Phase III Moss Mine Expansion and Exploration Project
Final Mine Plan of Operations
Mohave County, Arizona

Submitted to:

Bureau of Land Management Kingman Field Office
2755 Mission Boulevard
Kingman, Arizona 86401

Prepared for:

Golden Vertex Corp.
2440 Adobe Road
Bullhead City, Arizona 86442

July 5, 2019

TABLE OF CONTENTS

LIST OF TABLES

LIST OF PHOTOGRAPHS

LIST OF FIGURES

LIST OF APPENDICES

ACRONYMS

ºF	Degrees Fahrenheit
"	Inch
%	Percent
4WD	Four-wheel drive
AAC	Arizona Administrative Code
AASHTO	American Association of State Highway and Transportation Officials
ABA	Acid-Base Accounting
ABTR	Arizona Board of Technical Registration
ACC	Arizona Corporation Commission
ACEC	Area of Critical and Environmental Concern
ADA	Arizona Department of Agriculture
ADEQ	Arizona Department of Environmental Quality
ADOT	Arizona Department of Transportation
ADWR	Arizona Department of Water Resources
amsl	Above mean sea level
ANFO	Ammonium nitrate fuel oil
ANSI	American National Standards Institute
APP	Aquifer Protection Permit
ARMP	Approved Resource Management Plan
ARS	Arizona Revised Statute
ASMI	Arizona State Mine Inspector
ATF	Bureau of Alcohol, Tobacco, Firearms and Explosives
AZGFD	Arizona Game and Fish Department
BADCT	Best Available Demonstrated Control Technology
BFA	Bench face angle
bgs	below ground surface
BLM	United States Bureau of Land Management
BMP	Best management practice
BOR	United States Bureau of Reclamation
CAA	Clean Air Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CPR	Cardiopulmonary resuscitation
CWA	Clean Water Act
dB	Decibels
dBA	A-weighted decibels
DCT	Discharge control technologies
DOI	United States Department of Interior
DOT	United States Department of Transportation
DR	Decision Record
EMS	Environmental Management System
EPA	United States Environmental Protection Agency
ERMA	Extensive Recreation Management Area
ESA	Endangered Species Act
FCB	Flood Control Basin

ACRONYMS (continued)

FHWA	Federal Highway Administration
FLPMA	Federal Land Policy and Management Act
FMO	Fire Management Officer
FONSI	Finding of No Significant Impact
ft	Foot/feet
ft/ft	Feet per foot
GCL	Geosynthetic clay liner
gpm	Gallons per minute
GPS	Global positioning system
GVC	Golden Vertex Corp.
GWSI	Groundwater site inventory
HDPE	High-density polyethylene
HUD	United States Department of Housing and Urban Development
ID	Identification
IRA	Inter-ramp angle
KFO	Kingman Field Office
KOP	Key observation point
kV	Kilovolt
kW	Kilowatt
LCI	La Cuesta International
LCP	Leachate collection pond
LCRS	Leak collection recovery system
Ldn	Day-night average level
Leq	Equivalent noise level
LHFO	Lake Havasu Field Office
LLDPE	Linear low density polyethylene
Lmax	Maximum sound level
Lmin	Minimum sound level
mm	Millimeter
mph	Miles per hour
MPO	Mine Plan of Operations
MSDS	Material Safety Data Sheet
MSGP	Multi Sector General Permit
MSHA	Mine Safety and Health Administration
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NOI	Notice of Intent
NRHP	National Register of Historic Places
NWI	National Wetland Inventory
OHV	Off-Highway Vehicle
OHWM	Ordinary high water mark
PJD	Preliminary Jurisdictional Determination
Project	Moss Mine Phase III Expansion and Exploration Project
PAR	Pesticide Application Record
PUP	Pesticide Use Proposal
QAP	Quality Assurance Plan

ACRONYMS (continued)

RCMN	Roadway Construction Noise Model
RCRA	Resource Conservation and Recovery Act
RL	Reclamation level
RMP	Resource Management Plan
ROD	Record of Decision
ROW	Right-of-Way
SEDAR	System for Electronic Document Analysis and Retrieval, Canada
SHPO	State Historic Preservation Office
SMA	Special Management Area
SMRA	Special Recreation Management Area
SPCC	Spill Prevention, Control, and Countermeasure
SPLP	Synthetic Precipitation Leaching Potential
SWPPP	Stormwater Pollution Prevention Plan
TBD	To be determined
TMP	Travel Management Plan
TPD	Tons per day (United States)
UHF/VHF	Ultra high frequency/Very high frequency
USACE	United States Army Corps of Engineers
USC	United States Code
USFWS	United States Fish and Wildfire Service
USGS	United States Geological Survey
VoIP	Voice over Internet Protocol
VRCR	Visual Resource Contrast Rating
VRI	Visual Resource Inventory
VRM	Visual Resource Management
WEAP	Worker Environmental Awareness Program
WUS	Waters of the United States

1.0 INTRODUCTION

Federal policy encourages the development of mineral resources on public land and requires reclamation of disturbed federally administered lands, consistent with the Federal Land Policy and Management Act (FLPMA) and the Mining and Mineral Policy Act of 1970. Under these laws, the statutory right exists, guided by United States Department of Interior (DOI) regulations, to use public lands for the purpose of mineral prospecting, exploration, development, extraction, and other associated reasonable uses. DOI 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 public lands and to provide for reasonable reclamation" (43 Code of Federal Regulations [CFR] 3809.0-6).

This Mine Plan of Operations (MPO) for the Moss Mine Phase III Expansion and Exploration Project (Project, Phase III, or Proposed Action) was prepared by Golden Vertex Corp. (GVC) in compliance with the United States Bureau of Land Management (BLM) regulations contained in 43 CFR 3809. The Moss Mine is located in Mohave County, Arizona (latitude: 35° 06′ 00″ N/longitude: 114° 26′ 52″ W). The mine is approximately 8 miles east of US Highway 95, and approximately 4 miles east of the city limits of Bullhead City, Arizona. The former mining town of Oatman, Arizona is located 8 miles southeast of the mine. The Moss Mine lies within portions of Sections 19, 20, 29, and 30 of Township 20 North, Range 20 West, **Figure 1**. The Colorado River is 9 miles west of the Moss Mine. A substantial portion of the Moss Mine is comprised of patented mining claims, which constitutes approximately 254 acres as shown on **Figure 2**.

GVC activities to date have mainly focused on the exploration and exploitation of the Moss Vein and their associated stockworks that contain gold and silver mineralization of interest. The target mineralization is contained within a central area of 15 patented lode claims (254 acres; see **Table 2**), as well as east and west of the patented claims that occur on BLM managed lands. From 2013 to 2014, GVC's primary focus was on its Phase I Pilot Plant activities ("Phase I") that were comprised of open pit mining, on-site heap leaching and processing of a 125,000-ton bulk sample of Moss Vein mineralized material, with off-site carbon stripping and doré production. All Phase I activities were completed during the fourth quarter of 2014.

The second phase, or Phase II as it is referred to in GVC literature, was the subject of a 2015 Feasibility Study ("Moss Gold Silver Project NI 43-101 Feasibility Study Technical Report") dated June 15, 2015 and filed on SEDAR (System for Electronic Document Analysis and Retrieval, Canada). Phase II involves the mining and processing of ores wholly contained within the patented land boundaries that could be mined and processed without encroaching on federal lands. Subsequent to the 2015 Feasibility Study, the Project received the necessary permits and regulatory approvals, along with financing, to allow construction to proceed. Phase II encompasses mining, crushing, agglomeration and stacking of ore onto a conventional heap leach pad. Phase II gold and silver recovery from the leach solution is being achieved by a Merrill Crowe process to produce doré bars at the mine. The Phase II mine was designed to have a five-year mine life at a projected mining rate of 5,500 tons per day. GVC currently anticipates that capacity at the Phase II barren rock stockpile will be exceeded by December 2019 and would necessitate the expansion of the existing barren rock stockpile onto federal lands. Phase II construction activities were completed in 2017 and the mine declared commercial production effective September 1, 2018.

This MPO will describe: 1) expanding the existing mining operations onto BLM managed lands; 2) development of an expanded heap leach pad, construction of required barren rock stockpiles, solutions ponds, and other project related infrastructure and buildings on BLM land; 3) exploratory drilling and associated roads; 4) the reclamation of disturbed lands; and 5) environmental commitments that are intended to mitigate potential adverse natural resource impacts associated with the implementation of the

Project. All necessary federal, state, and local permits will be obtained, pursuant to 43 CFR 3715.5(b) and 43 CFR 3809.420.

Open pit mining activities at Moss Mine currently include:

1) Extraction of ore from open pits that includes the use of explosives to fragment rock
2) Crushing of ore
3) Stacking ore on heap leach pad
4) Piling of barren rock on stockpiles
5) Utilizing a weak cyanide solution to leach the ore
6) Recovering the gold and silver from the leach solution through the Merrill Crowe process

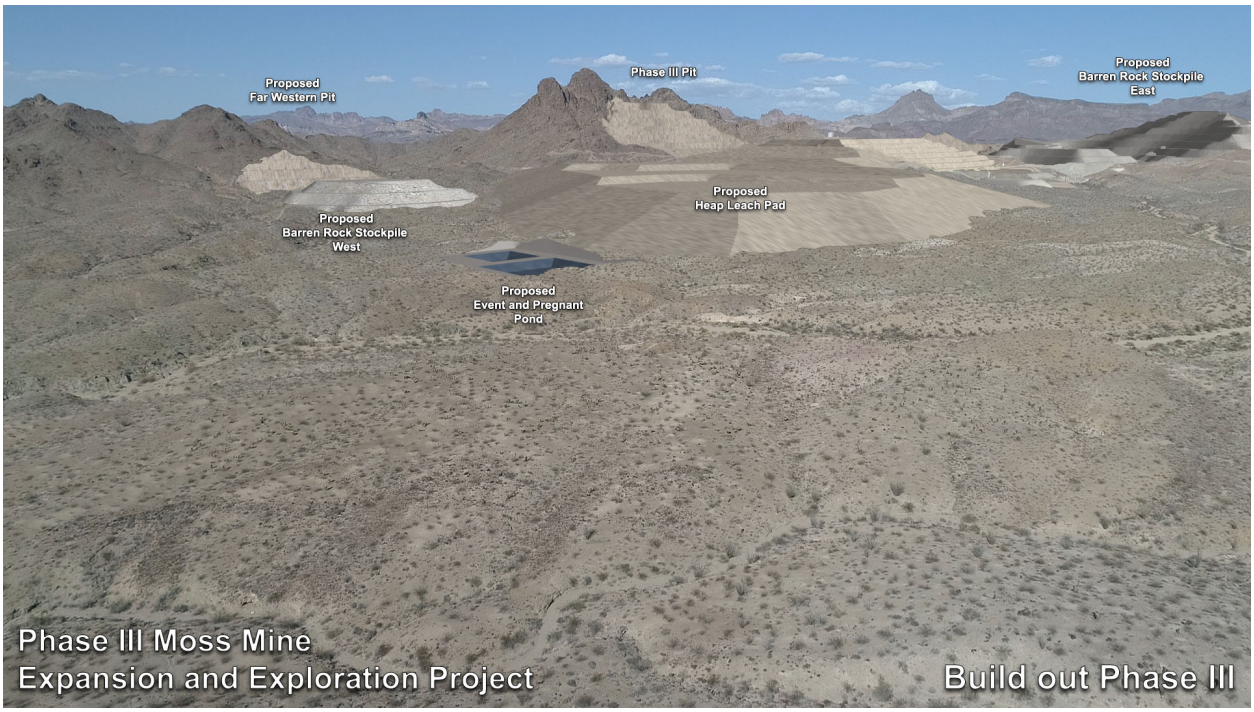
Operational components of mining operations at Moss Mine include:

1) Haul and access roads
2) Stormwater diversion facilities
3) Water supply and transmission of water (i.e., water wells/pipelines)
4) Miscellaneous storage yard areas
5) Core shack and assay lab
6) Other supporting infrastructure and ancillary equipment

