Act.

In addition, Newmont would be responsible for clean-up of releases of hazardous substances and/or oil associated with the Long Canyon Project in accordance with the National Oil and Hazardous Substances Contingency Plan (40 CFR 300). Newmont would notify the BLM Authorized Officer, NDEP, and the National Response Center of reportable quantities of hazardous substances and/or oil released as required. Spills would be cleaned up in accordance with local, state and federal regulations.

2.2.12 Non-Process Waste Management

Newmont would dispose of sewage through either a conventional septic tank and leach field system or a rotating biological contactor (RBC) discharging treated effluent to a leach field. The waste disposal system would be connected to the office, shop, heap leach, and mill complex facilities. The RBC consists of a cylindrical tank with a series of closely spaced, parallel discs mounted on a rotating shaft, which is supported just above the surface of the wastewater. Microorganisms grow on the surface of the discs where biological degradation of the wastewater pollutants takes place. The RBC process removes the “grit” and other solids through a screening process followed by a period of settlement. Upon completion of treatment and settlement, the wastewater would be discharged to a leach field.

Table 2.2-4 Materials, Supplies, and Reagents

Common Name	Annual Use	Delivery Form	Shipment Quantity	Location Stored	Max Amount Stored	Storage Method	Area Used
Diesel Fuel	9,000,000 gal	Bulk Liquid	10,000 gal	Truck Shop	120,000 gal	Tank	Project Site
Gasoline	200,000 gal	Bulk Liquid	5,000 gal	Truck Shop Area	10,000 gal	Tank	Project Site
Sodium Hypochlorite	5,000 lbs	50 lb bags	1,000 lbs	Water treatment building	1,000 lbs	Dry stacked	Water Treatment
Ammonium Nitrate[1]	N/A	Bulk Solid	N/A	ANFO Silos	N/A	Silo	Pit
Explosives[1]	N/A	Box	N/A	Powder Magazine	N/A	Secured Magazine	Pit
Propane	300,000 gal	Bulk Liquid	20,000 gal	Truck Shop Area	10,000 gal	Tank	Buildings
Sodium Cyanide	1,500,000 lbs	Bulk Liquid	8,000 gal	Process Plant	30,000 gal	Tank	Mill/Heap Leach
Lime	4,000 tons	Bulk Solid	40 tons	Process Plant/Heap Leach	200 tons	Silo	Mill/Heap Leach
Activated Carbon	900,000 lbs	Super Sack Solid	40,000 lbs	Process Plant	60,000 lbs	Warehouse	Mill
Scale Control Reagents	45,000 lbs	Bulk Liquid	2,000 gal	Process Plant/Heap Leach	3,000 gal	Tank	Mill/Heap Leach
Sulfuric Acid	1,000,000 lbs	Bulk Liquid	3,000 gal	Process Plant	150,000 lbs	Tank	Mill
Hydrogen Peroxide	375,000 lbs	Bulk Liquid	4,000 gal	Process Plant	90,000 lbs	Tank	Mill
Flocculent	90,000 lbs	Dry Super Sacks	40,000 lbs	Process Plant	40,000 lbs	Warehouse	Mill
Grease	50,000 lbs	Bulk liquid/solid	5,000 lbs	Truck Shop Area	10,000 lbs	Totes, drums	Truck Shop
Hydraulic Fluid - Motor Oil	200,000 gal	Bulk Liquid	5,000 gal	Truck Shop Area	5,000 gal	Tanks, totes, drums	Truck Shop
Solvents	1,000 gal	Bulk Liquid	200 gal	Truck Shop Area	1,000 gal	Totes, drums	Truck Shop
Antifreeze	40,000 gal	Bulk Liquid	4,000 gal	Truck Shop Area	4,200 gal	Tanks, totes, drums	Truck Shop

[1] U.S. Office of Homeland Security regulations do not allow mine operators to report explosive quantities.
gal = Gallons
lbs = pounds
N/A = Not applicable

Throughout construction, mining, and reclamation work, Newmont or its construction contractors would place portable chemical toilets at work sites around the operation. These toilets would be periodically cleaned and emptied by a contractor. Such sanitary waste would be transported off-site for disposal by the contractor.

Newmont would use on-site trash receptacles during mining and ore processing operations and install an on-site Class III waivered landfill to handle inert waste pursuant to Nevada Administrative Code (NAC) 444.731. The landfill area would be located on private property controlled by Newmont and not on BLM-administered land. Newmont would only place inert wastes in the on-site landfill. In no case would Newmont put materials in this landfill that meet the definition of a hazardous waste. Upon permanent closure of the landfills, Newmont would place and compact a suitable cover material to a minimum uniform depth of 24 inches over the top of the facilities. This cover would be graded to allow for proper surface runoff drainage.

Resource Conservation and Recovery Act (RCRA)-identified wastes anticipated to be generated at the Long Canyon Project include florescent bulbs and batteries, which are considered "universal wastes". Empty aerosol product containers that are considered hazardous would be managed as such under RCRA Small Quantity Generator status. Management of hazardous wastes including storage, disposal, and reporting would be in accordance with RCRA requirements. All hazardous wastes would be disposed of off-site in commercial hazardous waste disposal facilities.

The majority of the hazardous materials used on-site would be spent or consumed during operations. Materials that are not spent or consumed (e.g., oils, antifreeze, etc.) would be recycled, to the extent possible, or disposed off-site in an approved facility in accordance with applicable federal and state regulations. Newmont has prepared an Emergency Response Plan that established procedures for responding to accidental spills or releases of hazardous materials to minimize health risks and environmental effects (Newmont, 2012e).

Petroleum waste products would be stored on-site in approved containers that would be separate from other trash and garbage products, and these petroleum waste products would be transported off-site for recycling or disposal in an approved waste facility. Newmont has prepared a Spill Prevention, Control, and Countermeasure (SPCC) Plan that established procedures for responding to accidental spills and releases of petroleum products (Newmont, 2012d).

2.2.13 Schedule

The Long Canyon Project has an expected current life ranging from eight to 14 years (including construction, mining and ore processing, and final closure and reclamation), depending on the outcome of ongoing exploration, operating costs, and the price of gold. Construction activities for the mining, ore processing, and miscellaneous ancillary facilities would take place over 18 to 30 months. This includes startup and commissioning of the mill.

Construction and pre-production mine development work would consist of site preparation for laydown areas, clearing of tree vegetation from the mine area, removal of growth medium material from areas to be disturbed during construction, tailings dam construction, installation of the foundations for the mill and other buildings, construction of the mill and other buildings, and liner placements for both the TSF and heap leach facility.

Pre-production mine development would occur with construction of haul roads, removal of waste rock, and removal of initial ore material, which may be transported to an existing Newmont mill until the on-site Long Canyon Project mill is commissioned. After initial mill start-up testing, full mine production would begin. Mining and ore processing activities would continue at least six to eight years thereafter.

At the conclusion of mining and ore processing, closure and reclamation activities would be expected to take up to three years, followed by several years of reclamation success and hydrology monitoring.

2.2.14 Workforce

Newmont and construction contractors would employ 300 to 400 people for the construction and initial mine development activities. This would include workers to construct mine offices, maintenance shop, and mill facilities, along with the construction of the tailings embankment and liner systems, and heap leach liner facilities.

At full production, which would occur approximately nine to 12 months after construction is complete, project employment would be approximately 300 to 500 people. This would include miners, mechanics, electricians, process operators, engineers, geologists, environmental specialists, and management and administration personnel.

At the curtailment of operations, an estimated workforce of approximately 50 to 80 people would be utilized to salvage equipment and complete final reclamation activities.

2.2.15 Transportation

Newmont would establish parking areas in Wells, West Wendover, and Elko for employees and contractors using bus or van pooling to the Long Canyon Project site. As with its other northern Nevada operations, Newmont would make busing and vans available for employee and contractor transportation to the Long Canyon Project.

Newmont encourages, but does not mandate its employees and contractors to use the buses and vans; however, Newmont's experience in northern Nevada is that most people choose this option for its convenience and cost savings from driving private vehicles to the mine site. Some limited parking (around 50 spaces) would be provided at the Long Canyon Project for individual private vehicles. These could be employees, contractors, vendors, and visitors.

Newmont would be transporting ore and loaded carbon from the Long Canyon Project site to its Gold Quarry facilities near Carlin, 115 miles west on I-80. Ore may be stockpiled at the project site for transport to the Gold Quarry facility, but only until a mill is constructed at the Long Canyon project site. Transportation of ore would be in 10 40-ton loads per day. Transportation of carbon would be in 208 six-ton loads per year for loaded carbon and an equal number of loads of reactivated carbon back from Gold Quarry.

2.2.16 Exploration

Newmont would continue surface exploration and development work on the Long Canyon Project claims to further delineate known ore zones and to target potential mineralized resource areas. Surface exploration would be conducted on the previously-approved areas in the Surface Exploration Plans and Notices for the project area, filed at the BLM Wells Field Office under NVN-82445 and Reclamation Permits Numbers 0256 and 0284 authorized by NDEP. Additional information can be found in the *Environmental Assessment, Fronteer Development (USA) Inc., Expanded Long Canyon Exploration Project, Elko County, NV, Environmental Assessment, EA#: DOI-BLM-NV-N030-2011-0001, June 2011*.

Newmont would continue to conduct exploration and development drilling throughout the active mine life. Newmont would use the same or similar drilling methods, as well as the same or similar types of equipment that are presently employed. New drill sites would be established with other selected drill sites being reclaimed concurrently as drill targets are evaluated. Seasonal operating constraints for migratory bird nesting sites and mule deer winter habitat, as described in the EA (BLM, 2011d), would continue to be observed.

New drill pad disturbance would be kept to the minimum necessary for safe access and working area for equipment and crews. Drill pads typically require a working area of approximately 70 feet long by 30 feet wide (about 0.1 acres). The drill pad surface disturbance includes cut and fill slopes that may be necessary to compensate for the topography at any given drill pad.

Sediment basins or traps (sumps) are and would be constructed at each drill site to collect drill cuttings and to manage and circulate drilling fluids. Typical dimensions for a sump are approximately 15 feet long by 10 feet wide by 8 feet deep, with at least one side sloped to allow escape of any wildlife that may enter. In some cases, sumps may be fenced to prevent wildlife or livestock from entering. The 2011 EA (BLM, 2011d) places timing restrictions on use of the wildlife migration corridor during some seasons and conditions. At the end of each field season, drilling fluids would be pumped from the sumps and the sumps backfilled and reclaimed.

Newmont currently utilizes truck-mounted, track-mounted, or articulated buggy-mounted reverse circulation and core drill rigs and support equipment. These types of rigs would continue to be used in the future.

Water and non-toxic approved drilling fluids would continue to be utilized during drilling. Newmont obtains water for drilling from existing sources in the project area including the Johnson Springs system, Big Springs Ranch wells, the Cities' water system at the Big Springs Ranch, and from a private well at Oasis.

Drilling support equipment includes water trucks, crew trucks, portable mud tanks, pipe trucks or skids, portable toilets, light plants, portable generators, motor graders, excavators, dozers, and product storage pallets.

