

Chapter 2

Existing Operations, Proposed Action, and Alternatives

2.1 Introduction

This chapter describes and compares the Proposed Action, two action alternatives, and the No Action Alternative, as required by 40 Code of Federal Regulations 1502.15 (d). Alternatives are in comparative form to inform the public and other agencies and to provide a basis for a decision by the responsible official (40 CFR 1502.14). For a complete discussion of the effects used to compare alternatives, consult Chapter 3, “Affected Environment and Environmental Consequences.”

Each component or area of expansion is described in sufficient detail to facilitate understanding of the Proposed Action and alternatives. Figures that clearly show the current operations and proposed expansion of the facilities are included.

In addition to the Proposed Action, three alternatives are analyzed in the FEIS. The two action alternatives are based upon issues identified by the BLM, Barrick, and public comments received during the public scoping process. These alternatives are intended to reduce or minimize potential impacts associated with the Proposed Action and be responsive to the key issues. Descriptions of additional alternatives that were initially considered are provided, as well as the rationale for why they were eliminated from detailed analysis. A No Action alternative is also analyzed.

A description of existing operations at the BMM and Mooney Basin Operations Area is provided to facilitate a better understanding of the Proposed Action, as the Proposed Action is primarily an expansion of existing facilities including pits, waste dumps, and processing components. This chapter is organized to provide a description of the existing operations first, followed by a description of the Proposed Action, and, finally, a description of the alternatives, including those carried forward in the analysis and those that were eliminated from detailed analysis.

2.2 Existing Operations

This section describes the existing and authorized mining, processing, and exploration operations in the BMM and Mooney Basin Operations Area Plans of Operations. Section 2.2.1 describes the BMM, and Section 2.2.2 describes the Mooney Basin Operations Area. Existing and authorized disturbance totals are shown in Table 2-1. The content of this section is presented only as background information. Existing and previously authorized disturbance is not part of the Proposed Action, nor is it being analyzed in this FEIS.

TABLE 2-1 SURFACE DISTURBANCE SUMMARY

MINE	AUTHORIZED ¹ (ACRES)	EXISTING ² (ACRES)
Bald Mountain ³	3,418	3,058
Mooney Basin ⁴	747	510
Total	4,165	3,568

Sources: Enviroscientists, 2006; BLM, 2005b; BLM, 2005c; BLM, 1995a; BMM, 2009.

¹ Includes authorized exploration.

² Includes exploration and reclaimed acres that have not yet been released from bond requirements.

³ Authorized acres per 2006 BMM North Area Amendment to Plan and Three-Year Reclamation Bond Update. Existing acres are bonded acres from the 2006 BMM North Area Amendment to Plan and Three-Year Reclamation Bond Update.

⁴ Disturbance at Saga and Belmont facilities has been authorized, but facilities have not been fully constructed. 2005 proposed acres not included in existing disturbance.

2.2.1 Bald Mountain Mine

The existing BMM facilities include open pits, rock disposal areas, roads, an administrative/shop complex, and process facilities including heap leach pads, ponds, and associated buildings. The BLM has authorized approximately 3,418 acres of disturbance associated with these facilities (Table 2-2). Although authorized, the mill and tailings facilities have not been constructed. The current BMM operation, as shown on Figure 1-2, consists of four general areas: the Process Area, the North Area Complex, the Top/Sage Area, and the Rat/RBM Area. The existing and approved activities associated with these areas, as well as exploration activities, are described in this section.

TABLE 2-2 BALD MOUNTAIN MINE AUTHORIZED DISTURBANCE

PROJECT COMPONENT	AUTHORIZED DISTURBANCE IN MAY 2006 (ACRES)
Pits and Related Disturbance	
North Pit 1 (1, 2, 3, and 5)	159
North Pit 2 (LJ Ridge)	52
RBM	55
Rat	116
Top/Sage Complex (Top and Sage Flats Combined)	263
Top Underground	0
Subtotal	645
Ore and Process Facilities	
Pad #1	65
2/3 Pad	229
BMM Process	114
Tailings & Leach Pad Expansion ¹	333
Subtotal	741
Rock Disposal Areas	
North 1 (One, Two, Three, Five, West Combined)	343
North 4 (Formerly LJ Ridge)	60
Rat East ²	180
Rat West	51
RBM North	133
RBM South	30
East Sage	250
South Water Canyon (formerly Top)	263
Subtotal	1,310

PROJECT COMPONENT		AUTHORIZED DISTURBANCE IN MAY 2006 (ACRES)
Support Facilities		
	Soil Stockpiles	47
	Ancillary Facilities/Roads	50
	Haul Roads	233
	Interpit Areas	78
Subtotal		408
Total Mine and Process Area Disturbance		3,104
Other Areas of the Project		
	Exploration	314
Subtotal		314
Total BMM Area Disturbance		3,418

Source: BMM, 2009.

¹ Acres removed from 1995 tailings expansion authorization and placed into proposed 2/3 Pad Expansion (BLM, 1995a).

² Pit Expansion removes 15.6 acres of reclaimed rock disposal area.

Process Area

The existing process area at BMM consists of two heap leach facilities, process ponds, process and administrative buildings, utilities, and support facilities. The existing and authorized disturbance for the process area is shown on Figures 1-2, 2-1, and 2-2. Heap Leach Pad No.1 has been closed and reclaimed and is currently under post-closure monitoring. Leaching activities are ongoing at the 2/3 Heap Leach Pad. In addition, the BMM EIS (BLM, 1995a) analyzed a new ore process facility within the Plan of Operations boundary on the east side of the 2/3 Heap Leach Pad. The facility included milling facilities, an expanded heap leach pad, a tailings impoundment, haulage and access corridors, and other support facility disturbance. The milling facilities, expanded heap leach pad, and tailings impoundment have not been constructed.

North Area Complex

The existing and authorized facilities in the North Area Complex include the West Rock Disposal Area, 1/5 Rock Disposal Area, LJ Ridge Rock Disposal Area, six open pit areas, an interpit area (i.e., the area around pits and dumps with intermittent disturbance for access roads, safety berms, etc.), haul roads, exploration roads, secondary roads, and growth medium stockpiles. These facilities are shown on Figure 2-3. In May 2006, the BLM authorized expansion of the North 2/3 Pit to the east and west. The BLM also authorized expansion and combining of the North 1 Rock Disposal Area and the 2/3 Rock Disposal Area to form the West Rock Disposal Area, and development of interpit road areas at the North A Pit (BLM, 2005b). The North Area Complex is not currently being mined although exploration activity continues in this area. The LJ Ridge area is located east of Heap Leach Pad No. 2/3 (Figure 1-3) and consists of the LJ Ridge Pit, South Ridge Pit, Banghart Pit, LJ Ridge Rock Disposal Area, and a haul road. The LJ Ridge area is currently inactive.

Top/Sage Flat Area

The Top/Sage Flat Area includes the Top Pit, Sage Flat Pit, South Water Canyon Rock Disposal Area, East Sage Rock Disposal Area, and various haul roads and exploration disturbance. Existing and authorized activities are shown on Figure 2-4. The Top Pit and South Water Canyon Rock Disposal Area were approved as described in the BMM EIS (BLM, 1995a). The East Sage Rock Disposal Area has been authorized as described in the approval of the Amendment to the BMM Plan of Operations (BLM, 2005b). All waste rock has been placed in the South Water Canyon Rock Disposal Area. Associated haul roads are included in the Top/Sage Flat Area disturbance.

The Top Underground project has been authorized through approval of an Environmental Assessment (BLM, 2006c). To date, no underground mining activities have been initiated.

Rat/RBM Area

The Rat/RBM Area consists of an open pit, interpit areas, rock disposal areas, and haul roads as authorized by the BLM (BLM, 1992a). Existing and authorized disturbance is shown on Figure 2-5. The rock disposal areas are located east and west of the pits. The Rat Pit haul road intersects the Top Pit haul road in order to access support and process facilities.

Expansion of the Rat Pit to the north, south, east, and west, as well as at depth, has been previously authorized, as well as moving a portion of the reclaimed Rat East Rock Disposal Area to the east to accommodate the pit expansion. The reclaimed area shown on Figure 2-5 has not been released from bonding requirements. Currently, Barrick is conducting activities under the 2005 authorization.

The RBM Area is located northeast of the office complex and is also currently active. The RBM Area consists of a pit, two rock disposal areas, a haul road, and exploration disturbance. The current RBM Pit and the RBM North Rock Disposal Area were previously authorized by the BLM (BLM, 1992a). The rock disposal area has been authorized to disturb 68 acres of previously reclaimed area, which has not been released from bonding requirements. Interpit disturbance areas have been authorized between the RBM Pit and associated rock disposal areas (BLM, 2005b).

Exploration Areas

Exploration areas are widely distributed throughout the existing Plan of Operations boundary, with highest densities proximal to proposed or active pits. Barrick maintains an ongoing effort to reclaim inactive exploration roads and sites within the Plan of Operations boundary. Up to 314 acres of exploration disturbance are authorized within the BMM Plan of Operations (BLM, 1995a).

Roads

As previously authorized the Elko public access road would be re-routed to follow the western boundary of the existing BMM process and ancillary disturbance area shown in Figure 1-3. The current running width of 25 feet would be maintained with an average proposed disturbance width of 50 feet. The additional disturbance width would be used for berms, stormwater diversion ditches, and road cuts, where required by existing topography.

2.2.2 Mooney Basin Operations Area

As shown on Figure 1-2, the Mooney Basin Operations Area is located approximately two miles east of the current BMM Plan of Operations boundary. The BLM has authorized approximately 747 acres of disturbance associated with pits, rock disposal areas, heap leach and recovery facilities, roads, growth medium stockpiles, utilities, and support facility disturbance (Table 2-3). Existing and authorized facilities are shown in Figure 2-6. Operational pit areas include the Bida and Belmont pits, Galaxy Pit, Horseshoe Pit, and Saga Pit. Barrick has previously mined from the Galaxy and Horseshoe pits, and mining is currently active in both the Bida and Belmont pits and the Saga Pit. Waste rock is stored in the Horseshoe, Saga, Bida, and Galaxy rock disposal areas, and ore is hauled to the Mooney Basin Heap Leach Pad from these pits. Partial backfill of the Horseshoe Pit has also been completed.

In 2005, the existing Mooney Basin Heap Leach Pad was approved for a 56.2-acre expansion to the south of the existing facility. A new haul road from the Galaxy Pit to the Top Pit (BLM, 2003a) and a leach pad expansion that covered part of the Horseshoe and Saga haul roads

Figure 2-1 BMM Process and Administration Area Detail

Figure 2-2 Mooney Basin Detail

Figure 2-3 North Area Complex Detail

Figure 2-4 Top/Sage Flat Area Detail

Figure 2-5 Rat/RBM Area Detail

Figure 2-6 Mooney Basin Operation Detail

were also approved and constructed. Other changes to the heap leach facilities included adding a stormwater diversion ditch and a stormwater/freshwater pond.

Exploration activities are also ongoing within the existing Mooney Basin Operations Area Plan of Operations boundary.

TABLE 2-3 MOONEY BASIN AUTHORIZED DISTURBANCE

PROJECT COMPONENT		AUTHORIZED DISTURBANCE IN 2005 (ACRES)
Pits and Related Disturbance		
	Horseshoe	33.0
	East Bida	34.8
	Galaxy and Galaxy II	31.2
	Saga	70.0
	Belmont (1, 2, 3)	11.6
Subtotal		180.6
Ore and Process Facilities		
	Pad	137.2
	Process	11.8
Subtotal		149.0
Rock Disposal Facilities		
	Horseshoe	24.9
	Galaxy	29.9
	Saga	98.5
	Belmont ¹	42.7
Subtotal		196.0
Support Facilities		
	Soil Stockpiles	15.5
	Interpit Areas	0
	Existing Ancillary Facilities	28.6
	Water Well #3	1.1
	Leach Pad Diversion Ditch	1.4
	Galaxy Pit Shortcut	2.8
	All Haul Roads	121.8
	Secondary Roads/Pit Ramps/ Floors ²	11.2
	Landfill	0
	Power Line to Top/Sage Complex ³	0
	Borrow Pits ⁴	5.7
Subtotal		188.1
Total Mine and Process Area Disturbance		713.7
Other Areas of the Project		
	Exploration	33.6
Subtotal		33.6
Total Mooney Basin Area Disturbance		747.3

Source: BMM, 2009.

¹ The Belmont Pit 2 expansion removes 3.7 acres of previously authorized rock disturbance area.

² Secondary roads category was moved to the Interpit Areas category.

³ Total power line length is 34,157 feet, of which 9,035 feet is on previously authorized disturbance. Disturbance width is 25 feet.

⁴ Borrow pits and landfills were removed by the Mooney Basin Heap Leach Pad Expansion.

2.3 Proposed Action

The Proposed Action would unify the BMM and Mooney Basin Plans of Operations into one Plan of Operations entitled *Bald Mountain Mine - North Operations Area*. Barrick proposes to expand the existing gold mining and recovery operations, as well as develop new gold mining and recovery operations and continue exploration within a unified BMM North Operations Area Project Plan of Operations boundary, hereafter referred to as the Proposed Action area. The Proposed Action area encompasses 16,465 acres, of which 8,085 acres would be disturbed. The proposed disturbance is shown on Figure 2-7. The BLM has previously authorized the disturbance of 3,418 acres within the BMM Plan of Operations boundary and 747 acres within the Mooney Basin Operations Area boundary for a total of approximately 4,165 acres, also shown on Figure 2-7. As stated earlier in this chapter, the proposed disturbance is associated with pits, rock disposal areas, heap leach and recovery facilities, roads, growth medium stockpiles, and exploration (Table 2-4). Table 2-4 provides the authorized disturbance acreage for each facility and the Proposed Action disturbance acreage with the expansion of the facilities and development of the new facilities. This FEIS analyzes only the effects of the Proposed Action and does not address previously authorized actions (the existing BMM and Mooney Basin operations).