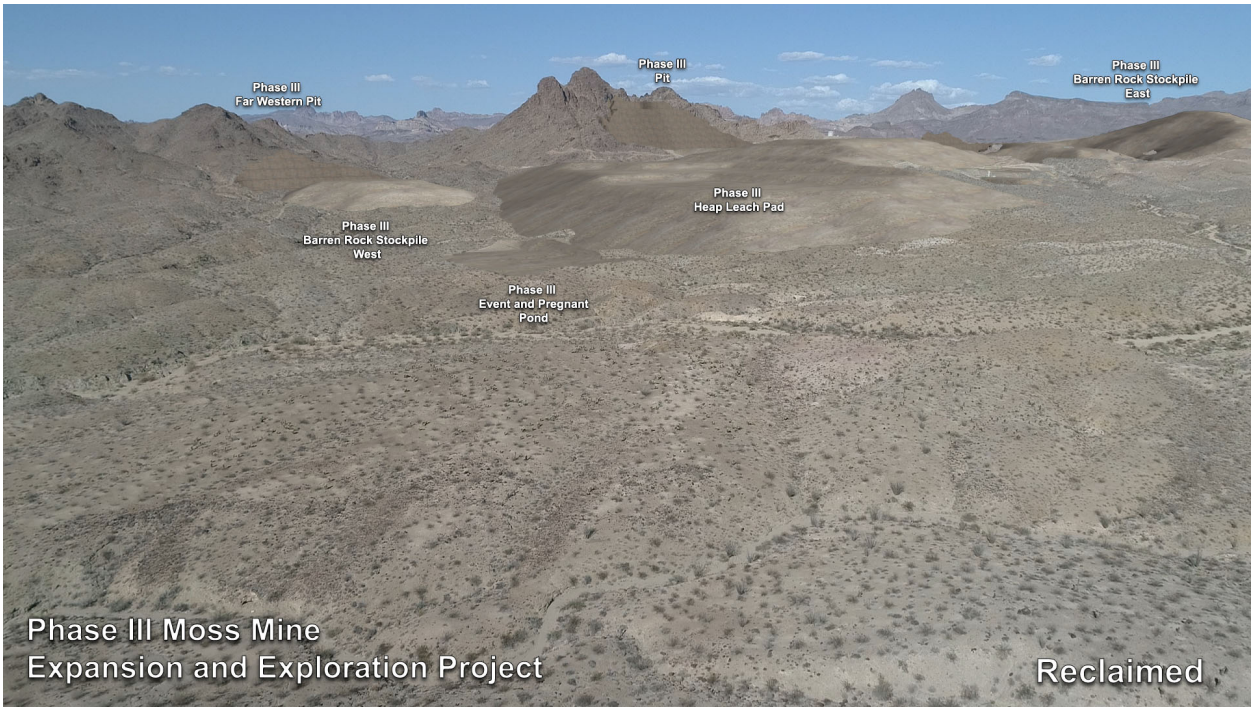
Ground disturbing acres on BLM land have been calculated at 495.94 acres, including 6.54 acres on Arizona State Land Department land, see **Table 1**. As stated above, Phase III includes an expanded heap leach pad to accommodate additional mineralized material and expanded barren rock stockpiles. The expansion of both the heap leach pad and the barren rock stockpiles would be developed on BLM land adjacent to Moss Mine patented claims. Further, exploration activities are included in the Phase III project and have been described in Section 16 of this MPO and shown in **Figure 3A through Figure 3F**. A simulation of the proposed buildout of Phase III is provided in **Photograph 1**. A simulation of the proposed reclamation following completion of Phase III is provided in **Photograph 2.**

It should be noted that current mining operations at Moss Mine provide economic benefits to communities in Mohave County as well as to the State of Arizona through tax revenues and long-term employment opportunities at the mine. Exploration activities conducted to date indicate the potential for the extraction of additional gold and silver at the mine beyond what is described in this MPO.

Preparation of this MPO has included coordination with and review by the BLM. Results of this coordination and review process are summarized in **Appendix A**, BLM Review Comment Response Matrix.



Photograph 1: Conceptual Phase III Moss Mine (Proposed) Simulation of Phase III completion) – View Looking Northeast



Photograph 2: Conceptual Phase III Moss Mine Reclamation (Proposed) – View Looking Northeast

Table 1: Proposed Disturbance by Land Status

Facility	Disturbance (Acres)		
	BLM	Private	Total
Exploration			
Estimated Exploratory Roads and Drill Sites within six exploration areas[1]	110.31	0	**110.31**
Open Pit			
Proposed Far Western Pit	16.70	0	**16.70**
Proposed Eastern Pit	84.55	1.20	**85.75**
Ancillary Facilities			
Proposed Heap Leach Pad (approximate height above ground elevation 75-feet [ft] to 115- ft)	109.0	14.95	**123.95**
Proposed Heap Leach Pad Buffer/Road	0.75	0	**0.75**
Proposed Pregnant and Event Ponds	4.20	0	**4.20**
Proposed Barren Pond	1.19	0.90	**2.09**
Proposed Barren Rock Stockpile West/Temporary Growth Medium Storage (approximate height above ground elevation 195-ft to 210-ft)	15.50	0	**15.50**
Proposed Barren Rock Stockpile West Buffer/Road	2.50	0	**2.50**
Proposed Barren Rock Stockpile East (approximate height above ground elevation 170-ft)	111.75	23.70	**135.45**
Proposed Barren Rock Stockpile East Buffer/Road	5.80	4.10	**9.90**
Proposed Assay Lab/Core Shack	2.01	0.21	**2.21**
Proposed Maintenance Shop/Office Complex	10.98	0	**10.98**
Proposed Municipal Source Water Pipeline (4-inch to 6-inch diameter)[2]	14.32	13.25	**27.57**
Proposed Water Wells (6) and Monitoring Wells (3) and Water Well Pipeline[3]	6.38	0	**6.38**
Totals	**495.94**	**58.31**	**554.25**

[1] *Acreage includes Arizona State Land Department-owned land because BLM has subsurface rights. Proposed exploration disturbance is detailed in Section 16.*

[2] *The proposed municipal source water pipeline would be co-located with BLM-approved 24.9 kV power line right-of-way (ROW) (BLM AZ 037253). This proposed water pipeline would consist of 4-inch (4") to 6" pipeline and includes 0.91 miles along BLM 7717, 0.82 miles along BLM 7922, and 1.91 miles along Silver Creek Road, for a total of 3.64 miles on BLM land. The proposed water pipeline disturbance was calculated using an average 33-ft wide ROW corridor. The approved 24.9 kV power line area of disturbance (approximately 2.86 acres on BLM land) is not provided in **Table 1** above because the ROW has already been approved by BLM. The power line is discussed in this MPO because it is closely associated with Phase III activities. The power line disturbance area was calculated to be 20% of the water pipeline disturbance on BLM land based on: the power line being be built using existing roads and within the same corridor as the water pipeline; and ground-disturbing activities would consist primarily of utility pole placement and power line tensioning/pulling sites. Reclamation associated with construction of the power line has been previously defined within BLM's Grant of ROW and will be implemented as directed by BLM.*

[3] *The proposed water well pipeline would consist of 4"-6" pipeline along the BLM 7717 realignment to convey groundwater from the three proposed water wells south of Moss Mine. The proposed water well pipeline disturbance was calculated using 35-ft temporary disturbance corridor.*

2.0 PURPOSE OF THIS MINE PLAN OF OPERATIONS

The purpose of this MPO is to describe expanding Moss Mine's existing mining operations beyond GVC patented claims and onto BLM managed lands as summarized above.

2.1 History of Moss Mine

The Moss Vein was discovered in 1863 by John Moss (1839-1880). At the time, it was reported to be the first major gold discovery in Mohave County. The larger San Francisco Mining District of Mohave County was established in 1864 (Malach 1977).

Available records show that John Moss was made aware of the Moss Mine area by stories about soldiers from nearby Fort Mojave prospecting for and finding gold. A popular, alternative account of the Moss Vein discovery is that Chief Irataba of the Mojave Tribe led Moss to what became known as the Moss Vein outcrop. Whatever the case, John Moss' name appeared on the first recorded mining claim called the Moss Lode, under the ownership of the San Francisco Gold and Silver Company. It was reported that a 'shoot containing more than $200,000 in gold' was mined in a 3-meter wide and 3-meter deep glory hole on the claim, to the east of the Allen Shaft.

Available records show that Moss sold the Moss Lode to Dahrean Black and that it was later sold to the Gold Giant Mining and Milling Company of Los Angeles. The area around the glory hole was explored by numerous holes and tunnels, but no other substantial quantities of gold are reported to have been found. The Ruth Vein was subsequently discovered and a 70-meter (230-foot [ft]) shaft was sunk and 'hundreds of feet of tunnels' were developed (Malach 1977). The Moss Mine is reported to have produced approximately 12,000 ounces of gold until it was closed in 1866 (Durning and Buchanan 1984).

Following its abandonment in 1866, there was little mining activity in the district until the discovery of the regionally famous Gold Road Vein in 1900. The town of Vivian was founded in that year with its name changed to Oatman in 1908. In 1906, the Tip Top and Ben Harrison mineralized shoots were discovered. In 1915 and 1916 the Big Jim, Aztec, and United Eastern mineralized bodies were discovered on the Tom Reed Vein. Mining activity increased and the population of Oatman grew to a reported 10,000 (today referred to as the Oatman gold mining boom, 1915 to 1917).

By the mid-1920s, the population of Oatman had fallen to a few hundred. In 1933, an increase in the gold price from US$20 to US$35 per ounce resulted in a brief flurry of activity, but all the local mines were closed by the Presidential Executive Order 9024 in January 1942 (Ransome 1923; Sherman & Sherman 1969; Varney 1994). Historical underground mine plans of the Moss Mine in the Company's database are dated May 10, 1915 by Goldroad Mines Co. of Goldroad, Arizona, and September 25, 1920 by the Moss Mines Co. of Gold Road, Arizona. These show the Allen Shaft and levels at 60-ft, 75-ft, 125-ft and 220-ft. The plans indicate that there were operations at the Moss Mine between 1915 and 1920.

Available records show that the Ruth Mine was accessed by a 60-degree incline shaft with drifts on the 100-ft, 200-ft, and 300-ft levels. Activity appears to have continued through to mid-1935, by which time approximately 600-ft of drifting is reported to have been completed. A mill was constructed on the property in 1900.

2.2 BLM's Role

The BLM's role is to respond to GVC's request (i.e., this MPO) to expand current gold and silver mining and exploration operations at Moss Mine onto BLM lands. The need for BLM to assume this role is established by the 1872 Mining Law as amended, FLPMA and regulations under 43 CFR 3809 and 3715, which govern mining operations involving locatable mineral resources on public lands and assigns to BLM the regulatory oversight in the assessment of the technical and administrative completeness of this MPO pursuant to 43 CFR 3809.

It should be noted that the Phase III Moss Mine Expansion and Exploration Project (Project) occurs within two BLM Resource Areas, **Figure 1**. Generally, the eastern portion of the Project occurs within the Kingman Field Office (KFO) and the western portion of the Project occurs within the Lake Havasu Field Office (LHFO). It is understood that KFO would lead the regulatory evaluation of the Project with support and participation from LHFO.

2.3 Decision to Be Made

The BLM would deem this MPO as technically and administratively complete pursuant to 43 CFR 3809. Based on this decision, analysis efforts associated with the National Environmental Policy Act (NEPA), as it relates to the implementation of the proposed action (i.e., Moss Mine Phase III), would commence. Completion of efforts associated with the NEPA would result in a decision from BLM approving, approving with modifications, or denying the GVC's request to implement the Proposed Action.

2.4 Resource Management Plan Conformance – KFO and LHFO

Resource management planning regulations mandate that all actions approved or authorized by BLM be reviewed for conformance with existing land use plans (43 CFR 1610.5-3) (516 Departmental Manual 11.5 [DOI 2008]). A proposed action and alternatives must either be consistent with the applicable land use plan and clearly in agreement with the terms, conditions, and decisions of the approved plan, or a plan amendment must be completed in order for the proposal to be approved (DOI 2008).

The Moss Mine Project is located within the administrative boundaries of BLM's Colorado River District, more specifically, within KFO and LHFO areas. The following sections discuss conformance of the Project within both Resource Areas as pertains to their respective Resource Management Plan (RMP).

