Marigold Mine
Plan of Operations Amendment (NVN-065034) and Reclamation Permit (#0108): Mackay Optimization Project

Submitted to:

United States Department of the Interior
Bureau of Land Management
Humboldt River Field Office
5100 East Winnemucca Blvd.
Winnemucca, NV 89445

Prepared by:

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Marigold Mining Company
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Valmy, NV 89438

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Executive Summary

This submission for the *Marigold Mine Plan of Operations Amendment (NVN-065034) and Reclamation Permit (#0108), also called the Mackay Optimization Project,* proposes modifications to existing and authorized operations. This Plan of Operations (Plan) Amendment was prepared by Silver Standard Resources Inc., Marigold Mining Company (MMC) in compliance with the United States Bureau of Land Management (BLM) regulations (43 CFR§3809) and Nevada regulations governing the reclamation of mined lands (Nevada Administrative Codes [NAC] 519A.010-635). Mining activities will be located in Humboldt County, Nevada on unpatented mining claims on public lands administered by the Bureau of Land Management (BLM) Humboldt River Field Office and private lands controlled by MMC.

Federal policy encourages the development of federal mineral resources and requires reclamation of disturbed federal lands, consistent with the Federal Land Policy Management Act and the Mining and Mineral Policy Act of 1970. Under these laws, the statutory right exists, guided by Department of Interior regulations, to use federal lands for the purpose of mineral prospecting, exploration, development, extraction, and other associated reasonable uses. The Department of Interior regulations state, "this statutory right carries with it the responsibility to assure that operations include adequate and responsible measures to prevent unnecessary or undue degradation of the federal lands and to provide for reasonable reclamation" (43 CFR §3809.0-6). The 43 CFR §3809 surface management regulations were modified on October 31, 2001 and the definition of "unnecessary or undue degradation" at §3809.5 was linked to the general and specific performance standards listed in §3809.420. These performance standards establish sideboards for determining whether a proposed Plan of Operations complies with the unnecessary or undue degradation standard.

Nevada reclamation laws govern private and public lands in the state of Nevada (NRS 519A.100). These laws define reclamation as actions that will:

> *" . . . shape, stabilize, revegetate or otherwise treat the land in order to return it to a safe, stable condition consistent with the establishment of a productive post-mining use of the land and the safe abandonment of a facility in a manner which ensures the public safety, as well as the encouragement of techniques which minimize the adverse visual effects."*

The BLM has previously authorized a Plan boundary of 19,275 acres, of which 10,354 acres are public lands administered by the BLM, and the remainder is private land. The BLM has authorized disturbance on up to 5,012 acres (2,855 acres of private land and 2,157 acres of public land) within the Plan boundary. Authorization documents analyzed under the National Environmental Policy Act of 1969 (NEPA) and other documents demonstrating a Determination

of NEPA Adequacy are listed in Appendix A. MMC does **not** propose to expand the authorized Plan boundary, but to optimize use within it. This includes authorization for pits, waste rock storage areas, processing facilities, roads, growth media stockpiles, water diversion structures, infill areas, and exploration (MMC, 2014). As part of this optimization strategy, MMC is amending the existing Plan to:

- Combine four of the existing and approved open pits (Target 1, Target 2, Target 3, and East Hill) pits to become a single open pit to be called the Mackay Pit;
- Combine the existing and approved Terry Zone Pit and 8 Pits to become the Mackay North Pit;
- Increase the size of the 5 North Pit;
- Dewater the Mackay Pit and Mackay North Pit at a rate of up to 6,000 gpm with an average rate of about 1,500 gpm to 2,000 gpm;
- Construct and operate a new production well and dewatering wells with associated roads, power, and above-ground pipelines;
- Construct and operate six rapid infiltration basins (RIBs) with associated roads, pipelines, and monitoring wells;
- Move overburden (waste rock) material stored in the Old Marigold and Top Zone waste rock storage areas (WRSAs) to help enable creation of the Mackay North pit;
- Create one new WRSA (the 5 North) and expand the Northeast and Northwest Expansion WRSAs;
- Move backfill material within pits to allow for pit expansions and future backfill placement;
- Construct processing pad cells 22, 23, and 24;
- Relocate material from Cell 5 through Cell 9 on the western edge of the processing pad facility to other areas on lined containment to accommodate the Mackay North Pit footprint;
- Increase the solution application rate from the existing 15,000 gallons per minute (gpm) to 20,000 gpm;
- Increase the ore stacking rate on the processing pads from 25 million tons per year to 30 million tons per year;
- Construct new process ponds on existing disturbance;
- Construct two new carbon column trains on existing disturbance;
- Relocate the existing 120-kV power line (by NV Energy);
- Changes to ancillary facilities including:
    - Move the approved East Stormwater Diversion Structure;
    - Relocate the existing lime silo;
    - Relocate the explosives magazine;
    - Movement and construction of growth media stockpiles;
    - Move/construct fencing to include proposed facilities;
    - Add miscellaneous infill disturbance areas;
- Move haul roads to accommodate the new facility footprints;
- Relocate the public Buffalo Valley Road to accommodate the mine changes;
- Re-establish a private land access road to land holdings in Section 30;
- Move the planned location of the approved but not yet constructed utility corridor;
- Increase exploration disturbance by 95 acres;
- Redistribute disturbance acres between disturbance categories;
- Increase the total disturbance area from approximately 5,012 acres to approximately 6,905 acres; and
- Increase the mine life by up to ten years as a result of the above optimization strategies.

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LIST OF ACRONYMS

°F	degrees Fahrenheit
ABA	acid base accounting
Amsl	above mean sea level
ANFO	ammonium nitrate fuel oil
Barrick	Barrick Gold Corporation
BLM	Bureau of Land Management
BMPs	best management practices
CFR	Code of Federal Regulations
Cordex	Cordex Exploration Company
Corona	Corona Gold, Inc.
Dome	Dome Exploration U.S. Limited
EPM	environmental protection measures
ERP	Emergency Response Plan
ET	evapotranspiration
Glamis	Glamis Gold Corporation
Goldcorp	Goldcorp Inc.
gpm	gallons per minute
HDPE	high density polyethylene
HLDE	Heap Leach Draindown Estimator
Homestake	Homestake Mining Company
H:V	horizontal to vertical
I-80	Interstate 80
ICMC	International Cyanide Management Code
Lacana	Lacana Gold, Inc.
MSHA	Mine Safety and Health Administration
MMC	Marigold Mining Company
MWMP	meteoric water mobility procedure
NAC	Nevada Administrative Code
NDOW	Nevada Department of Wildlife
NDWR	Nevada Division of Water Resources
NDEP	Nevada Division of Environmental Protection
NEPA	National Environmental Protection Act
NRHP	National Register of Historic Places
NRS	Nevada Revised Statutes
PCS	petroleum contaminated soil
Plan boundary	Plan of Operations boundary
RIBs	rapid infiltration basins
ROD	Record of Decision
SHPO	State Historic Preservation Office
SSMI	Silver Standard Marigold Incorporated
U.S.C.	United States Code
WRSA	waste rock storage area

1 Corporate Information

1.1. Name & Business Address of Individual Completing Application

Name:	Duane Peck
Title:	General Manager
Business Name:	Marigold Mining Company
Business Address:	P.O. Box 160 Valmy, NV 89438
Telephone Number:	(775) 635-2317
FAX Number:	(775) 635-2551

1.2. Partnership Information

Not applicable.

1.3. Corporation Information

1.1.1 Corporation Name

Marigold Mining Company

1.1.2 President Information

Full Name:	John Smith
Street Address:	800-1055 Dunsmuir Street Vancouver, BC Canada
ZIP Code:	V7X 1G4
Telephone Number:	(604) 689-3846

1.1.3 Treasurer Information

Full Name:	Matt Freeman
Street Address:	800-1055 Dunsmuir Street Vancouver, BC Canada
ZIP Code:	V7X 1G4
Telephone Number:	(604) 689-3846

1.1.4 Secretary Information

Full Name:	Kelly Stark-Anderson
Street Address:	800-1055 Dunsmuir Street
	Vancouver, BC Canada
ZIP Code:	V7X 1G4
Telephone Number:	(604) 689-3846

1.4. Taxpayer ID Number

CONFIDENTIAL

1.5. Registered Agent

Nevada Registered Resident Agent Information

Full Name:	The Corporation Trust Company of Nevada
Street Address:	311 Division Street
City:	Carson City, Nevada
ZIP Code:	89703
Telephone Number:	(775) 688-3061

1.6. Authorized Field Representative Information

Duane Peck, Marigold Mine General Manager, is the authorized field representative.

2 Existing and Proposed Operations

2.1 List of BLM Claims and Serial Numbers

Proposed exploration, mining, and related surface disturbance will be conducted on private lands or on unpatented lode claims owned, leased, or controlled by Marigold Mining Company (MMC) on Bureau of Land Management (BLM) administered public lands. Claim names and BLM serial numbers are provided in Appendix B. The Plan of Operations boundary (Plan boundary) location is shown on Figure 1, claims are shown on Figure 2, and a description is provided in Section 2.6.1.

2.2 History

MMC owns and operates the Marigold Mine located approximately three miles south of Valmy, Nevada in the southern portion of Humboldt County. MMC is a wholly owned subsidiary of Silver Standard Marigold Inc. (SSMI), whose parent company is Silver Standard Resources Inc. (SSRI).

Located on the northern end of the Battle Mountain-Eureka Trend, mining activities began in the project area in 1927 when three claims were staked that would later be named the Marigold Mine. Additional claims were staked until 1940 when underground mining was initiated and approximately 10,000 tons of ore, averaging 0.2 ounces of gold per ton, were processed. Operations ceased during World War II. However, exploration and geochemical testing continued through 1980. Mining resumed in 1983 when the Marigold Development Company and successor companies crushed and heap leached about 3,100 tons of gold ore mined from a small open pit located above the old underground workings. The gold production rate was approximately 270 ounces during 1983 and 1984. VEK Associates then staked several claims in the general area located south of Valmy, approximately one mile north of the historic Marigold Mine. During 1984 and 1985, geophysical surveys and exploratory drilling were completed within the claims area by the Cordex Exploration Company (Cordex) (a partnership of Dome Exploration U.S. Limited [Dome], Rayrock Mines, Inc. [Rayrock], and Lacana Gold, Inc. [Lacana]). Two of the exploration drill sites intersected gold-bearing ore bodies with higher gold concentrations (i.e., 0.07 to 0.22 ounces per ton) than other sites. Additional drilling and completion of a feasibility study lead to the decision in March 1988 to develop a mine and mill/heap leach operation, with

Rayrock named as the operating partner. Stripping the primary 8 South deposit began in September 1988. The first doré bar was poured in August 1989.

Rayrock was one of the original partners of Cordex (a partnership consisting of Dome, Rayrock, and Lacana, each owning a 33.3 percent interest). In 1986, Rayrock acquired a majority interest in the project when it purchased Dome's interest (33.3 percent). In 1999, Glamis Gold Corporation (Glamis) acquired Rayrock's 66.7 percent interest in the property and then in 2006, Goldcorp Inc. (Goldcorp) acquired its interest in the property it amalgamated with Glamis.

The third original partner, Lacana, was succeeded by Corona Gold, Inc. (Corona). In 1986, Santa Fe Pacific joined the partnership and provided some additional land that allowed continued exploration drilling in the area. Later that year, Welcome North and Nevada North (small Canadian companies) also joined the partnership. Homestake Mining Company (Homestake) joined the partnership as a result of their acquisition of Corona.

Shortly after the Homestake acquisition, the various joint ventures purchased the Welcome North/Nevada North interests and exchanged the newly discovered Stonehouse ore body, plus additional land, to Santa Fe Pacific for their 30 percent interest and additional other lands. Barrick Gold Corporation (Barrick) then acquired its interest in the property in 2002 when it merged with Homestake.

From 2006 to early 2014, Goldcorp (66.7 percent interest) and Barrick (33.3 percent interest) operated the Marigold Mine as a joint venture. In April 2014, SSMI completed their acquisition of the Marigold Mine by acquiring 100 percent of the interest in the property from these joint venture owners.

The original Plan for the Marigold Mine was authorized by the BLM in a Record of Decision (ROD) in July 1988. Since that time, several amendments leading to the current authorized operations were analyzed in numerous NEPA documents and other documents demonstrating a Determination of NEPA Adequacy as identified in Appendix B.

Activities within the Marigold Mine Plan boundary have expanded periodically since production began in 1988, and full-scale operations currently continue. As shown in Appendix B, these operations have been analyzed in four Environmental Assessments, one Environmental Impact Statement, and several minor modifications approved by the BLM, with associated Nevada Division of Environmental Protection (NDEP) permit approvals.

MMC has been an industry leader in environmental responsibility. In 2006, the Marigold Mine became the first operating mine in the world to be certified under the International Cyanide Management Code (ICMC) and has successfully completed recertification audits in 2009 and 2012 with their next audit to be completed in late 2015. They were also one of the first mines in the country to install mercury control technologies in there process plant, long before these air pollution control devices were required by state or federal mandate.

2.3 Land Status

The BLM Humboldt River Field Office administers public lands within the Plan boundary as shown on Figure 2. Lode claims within the Plan boundary are owned, leased, or controlled by MMC. Names and addresses of claimants and private landowners are listed below:

Claimants:

Marigold Mining Company
P.O. Box 160
Valmy, NV 89438

VEK/Andrus Associates
41 Red Willow Court

Blairsden, CA 96103

Suzanne Decker
3716 E. Idaho Street, Suite A
Elko, NV 89801

Franco-Nevada U.S. Corporation
1745 Shea Center Drive, Suite 310
Highlands Ranch, CO 80129

Private Landowners:

Marigold Mining Company
P.O. Box 160
Valmy, NV 89438

Franco-Nevada U.S. Corporation
1745 Shea Center Drive, Suite 310
Highlands Ranch, CO 80129

Board of Regents of the University of Nevada System Reno, Nevada
2601 Enterprise Road
Reno, NV 89512

2.4 Disturbance from Past and Present Operators

MMC will take responsibility for mining-related disturbances on MMC-controlled lands within the Plan boundary.

2.5 Access

The Marigold Mine is located approximately three miles south of Valmy, Nevada in the southeastern portion of Humboldt County, Nevada. Access to the site is via Interstate 80 (I-80) to the Valmy exit (Exit 216) and then southwest on the Buffalo Valley Road (County Road 507 N and BLM Road 2080 S) to the Marigold Mine access road. Mine access is shown in Figure 1.

2.6 Existing and Authorized Operations

Activities within the Marigold Mine operations area have expanded periodically since large scale production began in 1988 and full-scale operations currently continue. MMC has previously submitted plans of operation and amendments to the BLM Humboldt River Field Office for mining operations located within the Plan boundary. The NEPA actions associated with the Marigold Mine over the years are summarized in Appendix B.

MMC is authorized to construct facilities on approximately 2,855 acres of private land and 2,157 acres of public land, for a cumulative authorized mine disturbance of 5,012 acres. Authorized surface disturbance is provided in

Table 2-1 and authorized and existing facilities are shown on Figure 3 and Drawing 100. Existing exploration disturbance as of the end of 2014 is shown on Figure 4. Previously submitted plans of operation describe the existing and authorized disturbance associated with mine facilities in greater detail.