2.2.17 Reclamation

Closure and reclamation are an integral and important component of the Long Canyon Project. The overall purpose of reclamation is to return disturbed areas to a stabilized, productive, and functional landscape that can support post-mining land uses of livestock production, wildlife habitat, dispersed recreation, and mineral exploration. These land uses are compatible with surrounding uses, and they would assure long-term protection of land, water, and air resources in the area.

Closure and reclamation practices, such as those to be used at the Long Canyon Project, have been developed and successfully utilized by Newmont and other mining projects and operations in Nevada, as well as throughout the western United States. However, if improved practices and technology are developed, Newmont would present these to the Nevada Department of Wildlife (NDOW) and BLM and implement new closure and reclamation technologies as approved by NDOW and BLM.

The current land uses at and surrounding the Long Canyon Project consist of domestic livestock production, wildlife habitat, dispersed recreation, and mineral exploration. The emphasis of the reclamation plan would be to close and remove unnecessary surface facilities and infrastructure (some facilities would be retained on Newmont land for future ranching activity), blend the WRSF, heap leach facility, and TSF to create stable landforms and to conform to the surrounding landscape, and establish stable, self-sustaining plant communities on disturbed areas. Newmont would control noxious weed establishment during reclamation using the controls described in their Weed Management Plan (Newmont, 2012g).

<u>Interim Reclamation</u>

Newmont would provide for interim reclamation throughout the operational life of the Long Canyon Project. Interim reclamation would allow temporary stabilization during operations, and then allow the best technology available at the time of final closure to be implemented. Interim reclamation action taken to stabilize disturbed areas during site operations includes seeding, construction of berms, slope drains, slope armoring, rock check dams, silt fences, waterbars, detention basins, and stormwater ponds.

<u>Concurrent Reclamation</u>

Reclamation completed during active operations is termed “concurrent” reclamation. Concurrent reclamation differs from interim reclamation in that this reclamation is designed to provide permanent, low-maintenance achievement of reclamation goals. Newmont plans for concurrent reclamation work on the early construction of the WRSF, particularly on the west side of the facility (Section 28, T36N, R66E).

The western edge or toe of the WRSF would be established so that construction, grading, contouring, topsoil replacement, and reclamation work can be completed concurrently with initial pit development. This concurrent construction would augment a wildlife migration corridor that is being preserved between the mine pit and the WRSF. As the outer toe of the WRSF is set, waste rock would be placed in a lift such that the slope of this lift can be graded to its final configuration. As subsequent waste rock “lifts” are placed, the final slopes of the WRSF can be created in a concurrent fashion and with the desired final landform.

Once grading is completed, growth medium material would be replaced when practicable, using direct haulage from areas where such material is removed ahead of operations, and the area would be seeded with an approved seed mixture and/or cover crop.

Along the initial bottom lifts of the WRSF in Section 28 of T36N, R66E, Newmont would plant native tree and shrub species to begin the reclamation goal of enhancing the deer migration corridor and wildlife habitat along the reclaimed slopes.

The final grading plan for the project is designed, in part, to minimize the visual impacts of unnatural lines and landforms. Slopes would be graded to blend with surrounding topography and to facilitate vegetation. With the assistance of specialized software, the final WRSF design would apply fluvial geomorphic principles to create a landscape design that mimics the functions of a natural landform in a stable hydrologic equilibrium. The conceptual post-mining topography for the Proposed Action is shown on Figure 2.2-9. Figure 2.2-10 shows pre- and post-mining mine pit topography.

Revegetation of disturbed areas would be conducted as soon as practicable to reduce the potential for wind and water erosion. Following construction activities, areas such as cut-and-fill embankments and growth media stockpiles would be seeded. All sediment and erosion control measures and revegetated areas would be inspected periodically (such as after high precipitation events) to ensure long-term erosion control and reclamation success.

<u>Final Closure</u>

At the time of permanent cessation of mining and ore processing activities, Newmont would implement final reclamation activities consistent with the approved Reclamation Plan and a Final Permanent Closure Plan to be filed with NDEP, Bureau of Mining Regulation and Reclamation (BMRR). The Reclamation Plan and the Final Permanent Closure Plan would involve a number of steps including:

- Decommissioning, demolition or disposition of facilities;
- Contouring and grading;
- Growth medium replacement;
- Growth medium sampling for nutrient analyses;
- Seeding, planting and mulching; and
- Maintenance and monitoring.

Figure 2.2-9 Post-Project Topography

Figure 2.2-10 Pre- and Post-Mining Mine Pit Topography

Because of its ranching operations, Newmont foresees a post-project beneficial use for several Long Canyon Project structures and facilities that are located on its property, including:

- Truck shop;
- Office;
- Fuel storage and dispensing facility;
- Water supply wells and storage facility;
- Main mine access road and mine service roads; and
- Power lines.

Newmont would dismantle or demolish these structures (e.g., mill, conveyors, etc.), and the materials from the dismantling or demolition work would be salvaged or disposed in permitted on-site and/or off-site landfills. Unsalvageable portions of any facilities, such as the concrete pads used at the office and mill, would be broken up and buried on-site, at the on-site landfill and/or within the final lifts of the WRSF. A minimum of five feet of cover would be placed over the concrete.

Newmont would comply with NDEP requirements and pursue a systematic approach for closure of the heap leach facility that would include the following:

- A piping system would be investigated that would allow heap draindown solution to gravity flow to the tailing facility pump back system where the solution would be managed in conjunction with the tailings solution by evaporation, infiltration, and/or, if feasible, agricultural irrigation on the Big Springs Ranch;

- Heap leach slopes would be contoured to approximate 3H:1V slopes with pad material contained within the lined facility footprint;

- A cover system would be designed and constructed to minimize or eliminate meteoric input to the facility. The design would incorporate current technologies including evapotranspiration (ET) soil cover. It is anticipated that the ultimate discharge of the heap leach draindown would be a minimal flow and be managed through evaporation, infiltration, and/or agricultural applications;

- As available, growth medium material would be placed over the cover system and would become part of the cover thickness. The area would be vegetated;

- Post-closure monitoring would be conducted until the expected closure performance standards have been achieved and vegetation has been deemed to be successful; and

- Additional details on closure and reclamation are described in Section 4.2.2, including modeling of draindown and cover materials. Geochemistry is described in Section 3.2.2.

Newmont would comply with the NDEP requirements and pursue a systematic approach for closure of the TSF that would include the following:

- Design and construction of a cover system that would minimize or eliminate meteoric input to the facility. The design would incorporate current technologies such as an ET soil cover. The cover design would be based on results from hydro-geochemical conceptual modeling of potential source contaminants to groundwater. It is anticipated that the ultimate discharge of the tailings draindown would be managed through evaporation, infiltration, and/or agricultural applications;

- Schedule the placement of the cover system so the closure work would be accomplished over a period of several seasons to allow for drying of the tailings surface and placement of an operations layer. Concurrent placement may also be coordinated as the tailing surface is completed and dry during active operations; and

- Post-closure monitoring would be conducted until the expected closure performance standards have been achieved and vegetation has been deemed to be successful.

As part of the abandonment routine for exploration drilling operations, Newmont would plug drill holes according to NDWR regulations, using concrete, cement grout or bentonite grout to prevent any vertical movement of groundwater within the drill hole, as well as to eliminate a post-exploration danger to people, wildlife and/or livestock that might be traversing the area.

Final slopes of the WRSF and the heap leach facility would be graded to an average slope of approximately 3H:1V (or less), although slopes would be varied to achieve a more natural appearance and to blend with the surrounding landscape. The mine pit area would not be backfilled or graded.

Compacted areas, such as roads, ore stockpile areas, parking lots, etc., would be left in a roughened condition prior to growth medium material replacement. Haulage and access roads would be recontoured to establish natural drainage patterns. Roadway cuts, berms and loose, unconsolidated material below the road cuts would be reconfigured to blend the road surface with adjacent topography.

Salvage depths for growth medium materials (near surface and subsurface soil) in the project area range from approximately six to 20 inches. Where suitable for reclamation, growth medium material would be salvaged for reclamation and either stockpiled or replaced directly on graded areas. Growth medium material would be salvaged from the mine pit area, but would not be replaced there, as the mine pit would remain open after mining. This material would be replaced on other areas that are graded for reclamation.

The two borrow sites for clay material (Figure 2.2-1) have suitable material to a depth of approximately 20 feet. Topsoil would be removed and stockpiled for future usage. Then the “overburden” material that is covering the clay would be removed and would either be stockpiled nearby or hauled to the WRSF. Once into the clay (above the water table), contractor equipment would be used to remove the clay in lifts. Once near the water table, equipment would be utilized to dig into the wet clay. Sitting on dry ground from the excavated area, an excavator would dig out the clay below the water table. The excavated material would be placed in trucks and hauled to its destination. The excavator would also be used to shape a final wetland configuration and elevations, and replace topsoil.

The excavation of clay material from borrow pits would create an opportunity to convert those areas into wetlands. To create self-sustaining and functional wetlands following completion of the excavation of clay material, the pits would be shaped to a favorable wetland landform. Topsoil salvaged from the pit excavation would be redistributed along the slopes of the landform above where the permanent low water level is anticipated. Revegetation would be accomplished by employing a variety of methods, including direct seeding, cuttings from woody plants, divisions of herbaceous plants, and vegetation plugs using excavators or loaders. Plant material, cuttings, and plugs would be sourced from the Johnson Springs system. The seed mixture would be derived from species currently found in the Johnson Springs system. Areas above the expected water levels would be seeded with the upland seed mix found in Table 2.2-5 or as otherwise approved by BLM.

Graded and contoured areas would be seeded using broadcast, drill, or hydro-seeding methods applicable to the specific conditions. The general upland reclamation seed mix is set forth in Table 2.2-5. Reclamation seed mixes appropriate to the reclaimed site conditions, including soil, elevation, slope aspect, and precipitation zone, would be utilized. The ultimate species selection would be based on BLM listing of reclamation plants, seed availability, and cost.