TABLE 2-4 SUMMARY OF PROPOSED DISTURBANCE WITHIN THE PLAN OF OPERATIONS BOUNDARY

COMPONENT	AUTHORIZED DISTURBANCE (ACRES)	PROPOSED ACTION DISTURBANCE (ACRES)	TOTAL DISTURBANCE (ACRES) ¹
Open Pits			
North Pit 1 (combines existing North 1, 2/3, and 5 pits)	159	171.5	330.5
North Pit 2 (existing LJ Ridge)	52	21.4	73.4
North Pit 3 (existing South Ridge)	--	20.8	20.8
RBM	55	--	55
Rat	116	76.8	192.8
Top/Sage Flat Pit Complex	263	173	436
Horseshoe	33	--	33
East Bida	34.8	4.3	39.1
Galaxy and Galaxy II	31.2	--	31.2
Saga	70	60.1	130.1
Belmont (1,2, and 3)	11.6	12.6	24.2
Total Pit Disturbance	825.6	540.5	1366.1
Process Facilities²			
Leach Pad 1	65	--	65
Leach Pad 2/3	229	121.3	350.3
Mooney Basin Pad	137.2	272.1	409.3
BMM Process	114	16	130
Mooney Basin Process	11.8	32.9	44.7
Tailings and/or Leach Pad	333	-63.1 ⁴	269.9
Total Process Disturbance	890	379.2	1269.2
Rock Disposal Areas			
North 1 (One, Two, Three, Five, West Combined)	343	333.9	676.9
North 2	--	90.4	90.4
North 3	--	97.4	97.4
North 4 (formerly LJ Ridge)	60	41.4	101.4

COMPONENT	AUTHORIZED DISTURBANCE (ACRES)	PROPOSED ACTION DISTURBANCE (ACRES)	TOTAL DISTURBANCE (ACRES) ¹
North 5	--	141.1	141.1
Rat East	180	-15.6 ⁴	164.4
Rat West	51	299.5	350.5
RBM North	133	--	133
RBM South	30	--	30
East Sage	250	646.8	896.8
Sage Flat	--	259.1	259.1
South Water Canyon (formerly Top)	263	206.3	469.3
Horseshoe	24.9	--	24.9
Galaxy	29.9	--	29.9
Saga	98.5	121.4	219.9
Belmont	42.7	-3.7 ⁴	39
Total Rock Disposal Area Disturbance	1056	2218	3724
Support Facilities³			
Soil Stockpiles	62.5	93.7	156.2
Ancillary Facilities	78.6	12	90.6
Haul Roads	354.8	159.3	514.1
Interpit Areas	78	420.1	498.1
Water Well #3	1.1	--	1.1
Leach Pad Diversion Ditch	1.4	--	1.4
Galaxy Pit Shortcut	2.8	--	2.8
Secondary Roads/Pit Ramps/Floors	11.2	-11.2 ⁴	0
Borrow Pits	5.7	-5.7 ⁴	0
Power Line to Top/Sage Complex	0	14.4	14.4
Landfill	0	0	0
Total Support Facility Disturbance	596.1	682.6	1278.7
Exploration			
Exploration	347.6	100	447.6
Total Exploration Disturbance	347.6	100	447.6
Total Disturbance	4,165.3	3,920.3	8,085.6

¹ Includes BMM and Mooney Basin.

² Includes heap leach facilities and process facilities.

³ Includes interpit areas, temporary roads within the interpit areas, stormwater controls, secondary roads, haul roads, growth medium stockpiles, borrow pits, landfills, power lines, fresh water lines, wells, etc.

⁴ Negative numbers indicate that proposed disturbance would take place in an area already authorized to be disturbed; therefore, there would be no net increase in total disturbance for these categories as a result of the Proposed Action.

The following sections describe the components of the Proposed Action. The proposed disturbance areas are designed to accommodate projected disturbance related to the existing operations and the proposed expansions, as well as potential variations resulting from design modifications (i.e., engineering adjustments to the open pit perimeter, haul/access road realignments, and growth medium stockpiles).

The expected mine life for the proposed expansion is approximately 10 years (current operations estimated to end in 2009). Ore processing would continue for approximately three years after active mining operations cease. Reclamation, site closure activities, and post-

closure fluid monitoring would continue for a minimum of five years for each closed component. Reclamation monitoring would be conducted for a minimum of three years for each reclaimed area or until vegetative stability is established.

2.3.1 Access

As shown on Figure 1-1, there are three main access routes to the BMM North Operations Area Project:

- From Elko via State Highway 228 (Jiggs Highway) south;
- From Ely and Eureka via U.S. Highway 50 to State Highway 892 (Strawberry Highway); and
- From U.S. Highway 50 to Long Valley Road.

2.3.2 Proposed Action Area

The Proposed Action would unify the BMM and Mooney Basin Plans of Operations Area. The individual Plan of Operations boundaries would be expanded in several directions to accommodate the proposed expansion and associated development of facilities. As shown on Figures 1-2 and 1-3, the two Plans of Operations boundaries would merge where existing haul roads currently connect the BMM and Mooney Basin Operations Area.

The previously authorized Plans of Operations boundaries for both the BMM and Mooney Basin Operation Area encompass 12,727 acres. Expanding and merging the Plans of Operations boundaries would increase the authorized Plan of Operations area by 3,738 acres for a new BMM North Operations Area Project Plan of Operations boundary encompassing 16,465 acres. The total authorized disturbance within this new Plan of Operations boundary would be 8,085 acres (Table 2-4).

2.3.3 Open Pits

Conventional open pit mining methods (truck and shovel/loader) would continue to be used to extract ore and waste from the proposed open pit expansions. Rock would be drilled and blasted using ammonium nitrate and fuel oil or other appropriate blasting agents as determined by the rock characteristics. All explosives would be handled in accordance with Mine Safety and Health Administration and Bureau of Alcohol, Tobacco, and Firearms regulations. It is anticipated that one blast in each of the active pits would occur each day. The amount of explosive used would vary depending on the size of the working face of the pit. Barrick anticipates two or three pits would be active at any one time.

Trucks would be used to haul ore to the heap leach facilities and waste rock to the rock disposal areas. Low-grade ore material may also be temporarily staged on a selected portion of the rock disposal areas for later transport and processing.

Mining would be conducted 24 hours per day, 7 days per week, as with current operations. A list of the anticipated mining equipment requirements at peak operations within the proposed Plan of Operations boundary is provided in Table 2-5. The equipment indicated in Table 2-5 is an increase from the equipment currently being used.

Geological, geotechnical, and safety constraints have and would continue to dictate the ultimate pit designs. Overall pit slope angles in the existing pits range from approximately 38 degrees to 56 degrees but may vary with pit location and the individual geotechnical and safety constraints for each pit. Based on exploration drilling, no new geologic formations are expected to be encountered under the Proposed Action. Slope angles for the expanded portions of the pits are expected to remain within the same range as the current pit angles. Barrick proposes to mine pits on benches 20 to 25 feet high; however, bench heights may vary based upon mining

Figure 2-7 Existing/Approved and Proposed Disturbance

requirements or rock geotechnical properties. The Top/Sage Flat Pit Complex benches would be approximately 50 feet high but may also vary depending upon mining requirements or rock geotechnical properties. Pit bench widths and intervals would vary by pit and would be dependent upon local geology and rock geotechnical properties. Catch-bench intervals are nominally two bench heights, which may be increased or decreased depending upon mining requirements or rock geotechnical properties. A summary of basic design parameters and dimensions for the pits within the Proposed Action area is shown in Table 2-6. Detailed design parameters for each pit are discussed in the following sections.

TABLE 2-5 LIST OF PROPOSED MOBILE SURFACE EQUIPMENT

UNIT	QUANTITY
Electric Wire Rope Shovels	2
Hydraulic Shovel	2
Wheel Loaders	2
Haul Trucks (150- to 240-ton class)	17
Production Drills	2
Pre-Split Drills	2
Track Dozers	4
Wheel Dozers	1
Graders	3
Trackhoe	1
Water Trucks	3

Open pit design is based on review of previous pit mining data combined with the results of geotechnical testing and surface mining industry/Mine Safety and Health Administration standards. Barrick would continue to monitor wall stability throughout the active life of each open pit according to the parameters set forth by the licensed professional engineer providing pit slope stability design. Monitoring generally includes periodic surveying of pit wall surfaces to identify movement or deflection relative to benchmarks set outside the geotechnical influence of the pit.

TABLE 2-6 PIT DESIGN PARAMETERS AND DIMENSIONS SUMMARY

OPEN PIT	SLOPES (DEGREES)	LENGTH (FEET)	WIDTH (FEET)	DEPTH (FEET)	PIT BOTTOM ELEVATION (FEET ABOVE MEAN SEA LEVEL)
North Pit 1	40 – 50	6,620	3,500	1,100	6,625
North Pit 2	40 – 50	2,460	1,790	775	7,775
North Pit 3	40 – 50	1,130	1,010	625	7,750
Rat	50	4,930	2,190	650	7,625
Top Pit	38 – 56	3,880	3,740	1,725	6,500
Sage Pit	38 – 56	2,445	2,140	1,075	7,150
East Bida	50	1,875	1,190	450	7,150
Belmont Pit 2	50	835	715	275	7,050
Belmont Pit 3	50	665	575	275	6,925
Saga	50	3,000	2,465	700	6,425

Based on extensive area drilling information, Barrick does not anticipate intercepting the groundwater table while mining in the pits located within the Proposed Action area, and no dewatering activities are planned. As is the case with current operations, if any isolated,

perched saturated zones are encountered, diversion ditches and sumps would be installed as necessary to maintain safe operating conditions within the pit.

A summary of the mine ore and waste production amounts is presented in Table 2-7. Mined material is currently evaluated, and would continue to be, through quarterly sampling under Nevada Division of Environmental Protection Water Pollution Control Permit requirements. No new rock types or sulfide deposits are anticipated as part of the pit expansions under this Proposed Action. Barrick proposes to continue the current approved waste rock management practice of commingling all waste rock material due to the lack of sulfide content and leachable metalloid and metal contents (BMM, 2009).

TABLE 2-7 ESTIMATED PRODUCTION SUMMARY BY OPERATION AREA

MINE AREA	ORE (MILLION TONS)	WASTE (MILLION TONS)	TOTAL (MILLION TONS)
BMM	130	784	914
Mooney Basin	70	46	116
Total	200	830	1,030

Under the Proposed Action (and as authorized by the State General Stormwater Permit), stormwater would be diverted around the pits, rock disposal areas, and growth medium stockpiles and returned to natural drainages. Stormwater collection trenches would direct stormwater from disturbed areas to collection ponds where stormwater would be evaporated or used in process or mining activities.

North Pits

Exploration is currently the only activity in the vicinity of the proposed North Pit 1. The proposed pit expansion (approximately 172 acres) would merge the existing pits (2/3 Pit, North Pit, and 5 Pit) as shown on Figure 2-3 and described below. Ore would be hauled to the BMM process facilities, and waste rock would be hauled to one of the nearby proposed rock disposal area expansions.

North Pit 2 (formerly the LJ Ridge Pit) would be expanded by approximately 21 acres as shown on Figure 2-3. A typical pit cross-section for the North Pit 2 is shown in Figure 2-8. Ore would be hauled to the BMM process facilities, and waste rock would be hauled to a nearby proposed rock disposal area expansion.

North Pit 3 (formerly the South Ridge Pit) would be expanded by approximately 21 acres as shown on Figure 2-3. Approximately 1.6 acres of the existing LJ Ridge Rock Disposal Area (shown as the North 4 Rock Disposal Area) would be relocated with the proposed pit expansion, and approximately 5.6 acres of existing haul road would be excavated with the proposed pit expansion. Ore would be hauled on the existing haul road to the BMM process facilities, and waste rock would be hauled on the existing haul road to a nearby proposed rock disposal area expansion.

Top and Sage Flat Pit Complex

The Top and Sage Flat pits are currently being actively mined. The Top Pit would be expanded by approximately 173 acres and would merge with the proposed pit limits for the Sage Flat Pit as shown on Figure 2-4. The Sage Flat Pit would also be expanded as shown on Figure 2-4. As in current operations, ore would continue to be hauled to the Mooney Basin process facilities, and waste rock would be hauled to one of the nearby proposed rock disposal area expansions. Weather and/or processing capacity considerations could necessitate periodic

Figure 2-8 Open Pit Cross-Section LJ Pit

deliveries of ore from Top and Sage Pit Complex to the BMM process facility. A typical pit cross-section for the Top Pit is shown in Figure 2-9.

Rat Pit

Current activities in the Rat Pit vicinity include mining of the pit and depositing of waste rock into the Rat West and Rat East rock disposal areas. The proposed Rat Pit boundary expands the previously authorized pit boundary by approximately 77 acres as shown on Figure 2-5. As is the case with current operations, ore would continue to be hauled to the BMM process facilities, and waste rock would be hauled to either the Rat East Rock Disposal Area or the proposed Rat West Rock Disposal Area. A typical pit cross-section for the Rat Pit is shown in Figure 2-10.

East Bida Pit

The East Bida Pit is currently an active mining area. The proposed design would expand the pit by approximately four acres as shown in Figure 2-6. As is the case with current operations, ore would continue to be hauled to the Mooney Basin process facilities and waste rock would be hauled to adjacent rock disposal areas.

Belmont Pits

The Belmont Pits are currently an active mining area. The Belmont Pit 2 would expand and the Belmont Pit 3 would be created as shown in Figure 2-6. No expansion of the previously authorized Belmont 1 pit is proposed. Ore is proposed to be hauled to the Mooney Basin process facilities, and waste rock would be hauled to a nearby rock disposal area.

Saga Pit

The Saga Pit is currently an active mining area. The proposed pit design would expand the authorized pit limits by approximately 60 acres as shown in Figure 2-6. Ore would be hauled to the Mooney Basin process facilities, and waste rock would be hauled to the proposed Saga Rock Disposal Area. A typical pit cross-section for the Saga Pit is shown in Figure 2-11.

2.3.4 Rock Disposal Areas

Four new rock disposal areas (North 2, North 3, North 5, and Sage Flat rock disposal areas) would be constructed and would result in approximately 588 acres of new disturbance. The six existing rock disposal areas (North 1, North 4, Rat West, South Water Canyon, East Sage, and Saga rock disposal areas) would be expanded and would result in approximately 1,649 acres of new disturbance. These rock disposal areas would be used to store waste rock generated by the proposed mining activities. The new and expanded rock disposal areas would be constructed by end-dumping from haul trucks. In general, and as per current practice, rock disposal areas would be developed and reclaimed to an overall slope of 2.5 Horizontal:1 Vertical or 3 Horizontal:1 Vertical.

The North 2, North 3, and North 4 rock disposal areas (Figure 2-3) and the South Water Canyon Rock Disposal Area (Figure 2-4) are located in steeper terrain, and thus portions would be reclaimed to an approximate 2.5 Horizontal:1 Vertical slope. The Saga, Bida, and Top rock disposal areas would also be constructed to a 2.5 Horizontal:1 Vertical slope to limit the potential infiltration of meteoric water. The rock disposal areas would be built as benched structures to facilitate recontouring and reclamation. Each bench would be designed approximately 100 feet high, with an offset for each bench to provide for overall final regrade lines, except in areas of steeper terrain. Lift heights may be as high as 200 feet in steep terrain. Benches would generally be completed by starting at the base of the slope and working upward. The outside slopes of the final rock disposal area would be constructed such that variable topography would result during reclamation sloping. Basic rock disposal area design parameters

are summarized in Table 2-8, and additional design details are discussed in the following sections.

Waste rock would be hauled to either the proposed expanded rock disposal areas or to the proposed new rock disposal areas near the pit locations. Figure 1-3 shows the locations of the proposed existing/expanded and new rock disposal areas.

As with current operations, stormwater run-on from undisturbed areas upgradient of disturbed areas would be diverted around the rock disposal areas and returned to natural drainages during operations. Stormwater run-off from disturbed areas would continue to be collected in diversion channels and routed to stormwater collection ponds, where applicable. The diversions would be designed to handle the 100-year, 24-hour storm event. Upon rock disposal area reclamation, diversions may be maintained to provide erosional stability. Rock disposal areas would not be located on any seeps or springs.

TABLE 2-8 ROCK DISPOSAL AREA DESIGN PARAMETERS SUMMARY

ROCK DISPOSAL AREA	HEIGHT (FEET)	CREST ELEVATION (FEET ABOVE MEAN SEA LEVEL)	INCREMENTAL CAPACITY (MILLION TONS)
North 1	575	7,275	344
North 2	545	7,700	
North 3	670	8,225	
North 4	985	8,335	
North 5	485	7,300	
Rat West	645	7,500	96
South Water Canyon	750	8,175	95
East Sage	1,100	8,100	605
Sage Flat	540	8,000	40
Saga	340	7,000	50

Note: Capacity is incremental capacity for rock disposal area expansions.