Table 2-1: Authorized Surface Disturbance Summary

Mine Component	Authorized Public Land (acres)	Authorized Private Land (acres)	Total Authorized Disturbance (acres)
Exploration Evaluations	**22.0**	**69.2**	**91.2**
Access Roads, Drill Pads with sumps	22.0	69.2	91.2
Roads	**87.1**	**103.1**	**190.2**
Haul-Access	82.0	93.0	175.0
Buffalo Valley Realignment	5.1	10.1	15.2
Pits	**772.9**	**695.1**	**1,468.0**
5 North Pit	0.0	29.0	29.0
8 Pit	160.0	13.0	173.0
East Hill Pit	200.9	286.1	487.0
Target 1, 2, and 3 Pits	220.0	74.0	294.0
Antler Pit	32.0	45.0	77.0
Basalt Pit	34.0	140.0	174.0
Terry Zone Pit	126.0	108.0	234.0
Process Ponds Area	**18.0**	**15.8**	**33.8**
Processing Pad – ET Cell Closure Ponds[1]	16.0	9.0	25.0
Process Infrastructure	2.0	1.0	3.0
Infill Process Yards	0.0	5.8	5.8
Processing Pad Facility[1]	**309.1**	**468.4**	**777.5**
Cells 1-21	309.1	468.4	777.5
Waste Rock Storage Areas	**616.5**	**1,007.5**	**1,624.0**
Section 8	164.0	12.0	176.0
Northwest	136.0	273.0	409.0
Northwest Expansion	151.0	334.3	485.3
Old Marigold	51.0	23.0	74.0
Resort	14.0	171.0	185.0
South	53.0	0.0	53.0
Top Zone	41.0	67.0	108.0
Northeast	6.5	127.2	133.7
Tailings Facility	**0.0**	**184.8**	**184.8**
Facility Reclaimed	0.0	184.8	184.8
Buildings with Foundations	**6.4**	**5.7**	**12.1**
Miscellaneous Shops-Offices	6.4	5.7	12.1
Yards Storage-Ancillary[2]	**296.0**	**215.0**	**511.0**
Growth Medium Stockpiles	20.0	28.0	48
Infill-Ancillary-Misc.	276.0	187.0	463.0
Water Management - Diversions	**28.5**	**90.8**	**119.3**

Mine Component	Authorized Public Land (acres)	Authorized Private Land (acres)	Total Authorized Disturbance (acres)
Water Supply	4.0	5.0	9.0
Trout Creek Diversion/Dam	6.0	15.3	21.3
Lower Trout/Cottonwood Diversion	14.8	31.2	46.0
Millennium Catchment Area	0.1	24.2	24.3
WW4 Pond[3]	0.0	1.0	1.0
East Stormwater Diversion Structure[4]	3.6	14.1	17.7
Total	**2,156.5**	**2,855.4**	**5,011.9**

Source: Marigold Mine Reclamation Permit 0108 last amended on December 11, 2014.
[1]Referred to in the reclamation permit as the Heap Leach Facility
[2]Includes 7.0 acres of stormwater ponds and a utility corridor
[3]Referred to herein as the Freshwater Storage Pond
[4]Referred to in the reclamation permit as the Leach Cell 20/21 Diversion

2.6.1 Plan Boundary

The currently authorized Plan boundary encompasses approximately 19,275 acres of private land and public land administered by the BLM. Approximately 393.3 acres of private landholdings not controlled by MMC are located within the Plan boundary as shown on Figure 3. No changes to the Plan boundary are proposed, as the proposal is to optimize use within the current Plan boundary.

The Plan boundary is located within all or parts of: sections 35 and 36, T34N, R42E; sections 19, 20, 28 through 33, T34N, R43E; sections 1, 12, 13, 24, 25, 36, T33N, R42E; sections 4 through 10, 16 through 21, 29 through 31, T33N, R43E; and Section 6, T32N, R43E.

2.6.2 Open Pit Facilities

As shown in Figure 3, the existing and authorized open pits include:

- 8 Pit;
- East Hill Pit;
- 5 North Pit;
- Target 1 Pit;
- Target 2 Pit;
- Target 3 Pit;
- Antler Pit;
- Basalt Pit; and
- Terry Zone Pit.

Authorized and existing pit dimensions are listed in Table 2-2. Proposed changes to the pits are discussed in Section 2.7.1.

Table 2-2: Authorized Open Pit Design Parameters Summary

Pit	Length (feet)	Width (feet)	Maximum Depth (feet)	Bottom Elevation (feet amsl)
5 North	1,400	1,050	410	4,450
8 Pit	4,800	1,600	430	4,440
East Hill	8,100	3,800	850	4,550
Target 1	1,500	500	200	4,680
Target 2	3,400	1,800	480	4,680

Pit	Length (feet)	Width (feet)	Maximum Depth (feet)	Bottom Elevation (feet amsl)
Target 3	3,390	2,000	1,100	4,680
Terry Zone	6,400	2,400	500	4,470
Antler	2,625	1,380	600	5,180
Basalt	3,975	1,925	840	5,220

2.6.2.1 Mining Methods

The mining procedures at the Marigold Mine consist of drilling, blasting, loading trucks, and hauling material to designated areas. Ore and waste rock are drilled on approximately 21-foot centers using diesel-powered rotary hammer drills. The drill holes are charged with ammonium nitrate/fuel oil (ANFO) mixture by means of a truck-mounted mixing and dispensing unit. Unconsolidated gravels and growth media that do not require drilling and blasting are ripped with a dozer, as required, for removal. Blasting occurs during daylight hours and complies with applicable safety standards. Typically, one or two blasts occur daily at mid-morning and in mid-afternoon. Material is mined on 25- to 50-foot benches. Slope angles in the pits are generally 45 to 50 degrees.

Mining activities occur on a 24-hour, 7-days per week schedule using two to three shifts. The mining equipment fleet is identified in Section 2.6.11 and will not significantly change with the proposed amendment.

2.6.3 Waste Rock Storage Areas

As shown in Figure 3, the existing and authorized overburden, or waste rock, storage areas (WRSAs) include:

- Section 8;
- Top Zone;
- Old Marigold;
- Resort;
- Northeast;
- Northwest;
- Northwest Expansion; and
- South.

WRSAs are created by end dumping onto the active bench face at the angle of repose. The WRSAs are constructed with average bench heights between 50 and 60 feet at an overall slope of three horizontal to one vertical (3H:1V). Proposed changes to the WRSAs are discussed in Section 2.7.4. Authorized and existing WRSA parameters are summarized in Table 2-3.

Table 2-3: Authorized Waste Rock Storage Area Parameters

WRSA	Authorized		
	Storage Capacity (million tons)	Reclaimed slope	Height (feet)
Top Zone	30.0	3:1	590
Old Marigold	5.0	3:1	100
Resort	65.0	3:1	280 to 590
Northwest	150.0	3:1	280 to 590
Northwest Expansion	221.0	3:1	550
Northeast	59.0	3:1	400
South	5.0	3:1	200

WRSA	Authorized		
	Storage Capacity (million tons)	Reclaimed slope	Height (feet)
Section 8	136.5	3:1	350

Waste rock identified to have potential to be acid generating has been managed in accordance with the management requirements of the Marigold Mine Sulfide Waste Management Plan, which was last approved by the BLM on April 15, 2014. The Sulfide Waste Management Plan has specific testing for meteoric water mobility procedure (MWMP), acid base accounting (ABA), and kinetic testing, if necessary. It also includes performance criteria, material management procedures, and reporting requirements. These requirements are to ensure that potential acid generating material is identified prior to being mined, and once identified, managed in accordance with the Sulfide Waste Management Plan. To date, MMC has not encountered waste rock material requiring management procedures in accordance with the Sulfide Waste Management Plan requirements. Changes to the Sulfide Waste Management Plan are discussed in Section 2.9.

Changes to waste rock storages areas and waste rock management are discussed in Section 2.7.4.

2.6.4 Open Pit Backfill

Since mining is a dynamic process and the window of opportunity for potential pit backfilling is time-critical, MMC proposed and the NDEP and BLM have previously approved a flexible backfill approval process (BLM, 2001 and 2003), which requires the following documentation to be submitted to NDEP and BLM prior to backfilling:

- Source of the material to be used as backfill;
- Geologic information for the backfill material;
- Bottom elevation of the pit that will be backfilled; and
- The elevation of the 1992 pre-dewatering water table beneath the pit.

Presently, backfilling is only approved for pits that are above the 1992 pre-dewatering water table (pre-Lone Tree Mine dewatering ground water level) with the exception of the Terry Zone North Pit and the 8 Pit (southern portion) where backfilling is authorized below the 1992 pre-dewatering level.

The following pits have been approved to operate and receive backfill material:

- 8 Pit (8 south portion);
- Terry Zone Pit;
- East Hill Pit (the old Mackay Pit portion);
- Target 1 Pit;
- Target 2 Pit;
- Target 3 Pit;
- Basalt Pit; and
- Antler Pit.

The following geologic formations have been approved for use as pit backfill material:

- Valmy;
- Antler;
- Edna Mountain; and
- Havallah.

The Terry Zone North Pit and 8 Pit (southern portion) have been approved to receive Edna Mountain and Havallah waste rock backfill to approximately ten feet above the pre-1992 ground

water elevation to reduce the possibility of pit lake development. The Terry Zone Pit has been authorized for backfill to 4,520 feet amsl (BLM, 2003) and backfilling of the 8 Pit (southern portion) was completed during 2003 to an elevation of 4,460 feet amsl (MMC, 2013).

The Target 1 Pit is authorized for backfill with waste rock from the Target 2 Pit, and the Target 2 Pit is authorized for backfill with suitable waste rock from the Basalt Pit and/or the Antler Pit (BLM, 2003). Both pits are authorized for complete backfill as expansion of the Northwest and Northeast WRSAs form a continuous WRSA over the backfilled Target 1 and Target 2 pits. The Target 3 Pit has also been authorized for backfill with material from the Antler, Valmy, Havallah, and Edna Mountain formations.

In 2006, the BLM authorized backfill in the Antler Pit using waste rock material from the Basalt and Antler pits. The Antler Pit has been authorized to be backfilled and integrated, on the east and south sides, into the South WRSA to approximate the pre-mining surface topography (GMMC, 2006). The resulting WRSA will be sloped to limit meteoric infiltration.

In 2010, the BLM authorized backfill of the Basalt Pit and the old Mackay Pit which is now part of the East Hill Pit. The backfill material source is authorized from the East Hill and Target 2 pits as well as portions of the Basalt Pit.

Proposed changes to backfill are discussed in Section 2.7.5.

2.6.5 Processing Pad Facilities

The existing and authorized processing (heap leach) pad facilities include:

- Cells 1 through 21;
- Cell 2/3 Infill;
- East Expansion
- Re-Leach Test Cell; and
- Associated process ponds, stormwater ponds, conveyance ditches, carbon column trains, storage tanks, and plant facilities.

Unless otherwise noted in Table 2-4 the existing processing pads are generally constructed on at least 12 inches of low permeability or compacted native soil and overlain with a 60- or 80-mil high density polyethylene (HDPE) liner or dual liner system. Since 2004 (beginning with construction of Cell 12), all construction has included a layer of crushed rock/gravel as overliner to protect the liner and provide a drainage layer. Processing pad cell construction details are shown in Table 2-4.

Table 2-4: Processing Pad Cell Construction Details

Processing Pad Cell No.	Permitted (year)	Permitted height (feet)	Liner System / Leak Detection System
1	1989	85	24 inch Compacted Clay / None
2	1989	85	24 inch Compacted Clay / None
3	1990	350	Clay, HDPE, Tails / None
4	1990	350	Clay, HDPE, Tails / None
5a	1990	350	Clay, HDPE, Tails / None
5b	1990	350	Clay, HDPE, Tails / None
6	1990	350	Clay and HDPE / Yes[1]
7	1990	120	Clay and HDPE / Yes
8	1990	100	24 inch Compacted Clay / None

Processing Pad Cell No.	Permitted (year)	Permitted height (feet)	Liner System / Leak Detection System
2/3 In Fill	1998	350	Clay, HDPE, and Tails / None
9	1998	350	Clay, HDPE, and Tails / None
10	2000	350	Clay, HDPE, and Tails / None
East Expansion	2000	350	Clay, HDPE, and Tails / None
11	2002	400	Clay and HDPE / None
12[2]	2004	400	Clay and minimum 60-mil HDPE / None
13[2]	2005	400	Clay and minimum 60-mil HDPE / None
14[2]	2006	400	Clay and minimum 60-mil HDPE / None
15R[2]	2008	400	Clay and minimum 60-mil HDPE / None
16	2009	400	Clay and minimum 60-mil HDPE / None
17	2010	400	Clay and minimum 60-mil HDPE / None
18	2010	400	Clay and minimum 60-mil HDPE / None
19[3]	2015	400	Clay and minimum 60-mil HDPE / None
20[3,4,5]	2015	265[6]	Clay and minimum 60-mil HDPE / None
21[3]	2015	245[6]	Clay and minimum 60-mil HDPE / None

[1] Removed with the construction of the East Extension.
[2] Permitted with 60-mil HDPE.
[3] Have been approved but have not yet been constructed.
[4]Construction has started and is anticipated to be operational during the second half of 2015.
[5]Under construction
[6]These processing pads can be increased to a height of 400 feet with the approval of an engineering design change.

Internal berms covered with synthetic liner, separate the cells. The processing pad cells are stacked with run-of-mine ore, which is truck hauled to one of the active processing pad cells and end-dumped in 15- to 50-foot lifts. Heap leach ore is placed on the pad at a rate of 25 million tons per year. Once a lift or portion of a lift is complete, the surface is cross-ripped to a depth of approximately nine feet to enhance solution percolation. Solution distribution lines are then placed on top of the ore, and barren solution is applied using either drip emitters or sprays at a rate of up to 15,000 gpm.

The barren solution percolates through the ore collecting precious metals and exits the heap material at one of several collection areas as pregnant solution. The pregnant solution is conveyed, by gravity flow, to the pregnant solution pond or the recirculation system via HDPE pipelines located in synthetic lined ditches. The processing pad process flow sheet is shown on Figure 5.

Upon exiting the heap, the pregnant solution can be routed to either the recirculation system or the pregnant solution ponds. The pregnant solution routing is dependent upon the precious metal content of the solution. If the precious metal content is low, the solution is routed to the recirculation system to report back to the top of the heap for extraction of additional precious metals. If the pregnant solution is high enough, the solution is routed to the pregnant ponds.

Solution reporting to the pregnant ponds is pumped through a series of carbon column trains to recover the precious metal. The carbon stripping and gold recovery circuit is shown on Figure 6. Upon exiting the carbon column trains, the solution is barren of precious metal and either flows by gravity or is pumped to the barren solution pond. The barren solution is recirculated, using a pump, back to the top of the heap to continue the leaching process.

Leaching is conducted concurrently with ore stacking to allow progressive lifts to be constructed and operated in a similar manner. The pH and cyanide concentrations are adjusted in either the barren solution pond or by injection into the barren solution line at the toe of the heap.

Changes to the leaching facilities and leach rate are discussed under Section 2.7.6.

2.6.5.1 Processing Pad Ancillary Facilities

Processing pad ancillary facilities include piping and pumps, a pH adjustment system, a cyanide addition system, an anti-scalant solution system, a solution processing facility, and miscellaneous valves, and electrical controls. The mill building is connected to the processing pad facilities via a buried double-walled pipeline to pump process solutions from the plant to the leach ponds.

Processing facilities (carbon column trains) are located on the north side of Barren Pond No. 1 and consist of 25 carbon columns, carbon storage tanks, a liquid cyanide storage tank, and a liquid caustic soda storage tank. The processing facilities and storage tanks are located on a concrete slab with concrete berms. Synthetically lined solution channels connect the slab to Barren Pond No. 1.

The pH adjustment system consists of dry lime silos located near the crusher and on the haulage accesses to the processing pads as well as liquid caustic tanks at the processing facility. Dry lime may also be stored on the processing pads.

Upon exiting the carbon column trains, the leach solution, now barren of precious metals, flows by gravity or is pumped into the barren solution ponds, where fresh or reclaim water is added to maintain the appropriate water balance. The pH is adjusted to approximately 10.3 standard units prior to the addition of cyanide. Sodium cyanide solution is added to the barren leach solution to re-establish the desired cyanide level via an in-line cyanide mixing station located adjacent to the barren solution pond and at the toe of Cell 12. Barren leach solution is then pumped back onto the top of the heap to continue the process cycle.

The lime silo in Section 20 is proposed for relocation as discussed in Section 2.7.8.6. The installation of additional carbon column trains is presented in 2.7.6.1.

2.6.5.2 Heap Stability Analysis

Slope stability analyses were performed for the processing pads, which incorporated ground slope, sub-base and liner materials, ore stacking heights, ore composition, and final stack heights and slopes. Stability analyses are included with processing pad design documents (Davis, 1993; Vector, 1994, 2000a, 2000b, 2001a, 2001b, 2004, 2006, and 2008; and RTW 2005a and 2005b).

Safety factors for both static and seismic conditions were calculated using three stability scenarios as follows:

- Stability of the heap face at the maximum section. This case evaluates the potential for shallow “sloughing” of the benched slope configuration;
- Stability of the gross heap and foundation. This case evaluates the probability of deep circular failures through the heap and foundation; and
- Stability of the heap at the liner interface. This case evaluates the potential for large blocks of the heap to slide along the contact between the liner and the bedding material and the liner and the cushion layer.

In practice, a static factor of safety greater than 1.5 is generally accepted. A pseudo static (seismic) factor of safety greater than 1.1 is generally accepted for permanent structures for this seismic zone. Given the short life of this facility and the lack of long term risk associated with shallow slope failures, a minimum pseudo static value of 1.05 is considered acceptable.

Interim slopes, typically slopes that will be abutted by the construction of additional cells, may be slightly steeper than 3H:1V based upon stability analysis results. However, slopes are constructed as dictated by the slope stability analysis. Following completion of production leaching, the heaps will be contoured to a final overall slope of approximately 3H:1V.

2.6.6 Process Solution Ponds

There are a total of four pregnant solution ponds (Pregnant Ponds No. 1, 2, 3, and 4) and two barren solution ponds (Barren Pond No. 1 and 2) that are interconnected with synthetic-lined channels and cumulatively make up the "pond system". An additional pregnant solution pond has been approved but is not yet constructed (Pregnant Pond 5).

The process solution ponds have been designed to hold the working volume of solution while maintaining a two-foot freeboard after a 25-year, 24-hour storm event. The factors used for storm event calculations included on-site precipitation, off-site precipitation that could not be diverted, direct precipitation into the ponds, and a 24-hour power outage. Pond volumes are summarized in Table 2-5.