Table 2.2-5 Upland Seed Mix

Species Common Name	Scientific Name	Drill Application Rate (PLS/acre)	Seeds (PLS)	Seeds (/ft^2)
Sandberg bluegrass	*Poa secunda* ssp. *sandbergii*	0.1	1,047,000	2
Indian ricegrass	*Achnatherum hymenoides*	2.0	141,000	6
Needle and thread	*Hesperostipa comata* ssp. *comata*	2.0	115,000	6
Bluebunch wheatgrass	*Pseudoroegneria spicata*	2.0	140,000	6
Arrowleaf balsamroot	*Balsamorhiza sagittata*	0.5	55,000	1
Western yarrow	*Achillea millefolium* var. *occidentalis*	0.01	2,770,000	1
Black sagebrush	*Artemisia nova*	0.1	907,200	2
Wyoming big sagebrush	*Artemisia tridentata* ssp. *wyomingensis*	0.01	2,500,000	1
	Total	**6.72**		**25**

PLS = pure live seed
/ft^2 = per square foot

Appropriate shrub and tree seedlings would be planted in selected locations to establish desired post-mining plant communities in consultation with NDOW and BLM biologists. Curl-leaf mountain mahogany (*Cercocarpus ledifolius*) bare root stock would be planted in areas where it occurs in pre-mining inventories. Single-leaf pinyon pine (*Pinus monophylla*) and Utah juniper (*Juniperus osteosperma*) bare root stock would be planted along the toe and lower slopes of the WRSF. These trees would serve to provide cover for the deer migration corridor along the new landscape. Other shrub species including Wyoming big sagebrush, antelope bitterbrush

(*Purshia tridentata*), winterfat (*Krascheninnikovia lanata*), four-wing saltbush (*Atriplex canescens*), and black sage (*Salvia mellifera*), along with native grass seed species would be seeded or planted to establish post-mining plant communities supporting the sagebrush obligate wildlife species that include greater sage-grouse (*Centrocercus urophasianus*) and pygmy rabbit (*Brachylagus idahoensis*).

Mulch may be applied to the growth medium material to reduce erosion, promote stabilization, and enhance seed germination.

Planting, seeding, and mulching would be conducted in the fall and early winter to take advantage of snowpack and springtime moisture. Where cover crops are used in lieu of mulch, seeding would occur in the spring with the cover crop, followed by a fall seeding of the permanent mixture.

2.2.18 Environmental Protection Measures

Newmont would implement numerous environmental protection and management practices based on current technology, Best Management Practices (BMPs), Newmont's Sustainability and External Relations (SER) standards, the International Cyanide Management Code, the International Organization for Standardization (ISO) 14001 Environmental Management System, and federal, state, and local laws and regulations. In compliance with 43 CFR 3809.420(b), Newmont has developed specific performance standards. Collectively, these are referred to as Environmental Protection Measures (EPMs). The purposes of these measures are to ensure responsible mining operations, reduce adverse impacts, avoid undue and unnecessary effects to human health and the environment, and to reclaim disturbed areas.

2.2.18.1 Air Quality

- Identify and control point source and non-point source forms of air emissions for construction, operations, closure, and reclamation. Develop an emissions inventory to quantify pollutants.

- Design, construct, and operate Long Canyon Project facilities with appropriate air pollution controls to comply with applicable regulations and air quality permits issued by the NDEP, Bureau of Air Pollution Control, and the EPA National Ambient Air Quality Standards (NAAQS).

- Process carbon at Newmont's Gold Quarry facility near Carlin, Nevada, which utilizes maximum achievable control technology (MACT) to control mercury emissions. There are negligible amounts of mercury present in the Long Canyon Project ore.

- Use BMPs to control fugitive dust generation. This would include dust control for site access and haul roads using periodic watering and/or chemical treatment. A water truck would run periodically in the drier months, wetting the roads to minimize dust.

- Install water sprays and/or baghouse dust collectors at the ore crushing system and at ore reclaim feeders that deliver ore to the grinding circuit.

- Maintain internal combustion engines (diesel or gasoline powered) for efficient operation and to minimize emissions. Operate any on-site stationary diesel generators under air quality limitations required by NDEP air quality rules and regulations.

- Provide busing and/or van pooling for Newmont employees working at the Long Canyon Project to minimize traffic and emissions.

2.2.18.2 Hazardous Materials

- Transport hazardous chemicals to the mine site in USDOT-certified containers and transporters that would comply with USDOT, Occupational, Safety and Health Administration (OSHA), and MSHA regulations.

- Personnel transporting, handling, or using any hazardous chemicals (including sodium cyanide) would be trained to ensure the safe use of such materials.

- Store hazardous chemicals in designated areas with secondary containment for safety and to prevent environmental releases.

- The heap leach, mill, and TSF would be designed as zero discharge facilities to prevent release of process solutions and wastes to the environment.

- Store fuel and other petroleum products at the site in above-ground tanks, with secondary containment measures. Newmont would maintain a SPCC Plan for the operation as required by 40 CFR 112 regulations.

- Maintain a site-specific Emergency Response Plan to respond to spills and releases at the Long Canyon Mine. The procedures outlined in the Emergency Response Plan would be followed to protect the environment, the health of employees and the general public, and to comply with federal and state regulations.

- Develop a mine-site petroleum-contaminated soil (PCS) management plan compliant with NDEP regulations.

2.2.18.3 Cultural and Historic Resources

- Prior to disturbing new areas, cultural surveys would be conducted by archaeologists under guidance from the BLM and the State Historic Preservation Officer (SHPO). Newmont would avoid identified cultural resource sites (historic or pre-historic) or, if disturbance is unavoidable, mitigate to meet BLM and SHPO requirements. Mitigation for cultural resources is described in Section 2.7.2.2.

- Inform all employees and contractors about relevant governmental regulations intended to protect cultural and historic resources, including that it is illegal to collect artifacts, or to damage or vandalize archaeological, historical, or paleontological sites or artifacts within them.

- If previously unidentified cultural resources are discovered or an unanticipated impact situation occurs, all project-related activities within 100 meters of the discovery/impact would cease immediately and Newmont would secure the location to prevent vandalism or other damage, and would notify the BLM authorized officer immediately. Activity at the location would be suspended until after the discovery has been evaluated, any necessary environmental protection measures completed and the BLM authorized officer has issued a written Notice to Proceed.

- Newmont, its employees and contractors, would abide by all laws and regulations related to cultural and historical artifacts (Section 3.11).

2.2.18.4 Health and Safety

Health and safety aspects would be considered an integral part of planning and operation at the site, and have the highest priority in the operation of the Long Canyon Project. Newmont would operate under the company's HSLP standards and systems, including standard operating procedures, and MSHA requirements and regulations.

- Provide first aid supplies at various locations around the mine site, including the main administrative offices and the mill facility.
- Maintain a mine emergency vehicle at the site, which would be parked in the warehouse/shop building, and would be available for mine emergency situations.
- Establish a mine rescue team that would include certified Emergency Medical Technicians (EMTs) on-site on any given shift.
- Conform to health and safety rules and regulations of MSHA. Such MSHA regulations require worker safety training and the maintenance of a ground control plan for mining operations.
- Maintain a training room in the administrative office building. Newmont has new miner and refresher training as part of its Nevada operations.
- Manage public access on the project site to restrict unauthorized entry and provide for public safety.

2.2.18.5 Land Use

- Minimize disturbance by maintaining as compact an operation as practicable.
- Install and/or maintain fences around portions of the Plan boundary and cattle guards on access roads to preclude livestock access to the site, while allowing wildlife passage.
- Reclamation would return disturbed sites to a productive condition following operations.

2.2.18.6 Noise

- MSHA governs worker health and safety, which includes requiring hearing protection for workers in high noise areas.
- Enclose sources of noise in the mill circuit within the mill building.
- Maintain internal combustion engines associated with the Long Canyon Project to minimize noise.
- Limit blasting to either midday or early afternoon to minimize disruption.

2.2.18.7 Recreation

- Allow only authorized travel into the Plan boundary to protect public safety. No unauthorized vehicles, personnel, alcohol, illegal drugs, or firearms would be permitted on-site. Roads within the project area would be closed for public safety.

- Implement plans to control public access into the mine area using fencing, gate locking, security personnel, and/or notice postings to prohibit unauthorized entry. Signs would be posted outside the mine area to redirect public travel as required. The signs would specify that Goshute Valley is accessible from the Shafter exit (i.e., Exit 387) on I-80, and include a map to the exit.

- Prevent hunting within areas posted or fenced during the mine operation, but hunting would continue on public lands outside of fenced or posted project areas.

- Inform employees, contractors, and subcontractors that long-term camping (greater than 14 days) is prohibited on federally-administered lands.

- The mine perimeter fence would be a three-strand, 38-inch fence with the top and middle barbed. In areas of heavy cattle pressure, the fence would be a four-strand fence with three-barb strands plus a smooth wire bottom strand to facilitate wildlife movement. Newmont would use topographic features and ridgeline as the barrier at upper elevations.

- Instigate an orientation program for employees and contractors on the wildlife resource of the area. Make sure personnel are aware that it is prohibited to harass wildlife.

2.2.18.8 Sanitary and Solid Waste

- Collect, treat, and dispose of sanitary waste in accordance with all applicable codes and regulations.

- During construction, development, and mining activities contain trash and other miscellaneous inert (non-hazardous) garbage in on-site containers, and then haul to an on-site landfill for disposal.

- Prevent open burning of garbage and refuse at the site.

- Store petroleum waste products, spent solvents, maintenance wastes, and hazardous wastes in approved containers separate from other trash products and transport these materials off-site for recycling or disposal in approved waste facilities.

2.2.18.9 Social and Economic Resources

- Implement hiring practices that encourage the use of local contractors and workers to the extent available.

- Maintain a comprehensive program of health and safety training for employees. This program would include environmental considerations.

2.2.18.10 Soils

- Remove growth medium (soil) from areas that would be affected by project operations and surface facilities.

- Salvaged growth medium would either be stockpiled or would be directly reapplied on concurrent reclamation areas. If stockpiled, growth medium would be kept out of drainage areas and seeded to prevent water and wind erosion.

- Use salvaged and stockpiled growth medium in final reclamation activities upon permanent closure of the Long Canyon Project.

- Implement a noxious weed program to prevent noxious weeds from colonizing growth medium stockpiles.

2.2.18.11 Stormwater

- Maintain a stormwater permit for the Long Canyon Project site. Stormwater features and facilities would include diversion ditches, culverts, stormwater basins, sediment ponds, etc.

- Route runoff around the WRSF, ore stockpiles, the TSF, the heap leach facility, the mine administration, shop, and mill facility area; and, as practical, the mine pit area.

- Route runoff generated from precipitation on disturbed areas into ditches or through culverts toward stormwater basins, where sediment can collect and water can evaporate or percolate into the ground.

2.2.18.12 Vegetation and Noxious Non-Native Species

- Minimize removal or disturbance of vegetation by limiting the area of disturbance to the extent practicable to maintain safe and efficient operations.

- Remove vegetation and soil in a manner that minimizes erosion and sedimentation. Riparian vegetation would be avoided to the extent practicable.

- Stabilize and seed disturbed areas in accordance with BLM- and NDEP-approved guidelines and standards using certified weed-free materials.

- Use certified noxious weed-free seed mixtures as part of interim, concurrent, and final reclamation.

- Newmont would be responsible for noxious weed control within areas disturbed by project activities. The list of noxious weeds requiring control would be obtained from the BLM and the United States Department of Agriculture. Weed control would be accomplished using a number of appropriate tactics, including cultural, mechanical, biological, and chemical controls. Only BLM approved herbicides would be used on lands administered by the BLM.

- Prior to commencement of construction activities, all contractor vehicles and equipment arriving from off-site would be pressure washed prior to being allowed on the property. Company vehicles and other vendor or visitor light vehicles that have come from non-established roads would also be pressure washed during construction and active operation prior to being allowed on the property. Washing practices are to include the undercarriage and wheels.