Prior to use, the proposed rock disposal area footprints would be cleared of vegetation, and growth medium would be salvaged and placed in proposed or existing growth medium stockpiles. Growth medium includes all salvaged material to be used for covering facilities during reclamation. To facilitate concurrent reclamation, salvageable growth medium would be stockpiled as close to the place of use as possible, including direct placement on top of rock disposal areas. Proposed and existing growth medium stockpile locations are shown in Figure 2-7.

Rock disposal area material would be managed in accordance with the Waste Rock Management Plan (BMM, 2009). Barrick would continue to conduct quarterly geochemical evaluations of the waste rock in accordance with the approved Waste Rock Management Plan and applicable Water Pollution Control Permits. The geochemical characterization program provides representative information from the Meteoric Water Mobility Procedure, total sulfur, and acid base accounting analyses to evaluate the potential to degrade waters of the State.

No new rock types or sulfide deposits are anticipated to be excavated as part of this Proposed Action, and Barrick proposes to continue the current approved waste rock management practice of comingling all waste rock material. Should any unanticipated sulfide/acid-generating material be encountered late in a mining sequence that would limit or preclude effective comingling, neutralizing waste rock from another mining area would be rehandled as necessary and placed both beneath and over the sulfide material in a minimum 50-foot thickness.

Figure 2-9 Open Pit Cross-Section Top Pit

Figure 2-10 Open Pit Cross-Section Rat Pit

Figure 2-11 Open Pit Cross-Section Saga Pit

North 1, 2, 3, 4, 5

The authorized West Rock Disposal Area would be expanded to the north and west and renamed the North 1 Rock Disposal Area. The North 4 Rock Disposal Area (formerly LJ Ridge Rock Disposal Area) would expand laterally to the west and vertically (Figure 2-3). Waste rock placement on the North 4 Rock Disposal Area would be completed with bench heights of 100 to 200 feet and horizontal offsets to provide for a final constructed average slope of approximately 2.5 Horizontal:1 Vertical.

Proposed rock disposal areas include North 2 Rock Disposal Area, North 3 Rock Disposal Area, and North 5 Rock Disposal Area. Figure 2-3 shows the proposed rock disposal area expansions and locations of proposed new rock disposal areas. Due to the steep terrain, North 2 Rock Disposal Area and North 3 Rock Disposal Area would have final reclaimed slopes of approximately 2.5 Horizontal:1 Vertical.

East Sage

The current East Sage Rock Disposal Area was authorized by a Decision Record/Finding of No Significant Impact for the BMM 2005 Expansion Environmental Assessment (BLM, 2005b). Barrick proposes to further expand the rock disposal area both laterally and vertically as shown on Figure 2-4.

Sage Flat

The proposed Sage Flat Rock Disposal Area would be located south of the proposed East Sage Rock Disposal Area expansion as shown on Figure 2-4. The proposed haul road, shown on Figure 2-4, would connect the proposed Top/Sage Flat Pit Complex with the Sage Flat Rock Disposal Area.

Rat East

The Rat East Rock Disposal Area, which was authorized by the November 1995 Record of Decision for the BMM EIS (BLM, 1995a), would not be expanded under the Proposed Action; however, a portion of Rat East would be excavated by the proposed expansion of the Rat Pit.

Rat West

The Rat West Rock Disposal Area, previously authorized under the November 1995 Record of Decision for the BMM EIS (BLM, 1995a), would be expanded as shown on Figure 2-5.

South Water Canyon

The South Water Canyon Rock Disposal Area, which was authorized by the November 1995 Record of Decision for the BMM EIS (BLM, 1995a), would be expanded as shown on Figure 2-5. Proposed haul roads and interpit areas would connect the Top/Sage Flat Pit Complex to the South Water Canyon Rock Disposal Area. Due to the steep terrain, the South Water Canyon Rock Disposal Area would be reclaimed to final reclamation slopes of approximately 2.5 Horizontal:1 Vertical.

Saga

The Saga Rock Disposal Area, which was authorized by the November 1995 Record of Decision for the BMM (BLM, 1995a), would be expanded as shown on Figure 2-6.

2.3.5 Heap Leach Facilities

The currently authorized 2/3 Heap Leach Pad would be expanded by approximately 121 acres and the currently authorized Mooney Basin Heap Leach Pad would be expanded by approximately 272 acres. Figure 2-7 shows locations of the existing facilities and proposed heap leach expansions. Leach pad and facility footprints would be cleared of vegetation, and

growth medium would be salvaged and placed in growth medium stockpiles as close to the place of use as possible.

In general, ore would be end-dumped by haul trucks on the leach pads in 10- to 30-foot lifts. If conditions warrant, leach material may also be crushed followed by placement of the ore on the heaps using conveyors and a radial stacker. The need for crushing the ore would be based on future material testing. Seismic analysis and engineering principles would determine the appropriate placement of leach pad catch benches, lift height, maximum heap height, and overall foundation and pad slopes as per State of Nevada requirements. To maintain the reclaimed pad within the perimeter berm, the design would incorporate the principle of constructing the heap leach benches and setbacks or bench widths at an overall angle of 3 Horizontal:1 Vertical. Basic heap design parameters are consistent with existing, approved operations and are shown in Table 2-9. Detailed heap leach facility design is discussed in the following sections.

TABLE 2-9 HEAP LEACH PAD DESIGN PARAMETERS SUMMARY

LEACH PAD	HEAP HEIGHT (FEET)	CREST ELEVATION (FEET ABOVE MEAN SEA LEVEL)	INCREMENTAL CAPACITY (MILLION TONS)
BMM (2, 3, 4, 5)	250	6,810	94
Mooney Basin	250	7,195	124

2/3 Heap Leach Pad

The currently active 2/3 Heap Leach Pad was authorized by the November 1995 Record of Decision for the BMM EIS (BLM, 1995a) for 229 acres of disturbance. The proposed expansion of approximately 121 acres is shown in Figure 1-3.

Approximately 333 acres of disturbance was authorized by the Record of Decision for the 1995 BMM EIS (BLM, 1995a) for development of a tailings storage facility near the 2/3 leach pad. Although the tailings facility was never constructed, the disturbance has been authorized. The proposed expansion of the 2/3 leach pad would disturb approximately 63 acres of this previously authorized disturbance. Thus, Table 2-4 indicates a reduction in total acreage of leach pad disturbance under the Proposed Action.

Mooney Basin Heap Leach Pad

The Mooney Basin Heap Leach Pad and process facilities are currently authorized for 149 acres of disturbance. The proposed expansion of the currently authorized Mooney Basin Heap Leach Pad would disturb approximately 272 acres in the area shown in Figure 2-6. Final design of the proposed process components would be similar to that currently used for the existing leach pads and in accordance with State of Nevada Water Pollution Control Permit requirements.

Design and Operation

The expanded heap leach facilities would be designed to contain leach material and solution in accordance with Nevada Administrative Code 445A.432. Facilities would employ the design principle of 100 percent containment (zero-discharge design) under both normal operating and specific emergency conditions. Solution ponds are ponds that contain the barren and pregnant (gold-bearing) cyanide solution. As with existing facilities, new solution ponds and collection ditches would be double-lined with synthetic liners and would incorporate continuous leak collection and recovery systems between the liners. The solution ponds would be sized and operated to withstand and fully contain all process fluids as well as projected accumulations from a 25-year, 24-hour storm event and sustained power outage. Solution that could be toxic

to wildlife and domestic animals would be fenced and covered to prevent access, as required by the NDOW Industrial Artificial Pond Permit.

Before placement on the heap, ore would be amended with lime for pH control as necessary. Either dilute sodium cyanide or dilute calcium cyanide solution would be applied to the ore on the pad. Solution would percolate through the ore to the synthetic liner, flowing via pipes and ditches to a lined pregnant solution pond. The pregnant solution would then be recovered and pumped through carbon columns to load gold onto carbon. Cyanide would be added to the barren solution, which would be re-circulated back to the heap to continue the leaching process.

Loaded carbon would be managed at either BMM or Mooney Basin process facilities or transported to off-site refining facilities. On-site refining entails stripping gold from the carbon in pressure strip vessels and then washing the stripped carbon with acid prior to reactivation in a kiln. The stripped gold is plated onto cathodes in electrowinning cells and these cathodes are placed into a doré furnace. The molten metal is poured into gold doré bars, which are shipped off-site for further refining.

2.3.6 Monitoring Wells

BMM currently has six monitoring wells Bald 1, Bald 2, MWW 1, MWW 1R, MWW 2, and MWW 3. An additional eight wells are proposed to monitor groundwater quality around the site. This includes three wells at proposed Mooney Basin Heap Leach Pad, two wells at Saga rock disposal area, one well at East Sage rock disposal area, and two wells at North 1 rock disposal area. The locations of the existing and proposed monitoring wells are shown on Figure 2-12.

2.3.7 Roads

Roads within the Proposed Action area include existing and proposed haul roads and access roads as shown on Figure 1-3. Roads used for exploration activities have been previously authorized by the BLM, and new exploration access roads within the Proposed Action boundary would continue to be evaluated for potential site specific impacts on cultural resources, wildlife resources, and noxious weeds as they are proposed. Some existing exploration roads would be incorporated into proposed pit expansions; thus there would be a reduction in secondary road disturbance of 11.2 acres, as indicated in Table 2-4. Stormwater and erosion control features for proposed roads would be implemented in accordance with the Stormwater Pollution Prevention Plan (BMM, 2009) that has been prepared in compliance with the Nevada Mining General Stormwater Permit, NVR300000. See Table 2-13 for design features (applicant-committed environmental protection measures).

Public Access

Barrick would restrict public access on existing roads that cross active mining areas in the Proposed Action area, as per Mine Safety and Health Administration requirements. The Proposed Action area would encompass 16,465 acres, an expansion of 3,738 acres from the current BMM and Mooney Basin Plans of Operation boundaries. Public access would be controlled through the guard shack, with fences and locked gates or other physical methods. Once reclamation is complete, public access roads would be re-established for general use.

Haul Roads

The Proposed Action includes widening existing haul roads and developing new haul roads within the Plan of Operations boundary, as shown in Figure 1-3. Maximum running widths (road utilization) would be 110 feet with average total surface disturbance widths of approximately 165 feet. The actual road disturbance width (running width plus berms and cut-fill areas) would vary depending on topography. Approximately 159 acres of disturbance would result from

construction of new haul roads and expansion of existing haul roads. Haul road berms would be designed to facilitate mule deer migration, as identified as a key issue for wildlife.

Haul roads that are shown in interpit areas have been included with the surface disturbance associated with those facilities. Portions of the existing haul road, such as that between the North 1 Pit and the heap leach facilities, would become part of proposed rock disposal area disturbance (Figure 1-3). Haul roads that cross rock disposal areas, or are ultimately covered by reclaimed rock disposal areas, are included in the rock disposal area surface disturbance acreage.

2.3.8 Employment

Barrick presently employs approximately 180 to 210 full-time and 50 to 100 contract employees at the BMM. This Barrick staffing level is expected to increase approximately 50 percent under the Proposed Action with only a minor increase in contract employees (5 to 10). The total work force under the Proposed Action would be approximately 275 to 325 at peak levels.

2.3.9 Transportation

Employees would continue to be transported in buses and/or vans to the mining areas from Elko, Ely, and Eureka via the access routes shown in Figure 1-1. It is anticipated that one bus would be added to the fleet of two buses currently used. The additional bus would likely be added to the Elko route. The mine's Employee Handbook strongly encourages employees to use company-provided transportation to the mine instead of personal vehicles. In practice, employees rarely use personal vehicles unless they miss the bus or van. The high cost of personal transportation is a strong incentive to use company-provided transportation.

Bulk chemicals and supplies would typically be transported to the site on trucks via one of the following access routes:

- From Ely or Eureka via U.S. Highway 50 to State Highway 892 (Strawberry Highway) to the BMM operations; or
- From Ely via U.S. Highway 50 to Long Valley Road to the Mooney Basin Operations Area.

Bulk chemicals and supplies are not typically transported from Elko via Highway 228. There are no current restrictions on delivery times, and no restrictions are proposed. It is estimated that deliveries would increase 10 to 15 percent, to 1,500 trips per year.

2.3.10 Support Facilities

Surfaces for the support facilities described below would be grubbed (removal of vegetation) and cleared. Salvageable growth medium would be stockpiled in nearby existing or proposed stockpiles for use in reclamation when the facilities are no longer needed.

Power Lines and Substations

A new power line is proposed from the substation near the Mooney Basin process facilities to the Top/Sage Pit Complex area (Figure 1-3), resulting in 14.4 acres of disturbance. A substation would be located near the Top Pit haul road intersection, and line power would be run to the Top/Sage Pit Complex for mining/equipment needs and the proposed maintenance shop.

Freshwater Supply

BMM would continue to utilize existing water wells (Figure 1-2) located on-site for fresh and potable water supplies. BMM would install a treatment system to treat groundwater produced

Figure 2-12 Monitoring Well Locations

from an existing well in order to provide drinking water for the site. There would be an increase of approximately 250 acre-feet per year of ground water pumping.

Additional permits for water systems would be acquired, as needed, for supply and distribution systems that meet or exceed State standards for the number of users or number of connections. Depending on existing well productivity, new wells could be developed to insure adequate supply for site operations.

Growth Medium Stockpiles

Where possible, growth medium stockpiles would be located within interpit areas or on the top of existing rock disposal areas. Alternatively, stockpiles could be located at the base of proposed rock disposal areas and heaps as shown on Figure 1-3.

Yards (Shop Areas and Storage Areas)

A shop area is proposed within the existing East Sage Rock Disposal Area boundary on the southern edge; thus, no new disturbance would result. The shop would accommodate three to four large pieces of equipment and include an oil/lube storage area and fuel island. Existing shop facilities at BMM would also be expanded or modified to accommodate new equipment sizes.

2.3.11 Hazardous Materials

This section describes the quantities of additional mine process chemicals and fuel, transportation of these materials, and on-site storage. Emergency response procedures for transport accidents and for release from storage and processing facilities are also discussed. Types, quantities, and disposal methods for hazardous materials and other wastes that would be generated under the Proposed Action are expected to be similar to current amounts and procedures.

Chemical Transportation and Storage

As described in the draft Spill Contingency Plan (BMM, 2009), the primary chemicals and fuels to be used as part of the Proposed Action consist of sodium or calcium cyanide, diesel fuel, ammonium nitrate, sodium hydroxide, propane, lime, gasoline, carbon, and anti-scalant. These chemicals do not differ in type from those currently utilized at the existing operations, but there would be larger quantities (Table 3-34). Trucks transport chemicals to the BMM and Mooney Basin Operations Area sites on an as-needed basis.

The transportation routes for chemicals and petroleum products to the BMM North Operations Area Project would remain unchanged from current delivery routes, which are identified in Section 2.3.9.

Currently approved staging facilities, safety measures, transportation, and handling requirements that are already in use would continue to be utilized. Any new storage areas would be constructed as authorized with 110 percent secondary containment, where appropriate. Sodium cyanide is and would continue to be stored in areas that are physically separated from acid storage areas. Chemical storage areas are shown on Figure 2-1. Blasting agents and explosives would continue to be stored and used on-site in accordance with Mine Safety and Health Administration (30 Code of Federal Regulation 56E) and Bureau of Alcohol, Tobacco, and Firearms regulations.