Table 2-5: Pond Storage Requirements

Pond	Pond Depth (feet)	Pond Capacity (million gallons)	Normal Operating Volume (million gallons)	Normal Operating Freeboard (feet)
Pregnant Pond No. 1[1]	8.5	2.83	0	8.5
Pregnant Pond No. 2[1]	15	4.45	1.70	6.5
Pregnant Pond No. 3[1]	15	6.34	0.60	13
Pregnant Pond No. 4[1]	18	11.82	0.94	16
Pregnant Pond No. 5[2]	N/A	6.7	N/A	N/A
Barren Pond No. 1	8.5	2.83	0.83	5.5
Barren Pond No. 2	18	7.91	2.69	10
Stormwater/Emergency Overflow Pond	26	6.18	0	26
Total		**42.36**	**6.76**	N/A

[1]Formerly referred to as pregnant ponds 3, 4, 6, and 7 in sequence.

[2] Approved but not yet constructed

The fluid management system is designed to contain storm water flows and drain down from the processing pad cells during a 100-year, 24-hour event with a 24-hour power outage. In the event of a power outage, backup power is supplied by an on-site generator and/or with rental units. MMC has confirmed that rental units are available within four to six hours, which is sufficient lead time, considering the sponge-like nature of the heap and current pond capacities.

Changes to the process ponds are described in Section 2.7.7

2.6.7 Rock Crushing Facilities

Presently, crushing operations are only conducted for construction projects, such as producing "overliner" material for processing pad construction, and building roads. Ore crushing operations may resume in the future if economically feasible. When rock materials are desired to be crushed, they are hauled from the pits to the coarse ore stockpile located next to the ore crushing plant. A front-end loader places the coarse material into the jaw crusher. The rock is transferred by conveyor belt to a screen deck. Oversized rock is transferred by conveyor belt to the cone crusher for size reduction and then sent back to the screens. Undersized rock is transferred by

conveyor belt to the fine ore stockpile. The fine ore is loaded onto haul trucks and taken directly to the processing pad facility or placed in fine ore stockpiles. Particulate emissions from the ore crushing plant are controlled by dust collectors installed on the crushers, stackers, and screens as well as by a baghouse installed on the lime storage bin/feeder. The ore crushing plant components operate in accordance with Air Quality Operating Permit number AP1041-0158. No changes to the rock crushing facilities are proposed.

2.6.8 Processing Plant and Support Facilities

Processing facilities consist of a carbon column train facility just north of the process ponds, as described above, and a processing system inside of the building/plant farther to the north. No milling facilities exist at the site.

In the processing plant, a hot caustic solution is used to strip the precious metals from the loaded carbon. The temperature of the caustic solution is approximately 285 degrees Fahrenheit (º F), with a pH of 13 or greater. The solution containing precious metals is then passed through an electrowinning circuit where the metals are electroplated. The resultant precious metal-bearing material is retorted to remove mercury, then mixed with a flux, and smelted in a crucible furnace located in the refinery (Process building). The stripped carbon is acid washed and then reactivated by heating in a rotary kiln. The crucible furnace, mercury retort, and rotary kiln are operated in accordance with Air Quality Operating Permit number AP1041-0158 and Mercury Operating Permit to Construct: Phase 2, AP1041-2254. No changes to the processing plant and support facilities are proposed under this amendment.

2.6.9 Tailings Disposal Facilities

The existing approximately 185-acre tailings impoundment has been taken out of service, reclaimed, and is in advanced stages of the closure process. No changes to the tailings disposal facilities are proposed under this amendment.

2.6.10 Ancillary Support Facilities

2.6.10.1 Growth Media Stockpiles

Prior to constructing new and expanded facilities, suitable growth media is removed and stockpiled for later use during reclamation. Acceptable growth media encountered during mining activities is strategically placed adjacent to WRSAs or other facilities for potential future use. Authorized growth media stockpile locations are presented in Figure 3.

Interim reclamation measures are implemented to protect the stockpiles from wind and water erosion as well as invasion of noxious weeds. The interim reclamation for growth media stockpiles consists of seeding with a perennial grass species.

Proposed changes to growth media stockpiles are discussed in Section 2.7.8.1.

2.6.10.2 Surface Water Diversion Structures

Millennium Catchment Area and the Trout Creek Diversion

MMC has developed a permanent catchment area within the ephemeral Trout Creek drainage in Township 32 North, Range 43 East, Section 31, approximately one mile below the lower extent of perennial flow in Trout Creek. It is referred to in the reclamation permit and on Figure 3 as the Millennium Catchment Area. The catchment area design is presented in detail in the *Marigold Mine Plan of Operations (NVN-065034) and Reclamation Permit (#0108) Ephemeral Drainage Management Amendment* (MMC, 2011).

A conservation pool with a capacity of 20 acre-feet is maintained via a vertical standpipe connected to the embankment outlet works and a hydraulically actuated sluice gate. The catchment area has been designed to contain the 100-year, 24-hour storm event. MMC holds water storage rights for 724 acre feet per year. As a contingency for overflow conditions and per State requirements, the Trout Creek Diversion has been constructed from the dam. This overflow channel directs flows into the Cottonwood Creek drainage in Township 33 North, Range 42 East, Section 36. No changes to this structure are proposed.

The downstream water right continues to be delivered downstream of the embankment via the outfall pipeline, as needed. Downstream delivery is conditional on upstream receipt flow within the creek, which is monitored via the authorized upstream flow monitoring device. The upstream flow monitoring device consists of a Parshall Flume and stilling well with a solar powered data collection device. Creek flows less than the downstream property water right are conveyed per the existing condition if called for. No flows in excess of the downstream water right are conveyed via the outfall pipeline.

Trout/Cottonwood Diversion

This trapezoidal riprapped diversion structure diverts water to the north and away from the 8 Pit and Section 8 WRSA. No changes are proposed to the authorized Trout/Cottonwood Diversion under this amendment.

East Stormwater Diversion Structure

This diversion structure location is under construction. Changes to this diversion structure are discussed in Section 2.7.8.2.

2.6.10.3 Water Supply Facilities

Fresh water required for mining and processing purposes is currently obtained from existing MMC water supply wells (WW1, WW2B, and WW3B). The existing water supply pipeline transports water from the well field to the main water storage tanks and is distributed to the administration facility, processing facilities, processing pad facility, rock crushing plant, and fresh water supply stations. Presently, the total allowable duty of the water supply well field is approximately 1,577 gpm. Up to 1,500 gpm is required during peak operations to compensate for consumptive uses such as fresh make-up water for the process circuit, watering the roads for dust control, and domestic use. The average water use during the three peak water-use months of each year between 2010 and 2014 has been 1,100 gpm. The site has a permitted potable water system (permit number NV0001103) and bottled water is supplied for all employees.

Changes to water supply facilities are discussed in Section 2.7.8.3.

2.6.10.4 Infill Disturbance

In general, infill surface disturbance areas are used for access between facilities, disturbance in the course of mine construction and operation, and laydown yards for storage of extra pipe, culverts, and other non-hazardous materials during installation, construction, or maintenance activities. Proposed changes to infill areas and acres are discussed under Section 2.7.8.4.

2.6.10.5 Reagent and Hazardous Materials Management

Reagent and hazardous materials management will continue as authorized. Reagents stored and used at the site are identified in Table 2-6. No changes to reagent storage or use are proposed under this amendment.

Table 2-6: Fuels, Reagents, Volumes, and Shipments

Reagent	Storage	Amount/ Delivery	Estimated Trucks/ Month	Approximate consumption per day
Sodium cyanide	30,000 gallons	6,000 gallons	28	5,600 gallons
Sodium hydroxide	25,000 gallons	3,800 gallons	5	650 gallons
Lime	475,000 pounds	86,000 pounds	29	82,000 pounds
Activated Carbon	88,000 pounds	44,000 pounds	0.5	675 pounds
Diesel Fuel	80,000 gallons	10,500 to 12,500 gallons	70	25,163 gallons
Gasoline	5,000 gallons	1,860 gallons	6	360 gallons
Automatic Transmission Fluid	6 gallons	6 gallons	1	Minimal
Engine Oil	10,000 gallons	1,373 gallons	3	152 gallons
Hydraulic Fluid	5,000 gallons	1,059 gallons	2	57 gallons
Gear Oil	31,000 gallons	2,124 gallons	5	343 gallons
Antifreeze	5,000 gallons	3,893 gallons	1	32 gallons
Used Oil	13,000 gallons	991 gallons	9	N/A
Used Antifreeze	8,000 gallons	8,000 per year	3 per year	N/A
Ammonium Nitrate	200,000 pounds	80,000 pounds	25	71,850 pounds
Propane	190,000 gallons	11,000 gallons	2	500 gallons
Anti-scalent	11,000 gallons	2,250 gallons	1	50 gallons
Hydrochloric Acid	6,000 gallons	1,500 gallons	1	50 gallons

2.6.10.6 Sanitary and Solid Waste Disposal

Existing and authorized sanitary and solid waste disposal facilities will continue to be used. Sanitary and solid waste disposal practices will continue as previously authorized.

2.6.10.7 Petroleum-Contaminated Soils

Petroleum Contaminated Soils (PCS) are managed in accordance with the approved PCS Plan. Prior to transport of wet PCS (e.g., from the truck wash sediment basin), site personnel inspect and verify that the vehicle or other container used is not leaking. PCS is then temporarily stored on the approved holding pads (former bioremediation cells) until screening level analyses are performed. After determination that the PCS does not exceed screening levels established by risk-assessment, and does not classify as a hazardous waste, the material is ultimately placed in an approved location in the Resort WRSA. Hazardous waste is properly disposed off-site at an authorized facility. MMC will continue to manage PCS per these procedures.

2.6.10.8 Fencing and Site Security

The boundary fence is BLM-approved four-strand fencing with three strands of barbed wire and one strand of smooth wire at the bottom. The main access road has a manned gate while other gated roads along the boundary fence are locked. Proposed changes to the boundary fence are discussed under Section 2.7.8.5.

2.6.11 Mobile Equipment

Current mobile mining equipment are identified in Table 2-7. No changes to mobile equipment are proposed, other than typical replacement as needed.

Table 2-7: Current Mining Equipment Fleet

Description	# of Units
Diesel Shovels	2
Electric Shovel	1
CAT 16G Motor Graders	4
D11 Dozer	1
D10 Dozer	5
Wheel Dozers	3
190-Ton Haul Trucks	2
300-Ton Haul Trucks	19
Loaders	5
Blast Hole Drills	4
Water Trucks	3
Low Boy Truck	1
Scraper	1
Service/Fuel Trucks	11
Tire Trucks	1

2.6.12 Roads

Existing and authorized access and haul roads are presented in Figure 3. The authorized access road is generally a two-way thoroughfare sized to safely accommodate mine traffic utilizing optimum widths based on the largest anticipated vehicle at the site. Changes to haul and access roads are discussed in Section 2.7.9.

2.6.13 Utility Corridor and Power Lines

A 120 kilovolt (kV) power line within an 80-foot ROW controlled by NV Energy currently runs through the Plan boundary and over the edge of the authorized 5 North Pit footprint. MMC-owned power lines also run from the transfer station located west of the tailings dam to the processing facilities. An MMC-owned utility corridor wrapping around the north end of the Section 8 WRSA to the northern end of the Terry Zone Pit has been previously approved but not constructed. The utility corridor was designed to be approximately 25 feet wide and accommodate an overhead power line. Changes to the utility corridor and power lines are discussed in Section 2.7.10.

2.6.14 Exploration

Drill pads and sumps, when used, are typically 40 feet wide by 40 feet long. Access roads to the drill sites are approximately 20 feet wide with an operating width of 12 feet. Existing roads are used, where possible, to minimize new disturbance.

In steep terrain, growth media from drill sites and roads is stripped and stockpiled for use during reclamation activities. Each drill site may be constructed with two mud pits, one for settling drill cuttings and one for settling the mud solids. A berm is typically constructed on the downhill side of each drill site to provide containment and to prevent runoff from the drill site area.

Authorized exploration disturbance acreage is listed in

Table 2-1, and changes to exploration are described in Section 2.7.11.

2.6.15 Employment

MMC currently employs approximately 360 MMC employees and 20 contractors. As discussed in Section 2.7.12, MMC will continue to provide a sustainable employment base with this project for an additional ten years, with no noteworthy changes in the number of employees projected

2.6.16 Transportation

The existing transportation route for people and materials is via I-80 to the Valmy exit (Exit 216) and then southwest on the Buffalo Valley Road to the Marigold Mine access road as shown on Figure 1. Relocation of the Buffalo Valley Road and crossing of the Trout/Cottonwood Diversion structure is discussed in Section 2.7.9.

2.6.17 Project Schedule

The Marigold Mine is currently projected to be in operation until 2027. Concurrent reclamation is conducted on inactive mine areas when they become available and when reclamation is practical and safe. Approximately three additional years are required for ongoing ore processing, site closure, and final reclamation.

2.7 Proposed Operations

The BLM has previously authorized a Plan boundary of 19,275 acres, of which 10,354 acres are public lands administered by the BLM, and the remainder is private land. MMC does **not** propose to expand the authorized Plan boundary, but to optimize use within it. The BLM has authorized disturbance on up to approximately 5,012 acres (2,855 acres of private land and 2,157 acres of public land) within the Plan boundary. This includes authorization for pits, waste rock storage areas, processing, roads, growth media stockpiles, water diversion structures, infill areas, and exploration (MMC, 2014). As part of this optimization strategy, MMC is amending the existing Plan to:

- Combine four of the existing and approved open pits (Target 1, Target 2, Target 3, and East Hill) pits to become a single open pit to be called the Mackay Pit;
- Combine the existing and approved Terry Zone Pit and 8 Pits to become the Mackay North Pit;
- Increase the size of the 5 North Pit;
- Dewater the Mackay Pit and Mackay North Pit at a rate of up to 6,000 gpm with an average rate of about 1,500 gpm to 2,000 gpm;
- Construct and operate a new production well and dewatering wells with associated roads, power, and above-ground pipelines;
- Construct and operate six RIBs with associated roads, pipelines, and monitoring wells;
- Move overburden (waste rock) material stored in the Old Marigold and Top Zone WRSAs to help enable creation of the Mackay North pit;
- Create one new WRSA (the 5 North) and expand the Northeast and Northwest Expansion WRSAs;
- Move backfill material within pits to allow for pit expansions and future backfill placement;
- Construct processing pad cells 22, 23, and 24;

- Relocate material from Cell 5 through Cell 9 on the western edge of the processing pad facility to other areas on lined containment to accommodate the Mackay North Pit footprint;
- Increase the solution application rate from the existing 15,000 gpm to 20,000 gpm;
- Increase the ore stacking rate on the processing pads from 25 million tons per year to 30 million tons per year;
- Construct new process ponds on existing disturbance;
- Construct two new carbon column trains on existing disturbance;
- Relocate the existing 120-kV power line (by NV Energy);
- Changes to ancillary facilities including:
    - Move the approved East Stormwater Diversion Structure;
    - Relocate the existing lime silo;
    - Relocate the explosives magazine;
    - Movement and construction of growth media stockpiles;
    - Move/construct fencing to include proposed facilities;
    - Add miscellaneous infill disturbance areas;
- Move haul roads to accommodate the new facility footprints;
- Relocate the public Buffalo Valley Road to accommodate the mine changes;
- Re-establish a private land access road to land holdings in Section 30;
- Move the planned location of the approved but not yet constructed utility corridor;
- Increase exploration disturbance by 95 acres;
- Redistribute disturbance acres between disturbance categories;
- Increase the total disturbance area from approximately 5,012 acres to approximately 6,905 acres; and
- Increase the mine life by up to ten years as a result of the above optimization strategies.

The authorized and proposed surface disturbances within the Plan boundary are summarized in Table 2-8 and the proposed components are illustrated in Figure 7 and Drawing 101. Descriptions of the components are provided in the following sections. For permitting purposes, the disturbance includes sufficient area to accommodate projected disturbance related to the existing operations and the proposed expansions as well as potential variations resulting from design modifications, such as engineering adjustments to the pit perimeters. Some disturbance acres have been redistributed between disturbance categories. Changes to each category (additions and subtractions) are shown in Table 2-8.