2.4.1 KFO Resource Area Resource Management Plan (BLM 1993) Locatable Mineral Resources

"The objective of the minerals program is to provide for orderly exploration and development of minerals by allowing high- and medium-potential areas to remain open to appropriation under the mineral laws, with few restrictions. Approximately 1,555,000 acres of federal minerals would be open to locatable mineral exploration and development." (BLM 1993, KFO RMP Page 60)

GVC has described, in this MPO, the orderly development of a process for the mining of gold and silver within an area that is currently managed for such activities within the KFO RMP.

2.4.2 LHFO Resource Area Resource Management Plan (BLM 2007) Locatable Mineral Resources

"The Reasonably Foreseeable Development for locatable minerals would be three to five new exploration level notices submitted per year for 20 years that would disturb a maximum of 5 acres per notice. There would be 5 to 10 new small locatable mineral operations developed over the life of the plan, which would disturb approximately 20 acres at each operation. There may be one large mine that may disturb 200 to 300 acres. The total estimated disturbance related to new mining exploration and operations over the life of the plan is 1,000 acres.

Monitoring minerals activities consists of periodic field inspections that ensure compliance with applicable laws, regulations, and site-specific authorizations. Findings for each inspection are documented and placed in the case file. The number of sites inspected and the number of sites in compliance will be reported in the Annual Planning Update Report and Summary." (BLM 2007, LHFO RMP Page 42)

The proposed Project conforms to the development of a large mine that would not exceed "reasonably foreseeable development" disturbance estimates in an area that historically has undergone mining activities. Furthermore, this MPO describes how the proposed Project would monitor proposed mining activities in an effort to remain in compliance with applicable state and federal laws and regulations.

2.5 The National Environmental Policy Act

Federal regulations require that all MPOs (43 CFR 3809.411) and all ROWs (43 CFR 2804.25(d) granted under the FLPMA be analyzed in accordance with NEPA and Council on Environmental Quality (CEQ) regulations contained in 40 CFR 1500–1508. The BLM retains regulatory oversite in the compliance with the NEPA. Under NEPA requirements, BLM must also coordinate with other federal, state, and local agencies whose responsibilities may include some aspects of the Proposed Action. As the lead federal agency under NEPA, BLM may initiate, for example, coordination activities with other agencies, including consultation with: the United States Fish and Wildlife Service (USFWS) under Section 7 of the Endangered Species Act (ESA); the Arizona Game and Fish Department (AZGFD); the State Historic Preservation Office (SHPO) under the National Historic Preservation Act (NHPA); the United States Army Corps of Engineers (USACE) related to compliance with the Clean Water Act (CWA); and the Arizona Department of Environmental Quality (ADEQ) related to the protection of ground water sources and air emissions.

When a proposed MPO or its modification is complete and deemed ready for environmental analysis (i.e., NEPA analysis), BLM initiates a review under NEPA. Numerous measures to reduce impacts on the surrounding environment are typically described in the proposed MPO, but specific stipulations and/or environmental commitments may be developed during the NEPA process, typically when the NEPA analysis is nearing completion and a preferred alternative has been identified. Once BLM and the operator can be reasonably certain of how future mining activities, if approved, would be conducted, environmental commitments to the operator's proposed MPO are then included as "conditions of approval" in BLM decision document. This MPO discusses resource protection measures that GVC has committed to in the development of the proposed action, see Section 15.

2.6 General Mining Law of 1872 and BLM Oversight

The mining of locatable mineral activities conducted on federal land are authorized under the General Mining Law of 1872 (as amended) (30 United States Code [USC] 21–42). BLM's regulatory responsibilities for oversight of mining activities on federal lands are provided for in 43 CFR 3700 and 3800. Mining

operations on BLM-managed lands must be conducted in accordance with an approved MPO. An MPO must contain all information as described under 43 CFR 3809.401. BLM ensures that an operator and any locatable mining proposal describe actions to prevent unnecessary or undue degradation of public lands.

3.0 CLAIMANT AND OPERATOR INFORMATION [3809.401 (B)(1)]

Pursuant to 43 CFR 3809.401(b)(1), this section discusses:

- Proponent's name, address, phone number, and taxpayer identification (ID) number
- BLM serial numbers of involved unpatented claims
- Points of contact for the proponent
- 30-day notification required for any change in operator information

3.1 Name and Business Address of Individual Completing Application

Name:	Lloyd Joseph Bardswich
Title:	President
Business Name:	Golden Vertex Corp.
Business Address:	2440 Adobe Road, Suite 101 Bullhead City, Arizona 86442
Telephone Number:	928-763-6252

3.2 Corporation Information

Corporation Name:	Golden Vertex Corp.
Corporation Address:	2440 Adobe Road, Suite 101 Bullhead City, Arizona 86442

Corporation Contact Information

Full Name:	Lloyd Joseph Bardswich
Title	President
Street Address:	2440 Adobe Road, Suite 101 Bullhead City, Arizona 86442
Telephone Number:	928-763-6252

See Articles of Incorporation (**Appendix B**).

3.3 Taxpayer ID Number

Taxpayer ID Number:	27-5347979

3.4 Registered Agent

Full Name:	Lloyd Joseph Bardswich
Street Address:	2670 Sanctuary Drive
City:	Bullhead City, Arizona 86442
Telephone Number:	928-234-5227

3.5 Land Status

Moss Mine encompasses 15 patented claims covering 254 acres. The patented claims are owned by GVC. A list of the patented claims is provided in **Table 2**. The claim boundaries have been surveyed and a certified record of the survey was recorded by Eric L. Stephan (Registered Land Surveyor #29274) of Cornerstone Land Surveying, Inc., located at Bullhead City, Arizona 86439, which is dated February 29, 2012. A map of the patented claims is shown on **Figure 4**.

Table 2: Patented Mining Claims

Claim Name	Mineral Survey	Township/ Range	Section	Date of Location	Date of Amended Location	Date of Mineral Survey	Claim Area (acres)
Key No. 1	MS4484	20N/20W	19	Unknown	NA	April 1959	19.25
Key No. 2	MMS4484	20N/20W	19	Unknown	NA	April 1959	20.56
California Moss Lot 37 (Greenwood)	MS182	20N/20W	19, 30	Unknown	NA	Before October 1888	20.26
California Moss Lot 38 (Gintoff)	MS796	20N/20W	19, 20, 29, 30	February 2, 1882	NA	Before October 1888	20.39
Moss Millsite	MS4484	20N/20W	19	Unknown	NA	April 1959	13.62
Divide	MS4484	20N/20W	19	Unknown	NA	April 1959	4.72
Keystone Wedge	MS4484	20N/20W	19, 30	Unknown	NA	April 1959	10.0
Ruth Extension	MS4485	20N/20W	29, 30	July 2, 1929	June 27, 1958	April 1959	19.22
Omega	MS4484	20N/20W	19, 30	Unknown	NA	April 1959	20.49
Ruth	MS2213	20N/20W	30	October 15, 1888	NA	February 1906	18.11
Rattan Extension	MS4485	20N/20W	30	July 2, 1929	June 27, 1958	April 1959	20.66
Rattan	MS857	20N/20W	30	July 19, 1886	NA	October 1888	20.71
Partnership	MS4485	20N/20W	30	June 27, 1958	June 27, 1958	April 1959	5.88
Mascot	MS4485	20N/20W	30	June 27, 1958	June 27, 1958	April 1959	20.66
Empire	MS4485	20N/20W	30	June 27, 1958	June 27, 1958	April 1959	19.55
						TOTAL	**254.08**

3.6 List of BLM Claims and Serial Numbers [3809.401 (b) (2) (i)]

The Moss Mine Project area is located approximately 8 miles by road (i.e., Silver Creek Road) to the east of Bullhead City, in the historically significant Oatman Mining District of Mohave County, Arizona. Specifically, the mine (patented claims) is located in Mohave County, Arizona in portions of Sections 19, 20, 29, and 30 of Township 20 North, Range 20 West of the Gila and Salt River Meridian and associated baseline. Specific claim names and BLM serial numbers are provided in **Appendix C**.

3.7 30-Day Notification

GVC will notify BLM's KFO, in writing, within 30 days of any change of operator, corporate point-of-contact or the mailing address of the operator or corporate point-of-contact associated with Moss Mine.

4.0 LIST OF OPERATIONAL AND ENVIRONMENTAL PERMITS REQUIRED AND STATUS

GVC currently maintains and updates the permits and authorizations presented in **Table 3**. As noted, these permits and authorizations will be amended for the Proposed Project, as required.

Table 3: Major Permits and Authorizations

Permit/Approval	Permit Number (if applicable)	Granting Agency	Status/Comments
NEPA Finding of No Significant Impact (FONSI)/ Decision Record (DR)	To be determined (TBD)	BLM	TBD
Multi-Sector General Permit (MSGP)	AZMS68804	ADEQ	Phase II Approved; Phase III will need an amendment to existing MSGP
Spill Prevention, Control and Countermeasures Plan (SPCC)	N/A	United States Environmental Protection Agency [EPA] /ADEQ	Phase II Approved; Phase III will need an amendment to existing SPCC
Dust Control Plan	Air Quality Permit No. 69302	ADEQ	Phase II Approved; Phase III amendment process started
Emergency Response Plan	N/A	ADEQ/Arizona State Mine Inspector (ASMI)/Mine Safety and Health Administration (MSHA)	Phase II Approved by ASMI, October 24, 2016 - Moss Mine Project Amendment to the Mined Land Reclamation Plan
ROW Access Road (Realignment of BLM Road 7717)	AZ 037252	BLM	Approved July 3, 2018
ROW 24.9kV Power Line	AZ 037253	BLM	Approved July 3, 2018
ROW for Fiber Optic Line	AZ 037478	BLM	Approved July 3, 2018
Notice Level Exploratory Drilling Authorization	AZA-36827	BLM	Approved January 11, 2017

Permit/Approval	Permit Number (if applicable)	Granting Agency	Status/Comments
Explosive Permit Held by contractor N. A. Degerstrom	9-WA-063-22-1C-00112	Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF)	Phase II Approved
Exploration Permit	08-119642/08-119834	Arizona State Land Department	Approved November 2017 and June 2018
Mohave County Power Supply License	N/A	Mohave County	Approved July 7, 2018.
Mined Land Reclamation Plan	N/A	ASMI	Phase II Approved – October 24, 2016
Mining Claims (Lode and Placer), Mill Site Claims		BLM – Arizona State Office	Statement of Substantial Similarity of Phase III to Phase II required and submittal of additional required bonding
BLM Notices, Plans of Operation, and Occupancy (Mining Claims)		BLM	Current
Bonding Requirements, Federal Lands		BLM	State-wide bond in place for Notice Level exploration; large bond required upon BLM acceptance of MPO and completion of NEPA analysis
Notice of Intent (NOI) to Drill and Abandon an Exploration Well		Arizona Department of Water Resources (ADWR)	Required on an "as required" basis
Dry Well Registration		ADEQ	Application on an "as required" basis by licensed well driller
Manufacturers License or User Permit Explosives		ATF	Contractor (Degerstrom) has current license; the company can acquire the license in 30 to 60 days, if required
Transportation of Explosives		ATF/United States Department of Transportation (DOT)/ASMI/MSHA	Contractor (Degerstrom) has current license; the company can acquire license in 30 to 60 days, if required
Air Quality Control Permit	64302/69453 (minor revision)	ADEQ	Phase II Approved; Phase III amendment process started
Individual Aquifer Protection Permit (APP)	P-511225 (LTF#64007)	ADEQ – Groundwater Section	Phase II Approved; Phase III will need amendment to existing APP
208 Consistency Review		ADEQ – Regional Water Quality Planner, Surface Water Permits Unit	Associated with APP - completed annually