Emergency Planning and Response

The transportation, storage, and use of fuels, explosives, and reagents require adherence to applicable regulations and guidelines established and enforced by the Nevada Division of

Environmental Protection, U.S. Department of Transportation, Nevada Department of Transportation, Bureau of Alcohol, Tobacco, and Firearms, Department of Homeland Security, and Mine Safety and Health Administration. The site Emergency Response Plan (BMM, 2009) has been updated for the existing approved plans for the BMM and Mooney Basin Operations Area. The purpose of an Emergency Response Plan is to establish responsibilities and guidelines for actions to be taken by mine personnel in the event of an emergency at the mine. The plan identifies potential sources of spills, establishes measures of prevention, and defines control, cleanup, and reporting procedures in the event of a hazardous material spill, petroleum release, or natural disaster. The plan contains procedures for response to on- and off-site incidents.

A fluid management plan is required by the Nevada Division of Environmental Protection for each Water Pollution Control Permit. This plan provides designs and operational descriptions of the fluid management systems in place for process facilities that provide containment of process fluids during normal and unusual natural or operational events. These plans are currently in place and would be updated as part of the Nevada Division of Environmental Protection permitting process for any new process components associated with the Proposed Action.

Reporting and Notification

BMM and Mooney Basin Operations Areas have currently approved Emergency Response Plans. The updated site plan would be submitted to the applicable agencies for approval prior to commencement of expanded process operations. With an approved plan, state and federal reporting requirements for qualifying releases consist of notification by telephone no later than 5 p.m. of the next regular work day from the time of the incident to:

- Nevada Division of Environmental Protection's 24-hour emergency notification number at 888-331-6337;
- Nevada Division of Emergency Management at 775-687-4240 during normal working hours or at 775-687-5300 after hours;
- Local Emergency Planning; and
- National Response Center at 800-424-8802.

Waste Management

No change to the existing non-hazardous solid waste streams (types and sources of non-hazardous waste) would occur as a result of the Proposed Action. The currently authorized BMM Class III waived landfill location would continue to be utilized for the Proposed Action, and an additional landfill site may be developed in the Mooney Basin Operations Area to accommodate expanded operations. The new landfill location is in a previously disturbed area associated with the Saga rock disposal area and is shown on Figure 2-6. When an appropriate site has been finalized, a permit application for the landfill would be submitted for approval by the Nevada Division of Environmental Protection. The landfills can accept approved non-hazardous wastes including glass, plastics, waste paper, wood, scrap metal, used tires, and non-hazardous laboratory wastes. An approved management plan for the landfill lists the allowable materials types, weekly maintenance programs, inspection programs, and closure requirements. Maintenance activities include weekly cover of the waste material. Inspections are conducted weekly to insure adequate cover placement, containment of waste material, and control of stormwater.

The Nevada Division of Environmental Protection, Bureau of Waste Management regulates the hazardous waste program in the State of Nevada. Its role, as defined in Nevada Revised Statutes 459.400, is "to protect human health, public safety and the environment from the effects of improper, inadequate or unsound management of hazardous waste; establish a program for regulation of the storage, generation, transportation, treatment and disposal of hazardous waste; and ensure safe and adequate management of hazardous waste." The Nevada Division of Environmental Protection hazardous waste program is responsible for permitting and inspecting hazardous waste generators and disposal, transfer, storage, and recycling facilities. It is also responsible for enforcing State hazardous waste statutes and regulations and is authorized to enforce Federal hazardous waste regulations in lieu of the Environmental Protection Agency. The State of Nevada has adopted by reference, with certain modifications, the Federal hazardous waste regulations.

Hazardous waste management is subject to specific requirements that are dependent upon the amount of hazardous waste produced at a facility in a calendar month. The BMM and Mooney Basin Operations Areas are currently classified as a Small Quantity Generator of hazardous waste as defined by the Resource Conservation and Recovery Act. Facilities with this classification generate less than 1,000 kilograms (2,200 pounds) of hazardous waste in a month. No change in classification is expected due to the Proposed Action.

No new hazardous waste streams would be generated as part of the Proposed Action. The practice of recycling used oil, antifreeze, solvents, and batteries would continue under the Proposed Action. Currently authorized temporary on-site hazardous waste storage areas would be utilized for any hazardous waste generated under the Proposed Action. All off-site, manifested transfers to treatment, storage, and disposal facilities would continue in accordance with the Resource Conservation and Recovery Act, Nevada Division of Environmental Protection, and Nevada Department of Transportation regulations.

2.3.12 Public Safety

The Proposed Action boundary is only partially fenced due to existing topography and the size of the Proposed Action area. Barrick currently utilizes and will continue to provide public safety controls for the mine site to limit public access to the extent possible. Public safety measures used at the facility include security fences located at the two entrances to the mine site, fencing around potentially hazardous areas such as the heap leach pads, process ponds, and process buildings, and construction of berms along haul roads to prevent access to these roads. All chemicals on-site are stored in secure buildings at locations throughout the mine site.

Other general safety measures used at the mine site include the following:

- Speed limits are posted and enforced on access routes and on roads throughout the project site;
- Warning signs are posted in areas where flammable materials and hazardous materials are stored and in areas where conditions warrant posting of signs;
- Training is conducted for all employees as required by the Mine Safety and Health Administration;
- All other Mine Safety and Health Administration training and safety requirements are followed and enforced by Barrick.

2.3.13 Building Inventory

There are numerous buildings associated with the existing operation. These buildings would remain in place and be used for the same purposes as with the existing operation. Only one new structure is planned with the Proposed Action. As part of the Proposed Action, a new vehicle maintenance building would be constructed in the Top Pit area. In addition, the maintenance building at BMM would be expanded to allow maintenance of the larger equipment planned under the Proposed Action. The following provides a list of the current structures at the site.

Bald Mountain Buildings

- Main Office
- EHS Office
- Geology Office
- Truck Shop/Warehouse
- Main Process
- Process Trailer #1
- Process Trailer #2
- Mine Operations Office
- Geology/Core Shed
- Guard Shack/Ambulance Bay
- Assay Lab
- Wash Bay
- Tire Pad/Shop
- Electrical Shop
- Mobile Storage Trailers (10 total)

Mooney Basin Buildings

- Main Process
- Mooney Process Trailer #1
- Mooney Process Trailer #2
- Communications Center

All of these structures meet the “Reasonably Incident” definition in 43 CFR 3715.0 – 5, and the activities that are the reason for occupancy as specified in 43 CFR 3715.2.

2.3.14 Reclamation Plan

Reclamation activities described in this section would be implemented for the facilities or disturbance associated with the Proposed Action. Reclamation of current or existing facilities has been addressed and approved under the previously approved Plans of Operations and reclamation permit. Reclamation of disturbed areas resulting from activities associated with the Proposed Action would be completed in accordance with BLM and Nevada Division of Environmental Protection regulations. BLM Surface Management Regulations, 43 Code of Federal Regulation 3809, establish procedures and standards for prevention of unnecessary or undue degradation of public lands by operations authorized by the mining laws and provide for the maximum possible coordination with appropriate State agencies to avoid duplication. The State of Nevada requires that a reclamation plan be developed for any new mining projects or expansion of existing operations (Nevada Revised Statute 519A). The BMM North Operations Area Project Reclamation Plan (BMM, 2009) incorporates previously authorized reclamation plans and addresses activities associated with the Proposed Action.

The objectives of the proposed reclamation program are as follows:

- To provide a stable post-mining landform that supports defined land uses;
- To minimize erosion damage and protect water resources through control of water run-off and stabilization of components;
- To establish post-reclamation surface soil conditions conducive to the regeneration of a stable plant community through stripping, stockpiling, and reapplication of soil material;
- To revegetate disturbed areas with a diverse mixture of plant species in order to establish productive plant communities compatible with existing land uses;
- To maintain public safety by stabilizing or limiting access to mine features that could constitute a public hazard; and
- To minimize impacts to visual resources.

Schedule

Under the Proposed Action, the BMM North Operations Area Project would be active for approximately 10 years. The combined life of the current and Proposed Actions, including mining, ore processing, and most reclamation, is estimated to extend to the year 2020. Closure activities, final reclamation, and post-closure monitoring may extend several years beyond that date. The projected reclamation schedule is provided in the BMM Plan of Operations (BMM, 2009).

Concurrent reclamation would occur when practical and safe. Concurrent reclamation would involve contouring and revegetating the permanently inactive areas during operations. Upon completion of mining, final recontouring and seeding would be completed pursuant to the Reclamation Plan and Final Permanent Closure Plan as approved by the Nevada Division of Environmental Protection and BLM.

Post-Mining Land Use

The post-mining land use would be consistent with pre-mining land uses, including mineral exploration and development, livestock grazing, wildlife habitat, and dispersed recreation. Barrick would work with the agencies and local governments to evaluate alternative land uses that could provide other socioeconomic benefits from the mine infrastructure. The proposed reclamation activities and post-mining land uses are designed to be in conformance with the approved Ely District Record of Decision and Approved Resource Management Plan (BLM, 2008) and with White Pine County zoning ordinances.

Post-Mining Topography

Large constructed topographic features, such as rock disposal areas and heap leach pads, may have rounded crests and variable slope angles to resemble natural landforms, as well as interspersed rock piles or rock features. The final reclamation configuration would provide a stable post-mining landform as determined by both seismic and erosional performance (Figure 2-13). Slopes would be regraded to either 2.5 Horizontal:1 Vertical (in select cases) or 3 Horizontal:1 Vertical or shallower. To limit erosion, growth medium would be placed on the regraded surface and the surface would be seeded. The open pits would remain as open pits with safety berms to preclude vehicular access to the pits. Post-reclamation topography is provided in the BMM (2009) Plan of Operations.

Growth Medium Management

Growth medium would be salvaged prior to construction of any proposed mine component, including pits. The growth medium would be recovered where available, targeting minimum reclamation cover volumes for nearby components. The targeted depth of growth medium on reclaimed surface will be dependent on the specific component. Minimum depths for growth medium placed on reclaimed surfaces range from six (six to 12 inches on waste rock areas) to 24 (heap leach pads) inches. It is anticipated that all areas affected by the Proposed Action, except areas limited by topography, would have available growth medium removed and placed into stockpiles. All salvageable growth medium would be removed from these areas. The growth medium would be placed in segregated stockpiles located near the components for which the material would be used and in such a manner as to reduce degradation of the material by wind and water erosion. Stockpiles that would remain in place throughout a growing season would be seeded with an interim seed mixture (Table 2-10) to help stabilize the material and minimize non-native species establishment.

TABLE 2-10 INTERIM SEED MIXTURE FOR GROWTH MEDIUM STOCKPILES

SPECIES	COMMON NAME	PURE LIVE SEED (POUNDS PER ACRE)
<i>Agropyron smithii</i>	Western wheatgrass	3.0
<i>Elymus trachycaulus ssp.</i>	Slender wheatgrass	1.0
<i>Melilotus officinalis</i>	Yellow sweetclover	3.0
<i>Onobrychis viciifolia</i>	Remont sainfoin	1.0
	Total	8.0

Revegetation

Reclaimed surfaces would be revegetated to reduce run-off and erosion, provide forage for wildlife and livestock, control invasive weeds, and reduce visual impacts. Seed would be applied with a rangeland drill, hydroseeder, or mechanical broadcaster and harrow, depending upon accessibility. Seedbed preparation and seeding would typically take place between the BLM-recommended dates of October 1 and March 15 of each year after grading and growth medium placement activities are complete. Seeding outside these dates may occur depending on weather conditions.

Two reclamation seed mixtures and application rates have been approved by the BLM for the authorized facilities: one for elevations above 7,000 feet and a second for elevations below 7,000 feet, as shown in Tables 2-11 and 2-12. The plant species in these seed mixtures have the ability to grow within the constraints of the low annual precipitation experienced in the region and are suitable for the site elevation, soil types, and aspects. The plants also provide erosion protection as well as forage and cover characteristics similar to the pre-disturbance conditions, thus facilitating post-mining land use.

The proposed seed mixtures and application rates would be subject to modification based upon the actual results of concurrent reclamation within the Proposed Action area, revegetation test plots, or changes by the BLM to the seed mix recommendations.

Revegetation monitoring has been ongoing at the existing, authorized facilities to evaluate and select successful, site-specific reclamation measures that would achieve the reclamation standards or to demonstrate the need to plant species mixes that would be adaptable to different geomorphic settings expected within the reclaimed Proposed Action area, including different aspects and soil or growth medium amendments. Various surface preparation techniques would continue to be evaluated for their success in promoting plant establishment and resistance to soil erosion. This program has been implemented in the past in coordination

Figure 2-13 Post Mining Reclamation Topography

with BLM and Nevada Division of Environmental Protection, and results from this program would be used in determining proper revegetation methods for approved and proposed disturbance.

TABLE 2-11 RECOMMENDED SEED MIXTURE BELOW 7,000 FEET

SPECIES	COMMON NAME	PURE LIVE SEED (POUNDS PER ACRE)
<i>Pseudoroegneria spicata</i> spp. <i>spicata</i>	Bluebunch wheatgrass	1.0
<i>Agropyron smithii</i>	Western wheatgrass	1.5
<i>Leymus cinereus</i>	Great Basin wildrye	1.0
<i>Achnatherum hymenoides</i>	Indian ricegrass	0.5
<i>Elymus lanceolatus</i> spp. <i>lanceolatus</i>	Thickspike wheatgrass	1.0
<i>Elymus elymoides</i>	Bottlebrush squirreltail	0.5
<i>Poa secunda</i>	Sandberg's bluegrass	0.1
<i>Linum lewisii</i>	Appar blue (Lewis') flax	0.5
<i>Onobrychis viciifolia</i>	Remont sainfoin	2.0
<i>Penstemon palmeri</i>	Palmer's penstemon	0.1
<i>Atriplex confertifolia</i>	Shadscale	1.0
<i>Atriplex canescens</i>	Fourwing saltbush	1.0
<i>Chrysothamnus viscidiflorus</i>	Douglas' rabbitbrush	0.1

Note: The above is a list of BLM-approved reclamation species; the actual seed mix would vary from one area to another. BLM and NDOW would approve the actual seed mix before seeding of a particular area.

TABLE 2-12 RECOMMENDED SEED MIXTURE ABOVE 7,000 FEET

SPECIES	COMMON NAME	PURE LIVE SEED (POUNDS PER ACRE)
<i>Artemisia tridentata</i> ssp. <i>vaseyana</i>	Mountain big sagebrush	0.1
<i>Purshia tridentata</i>	Antelope bitterbrush	0.5
<i>Linum lewisii</i>	Appar blue (Lewis') flax	0.1
<i>Balsamorhiza sagittata</i>	Arrowleaf balsamroot	0.5
<i>Penstemon palmeri</i>	Palmer's penstemon	0.1
<i>Pseudoroegneria spicata</i> spp. <i>spicata</i>	Bluebunch wheatgrass	2.0
<i>Elymus trachycaulus</i> ssp.	Slender wheatgrass	1.0
<i>Elymus lanceolatus</i> ssp. <i>lanceolatus</i>	Thickspike wheatgrass	1.0
<i>Poa canbyi</i>	Canby's bluegrass	0.1
<i>Leymus cinereus</i>	Great Basin wildrye	1.0
<i>Achnatherum hymenoides</i>	Indian ricegrass	0.5
<i>Elymus elymoides</i>	Bottlebrush squirreltail	0.5

Note: The above is a list of BLM-approved reclamation species; the actual seed mix would vary from one area to another. BLM and NDOW would approve the actual seed mix before seeding of a particular area.