Table 2-8: Summary of Proposed Disturbance

Mine Component	Authorized Public Land	Authorized Private Land	Total Authorized Disturbance	Proposed Change Public Land	Proposed Change Private Land	Total Proposed Change	Total Proposed Public Land	Total Proposed Private Land	Total Proposed
	(acres)	(acres)	(acres)	(acres)	(acres)	(acres)	(acres)	(acres)	(acres)
Exploration Evaluations	**22**	**69.2**	**91.2**	**50**	**45**	**95**	**72**	**114.2**	**186.2**
Access Roads, Drill Pads with sumps	22	69.2	91.2	50	45	95	72	114.2	186.2
Roads	**87.1**	**103.1**	**190.2**	**40.4**	**10.9**	**51.3**	**127.5**	**114**	**241.5**
Haul-Access	82	93	175	40.4	10.1	50.5	122.4	103.1	225.5
Buffalo Valley Realignment[1]	5.1	10.1	15.2	0	0.8	0.8	5.1	10.9	16.0
Pits	**772.9**	**695.1**	**1468**	**166.2**	**567.8**	**734**	**939.1**	**1262.9**	**2202.0**
5 North Pit	0	29	29	16.5	166.7	183.2	16.5	195.7	212.2
8 Pit	160	13	173	-160	-13	-173	0	0	0.0
East Hill Pit	200.9	286.1	487	-200.9	-286.1	-487	0	0	0.0
Target 1, 2, and 3 Pits	220	74	294	-220	-74	-294	0	0	0.0
Antler Pit[2]	32	45	77	-0.3	0.2	-0.1	31.7	45.2	76.9
Basalt Pit[2]	34	140	174	0.2	-0.1	0.1	34.2	139.9	174.1
Terry Zone Pit	126	108	234	-126	-108	-234	0	0	0.0
Hercules Pit	N/A	N/A	N/A	350.6	277.4	628	350.6	277.4	628.0
Mackay Pit	N/A	N/A	N/A	506.1	604.7	1110.8	506.1	604.7	1110.8
Process Ponds Area	**18**	**15.8**	**33.8**	**3.4**	**-1.8**	**1.6**	**21.4**	**14**	**35.4**
Leach Pad – ET Cell Closure Ponds	16	9	25	0	0	0	16	9	25.0
Process Infrastructure	2	1	3	0	0	0	2	1	3.0
Infill Process Yards[2]	0	5.8	5.8	3.4	-1.8	1.6	3.4	4	7.4
Processing Pad Facility[3]	**309.1**	**468.4**	**777.5**	**293.7**	**45.6**	**339.3**	**602.8**	**514**	**1116.8**

Mine Component	Authorized Public Land	Authorized Private Land	Total Authorized Disturbance	Proposed Change Public Land	Proposed Change Private Land	Total Proposed Change	Total Proposed Public Land	Total Proposed Private Land	Total Proposed
	(acres)	(acres)	(acres)	(acres)	(acres)	(acres)	(acres)	(acres)	(acres)
Cells 1-21	309.1	468.4	777.5	0	0	0	309.1	468.4	777.5
Cells 22-24	N/A	N/A	N/A	293.7	45.6	339.3	293.7	45.6	339.3
Waste Rock Storage Areas	**616.5**	**1007.5**	**1624**	**348.7**	**198.1**	**546.8**	**965.2**	**1205.6**	**2170.8**
5 North	N/A	N/A	N/A	2.9	157.4	160.3	2.9	157.4	160.3
Section 8	164	12	176	-6.2	0	-6.2	157.8	12	169.8
Northwest	136	273	409	-4.3	0.3	-4	131.7	273.3	405.0
Northwest Expansion	151	334.3	485.3	435.8	156.2	592	586.8	490.5	1077.3
Old Marigold	51	23	74	-51	-23	-74	0	0	0.0
Resort	14	171	185	-12.2	-54.4	-66.6	1.8	116.6	118.4
South	53	0	53	0	0	0	53	0	53.0
Top Zone	41	67	108	-33.2	-51.2	-84.4	7.8	15.8	23.6
Northeast	6.5	127.2	133.7	16.9	12.8	29.7	23.4	140	163.4
Tailings Facility	**0**	**184.8**	**184.8**	**0**	**0**	**0**	**0**	**184.8**	**184.8**
Facility Reclaimed	0	184.8	184.8	0	0	0	0	184.8	184.8
Buildings with Foundations	**6.4**	**5.7**	**12.1**	**0**	**0**	**0**	**6.4**	**5.7**	**12.1**
Miscellaneous Shops-Offices	6.4	5.7	12.1	0	0	0	6.4	5.7	12.1
Yards Storage-Ancillary	**296**	**215**	**511**	**-57.9**	**182.1**	**124.2**	**238.1**	**397.1**	**635.2**
Growth Medium Stockpiles	20	28	48	21.2	71	92.2	41.2	99	140.2
Infill-Ancillary-Misc.[4]	276	187	463	-79.1	111.1	32	196.9	298.1	495.0
Water Management – Diversions	**28.5**	**90.8**	**119.3**	**2.4**	**-2.8**	**-0.4**	**30.9**	**88**	**118.9**

Mine Component	Authorized Public Land	Authorized Private Land	Total Authorized Disturbance	Proposed Change Public Land	Proposed Change Private Land	Total Proposed Change	Total Proposed Public Land	Total Proposed Private Land	Total Proposed
	(acres)	(acres)	(acres)	(acres)	(acres)	(acres)	(acres)	(acres)	(acres)
Water Supply	4	5	9	0.9	-0.9	0	4.9	4.1	9.0
Trout Creek Diversion/Dam	6	15.3	21.3	0	0	0	6	15.3	21.3
Trout/Cottonwood Diversion[2]	14.8	31.2	46	1.2	-2.3	-1.1	16	28.9	44.9
Millennium Catchment Area[2]	0.1	24.2	24.3	0.1	0.6	0.7	0.2	24.8	25.0
WW4 Pond[2,5]	0	1	1	0	0	0	0	1	1.0
East Stormwater Diversion Structure[6]	3.6	14.1	17.7	0.2	-0.2	0	3.8	13.9	17.7
Total	**2156.5**	**2855.4**	**5011.9**	**843.5**	**1049.9**	**1893.4**	**3000**	**3905.3**	**6905.3**

[1]Approximately 750 feet of road will be covered by other facilities while approximately 2,550 feet or new road will be constructed for a total length change of 1,800 feet. The disturbance area was calculated using a width of 20 feet
[2]Slight acreage changes resulting from mapping corrections
[3]Referred to as Heap Leach Facility in the reclamation permit
[4]Includes 7.0 acres of stormwater ponds, the utility corridor, RIBs, and RIB pipeline
[5]Referred to herein as the Freshwater Storage Pond
[6]Referred to in the reclamation permit as the Leach Cell 20/21 Diversion

2.7.1 Open Pit Facilities

MMC proposes to combine the existing Target 1, Target 2, Target 3, and East Hill pits into one facility called the Mackay Pit and similarly, combine the Terry Zone and 8 pits into a single pit called the Mackay North Pit. MMC also proposes to expand the 5 North Pit. The proposed pit footprints are shown on Figure 7 and the proposed designs and parameters are summarized in Table 2-9. The tons of ore proposed for removal and processing during the life of the mine by source are shown in Table 2-10. No changes to the Antler or Basalt pits are proposed.

Table 2-9: Proposed Pit Design Parameters and Dimensions

Pit	Authorized				Proposed				
	Length (feet)	Width (feet)	Maximum Depth (feet)	Bottom Elevation (feet amsl)	Slopes (degrees)	Length (feet)	Width (feet)	Maximum Depth (ft)	Bottom Elevation (feet amsl)
5-North	1,400	1,050	410	4,450	45 - 52	4400	3,700	450	4,325
8-Pit	4,800	1,600	430	4,440	Will become part of the Mackay North Pit				
Terry Zone	6,400	2,400	500	4,470					
East Hill[2]	8,100	3,800	850	4,550	Will become part of the Mackay Pit				
Target 1[2]	1,500	500	200	4,680					
Target 2[2]	3,400	1,800	480	4,680					
Target 3[2]	3,390	2,000	1,100	4,680					
Antler	2,625	1,380	600	5,180	No change				
Basalt	3,975	1,925	840	5,220	No change				
Mackay North	N/A	N/A	N/A	N/A	45 - 52	7,500	5,500	825	4,200
Mackay	N/A	N/A	N/A	N/A	45 - 52	15,000	5,820	1,400	3,975

[1] Will become part of the Mackay North Pit

[2] Will become part of the Mackay Pit

Table 2-10: Mined Ore by Source

Ore Source	Ore Mined (million tons)
Mackay Pit	289.1
Mackay North Pit	22.7
5 North Pit	4.2
Total	**315.9**

Mining will be carried out as described in Section 2.6.2.1. Material will be mined on 25- to 50-foot benches. Slope angles in the pits will generally range from 45 to 52 degrees. A general pit cross section is shown in Figure 8.

Slope stability analyses haves been carried out previously for the site with the most recent geomechanical review conducted in 2014 (Knight Píesold, 2014).

A slope stability analysis was performed for the western Target 3 Pit west wall which runs adjacent to a piece of private property for a length of approximately 2,600 feet with an offset

between the pit crest and the property line varying between 150 and 300 feet. The pit wall is being constructed with a 49 degree inter-ramp slope and a 70 degree bench face angle with 25-foot high production benches and a double bench configuration.

2.7.2 Pit Dewatering

The increased pit depths, which will go below the ground water table levels in some areas, will necessitate pit dewatering. Preliminary estimates of pit dewatering rates are up to 6,000 gpm with an average rate of approximately 3,000 to 6,000 gpm during mining. The water produced from the dewatering wells will be piped to RIBs or used as production water. Up to 20 dewatering wells, including WW-4, may be required. The dewatering well areas and WW-4 are shown on Figure 7.

Some pit areas will be backfilled as discussed in Section 2.7.5. MMC anticipates that one pit lake will form when dewatering ceases and the ground water table rebounds.

A water management plan is included as Appendix C.

2.7.3 Rapid Infiltration Basins

Six RIBs, approximately six acres each, will be constructed approximately one mile north of the 5 North Pit as shown on Figure 7. The pit dewatering water will be piped from the dewatering wells north to the RIBs. The pipeline will be included within the proposed utility corridor discussed in Section 2.7.8. South of the 5 North Pit, the pipeline will follow the proposed RIB access road as shown on Figure 7. Staging pumps and tanks will be used as needed. The RIBs and associated roads will have a disturbance area of approximately 45 acres as shown in Table 2-8. The RIBs will be situated over soils exhibiting suitable conditions for infiltration. An infiltration rate of 43 feet per day was used for the design, with infiltration test results ranging from 6.5 to 1,245 feet per day (Geomega 2014).

The RIB basins will be scoured and accumulated deposits will be removed as needed to maintain the required infiltration rates. Removed material will be tested for contaminates and disposed of appropriately. Four monitoring wells will be installed around the RIBs to monitor the flow direction and depth of infiltrated waters.

2.7.4 Waste Rock Storage Areas

To accommodate the Mackay North and Mackay pit footprints, previously characterized waste rock material in the Old Marigold and Top Zone WRSAs will be moved to other adjacent WRSAs in accordance with the most recent waste rock handling methods. To accommodate the increased waste rock material being mined and moved, the new 5 North WRSA will be constructed and the existing Northeast and Northwest Expansion WRSAs will be expanded.

The new and expanded WRSAs will be constructed as described in Section 2.6.3, by end-dumping onto the active bench face at the angle of repose. The WRSAs will be constructed with average bench heights between 50 and 100 feet and an overall slope of 3H:1V. The new portion of the Northwest Expansion will extend northward along the ephemeral Cottonwood Creek drainage, and the facility edge will be kept at least 100 feet away from the creek edge.

Disturbance acreage changes are shown in Table 2-8. WRSA design parameters and dimensions are shown in Table 2-11 and waste rock material sources and destinations are shown in Table 2-12.

The waste rock from the new pit footprints will be comprised of the same suite of rocks which has been characterized and previously authorized for the site. Dominant waste rock lithologies will be the Valmy, Antler, and Havallah formations, with alluvium material also being removed. Given the waste characterization results obtained to date from these lithologies, MMC anticipates

that the waste rock material from the proposed pit configurations will continue to be non-acid generating. The Sulfide Management Plan will be updated as necessary to address the results of geochemical characterization investigations.

Table 2-11: Proposed WRSA Design Parameters and Dimensions Summary

WRSA	Authorized		Proposed			
	Storage Capacity (million tons)	Reclaimed slope (H:V)	Storage Capacity (million tons)	Reclaimed slope (H:V)	Height (feet)	Crest elevation (feet)
Top Zone	30.0	3:1	11.6	3:1	290	4,950
Old Marigold[1]	5.0	3:1	N/A	N/A	N/A	N/A
Resort	65.0	3:1	No change			
Northwest	150.0	3:1	No change			
Northwest Expansion	221.0	3:1	No change			
Northeast	59.0	3:1	No change			
South	5.0	3:1	No change			
Section 8	136.5	3:1	No change			
5 North	N/A	N/A	34.2	3:1	200	4,975
Trout Creek	N/A	N/A	244	3:1	500	5,870
Section 29-1	N/A	N/A	0.6	3:1	500	6,000
Section 29-2	N/A	N/A	3.1	3:1	500	6,000

[1] Will be removed for pit development

Table 2-12: Waste Rock Material Sources and Destinations

Material Source	Material Destination (million tons)						
	Northwest Expansion WRSA	Northeast WRSA	Mackay North Pit Backfill	Section 8 WRSA	5 North WRSA	Mackay Pit Backfill	Mackay Pit (southern portion - Target 3 Pit) Backfill
Mackay Pit	279	65	120	10	5	314	501
Mackay North Pit	0	0	125	22	0	0	52
5 North Pit	0	0	0	0	30	0	0
Total	**279**	**65**	**245**	**32**	**35**	**314**	**553**
Grand Total							**1,523**

2.7.5 Open Pit Backfill

Backfilling will occur during operations and will be done in accordance with the previously approved flexible backfill process (BLM, 2001 and BLM, 2003) which requires the following documentation to be submitted to the NDEP and BLM prior to backfilling:

- Source of the material to be used as backfill;
- Geologic information for the backfill material;
- Bottom elevation of the pit that will be backfilled; and
- The elevation of the 1992 pre-dewatering water table beneath the pit.

Under this Plan amendment, backfilling of the Basalt and Antler pits will proceed as previously approved, and backfilling approval for elevations above the 1992 pre-dewatering water table

within the other pits will be sought per the approved flexible backfill process described above. Backfilling will occur concurrently during operations. Proposed backfill tonnages are listed in Table 2-12.

Approximately 73 million tons of previously placed backfill material will need to be moved to the new WRSAs and to backfill areas. The backfill material, which has been previously characterized per the above requirements, will be handled in accordance with the Sulfide Waste Management Plan or other most recent waste rock management plan. It will be processed, placed as backfill in other locations, or placed in an approved WRSA.

Saturated zone pit backfill is proposed for areas within the Mackay North Pit, the Mackay Pit, and the 5 North Pit. Saturated zone backfill is defined as backfill placed in the deeper pit areas which will be below the groundwater rebound elevation. Placement of backfill in these saturated zones will be used to minimize the formation of post-mining pit lakes, with the exception of the Mackay pit lake. Figure 7 shows the proposed saturated backfill zones. Backfill will be placed in lifts to at least 50 feet above the highest modelled groundwater rebound elevation as shown on Figure 8. No backfill will be placed within the anticipated pit lake area, i.e. no partial pit backfilling will occur.

2.7.6 Processing Pad Facility

Processing pad cells 22, 23, and 24 will be constructed to accommodate the increased ore mined from the new pit footprints. Cells 22 and 24 will be constructed in the same manner as the other more recently constructed Cells such as 17 and 18. Cell 23 will be constructed as a valley fill structure.

Construction activities will generally include: clearing and grubbing; growth media stripping and stockpiling; subsurface preparation; processing pad liner and solution collection system placement; and completion of other ancillary work within the proposed disturbance area for access, control, and stormwater management.

Internal berms, covered with synthetic liner will separate the cells. The pads will generally be constructed on at least 12 inches of low permeability or compacted native soil and overlain with a 60-mil HDPE liner or dual liner system. A layer of crushed rock/gravel will be put in place as overliner to protect the liner and provide a drainage layer. The proposed processing pad cell design parameters are shown in Table 2-13 and construction periods are shown in

Table 2-14.

Detailed engineering design reports will be submitted to the NDEP for approval as part of the site's water pollution control permit prior to NDEP authorization and construction. A copy of the final approved engineering design report will be provided to the BLM.

Table 2-13: Proposed Processing Pad Facility Design Parameters

Processing Pad Cell	Height (feet)	Crest Elevation (feet amsl)	Liner System / Leak Detection System	Capacity (million tons)
22	400	5,250	Clay and minimum 60-mil HDPE / None	18.9
23	400	5,250	Clay and minimum 60-mil HDPE / None	44.4
24	400	5,250	Clay and minimum 60-mil HDPE / None	62.6

Table 2-14: Proposed Processing Pad Cell Construction Dates

Construction Year[1]	Cell or Cell Section
2019	Cell 22
2020	Cell 24 North Half
2022	Cell 24 South Half
2024	Cell 23 West Half
2025	Cell 23 East Half

[1]Construction for each cell or cell section is anticipated to take approximately five months.