Permit/Approval	Permit Number (if applicable)	Granting Agency	Status/Comments
Storm Water Discharges from Industrial Activities (402 Permit) - Arizona Pollution Discharge Elimination System		ADEQ – Surface Water Section, Storm Water and General Permits Unit	Permit granted. Amendments and updates required on an "as required" basis
NOI to Clear Land		Arizona Department of Agriculture (ADA)	File the notice with ADA 20 days before clearing land
Hazardous Waste, Treatment, Storage and Disposal Permit		ADEQ – Hazardous Permits Unit	Possible applicability - Awaiting determination from EPA as to necessity
Notification of Regulated Waste Activity - EPA Identification Number		ADEQ – Waste Programs Division, GIS & IT Unit	Possible applicability - Application for number is being processed
Risk Management Plan		EPA – Office of Emergency Management	Possible applicability - Awaiting determination from EPA as to necessity.
Hazardous Waste Management Facilities - Annual Registration		ADEQ – Waste Programs Division	Possible applicability - Awaiting determination from EPA as to necessity
Mining Exemption		State of Arizona	Arizona Statute 11-830 excludes mines from county building codes
Notice of Start-up, Move, or Stop for Portable Mining Equipment and Mine Operations		ASMI	Approved in 2012. Updated and amended as required
Mine Safety and Health Administration For 2000-7		MSHA	Approved in 2012. Updated and amended as required
Radio Station License, Wireless Communication		Federal Communication Commission	Approved
Transaction Privilege Tax License		Arizona Department of Revenue – License and Registration	In compliance
Severance Tax		Arizona Department of Revenue – License and Registration	Payments based on production are being made
Application for Incorporation Authority, Articles of Incorporation. Corporate Annual Report		Arizona Corporation Commission (ACC)	Annual reports are filed with the ACC
Professional Registration		Arizona Board of Technical Registration (ABTR)	Lloyd Joseph Bardswich, GVC President, registered as Professional Engineer with ABTR

5.0 DISCUSSION OF RECLAMATION BONDS AND FINANCIAL WARRANTY [43 CFR 3809.500-599]

The Reclamation Plan is described in Section 16. Reclamation bonds would be posted prior to implementation of the Project. Reclamation bonds associated with the exploration drilling program (the proposed exploration program is provided in Section 16 would be posted prior to exploration activities on an "as required" basis. Pursuant to 43 CFR 3809.554 (a) the Reclamation Cost Estimate includes all reclamation, closure, and post reclamation efforts, The Phase III Reclamation Cost Estimate was generated utilizing the Standardized Reclamation Bond Calculation Estimator format that has been modified to include the Arizona labor and equipment rates to facilitate the accuracy, completeness and consistency in the calculation of costs for mine site reclamation. GVC will complete an update to the cost estimate every three years for BLM review. The Reclamation Cost Estimate is contained in **Appendix D**.

6.0 PROJECT USE AND OCCUPANCY [43 CFR 3715.3-2]

6.1 Use and Occupancy

Activities at the Project, which are described in this MPO, comply with Use and Occupancy criteria in 43 CFR 3715.2 in that they:

- Are reasonably incident
- Constitute substantially regular work
- Are reasonably calculated to lead to the extraction and recovery of locatable minerals (i.e., gold and silver)
- Involve observable on-the-ground activity,
- Use appropriate equipment

6.1.1 Reasonably Incident

All aspects of the mining operation and occupancy of public lands involve the mining and processing of gold and silver ores. Other than valuable ore that will be removed from public lands, the amount of other materials disturbed (i.e., vegetation, growth medium, and barren rock) will be limited within areas that are required to mine and process the ore. Barren rock accumulated in the mining of ore may be used as a source of compatible aggregate by local paving, concrete, road building, and construction contractors. Sufficient accumulated private property material (barren rock) stored on private property is anticipated to allow private sale for decades. BLM would need to provide direction associated with the transport and sale of barren rock on federal land to an off-site third party, which is considered outside the scope of this MPO, currently.

6.1.2 Substantially Regular Work

Mining activities are conducted at Moss Mine 24 hours per day, 365 days per year. The mining activities substantially and directly benefit the Project and are work associated with the active development of existing mineral deposit and processing of mined ore, as well as exploration activities off of the Moss Mine patented claims. Ongoing activities also include the maintenance of equipment and related mine operations.

6.1.3 Reasonably Calculated

GVC has determined, through exploration (e.g., over 900 holes have been drilled and assayed within the region), mining, and metallurgical activities, that the mineral resources to be mined are economically recoverable; see **Table 4** below, excerpted from the Preliminary Economic Analysis report associated with Phase III prepared by M3 (2017; provided as **Appendix E**). The Project is an existing open pit mining and heap leaching operation that results in the extraction of gold and silver from mineralized rock. Mining has been ongoing at the site, on a small scale, for decades. The current Phase II constitutes a major investment in the mine and additional financial resources, which will not be advanced without a credible expectation of extraction and sale of gold and silver present in the ore.

Table 4: Moss Mine Project Mineral Resource Estimates

Category (0.25 g/t Au Cut-Off	Tonnes	Au (g/t)	Ag (g/t)	Au (oz)	Ag (oz)	AuEq (g/t)	AuEq (oz)
Measured	4,860,000	0.97	10.4	152,000	1,630,000	1.10	172,000
Indicated	10,620,00	0.66	8.7	225,000	2,980,000	0.77	263,000
Measured + Indicated	15,480,000	0.76	9.3	377,000	4,610,000	0.87	435,000
Inferred	2,180,000	0.55	5.6	38,000	390,000	0.62	43,000

Note:
*As provided in Preliminary Economic Analysis (M3 2017; see **Appendix E**) - Estimates by David Thomas, P.Geo (undiluted, pit constrained, 100 percent (%) in-pit recovery; Effective Date: October 31, 2014).*

6.1.4 Observable Activities

Equipment (e.g., haul trucks, loaders, excavators, bulldozers, graders, drills, explosive trucks, jaw crusher, cone crushers, screen decks, agglomerating drum, conveyors, and a stacker) is currently used on-site for the expressed purposes of defining, developing, exploring, open pit mining, crushing, agglomerating, conveying, stacking, leaching, and recovering gold and silver on private land. In accordance with 43 CFR 3715.7, BLM field staff will be able to physically verify the activities described in this MPO should the Project be implemented.

6.1.5 Use of Appropriate Equipment/Description of Proposed Action

GVC uses equipment at the mine that is appropriate both in the physical requirements and cost effectiveness for the mining of ore. All equipment is routinely maintained at the mine. For major repairs, equipment is sent off-site to third-party facilities. The location of proposed Phase III structures and facilities on BLM land is shown on **Figure 2**.

Descriptions of proposed significant structures on BLM land, associated with Phase III, are discussed throughout the MPO as follows:

- Proposed Eastern Pit
- Proposed Far Western Pit
- Proposed Barren Rock Stockpile East
- Proposed Barren Stock Stockpile West/Temporary Growth Medium Stockpile
- Proposed Heap Leach Pad/Pregnant and Event Ponds

- Proposed Municipal Source Water Pipeline (4" to 6" diameter)
- Proposed Maintenance Shop/Office Complex
- Proposed Assay Lab/Core Shack
- Proposed Barren Pond
- Six Proposed Water Wells and Water Well Pipeline (groundwater source; 4" to 6" diameter)
- Three Proposed Monitoring Wells
- Powerline extension to Phase III leach pad ponds

Existing GVC approvals to support Phase II and Phase III operations are discussed throughout this MPO as follows:

- Approved 24.9 kilovolt (kV) Power Line
- Approved Existing BLM Road 7717 Realignment

Fences have been established to completely encompass the Phase II heap leach pad. These fences include 7-ft game fences around the heap leach pad, 7-ft chain link security fence around the processing facilities, and 4-strand barbed wire fence on all sides of the patented property boundary. Phase III operations would have similar 7-ft game fences established around the proposed heap leach pad and proposed event and pregnant leach solution ponds, with desert tortoise fencing installed in sensitive tortoise habitat areas (see **Figure 5** for proposed fence lines). Post- and gate-mounted warning signs are located throughout the property and will be incorporated into Phase III developments. Additional description of site fencing and signage for site security and to prevent wildlife entrapment and mortality is provided in Section 6.2.2.

A BLM-approved 24.9 kV power line (BLM AZ 037253) will be constructed along Silver Creek Road from the Bullhead Parkway easterly onto BLM land at mile 3.3, continuing easterly to BLM Route 7922 and then to BLM Road 7717 where it will head north to Moss Mine, see **Figure 6**. The power line will be three-phased, constructed above ground on wood/steel poles spaced approximately 300-ft to 400-ft apart, and will also have a fiber-optic line (previously approved by BLM). This power line will be used to supply electrical energy to the mine. Currently, for Phase II, electrical power is being generated on-site through the use of eight 450 KVA diesel-powered generators.

6.2 Security Flagging, Fencing, and Signage

6.2.1 Security Measures

This section describes the methods that will be used in the field to delineate Project facilities and sensitive environmental resource areas and warnings during Project construction and operations. These methods are intended to ensure that ground disturbance is limited to previously approved areas, to ensure that Project personnel stay on approved access routes and within approved work areas, and to establish Project notifications (i.e., warning, speed limit, and sensitive area signs). The measures described in this section are an integral part of the environmental compliance program for avoiding and minimizing impacts to sensitive resources.

The purpose of this plan is to provide information on the field markings (i.e., flagging, staking, fencing, and signage) that will be used to identify approved Project work areas, exploration areas (i.e., drill sites and drilling roads) as well as sensitive resource areas where construction and exploration is to be excluded (e.g., eligible cultural resource sites, sensitive natural resource areas). The methods and measures described in this section will help to avoid adverse impacts to the environment, human health and safety, and property

that could potentially result from the activities associated with the construction of the Project and exploration activities.

Signs, flags, and/or fencing will be used to delineate and protect sensitive environmental resources in the vicinity of construction and drilling activities. No paint or permanent discoloring agents will be applied to rocks or vegetation to indicate limits of survey or construction activity. A system of standardized and simplified exclusion markings will be used to reduce potential confusion during construction and exploration activities, and to minimize the risk of highlighting types of sensitive resources that could be targeted by vandals (e.g., if exclusions around archaeological sites were marked differently than those around sensitive natural resource areas, the sites would be at a higher risk of unauthorized artifact collecting or other disturbance).

The aerial limits of construction and exploration activities will be predetermined (e.g., activity restricted to and confined within those limits) by BLM. Standard survey flags and stakes will be installed before the start of Project construction. Phase III expansion areas, drilling sites, and roads will be marked by GVC. Designated access roads and pullout areas will be marked to facilitate travel to and from BLM approved work areas. GVC will stake the boundaries of the maximum area needed for work areas. **Table 5** describes standards that will be used for marking Project features needed for construction and exploration as well as sensitive environmental resources to be avoided.

Table 5: Flagging Plan

Colors	Meaning	Action or Response
Yellow/Green	Avoidance Area – Desert Tortoise, sensitive plant resource, or other sensitive resources (e.g., cultural)	Avoid these area – do not drive vehicles or equipment near or within flagged areas
Orange/Green	Protected plant species that will be marked for transplanting	Avoid these plants
Pink	Survey stake for mine facility (e.g., leach pad/barren rock stockpile limits)	Do not disturb survey stake
Blue/White	Construction access points, road access, temporary work areas	Do not drive outside of marked access routes or on unauthorized roads unless authorized by BLM to do so
Red	Outer boundary of BLM permitted area	Do not drive vehicles/equipment or conduct construction activities outside of BLM permitted area
Pink/White	Cadastral Survey Markers	Avoid disturbing these markers

6.2.2 Fencing

To delineate the limits of construction and exploration activities near sensitive resources that require a high level of protection from inadvertent Project disturbance, a combination of one or more of the following fencing materials will be installed by GVC:

- 7-ft chain link fencing plus four-strand barbed wire (existing)
- 7-ft wire mesh fencing plus four-strand smooth wire (proposed game fencing)
- Desert tortoise fencing (wire mesh along lower portion of game fencing)

- Rope (0.25" diameter, yellow or orange colored)
- Plastic or fabric tape
- Safety fencing (plastic orange or red mesh at least 24" wide and at least 18" off the ground to address travel by small animals)
- Roping with periodic marking by exclusionary signs or lengths of tape (a highly visible and effective exclusion device)
- Roping, tape, and safety fence installed using metal posts for increased durability

In most cases, it is anticipated that the materials will be installed at the margins of the sensitive resource (including any required buffers) rather than at the edge of the work area. See **Appendix F** for typical fence design drawing and example photos. See **Figure 5** for a depiction of proposed fence lines associated with the proposed Phase III activities.