2.2.18.13 Visual Quality

- The Long Canyon Project would conform to applicable BLM visual management requirements for this area. Newmont would use early planning and design features to minimize contrast with the surrounding landscape to meet the Visual Resource Management (VRM) objectives of the area.

- To the extent practicable, interim and concurrent reclamation practices would be implemented.

- External lighting would be kept to the minimum required for safety and security purposes. Lights would be directed down toward the interior of the project site.

- Non-reflective, earth tone paints would be used on mine site buildings and other structures.

- Final reclamation would restore disturbed areas to blend with the surrounding landscape.

2.2.18.14 Water Resources

Newmont would implement BMPs for erosion and sediment control. These measures include the following:

- Remove vegetation only from those areas to be directly affected by project operations and only from areas directly ahead of operations.

- Schedule soil removal activities for dry months when possible to reduce the potential for erosion and soil losses.

- Design cut-and-fill slopes for access and haul roads to prevent soil erosion. Drainage ditches, with cross drains and/or culverts would be constructed as necessary.

- Route runoff from roads, building sites, and parking lots through sediment traps, settling ponds, berms, wattles, sediment filter fabric, etc. Design of these features would be based on NDEP requirements and analysis of local hydrologic conditions.

- Avoid off-road vehicle traffic.

- Construct and maintain diversions around disturbed areas to minimize erosion. When appropriate, sediment would be removed from these diversions and deposited in the WRSF.

- Implement reclamation and revegetation as soon as practical for long-term stability and erosion control.

- Reclaim clay borrow pits as wetlands (Section 2.2.17, Reclamation).

In coordination with the Cities' hydrologic consultants and supplementing existing hydrogeologic testing, conduct additional bedrock and alluvial aquifer tests to quantify potential effects of pumping on local and regional aquifers. Newmont would share local and regional hydrologic information generated associated with the development of the Long Canyon Project to the extent permitted by disclosure laws applicable to publicly-held companies.

Newmont has coordinated with the Cities' hydrologic consultants in developing a general hydrologic study of the northern part of the Goshute Valley with a goal of assessing the adequacy of the valley aquifer to supply water to the Cities' Shafter well field and potential effects from continual mine production pumping. Newmont would continue to work with the Cities to expand and refine this study and to develop contingency plans for assuring that adequate water is available to the Cities.

2.2.18.15 Wildlife

- Minimize disturbance to wildlife habitat by maintaining a compact operation.
- Conduct clearance surveys for migratory birds during the appropriate season (March 15 to July 31) before disturbance of new areas. Surveys must occur no more than 14 days prior to initiation of disturbance. If active migratory bird nests are identified, Newmont would coordinate with the BLM to develop appropriate protection measures for these sites, which may include avoidance, construction constraints, or buffer establishment. This includes surveys for active raptor nest. If active raptor nests are identified, Newmont would work with the BLM to coordinate protection and avoidance of these nests until the young have fledged.
- Clear vegetation only in those areas necessary for project activities.
- Establish a 45-mile per hour speed limit for the main access road (county road). Speed limits within the mine (from the fence line) would be restricted to a 25-mile per hour speed limit. This would reduce the potential for vehicle/wildlife collisions. Any vehicle/wildlife (process solution mortalities, big game, sensitive species, federally-protected species, or other mortalities where appropriate) collisions would be reported to NDOW in compliance with the Artificial Industrial Pond Permit.
- Prohibit hunting or discharge of firearms during construction, development, or mining operations within the fenced Plan boundary of the Long Canyon Project.
- Design and construct electric power structures within the Long Canyon Project boundary to deter avian perching, predation, and nesting. Incorporate perching deterrents to reduce electrocution of birds. All electrical structures and facilities constructed under the Proposed Action would be Avian Power Line Interaction Committee compliant for avian safe designs.
- Install a wildlife exclusion fence around the TSF and the heap leach facility, but all other fences would meet BLM specification. The mine perimeter fence would be a three-strand, 38-inch fence with the top and middle barbed. In areas of heavy cattle pressure, the fence would be a four-strand fence with three-barb strands plus a smooth wire bottom strand to facilitate wildlife movement. Reflectors would be installed where appropriate to reduce greater sage-grouse collisions. Newmont would use topographic features and ridgeline as the barrier at upper elevations.

- Where feasible, in coordination with grazing practices, Newmont would lay down fencing in migration corridors during the migration seasons. The appropriate locations and seasons would be coordinated with BLM and NDOW.

- There would not be wildlife exclusion fencing around the mine pit post-closure.

- Comply with NDOW Artificial Industrial Pond Permit requirements. Current design for ponds is to utilize ponds as event ponds and not production ponds. Solutions coming from the heap leach and TSF would be directed into process solution tanks. The event ponds would only be used under upset conditions when the tanks cannot contain the entire flows.

- Instigate an orientation program for employees and contractors to be educated on the wildlife resources in the area. All personnel would be trained and made aware of wildlife issues.

- Maintain the 500-foot mule deer migratory corridor between the mine pit and the WRSF.

- Pygmy rabbit habitat would be mowed at least 72 hours before any ground-disturbing activity to allow for dispersal.

- Along the haul road, cuts in berms would be placed along each side of the haul road to allow for mule deer crossing. Berm cuts would be coordinated with BLM, NDOW, and MSHA in order to meet the needs of all agencies and may be adjusted based on migration movement.

- Apply seasonal operational limitations for exploration activities when mule deer are migrating to their wintering grounds or if they are wintering in the Plan boundary during the timeframes established by NDOW. Limitations on the amount of surface disturbing activities, type and scale of exploration, location of disturbance, and timing of disturbance would be developed annually in consultation with the BLM by assessing on-the-ground conditions in the Plan boundary using existing and future deer tracking data (collared studies and survey flights) from NDOW.

2.2.18.16 Access Control

- Only authorized travel would be allowed into the Plan boundary to protect public safety. No unauthorized vehicles or personnel would be permitted on-site. The Long Canyon road would be closed to the public, in compliance with MSHA regulations.

- Newmont would implement plans to control public access into the mine area using fencing, gate locking, security personnel, and/or notice postings to prohibit unauthorized entry. Signs would redirect public to available access routes outside the mine area.

- Public access to the Goshute Valley south of the project would be via the Shafter exit 387 off I-80 and existing roads.

2.2.18.17 Fire Prevention and Procedures

- Comply with applicable federal and state fire law and regulations. Take all reasonable and practical measures to prevent and suppress fires in the area of operations.
- Follow project-specific Site Emergency Response Plan fire procedures. This plan includes procedures for mine structure/surface fires, mobile equipment fires, wildland fires, Liquefied Petroleum Gas/natural gas fires, and explosive fires.
- Report all fires to the HSLP Manager. The HSLP Manager would report to the BLM and MSHA as appropriate. The insurance company would also be notified. Proper documentation would be kept (i.e., pictures, date, time, circumstances, etc.). Documentation is the responsibility of the area Supervisor and HSLP Manager.

2.3 Alternatives to the Proposed Action

As provided by the National Environmental Policy Act of 1969 (NEPA), 42 U.S.C. 4332(2)(C)(ii), an EIS is to evaluate reasonable alternatives to the Proposed Action. The Council on Environmental Quality (CEQ) NEPA regulations direct that the NEPA process be used to "identify and assess the reasonable alternatives to proposed actions that would avoid or minimize adverse effects of these actions upon the quality of the human environment". NEPA also provides under 40 CFR 1501.2(c) that agencies need to "study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved resource conflicts concerning alternative uses of available resources...".

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

- The alternative meets the Purpose and Need for the Proposed Action and addresses one or more significant issues;
- The alternative satisfies 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; and
- The alternative is environmentally reasonable, that is, would not be obviously environmentally inferior (i.e., cause more onerous environmental impacts) than other action alternatives.

Proposals for alternatives have come from Newmont, BLM, and cooperating agencies such as the Cities. These proposals were all given an initial screening by the BLM, and cooperating agencies using the criteria described above. Those that passed initial screening have been carried forward for detailed analysis and are described briefly below. Those proposals that did not pass initial screening are described in Section 2.5, and the reasons they were dismissed from detailed study are provided.

2.3.1 North Facilities Alternative

The North Facilities Alternative (Figure 2.3-1) was designed in response to several environmental issues raised by the BLM Interdisciplinary (ID) Team and scoping comments. Under the North Facilities Alternative, most of the mine facilities would be moved to the northeastern quadrant of the Plan boundary. This alternative addresses impacts to several wildlife species, cultural resources, and responds to requests from the Cities related to potential impacts to their water supply (Big Springs and groundwater). The North Facilities Alternative includes the following components and considerations:

- All mine facilities except the pit and a borrow pit would be located farther from Big Springs and other surface water features, such as the wetlands;
- The TSF would be surrounded by the WRSF, reducing the total disturbed area of both facilities. Placement of waste rock around the TSF would further increase geotechnical stability of the TSF, and the same design criteria (i.e., liner, slurry water piping), operational management, and closure methods would be used as if the TSF were a standalone facility. For example, all design, construction, operations, and closure features would be the same as described for the Proposed Action described in Section 2.2.6 except that instead of being a freestanding facility, the embankment surrounding and supporting the TSF would be comprised of the WRSF. The under-drainage collection pond associated with the TSF would be exterior to both the TSF and WRSF footprint;
- No major facilities would be positioned on the bedrock aquifer from which Big Springs emanates; all major facilities would be situated over the alluvial aquifer;
- Ground surface at the north location is approximately 30 to 50 feet above the water table than where facilities would be located for the Proposed Action;
- Impacts to several cultural sites located in the southern portion of the Plan boundary would be minimized or avoided;
- Activities and noise disturbance near a greater sage-grouse lek would be minimized and this alternative locates mine facilities farther from greater sage-grouse leks;
- The mule deer migration corridor would be greatly enlarged to encompass approximately 2,200 feet between the pit and the WRSF;
- The same power supply design would be employed as for the Proposed Action;
- Municipal water supply wells for the Cities would be located in Section 21, T35N, R66E;
- Design criteria for individual facilities would be the same as for the Proposed Action;
- Operations and reclamation would be the same as described under the Proposed Action;
- County Road 790 would terminate at the north project boundary and public access to the Goshute Valley would be the same as described under the Proposed Action; and
- All BMPs and EPMs would be the same as for the Proposed Action.

Table 2.3-1 shows the estimated acres of disturbance under the North Facility Alternative. Note that all features represent disturbance through the end of operations with the exception of the power supply pipeline corridor, which would be reclaimed as soon as practicable after construction. Figure 2.3-2 shows the site layout for support facilities (i.e., offices, mill, shop), and Figure 2.3-3 shows post-mining topography for the North Facilities Alternative. Figure 2.2-10 shows pre- and post-mining topography for the mine pit.