The proposed cells will be stacked with run-of-mine ore as described in Section 2.6.5. MMC is permitted for a total material handling rate of 150 million tons per year. Within this authorization, MMC proposes to place 30 million tons of ore per year on the processing pads. The surface will be cross-ripped and solution distribution lines placed on top of the ore. Barren solution will be applied and pregnant solution will be collected and processed as described in Section 2.6.5. Upon exiting the heap, pregnant solution will be routed to either the recirculation system or the pregnant solution ponds.

To allow for the expansion of the Mackay North Pit and adjacent haul road, a minimum of three million tons of processing pad material will be removed from cells 6, 7, 8, and 9. Prior to removal, solution application will be stopped to allow the material to drain. This material will either be processed or hauled and placed on adjacent processing pad facilities with capacity. The liner material and any associated equipment will be removed and properly disposed of on the existing lined processing pads or in an approved landfill. The new processing pad cell edges will be reconstructed to match the previously existing design.

Changes to the processing pad cells are shown on Figure 9.

2.7.6.1 Processing Pad Ancillary Facilities

Solution reporting to the pregnant ponds is pumped through a series of carbon column trains to recover precious metal. Upon exiting the carbon column trains, the solution is barren of precious metal and either flows by gravity or is pumped to the barren solution pond. To meet the solution demands resulting from the increased processing pad area and the increased flow rate, two new carbon column trains will be constructed. They will be constructed near the other carbon column trains north of Cell 19. The proposed carbon column trains will be similar to the existing and will be placed on a concrete slab with concrete berms. Synthetically lined solution channels connect the slab to Barren Pond No. 1.

2.7.7 Process Solution Ponds

In order to handle the increased quantity of solution resulting from the additional processing pad cells and the increased solution rate, additional solution ponds will be constructed. The proposed ponds will be connected to the existing ponds through synthetic-lined channels.

The proposed process solution ponds will constructed and operated in accordance with NAC 445A.433 (c) and (d). The factors used for storm event calculations will include on-site precipitation, off-site precipitation that cannot be diverted, direct precipitation into the ponds, and a 24-hour power outage.

Measures to be taken for the protection of wildlife and the management of wastes are discussed in Section 2.8.

2.7.8 Ancillary Support Facilities

2.7.8.1 Growth Media Stockpiles

Prior to construction of proposed facilities, suitable growth media will be removed and stockpiled for later use during reclamation. Existing growth media stockpiles which may be covered by or otherwise disturbed by development of proposed facilities will be moved. Growth media stockpiles are summarized in Table 2-15. Their locations are shown on Figure 7.

Table 2-15: Growth Media Stockpile Design Parameters

Name	Existing Facilities and Material		Proposed Facilities and Capacities	
	Acres	Cubic Yards	Acres	Cubic Yards[1]
GMS-1 (formerly Tailings West)	6.0	49,700	9.1	878,100
GMS-2 (formerly Tailings East)	10.8	136,800	14.9	1,713,800
GMS-3 (formerly Process East)	9.3	109,200	16.0	1,818,400
GMS-4A (formerly Old Lime Silo)	3.4	106,200	Material relocated to GMS-4B	
GMS-4B	N/A	N/A	38.9	4,891,600
GMS-5	2.0	24,130	2.0	107,600
GMS-6	N/A	N/A	26.7	3,126,100
GMS-7	N/A	N/A	21.4	2,549,500
GMS-8	N/A	N/A	11.2	1,099,200
GMS-9	N/A	N/A	8.2	815,300

[1]Capacities calculated as 100 feet high with 37 degree slopes with the exception of GMS-5 which has a height of 60 feet.

Interim reclamation measures will be implemented to protect the stockpiles from wind and water erosion as well as invasion of noxious weeds. The interim reclamation for growth media stockpiles is discussed in Section 3.1.2.

2.7.8.2 Surface Water Diversion Structures

The approved East Stormwater Diversion Structure will be relocated to the south of proposed Cell 22. The construction will be generally the same as the approved alignment. The channel bottom will measure approximately 50 feet in width with 2H:1V sloped sides measuring nine feet in height. The rip-rap size and thickness will vary based on channel slope. A 12-foot wide access road will run alongside the channel build either on native earth or on structural fill as needed.

2.7.8.3 Water Supply Facilities

The existing water supply wells will continue to be used for production water. The proposed dewatering wells may also be used to pump water to the freshwater system for production use.

2.7.8.4 Infill Disturbance

Additional infill disturbance is proposed as shown in Table 2-8 and on Figure 7. In general, infill surface disturbance areas are used for access between facilities, disturbance during mine construction and operation, and laydown yards for storage of extra pipe, culverts, and other non-hazardous materials during installation, construction, or maintenance activities.

2.7.8.5 Fencing and Site Security

The existing facility boundary fence will be moved and/or expanded to encompass the proposed facility footprints as shown on Figure 7. Approximately 43,600 feet of existing fencing will be removed and approximately 64,300 feet of new fence will be installed. The new boundary fence

will be constructed to match the existing fence. It will be a BLM-approved four-strand fence with three strands of barbed wire with one strand of smooth wire at the bottom. Proposed process ponds will be fenced with eight-foot tall chain-link wildlife fencing.

2.7.8.6 Relocating the Lime Silo and Explosives Magazine

The lime silo will be relocated to the south of its current location in Section 20 to allow for the development of Cell 22. The explosives magazine will be moved to the southwest of the lime silo from its current location in Section 17 to allow for development of the Mackay North Pit.

2.7.9 Roads

Haul roads will be constructed along the proposed Mackay and Mackay North pit edges and between some WRSAs as shown on Figure 7. They will be constructed in the same manner as the existing roads, with on-site sourced material. Berms will be constructed to MSHA-required specifications.

The publicly accessible Buffalo Valley Road will be rerouted slightly to allow for the expansion of the northern end of the Mackay North Pit as shown on Figure 7. The rerouted section will measure approximately 3,000 feet in length and will be located to the outside of the proposed facility boundary fence. The rerouted portion of the road will be constructed in the same manner as the existing road to meet county road standards.

The Trout Creek and Cottonwood Creek Diversion structure will be crossed by the rerouted road slightly to the north of where the current crossing is located. The new crossing will be constructed in the same manner as the existing crossing, utilizing two eight-foot wide box culverts placed in aggregate fill. The existing culverts and fill will be removed, and the channel base repaired to match the original channel design.

The existing access road for the private land located in Section 30 will be covered by proposed WRSA material. A new access road will be constructed over the WRSA material. The exact location may vary during the life of the mine as WRSA material is put in place and the road is kept away from active dumping areas.

2.7.10 Utility Corridor and Power Lines

MMC proposes to reroute the authorized but not yet constructed utility corridor north of the Section 8 WRSA. The proposed utility corridor will be similar to the authorized corridor, with a width of approximately 25 feet. It will run to the north of the proposed Mackay North Pit toward the 5 North Pit, and south along the western edge of the Mackay North and Mackay pits as shown on Figure 7 for a total length of approximately five miles. The adjacent proposed haul road will be used for access and maintenance.

A 25-kilovolt (kV) single pole overhead transmission line within the corridor will consist of 60- to 80-foot treated wood poles. Design and construction of the transmission line will follow Avian Power Line Interaction Committee guidance. Maintenance of the transmission line will occur on an as needed basis. A water pipeline will be included in the utility corridor to bring water from the dewatering wells to the RIBs and to the processing facilities.

The 120-kV NV Energy power line may eventually be routed to the north of the proposed 5 North Pit and will tie in with the original alignment west of the 5 North WRSA. A conceptual route alignment is shown on Figure 7.

2.7.11 Exploration

MMC proposes to add 95 acres of exploration disturbance for a total disturbance acreage of 186.2 acres to be located outside of the proposed disturbance footprints. Exploration will be carried out

as described in Section 2.6.14 with drill pads typically measuring 40 feet wide by 40 feet long, access roads will have an operational width of 12 feet. MMC will adhere to the environmental protection measures described in Section 2.8 including the avoidance or mitigation of National Register of Historic Places (NRHP) -eligible or unevaluated cultural sites.

2.7.12 Employment

MMC employment will remain generally the same as described in Section 2.6.15. MMC will continue to provide a sustainable employment base with this project for an additional ten years, with no significant changes in the number of employees projected. Contract employees will be used for the construction of the proposed processing pads cells during the periods shown in

Table 2-14. Construction of each cell will take approximately five months. Approximately 30 contract employees will be used during these times. This is consistent with current practice and numbers during construction of new cells about every two years. Construction periods are shown in

Table 2-14. Contract employees will generally be commuting from the towns of Battle Mountain, Elko, Carlin, or Winnemucca.

2.7.13 Project Schedule

The proposed changes to the Plan will increase the mine life by ten years until approximately 2037. Pre-stripping and construction of proposed facilities is anticipated to occur soon after the acquisition of requisite authorizations and permits. Processing pad cell construction will take place as summarized in

Table 2-14. Leaching will continue for an additional four years after mining has ended. Concurrent reclamation will be carried out where feasible on fully built-out facilities which will not be used or otherwise disturbed. Reclamation is discussed in Section 3.

2.8 Environmental Protection Measures

During construction and operation of the Marigold Mine, measures will be taken to minimize impacts to air, land, water, wildlife, and cultural resources and to prevent undue or unnecessary degradation of the environment in the Plan boundary. Environmental protection measures (EPMs) will be used to comply with appropriate federal and state air quality and water quality standards, hazardous waste, and solid waste disposal requirements. Pre-development planning, pollution prevention measures, and pollution control measures and equipment will be used to reduce potential mine-generated environmental impacts. Environmental protection measures for the Marigold Mine are described in the following sections.

2.8.1 Air Quality

MMC has incorporated a number of EPMs into the existing operation to control particulate emissions. These measures will continue to be incorporated into the proposed operation. To control fugitive dust, water or mineral stabilizers will be applied to haul and access roads within the proposed Plan boundary. Speed restrictions will be enforced to further minimize particulate emissions from roadways. Concurrent reclamation during the life of the operation, as mine components are completed, will reduce the acreage of disturbed lands, thereby reducing fugitive dust. Enclosures, baghouses, binder chemicals, and water sprays will be used as appropriate to control dust emissions from existing crushers, screens, crusher transfer points, and dry material

transfer points (lime). MMC maintains an Air Quality Operating Permit (AP1040-0158) which includes surface area disturbance conditions.

2.8.2 Cultural and Paleontological Resources

EPMs have been incorporated into the existing operation to prevent and to minimize potential impacts to cultural and paleontological resources. These measures, as identified below, also provide protection of resources during development and operation. MMC has developed this amendment with regard to the location of sites known to be eligible for inclusion on the NRHP. Avoidance of these sites has been incorporated into the Plan; however, to prevent inadvertent impacts to these sites, MMC has a Cultural Resources Protection Program previously authorized under NEPA for the Marigold Mine that includes the following:

- Employee and equipment access within the proposed Plan boundary will be prohibited in known eligible cultural sites to prevent the potential for direct impacts to resources;
- Mine exploration and operations equipment will be limited outside of the proposed Plan boundary;
- Employee access to known archaeological and paleontological sites on public and private land in the vicinity of the mine will be prohibited;
- Per the 2003 Final Supplemental Environmental Impact Statement (BLM, 2003), a 100-foot buffer zone will be established by a qualified, third-party archaeologist approved by the BLM;
- If previously undocumented or unidentified cultural (archaeological or historical) resources, subsurface components of documented sites, human remains, burial sites, or vertebrate paleontological resources are discovered during exploration, construction, operation, or reclamation activities, MMC will immediately cease activities within 300 feet of the discovery, ensure that the discovery is appropriately protected, and immediately notify the BLM by telephone followed with written communication. Work will not resume until a BLM Authorized Officer issues a notice to proceed. If resources are identified as eligible for the NRHP, impacts will be mitigated through an appropriate Treatment Plan approved by the BLM, the State Historic Preservation Office (SHPO), MMC, and the Advisory Council, or through site avoidance;
- If fossiliferous deposits, specifically vertebrate fossil deposits, are located during exploration construction, operation, or reclamation activities, the BLM will be notified, and measures will be taken to identify and preserve or avoid the fossils;
- MMC will be responsible for ensuring that employees, contractors, or others associated with the Marigold Mine do not damage, destroy, or vandalize archaeological, historical, or vertebrate paleontological sites or the artifacts/fossils within them. Should damage to cultural or paleontological resources occur within in or near the Proposed Action during the period of construction, operation, or rehabilitation due to unauthorized, negligent, or inadvertent actions of MMC or other mine personnel, MMC will be responsible for costs of rehabilitation or mitigation. Individuals involved in illegal activities could be subject to penalties under the Archaeological Resources Protection Act (16 United States Code [U.S.C] 470ii), Federal Land Policy and Management Act of 1976, the Native American Graves and Repatriation Act (16 U.S.C. 1170) and other applicable statutes;
- Known site locations will be avoided by exploration activities. Secondary effects to eligible sites resulting from road and drill site construction and use will be minimized through the implementation of erosion control measures, such as waterbars, double sumps for drill water, and appropriate road design; and
- The entire Plan boundary has been inventoried at the Class III level.

2.8.3 Survey Monuments

Survey monuments, claim markers, witness corners, reference monuments, bearing trees, etc. will be protected against destruction, obliteration, or damage. When operations are concluded, the operator will remove survey markers, stakes, flagging, etc. for which the operator has no further need. Prior to destruction or damage during surface disturbing activities, MMC will contact the BLM to develop a plan for necessary restoration or re-establishment activity of the affected monument in accordance with Nevada Instruction Memorandum No. NV-2007-003 and Nevada law. MMC will bear the cost for the restoration or re-establishment activities including the fees for a Nevada professional land surveyor.

2.8.4 Noxious Weeds

MMC will continue active management of noxious weed controls at the site as described in MMCs Integrated Weed Management Plan (JBR, 2013). Preventative measures include the education of key employees for the identification of weed species and the implementation of BMPs. Noxious weed BMPs include timing of disturbance, timing of weed control activities, controlling weeds prior to disturbance, gear cleaning, proper disposal of weeds, use of weed-free materials, and the establishment of competing vegetation. Treatment or control of weeds may be done through mechanical, biological, or chemical controls. Chemical applications will be carried out by trained personnel.

Noxious weed occurrences within the reclaimed areas will be reported to the BLM, and an appropriate eradication plan will be developed. If herbicides are used to control noxious weeds, the application rates and methods will conform to BLM standards, thereby avoiding potential risks to human health and the environment. Noxious weed occurrences on public lands adjacent to the Plan boundary will be reported to the BLM.

2.8.5 Migratory Birds and Raptors

MMC will continue to use a qualified biologist to conduct breeding bird surveys within all suitable habitats prior to ground disturbance if construction activities were to occur between March 1 and August 31. This survey will identify either breeding adult birds (i.e., by territorial defense behavior) or nest sites within the areas to be disturbed. MMC will also conduct raptor nest surveys within areas to be disturbed if the disturbance will occur between February 1 and August 31. If active nests are present, MMC will coordinate with the BLM to develop appropriate EPMs for these sites, which may include avoidance, construction constraints, buffer establishment, etc. An option to conducting breeding bird surveys will be to avoid ground disturbance activities between February 1 and August 31, allowing construction to proceed outside of the breeding season without clearance surveys.

EPMs for migratory and raptor bird species include the following:

- Protect active raptor nests in undisturbed areas within 0.25 miles of areas proposed for vegetation conversion using species-specific protection measures provided by the BLM, Nevada Department of Wildlife (NDOW), and the United States Fish and Wildlife Service;
- Limit permitted activities from May 1 to the end of July within 0.25 miles of raptor nest sites unless the nest site has been determined to be inactive for at least the previous five years; and
- Prevent access of migratory birds to cyanide solutions in process ponds by utilizing bird balls or netting.

2.8.6 Solid Waste and Hazardous Materials

Management of solid waste and hazardous materials will continue to be managed under MMC's integrated Emergency Response Plan (ERP), to address release of fluids from mine facilities. The section of the ERP that addresses chemical releases contains procedures for the control of leaks or spills. Continued operation in accordance with the ERP will assist in keeping spills localized and contained to allow for efficient cleanup. MMC has the necessary spill containment and cleanup equipment and trained personnel available at the site to quickly respond to minor releases.

Hazardous materials storage tanks require secondary containment sufficient to hold 110 percent of the volume of the largest tank within the containment system. Management of tanks and vessels comply with manufacturer's recommendations, state and federal regulations, and best management practices. Hazardous substances are handled in accordance with applicable Mine Safety and Health Administration (MSHA) or Occupational Safety and Health Administration regulations (Titles 30 and 29 of the Code of Federal Regulations [CFR]).

Non-hazardous solid waste generated on the site is disposed in an approved Class III waivered on-site landfill. Used tires are either recycled by the suppliers or buried in the WRSAs. Used equipment, such as batteries, alternators, starter motors, etc., are recycled for remanufacture. Slag from the on-site laboratory is recycled. Crucibles and cupels from the laboratory are sent to a licensed hazardous waste landfill for disposal. Used petroleum products, antifreeze, and Freon are transported off-site to approved recycling facilities.