6.2.3 Security Signage

Signs will be used to help identify Project features, such as access roads and certain Project facilities. Signs will be a minimum of 8.5" by 11" on laminated (7 mil or greater) white/colored paper for protection from the elements. Signs will be installed on metal posts, wooden stakes, or attached to exclusion fencing/roping, as appropriate. Background colors will vary to enhance sign recognition from a distance. **Table 6** provides some standards for marking Project features that will be needed during Project construction and ongoing drilling and exploration activities. Signs for sensitive resource areas will be oriented for visibility from all directions of likely travel.

Table 6: Signage Standards

Feature	Feature Color	Sign Text Example	Comments
Speed Limit Signs	White	"Speed Limit 15 MPH"	To be located at various locations along the approved Project access road, depicting allowed speed limits
Direction Sign	White	"Drilling Sites XX through XX Ahead"	To be located near areas to be drilled or areas to be constructed
Sensitive Cultural or Ecological Resource	Yellow	"Sensitive Resource Area – Stay Out"	To be installed, as needed, in addition to exclusion fencing and flagging
Temporarily Closed Areas	Yellow	"Nesting Bird Area – Stay Out"	To be installed as needed at points of entry to exclusion areas
Invasive Weed Cleaning Station	Yellow	"Weed Clearing Station"	To be installed at points of entry to weed cleaning station(s)
Unapproved Access Road/Closed Roads	Yellow	"Non-Project Road – Do Not Enter"	To be located at entry points to unapproved access road (s)

6.2.4 Installation, Monitoring, Maintenance, and Removal of Flagging, Fencing and Signage

The success of Project flagging, fencing, and signage is a direct function of proper installation, monitoring, and maintenance of these methods. GVC will be responsible for the installation and maintenance of field markings during construction of Phase III facilities and during exploration activities. These markings will be

installed in advance of construction or exploration activities, maintained during construction and exploration, as necessary, and removed upon activity completion.

Environmental exclusions, signs, flags, and fencing for general inventory purposes and to denote exclusionary zones will be installed by GVC along with the assistance of appropriate resource specialists (e.g., ecologist, biologists, and archaeologists), as necessary. These environmental exclusions will be installed prior to the start of construction within a work area. Resource specialists will be consulted if there is uncertainty regarding the type or location of needed exclusion devices for botanical, wildlife, or archaeological sites.

Routine project monitoring by GVC will include an ongoing assessment of the need for replacement or repair of exclusionary flagging or fencing. Maintenance of exclusionary flagging or fencing within active construction and exploration areas will be prioritized. Upon completion of construction and exploration activities, all staking and flagging will be removed and disposed of by GVC.

7.0 PROJECT SETTING [43 CFR 3809.401(C)]

7.1 Location and Access

Moss Mine is located between Oatman and Bullhead City, Mohave County, Arizona in portions of Sections 19, 20, 29, and 30 of Township 20 North, Range 20 West of the Gila and Salt River Meridian and associated baseline, **Figure 1**. Access to the Moss Mine is by US Highway 95, and NV Highway 163 southeast from Las Vegas, Nevada or AZ Highway 68 west from Kingman, Arizona to Bullhead City, Arizona. Both highways intercept with the Bullhead Parkway in the northern portion of Bullhead City. Silver Creek Road, a Mohave County regional road, is 5 miles south on the Bullhead Parkway and leads easterly to the primary mine access road on BLM land (BLM Road 7717) that is designated as open to motor vehicle use in the KFO RMP (BLM 1993). The origination of BLM Road 7717 is at mile 5.7, east of Bullhead Parkway, on Silver Creek Road and is constructed northerly 1.3 miles to the southern boundary of the GVC patented Moss Mine property.

7.2 Local Community

The nearest cities to the Moss Mine property are Bullhead City in Arizona (4 miles west of the city limits) and Laughlin in Nevada (10 miles west). According to the 2010 census, Bullhead City had a population of approximately 39,500 people with approximately 100,000 people living in the Bullhead City-Laughlin-Kingman area, including other smaller communities (e.g., Oatman and Fort Mohave).

The nearest towns to the mine are Bullhead City and Oatman in Arizona, which is approximately 6 miles to the south-southeast of the mine. According to the 2010 census, Oatman had a population of 135 people. During the Oatman gold mining boom, it was a mining town with a population estimated at 10,000. Oatman is a historical gold mining town that hosted three major underground gold mines, producing over two million ounces of gold between 1900 and 1942.

The nearest major city to the mine is Las Vegas, Nevada, which is approximately 90 miles northwest of the Project. According to the 2010 census, Las Vegas has a population of approximately 1.95 million people in the metropolitan area, including 0.58 million people in the city proper. Good quality paved roads (Highways 93 and 95 leading to Highways 68 and 163, respectively) link Las Vegas and Bullhead City. Interstate Highway 40 is approximately 25 miles to the south of the Project. There is an international airport at Las Vegas from where chartered flights can be secured to the Laughlin/Bullhead City International Airport located on the

Arizona side of Colorado River, which forms the local boundary between the two states. The nearest railway station is at Needles, California, approximately 25 miles to the southwest of the mine.

Kingman, Arizona, approximately 40 miles due east of the Project, is the Mohave County seat. According to the official City of Kingman's website, Kingman and the surrounding area have a population of approximately 45,000. The airport, formerly known as Kingman Army Airfield, is city-owned for public use and is located about 10 miles northeast of the central business district of Kingman.

Phoenix is the Arizona state capital, which is approximately 240 miles to the southeast of the mine. In 2017, the metropolitan Phoenix population was 1.626 million not including neighboring areas, such as Chandler, Tempe, Mesa, Gilbert, Scottsdale, Glendale, Cave Creek, Surprise, Peoria, and Avondale (M3 2017).

The Project area is located on the western edge of the Black Mountain Range in the southern part of the basin-and-range physiographic province. Elevations in the general vicinity of the mine vary from 660 ft (at Davis Dam, on the Colorado River) to 5,062 ft (the peak of Mount Nutt). Elevations across the Project area vary from an average low of approximately 1,900 ft to a local maximum of approximately 2,700 ft at the western end of the Property (see **Figure 1** for a general view of the Project area). The Moss Vein forms a prominent east-west ridge across the northern portion of the block of 15 patented lode claims. It is the Moss Vein and the accompanying mineralized wall rocks that comprise the principal target for mining in Phase III.

The local Project area is drained by a minor tributary of Silver Creek at the eastern end of the block of 15 patented lode claims, which is dry for most of the year and drains southwest into Silver Creek and then west into Colorado River. Vegetation is generally sparse and comprised of bunch grass, sagebrush, and cacti. The Fort Mojave Indian Tribe and other private companies have created an agricultural community that covers several square miles in the fertile fields of Mohave Valley and Fort Mohave, to the immediate south of Bullhead City. The primary monocultural crops in the region are cotton and alfalfa. Current land use surrounding the mine reflects a mixture of mining and recreational (passive and active) activities. There has been ongoing mining and mineral exploration occurring in the region since 1860.

7.3 Operational Area Requirements and Baseline Environmental Data

This section discusses operational area requirements and baseline environmental data that have been compiled in the preparation of this MPO.

7.3.1 Climate

The Project is situated in the Mohave Desert, as such the climate is warm to hot within this temperate latitudinal region, pre-montane to lower montane altitudinal zone, and is characterized with low humidity on average throughout the year. There are no climatic constraints associated with mining, although daytime temperatures can exceed 100 degrees Fahrenheit (ºF) during June, July, and August (**Figure 7**). Heatwaves with temperatures in excess of 122ºF are not uncommon. The average annual rainfall at Bullhead City is approximately 6". No rain can fall for months with occasional heavy downpours occurring.

Climatic conditions in the region are arid and characterized by hot, windy summers and moderate, moist winters. Elevation is a controlling factor for temperature and precipitation, with decreasing temperatures and increasing precipitation occurring with an increase in elevations. Most precipitation, approximately 5" to 7" a year, occurs during the summer "monsoon" season (July and August) when prevailing moisture

bearing winds are dominant from the southwest, and again during the later winter months of January, February, and March when winds are dominant from the west. Snow also occurs during winter months, though seldom covers the ground for more than a few days at a time.

7.3.2 Air Quality/Noise

7.3.2.1 Air Quality

The location of the Project in the air quality planning area of Mohave County is classified by the United States Environmental Protection Agency (EPA) as "maintenance" for particulate matter of size 10 micrometers in diameter or less. The existing air quality in the region includes limited industrial influence with the nearest population center in Bullhead City, Arizona and Laughlin, Nevada. The compliance of the non-attainment and maintenance areas in Arizona is managed under the State Implementation Plan implemented under Title I of the Clean Air Act (CAA) to bring areas into compliance. The Moss Mine will continue to comply with monitoring requirements in accordance with the terms, conditions, and requirements of the mine issued State of Arizona Air Quality Permit. Amendments to the Air Quality Permit are currently in progress to address the changes required with the incorporation of the Phase III operations.

More specifically, GVC maintains compliance with federal and state standards through permits administered by ADEQ. The CAA established primary and secondary National Ambient Air Quality Standards. ADEQ administers air quality permitting in Arizona, requiring sources of air pollution to obtain permits to ensure compliance with applicable federal and state air pollution control requirements and air quality standards. GVC complies with applicable regulations under Arizona Revised Statute (ARS) Title 49, Chapter 3, air quality rules under Title 18, Chapter 2 of the Arizona Administrative Code (AAC R18-2-101 et seq.), and Title 40 of the CFRs except as otherwise defined in its air quality control permit No. 64302 (as amended No. 69453) issued by ADEQ.

The mine's potential to emit criteria pollutants with applied controls is less than the major pollutant source thresholds; consequently, an Individual Permit is not required. Permit No. 64302, acquired by GVC in February 2017, is a Class I General Permit. The specific operating conditions of the air quality permit to limit criteria pollutant emissions (i.e., particulate matter, nitrogen oxides, sulfur dioxide, and carbon monoxide) can be found in Attachment B, Section 1, of Permit No. 64302. Requirements for limiting volatile organic compounds from fuel storage and on-site electrical generator combustion are also included in Attachment B of Permit No. 64302. Visible emissions are monitored at the mine per EPA Reference Method 9 Opacity measurements that are routinely taken to remain in compliance with permit stipulations. Fugitive dust from blasting, operations, exploration, equipment, and unpaved roads is managed by GVC per ADEQ approved Dust Control Plan, which is included as an integral part of Air Quality Permit No. 64302.

7.3.2.2 Noise

7.3.2.2.1 Introduction

Project noise considerations relate to changes in baseline conditions that would result from the proposed expansion of mining activities outside the existing patented claims onto BLM lands and the proposed exploration drilling within 3 miles of the existing mine. This section provides the results of noise measurements on and off the existing mine to establish baseline conditions and calculations of future noise levels that are likely to result from mine expansion and exploration activities. Outside the existing mine, within the 3-mile Project area radius, most land is managed under BLM's KFO RMP (BLM 1995) and LHFO

RMP (BLM 2007) and supporting documents. While the RMPs do not specifically address or set standards for noise, they do dictate management goals, objectives, and compatible activities within designated areas under BLM's jurisdiction. These policies have implications for acceptable noise levels. Other federal agencies also provide guidance on acceptable noise levels for various sensitive land uses. This section evaluates the baseline noise measurements and future calculations in relation to these standards and the land uses in the Project area.

7.3.2.2.2 Noise Measurement Units and Properties

The relative loudness of sound or noise is described in units of decibels (dB), a measure of sound pressure on a logarithmic scale. A level of 0 dB is roughly equal to the threshold of human hearing, 55-65 dB is the range of normal conversation, and a level of 120 dB is often considered the threshold of pain. For community impact assessments, noise is typically averaged over a peak or representative period and is expressed as an equivalent noise level (Leq). An A-weighted filter is also used to correlate physical noise levels with the frequency sensitivity of human hearing and the subjective response to noise. Thus, community noise conditions are generally discussed in terms of average noise levels (Leq) in A-weighted decibels (dBA). Other statistics are also relevant to the noise environment, including the maximum sound level (Lmax) and minimum sound level (Lmin). These momentary maximum and minimum sound levels are incorporated into the average levels and indicate the range of noise occurring during the measurement period. The difference in daytime and nighttime noise is also important to the degree of impact or annoyance experienced; noise is more disturbing at night than during the day. Noise metrics have been developed to account for the varying noise levels over time to help assess community response to day and nighttime levels. The day-night average level (Ldn) represents the 24-hour Leq with a 10-dBA penalty added to the "nighttime" levels between 10:00 pm and 7:00 am.