Revegetation efforts would be determined to be successful and complete upon demonstrating compliance with Nevada Guidelines for Successful Reclamation (NDEP, 1998) and upon approval by the BLM and Nevada Division of Environmental Protection. The results of revegetation monitoring would be used in conjunction with these guidelines to determine applicable vegetation release criteria under the Proposed Action.

Surface Water and Sediment Control

Surface water would be diverted around mine features through primary stormwater diversions, culverts, and secondary perimeter berms and/or ditches. Silt fences, sediment traps, and/or other erosion control measures would be used to prevent migration of sediment from disturbed areas until reclaimed slopes and exposed surfaces are stabilized. A preliminary Stormwater Pollution Prevention Plan has been prepared and is part of the Proposed Action. This draft plan is based on existing stormwater controls and outlines potential sources of stormwater pollution and erosion control measures that may be used during operations.

Open Pits

Mining would result in excavations to varying depths. Overall, pit slopes would range from approximately 38 degrees to 56 degrees, depending on rock type and geotechnical considerations. Ongoing geotechnical and slope movement monitoring studies would be used to evaluate the safety of open pit slopes. During final reclamation, a berm would be constructed along open pit crest areas to control and prevent access by people and livestock.

Rock Disposal Areas

The rock disposal areas would be reclaimed to meet certain objectives including reduced slope erosion, mass stability, rounded edges, revegetated surfaces, reducing meteoric infiltration, and rates of soil loss consistent with the surrounding topographic features. The final slopes of the reclaimed rock disposal areas would vary, with slopes of 2.5 Horizontal:1 Vertical or shallower and slight benches remaining at required intervals to reduce surface water flow velocities and erosion. As shown in the Revised Universal Soil Loss Equation analyses (BMM, 2009), reducing the slope length by providing a horizontal catch bench results in significantly less potential erosion from rock disposal area surfaces. The tops of the Saga, Bida and Top rock disposal areas would be rounded to promote meteoric water run-off and eliminate large, flat surfaces which could allow water to pond and infiltrate.

As the rock disposal areas reach their ultimate configurations and become inactive, the face would be regraded. Once regraded, the surface would be covered with stockpiled growth medium. The targeted depth for growth medium on the rock disposal areas is between six and 12 inches. Depending upon location, the area would then be seeded with the seed mixture shown in either Table 2-11 or Table 2-12 or as determined at the time of closure through consultation with the BLM and Nevada Division of Environmental Protection. This method has proven successful at BMM over the past several years on existing rock disposal areas.

In addition to the general description of the reclamation for the rock disposal areas, additional reclamation measures for the specific rock disposal areas include the following:

- The reclamation for the Saga, Bida, and Top rock disposal areas would include placement of adequate material at closure so the top of each rock disposal area would be “rounded” to promote surface run-off from the top of the rock disposal area.
- After final grading of the Saga and Bida rock disposal areas during reclamation, there would be six to 12 inches of growth media (depending on availability) placed on the rock disposal areas prior to seeding with the approved BLM seed mixture. This soil/vegetative cover would reduce the infiltration of meteoric water and enhance evapo-transpiration.
- The side slopes of the Saga, Bida, and Top rock disposal areas would be graded to a nominal 2.5 horizontal to 1 vertical. This change will reduce the residence time of water

on the rock disposal area face and increase the run-off rate, further reducing the potential for infiltration.

- The engineering design for the drainage channel network for the Saga, Bida, and Top rock disposal areas would be modified to account for the slightly higher flow rates resulting from the steepening of the side slopes and to prevent erosion.

Heap Leach Pads

The heap leach facilities would be decommissioned in accordance with Nevada Division of Environmental Protection regulations and guidelines for closure. A Tentative Plan for Permanent Closure, as required by Nevada Administrative Code 445A.398, is already included within the current Water Pollution Control Permit applications for existing leach facilities. A Final Plan for Permanent Closure, to include proposed expansion components, would be prepared and submitted to Nevada Division of Environmental Protection and BLM two years prior to the termination of each heap leach facility operation, as per Nevada Administrative Code 445A.447. Final closure plans for both the 2/3 Heap Leach Pad and Mooney Basin Heap Leach Pad are anticipated to follow those of other pad closures already evaluated and successfully completed within the BMM district (Alligator Ridge, Yankee, Little Bald Mountain, and BMM Pad 1).

Chemical stabilization of heap leach pads is required to obtain permanent closure. Nevada Administrative Code 445A.379 defines *stabilized* as “the condition which results when contaminants in a material are bound or contained so as to prevent them from degrading the waters of the State under the environmental conditions that may reasonably be expected to exist at a site.”

Geochemical investigations and empirical monitoring that have been conducted at the existing closed facilities such as Yankee and BMM Pad No. 1 (SRK, 2001; Geomega, 2000) indicate that there is no additional benefit in recirculation of process solution within the heap or rinsing with fresh water beyond the point in time where economic gold recovery is no longer achieved. Further, the evapo-concentration of salts and metals resulting from extended recirculation may slow chemical stabilization. Therefore, rinsing is not expected to be beneficial or required to stabilize the heaps associated with this ore type.

Following cessation of active leaching, solution from both currently active heap leach pads would be managed through recirculation and active evaporation until draindown from the pads can be managed long-term through the use of evapo-transpiration cells. Recirculation would occur until the existing process ponds have sufficient capacity to contain 24-hours of draindown from the leach pads. Active evaporation would be used to reduce the volume of process solution through the use of sprinklers, snow makers, or other devices. This active evaporation would occur until the volume of draindown is sufficient to be managed with the evapo-transpiration cells.

The heap leach pads would be constructed in lifts ranging in thickness of 10 to 30 feet (design benches of 25 feet), depending upon operational considerations. Heaps would be constructed in lifts set on a 3 Horizontal:1 Vertical balance line to ensure ease of final reclamation to a 3 Horizontal:1 Vertical slope. As with previous heap leach closures within the mining district, each bench would be regraded to the final configuration with overall slopes of 3 Horizontal:1 Vertical. When no longer required for evaporation of fluids, the surface solution circulation piping would be removed or buried within the leach facility, and the perimeter ditches would be filled with a protective layer and clean growth medium and/or barren rock. Side-slopes would then be regraded to match closely with the crest of the perimeter collection ditches in preparation for the placement of soil cover. The BMM leach pad closure studies (Brown and Caldwell, 1997, 1998,

2000; Geomega, 2000; SRK, 2001) indicate the benefit of placement of 18 to 36 inches of growth medium on the reclaimed heaps as this provides for a stable post-closure landform and reduces the infiltration of meteoric waters. A thicker cover on the heap leach pad as compared with other facilities (e.g., waste rock facilities) would allow retention of water in the cover material during snow melt and precipitation events and make this water readily available for uptake by plants. By retaining the water in the cover material, the amount of water infiltrating is reduced, thus minimizing the draindown solution that would be handled by the evapo-transpiration cells during closure and post-closure.

The recontoured heap leach pads would be covered with 24 inches of growth medium, which will act as an evapo-transpiration cover to reduce meteoric water infiltration into the heap leach pad. The depth of the evapo-transpiration cover is based on studies conducted to analyze infiltration at differing depths of cover (from 18 inches to 36 inches) (Brown and Caldwell, 1997, 1998, 2000; Geomega, 2000; SRK, 2001), and on information and past success at other closed facilities at this mine site. If future studies for any individual pad indicate a need for greater cover, this information would be provided to the Nevada Division of Environmental Protection and BLM, and the reclamation plan would be adjusted accordingly. Revegetation of the heaps would be carried out following growth medium placement.

Stormwater diversion structures would be constructed upgradient of the heaps to prevent impacts from stormwater run-on. These structures would not be reclaimed but would be retained to minimize erosion over the long-term.

As the heaps are stabilized and closed, the long-term heap drainage would be routed to evapo-transpiration cells or evaporation cells to further reduce or eliminate the discharge from the system. Long-term heap drainage refers to drainage from the heap leach pad after active evaporation is no longer needed to reduce the draindown and the draindown is solely managed through the evapo-transpiration or evaporation cells. This time period varies with each leach pad but typically ranges from several years to 20 years. The evapo-transpiration cells or evaporation cells are typically constructed by converting the existing solution ponds. Evapo-transpiration cells use plants to evapo-transpire solution while evaporation cells rely strictly on evaporation to eliminate draindown solution. Initial heap water balances and empirical evapo-transpiration cell data from other closed facilities at this site indicate that site evaporation and transpiration can be employed to result in zero-discharge stability at the site. Barrick proposes to pursue this long-term zero-discharge option as a primary goal for closure.

Site-specific data would be collected for each proposed heap and submitted as part of the Final Plan for Permanent Closure at least two years prior to the closure of each heap. Information from the site closure studies conducted for the five closed heaps within the mining district indicated no long-term potential to degrade waters of the State. Where data do not support the implementation of evapo-transportation cells or evaporation cells, alternative removal, use, or treatment of the fluids may be required. A final permanent closure plan would be developed with the Nevada Division of Environmental Protection.

Solution Ponds

Solids would be present in some quantity in most of the ponds at the time of closure. Representative samples would be obtained to determine the chemical characteristics of the pond solids. Depending on the results of the characterization testing, the solids would either be left in the ponds with the pond liners (liners would be folded over and buried in place), removed and placed on the heap prior to regrading and covering, removed and sold for metal recovery, or removed and placed in an approved landfill.

Where the ponds may be converted into a passive post-closure fluid management evapo-transpiration cell or evaporation cell, the liners would be inspected and repaired as necessary. The pond liners would be protected with a specified two-foot overliner layer or other suitable protective layer and then backfilled with alluvium with a fluid conveyance/distribution system. The surface would be graded to prevent accumulation of water and to blend with the surrounding topography. A growth medium cover of six to 12 inches would be placed over the resulting evapo-transpiration cell. Evaporation cells would be left open, if used (generally based on geochemical considerations and biological risk evaluation), resulting in a lined pond.

The liners for ponds not designated as part of the closure fluid management system would be cut, folded, and left in the pond bottoms prior to backfill and reclamation of the pond. The pond would be returned to a landform that is free-draining and supports post-closure revegetation through placement of an average of six to 12 inches of growth medium.

Roads

The Proposed Action area encompasses terrain from nearly flat to upwards of 30 percent slopes. Haul and access roads would be constructed in a wide variety of terrain within the Proposed Action area. Reclamation of roads in very steep terrain may not allow original topography to be attained. In this case, the cross-section would be blended to ensure no steeper than 2.5 Horizontal:1 Vertical slopes except where cut banks are on the inside of the road and located generally in bedrock. Those cuts in bedrock may remain as permanent features similar to a cliff or rock outcrop.

Within the Proposed Action area, roads and safety berms would be recontoured or regraded to the approximate original topography. Where the road is located on fill, the side slopes would be rounded and regraded to 3 Horizontal:1 Vertical. Finished slopes would be relatively similar to the surrounding topography. Compacted road surfaces would be ripped, covered with soil/growth medium from the safety berms or road fill if required, and revegetated. Dikes and ditches that would no longer be required would be regraded. Where the fill portion of the road would be largely removed, ripping would be performed only where the original roadbed would otherwise be left in place.

Some roads would be needed during closure activities to access monitoring points. Any remaining roads would be recontoured and revegetated when no longer needed.

Disposition of Structures, Equipment, and Materials

As stated in the current reclamation plan for existing facilities, during final mine closure buildings and structures would be dismantled and materials would be salvaged or moved to the site landfill or other appropriate disposal site. Concrete foundations and slabs would be broken up using a track-hoe mounted hydraulic hammer or similar methods and buried in place under approximately three feet of material in such a manner to prevent ponding and to allow vegetation growth. After demolition and salvage operations are complete, the disturbed areas would be covered with growth medium and revegetated.

Reagents and explosives would be removed for use as product at other mines, or appropriately disposed of off-site. Any surface pipelines would be removed, typically for salvage. Underground pipeline ends would be capped/plugged and left in place. Unneeded utility poles would be cut off at ground level and removed.

Drill Hole Plugging

All mineral exploration and development drill holes and monitoring, production, and dewatering wells that are subject to Nevada Division of Water Resources regulations would be abandoned

in accordance with applicable rules and regulations (Nevada Administrative Codes 534.420 through 534.430). Boreholes would be sealed to prevent cross contamination between aquifers, and the required shallow seal would be placed to prevent contamination by surface access.

Monitoring wells associated with the processing facilities would be maintained until BMM is released of this requirement by the Nevada Division of Environmental Protection. These wells would then be plugged and abandoned according to the requirements of the Nevada State Engineer.

Post-Closure Monitoring

Monitoring of water quality, stability, and revegetation would occur in compliance with existing regulations, permits, and approvals. Monitoring for stability, focusing on erosion of reclaimed areas and stability of the pit high walls, would be conducted after completion of earthworks associated with reclamation. The monitoring would be conducted for a minimum of two years or in accordance with the reclamation permit. Monitoring of stormwater controls and stability would also be conducted as required under the Nevada General Stormwater Permit.

Revegetation monitoring would be conducted for a minimum of three years following completion of seeding of reclaimed areas. This monitoring would be conducted to determine if revegetation meets the requirements of the Attachment B, Nevada Guidelines for Successful Revegetation for the Nevada Division of Environmental Protection, the BLM, and the U.S. Department of Agriculture Forest Service (NDEP, 1998).

Water quality monitoring would be conducted in accordance with the Water Pollution Control Permit issued by the Nevada Division of Environmental Protection. Sampling locations and monitoring frequency are identified in this permit. Post-closure monitoring would continue for a minimum of five years following complete closure of the heap leach pads (draindown managed by the evapo-transpiration cells) and reclamation of waste rock areas. Existing and proposed water monitoring locations are shown on Figure 2-12.

2.4 Design Features (Applicant-Committed Environmental Protection Measures)

Design Features (Applicant-committed environmental protection measures) have been developed as a way of minimizing or avoiding environmental impacts. Table 2-13 provides the Design Features (applicant-committed environmental protection measures) that would be implemented by Barrick for the Proposed Action. They have been organized by the primary resource the protection measures would benefit or protect. Potential impacts are also provided. The operator would comply with performance standards in 43 CFR 3809.420 as well as appropriate BLM Best Management Practices found in Appendix D.