Cyanide on-site transportation, storage, handling, and use will continue to be carried out in accordance with the ICMC.

2.8.7 Sedimentation and Erosion

Sediment control will be provided by a combination of EPMs at each facility. The processing pad and chemical/petroleum storage areas will be contained within an exclusionary berm. The WRSAs will have stormwater containment berms and sediment basins to reduce runoff impacts to receiving waters.

The WRSAs will be reclaimed concurrently to reduce sediment loss. This will include ripping compacted surfaces and application of growth media to increase permeability to the vegetation root zone. Temporary stormwater diversions will be installed where appropriate and armored where flow velocities exceed approximately four feet per second, dependent upon channel material. Permanent diversion structures will be designed to withstand flow from the 100-year, 24-hour event.

EPMs will be used to limit erosion and reduce sediment in precipitation runoff from project facilities and disturbed areas during construction and operations. EPMs may include, but are not limited to, diversion and routing of stormwater using accepted engineering practices, such as diversion ditches, and the placement of erosion control devices such as sediment traps, and rock and gravel cover.

Revegetation of disturbed areas will reduce the potential for wind and water erosion. Following construction activities, areas such as cut and fill embankments and growth media stockpiles will be seeded as soon as practical and safe. Concurrent reclamation will be maximized to the extent practical to accelerate revegetation of disturbed areas.

Surface waters will be managed to avoid excessive sediment loading to runoff outside of the Plan boundary. Temporary diversions will be employed under the site Stormwater General Permit and will be maintained and modified on an annual basis. Permanent diversion structures will be completed when a component, such as a tailings facility or a waste rock facility, are at final design limits, to ensure the structure is appropriately sized and located.

The upslope portion of the facility surface will be graded to control runoff and permanent and temporary engineered diversions will be installed as necessary for erosion control and rerouting of the surface water features. Permanent diversions are designed to contain the 100-year, 24- hour storm event. A typical ditch is about ten feet in width and four feet in depth; however, the dimensions vary based on topography and watershed size.

2.8.8 Water Quality

The various stormwater diversion and sediment control structures will be monitored by visual inspection to ensure integrity. If necessary, precipitation accumulated within process component containment areas after major storm events will be removed by pumping and disposing stormwater in the processing pad facilities. Stormwater diversion structures at the WRSAs will be visually inspected after major storm events and during spring snowmelt to verify the integrity of the diversion structures and to remove accumulated debris that could impede water flow. These monitoring efforts comply with the requirements in the General Stormwater Permit (NVR 300000). Monitoring data will be reported to the NDEP Bureau of Mining Reclamation and Regulation and the BLM on an annual basis.

Ground water monitoring will be conducted on a quarterly basis in compliance with the Water Pollution Control Permit. Water quality samples will be collected from existing monitoring locations. The samples will be analyzed for the constituents specified in the site's Water Pollution Control Permit. Monitoring data will be submitted to the NDEP and BLM on a quarterly basis.

Samples will continue to be collected from the fresh water production wells on an annual basis and will be analyzed for the constituents specified in the Water Pollution Control Permit. Monitoring data will be submitted to the NDEP and the BLM on an annual basis.

Monitoring of the processing pad facilities will include daily inspection to verify the liner containment system is functioning properly. Flow rates for the processing pad leak detection and pregnant pond and barren pond leak detection sumps will be monitored weekly. If fluid is present at the monitoring ports, then the sumps must be evacuated and monitoring must be conducted on a more frequent basis. The daily, weekly, and quarterly monitoring and sampling must be documented in the quarterly monitoring report submitted to the NDEP and the BLM. Samples from the pregnant ponds, barren ponds, tailings solution, and tailings reclaim water must be collected and analyzed annually for the constituents specified in the Water Pollution Control Permit.

The site Water Pollution Control Permit will be updated to include monitoring points required for the proposed facilities and for the dewatering, RIBs, and water management procedures included in the updated reports.

2.8.9 Vegetation

MMC will continue to use established EPMs to prevent impacts to vegetation. During reclamation WRSAs and roads will be ripped and or/scarified to produce a rough surface for anchoring of reapplied growth media and seeded with the approved seed mix. Growth media will be placed at a minimum depth of six inches. Seed bed preparation may be performed immediately prior to seeding to allow seed placement prior to soil re-compaction. Seed bed preparation and seeding will typically be conducted in the fall to take advantage of winter and spring moisture.

2.8.10 Visual Resources

During reclamation activities, the WRSAs will be graded to eliminate the benches between lifts, reduce the side slopes to an approximate 3H:1V grade, and round-off top benches to approximate more natural contours. After slopes are stabilized and graded, growth media will be applied, and

the WRSAs will be seeded. These efforts will reduce moderate contrasts in land forms and lines associated with the Marigold Mine to weaken contrasts as vegetation establishes and matures.

2.8.11 Wildlife and Livestock

To prevent access by wildlife and livestock, fencing that meets the NDOW requirements will be installed around solution ponds, stormwater ponds, and open conveyance solution channels. A BLM-approved range control fence will be placed around the perimeter of mine facilities as needed to prevent access by wildlife and livestock to mining operations. MMC currently manages livestock access to water by providing a trough outside the fenced mine boundary, which is supplied by the mine supply well. Livestock herders will continue to have access to this trough to fill their water trucks. Monitoring wells located outside the fenced area will be clearly marked and locked. Additional fences and controls will be installed as necessary.

EPMs that are currently implemented include:

- Installation of netting or bird balls over open solution conveyance channels and ponds to prevent access by birds and bats;
- Monitoring and managing cyanide concentrations of the process solutions;
- Enforced speed limit of 10 miles per hour around facilities and 35 miles per hour on haul roads;
- Proper management of the waivered-Class III landfill; and
- Formalized procedures for verbal and written reporting of wildlife mortalities to the NDOW.

2.8.12 Employee Training

MMC currently provides department-specific environmental management education for employees. This training includes information on management practices incorporated into the operation of the facility to minimize impacts to the environment and ensure compliance with environmental permit criteria. MMC also provides annual hazardous materials and waste management training for select employees,

2.8.13 Drill Hole Abandonment

Mineral exploration and development drill holes subject to Nevada Division of Water Resources (NDWR) regulations will be abandoned in accordance with Nevada Revised Statutes (NRS) 534.

2.8.14 Fire Management

MMC will comply with all applicable state and federal fire laws and regulations, and reasonable measures will be taken to prevent and suppress fires in the Project boundary. Smoking will only be permitted in areas that are free of flammable materials and only if allowed by state law or federal regulations. If smoking is allowed, smokers will position themselves in such a manner that burning material would fall within cleared areas. Smoking materials will be extinguished by pressing said materials into mineral soils. When completely extinguished, debris associated with smoking will then be put into containers designed solely for this purpose and properly disposed.

The mine buildings are equipped with fire extinguishers and fire hydrants. Mobile equipment on the mine site will be equipped with fire extinguishers as required by MSHA.

In the event the proposed activities start or cause a wildland fire, MMC will be responsible for all the costs associated with suppression. The following precautionary measures will be taken to prevent and report wildland fires:

- All vehicles will carry fire extinguishers;

- Adequate fire-fighting equipment (i.e., shovel, Pulaski, extinguishers), and a minimum ten gallons of water will be kept at each drill site if a water truck will not be readily available;
- Vehicle catalytic converters will be inspected often and cleaned of brush and grass debris;
- Welding operations will be conducted in an area free from or mostly free from vegetation. A minimum of ten gallons of water, if a water truck is not readily available, and a shovel will be on hand to extinguish any fires created from the sparks. Extra personnel will be at the welding site to watch for fires created by welding sparks. Welding aprons will be used when conditions warrant (i.e., during red flag warnings);
- Wildland fires will immediately be reported to the BLM Central Nevada Interagency Dispatch Center at (775) 623-3444. Information reported will include the location (latitude and longitude if possible), fuels involved, time started, who or what is near the fire, and the direction of fire spread; and
- When conducting operations during the months of May through September, the BLM will be contacted to determine if any fire restrictions are in place for the area and to provide approximate beginning and ending dates for Project activities.

2.8.15 Reclamation

The post-mining land use for the area disturbed by the expansion is expected to be similar to the pre-mining land uses. The uses include mineral exploration, mining, livestock grazing, wildlife, and recreation. Reclamation will be in conformance with the BLM and Nevada state reclamation regulations (Attachment B of the Nevada Guidelines for Successful Revegetation for the NDEP, the BLM, and the U.S.D.A Forest Service). Experience from past reclamation efforts will be considered for designing reclamation of the proposed disturbance.

2.9 Rock Characterization and Handling

Waste rock samples will continue to be submitted as determined by the Water Pollution Control Permit requirements for analysis as required by the NDEP. Waste rock analyses may include MWMP and ABA analysis as outlined in the Water Pollution Control Permit. Analyses will continue to be reported to the NDEP and to the BLM. If the ABA tests exceed the NDEP and the BLM criteria and MWMP and/or pH analysis is below the state standards, then kinetic testing (humidity cell tests) may be performed.

To accommodate the Mackay North and Mackay pit footprints, previously characterized waste rock material in the Old Marigold and Top Zone WRSAs will be moved to other adjacent WRSAs in accordance with the most recent waste rock handling methods. Previously placed backfill material will also need to be moved in order to expand the pits to their proposed extents. The backfill material, which has been previously characterized, will be handled in accordance with the Sulfide Waste Management Plan or other most recent waste rock management plan. It will either be placed as backfill in other locations or placed in an approved WRSA.

To date, waste rock analyses have indicated low potential for acid generation due to the low sulfide content of the waste rock. If waste rock monitoring were to indicate the material had a high potential to generate acid, that portion of the waste rock will be managed in accordance with MMC's approved Sulfide Waste Management Plan. The Sulfide Waste Management Plan provides for early identification of and blending and/or encapsulation of potential sulfide waste rock in oxide material at one of the out-of-pit WRSAs. A minimum blending ratio of 3:1 acid-neutralizing to acid-generating material will be used. A minimum depth of 20 feet of oxide material will be used to encapsulate unblended potential sulfide material and a minimum depth of

15 feet will be used to encapsulate blended material. These measures will reduce the potential for generation of acid rock drainage, thereby reducing the potential impact on surface water and groundwater.

2.10 Quality Assurance Plan

Quality assurance/control plans will be prepared according to the NDEP requirements for the Water Pollution Control Permit. Upon final engineering design approval from the NDEP and prior to construction, quality assurance/control plans will be developed and submitted to the BLM.

2.11 Spill Contingency Plans

Table 2-16 illustrates a chain of notification for spill containment and handling for the primary responsibility and authority to deal with spills and releases of solutions from various portions of the fluid management system. The appropriate personnel will be responsible for:

- Assessing the magnitude of the spill (in gallons of solution or pounds of solid material) and the amount and type(s) of hazardous materials present in the spill;
- Determining the cause of the spill or release;
- Ordering measures necessary to minimize the volume of the spill (i.e., shut down a pipeline, drain a ruptured tank, etc.);
- Ordering necessary measures to contain the spill to as small of an area as possible and to prevent releases to natural waters or off site, including construction of dikes, berms, or temporary containment impoundments;
- Taking necessary measures to clean up the spill;
- Ensuring the cleanup measures are accomplished safely (use of protective clothing and eyewear, and/or respirators, where warranted) and with a minimum of environmental damage;
- Notifying the NDEP and BLM of significant releases from the fluid management system, as required by permit conditions;
- Notifying the Nevada Division of Emergency Management and the National Response Center in the event of a release of reportable quantity of cyanide or other hazardous material;
- Notifying other emergency response or rescue agencies, such as the County Sheriff's Department, the local fire department, ambulance services, etc. as necessary; and
- Preparing written reports of the spill for the NDEP or the Nevada Division of Emergency Management within ten days.

Table 2-16: Spill Notification and Duties

Personnel	Duties
Spill Observer	Immediately contact one of the responsible persons listed below to report details of the spill. Initiate measures to abate and contain the spill.
Primary Contact Process Lead Person	Contact, assess the spill, assemble response team and equipment, and clean up spill. Either primary contact or

Personnel	Duties
Mine Lead Person	in his absence, secondary.
Secondary Contacts Operations Manager Mine Maintenance Supervisor Process Manager	Determine if emergency services are needed. Ensure required personal protective equipment is donned.
Spill Response Team Process Lead Person Mine Lead Person	Provide equipment and manpower to clean up the spill.
Regulatory Notification Environmental Personnel	Make necessary notifications to appropriate regulatory agency.

The chain of notification of spill occurrences is as follows:

- The person who first notices the spill or unplanned release of fluid has occurred must immediately contact the Process Lead Person or the Mine Lead Person; then
- The Mine Lead Person (or one of the other responsible individuals) immediately contacts the necessary supervisory personnel to procure manpower and equipment to contain and clean up the spill.

The Operations Manager is responsible to see that management personnel who may supervise the operation of portions of facilities or who supervise handling of materials or maintenance and repair of the facilities, including the maintenance and repair of the fluid management system, will be familiar with the Emergency Plan and with the personnel to be notified in the event of a spill or fluid release. Various supervisory personnel are responsible to ensure that their employees are familiar with the chain of notification in the event of a spill discovery or fluid release.

A listing of the work day and off-hours telephone numbers of the primary and secondary contact individuals, along with the emergency numbers for ambulance, fire, and law enforcement services, are posted at appropriate telephones. First aid kits, fire extinguishers, respirators, protective equipment, and sorbents are installed at key locations throughout the process plant and leaching facility. The locations of emergency equipment are clearly indicated and personnel are instructed regarding the use and location of the equipment.

2.11.1 Spill Prevention

The fluid management system is designed to contain solutions and prevent releases to the environment. The fluid management system is defined as the processing pad liners, the process pond primary liners, the lined perimeter solution collection trenches, the leachate collection pipelines, and piping to and from the recovery plant and the tanks, vats, piping, etc. within the plant. A regular schedule of inspection and maintenance for the facility is followed. Leaks, damage, or unusual conditions will be reported immediately through the chain of command, and necessary repairs will be made promptly. The routine monitoring of the processing pad and solution pond leak detection and collection systems and the regular schedule of maintenance will provide for early detection of releases occurring from the containment systems. Specific prevention measures for the various portions of the Project facilities are provided in the following sections.

2.11.2 Spill Handling and Cleanup

Following containment of spills outside the lined areas, cleanup efforts will commence immediately. Proper cleanup methods will be employed for the particular materials spilled.

Protective clothing, eyewear, and respirators will be worn should conditions warrant. Adequate heavy construction equipment and personnel will be available onsite to contain and clean up spills. When the approximate volume and type of material spilled is determined, the Mine Lead Person or Process Lead Person, or other authorized individual operating on his behalf, will notify the appropriate authorities and agencies.

2.11.3 Notification Requirements

Depending upon the magnitude and type of spill, notification of one or all of the following will be required:

- Nevada Division of Environmental Protection;
- Nevada Division of Emergency Management; and
- National Response Center.
- BLM

Once the volume of a spill or release and the quantity of cyanide or other hazardous material contained in the spill or release is determined, environmental personnel will be responsible to make the appropriate notifications.

2.12 Monitoring Plan

MMC conducts monitoring to demonstrate compliance with the Plan of Operations and other federal or state laws, regulations, and permit requirements and to provide early detection of potential problems. Many of the monitoring requirements were established in state permits and approvals, such as the NDEP Water Pollution Control Permit (NEV88040), the NDEP Air Quality Operating Permit (AP1040-0158), the NDOW Artificial Industrial Pond Permit (S23908), and the Mercury Operating Permit (AP1041-2254).

Downstream delivery of the water right located downstream of the catchment area embankment will be conditional on upstream receipt flow within the creek, which will be monitored via the upstream flow monitoring device. The upstream flow monitoring device consists of a Parshall Flume and stilling well with a solar powered data collection device.

2.13 Water Management Plan

The water management plan defines the water management strategies that will be used during defined periods of the mine life including dewatering, rapid infiltration, production use, and water table recovery. The water management plan is included in Appendix C.

2.14 Interim Management Plan

The standard operating schedules at the Mine will be up to 24 hours a day, 365 days a year for the mining activities and processing operations. No temporary or interim closures of the facility are planned. However, it is possible that, due to weather conditions, mechanical or technical difficulties, unfavorable economic conditions, litigation, severe seismic events, or other unforeseen events, mining and processing facilities may have to be temporarily closed. In the event of an unplanned temporary closure, the following plan will be activated:

- Pursuant to Nevada Administrative Code (NAC) 445.445(1)(a), NDEP and BLM will be notified within 30 days of the temporary closure of the pits, the WRSAs, and the process facilities. This notification will include a description of the procedures and controls that

have been or will be initiated to maintain the process components during the temporary closure period.