Noise levels diminish over distance. Typically, a point source of noise will diminish by 6 dBAs per doubling distance, with no intervening terrain or barriers. Thus, a noise source that registers 60 dBA at 50 ft will decline to 54 dBA at 100 ft, 48 dBA at 200 ft, and so on. Noise attenuation over distance is more complex with variable terrain. The 6 dBA per doubling distance sound attenuation rate will apply if there is a clear line of sight between the noise source and receiver; however, topographic features or actual barriers that block the line of sight will further reduce sound over distance.

7.3.2.2.3 Regulatory Requirements Associated with Noise

Federal, tribal, state, and local regulations and policies are established to limit noise exposure at noise-sensitive land uses. Regulations vary among agencies and jurisdictions, with different noise standard levels of acceptability or impact. These are briefly described below.

7.3.2.2.4 Noise Control Act of 1972

The Noise Control Act of 1972 establishes guidelines for acceptable noise levels for sensitive receivers such as residential areas, schools, and hospitals. The levels set forth are 55-dBA Ldn for outdoor use areas, 45-dBA Ldn for indoor use areas, and a maximum level of 70-dBA Ldn for all areas. These levels provide guidance for local jurisdictions, but do not have regulatory enforceability. In the absence of applicable noise limits, these levels may be used to assess the acceptability of project-related noise.

7.3.2.2.5 U.S. Department of Housing and Urban Development

The US Department of Housing and Urban Development (HUD) also has guidelines for acceptable noise levels for sensitive receptors such as residential areas, schools, and hospitals (24 CFR 51). HUD's noise levels include guidance for the desirable noise level and for the maximum acceptable noise level. The desirable noise level established by HUD conforms to the EPA guidance of 55-dBA Ldn for residential outdoor use areas and 45-dBA Ldn for residential indoor areas. The HUD standard establishes a maximum acceptable noise level of 65-dBA Ldn for outdoor areas of residential land uses.

7.3.2.2.6 Mine Safety and Health Administration

The Mine Safety and Health Administration (MSHA) regulates noise levels in mining environments (30 CFR 62). These regulations require that the Leq of any work environment be limited to 90 dBA for any 8-hour period. Hearing protection can be used to bring the miner's noise exposure down to the permissible exposure level. Work environments exceeding 85 dBA for an 8-hour period require a hearing conservation program for workers. The MSHA regulations stipulate that at no time should a miner be exposed to noise levels exceeding 115 dBA.

7.3.2.2.7 State and Local Regulations

The State of Arizona and Mojave County do not have regulations or requirements that would be applicable to noise generated by the Project.

7.3.2.2.8 BLM Resource Management Plans

About two-thirds of the Project area is located within the KFO resource area with the remaining area in the LHFO resource area. The Mount Nutt Wilderness Area is included under the KFO RMP. Although a specific management plan has not been established for Mount Nutt Wilderness Area, the general goal of BLM wilderness areas is to provide for the long-term protection and preservation of wilderness character, natural conditions, opportunities for solitude, primitive and unconfined types of recreation, and other features of scientific, educational, scenic, or historical value. The Mount Nutt Wilderness Area borders the proposed Project exploration drilling area.

Most of the LHFO resource area is managed as an Extensive Recreation Management Area, which allows recreational uses such as backpacking, equestrian, hiking, climbing, remote camping, mountain biking, hunting, enjoyment of scenery or natural features, nature study, and photography. Allowed motorized uses include vehicle-based camping and auto touring, such as off-highway vehicle (OHV), four-wheel drive (4WD), dune buggy, and dirt bike uses.

The Bullhead Bajada Natural and Cultural Area of Critical Environmental Concern (ACEC) is designated on LHFO lands and is managed to protect important values related to the Historic Beale's Wagon Road, adjacent prehistoric resources, habitat for the Arizona State-listed Sonoran Desert tortoise, and other special status or sensitive species. The ACEC's northeast corner creates a boundary with the proposed Project exploration drilling area. Recreational activity is allowed in the ACEC including both motorized and non-motorized use.

7.3.2.2.9 Noise-Sensitive Land Uses

Some land uses are more sensitive to noise levels than others due to the characteristics of noise exposure and the types of activities typically involved. As described in the previous section, sensitive receptors are defined as residential areas and land uses such as sports areas, hospitals, parks, places of worship, playgrounds, recreation areas, schools, and other areas where a relatively quiet environment is appropriate and serves to preserve community quality of life. Commercial and industrial land uses are generally not included in discussions of noise-sensitive receptors.

The Analysis Area generally does not include noise sensitive residential receptors; rather, the land is vacant or limited to mining and BLM-managed recreational and resource preservation activities. Several specific areas are addressed below.

One residential site is present within the 3-mile exploration drilling area, consisting of a group of one or two residences and outbuildings located on Silver Creek Road (BLM No. 7748) approximately 7 miles east of the Bullhead Parkway and about 10,000 ft southeast of the current mining operation.

The Mount Nutt Wilderness Area may also be considered a noise-sensitive area because it is managed for outdoor activities that provide opportunities for solitude and primitive types of recreation. Motorized vehicles are not allowed in this area.

Most of the remaining BLM land within the proposed 3-mile Project area, including the Bullhead Bajada ACEC, would probably not be considered noise-sensitive. Although these areas are managed for resource protection and their scientific values, motorized vehicles and activities such as hunting are allowed, and users can expect to encounter noise from these uses.

For purposes of this noise evaluation, the EPA standard of 55 dBA is considered the appropriate threshold for sensitive land uses.

7.3.2.2.10 Noise Data Sources and Results

Noise data sources, including baseline data collection and calculated future noise levels are presented in the following sections.

7.3.2.2.10.1 Baseline Data Collection

To establish baseline noise data, measurements were conducted by Ecosphere Environmental Services, Inc. (Ecosphere). The measurements were collected at two locations considered to represent ambient noise in the noise-sensitive areas, the residence described above and BLM-designated Mount Nutt Wilderness Area. Additional measurements were collected within the existing mine boundaries to evaluate the magnitude of typical noise levels from the various mine operations.

Field noise measurements were collected with a Larson Davis Sound Track LxT1, Type I Integrating Sound Level Meter (serial number 4880), which was calibrated before and after the measurement sessions. Noise measurements were performed on Thursday, April 18, 2019. The noise measurements were conducted in accordance with American National Standards Institute (ANSI) S12.9-2005/Part 4 (ANSI 2005), the standard for environmental noise measurements. Data collected at various areas of the mine and surrounding area were considered to represent noise levels under typical weather and operational conditions. Non-typical

conditions affecting noise levels may occur at other times, including more extreme weather environments or modifications of mine operating activities.

A total of eight separate noise measurements were collected, ranging in duration from approximately 2 to 12 minutes. **Table 7** summarizes the noise levels measured in the Project area, including measurement times and locations, approximate distances to the sources, and results in terms of Leq, Lmax, and Lmin.

Table 7: Noise Measurements Results

No.	Time	Location Description	Approximate Distance to Source	Leq (dBA)	Lmin (dBA)	Lmax (dBA)
1.	12:18-12:31 pm	Residence	10,000 ft from mine boundary	41.9	32.4	51.9
2.	1:05-1:18 pm	Mount Nutt Wilderness Area Boundary	8,000 ft from mine boundary	35.0	29.9	47.8
3.	1:51-1:58 pm	Merrill Crowe Facility	40 ft from facility	82.3	81.2	84.7
4.	2:08-2:16 pm	Crusher Operation	50 ft from crusher	72.4	69.7	78.1
5.	2:32-2:39 pm	Water Tank-Above Pit	450 ft from center of pit	61.6	61.1	61.7
6.	2:48-2:55 pm	North Rim-Above Pit	400 ft from center of pit	64.8	56.9	73.8
7.	3:50-3:57 pm	Entry Gate	1,500 ft from center of pit	55.7	52.5	72.3
8.	5:25-5:27	Entry Gate-During Blasting	800 ft from blast area	59.4	55.3	70.3

Measurement 1 was conducted at the residential area on Silver Creek Road. The noise value of 41.9 dBA is considered representative of background levels in the undeveloped land surrounding the mine. Mine operations were not audible during the measurement period. The measurement site is higher in elevation than the mine and intervening terrain likely blocks sound from the mine.

Measurement 2 was conducted at the edge of BLM's Mount Nutt Wilderness Area at a point where vehicular traffic is blocked in Mossback Wash and signs are present indicating the wilderness boundary. The measurement area is surrounded by the banks of Mossback Wash and the foothills of the Black Mountains, which likely buffer sound. The measured noise value of 35.0 dBA is considered to represent a "quiet" background noise level. Mine operations were not audible during the measurement period.

Measurement 3 was conducted on the existing mine approximately 40-ft from the Merrill Crowe facility. Mine staff and the measured noise level of 82.3 dBA indicate that this facility is the noisiest operations on the site.

Measurement 4 was taken approximately 50-ft from the crushing operation, which includes conveyor belts, the crushers, and several operating pieces of heavy equipment. The measured noise level of 72 dBA is also relatively high.

Measurement 5 was taken near the water tower site on the ridge at the south side of the mine pit. This location captured noise from various sources including heavy equipment in the pit and the crusher and

Merrill Crowe operations. The measurement was approximately 450-ft from the center of the pit and about 250-ft from the crusher, which was buffered by intervening terrain.

Measurement 6 was taken on the ridge on the south side of the mine pit. Noise levels at this location primarily reflect heavy equipment operating in the pit.

Measurement 7 was taken outside (south) of the entry gate to the mine. This site is approximately 1,500-ft from the center of the pit and is buffered by intervening terrain from most pit noise; however, it is located relatively near a bank of diesel-powered electric generators.

Measurement 8 was taken at the same location as Measurement 7, outside the mine entry gate. This measurement was taken to capture the noise during the daily blasting operation, which occurred toward the east end of the pit about 800-ft from the gate. The noise level during the blast was not significantly higher than the previous measurement (59.4 versus 55.7 dBA), presumably because the explosive material is placed in drilled shafts and buried under soil cover.

Overall, ambient noise in the area surrounding the mine is very low and typical of undeveloped vacant land in a natural setting. The noise within the mine is relatively high but buffered from much of the surrounding area by the depth of the excavated pit, the rolling terrain around the mine site, and distance.

7.3.2.2.10.2 Calculated Future Noise Levels

7.3.2.2.10.2.1 Proposed Mine Expansion

Proposed future mine activities include east and west pit extensions, new barren rock stockpile areas to the southeast and southwest of the current operation, a leach pad to the south and west, and construction of other ancillary facilities. These operations would include heavy equipment usage and blasting (in the mine pit). To estimate future noise resulting from these operations, the Federal Highway Administration's (FHWA's) Roadway Construction Noise Model (RCNM) was utilized. The RCNM is the FHWA's national model for the prediction of construction noise, based on actual sound-level measurements from various equipment types taken during the Central Artery/Tunnel project conducted in Boston, Massachusetts in the early 1990s. Although the proposed mine expansion is not a road construction project, the RCNM includes much of the same equipment used in mine operations. Noise levels were calculated with the RCNM by specifying likely construction equipment that would operate on the mine expansion areas. Normal operations at any single area on the mine were assumed to include use of a frontend loader, two large haul trucks, a dozer, and blasting. Distances were specified in the RCNM to the nearest noise-sensitive receivers, including the residential area on Silver Creek Road and the boundary of the Mount Nutt Wilderness Area. Several buffer zones (at 500-, 1,000-, and 2,500-ft) were also specified in the RCNM to calculate noise levels at various distances around the mine expansion perimeter. **Table 8** shows the results.

Table 8: Mine Expansion Area: Noise Model Results

No.	Location Description	Approximate Distance to Source	Leq (dBA)	Lmax (dBA)
1.	Residence on Silver Creek Road	8,500 ft from closest edge of mine expansion area	37.2	49.4
2.	Mount Nutt Wilderness Area Boundary	6,000 ft from closest edge of mine expansion area	40.2	52.4
3.	500-ft Buffer	500 ft from closest edge of mine expansion area	61.8	74.0
4.	1,000-ft Buffer	1,000 ft from closest edge of mine expansion area	55.8	68.0
5.	2,500-ft Buffer	2,500 ft from closest edge of mine expansion area	47.8	60.0

The values in **Table 8** show that noise levels at the sensitive residential and wilderness areas would be well below the 55-dBA threshold. Mine-related noise would likely continue to be imperceptible in these areas. In the buffer areas closer to the mine (500-, 1,000-, and 2,500-ft), mine noise would likely be audible but still at relatively low levels. The values predicted by the RCNM do not account for the variable terrain in the area, which likely blocks mine noise in some areas, or the fact that equipment would often operate at greater distances from noise receivers than the boundary of the expansion area used in this analysis.