Table 2.3-1 North Facilities Alternative Disturbances

Mine Feature	Surface Area Disturbance (acres)[1]		
	Public	**Private**	**Total**
Mine Pit Area	693	43	736
Haul Roads[2]	19	52	71
Waste Rock Storage Facility[3]	291	691	982
Mine Office, Shop, and Mill Facilities	9	175	184
Tailings Storage Facility	66	153	219
Heap Leach Facility	146	74	220
Construction Borrow Sites	25	390	415
Growth Medium Stockpiles	168	1	169
County Road 790 and Main Site Access Road[4]	36	49	85
Miscellaneous Site Access and Service Roads[5]	7	9	16
Bulk Ammonium Nitrate and Fuel Oil Storage Area	0	0.01	0.01
Explosive Magazines	0	1	1
Water Supply Well, Storage Tanks, and Pipelines	6	12	18
Miscellaneous[6]	21	84	105
Power Supply (gas pipeline, power plant)[7]	95	143	238
Water Supply to Cities with Associated Facilities	11	15	26
Total Acres of Disturbance	**1,593**	**1,892**	**3,485**

[1]Surface disturbance acreage is the total footprint for the North Facilities Alternative. There are several locations that consist of overlapping elements of the mine features (i.e., pit, mill facilities, leach facilities, TSF, roads, fences, septic system and the proposed pipeline). The disturbance acreage provided is the true surface disturbance without the duplicative disturbance of these overlapping elements.
[2]Assume average disturbance width for haul roads is 225 feet; this includes cuts, fills, safety berms, and ditching.
[3]The TSF is entirely located within the WRSF area. The disturbance acreage associated with the TSF has been separated from that of the WRSF in this table, but care has been taken that no disturbance acreage has been added twice. This disturbance acreage also includes landfills.
[4]Assume average disturbance width for County Road 790 and main access road is 60 feet; this includes cuts, fills, and ditching. Assume average disturbance width for other site access and service roads is 44 feet; this includes cuts, fills, safety berms, and ditching.
[5]Assume average disturbance width for miscellaneous site access and service roads is 15 feet.
[6]This includes the lime silo, fencing, septic system, storm control features for 25-year, 24-hour event, power line ROW and service roads from WREC Oasis substation for power line. Stormwater control structures include diversion ditches and stormwater basins.
[7]Short-term disturbance (approximately 5-6 months) (reclaimed after construction) 50-foot-wide corridor by approximately 42 miles.

Figure 2.3-1 North Facilities Alternative

Figure 2.3-2 North Facilities Alternative, Mill Site, Office and Shop

Figure 2.3-3 Post Project Topography, North Facilities Alternative

2.4 No Action Alternative

Under the No Action Alternative, the Long Canyon Mine Plan would not be authorized by BLM and the activities described in the Proposed Action would not occur. Mineral resources would remain undeveloped and the construction and operation of the proposed mining and mineral beneficiation facilities would not occur. Newmont could continue exploration efforts that are already approved.

BLM's lack of approval of the Plan would not directly affect further mineral development on private land and private mineral rights. However, due to the nature of the area and the locations of public lands, development of the private mineral rights would not be feasible without the use of public lands.

Selection of the No Action Alternative would not preclude a future filing of a different Plan by Newmont or any other authorized mineral rights holder to mine these minerals. Any future plans of operations would need to be addressed in an environmental review (NEPA).

2.5 Alternatives Considered But Not Studied in Detail

For alternatives that were considered but eliminated from detailed consideration, an EIS shall briefly describe the reasons for eliminating those alternatives from further evaluation (40 CFR 1502.14(a)). When developing the Proposed Action, several mine configurations, mining and processing methods, and other aspects were considered. This section of the EIS summarizes those alternatives that were not chosen for detailed consideration and the rationale for why they were not selected for further consideration (i.e., why they did not meet the criteria presented in Section 2.3). Consideration of these alternatives was made in conjunction with Newmont, the BLM, the BLM ID Team, the Wildlife Working Group (biologists from Newmont, BLM, and NDOW), and cooperating agencies (i.e., NDOW, EPA). A list of issues raised during scoping is found in Chapter 1.

2.5.1 Reducing the Depth of the Open Pit

In their scoping comments, the Cities recommended that Newmont maintain a minimum vertical separation of 200 feet between the bottom of the pit elevation and the static water level of the bedrock aquifer due to their concern that groundwater quality might be affected. The current plan for the pit floor is an elevation of 5,700 feet AMSL, which is approximately 14 feet above the water table. The Cities suggested that the floor elevation be changed to 5,900 feet AMSL, which would be 214 feet above the water table.

Newmont engineers conducted a detailed analysis in consideration of this potential alternative and concluded that changing the pit design to provide the suggested separation between the pit bottom and the water table would result in a loss of approximately 35 percent of the contained ounces in the ore body (Newmont, 2012b). Such a substantial loss in the gold resource would significantly impact the project economics, making the project economically infeasible.

2.5.2 Rearranging Mine Facilities within the Proposed Action

Several locations for the mine facilities at the mine property were considered. The project facilities fell into three areas as follows:

- Mine offices: administration office, technical services, employee and visitor parking;
- Mine facilities: truck shop, ready line, truck wash, fueling island, and mine office; and
- Process Area: CIP and CIC plants and crushing system (but excluding course ore stockpiles).

Initially, six locations where studied (AMEC, 2011). The locations were evaluated against criteria that included construction and operational costs; depth to groundwater; upstream/downstream location relative to the Big Springs Ranch; private/public land (permitting); and intangibles (private landownership and the ability to accommodate expansion were considered desirable). The facility layout included in the Proposed Action is the most technically and economically suitable arrangement of the alternatives considered during its development. Details of the study are available in the Administrative Record through the BLM.

2.5.3 Locating the Mine Elsewhere

There is no technically feasible alternative for location of the open-pit mine because mining must occur at the ore body, which is fixed.

2.5.4 Underground Mining

It would not be economically feasible to mine this low-grade, near surface ore body using underground mining techniques. The Long Canyon deposit sits on the flanks of the Pequop Range in steep terrain. Of the total ore tons capable of being mined, approximately 23 percent could technically be mined utilizing underground methods. The remaining 77 percent would not be accessible via underground mining methods. The grade of the gold that makes up this 23 percent is not high enough to support underground mining costs. Underground mining is substantially higher in costs than open pit mining and requires a high enough ore grade to support the increased operating costs. These costs for underground mining would make that part of the mine uneconomic, which would render the overall project economically infeasible.

2.5.5 Complete or Partial Backfilling of the Open Pit during Reclamation

Backfilling the mine pit with waste rock was considered as a means of reducing the footprint of the WRSF and making the mine pit shallower following operations.

The mine plan for the Long Canyon deposit was developed to ensure that a consistent quantity of ore is delivered to the processing facilities on an annual basis. This is required to avoid fluctuations in the workforce and maintain a constant mining rate for the life of the project. Both of these parameters affect the economic viability of the project as a whole. The mine plan includes commencement of mining in the south end of the ore body and extending the pit to the north over the life of the project.

The Long Canyon ore body lies on a northeasterly strike and dips from south to north. The ore is near the surface in the southern area of the pit and can produce ore while stripping overburden in the northern area, thereby maintaining a consistent feed of ore to the processing facilities while preparing the northern sections to produce ore. The section view (Figure 2.2-10) of the post-mining pit and original topography illustrates the orientation of the ore body. As can be seen in the plan and section, as the pit is extended to the north the deposit gets deeper and requires more waste rock removal to access the ore.

The amount of material required to backfill the Long Canyon Pit to a self-draining profile is approximately 33 percent of the total tonnage moved during the project life under the current Plan. Approximately 15 percent of the backfill can be accomplished by moving waste rock directly from the northern area to the southern area during active mining. The remaining 85 percent of the backfill required for the northern area would have to be brought back to the pit area from the WRSF after mining operations are completed. As this requires moving the waste rock a second time, it would make this option uneconomic and thereby the project economically infeasible. It is also noteworthy that complete backfilling of the pit during reclamation would not be feasible because ore placed on the leach pad or processed in the mill (tailings) could not be returned to the open pit as backfill because it must remain in the lined leach pad or TSF to protect groundwater from potential leachate following operations and reclamation.

If the deposit was mined from north to south, the project would be uneconomical due to the depth of the overburden that would need to be removed before any ore could be mined and processed. The amount of stripping required to expose the ore in the north is illustrated in the cross section on Figure 2.2-10. To mine from north to south would require mining approximately 40 benches in the north before any sustainable ore volumes are encountered. This scenario would still require re-handling post mining. Attempts to simulate this north to south mining scenario with Newmont's optimizing software continuously failed to show any positive economics even without including any re-handle costs in the optimization parameters (Newmont, 2012c).

It should also be noted that under any backfilling scenario lower grade material that is deeper below the surface that might become economic to mine at a later date would be more difficult and costly to access, since the cover of waste rock would need to be removed to reach the lower grade ore body.

2.5.6 Other Power Supply Alternatives

Five alternatives for supplying power to the project were analyzed using Geographic Information System (GIS) and publicly available resource information (Figure 2.5-1). These alternatives included bringing power to the site by upgrading existing electrical transmission lines; bringing natural gas to the site via pipeline to power an on-site generator; or combinations of the two. Alternatives were screened using agency geodatabases for cultural sites; threatened, endangered, and sensitive (TES) species; wetlands; critical wildlife habitat; and other criteria (JBR, 2012b).

For example, the five routes were overlaid on BLM and NDOW geodatabases (GIS files) showing eagle nests; a two-mile buffer was applied to each nest. Where the two-mile buffer intersected one of the routes, the length of the route within the buffer was recorded and counted as an environmental issue. This same test was applied to wetlands, greater sage-grouse leks, lakes, and VRM Class II areas. Similar tests were applied for 14 other species and types of water features to determine potential environmental issues. Economic viability was also considered in the final selection process, which is consistent with CEQ guidelines. The five alternatives that were considered are shown on Figure 2.5-1.
The five alternatives considered are as follows:

Alternative 1 would include 24 miles of pipeline extending south from the Ruby Pipeline to Wells, Nevada. Then 32 miles of transmission line would extend east to the Long Canyon Mine site, generally following I-80. The total length of Alternative 1 would be 56 miles. Assuming an average width of 50 feet, it would result in approximately 339 acres of disturbance.

Alternative 2 consisted of a 39-mile pipeline extending south from the Ruby Pipeline to the Long Canyon Mine site. Again, a 50-foot disturbance width was assumed, for a total disturbance area of 234 acres.

Alternatives 3 and 4 would extend south-southwest from the Ruby Pipeline to the Long Canyon Mine site. They were located within the same area and both assumed a disturbance width of 50 feet. Alternative 3 would be approximately 46 miles for a total disturbance area of 277 acres. Alternative 4 would extend approximately 42 miles for a total disturbance acreage of 253 acres.

Alternative 5 would involve upgrading an existing transmission line from Jackpot, Nevada to Wells, Nevada and then to the mine site. This alternative would involve off-setting a new transmission line 500 feet from an existing 138 kilovolt line, then decommissioning and removal of the old line. For this analysis, a 1,000-foot buffer (500 feet on each side) of the existing line was applied to encompass potential disturbance. Alternative 5 would be approximately 100 miles long and would disturb up to 12,146 acres.