- MMC will provide the BLM and NDEP with a list of supervisory personnel who will oversee the mine facility during the temporary closure period. This list also will include the number of support staff required in each department to maintain the facility during the closure period. Standard security procedures will remain in place for the duration of the temporary closure period. Access to the site will be allowed for appropriate regulatory agency personnel.
- Pursuant to NAC 445.445(1)(b)(1), if the interim closure period exceeds 90 days, MMC will begin to evaluate procedures required to carry out a permanent closure of the process components. These procedures will be reviewed and approved by the NDEP and BLM. As stipulated by NAC 445.445(1)(b)(2), MMC may petition the NDEP for an extension that will delay permanent closure. These actions will be coordinated between MMC, the NDEP, and BLM.

Pursuant to NAC 445A.399, a seasonal closure plan is required for facilities located where the mean diurnal temperature does not exceed freezing (32º F) for 30 days or more each year. Based on a review of available meteorological data, the mean diurnal temperature at the site may remain below 32º F for more than 30 days each year. Current plans do not include closure during the winter months; however, if closure is necessary due to extremely severe weather conditions, the process facilities will be temporarily closed per the following plan:

- In the event of severe winter weather conditions causing a closure, the NDEP and BLM will be notified within 30 days of a seasonal closure. The notification will include a description of the procedures and controls that have been or will be carried out to maintain the process components during the closure period.
- Heap leaching and solution processing operations will be discontinued. The addition of makeup water to the leaching circuit will stop, but the heaps will continue to be irrigated as long as possible. During severe winter weather conditions, some of the process solution may freeze on the top of the heaps; however, the solution near the bottom of the heaps and in the solution collection pipes will likely continue to flow.
- Irrigation of the heaps will continue until process solution has been converted to ice or the weather warms enough to melt the ice on the heaps.
- Seasonal closure will continue until the weather warms enough to begin melting the ice on the heaps. At this time, process solution will be circulated between the heaps and the solution ponds. Based on operational experience, ice in the heaps will melt slowly so that rundown can be easily controlled. Once the temperature of the leaching solution increases enough so that gold recovery is favorable, the process plant will be brought back on-line. Addition of makeup water to the circuit will resume as appropriate to maintain the normal working inventory of solution.

No additional measures will be necessary to stabilize excavations and workings during an unplanned temporary closure. Interim reclamation procedures will be implemented as necessary to stabilize disturbed sites during the temporary closure period, which will be coordinated with the BLM and the NDEP.

MMC will follow the Sulfide Waste Management Plan procedures to isolate waste rock as necessary during unplanned temporary closure.

In the event of a temporary unplanned closure, the following activities will be undertaken for the storage or removal of equipment, supplies, and structures:

- Explosives will continue to be stored and handled according to federal and state regulations.
- Hazardous materials will continue to be stored, handled, and disposed of according to federal and state regulations.
- Equipment and machinery will be stored in a safe and clean condition.
- Mine equipment remaining in operation during the temporary closure, including haul trucks, loaders, drills, and personal vehicles will continue to be maintained according to standard company procedure.
- Following a temporary closure period, mine equipment will be inspected for compliance with appropriate federal and state mining regulations before mining activities re-commence. A thorough inspection of pipelines, drainage channels, ponds, pumping equipment, and processing equipment will be conducted prior to start-up. Remaining solution in the solution ponds will be processed through the metals recovery circuit or applied to the heap, and the leaching circuit will be re-established

Supervisory personnel will ensure that regulatory requirements continue to be met during the temporary closure period. This will include monitoring, notifications, and report submittals.

Maintenance and inspection of processing facilities will take place regularly to ensure the maintenance of adequate storm storage capacity in the process and reclaim ponds and to ensure that the integrity of pipelines, trenches, diversion structures, berms, and embankments are maintained. Monitoring of the processing pad facilities, solution ditch leak detection system, pond leak detection system, groundwater, and other permitted solution monitoring will continue as outlined in the Water Pollution Control Permit during the duration of the temporary closure.

2.15 Use and Occupancy

Under CFR 3809 Part 710 Section 3715.01, occupancy means full or part-time residence on the public lands. It also means activities that involve residence; the construction, presence, or maintenance of temporary or permanent structures that may be used for such purposes; or the use of a watchman or caretaker for the purpose of monitoring activities. Residence or structures include, but are not limited to, barriers to access, fences, tents, motor homes, trailers, cabins, houses, buildings, and storage of equipment or supplies. Many of the facilities described above, such as the office buildings, laboratory, fences, meet the definition of surface occupancy. MMC will maintain compliance with the Use and Occupancy regulations throughout the duration of the approved Plan

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3 Reclamation Plan

Reclamation of disturbed areas resulting from activities outlined in this Reclamation Plan will be completed in accordance with BLM and NDEP regulations. The purpose of Subpart 43 CFR 3809 – Surface Management is to prevent unnecessary or undue degradation of public lands by operators authorized by the mining laws. Anyone intending to develop mineral resources on public lands must prevent unnecessary or undue degradation of the land and reclaim disturbed areas. This subpart establishes procedures and standards to ensure that operators and mining claimants meet this responsibility and provide for the maximum possible coordination with appropriate state agencies to avoid duplication and to ensure that operators prevent unnecessary or undue degradation. In addition, the State of Nevada requires that a reclamation plan be developed for new mining projects and for expansions of existing operations (NRS 519A).

The proposed disturbance areas are summarized in Table 2-8. The areas proposed for disturbance can be divided into the following components: exploration, roads, pits, process and pond area, processing pad facilities, WRSAs, tailings facility, buildings, yards and ancillary areas, water management diversions, and RIB facilities. With the exception of pit highwalls, ramps, and floors; surface water diversion structures; stormwater controls; and roads with an approved post-mining use, surface disturbance associated with these mine components will be reclaimed.

Post-reclamation topography is shown on Figure 10 and Drawing 102.

3.1 Measures Taken to Prevent Unnecessary and Undue Degradation

Surface management regulations 43 CFR 3809.420 establish performance standards that apply to this amendment. Measures to be taken to prevent unnecessary and undue degradation at the proposed Project listed below. These measures will be implemented during the design, construction, operation, and closure of the Project:

- Regulated components of the facility will be designed and constructed to meet or exceed BLM, NDEP, NDOW, and NDWR design criteria. WRSAs and stockpiles, which do not require engineered containment, will be evaluated for potential to release constituents and will be monitored routinely, or in accordance with an approved waste rock monitoring plan;
- Surface disturbance will be limited to that which is reasonably incidental to exploration, mining, and mineral processing operations as described in Section 2.7.

- The processing pad facilities will be operated as zero-discharge and in accordance with fluid management, emergency response, and monitoring plans established by MMC, NDEP permit conditions, the Nevada BLM Cyanide Management Plan, and the ICMC;
- Mineral exploration and development drill holes, monitoring and observation wells, and production dewatering wells subject to Nevada regulations will be properly abandoned to prevent potential contamination of water resources;
- Regulated wastes will be managed according to relevant regulations;
- Surface disturbance will be minimized while optimizing the recovery of mineral resources;
- Fugitive dust emissions from disturbed and exposed surfaces will be controlled in accordance with NDEP regulations and permits;
- Surface water drainage control will be accomplished by diverting storm water, isolating facility runoff, and minimizing erosion;
- Where suitable as a growth media, surface soils and some alluvial material in the pits will be managed as a growth media resource and removed, stockpiled, and used during reclamation; and
- A reclamation plan will be implemented which addresses earthwork and recontouring, revegetation and stabilization, detoxification and disposal, and monitoring operations necessary to satisfactorily reclaim the proposed disturbance including: roads, process ponds, heaps, WRSAs, buildings, and equipment.

MMC is a signatory company for the ICMC, which is a voluntary program for gold mining companies focusing exclusively on the safe management of cyanide and cyanide solutions. The Marigold Mine originally received third-party certification for full compliance with the ICMC in 2006 and was last recertified in 2012. MMC plans to continue operating processing pad facilities in compliance with the ICMC.

3.1.1 Growth Media / Soil Balance

Suitable growth media will be salvaged during development of the pits, construction of the WRSAs, and construction of the processing pad facilities for subsequent use in reclamation. Suitable alluvial material from the pits will also be salvaged as growth media. Growth media will be placed in stockpiles within designated areas and will be located such that mining operations will not disturb the stockpiles. To minimize wind and water erosion, the stockpiles will be recontoured to slopes of 2.5H:1V and seeded with an interim seed mix shown in Table 3-1. Diversion channels and/or berms will be constructed around the stockpiles, as needed, to prevent erosion from overland runoff. Best management practices (BMPs) (e.g., silt fences or staked weed-free straw bales) also will be used, as necessary, to control sediment transport. Alternatively, the growth media may be transported to, and redistributed on mine-related surface disturbance areas undergoing concurrent reclamation (e.g., WRSAs).

Table 3-1: Interim Reclamation Seed Mix

Species	Common Name	Pure Live Seed (lb./acre)
Agropyron desertorum	Crested Wheatgrass	7.0
Oryzopsis hymenoides	Indian Ricegrass	3.5
Atriplex confertifolia	Shadscale	3.5

Based on reclamation experience at the existing facilities, the proposed growth media replacement depth for the mine facilities (with the exception of the pits) will be a minimum of six inches. The heaps will be covered to a depth of at least 24 inches, which is consistent with fluid management goals of reducing infiltration of meteoric water. Other facilities to be reclaimed will be covered to a depth of at least six inches. The proposed growth media placement depth will be reviewed in coordination with the BLM and the NDEP for specification in the final closure plan for the Marigold Mine.

Following placement of growth media, BMPs for erosion control (e.g., silt fences or staked weed-free straw bales) will be installed and maintained to minimize erosion from the facilities until vegetation has been re-established.

3.1.2 Revegetation, Seeding, and Planting

Revegetation of disturbance areas will be conducted as soon as practical to reduce the potential for wind and water erosion. Following construction activities, areas such as cut and fill embankments and growth media stockpiles will be seeded. Concurrent reclamation will be conducted to the extent practical and safe to accelerate revegetation of disturbance areas. Sediment and erosion control measures and revegetated areas will be inspected periodically to ensure long-term erosion control and successful reclamation.

Reclamation will be completed to control runoff, reduce erosion, provide forage for wildlife and livestock, and reduce visual impacts. Prior to seeding, disturbance areas will be recontoured, surfaces will be ripped or scarified (where conditions warrant), and growth media will be redistributed. Following the placement of growth media, the final surface will be contour scarified, where conditions warrant, to promote water retention, reduce erosion, and prepare the final seed bed. Seed bed preparation may be performed immediately prior to seeding to allow seed placement prior to soil re-compaction. Seed bed preparation and seeding will be conducted in the fall to take advantage of winter and spring moisture.

Seeding will be conducted by a number of methods (e.g., rangeland drill, mechanical broadcast seeder and harrow, hydroseeding, etc.) depending upon accessibility and success. The seed mix presented in Table 3-2 was developed by the BLM and are based on the species' effectiveness in providing erosion protection, the ability to grow within the constraints of the low annual precipitation experienced in the region, the species' suitability for site aspect, and the site elevation and soil type. These mixtures will provide forage and cover species similar to the pre-disturbance conditions, facilitating the post-mining land uses of livestock grazing and wildlife habitat.

Table 3-2: Recommended Seed Mixture

Species	Common Name	Pure Live Seed (pound/acre)
Agropyron desertorum	Crested Wheatgrass	2.0
Oryzopsis hymenoides	Indian Ricegrass	2.5
Atriplex confertifolia	Shadscale	3.0
Sitanion hystrix	Bottlebrush Squirreltail	2.5
Atriplex canescens	Fourwing Saltbush	3.0
Ceratoides lanata	Winterfat	0.5
Sphaeralcea coccinea	Scarlet Globemallow	0.5
Note: The above is a list of BLM-approved reclamation species; the actual seed mix will vary from one area to another. The BLM, NDOW, and MMC will decide upon the actual seed mix before seeding of a particular area.		

The proposed seed mixture and application rates are subject to modification. The actual seed mixture and application rates will be determined prior to reseeding based on the results of reclamation in other areas of the mine, concurrent reclamation, revegetation test plots, or changes by the BLM in the seed mix recommendations. In addition, seed mix and application rates may need to be modified as a result of limited species availability or poor seed quality; modifications will be undertaken with the concurrence of the BLM.

Revegetation success will be determined based on criteria outlined in the Nevada Guidelines for Successful Revegetation (NDEP et. al., 1998).

3.2 Proposed Reclamation Schedule

The life of the mine will include approximately fourteen years of active mining. Concurrent reclamation will be conducted on inactive mine areas during this period as soon as areas become available and when reclamation is practical and safe. Up to an additional three years will be required for ongoing ore processing, site closure, and final reclamation. The projected reclamation schedule for the Marigold Mine is shown on Figure 11.

Concurrent WRSA reclamation will occur during the life of the mine on inactive areas as available and when reclamation is practical and safe. This reclamation will include recontouring and revegetating the completed sections of the WRSAs incrementally during operations. Upon completion of mining, final WRSA reclamation will be completed pursuant to the final closure plan and schedule submitted to the BLM and NDEP for approval.

Processing pad facility reclamation activities will commence once chemical stabilization of the spent heap material is achieved and the heap surface is no longer needed for fluid management. Stabilization of the heaps is defined under NAC 445A.430 and 431 and is generally summarized as not having the potential to degrade waters of the state. The time required to drain the heaps is conservatively estimated at approximately one year. Draindown time may vary depending on the operational conditions and precipitation amount and will be calculated using the Heap Leach Draindown Estimator (HLDE).

A detailed closure plan for each process facility component will be prepared at least two years prior to the anticipated closure date (NAC 445A.447). The closure plan will conform to the water pollution control regulations in effect at the time of closure.

3.3 Post-Mining Land Use and Reclamation Goals

Principal land uses in the Plan boundary include wildlife habitat, domestic livestock, grazing, dispersed recreation, and mineral exploration. Following closure and final reclamation, the Plan boundary will support the multiple land uses of wildlife habitat, domestic livestock, grazing, dispersed recreation, and mineral exploration.

The goal of the reclamation plan is to promote public safety, minimize visual impacts, and to re-establish stable topographic features that support a diverse, self-sustaining vegetative community. To achieve this goal, reclamation procedures at the Marigold Mine incorporate the following basic components:

- Establishment of stable topographic surface and drainage conditions that are compatible with the surrounding landscape and serve to control erosion;
- Establishment of soil conditions most conducive to establishment of a stable plant community through stripping, stockpiling, and re-application of suitable growth media;
- Revegetation of disturbed areas to establish a long-term productive biotic community compatible with proposed post-mining land uses;

- Consideration of public safety through stabilization, removal, and/or fencing of structures or land forms that could constitute a public hazard; and
- Consideration of the long-term visual character of the reclaimed area.

3.4 Post-Mining Contours and Topography

The final grading plan for the Marigold Mine is designed in part to reduce the visual impacts of unnatural lines and land forms. Resulting slopes will be regraded to better blend with surrounding topography, to the extent possible, and facilitate revegetation. Where feasible, large constructed topographic features (e.g., WRSAs and heaps) may have rounded crests and variable slope angles to more closely resemble natural landforms. The pits will remain as large depressions if not backfilled.

3.5 Final Gradient Slope Stability Technical Criteria

Site stability is influenced by the final slopes of earthen/rock components, with shallower slopes typically representing more stable configurations.

3.5.1 Open Pit Facilities

Slope angles in the pits will range from 45 to 52 degrees, depending upon the pit and the specific location within each pit. The specific technical criteria used in the determination of final gradient and stability of the pit walls are: pit economics; rock type and strength; geologic structure; the presence and quantity of ground water; and the results of previous studies and construction.

The final slopes of the Mackay North Pit (formerly the Terry Zone Pit along the north and northwest sides that will border the Buffalo Valley Road will be determined by one of the following:

- The overall slopes will be 1H:1V with minimum bench widths of 20 feet; or
- The final slopes in this area of the pit will be determined by an investigation to be performed by a professional geotechnical engineer as the pit nears the end of the life.

3.5.2 Waste Rock Storage Areas

The WRSA designs employ several proven techniques to ensure that reclaimed slopes will be stable during construction, operation, and final reclamation. Since depths from the ground surface to ground water at the WRSAs are in excess of several hundred feet, ground water is not expected to be a factor in slope stability. WRSAs will be regraded to 3H:1V slopes.

3.5.3 Processing Pad Facilities

Slope stability analyses for the heaps incorporate ground slope, sub-base and liner materials, ore stacking heights, ore composition, and final stack heights. Following completion of leaching, the heaps will be contoured to approximately 3H:1V slopes.

3.5.4 Erosional Stability

Slopes that are reclaimed to 3H:1V are not expected to experience excessive erosion. During reclamation, slopes will be monitored for excessive erosion after application of growth media, and if necessary, BMPs will be utilized to control erosion until vegetation has established.

3.6 Reclamation of Waste Rock Storage Areas

Upon final mine closure, the WRSAs will be regraded to 3H:1V slopes, recontoured, and crowned to prevent water ponding. Perimeters will be irregular to allow blending with the existing topography and to break up long, linear features. Large boulders encountered during mining will be placed strategically to provide wildlife habitat. WRSA flat benches will be ripped and/or scarified to produce a rough surface for anchoring of reapplied growth media. Growth media will be distributed on the tops and portions of the WRSA slopes. Disturbed areas will be reseeded with the approved seed mixture.