7.3.2.2.10.2.2 **Proposed Exploration Areas**

Six areas for resource exploration are proposed around the mine site. Construction of exploratory drill holes, associated access roads, and reclamation activities would require use of heavy equipment, assumed to include a grader, backhoe, haul truck, and drill rig. Several of the exploration areas are adjacent to the residential and wilderness areas. The RCNM was used to predict noise levels at various distances from work locations, assuming the above mix of equipment. As shown in **Table 9**, noise levels would be relatively high in the 100- to 500-ft buffer zones (63.5 to 75.0 dBA). This would result in noise levels above the EPA-identified threshold of 55 dBA. However, the increase in ambient noise would be short term, lasting only the duration of construction of the exploratory drill holes, access roads, and reclamation.

Table 9: Mine Exploration Area: Noise Model Results

No.	Location Description	Approximate Distance to Source	Leq (dBA)	Lmax (dBA)
1.	100-ft Buffer	100 ft from construction/drilling area	75.0	79.0
2.	250-ft Buffer	250 ft from construction/drilling area	69.5	71.0
3.	500-ft Buffer	500 ft from construction/drilling area	63.5	65.0
4.	1,000-ft Buffer	1,000 ft from construction/drilling area	57.4	59.0
5.	2,500-ft Buffer	2,50 ft from construction/drilling area	49.5	51.0

7.3.2.2.11 Conclusions

Increased noise levels calculated to result from the proposed mine expansion are comparable to ambient noise levels at the two identified sensitive areas and are well below the 55-dBA threshold. Within about 1,000 ft of the mine expansion area, the RCNM calculations show that noise levels could exceed the 55-dBA threshold. These levels are assumed to be tolerable for activities around the perimeter of the expansion area, which already experiences existing mine noise.

Noise levels from construction of the drill holes, accessed roads, and reclamation activities are predicted to exceed 55 dBA within approximately 1,000 ft of the construction sites. The noise-sensitive residential and wilderness areas could be impacted by noise from exploration. The increase in ambient noise would be short term; however, lasting only during construction of the exploratory activities.

7.4 Surface Hydrology and Clean Water Act

Regionally, the Moss Mine patent area, the proposed expansion and exploration areas, and proposed Silver Creek Road waterline are located in the Upper Colorado River Region, within the approximately 980 square mile Lake Mohave Basin. The basin is characterized by a broad valley along the Colorado River in the southern part of the basin and by mountains in the northern part of the basin. The Black Mountains define the eastern basin boundary. Besides the Colorado River, Silver Creek Wash running east to west from Oatman to Bullhead City is the most prominent hydrologic feature in proximality to Moss Mine. The Analysis Area for surface water resources consists of the approximately 263 square mile Silver Creek Wash-Lower Colorado River sub watershed basin (1503010103). A detailed delineation of study area watersheds and sub-basin is provided in the Preliminary Jurisdictional Determination approved by the USACE on March 22, 2019 and provided as an attachment to this MPO.

Surface water resources in proximity to Moss Mine are scarce, owing to the arid climate. Average annual rainfall in the study area is about 5". Runoff in the ephemeral streams occurs only during the heaviest rains and usually lasts not more than several hours. Surface water drainage in Silver Creek Wash-Lower Colorado River sub basin generally flows west-northwest toward the Colorado River via Silver Creek (6 miles) and Silver Creek Wash (9 miles). Silver Creek and Silver Creek Wash are both intermittent for their entire length. The only United States Geological Survey (USGS) stream gage within the basin is located along the Colorado River. Surface water resources in the sub basin consist of ephemeral washes and reservoirs or stock ponds. There are no reservoirs or stock ponds with more than 15-acre ft of capacity in the study area. The only perennial (continuing throughout the year) flowing water course is the Colorado River located approximately 12 miles down drainage from the Moss Mine study area. There are no surface waters in the Silver Creek Wash-Lower Colorado River sub watershed basin that have been designated by ADEQ as Impaired Waters.

The total number of springs identified by the USGS within the Lake Mohave Basin is 27 to 37, depending upon the database reference. There are no springs that produce 10 gallons per minute (gpm) or greater in the study area. Silver Creek Spring and an unnamed spring are the nearest springs to the study area, approximately 2 miles and 2.5 miles respectively from the Moss Mine patent area. There are no National Wetland Inventory (NWI) mapped wetland features within the study area.

In 2018, hydrologists from Ecosphere Environmental Services, Inc. (Ecosphere) coordinated the review of potentially jurisdictional Waters of the United States (WUS) within the Moss Mine proposed MPO Project area.

The jurisdictional review of the subject drainages was conducted in two phases. During the first phase, a desktop level screening was conducted. Aerial imagery, USGS topographic maps of the area and National Hydrographic Data Set were reviewed to identify potential drainage locations and to evaluate watershed drainage areas. Reports previously developed for the Moss Mine were also reviewed to understand information previously collected for the Project. Jurisdictional Determinations posted on the USACE Los Angeles District website were also reviewed for waterways that may be in the Project vicinity for context.

Since all drainages in the study area are ephemeral, only flowing in response to large or sustained precipitation events, stream flow data was not available.

A field visit was conducted over a 3-day period from September 4–6, 2018. The Ecosphere field assessment team included a hydrologist, wetland scientist, and a CWA regulatory analyst. Four ephemeral drainages within the study area were the focus of the field effort. The assessment team also visited several other ephemeral drainages beyond the study area as reference areas. In addition, eight other ephemeral drainages were visited beyond the study area as part of assessing potential CWA compliance for exploration drilling activities. Each of the subject drainages were identified as unnamed, ephemeral drainages that only flow during storm events. Each of the identified drainages was reviewed for potential CWA jurisdiction using the guidance documents mentioned below, and included assessing reaches of each drainage for the following factors:

- Surface connection to any WUS
- A defined bed and bank or well-defined channel
- Presence of an ordinary high water mark (OHWM)
- A continuum of wetlands that connected it to WUS

These factors were reviewed with consideration of both the USACE Jurisdictional Determination Form Instructional Guidebook, including the Approved Jurisdictional Determination Form, and the Revised Guidance on Clean Water Act Jurisdiction Following the Supreme Court Decision in Rapanos v. US and Carabell v. US (December 2, 2008). The OHWM considerations were consistent with USACE's *A Field Guide to the Identification of the Ordinary High Water Mark in the Arid West Region of the Western United States* (2008). Other factors evaluated in the field included documentation of depositional areas, head cutting erosion, flood plains, vegetative community changes, bed materials compared to upland materials and the relative size of drainage watersheds.

The results of this assessment are summarized below:

- Hydrologic field assessment and characterization updated in September 2018
- No perennial waterways, wetlands or springs present
- Hydrologic features are limited to small erosional and ephemeral drainages
- MPO study area ephemeral drainages mostly drain to the west-southwest to Silver Creek, which drains to the Colorado River
- Larger washes commonly used as OHV travel corridors and/or are designated as BLM roads
- A Preliminary Jurisdictional Determination (PJD) was submitted to the USACE in October 2018
- No impacts to any jurisdictional areas are proposed in the exploration activity study areas
- A Preconstruction Notification associated with the GVC's proposed use of Nationwide Permit 44 *Mining Activities* was submitted to the USACE in February 2019
- The USACE issued a PJD concurrence and authorization letter to GVC for minor impacts authorized under Nationwide Permit 44
- Permanent impacts will be mitigated by GVC's purchase of in-lieu fee credits

7.5 Groundwater

7.5.1 Groundwater Data Sources

The groundwater site inventory (GWSI) database maintained by ADWR contains records for thousands of wells in Arizona and consists of field-verified data regarding wells and springs collected by personnel from the Hydrology Division's Basic Data Section, USGS, and other cooperating agencies. The information in the GWSI database is constantly being updated by ongoing field investigations and through a state-wide network of water level and water quality monitoring sites (ADWR 2019a). Primarily, the GWSI database is used to record and obtain historical ground water level elevation data, although it also contains limited well construction and groundwater quality data (primarily pH, conductivity, and temperature) for some wells. There are 27 GWSI wells with groundwater elevation data within the study area (**Figure 8**), defined in this section as Townships 19-21 North, Ranges 19-21 West. These wells are located in Mohave Valley, Sacramento Valley or on the eastern slope of the Black Mountains. None are located on the western slope of the Black Mountains or in the vicinity of Moss Mine.

The "Wells 55 Registry" was created in 1980 to store registration information submitted by well owners and drillers and maintains a running record of all wells registered in the state of Arizona (ADWR 2019b). A well record maintained within the Wells 55 Registry database may contain all or a portion of the following data: Owner's name; a Notice of Intent (NOI) to drill, modify, abandon, or deepen a well; the 55-registration number; the driller completion and/or abandonment report(s); change of well owner or well construction information; notice of well capping; and an abandonment completion report (ADWR 2019b). The Wells 55 Registry database was searched for Townships 19-21 North and Ranges 19-21 West resulting in 503 wells with a reported groundwater elevation measurement (**Figure 9**). Most of these wells are located near Oatman, in Sacramento Valley, and on the eastern slope of the Black Mountains. Eighteen of these wells are located within Moss Mine Watershed D, north of Silver Creek Wash (**Figure 10**).

In addition, information from reports prepared by Golder Associates [Golder] was used to evaluate groundwater conditions of the study area. Golder prepared a preliminary groundwater resource evaluation (2016) and groundwater flow model update (2017a) for GVC Moss Mine and are provided in **Appendix G**.

Thirty-seven springs were identified on the four topographic quadrangle maps in which Moss Mine is located (USGS 2014a, 2014b, 2014c and 2014d; see also **Appendix G**, *Preliminary Groundwater Resource Evaluation,* dated July 20, 2016, Table 2-3) and were used to supplement the groundwater elevation and depth-to-water data from the GWSI and Wells 55 Registry databases in the study area. The locations and elevations of the springs were verified using Google Earth and are presented in **Figure 10**. All of the springs are located in the Black Mountains and were used to supplement the groundwater elevation data from wells and provide data in areas with no inventoried or registered wells.

Moss Mine has drilled and installed 21 potential water supply wells (WW-01 through WW-21), five observation wells (OW-01 through OW-05), five monitoring wells (MW2012-01, MW2012-02, MW2012-03, MW2017-04 and MW2017-05), and one piezometer beside (WW-22). Groundwater elevations measured at these wells provide site-specific information relating to site-wide groundwater flow direction and gradient. Aquifer testing was performed at select wells to estimate the radius of influence of groundwater drawdown from the pumping wells. The locations of the Moss Mine wells and groundwater elevations measured at each well (where available) are shown on **Figure 10**. For additional information on these wells, please see **Appendix G**, *Preliminary Groundwater Resource Evaluation,* dated July 20, 2016, Table 3-1.

7.5.2 Groundwater Elevations and Flow Directions

Groundwater elevations in the Lake Mohave Groundwater Basin, in which Moss Mine is located, range from more than 3,000 ft above mean sea level (amsl) along the crest of the Black Mountains to less than 500 ft amsl along the Colorado River. Groundwater elevations at Moss Mine historically ranged from about 1,900 to 2,050 ft amsl based on historical well drilling data associated with previous mining operations. Water level measurements collected at the site from March to May 2015 indicate groundwater elevations range from approximately 2,065 ft amsl on the southeast area of the site in well WW-13, to approximately 2,016 ft amsl in the southwest area of the site in well WW-14 (**Figure 10**). The Golder preliminary groundwater resource evaluation (2016) and groundwater flow model update (2017a) for GVC Moss Mine are provided in **Appendix G**.