Table 2.5-1 shows the results of the analysis. Alternative 3 was selected based on having the least environmental impacts and, as being the least expensive to construct and operate. Consequently, Alternative 3 has been incorporated into the Proposed Action.

Table 2.5-1 Estimated Disturbance and Environmental Issues by Alternative

Alternative	Environmental Issues		Potential Environmental Issues Identified		No Environmental Issues Identified		Total
	Acres	%	Acres	%	Acres	%	Acres
1	226	67	0	0	112	33	338
2	151	65	10	4	72	31	234
3	123	44	43	16	111	40	277
4	113	45	31	12	109	43	253
5	8,229	68	846	7	3,071	25	12,146

Source: Power Supply Screening Study for Proposed Long Canyon Mine (JBR, 2012b)

Figure 2.5-1 Power Supply Alternatives Considered

2.6 Comparison of Alternatives

Table 2.6-1 compares the anticipated effects from each alternative on the resources analyzed in this EIS. Chapter 4 provides more detail, including analysis methods and rationale for the effects conclusions.

Table 2.6-1 Comparison of Effects

Potential Impact	Proposed Action	North Facilities Alternative	No Action Alternative
Water Resources (Surface Water)			
Increase in sedimentation	Disturbance of approximately 4,193 acres of land may increase sediment in ephemeral drainages. Implementation of BMPs would reduce or minimized this impact.	Disturbance of approximately 3,485 acres of land may increase sediment in ephemeral drainages. Implementation of BMPs would reduce or minimize this impact.	No impacts other than those previously authorized.
Effects of water use on Johnson Springs	Wellhead Analytic Element Model (WhAEM) model results show that the influence of the proposed water supply well at or near BSR-2 would be less than 2.5 feet of drawdown on the Johnson Springs system.	Same as the Proposed Action.	No impacts other than those previously authorized.
Contamination from chemical spills or leaks	Accidental release of hydrocarbons from mobile sources during construction may occur. Impacts to stream channels would likely be low due to the perennial nature of the streams, as well as implementation of BMPs.	Similar potential for contamination from chemical spills or leaks as the Proposed Action; however, the facilities would be located further north, which would reduce the chance that an inadvertent release of process chemicals, hydrocarbons, or other contaminants would contact the water in Hardy Creek.	No impacts other than those previously authorized.
Water Resources (Groundwater)			
Changes in groundwater quality	At a final depth of 5,700 feet AMSL, the pit floor would not intercept the groundwater table. The TSF and heap leach facility would both be synthetic-lined with 80-mil HDPE geomembrane liner and equipped with leak detection systems. The waste rock that would be placed in the WRSF is net neutralizing and does not have acid generating potential (AGP). Water quality samples would be	The WRSF would be located close to the northernmost smaller spring in the Johnson Springs system. The heap leach and processing facilities would be located approximately 30 to 50 feet higher above the water table, which would greatly increase attenuation of leachate that might otherwise reach groundwater.	No impacts other than those previously authorized.

Potential Impact	Proposed Action	North Facilities Alternative	No Action Alternative
	taken quarterly from the monitoring wells located downgradient of the proposed mining and processing activities.		
Changes in availability of groundwater for other water rights holders	Water use at the proposed rate of 580 to 5,040 acre feet per year (AFY) depending on the project phase, could potentially cause reduced availability of groundwater in the Goshute Basin through drawdown of the groundwater table. This represents a range of five to 43.6 percent of current appropriated water rights.	Same as the Proposed Action.	No impacts other than those previously authorized.
Contamination from chemical spills or leaks	The potential for hazardous or other wastes to spill and subsequently affect groundwater quality would be minimized through implementation of the Emergency Response Plan and SPCC.	Same as the Proposed Action.	No impacts other than those previously authorized.
Wetlands/Riparian			
Degradation or loss of wetlands or riparian areas	Newmont does not anticipate removal of vegetation within wetland and riparian areas. Indirect impacts to wetlands or riparian areas due to increased water use and groundwater drawdown include changing flows within the wetlands and Hardy Creek, or degrading the riparian habitat in Hardy Creek such that it no longer supports sensitive resources. Construction of the power supply pipeline would result in a minor, short-term impact to wetland vegetation present along its corridor. The Proposed Action has the potential to reduce the flow in Big Springs by 300 to 500 gpm, and cause reductions in flow of up to 20 gpm in other (combined) springs in the Johnson Springs system.	Same as the Proposed Action.	No impacts other than those previously authorized.
Creation of new wetlands	Additional water discharged into Hardy Creek or adjacent	Same as the Proposed Action.	No impacts other than those

Potential Impact	Proposed Action	North Facilities Alternative	No Action Alternative
	areas as a result of proposed mining and processing activities has the potential to create new wetlands and riparian areas.		previously authorized.
Geology and Minerals			
Ore extraction and waste rock placement	The Proposed Action would remove approximately 489 million tons (MT) of material.	The North Facilities Alternative would remove approximately 489 MT of material; however, the WRSF would be in a different location.	No impacts other than those previously authorized.
Paleontological Resources			
Loss of paleontology resources	Invertebrate fossils in the geologic units that would be disturbed are likely to be found throughout the outcrop area of these formations in northeast Nevada. No vertebrate or significant invertebrate fossils have been found on site in these geologic units.	Same as the Proposed Action.	No impacts other than those previously authorized.
Soils			
Loss of productive topsoil in disturbed areas	Approximately 4,193 acres of soils representing 28 3rd Order Natural Resources Conservation Service (NRCS) soil map units are associated with disturbance related to the Proposed action. Approximately 3.1 million cubic yards of primary and secondary growth medium would be salvaged and used during reclamation.	Implementation of the North Facilities Alternative would disturb 708 fewer acres of soils than the Proposed Action.	No impacts other than those previously authorized.
Increased wind and water erosion	Environmental controls including EPMs for erosion and dust control would minimize impacts associated with erosion and off-site deposition.	Implementation of the North Facilities Alternative would disturb 708 fewer acres of soils than the Proposed Action.	No impacts other than those previously authorized.
Contamination of soils from spills of chemicals	Continued adherence to chemical handling practices would minimize the risk of chemical spills. An SPCC Plan and Emergency Response Plan would be followed for notification and cleanup procedures.	Same as the Proposed Action.	No impacts other than those previously authorized.
Air Resources			
Impacts to air quality from dust, vehicle	The mining activity would result in a moderate increase	Mining activity would be the same as the Proposed	No impacts other than those

Potential Impact	Proposed Action	North Facilities Alternative	No Action Alternative
emissions, milling operations	in air emissions throughout the life of the project. A modeling analysis has determined that impacts would qualify as a Nevada Class II minor source. Most of the emissions as a result of the Proposed Action would be from fugitive emissions from vehicular travel.	Action. However, emissions would be slightly decreased due to shorter haulage distances.	previously authorized.
Vegetation Resources			
Removal of vegetation	Approximately 4,193 acres of vegetation would be removed during construction and operation of the Proposed Action. Of that, approximately 736 acres are not subject to reclamation. Reclamation of the remainder of the disturbed acreage would result in established suitable vegetation for post-mine use.	Implementation of the North Facilities Alternative would disturb 708 fewer acres of vegetation than the Proposed Action.	No impacts other than those previously authorized.
Increased potential for establishment of noxious and non-native, invasive weeds	Removal of vegetation may allow non-native species to become established. Control of non-native species through EPMs would minimize this risk.	Implementation of the North Facilities Alternative would disturb 708 fewer acres of vegetation than the Proposed Action.	No impacts other than those previously authorized.
Special status plants	Although no special status plants were located during field surveys, loss of habitat for the barren valley collomia, Deeth buckwheat, and rayless tansy aster has the potential to occur as a result of the Proposed Action.	Implementation of the North Facilities Alternative would disturb 708 fewer acres of vegetation than the Proposed Action.	No impacts other than those previously authorized.
Wildlife Resources			
Displacement from existing habitat from disturbance, noise	Noise disturbance and human activities associated with the Proposed Action may displace foraging and/or nesting golden eagles and other wildlife, including greater sage-grouse and the pygmy rabbit. Mitigation measures designed to reduce impacts to golden eagles and greater sage-grouse would be implemented.	Implementation of the North Facilities Alternative would disturb 663 fewer acres of Preliminary Priority Habitat (PPH) and Preliminary General Habitat (PGH) than the Proposed Action. The facilities would also be more concentrated and located farther north, and likewise farther from greater sage-grouse nesting and brood-rearing habitat. The facilities would be located further	No impacts other than those previously authorized.

Potential Impact	Proposed Action	North Facilities Alternative	No Action Alternative
		from known golden eagle nests, and closer to existing noise disturbances. This alternative removes approximately 708 fewer acres of available golden eagle foraging habitat.	
Mortality due to construction activities, additional power lines, and increased traffic	Slow-moving and/or underground-dwelling animals would likely be lost during construction activities. Increased traffic would increase the incidents of vehicle-wildlife collisions.	Implementation of the North Facilities Alternative would disturb 708 fewer acres of vegetation than the Proposed Action. Increased traffic would still increase the incidents of vehicle-wildlife collisions; however, haulage distances would be shorter.	No impacts other than those previously authorized.
Effect on migration routes, particularly mule deer	Under the Proposed Action, approximately 3,895 acres of vegetation would be removed during mining and processing operations. Habitat fragmentation as a result of the proposed disturbance related to mining and processing activities could impact mule deer, elk, and pronghorn seasonal movement. Short- and long-term impacts due to the proposed power supply pipeline and the Cities' water supply would be negligible. No effect on migration routes due to the proposed power supply pipeline and the Cities' water supply would be anticipated.	Migration corridor would be generally wider (by approximately1,700 feet) and 674 fewer acres of vegetation would be disturbed during mining and processing operations than the Proposed Action. This alternative would have less impact on big game migration route.	No impacts other than those previously authorized.
Effects on wildlife due to water use	Impacts to amphibians that may reside adjacent to or within the wetland complex is unstudied. No impacts would occur to aquatic species.	Same as the Proposed Action.	No impacts other than those previously authorized.
Effects on special status species (i.e., pygmy rabbit, greater sage-grouse, sensitive butterflies)	The Proposed Action would impact approximately 3,257 acres of mapped PPH and PGH. This would result in a loss of habitat and habitat fragmentation for the greater sage-grouse, and would have a moderate to major impact on the species. Impacts from the Proposed Action would not cause more	Implementation of the North Facilities Alternative would disturb 663 fewer acres of PPH and PGH than the Proposed Action. The facilities would also be located farther north, and likewise farther from greater sage-grouse nesting and brood-rearing habitat.	No impacts other than those previously authorized.