TABLE 2-13 DESIGN FEATURES (APPLICANT-COMMITTED ENVIRONMENTAL PROTECTION MEASURES)

RESOURCE	POTENTIAL IMPACTS	ACTIONS TO MINIMIZE OR AVOID IMPACTS
Water Resources	<ul style="list-style-type: none"> • Erosion (water) • Impacts to groundwater 	<ul style="list-style-type: none"> • Construct access roads to BLM road standards. • Close surface drill holes per Nevada Revised Statute 534. • Install erosion control berms, silt fence, straw bales, detention basins or other features as necessary in areas prone to erosion. • Install wells to monitor water quality
Geology and Minerals	<ul style="list-style-type: none"> • Removal of mineral resources 	<ul style="list-style-type: none"> • Pits with remaining resources would not be backfilled
Paleontology	<ul style="list-style-type: none"> • Impacts to paleontological resources of scientific interest 	<ul style="list-style-type: none"> • If paleontological resources of potential scientific interest are encountered (including all vertebrate fossils and deposits of petrified wood), leave them intact and immediately bring them to the attention of the BLM Authorized Officer.
Soils	<ul style="list-style-type: none"> • Soil erosion (wind and water) 	<ul style="list-style-type: none"> • When preparing the site for reclamation, include appropriate Best Management Practices as determined appropriate for site-specific conditions. • Use existing roads as much as possible. • Store growth media in stockpiles. • Upon completion or temporary suspension of mining operations, backfill all holes and trenches and re-contour area to the approximate natural slope with slopes at 3 Horizontal to 1 Vertical or to the original topography, whichever is less. • If stockpiles would remain over a growing season, seed with interim seed mix.
Vegetation	<ul style="list-style-type: none"> • Loss of native vegetation 	<ul style="list-style-type: none"> • Where seeding is required, use appropriate seed mixture and seeding techniques approved by the BLM Authorized Officer. • Reclaim with interim and final seed mixes. • Generally, conduct reclamation with native seeds that are representative of the indigenous species present in the adjacent habitat. Possible exceptions would include use of non-native species for a temporary cover crop to out-compete weeds. In all cases, ensure seed mixes are approved by the BLM Authorized Officer prior to planting. • Reclamation goals would be to satisfactorily reclaim disturbed areas in accordance with the approved reclamation plan. Disturbance would be recontoured to blend with the natural topography, erosion stabilized, and an acceptable vegetative cover established in accordance with Nevada Guidelines for Successful Revegetation prepared by the Nevada Division of Environmental Protection, the BLM, and the U.S. Department of Agriculture Forest Service. • Curl-leaf mountain mahogany (<i>Cercocarpus ledifolius</i> Nutt.), single-leaf pinyon pine (<i>Pinus monophylla</i>) and juniper (<i>Juniperus osteosperma</i>) trees would be removed only as necessary in proposed disturbance areas.
Non-Native Invasive Species	<ul style="list-style-type: none"> • Increasing weed infestation from existing local sources • Introduction of new weed infestations by importing new seed sources on equipment 	<ul style="list-style-type: none"> • Barrick would continue to work with the BLM, the Tri-County Weed District, and the Newark Valley/Long Valley Cooperative Weed Management Area to prevent the spread of invasive, nonnative species in the area affected by the expansion. • Prior to project approval a site-specific weed survey would occur and a weed risk assessment would be completed. Monitoring would be conducted for a period no shorter than the life of the permit or until bond release and monitoring reports would be provided to the BLM. If the spread of noxious weeds is noted, appropriated weed control procedures would be determined in consultation with BLM personnel and would

RESOURCE	POTENTIAL IMPACTS	ACTIONS TO MINIMIZE OR AVOID IMPACTS
	<ul style="list-style-type: none"> • Herbicide application • Inspection of source sites such as borrow pits, fill sources, or gravel pits used to supply inorganic materials • Construction site management 	<p>be in compliance with BLM Handbook H-9011, H-9011-1 Chemical Pest Control, H-9014 Use of Biological Control Agents of Pests on Public Lands, and H-9015 Integrated Pest Management. Should chemical methods be approved, the lessee must submit a Pesticide Use Proposal to the Authorized Officer 60 days prior to the planned application date. A pesticide Application Report must be submitted to the Authorized Officer by the end of the fiscal year follow chemical application.</p> <ul style="list-style-type: none"> • Barrick would continue existing measures to survey for and treat noxious weeds. • Areas of concern would be identified and flagged in the field by a weed scientist or qualified biologist. The flagging would alert personnel or participants to avoid areas of concern. These sites would be recorded using global positioning systems or other BLM Ely District Office approved equipment and provided to the Field Office Weed Coordinator or designated contact person. • Segregate growth media that may contain noxious weed seeds away from growth media not containing noxious weed seeds. • The contractor, operator, or permit holder would provide information and training regarding noxious weed management and identification to all personnel who would be affiliated with the implementation and maintenance phases of the project. • To eliminate the transport of vehicle-borne weed seeds, roots, or rhizomes all vehicles used on the site would be free of soil and debris capable of transporting weed propagules. All such vehicles and equipment would be cleaned with power or high pressure equipment prior to entering or leaving the work site or project area. Vehicles used for emergency fire suppression would be cleaned as a part of check-in and demobilization procedures. Cleaning efforts would concentrate on tracks, feet and tires, and on the undercarriage. Vehicle cabs would be swept out and refuse would be disposed of in waste receptacles. Cleaning sites would be recorded using global positioning systems or other mutually acceptable equipment and provided to the BLM Ely District Office Weed Coordinator or designated contact person. • To eliminate the introduction of noxious weed seeds, roots, or rhizomes all interim and final seed mixes, hay, straw, hay/straw, or other organic products used for reclamation or stabilization activities, feed, bedding would be certified free of plant species listed on the Nevada noxious weed list or specifically identified by the BLM Ely District Office. • To eliminate the introduction of noxious weed seeds, roots, or rhizomes all source sites such as borrow pits, fill sources, or gravel pits used to supply inorganic materials used for construction, maintenance, or reclamation would be inspected and found to be free of plant species listed on the Nevada noxious weed list or specifically identified by the BLM Ely District Office. Inspections would be conducted by a weed scientist or qualified biologist. • Removal and disturbance of vegetation would be kept to a minimum through construction site management (e.g. using previously disturbed areas and existing easements, limiting equipment/materials storage and staging area sites, etc.). • Reclamation would normally be accomplished with native seeds only. These would be representative of the indigenous species present in the adjacent habitat. Possible exceptions would include use of non-native species for a temporary cover crop to out-compete weeds. Where large acreages are burned by fires and seeding is required for erosion control, all native species could be cost prohibitive and/or unavailable. In all cases, seed mixes would be approved by the BLM Authorized Officer prior to application. • Mixing of herbicides and rinsing of herbicide containers and spray equipment would be conducted only in

RESOURCE	POTENTIAL IMPACTS	ACTIONS TO MINIMIZE OR AVOID IMPACTS
		<p>areas that are safe distance from environmentally sensitive areas and points of entry to bodies of water (storm drains, irrigation ditches, streams, lakes, or wells).</p> <ul style="list-style-type: none"> • Methods used to accomplish weed objectives would consider seasonal distribution of large wildlife species. • No noxious weeds would be allowed on the site at the time of reclamation release. Any noxious weeds that become established would be controlled.
Wildlife	<ul style="list-style-type: none"> • Active raptor nests • Mule deer migration • Bat hibernacula 	<ul style="list-style-type: none"> • Protect active raptor nests in undisturbed areas within 0.25 mile of areas proposed for vegetation conversion using species-specific protection measures. Inventory areas containing suitable nesting habitat for active raptor nests prior to the initiation of any project. • Consider seasonal distribution of large wildlife species when determining methods used to accomplish weed and insect control objectives. • Reclaim as soon as activities are complete. • Do not disturb bats while they are hibernating. • Gaps in haul road berms for ease of deer crossings
Migratory Birds	<ul style="list-style-type: none"> • Migratory bird nesting 	<ul style="list-style-type: none"> • Conduct nesting surveys if disturbance needs to occur between April 15 and July 15. • Comply with Suggested Practices for Raptor Protection on Power Lines – The State of the Art in 2006 (Edison Electric Institute/Raptor Research Foundation).
Special Status Animal Species ¹	<ul style="list-style-type: none"> • Herbicides application in areas of special status species • Sage grouse leks • Utilities in sage grouse lek areas • Ferruginous hawk nests • Non-native invasive species control in special status species areas • Pygmy rabbits and pygmy rabbit habitat • Special status bat species 	<ul style="list-style-type: none"> • When managing weeds in areas of special status species, carefully consider the impacts of the treatment on such species. Wherever possible, hand spraying of herbicides is preferred over other methods. • Avoid line-of-sight views between power line poles and sage grouse leks, whenever feasible. • Determine location of active sage grouse leks and avoid during strutting season. • Avoid ferruginous hawk nests. • Do not conduct noxious and invasive weed control within 0.5 mile of nesting and brood rearing areas for special status species during the nesting and brood rearing season. • Identify pygmy rabbit habitat, and avoid pygmy rabbits, if encountered. • Conduct bat surveys, where appropriate.
Wetlands	<ul style="list-style-type: none"> • Disruption of wetlands • Loss of spring recharge 	<ul style="list-style-type: none"> • Avoidance of disturbance in wetlands (identified in Section 3.9.1). • Hydrology studies to determine potential impacts.
Range Resources	<ul style="list-style-type: none"> • Loss of forage 	<ul style="list-style-type: none"> • Reclaim as soon as activities are complete.
Wild Horses	<ul style="list-style-type: none"> • Traffic around wild horses • Loss of forage 	<ul style="list-style-type: none"> • If a project involves heavy or sustained traffic, require road signs for safety and protection of wild horses. • Reclaim as soon as activities are complete.
Land Use and Access	<ul style="list-style-type: none"> • Post-mining configuration of access roads 	<ul style="list-style-type: none"> • BMM would establish post-mining access in conjunction with BLM travel management plan. • Traffic control measures would be used during operations.

RESOURCE	POTENTIAL IMPACTS	ACTIONS TO MINIMIZE OR AVOID IMPACTS
Recreation	<ul style="list-style-type: none"> • Public safety • Potential restriction of recreation use 	Reclaim as soon as activities are complete.
Air Quality	<ul style="list-style-type: none"> • Fugitive dust from roads and loading/dumping • Exhaust emissions • Reduction of airborne fugitive dust • Fugitive dust during mining activities 	<ul style="list-style-type: none"> • Use dust abatement techniques on unpaved, unvegetated surfaces to minimize airborne dust. • Conduct maintenance on equipment to ensure proper function. • Post and enforce speed limits (e.g., 25 miles per hour). • Use dust abatement techniques before and during surface clearing, excavation, or blasting activities. • Compliance with NDEP air permit.
Visual Resources	<ul style="list-style-type: none"> • Light pollution • Viewshed protection 	<ul style="list-style-type: none"> • At industrial facilities authorized by the BLM Ely District Office, utilize anti-glare light fixtures to limit light pollution. • Reclaim as soon as activities are complete.
Cultural Resources	<ul style="list-style-type: none"> • Cultural resource protection 	<ul style="list-style-type: none"> • Ensure that all activities associated with the undertaking, within 100 meters of the discovery, are halted and the discovery is appropriately protected, until the BLM authorized officer issues a Notice to Proceed. • BLM would determine level of inventory needed (Class I, II, or III, reconnaissance or none). • Prior to surface disturbing activities, inventories would be conducted by permitted archeologist for unsurveyed sites or those not evaluated within the past 10 years. • All historic properties and cultural resources would be avoided if possible. • If avoidance is not possible, develop treatment plan for the historic properties affected by the proposed disturbance. • Submit all cultural reports to the BLM. • The applicant would inform all persons associated with the project that knowingly disturbing cultural resources (historic or archaeological) or collecting artifacts is illegal. • Perform viewshed reclamation when the setting of a site contributes to the significance of the property.
Native American Religious Concerns	<ul style="list-style-type: none"> • Native American concerns 	<ul style="list-style-type: none"> • BLM to consult with potentially affected Native American tribes.

RESOURCE	POTENTIAL IMPACTS	ACTIONS TO MINIMIZE OR AVOID IMPACTS
<p>Hazardous and Solid Waste/Hazardous Materials</p>	<ul style="list-style-type: none"> • Disposal of toxic and hazardous materials, and solid wastes • Herbicide applications • Accidental spills of hydrocarbons that could contaminate water, soil, and vegetation • Storage of hazardous materials • Handling of hazardous and solid wastes • Transporting hazardous materials • Potential of public mine site accidents 	<ul style="list-style-type: none"> • Properly dispose of all tailings, dumps, and deleterious materials or substances. Take measures to isolate, control, and properly dispose of toxic and hazardous materials. • Remove and properly dispose of all trash, garbage, debris, and foreign matter. Maintain the disposal site and leave it in a clean and safe condition. Do not allow burning at the site without prior approval. • Prior to commencing any chemical control program, and on a daily basis for the duration of the project, the certified applicator would provide a suitable safety briefing to all personnel working with or in the vicinity of the herbicide application. This briefing would include safe handling, spill prevention, cleanup, and first aid procedures. • Do not drain oil or lubricants onto the ground surface. Immediately clean up any spills under 25 gallons; clean up spills over 25 gallons as soon as possible and report the incident to the BLM Authorized Officer and Nevada Division of Environmental Protection. • Containerize petroleum products such as gasoline, diesel fuel, and lubricants in approved containers. • Properly store hazardous materials in separate containers to prevent mixing, drainage, or accidents. • Clean up spills in accordance with Nevada Division of Environmental Protection guidelines • Follow BMM and contractor Standard Operating Procedures for handling hazardous and solid waste • Restrict public access locally during active mining.

¹U.S. Fish and Wildlife Service Threatened, Endangered, Candidate, and Proposed Species; State Protected Species; BLM Sensitive Species

2.5 Alternatives to the Proposed Action

Several alternatives were identified during the scoping process and during preparation of this FEIS: partial or full pit backfill, less mining, underground mining, Mooney Basin Heap Leach Pad, putting in conveyors, off-site ore processing, and changing pit geometry. Three specific criteria were determined necessary for an alternative to be carried forward in the FEIS:

- Does the alternative meet the Purpose and Need?
- Is the alternative practical or feasible from a technical and economic standpoint and using common sense rather than simply desirable from the standpoint of the applicant? and
- Does the alternative provide an environmental benefit?

Based on these criteria, two action alternatives to the Proposed Action were identified through consultation with BLM, NDOW, and BMM with input taken from public scoping comments in addition to the No Action Alternative. These alternatives are intended to reduce or minimize potential impacts associated with the Proposed Action and be responsive to scoping issues. The three alternatives identified and discussed further in this FEIS include the No Action Alternative, Partial Backfill Alternative (Alternative A), and the Mooney Basin Heap Leach Pad Alternative (Alternative B). An alternatives matrix was used to determine action alternatives that met the criteria (Table 2-14). Alternatives considered, but eliminated from detailed analysis with the reasons for their elimination, are described in Section 2.6.

TABLE 2-14 ACTION ALTERNATIVES CONSIDERED IN THE ANALYSIS

ALTERNATIVES	MEETS PURPOSE & NEED	FEASIBLE	ENVIRONMENTAL BENEFIT	CARRIED FORWARD FOR ANALYSIS
Partial Backfill	Y	Y	Y	Y
Full Pit Backfill	N	N	Y	N
Less Mining	N	Y	Y	N
Underground Mining	Y	N	Y	N
Mooney Basin Heap Leach Pad	Y	Y	Y	Y
Conveyor Rather Than Haul Road	Y	Y	N	N
Hauling Ore for Off-site Processing	N	Y	N	N
Pit Geometry	N	Y	Y	N

2.5.1 No Action Alternative

Under the No Action Alternative, gold mining activities would continue under the current authorizations for the BMM and Mooney Basin Operations Area as established by the Record of Decision for the BMM EIS (BLM, 1995a) and subsequent Environmental Assessments. Activities associated with the Proposed Action would not occur. The two existing mine plan areas would not be joined into one Plan of Operations, and the expansion activities associated with the Proposed Action would not occur. Mineral resources in these areas of expansion would remain undeveloped. It is anticipated that activities currently authorized would be completed in 2009 for both BMM and Mooney Basin Operations Area.