Portions of the pit backfill areas will be reclaimed in the same manner as the WRSAs.

3.7 Reclamation of Processing Pads

MMC proposes to use the approved closure and reclamation measures for the existing processing pad facilities at the Marigold Mine as analyzed in the 2003 Final Supplemental Environmental Impact Statement (BLM, 2003). The closure measures proposed for the processing pad facilities will stabilize the heaps to prevent draindown solutions from having the potential to degrade of waters of the State, as defined in the NAC 445A.430. The following steps will be undertaken to achieve heap stabilization:

- The heaps will be leached until economic recovery has been achieved. Following leaching, the liner and drain pipes will be left under the heaps;
- The heaps will be allowed to drain, with on-going monitoring of draindown quantity and quality to determine the concentration of key constituents in the draindown solutions;
- The draindown solutions will be sprayed onto the side slopes of the heap using a fogger system to enhance solar evaporation and reduce the volume of solution to a level that can be accommodated by the proposed evapotranspiration (ET) basins;
- The heaps will be re-sloped to 3H:1V to eliminate catchment benches with all spent ore material kept on existing and cushioned liner systems. Drainage to the collection systems will be maintained;
- The growth media cover on the processing pads will be a minimum of two feet thick to ensure the establishment of a viable and effective stand of vegetation, to protect against long term wind erosion, and to further reduce the infiltration of precipitation into the spent ore;
- The covered heaps will be revegetated to promote evapotranspiration of meteoric waters;
- Heap draindown solutions will be treated in passive water treatment facilities consisting of evapotranspiration basins; and
- New technologies to achieve stabilization will also be evaluated and may be submitted to BLM and NDEP for approval as conditions warrant.

The approved evapotranspiration cover closure plan is optimal from both environmental and economic perspectives. Monitoring of draindown from other heaps in the vicinity of the Marigold Mine, as well as limited draindown information from inactive cells in the Marigold heap, indicate that weak acid dissociable cyanide and pH levels drop very quickly without additional fresh-water rinsing. Therefore, fresh water rinsing, which is costly and consumes an enormous volume of water, does not appear necessary to protect waters of the State.

MMC will construct a passive, evapotranspiration water treatment system at the processing pad area. The optimal method to treat the heap draindown solution will be determined by the chemistry and volume of this solution. As presently planned, MMC will construct ET basin passive water treatment systems.

The water treatment facilities will consist of constructed ET basins to accelerate evapotranspiration. The ET basin treatment systems that will be constructed at the process pond area will use essentially the same design and construction techniques, with appropriate site-specific modifications, as have been approved by NDEP and BLM for the Millennium and Marigold processing pad facilities (BLM, 2003 - Section 2.2.17.7, pages 2-48 through 2-50).

In order to construct an ET basin, one or more of the solution ponds will be cleaned of residual sludge. An area designed to enhance evapotranspiration of draindown solutions will be constructed within the pond. The pond liners will be left in place and will be protected with a cover of geotextile fabric and/or fine soil. The pond(s) will then be backfilled with soils, to a level below the draindown point to allow for drainage to filter across the pond. Perforated piping will be connected to the draindown collection point and spread across the backfill to promote a broad infiltration field. The pond(s) will then be backfilled with growth media and seeded. A vertical piezometer will be installed during construction to monitor solution levels within the pond(s), as well as solution chemistry.

Chemicals or reagents will be removed from the processing pad facilities, and along with empty containers, will be disposed of consistent with appropriate state and federal regulations. Surface plumbing and exposed conduit will be removed and disposed of properly. Following establishment of vegetation, fencing will be removed.

Buildings, tanks, and equipment associated with the leaching facilities will be removed and cement foundations buried in place. Other disturbed areas will be regraded, surfaced with growth media and seeded with the specified seed mix.

3.8 Reclamation of Impoundments

The tailings dam and facility will be reclaimed as proposed in the 2001 Plan of Operations (GMMC, 2001). The Millennium Catchment Area will remain as a post-mining feature; since the up gradient embankment slope will be constructed at 3H:1V recontouring will not be required. The area around the catchment has been seeded to stabilize soils and to provide cover to the banks of the basins.

The RIBs will be filled and recontoured to match the surrounding landscape. The surface will be reseeded in the same manner as yard facilities.

3.9 Reclamation of Process Ponds

Unless the solution ponds are incorporated into the evapotranspiration treatment facilities for the heap draindown solutions, reclamation of the process solution ponds and water storage ponds will consist of draining, removal or burial in place of the synthetic liners, reshaping, seedbed preparation and seeding. Following evaporation of liquid from the ponds, sludge in the ponds will be analyzed using the MWMP. If the results are within the limits as defined by each procedure, the synthetic liners will be folded in a manner to contain the sludge and buried in-place. In the event that the test results are not within limits as defined by the procedure, MMC will work with the BLM and NDEP to develop an appropriate plan for sludge removal and disposal in accordance with state and federal regulations or stabilization and burial on site.

Pond sites and ditches will be filled and recontoured to prevent ponding of runoff and allow for natural drainage. The pond areas will be graded and contoured to blend in with the natural topography. Disturbed areas will be scarified and seeded with suitable species to revegetate.

3.10 Constraints on Estimated Time to Complete Reclamation

The estimated time to complete reclamation assumes average precipitation occurs during the year following reseeding. Periods of drought could delay revegetation, while excessive precipitation could increase processing pad inventory evaporation times. Generally, the time to complete reclamation and closure activities is assumed to be staged in a manner that allows completion of earthworks within 18 to 24 months although neither planning nor bond cost estimation is critically dependent on whether the reclamation is completed in a single year or two years.

3.11 Proposed Reclamation Techniques of Road Features

With the exception of designated county and public access roads, main haul roads, roads that MMC links in the road network around the mine, exploration roads, and compacted surfaces will be ripped, scarified, and revegetated. Roads will be contoured to blend in with the surrounding terrain. Culverts and other water diversion structures will be removed and the natural drainage patterns restored. Waterbars or other structures may be left in place to reduce undue erosion. Drill pads and mud pits associated with exploration roads and exploration activity will be reclaimed. The mud pits will be allowed to evaporate prior to backfilling with stockpiled growth media. The stockpiled growth media will be distributed over the drill pads and the area recontoured as necessary prior to seed application.

3.12 Measures to Minimize Loading of Sediment to Surface Waters

Runoff from the WRSAs, the processing pad facilities, and other slopes will occur following precipitation events; however, regraded slope angles, revegetation (including growth media placement), and BMPs will be used to limit erosion and reduce sediment in runoff. Surface water will be diverted around the pits and around the process facilities by the primary stormwater diversion and secondary perimeter berms and/or ditches. Silt fences, sediment traps, or other BMPs will be used to prevent migration of eroded material until reclaimed slopes and exposed surfaces have demonstrated erosional stability.

3.13 Disposition of Buildings and Support Facilities

Major structures and buildings are located on both private and public land. The disposition of the structures on private land will be in conformance with the post-mining land-use and as determined by the land owner. Structures will be properly removed and/or buried. Following removal or burial, the ground surface will be recontoured, prepared, and seeded.

Disposition of other mine components on public grounds will consist of:

- Freshwater rinsing or active treatment of piping which contained cyanide solutions;
- Buildings, piping/conduits, water storage tanks, septic systems, and other miscellaneous equipment will be salvaged, buried in place, or placed in the Class III landfill;
- Concrete foundations will be buried in place;
- Buried piping and conduits will be drained, rinsed as needed, and buried in place. After draining, pipe ends will be closed;
- Septic tanks will be pumped, ripped, and backfilled;
- Scrap metal, trash, and other debris will be placed in the existing Class III landfill or salvaged;
- Process solutions will be evaporated or placed in a treatment facility;

- Other chemicals not salvaged will be removed and properly disposed offsite; and
- Power lines and electrical systems not required for post-mining use will be removed and disposed properly. Surface Facilities or Roads not Subject to Reclamation

The following mine components will not be subject to post-mining reclamation:

- The public access road from the Buffalo Valley Road;
- Electric power lines, communication systems, or equipment necessary for post-mining uses;
- Water wells, water lines, or other utilities required for post-mining uses;
- Fencing to protect evapotranspiration facilities and reclaimed processing pads;
- Millennium Catchment Area; and
- Trout Creek Diversion, the Trout/Cottonwood Diversion, and the East Stormwater Diversion Structure.

3.14 Reclamation of Open Pit Facilities

The objective of mine pit reclamation is to create safe and stable topographic features. Following the completion of mining, in-pit benches, highwalls, and haul roads will be left in place. Post-mining safety barriers (e.g., berms, fencing, or other appropriate barriers) will be installed peripherally to the crest of each pit (based on predicted wall stability at the time of closure) to control access by people, livestock, and most wildlife. Pit ramps will be barricaded in a similar manner to prevent entrance. Some barriers will be installed earlier in the mining operation when access is readily available. Stormwater runoff will be diverted around each pit by stormwater diversions.

Backfilling will occur in some pit areas as shown on Figures 7 and 10. Backfill will be placed at least 50 feet above the highest modelled groundwater elevation as shown on Figure 8. Backfilled areas will be reclaimed in the same manner as the WRDAs. At the cessation of mining and dewatering the water table will rebound. MMC anticipates that one pit lakes will form. Pit lake development and backfill saturation will be modelled for the Marigold Mine.

MMC may request an exemption from backfilling some pits or portions of pits, which are not already proposed for backfilling, under NAC 519A.250 as mineral resources not presently economic may become economic in the future. Backfilling the pits will render the remaining resources either more costly to mine or will remove them from economic viability.

3.15 Reclamation of Underground Mines

Not applicable.

3.16 Post Reclamation Monitoring and Maintenance

When reclaimed areas meet the specified bond release criteria (Attachment B of the Nevada Guidelines for Successful Revegetation for the NDEP, the BLM, and the U.S.D.A Forest Service), no post-reclamation maintenance will take place. Reclaimed areas which have not met specified bond release criteria will be maintained to achieve the following goals: prevention of undue degradation of the disturbed lands; determination of revegetation success; and completion of bond release.

Remedial measures will be performed as necessary until the revegetation requirements and bond release criteria have been met. Where required, the following corrective actions will be taken to prevent undue erosion, sedimentation, soil de-stabilization and unsatisfactory vegetation growth:

- Construction and maintenance of surface diversion facilities;
- Construction and maintenance of rock filters;
- Application of soil stabilizers;
- Additional shaping and recontouring;
- Noxious weed control; and
- Additional revegetation operations.

MMC will monitor those portions of the Plan boundary still under bond stipulations to ensure that warning signs, erosion control structures, fences, and other facilities remain in good condition. MMC will continue monitoring and maintaining the Plan boundary until the reclamation goals and requirements have been achieved, and the bond is released.

The Record of Decision for the Millennium Expansion Project Final Supplemental Environmental Impact Statement (BLM, 2003) included the establishment of a trust fund in accordance with 40 CFR 3809.552 (c.) to maintain fencing around the ET basins and processing pads and to perform other post-reclamation tasks, including monitoring that may be identified at the time of closure. Post-reclamation features that require long-term periodic maintenance or monitoring will be addressed through additions to this trust fund.

3.17 Reclamation for Instream Mining

Not applicable.

3.18 Statement of Effect of Proposed Reclamation of Future Mining

Site reclamation will have little effect on future mining in the area, although the WRSAs, processing pad and plant facility, shop facilities, and dewatering facilities will have to be recommissioned or rebuilt if post-reclamation mining were to occur.

3.19 Effect of Mining on Public Safety

Chapter 513 of the NAC rates a mine's dangerous condition based on its location from occupied dwellings, public roads, and towns (NAC 513.330) as well as its degree of danger based on the mine's configuration (underground shafts, declines, and adits or pit highwalls) (NAC 513.340).

The pit highwalls are considered "dangerous conditions". The Buffalo Valley Road is a public road maintained by Humboldt County. The road comes to within approximately 325 feet of the proposed 5 North Pit highwall and is within approximately 80 feet of the 5 North Pit disturbance area. MMC is conservatively considering the "dangerous condition" location to start at the pit disturbance area edge rather than at the highwall edge.

Per NAC 513.330, the Marigold mine would have a location rating of 5, correlating to a dangerous condition (the pit highwalls) located within 100 feet of an occupied structure of public road maintained by some governmental entity (Buffalo Valley Road).

Per NAC 513.340, the Marigold mine would have a degree of danger rating of 1, correlating to the open pit highwalls.

Per NAC 513.360, the dangerous condition has 6 total points meaning it is a moderate hazard. Moderate hazards need to be secured within 120 days upon notification of the existence of a dangerous condition (NAC 513.380). The proposed boundary fence will secure the dangerous

condition "to prevent a person or animals from accidentally exposing himself or herself to the dangerous condition" and will satisfy the requirements stipulated by NAC 513.390.

3.20 Drill Hole Plugging and Water Well Abandonment

Mineral exploration and development drill holes, and monitoring, production, and dewatering wells subject to NDWR regulations will be abandoned in accordance with applicable rules and regulations (NAC 534.425 through 534.427 and NAC 534.4369 through 534.4371). Boreholes will be sealed to prevent cross contamination between aquifers, and the required shallow seal will be placed to prevent contamination by surface access.

Monitoring will be maintained until MMC is released of post-mining groundwater monitoring requirements by the NDEP. These wells will then be plugged and abandoned according to the requirements of the NAC 534.425 through 534.427 and NAC 534.4365.

3.21 Concurrent Reclamation

Some of or portions of the mine facilities will be decommissioned prior to final mine closure. These areas will be reclaimed concurrently with the active mining operations.

Concurrent reclamation will take place on inactive portions of the WRSAs as soon as practical and safe. Growth media stockpiles will be interim-seeded following construction and the area reclaimed after the soil is used in reclamation.

3.22 Measures to be taken during Extended Periods of Non-operation

In the event that continuous, full-scale production is interrupted due to economic considerations or unforeseen circumstances, interim reclamation may be initiated. Interim reclamation is outlined below:

- *Power Lines:* The power line will be inspected regularly and maintained as necessary.
- *Roads:* The main access road will receive maintenance, as necessary.
- *Mine Open Pit:* Berms or fences will be placed to help restrict access to bench face areas.
- *Erosion Control Measures:* Erosion control measures and BMPs will be regularly inspected and maintained.
- *Buildings:* Building, equipment, and support facilities will be protected from public access and maintained as necessary.

Per NAC 519A.320 (2) MMC will notify Bureau of Mining Regulation and Reclamation in writing within 90 days after suspension of mining and/or processing that is anticipated to last longer than 120 days. The BLM will also be notified per 43 CFR 3809.401(b)(5)(vi). MMC will identify the nature and reason for the suspension, the duration of the suspension, and the events expected to result in either resumption of mining or the abandonment of the Marigold Mine. If mining remains inactive for five years, final reclamation will commence.

4 Assumption of Reclamation Responsibility

The applicant, MMC, hereby agrees to assume responsibility for the completion of the reclamation work described within this document on all the surface areas affected by the operation of the Marigold Mine.

5 NDEP Reclamation Permit Application Fee

The proposed amendment meets the requirements of NAC 519A.043 defining a "major modification". Per NAC 519A.227 the fee for a major modification to a mining operation permit is equal to the amount of the applicable annual fee assessed pursuant to NAC 519A.230 and 519A.235. Approximately 6,905 acres of disturbance are proposed in this Plan amendment. As per NAC 519A.235, the annual fee for a major modification to a mining operation proposing to disturb more than 5,000 acres is $16,000.

6 Reclamation Cost Estimate

The Reclamation Cost Estimate for the Marigold Mine will be submitted at the completion of the NEPA analysis and approval of the proposed plan amendment.

7 Acknowledgments

A. It is understood that should the nature of the operation change, a modified or supplemental Plan of Operations and Reclamation may be required.

B. It is understood that approval of this Plan of Operations and Reclamation Permit Application does not constitute: (1) certification of ownership to any person named herein; and (2) recognition of the validity of any mining claim herein.

C. It is understood that a bond equivalent to the actual cost of performing the agreed upon reclamation measures will be required before this plan can be approved. The lead agency in coordination with the cooperating agencies will set bonding and any bond reduction amounts on a site-specific basis.

D. It is understood that approval of the plan does not relieve me of my responsibility to comply with any other applicable state or federal laws, rules, or regulations.

E. It is understood that any information provided with this plan that is marked confidential will be treated by the agency in accordance with that agency's laws, rules, and regulations.

I/We have reviewed and agree to comply with the conditions in the Plan of Operations and Reclamation Permit Application, including the recommended changes and reclamation requirements. I/we understand that the bond will not be released until the BLM or the state agency in charge gives written approval of the reclamation work.

_____ _____

Duane Peck Date

Mine General Manager

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APPENDIX A

Historic NEPA Actions

APPENDIX B

Claim Information

APPENDIX C

Water Management Plan