Potential Impact	Proposed Action	North Facilities Alternative	No Action Alternative
	than negligible short- and long-term impacts to pygmy rabbit or BLM sensitive birds. There would be no impacts on the Mattoni's blue butterfly.		
Effects on greater sage-grouse a special status species due to loss of habitat and impacts to leks	The Proposed Action would impact approximately 3,257 acres of mapped PPH and PGH habitat. This would result in a loss of habitat and habitat fragmentation for the greater sage-grouse, and would have a moderate to major impact on the species.	Implementation of the North Facilities Alternative would disturb 663 fewer acres of PPH and PGH than the Proposed Action. The facilities would also be located farther north, and likewise farther from greater sage-grouse nesting and brood-rearing habitat.	No impacts other than those previously authorized.
Vehicle collisions	Long-term potential for vehicular collisions due to increased vehicular traffic. These effects would be minimized through the use of EPMs.	Same as the Proposed Action.	No impacts other than those previously authorized.
Loss of a golden eagle nest	Loss of a golden eagle nest during the construction of the pit.	Same as the Proposed Action.	No impacts other than those previously authorized.
Range Resources			
Loss of AUMs during construction and operation, and improved forage after reclamation	Short-term impacts and/or restrictions of 16,924 acres would result in a suspension of 565 animal unit months (AUMs) during the life of the mine. Implementation of EPMs would minimize potential degradation of range resources. Long-term impacts due to the planned pit would result in a loss of 736 acres, or 25 AUMs. Final surface reclamation and re-vegetation could provide a long-term improvement of the habitat by providing a greater amount of herbaceous vegetation species available for livestock foraging.	Implementation of the North Facilities Alternative would impact and/or restrict short-term 4,733 fewer acres, or 144 fewer AUMs than the Proposed Action.	No impacts other than those previously authorized.
Restricted Access	Under the Proposed Action, the use of approximately 16,739 acres would be restricted during the life of the mine (8 - 14 years). Of that, 736 acres is not subject to reclamation.	Implementation of the North Facilities Alternative would restrict 4,733 fewer acres for the life of the mine than the Proposed Action.	No impacts other than those previously authorized.

Potential Impact	Proposed Action	North Facilities Alternative	No Action Alternative
	Approximately 16,003 acres would be unrestricted again after reclamation.		
Wilderness			
Impacts to wilderness characteristics	There are no federally-designated Wilderness Areas and Wilderness Study Areas (WSA) within or near the project area. Visibility of the proposed project and detection of sounds generated by its operation would be the only possible effects to other lands with wilderness characteristics. Because the pit cannot be reclaimed, it would be precluded wilderness designation.	Same as the Proposed Action.	No impacts other than those previously authorized.
Cultural Resources			
Historic or prehistoric site disturbance	62 National Register of Historic Places (NRHP)-eligible cultural resource sites have been identified within the project area. Any of these that would be impacted, as well as any new sites or human remains discovered during construction or operations would be mitigated in accordance with the Programmatic Agreement.	Within the North Facilities Alternative project area, 14 fewer NHRP-eligible cultural resources sites have been identified than the Proposed Action.	No impacts other than those previously authorized.
Impacts to the California Trail	The Hastings Cutoff of the California Trail goes through the area. A small portion would be inside the fenced Plan boundary and inaccessible to the public. Visual impacts to the trail, currently VRM Class III, would be within the range allowed.	Same as the Proposed Action	No impacts other than those previously authorized.
Impacts on original Continental Railroad	There would be no impact on the original Continental Railroad by proposed activities.	Same as the Proposed Action.	No impacts other than those previously authorized.
Native American Religious and Traditional Values			
Native American Site Disturbance	None identified	Same as the Proposed Action.	No impacts other than those previously authorized.
Land Use			

Potential Impact	Proposed Action	North Facilities Alternative	No Action Alternative
Restricted public access for recreation, hunting, and other use	Approximately 16,739 acres would be restricted from public access during active mining and reclamation.	Implementation of the North Facilities Alternative would restrict 4,733 fewer acres than the Proposed Action.	No impacts other than those previously authorized.
Visual Resources			
Conflicts with established BLM VRM objectives	Impacts from the Proposed Action would not conflict with VRM objectives.	Under the North Facilities Alternative the WRSF, heap leach facility, and a growth medium material stockpile would be located within the Low Visibility Corridor. These components would conflict with the VRM objectives of the corridor.	No impacts other than those previously authorized.
Change in scenic quality of the existing landscape	During active mining and reclamation operation of the project would require numerous project facilities and equipment that would be visible from Key Observation Point (KOP)-1 and elsewhere along I-80 between KOP-1 and the Pequop Mountains. Post-mining impact would be from the unreclaimed pit, which would encompass 736 acres. This feature would be an irreversible and irretrievable commitment of visual resources.	The WRSF, TSF, and growth medium stockpile would be visible from KOP-2.	No impacts other than those previously authorized.
Recreation			
Conflicts with existing federal, state, and local recreation management plans and policies	Proposed Action would not conflict with any known existing federal, state, and local recreation management plans and policies.	Same as the Proposed Action.	No impacts other than those previously authorized.
Change in access to existing recreation opportunities or areas	Project area would not be accessible for recreational use for the life of the project. Impacts would be minor and long-term, with the exception of permanent loss of access within the 736 acres that would not be reclaimed within the proposed pit area. This area would be inaccessible in perpetuity due to safety concerns.	Same as the Proposed Action.	No impacts other than those previously authorized.
Impacts on solitude, hunting and non-motorized use	Proposed Action would have a negligible impact on solitude, hunting, and non-motorized use because 1) there are ample dispersed	Implementation of the North Facilities Alternative would restrict 4,733 fewer acres than the Proposed Action.	No impacts other than those previously authorized.

Potential Impact	Proposed Action	North Facilities Alternative	No Action Alternative
	recreation opportunities elsewhere in the vicinity; and 2) unique opportunities do not occur within the project area.		
Socioeconomics			
Employment and income	The Proposed Action would bring a county-wide increase of 2.8 percent in employment and 4.3 percent in earnings over the 2011 base. For the local residents, the increased opportunities of high-paying employment would be considered beneficial. Consequently, local businesses may face competition for workers and upward pressure on wages.	Same as the Proposed Action.	No impacts other than those previously authorized.
Population and housing	Population would increase slightly (1.7 percent), and available housing would decrease. Housing costs may increase as a result.	Same as the Proposed Action.	No impacts other than those previously authorized.
Infrastructure and community services	The Proposed Action is not expected to have an appreciable effect on infrastructure but may slightly increase calls to law enforcement and emergency services.	Same as the Proposed Action.	No impacts other than those previously authorized.
Environmental Justice			
Impact on minority or low-income populations	None identified	Same as the Proposed Action	No impacts other than those previously authorized.
Undue burden to children	None identified	Same as the Proposed Action	No impacts other than those previously authorized.
Hazardous and Solid Waste			
Accidental spills/releases during transportation to and from the project area	Chemical spills during transportation could occur but the probability of a spill is expected to be very low. The commercial transportation company would be responsible for first response and cleanup. Local and regional law enforcement and fire protection agencies also may be involved to secure the site and protect public safety.	Same as the Proposed Action.	No impacts other than those previously authorized.

Potential Impact	Proposed Action	North Facilities Alternative	No Action Alternative
Accidental spills/releases during storage or use on the project site	Some spills of chemicals and fuel could occur during operations. In the event of such a spill, the spill would be handled in accordance with the Spill Contingency Plan/Emergency Response Plan.	Same as the Proposed Action.	No impacts other than those previously authorized.

2.7 Monitoring and Mitigation Measures

2.7.1 Monitoring

Newmont would design and implement environmental monitoring programs developed for the various components of the mining life cycle to evaluate and quantify environmental conditions. These programs would meet Newmont's SER standards, the International Cyanide Management Code, the ISO 14001 Environmental Management System, and the requirements of federal, state and local regulations and permits.

Monitoring would determine the effects of project activities and the efficiency of environmental management and mitigation measures. Monitoring would also provide input to Newmont and governmental regulatory agencies regarding project performance. The information gained during monitoring would be used as the basis for implementing additional mitigation measures or altering existing practices, if necessary.

The general objectives for site environmental monitoring are as follows:

- Confirm compliance with the approved Plan, as well as with federal and state laws, regulations, and permit conditions;
- Provide data and information to calibrate and validate baseline modeling applications;
- Provide data and information that can detect potential problems early;
- Provide data and information that can be used to formulate direct corrective actions should they become necessary; and
- Establish response protocols to solve or prevent problems.

Newmont would employ environmental monitoring measures that would be part of approvals and permits to be issued by the BLM, NDEP, and other appropriate agencies. The Long Canyon Project would operate under federal and state permit approvals that would require practices and procedures that reduce or avoid environmental impacts and reclaim disturbed areas, including those that would be in the Historic Properties Treatment Plan.

As mining and ore processing approvals and permits are approved and obtained, Newmont would incorporate appropriate new or revised environmental mitigation and monitoring measures into its future operations at the site. Figure 2.7-1 shows the locations of hydrology and meteorology monitoring sites for the Proposed Action. Monitoring for the North Facilities Alternative would be the same as the Proposed Action, with the exception of the locations of monitoring wells. The location of monitoring wells for the North Facilities Alternative is shown on Figure 2.7-2. The currently anticipated monitoring programs for the Proposed Action are described in Sections 2.7.1 through 2.7.10.

2.7.1.1 Air Resources

Newmont would continue to collect and maintain climate data (precipitation, temperature, pan evaporation, and wind) from its on-site meteorological stations.

2.7.1.2 Water Resources

As part of its baseline and background hydrologic study work, Newmont has both surface water (spring) sample points and groundwater monitoring wells at the Long Canyon Project. These sites have been monitored for several years and helped in evaluating the background groundwater chemistry conditions of the site. Monitoring of these sample points and wells would continue as part of mine development and operations and as required by the NDEP-BMRR issued Water Pollution Control Permit (WPCP).

As part of construction and development work, Newmont would install additional groundwater wells downgradient of the WRSF, the heap leach facility, and the TSF to further characterize and monitor groundwater conditions around these sites.

Surface water and groundwater wells would be measured quarterly for flow or water level elevations, respectively. Water level elevation measurements would continue to be taken during each sampling trip during the operational phase of the project or as required by the NDEP-BMRR WPCP.

Monitoring of surface water and groundwater wells would be conducted as follows:

- Quarterly during project development and operations for water levels and field parameters (temperature, pH, and electrical conductivity). If wells are dry at the time of monitoring, that condition would be noted on the observation log sheets. Wells would be monitored for three to five years after reclamation activities are completed for the heap leach facility and the TSF or as required by the NDEP-BMRR WPCP.

- Quarterly surface and ground water quality samples would be taken and analyzed during project development and operations for NDEP Profile I parameters. Wells would be monitored for three years after reclamation activities are completed on the heap leach pad and the TSF or as required by the NDEP-BMRR WPCP.

2.7.1.3 Wildlife

Newmont, BLM, and NDOW are working cooperatively to determine mule deer use and migration behavior in the project area southwest of Oasis in the Pequop Mountains with a goal of better delineating critical habitats. In cooperation with Newmont, NDOW initiated a deer-collaring program in January 2011, with plans to augment existing knowledge of mule deer use of the area by fitting Global Positioning System (GPS)/satellite collars on approximately 30 mule deer. The collars used in this project are Advanced Telemetry System Iridium satellite collars programmed so that mule deer daily and seasonal use of the proposed mine site are collected for a period of approximately three years per collar. This effort is part of a monitoring program to assess changes over time and to identify any future impediments to mule deer movement. The project is being developed by BLM, NDOW, and Newmont biologists. Data would be shared jointly amongst NDOW, BLM, University of Nevada Reno, and Newmont.