2.5.2 Partial Backfill Alternative (Alternative A)

The Partial Backfill Alternative is a modification of the Proposed Action to partially backfill up to six open pits as described below; other features of the Proposed Action would remain as

described above. The purpose is to reduce the footprint of the rock disposal areas by reducing the quantity of material they would contain. Table 2-15 provides the volumes of backfill for each pit and associated reduction in volume and surface disturbance for each rock disposal area. Figures 2-14, 2-15, and 2-16 show the reduction area in the rock disposal areas with this alternative. There would be a 434-acre reduction in the amount of disturbance compared to the Proposed Action, resulting in a total disturbance of 3,486 acres.

TABLE 2-15 ALTERNATIVE A – PARTIAL BACKFILL DETAILS

BACKFILL LOCATION	BACKFILL AMOUNT (MILLION TONS)	ROCK DISPOSAL AREA REDUCTION (MILLION TONS)	ROCK DISPOSAL AREA REDUCTION (ACRES)
East Bida Pit	6.6	9.8 (Saga)	35.6 (Saga) ¹
Belmont Pit 2	3.2		
North 1 Pit	25.4	63.4 (North 1, 2, 5)	280.2 (North 1, 2, 5)
RBM Pit	38.0		
Saga Pit Area 1	6.1	8.3 (Saga)	35.6 (Saga) ¹
Saga Pit Area 2	2.2		
Sage Flat Pit	117.5	117.5 (East Sage North and South, Sage Flat)	118.6 (East Sage North and South, Sage Flat)
Totals	199	199	434¹

¹ The total reduction of the Saga Rock Disposal Area is 35.6 acres, with backfill of east Bida Pit, Belmont Pit 2, and Sage Pit 1 and 2 all contributing to the reduction in the Saga Rock Disposal Area.

2.5.3 Mooney Basin Heap Leach Pad Alternative (Alternative B)

The Mooney Basin Heap Leach Pad Alternative would modify the Proposed Action by changing the design of the proposed Mooney Basin and BMM heap leach expansions in order to reduce the footprint of disturbance (Figures 2-17 and 2-18). Other features of the Proposed Action would remain as described above. In order to limit the footprint of the Mooney Basin heap leach facility, the BMM 2/3 heap leach facility design must be modified to accommodate the leach material produced in the Proposed Action. The total production of heap material for the Proposed Action is approximately 200 million tons.

Figure 2-18 shows the capacity and footprint of the currently proposed Mooney Basin heap leach facility in comparison with the redesigned facilities under this alternative with the subsequent capacity and footprint. This modification to the heap leach pad designs would result in a reduction of 96 acres to the Mooney Basin Heap Leach Pad and associated facilities. The reduction would be by removing a section of the proposed power line and reducing the size of the heap leach and process areas (Figures 2-14 and 2-18). The power line would be reduced by 8,106 (9 acres) feet for a total reduction of 105 acres. This alternative would result in an increase of approximately 14 acres of disturbance to the BMM 2/3 heap leach pad process facilities from what is currently authorized.

The reconfiguration of the BMM heap leach facility would also affect the placement of growth medium stockpiles, process facilities, and ponds. Additional surface disturbance is also incurred due to the establishment of ancillary disturbance between heaps, process facilities, and existing roads. Additional surface disturbance for the growth medium stockpiles would be 12.3 acres, and additional surface disturbance for ancillary and process facilities would be 19.7 acres. The overall disturbance increase to the BMM heap leach facility would be approximately 14 acres beyond what is currently authorized. The total disturbance under Alternative B would be 3,815 acres.

2.6 Alternatives Considered but Eliminated from Detailed Analysis

As discussed in Section 2.5, several alternatives were identified and proposed by BLM, NDOW, and BMM but were eliminated from further analysis, as indicated in Table 2-14. These included full backfill of pits, less mining, underground mining, installation of conveyors to transport ore, hauling ore for off-site processing, and altering pit configuration or geometry. Each of these alternatives was considered to determine if it met the criteria identified in Section 2.6. Table 2-14 lists each alternative that was considered and identifies whether the alternative met the criteria for carrying the alternatives forward in the analyses.

Full Pit Backfill

Complete backfill of all pits was considered but not deemed a viable alternative. While there would be similar environmental benefits as those discussed for the Partial Backfill Alternative, significant double handling of waste rock would be required, rendering the overall project economically infeasible as well as not meeting stated purpose and need. Additionally, complete pit backfill would significantly restrict or eliminate further mineral access in these areas, should different technologies or economic conditions develop in the future.

Less Mining

Less mining was determined not to meet the Purpose and Need statement of this EIS. The purpose of Barrick's Plan of Operations for the BMM North Operations Area Project is to expand mining opportunities at the BMM and Mooney Basin Operations Area, while consolidating these two mines into one new Plan of Operations called North Operations Area. The need is to continue to profitably recover gold resources from federal mining claims within the Proposed Action area. Because conducting less mining does not meet the Purpose and Need for this project, it was not carried forward in the analysis.

Underground Mining

Underground mining of the ore deposit was once believed to be feasible, as indicated with limited underground mining being previously approved by the BLM (BLM, 1995a). The original plan for underground mining was based on limited exploration drilling in the area at the time the decision was made. Underground mining of concentrated deposits would have extended the life of the mine for a short period. Since that time, BMM has conducted extensive additional drilling in the area and has determined that a larger, low-concentration dispersed deposit is present. Therefore, conducting underground mining is no longer considered feasible.

Conveyors to Transport Ore

A conveyor between the Top Pit and BMM processing facilities was mentioned in the 1995 EIS as a reasonably foreseeable, interrelated project. However, the conveyor was not part of the Proposed Action or alternatives that were analyzed or approved in that EIS. The use of conveyors (in lieu of haul roads) was determined to be feasible during scoping for this EIS. The discussion included whether the conveyor was a means and method best determined by the proponent or whether there was an environmental benefit to the use of conveyors over the use of haul roads. It was determined that disturbance associated with conveyors would be the same as or greater than the Proposed Action and therefore did not offer a benefit. It was also determined that the use of conveyors would still require a maintenance road to service the conveyor and existing roads could not be eliminated as they also served as transport avenues for workers and delivery of materials to various components of the Proposed Action. Vehicles would still need to be used with this operation to transport ore from open pits to the base of the conveyor for further transporting. In addition, conveyor systems are not designed to convey run-of-mine ore because of the size of the material. Barrick would need to install a crusher at a centralized location and haul material to the crusher prior to conveyance to the heap leach pad.

Figure 2-14 Alternative A Part 1 Saga and Belmont, Alternative B Mooney Basin Pad Reduction

Figure 2-15 Alternative A Part II North Area Complex Rock Disposal Area

Figure 2-16 Alternative A Part III Sage Flat

**Figure 2-17 Alternative A Part IV RBM Rock Disposal Area, Alternative B Heap 2/3
Expansion at Bale Mountain Mine**

Figure 2-18 Mooney Basin Alternative B

Installation of a crusher system would require a significant increase in electrical use and would increase fugitive emissions. Based on no perceived environmental benefit, potentially even greater environmental impacts (additional disturbance, fugitive emissions, and increase electrical power), and the continued use of mine vehicles, conveyors were not carried forward in the EIS for analysis.

Hauling Ore for Off-Site Processing

Hauling ore off-site was determined not to meet the Purpose and Need statement of this EIS. The purpose of Barrick's Plan of Operations for the BMM North Operations Area Project is to expand mining opportunities at the BMM and Mooney Basin Operations Area while consolidating these two mines into one new Plan of Operations called North Operations Area. The need is to continue to profitably recover gold resources from federal mining claims within the Proposed Action area. Barrick has other mines in northern Nevada that employ similar processing methods that could be utilized in the recovery of precious metals. The nearest Barrick operation potentially suitable for processing ore from the Proposed Action is the Ruby Hill Mine, west of Eureka. While an adequate public road network is in place that could be used to transport ore to Ruby Hill, the average grade of gold ore and haul costs over the approximately 70-mile distance to the processing site would not allow Barrick to meet the need to profitably recover gold resources. Because hauling ore off-site does not meet the Purpose and Need for this Proposed Action, it was not carried forward in the analysis.

Alternate Pit Geometry

Alternate pit geometry (steeper pit wall slopes with smaller pit footprints) was considered but determined to not be feasible or meet the purpose and need. Pit wall slopes are based on safety constraints and the need to access the ore reserve. Proposed pit designs will optimize recovery of the ore consistent with geotechnical and pit wall stability criteria. Steeper pit walls would not meet those criteria. Because alternate pit geometry would not be optimal, it does not meet the Purpose and Need for this Proposed Action and was not carried forward in the analysis.

2.7 Comparative Analysis of Alternatives

A comparison of the environmental impacts between the Proposed Action and the alternatives including the No Action Alternative was completed with a summary of the results provided in Table 2-16. This comparison of environmental impacts was based on implementation of the Design Features identified in Table 2-13 and BLM Best Management Practices provided in Appendix D. A detailed description of the environmental impacts for each resource is provided in Chapter 3.0.

2.8 BLM Preferred Alternative

The BLM's preferred alternative, based on the information from the scoping process and information contained within this FEIS, is the Partial Backfill Alternative as described in Section 2.5.2. The selection of this alternative is the one that the BLM believes best fulfills the agency's statutory requirements and responsibilities. The selection of this alternative takes into consideration environmental, economic, and technical factors.

The Partial Backfill Alternative (Alternative A) would have a reduction in the footprint of the rock disposal areas, return some of the open pits to pre-mining land use, and be economically feasible for the operator. There could be some risk of covering potential ore reserves, depending on future technologies and the price of gold. This would be minimized through

careful exploration and planning by the operator. Pits not backfilled would either have potential future reserves or would not be economically feasible for backfilling.

Consideration was given to the Proposed Action and the other alternatives. The Proposed Action would have the same beneficial economic and social benefits associated with continued mining but would result in more disturbance and less land returned to post-mining land use than the Partial Backfill Alternative. Both the Proposed Action and the Mooney Basin Heap Leach Pad Alternative have less potential for reducing environmental impacts and surface disturbance. Under the No Action Alternative, there would be no additional surface disturbance, but the identified mineral resource would remain undeveloped and unrecovered. The economic and social benefits from continued mining would also not be met under the No Action Alternative. The BLM strives to achieve a balance between land use and resource protection, and this balance appears to be best reached with the Partial Backfill Alternative.

TABLE 2-16 SUMMARY OF POTENTIAL ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION AND OTHER ALTERNATIVES

RESOURCE	POTENTIAL IMPACT	PROPOSED ACTION	ALTERNATIVE A PARTIAL PIT BACKFILL	ALTERNATIVE B MOONEY BASIN LEACH PAD	NO ACTION ALTERNATIVE
Water Resources (Surface Water)	Increase in sedimentation and erosion	Disturbance of area and creation of waste rock dumps may lead to increased sedimentation in ephemeral drainages.	Same as Proposed Action.	Same as Proposed Action.	No impacts other than those already authorized.
	Water quality impacts from rock disposal areas or other facilities	No water quality impacts are anticipated as a result of drainage from the waste rock or other sources.	No anticipated impacts to water quality are anticipated because of smaller footprint of waste rock facility and no anticipated impacts to water quality.	Same as Proposed Action.	No impacts other than those already authorized.
	Reduction in spring recharge	Waste rock placed in the Cherry Creek recharge area may reduce or delay recharge to the local aquifer.	The reduction of the size of the Sage Flat RDA would result in less waste rock within the Cherry Spring recharge area, thus reducing the potential impact	Same as Proposed Action.	No impacts other than those already authorized.
	Fuel or chemical spills to drainages	Appropriate handling procedures would be used to minimize the risk of chemical spills during transporting and loading/unloading and discharging to drainages.	Same as Proposed Action.	Same as Proposed Action.	No impacts other than those already authorized.
Water Resources (Groundwater)	Increase groundwater withdrawal by approximately 250 acre-feet per year	No impacts are anticipated from greater groundwater usage as there are no other users within the anticipated cone of depression.	Same as Proposed Action.	Less water needs at Mooney Basin but greater water needs at BMM. The total groundwater withdraw would be the same as the Proposed Action as the same amount of ore would be processed. No impacts to current users of the alluvial aquifer are anticipated.	No impacts other than those already authorized.
	Intersection of local groundwater by open pits	Local saturated zones may be intercepted but the deeper bedrock aquifer would not be intercepted by the pits. Water encountered from isolated saturated material during excavation would be handled as per the Water Pollution Control Permit.	Same as Proposed Action.	Same as Proposed Action.	No impacts other than those already authorized.

RESOURCE	POTENTIAL IMPACT	PROPOSED ACTION	ALTERNATIVE A PARTIAL PIT BACKFILL	ALTERNATIVE B MOONEY BASIN LEACH PAD	NO ACTION ALTERNATIVE
	Changes in groundwater quality	Heap leach pads and process ponds would be double-lined and operated in accordance with the Water Pollution Control Permit thus minimizing the risk of process solution impacting groundwater.	Same as Proposed Action.	Smaller pad at the Mooney Basin but larger pad at BMM, however, there would be no anticipated impacts to groundwater quality.	No impacts other than those already authorized.
Water Resources (Drinking Water)	Additional use of groundwater as a drinking water source	Installation of a treatment system for use of groundwater as a drinking water source. Would not significantly increase the consumption of groundwater.	Same as Proposed Action.	Same as Proposed Action.	No impacts other than those already authorized.
Geology and Minerals	Ore extraction and waste rock placement	Removal of approximately 200 million tons of ore and 830 million tons of waste rock. Expansion of two heap leach facilities with the 200 million tons of ore.	Total tonnage of material mined would remain the same as Proposed Action, but the location of disposal, rock disposal area, and backfill is the only difference from the Proposed Action.	Same as Proposed Action. The only difference would be the location where the ore is processed.	No impacts other than those already authorized.
	Limitation on the future availability of mineral resources	No impacts identified.	Backfill of several of the pits is not expected to impact any future precious metal resources as they will be fully explored prior to completing backfill activities	Same as Proposed Action	No impacts other than those already authorized.
Paleontology	Loss of paleontological resources	No paleontological resources within the project area appear to have scientific or educational value	Same as Proposed Action	Same as Proposed Action	No impacts other than those already authorized.
Soils	Loss of productive topsoil in disturbed areas (soil development and biological activity)	Approximately 3,920 acres of soils representing 16 soil associations would be permanently disturbed. Between 7.3 and 11.7 million cubic yards of soil would be salvaged and used during reclamation.	Impacts would be the same as Proposed Action, but approximately 434 less acres of disturbance would occur.	Impacts would be the same as Proposed Action, but approximately 105 less acres of disturbance would occur.	No impacts other than those already authorized.