Newmont would internally monitor the TSF weekly for the presence and mortality of birds, mammals, reptiles, and amphibians. The heap leach pad area would be monitored weekly to determine the presence of any substantial solution “ponding” on the heap pad, as well as for the presence and mortality of birds, mammals, reptiles, and amphibians. Sightings of aforementioned wildlife, along with any wildlife mortalities, would be recorded in a log while walking or driving the perimeter of the TSF and heap leach pad. Internal weekly results would be summarized in a quarterly report to NDOW. Maintaining a routine record would assist the Newmont SER Department and management in evaluating wildlife use of the TSF and any resulting mortalities. Monitoring would begin with the application of barren solution on the ore heap and introduction of tailings slurry into the TSF. After one year of monitoring, Newmont and NDOW would evaluate the monitoring program, specifically the frequency of such monitoring.

If wildlife mortalities are found in or around the TSF or the heap leach facility, an effort would be made to determine the apparent cause of death. Per the NDOW Permit, Newmont shall report any mortalities of wildlife species protected under the Migratory Bird Treaty Act (MBTA), all game animals, game birds, and TES species. This includes mortalities that are associated with chemical-containing tanks or impoundments. This report shall be made by telephone to the regional office by the beginning of the next working day following the occurrence or observation of those mortalities. If there are mortalities recorded in a month that are attributable to cyanide or metals poisoning, additional measures would be taken to discourage wildlife use or incursion into the area.

2.7.1.4 Reclamation Success

Newmont would monitor for reclamation success and also monitor disturbed sites for undesirable and noxious weeds as set forth in a Weed Management Plan (Newmont, 2012).

Following site closure, Newmont would conduct site maintenance, site inspections, and any other necessary monitoring for the period of reclamation responsibility.

Newmont would monitor reclamation success annually for a minimum of three years following implementation and the completion of revegetation activities or until reclamation success has been achieved.

Figure 2.7-1 Monitoring Locations for the Proposed Action

Figure 2.7-2 Monitoring Locations for the North Facilities Alternative

Newmont would evaluate vegetation cover and species composition. Adjacent undisturbed vegetation communities and vegetation reference areas may be established to serve as a means of comparing project revegetation with natural vegetation. The reference area would be selected from representative undisturbed plant communities adjacent to, or within like soil types of, the disturbed areas.

Vegetation cover would be estimated using a canopy cover measured by the point or line intercept method. In addition, as part of the determination for successful revegetation of disturbed areas, the following guidelines would be considered:

- Successful establishment of the desired species;
- Evidence of vegetative reproduction processes;
- Evidence of overall site stability;
- Indication that revegetation cover of reclaimed sites is trending toward and/or matching the vegetation cover found in the adjacent reference area; and
- Rangeland health indicators/mine reclamation standards and guidelines.

2.7.1.5 Geochemistry

Based on current geochemical analytical work, Newmont does not anticipate that acid generation would develop during or following mining at the Long Canyon Project site. No monitoring measures are proposed with regard to acid rock drainage (ARD).

2.7.1.6 Soils

As part of final reclamation, depths of any replaced growth medium would be checked for thickness prior to planting or seeding. This would be conducted by employing a grid pattern (approximately 200 feet by 200 feet) over the areas where growth medium has been replaced.

2.7.1.7 Tailings and Heap Leach Closure

Monitoring of the soil covers over the TSF and the heap leach facility would focus on indicators that the covers have been breached or lost their integrity.

These cover areas would be visually inspected by personnel traversing the perimeter and across the cover in several locations. The inspector would look for the following types of indicators:

- Evidence of excessive erosion including rills, gullies, or bare spots;
- Ponding or damp areas, including the presence of riparian vegetation, indicating significant settlement;
- Cracks, slumps, or scarps indicating localized differential settlement or slope failure;

- Areas of sparse vegetation that may need re-seeding for continued erosion control; and
- Holes or burrows that could disrupt the integrity of the cover or allow transport of tailings or the ore material in the heap leach to the cover surface.

Quantitative measurement of settlement (i.e., tailings or heap leach material consolidation) would be performed by periodic surveying of monuments located on a regular grid on the cover surface.

The purpose of the permanent surface water management system is to divert runoff away from the tailings or heap leach cover and to drain the cover surface. Inspection activities would therefore focus on identifying conditions that reduce the flow capacity of the system or disrupt its integrity.
The surface water management system would be inspected visually by personnel walking along all ditches, culvert entrances, and culvert discharge locations. The inspector would look for the following types of features:

- Loss of gravel or rock in lined channels and discharge aprons;
- Localized settlement and ponding;
- Excessive sediment accumulation;
- Blockage by debris;
- Bank sloughing;
- Excessive debris at culvert entrances;
- Significant deformation of a culvert cross section;
- Corrosion of culvert pipes; and
- Culvert pipe exposed at ground surface.

2.7.1.8 Landfill
Newmont would monitor the on-site landfill weekly to verify that no deleterious material has been disposed and that the cover requirements have been met.

2.7.1.9 Stormwater Management
Newmont would monitor stormwater controls and BMPs on a semi-annual basis and after significant storm events. An inspection checklist would be developed to aid the inspection team during monitoring periods.

2.7.1.10 Materials Storage and Use
Newmont would monitor areas designated for storage and use of hazardous materials to verify compliance with regulatory requirements and area design criteria. Newmont would develop a monitoring checklist to assist the inspection team to identify and mitigate potential concerns.

2.7.2 Mitigation
Mitigation required for impacts to resources are discussed briefly below. Additional details regarding mitigation will be developed and included in the final EIS prior to issuing for public

comment. A mitigation plan will be developed and outlined in a Memorandum of Understanding (MOU) between the appropriate agencies and Newmont. This mitigation applies to publically-owned land.

2.7.2.1 Water Resources

There are no specific mitigation measures for water resources. Mitigation Measure W-3 would require enhancement projects for brood rearing habitat on Hardy Creek, which may also provide mitigation for some of the potential impacts to surface water resources associated with Hardy Creek.

2.7.2.2 Wildlife Resources

Mule Deer

Mitigation Measure W-1

Newmont would mitigate crucial winter habitat at a 1:1 ratio for habitat lost during construction and operation of the mine. Mitigation under this measure would occur on mule deer habitat that is not also categorized as greater sage-grouse habitat.

Loss of mule deer crucial winter habitat is approximately 736 acres (corresponding to the pit), where 693 acres are on public land and 43 acres are on private land. Mitigation would include habitat enhancements within the northwest corner of the Plan boundary; however, if exploration/mining activities expand within the mitigated/enhanced habitat, then Newmont would continue to mitigate loss of habitat at the 1:1 ratio. These additional enhancements would occur off-site. Off-site, but regionally important, habitat enhancements could include funding locations in the South Pequop Range/Spruce Mountain for pinyon-juniper thinning, browse species seeding, or other habitat enhancements beneficial to the Area 7 mule deer. An MOU between BLM, NDOW, and Newmont would be established to guide mitigation funding and enhancement projects. Mitigation costs would be $600 per acre (NDOW, 2010).

Greater Sage-Grouse

Mitigation Measure W-2

A seasonal restriction would be in place for exploration drilling. This restriction includes no exploration disturbances within a three-mile radius of the Big Springs lek from March 1 to May 15 from one hour before sunrise to 10 AM.

Mitigation Measure W-3

A seasonal restriction for the use of the south borrow pit, access road to the borrow pit, the Cities' water supply area and the access to the Cities' water supply area would be in place. The restriction includes no human or vehicular access from March 1 to May 15 from one hour before sunrise to 10 AM. Emergency access, if necessary, to the Cities' water supply area during these seasonal restrictions would be coordinated with the BLM.

Mitigation Measure W-4

Compensation for impacts to greater sage-grouse habitat within the project area would be required by the BLM Details of the habitat improvement process would be outlined in an MOU developed between BLM, NDOW, and Newmont, and would include the development of a conservation easement on Newmont's private land at Big Springs Ranch as described below. Habitat improvement on public land would be based on the acres of habitat impacted by the project. Greater sage-grouse habitat that enhancement projects could occur for includes PPH, PGH, and brood rearing habitat.

- On-site private/public land brood rearing habitat enhancement and restoration within the Hardy Creek corridor would be at a 2:1 ratio.

Other habitat improvement projects may include but not be limited to the following:

- Funding could occur to support off-site habitat improvement projects to improve greater sage-grouse PGH and PPH habitat. The funding would be no more than 3:1 ratio for PPH and 2:1 PGH at $600 per acre (BLM, 2013k).

- Off-site enhancement projects of PPH and PGH habitat could be offset at a ratio of 1:1 if long-term assurances are provided, acceptable to the BLM and NDOW, and in place prior to the disturbance. These would be for the protection, management, and conservation of comparable habitat on private land.

Mitigation on private land could occur and would require a conservation easement, as defined in the MOU. The conservation easement would outline achievable goals for habitat restoration/enhancement success.

Mitigation Measure W-5
Newmont would install flight diverters on fencing near the greater sage-grouse lek and brood rearing habitat to reduce collisions. The placement of the flight diverters would be coordinated with BLM and NDOW.

Raptors
Mitigation Measure W-6
An Newmont's Eagle Conservation Plan (ECP) is under development in coordination with the USFWS to mitigate potential impacts to eagles from mine construction and operations. Newmont would fully implement and adhere to the construction techniques, design standards, and avian mortality reporting set forth in the ECP. While an ECP is developed for the protection of eagles, the construction techniques and design standards area also applicable to and protect other raptor species in the area.

2.7.2.3 Cultural Resources
Cultural Sites
Mitigation Measure C-1
A programmatic agreement between BLM, SHPO, and Newmont has been developed which outlines how NRHP-eligible cultural resources would be managed throughout the life of the project.

Mitigation Measure C-2
A Historic Property Treatment Plan has been developed to define how NRHP-eligible cultural resource sites within areas of proposed disturbance would be mitigated.

National Trails
Mitigation Measure C-3
Mitigation for the National Trails would be a detailed Regional Mitigation strategy for trails that contains a cost structure that would be used to determine mitigation costs. The mitigation agreement for National Trails would be contained in a MOU executed between BLM and SHPO. The assessed costs would provide funds to develop interpretive and/or educational programs that mitigate for the adverse effects caused by the proposed project. The MOU would detail procedures needed to establish a Board to manage the dispersal of the funds.

2.8 Agency-Preferred Alternative

The BLM has identified the North Facilities Alternative as the preferred alternative because, with few exceptions, it would have less impact on the environmental resources evaluated. Identification of the preferred alternative at the draft EIS (DEIS) stage does not constitute a decision or commitment to select this alternative following completion of the Final EIS.

This page intentionally left blank.