RESOURCE	POTENTIAL IMPACT	PROPOSED ACTION	ALTERNATIVE A PARTIAL PIT BACKFILL	ALTERNATIVE B MOONEY BASIN LEACH PAD	NO ACTION ALTERNATIVE
	Increased soil erosion due to wind and water resulting in off-site deposition	Environmental controls including use of proper Best Management Practices for erosion and dust control would minimize impacts associated with erosion and off-site deposition.	Same as the Proposed Action.	Same as the Proposed Action.	No impacts other than those already authorized.
	Contamination of soil from chemical spills	Continued adherence to chemical handling practices would minimize the risk of chemical spills. Emergency response procedures and Spill Contingency Plan would be followed for notification and cleanup procedures.	Same as the Proposed Action.	Same as the Proposed Action.	No impacts other than those already authorized.
Vegetation	Removal of vegetation	Approximately 3,920 acres of vegetation would be removed during construction and operation of the Proposed Action. Of the 3,920 acres to be disturbed, approximately 540 acres of vegetation would be permanently removed as a result of pit expansion. Reclamation of the remainder of the disturbed acreage would result in established suitable vegetation for post-mining land use.	Impacts associated with this alternative would be similar however, removal of 434 acres less vegetation than the Proposed Action.	Impacts associated with this alternative would be similar however, removal of 105 acres less vegetation than the Proposed Action.	No impacts other than those already authorized.
	Increase in vegetation diversity following reclamation	Reclamation of the disturbed areas to a grass and shrub community would increase the diversity of the vegetation communities resulting in better forage.	Same as Proposed Action, but for a smaller area.	Same as the Proposed Action, but for a smaller area.	No removal of vegetation other than what was previously authorized.
	Increased potential for establishment of non-native species	Removal of vegetation will allow non-native species to become established. Control of non-native species through a weed management program will minimize this risk.	Same as Proposed Action with fewer acres of disturbance.	Same as Proposed Action with few acres of disturbance.	No additional impacts would occur.

RESOURCE	POTENTIAL IMPACT	PROPOSED ACTION	ALTERNATIVE A PARTIAL PIT BACKFILL	ALTERNATIVE B MOONEY BASIN LEACH PAD	NO ACTION ALTERNATIVE
	Short-term loss of forage for wildlife and livestock	Approximately 3,920 acres of vegetation will be lost for available forage for wildlife and livestock. Reclamation would restore all but 540 acres of the forage that is currently available.	Same as Proposed Action with fewer acres of disturbance.	Same as Proposed Action with few acres of disturbance.	No additional impacts would occur.
	Increased potential for soil erosion in disturbed areas	Approximately 3,920 acres of disturbance would occur, thus increasing the risk of soil erosion in these areas. Best Management Practices for controlling erosion will be implemented to minimize soil loss.	Same as Proposed Action.	Same as Proposed Action.	No additional impacts would occur.
Non-Native Invasive Species	Establishment of non-native and invasive species in disturbed areas as a result of vegetation removal	With the disturbance of 3,920 acres, the potential of non-native invasive, and/or noxious weed establishment will increase. Appropriate control measures including spraying and seeding will minimize the establishment of these species.	Same as the Proposed Action, but 435 less acres of disturbance.	Same as the Proposed Action, but 105 less acres of disturbance.	No impacts other than those already authorized.
Wildlife (Including Migratory Birds)	Interference with deer migration and mortalities due to increased traffic	Potential to interfere with north-south deer migration during winter months due to disturbance such as road and other potential barriers. Deer mortalities have been extremely low over the past 12 years. Mitigation, such as gaps in berms would minimize the impacts.	Same as the Proposed Action.	Same as the Proposed Action.	No impacts other than those already authorized.
	Loss of deer habitat including winter range	Approximately 219 acres of mountain brush habitat (preferred deer habitat) would be removed. Additional winter range habitat would be lost along the flanks of the mountain range in the Mooney Basin area.	Same as the Proposed Action.	Same as the Proposed Action.	No impacts other than those already authorized.

RESOURCE	POTENTIAL IMPACT	PROPOSED ACTION	ALTERNATIVE A PARTIAL PIT BACKFILL	ALTERNATIVE B MOONEY BASIN LEACH PAD	NO ACTION ALTERNATIVE
	Conversion of habitat	Approximately 1,712 acres of pinyon juniper habitat would be converted to grass and shrub habitat. This would likely benefit wildlife, especially grazing and browsing by providing good forage. In addition pit highwalls would be habitat roosting bats and for nesting raptors. Other existing habitats (big sagebrush and mountain brush) would be restored through reclamation.	Approximately 1,522 acres of pinyon-juniper habitat would be converted to grass and shrub habitat. This would likely benefit wildlife, especially grazer, by providing good forage.	Approximately 1,652 acres of pinyon juniper habitat would be converted to grass and shrub habitat. This would likely benefit wildlife, especially grazers, by providing good forage.	No impacts other than those already authorized.
	Mortalities due to land clearing activity, increased traffic and chemical exposure	Small less mobile animals would likely be destroyed during land clearing activities. Increased risks of wildlife injury or mortality by collisions with vehicles as a result of an increase in traffic on mine access roads. Cyanide and other chemicals used on site could result in wildlife mortalities. Environmental controls such as fencing and floating HDPE balls are designed to prevent access to chemical laden waters.	Same as Proposed Action.	Same as Proposed Action.	No impacts other than those already authorized.
	Displacement from existing habitat	Displacement of wildlife into adjacent undisturbed area could increase competition for resources resulting in higher mortality for some species.	Same as Proposed Action.	Same as Proposed Action.	No impacts other than those already authorized.

RESOURCE	POTENTIAL IMPACT	PROPOSED ACTION	ALTERNATIVE A PARTIAL PIT BACKFILL	ALTERNATIVE B MOONEY BASIN LEACH PAD	NO ACTION ALTERNATIVE
	Migratory birds - loss of habitat, displacement from human activity, potential nest and young destruction	Reduction of pinyon-juniper habitat would alter local bird species composition. Disturbance of vegetation during the bird breeding season could result in destruction of nest and young birds. Environmental controls including performing land – clearing activities outside of the avian breeding season (April 15 to July 15) and conducting bird nesting surveys prior to disturbance during avian breeding season would minimize the potential loss of nests and young.	Same as proposed action, with a reduction of approximately 434 acres of disturbance.	Same as Proposed Action, with a reduction of approximately 105 acres of disturbance.	No impacts other than those already authorized.
Wetlands, Riparian Zones, Waters of the U.S.	Disturbance and Destruction to isolated wetlands	All wetlands would be avoided by design.	Same as Proposed Action.	Same as Proposed Action.	No impacts other than those already authorized.
	Increase in sedimentation from erosion	Appropriate Best Management Practices for erosion control would be implemented to minimize water and wind erosion, resulting in sedimentation to isolated wetlands.	Same as Proposed Action.	Same as Proposed Action.	No impacts other than those already authorized.
	Alteration of Cherry Spring recharge area	A portion of the Cherry Spring recharge area would be covered with a waste rock disposal area. This could potentially reduce or slow recharge to the spring. Cherry Spring over the recent past as had no or very limited flow.	A significant reduction in the size of the Sage Flat Rock Disposal Area of within the Cherry Spring recharge area would occur reducing the potential impact to the recharge area.	Same as Proposed Action.	No impacts other than those already authorized.

RESOURCE	POTENTIAL IMPACT	PROPOSED ACTION	ALTERNATIVE A PARTIAL PIT BACKFILL	ALTERNATIVE B MOONEY BASIN LEACH PAD	NO ACTION ALTERNATIVE
Range	Loss of forage during operation and improved forage after reclamation	Short-term loss of approximately 98 animal unit months with removal of 3,920 acres of vegetation and a permanent loss of 98 animal unit months associated with pit disturbance. Reclamation would convert approximately 1,712 acres of pinyon juniper habitat to grass and shrub habitat providing additional forage.	Short-term loss of 87 animal unit months and the same permanent loss of animal unit months as the Proposed Action.	Short-term loss of 95 animal unit months and the same permanent loss of animal unit months as the Proposed Action.	No impacts other than those already authorized.
	Restricted Access	At a minimum, an additional 3,920 acres of land would be temporarily restricted from livestock access as a result of expansion of the Plan of Operations boundary. An additional 540 acres (expanded area of pits) of public land would be removed permanently from livestock access.	Same as Proposed Action.	Same as Proposed Action.	No impacts other than those already authorized.
Wild Horses	Vehicle collisions, human disturbance	Short-term potential for vehicle collisions and avoidance of active mining areas.	Same as Proposed Action.	Same as Proposed Action.	No impacts other than those already authorized.
	Loss of forage during operation, improved forage after reclamation, and displacement	Short-term loss of approximately 3,920 acres of vegetation and a permanent loss of 540 acres of vegetation associated with pit disturbance. Reclamation would convert approximately 1,712 acres of pinyon juniper habitat to grass and shrub habitat providing additional forage.	Same as Proposed Action with a reduction of approximately 434 acres of disturbance..	Same as Proposed Action with a reduction of approximately 105 acres of disturbance.	No impacts other than those already authorized.

RESOURCE	POTENTIAL IMPACT	PROPOSED ACTION	ALTERNATIVE A PARTIAL PIT BACKFILL	ALTERNATIVE B MOONEY BASIN LEACH PAD	NO ACTION ALTERNATIVE
Land Use and Access	Restricted access	At a minimum, an additional 3,738 acres of land would be temporarily restricted from public access as a result of expansion of the Plan of Operations boundary. An additional 540 acres (expanded area of pits) of public land would be removed permanently from public access.	Same as the Proposed Action.	Same as the Proposed Action.	No impacts other than those already authorized.
	Conflicts with existing land use authorizations	Conflicts with existing land use authorizations would be negotiated with the owner of holder of that land use authorization.	Same as the Proposed Action.	Same as the Proposed Action.	No impacts other than those already authorized.
	Increased traffic	The increase in traffic is anticipated to be minimal as only one additional bus is expected to be put into use.	Same as the Proposed Action.	Same as the Proposed Action.	No impacts other than those already authorized.
Recreation	Restricted public access	At a minimum, an additional 3,738 acres of land would be temporarily restricted from public access and recreation activity such as hunting, trapping, hiking, etc. as a result of expansion of the Plan of Operations boundary.	Same as the Proposed Action.	Same as the Proposed Action.	No impacts other than those already authorized.
Air Quality	Impacts to air quality	Increase in air emissions from mobile sources and fugitive dust during construction of the facilities. This would be a slight increase over existing operations due to the additional equipment used during the construction period. All other emission would be similar to current operations. Mercury emissions are expected to decrease by 75 percent with the installation of	Same as the Proposed Action.	Same as the Proposed Action.	No impacts other than those already authorized.

RESOURCE	POTENTIAL IMPACT	PROPOSED ACTION	ALTERNATIVE A PARTIAL PIT BACKFILL	ALTERNATIVE B MOONEY BASIN LEACH PAD	NO ACTION ALTERNATIVE
		mercury emission controls installed in 2008 and 2009.			
Visual	VRM Objectives (changes in line, form, color, and texture)	High contrast with surrounding undisturbed areas would result in objectives of the Visual Resource Measurements not being met during operation but with successful reclamation, Visual Resource Measurement objectives would be met.	Slight changes in disturbance from the Key Observations Points but result in the same conclusion as the Proposed Action.	Slight changes in disturbance from the Key Observations Points but result in the same conclusion as the Proposed Action.	No impacts other than those already authorized.
Noise and Vibration	Increase in noise	The level of mining activity would increase slightly but no significant increase in noise levels is expected over the current noise level with the existing operation. A slight increase in traffic along the access route may slightly increase the noise level in those areas.	Same as the Proposed Action.	Same as the Proposed Action.	No impacts other than those already authorized.
Socioeconomics	Work force increase	There would be an increase of approximately 110 employees at the mine which modeling indicates could result in an additional 33 indirect and 50 induced jobs. These would be divided between the three counties.	Same as the Proposed Action.	Same as the Proposed Action.	No impacts other than those already authorized.
	Labor Income	Modeling estimates that the value of direct, indirect, and induced annual labor income would be \$9.9 million in 2006 dollars.	Same as the Proposed Action.	Same as the Proposed Action.	No impacts other than those already authorized.
	Increased demand on county and city infrastructure	Housing limitations in Ely and Eureka would like result in new employees finding housing in Elko. This trend may shift in the long-term as additional housing is constructed in the other	Same as the Proposed Action.	Same as the Proposed Action.	No impacts other than those already authorized.

RESOURCE	POTENTIAL IMPACT	PROPOSED ACTION	ALTERNATIVE A PARTIAL PIT BACKFILL	ALTERNATIVE B MOONEY BASIN LEACH PAD	NO ACTION ALTERNATIVE
		communities. If all the new employees were to find housing in Elko, this would only represent 0.4 percent of the current civilian labor force. It is anticipated that the existing city and county infrastructure (schools, utilities, fire protection, law enforcement, etc.) would be adequate.			
Environmental Justice	Impact on minority or low income populations	None identified.	Same as Proposed Action.	Same as Proposed Action.	No impacts other than those already authorized.
	Undue burden to children	None identified.	Same as Proposed Action.	Same as Proposed Action.	No impacts other than those already authorized.
Cultural Resources (Prehistoric)	Site disturbance	Seven prehistoric period archaeological sites have been identified as eligible for the National Register of Historic Places. Approximately 503 acres of the Proposed Action Area has not been surveyed. Any eligible sites that would be impacted by the Proposed Action would be handled in accordance with the programmatic agreement between Barrick, the BLM, and the State Historic Preservation Office.	With the reduction in disturbance, three non-eligible sites would be eliminated from potential impacts. Sites impacted by Alternative A would be in accordance with the programmatic agreement.	With the reduction in disturbance, one eligible site and two identified non eligible site would be outside the disturbance footprint, and one site that has not yet been evaluated. Sites impacted by Alternative B would be treated in accordance to the programmatic agreement.	No impacts other than those already authorized.
Cultural Resources (Historic)	Site disturbance	Twenty-nine historic period archeological sites have been identified with only one site deemed eligible for the National Register of Historic Places. Only one non-eligible site has been disturbed to date. Any eligible sites that would be impacted would be treated in accordance with the Programmatic Agreement.	With the reduction in disturbance, two non-eligible sites would be outside of the proposed disturbance footprint. Sites impacted by Alternative A would be treated in accordance with the programmatic agreement.	No non-eligible nor eligible historic sites are located in the reduced disturbance area associated with Mooney Leach Pad, thus impacts would be the same as the Proposed Action.	No impacts other than those already authorized.

RESOURCE	POTENTIAL IMPACT	PROPOSED ACTION	ALTERNATIVE A PARTIAL PIT BACKFILL	ALTERNATIVE B MOONEY BASIN LEACH PAD	NO ACTION ALTERNATIVE
Native American Religious Concerns	None Identified	None identified.	Same as Proposed Action.	Same as Proposed Action.	No impacts other than those already authorized.
Hazardous and Solid Waste/Hazardous Materials	Spills during transportation	Chemical spills during transportation could occur but the probability of a spill is expected to be very low. The probability of a spill in a sensitive area such as a population center or ecologically sensitive area is extremely low and not anticipated.	Same as the Proposed Action.	Same as the Proposed Action.	No impacts other than those already authorized.
	Spills during storage or use	Some spills of chemicals and fuel could occur during operations. Handling, storage and use of chemicals and fuels would be conducted in accordance with the Hazardous Materials Spill and Emergency Response Plan, which would ensure the impacts from spills would be minimized and the spilled material contained and removed.	Same as the Proposed Action.	Same as the Proposed Action.	No impacts other than those already authorized.