Generalized groundwater flow direction in the Lake Mohave Basin is from the north to the south (ADWR 2009). More locally, groundwater in the vicinity of Moss Mine is inferred to flow from higher elevations in the Black Mountains in the east to the west toward the Colorado River (Golder 2016). Groundwater in the vicinity of Moss Mine occurs in two distinct geologic formations with varying degrees of connectivity: 1) in fractures found in bedrock consisting of faulted and fractured Precambrian metamorphic and granitic rocks and Tertiary volcanic rocks, basalt, and granitic intrusions (see Sections 8.2 and 8.3); and 2) in the pore space of alluvial materials deposited by paleo and quaternary stream channels. In both cases the groundwater flow direction is generally towards the west at an average hydraulic gradient of about 0.05 feet per foot (ft/ft).

The existing wells at the Moss Mine are bedrock wells, meaning they intercept water that exists within fractures in the rock. Fractured bedrock aquifers typically have limited storage capacity and generally yield no more than 100 gpm (Kirk 2016). Alluvial aquifers store and transmit water through sediment pores and generally yield more water per unit volume of aquifer than fractured bedrock aquifers. In the vicinity of the mine, alluvial groundwater is only present in streambeds. The closest streambed to Moss Mine with the potential to contain alluvial groundwater is the Silver Creek Wash located approximately one mile to the south.

The presence of dikes and faults at the site appear to influence the flow of fractured bedrock groundwater locally. Notably, groundwater elevations fall into three populations separated by the Canyon Fault and the feldspar porphyry dike. On average, groundwater elevations in the wells east of the feldspar porphyry dike cutting across the eastern portion of the site are about 30 ft higher than in the wells west of the dike (**Figure 10**; see also **Figure 11**), suggesting the dike acts as an impediment to groundwater flow as it moves westward across the property. Groundwater elevations in the three monitoring wells on the west side of the mine property are approximately 50 ft lower than groundwater elevations in wells east of the Canyon Fault, which suggests that the fault may also be impeding groundwater flow (Golder 2016).

7.5.3 Depth to Groundwater

Depth to groundwater in the Lake Mohave Groundwater Basin ranges from land surface at springs in the Black Mountains to over 400 ft below ground surface (bgs) south of Bullhead City (ADWR 2009). Based on ADWR records (ADWR, 2019b), depth to groundwater on the patented Moss property ranges from approximately 35 to 165 ft bgs. On the west side of the patents, well WW-20 was drilled to a depth of 1,000 ft bgs without encountering water.

7.5.4 Sources of Groundwater Recharge and Discharge

Sources of recharge to regional groundwater consist of leakage from the perennially-flowing Colorado River (ADWR 2009), infiltration from agricultural irrigation along the Colorado River, mountain front recharge from precipitation along the Black Mountains, and stream channel recharge from flood-stage flows in ephemeral washes. Recharge in the vicinity of the Moss Mine occurs along the western slope of the Black Mountains east and upgradient of the mine, and within the Secret Pass Canyon and Silver Creek Wash drainages located north and south of the mine, respectively. Moss Mine is located in the Silver Creek Wash watershed (Hydrologic Unit Code 150301010303), a 23,000-acre watershed that extends from the Black Mountains to the Colorado River. Within this larger watershed, the footprint of Moss Mine falls within a smaller, unnamed 890.8-acre watershed (EcoSphere 2018), where the average annual precipitation for the period from 1981 to 2010 is estimated at 6" (National Oceanic and Atmospheric Agency 2019). This equates to roughly 445 acre-ft[1] of precipitation falling within the unnamed watershed annually. Assuming no more than 25% of this volume infiltrates into the ground (Kirk 2016), a best-case scenario annual recharge rate for groundwater at the mine is 113.5 acre-ft, or 70 gpm. The watershed area is shown in **Figure 10**.

Sources of groundwater discharge in the region include groundwater pumping, discharge from springs, and evapotranspiration, most of which occur along the Colorado River and in ephemeral wash beds. Groundwater along the Colorado River is used primarily for municipal and industrial supply, and agricultural irrigation south of Bullhead City (ADWR 2009 as cited in Golder 2016). Groundwater on the western slope of the Black Mountains is used primarily to supply water to Oatman, the Gold Road Mine, small mines near Oatman, and the Moss Mine. Springs, which are simply surface expressions of groundwater, are found throughout the Black Mountains and within ephemeral washes (**Figure 10**). Most of the springs shown on **Figure 10** are several miles east (upgradient) of Moss Mine in the Mount Nutt Wilderness Area. The exception to this statement is Silver Creek Spring and the unnamed spring, located in or near the alluvial deposits of Silver Creek Wash roughly 1.5 miles upgradient from the mine.

GVC has been pumping water from wells on the patented property for use in drilling and for the Phase I and Phase II heap leaching operations since January 15, 2013. In December 2012, GVC drilled three monitoring wells 2,100 ft south and west of the existing GVC water supply wells. Water levels in these wells have been measured quarterly and reported to the groundwater section of the ADEQ since that time. Contemporary data provided by Moss Mine from 2018 and 2019 suggest that pumping the Moss Mine water supply wells results in a lowering of water levels in the Moss Mine pumping wells. However, the surrounding non-pumping Moss Mine monitoring wells, more distant from the pumping wells have not shown a lowering of the water levels. A more detailed analysis will be conducted during the project NEPA review.

Golder prepared a preliminary groundwater resource evaluation (Golder 2016) and technical memorandum documenting the groundwater flow modeling for pit de-watering (Golder 2017). These reports are provided in **Appendix G**. The Golder modeling evaluation (2016) hypothesized that there would be a water supply of 180 to 240 gpm from existing wells and the future pit would require additional wells for de-watering. At GVC's request, Golder modified the preliminary groundwater flow model to simulation de-watering of the open pit without additional groundwater pumping wells to maintain a dry pit during mining. The Golder simulation used the existing eight water supply wells and an additional 11 de-watering wells in an attempt to de-water the pit, but ultimately the groundwater model simulation predicted that the pit could not be completely de-watered with the 19 simulated wells. However, in June of 2018 the pumping wells either went

[1] Calculation is as follows: (6" * 1/12 ft/inch)*(890.8 acres) = 445 acre-ft.

dry or the pumping water level declined below a depth of 500 ft bgs, and GVC began to truck water to the site.

7.5.5 Regulatory Constraints on Groundwater Development

Moss Mine lies outside of the groundwater Active Management Area and Irrigation Non-Expansion Area administered by ADWR; therefore, there are few regulatory constraints on groundwater development. A new well located outside of either an Active Management Area or an Irrigated Non-Expansion Area must be registered with ADWR through the filing of the appropriate NOI to Drill form prior to drilling and the subsequent filing of a well completion report. Further, pursuant to ARS 45-453, groundwater may be pumped without restriction, provided that the water produced from the well is put to beneficial use. ADWR groundwater withdrawal permits and well spacing/impact requirements are not applicable in these areas (outside of either an Active Management Area or an Irrigated Non-Expansion Area).

Moss Mine is located approximately 9 miles from the Colorado River, which is administered by the United States Bureau of Reclamation (BOR). The only potential regulatory constraint on groundwater development is the Colorado River accounting surface, which was developed by the USGS and the BOR to identify wells outside of the floodplain of the lower Colorado River that yield water that will be replaced by water from the Colorado River (Wilson and Owen-Joyce 1994 and Owen-Joyce et al. 2000, as cited in Golder 2016). Based on the current Colorado River accounting surface (Weile et al. 2008 as cited in Golder 2016), Moss Mine is located approximately 2 miles east of the accounting surface boundary, and the groundwater elevation near the western property boundary (more than 1,900 ft) is at least 1,400 ft above the accounting surface elevation (490 ft amsl). Therefore, groundwater beneath the Moss Project Property would not be classified as" Colorado River" derived water.

7.6 Biological Resources Overview [43 CFR 3809.420]

7.6.1 Federally Threatened, Endangered, Candidate Species

A Draft Biological Evaluation of the Project area (WestLand Resources Inc. [WestLand] 2019; see **Appendix H**) has been provided to BLM for review. The Project area is located on the western foothills of the Black Mountain Range, at an elevation ranging from approximately 1,900 ft to approximately 2,700 ft. The Analysis Area is located within the Basin and Range physiographic province, which is characterized by a series of northwest-southeast trending mountain ranges separated by broad alluvial valleys (Chronic 1983). The topography of the Analysis Area ranges from alluvial fans, such as Silver Creek Wash, to steeper terrain towards the Black Mountains on the eastern edge of the Analysis Area.

The following summary of biological resources within the analysis area is provided to facilitate evaluating the Project in conjunction with BLM's RMP objectives to maintain and enhance wildlife habitat for population viability and natural diversity, preserve and enhance threatened and endangered species and their habitats, and to manage vegetation communities for multiple use benefits and maintain natural ecological balance (BLM 1993). The resource protection measures described in Section 15 and reclamation plan in Section 17 include actions that facilitate BLM RMP objectives for biological resources, including vegetation, noxious weeds, and wildlife habitat.

7.6.2 BLM Sensitive Species and Species of Management Concern

WestLand conducted an initial screening analysis of the potential for species considered sensitive by BLM's Colorado River District and species previously identified by BLM as of management concern to occur in the Analysis Area. Of the 56 species analyzed, 32 species have no potential to occur, three are unlikely to occur, 18 are possible to occur, and three are known to occur in the Analysis Area. Refer to the Draft Biological Evaluation (**Appendix H,** [currently under agency review]) for a list of BLM sensitive species evaluated. Sonoran Desert tortoise and desert bighorn sheep are two of those species that are expected to be affected by Project activities.

7.6.3 Federally Threatened, Endangered, Candidate Species

WestLand completed a screening analysis for six species listed under ESA that were identified by the USFWS Information, Planning, and Consultation tool as species to be considered in an analysis of the potential effects of the Project. None have the potential to occur within the Analysis Area (**Table 10**). No critical habitat is present within the Analysis Area. Refer to the Draft Biological Evaluation (**Appendix H,** [currently under agency review]) for information on determination of the potential for these species to occur within the Analysis Area.

Table 10: ESA Species and Potential to Occur

Common name	Species name	Potential to occur
Yellow-billed cuckoo, western DPS	*Coccyzus americanus*	**None.** The Analysis Area does not contain appropriate habitat.
Yuma clapper rail	*Rallus obsoletus [=longirostris] yumanensis*	**None.** The Analysis Area does not contain appropriate habitat.
California least tern	*Sterna antillarum browni*	**None.** The Analysis Area does not contain appropriate habitat.
Bonytail Chub	*Gila elegans*	**None.** The Analysis Area does not contain appropriate habitat.
Razorback sucker	*Xyrauchen texanus*	**None.** The Analysis Area does not contain appropriate habitat.
Northern Mexican gartersnake	*Thamnophis eques megalops*	**None.** The Analysis Area does not contain appropriate habitat.

7.6.4 Invasive Species

During field reconnaissance, three species of introduced plants were observed in the Analysis Area, including Mediterranean grass (*Schismus* sp.), compact brome (*Bromus madritensis*), and five-stamen tamarisk (*Tamarix ramosissima*). Mediterranean grass is a common groundcover in portions of the Analysis Area. Tamarisk is limited to a few patches in dry washes in the southeast of the Analysis Area and Silver Creek Wash. Compact brome occurs in concentrated patches throughout the Analysis Area and along washes. Further information on invasive species is included in the Draft Biological Evaluation (**Appendix H,** [currently under agency review]).

7.6.5 Rangeland Resources

Rangeland resources within the Analysis Area are limited. Few grasses persist and dominant vegetation is woody and not palatable. No grazing allotments exist within the Analysis Area (BLM 2007, 2018).

7.6.6 Native Plants

The Analysis Area is mapped within the Mojave Desert Scrub biotic community (Brown and Lowe 1980). Desert Scrub is typical on broad alluvial plains in Arizona below 3,500 ft in elevation. Vegetation is generally characterized by creosote bush (*Larrea tridentata*) and white bursage (*Ambrosia dumosa*) as the dominant species, oftentimes with other shrubs, sub-shrubs, and cactus species acting as co-dominant or associate plants. Associate species within the Analysis Area include brittlebush (*Encelia farinosa*), teddy bear cholla (*Cylindropuntia bigelovii*), velvet mesquite (*Prosopis velutina*), and eight-spine fishhook cactus (*Echinomastus johnsonii*). Other native species observed during field reconnaissance include Mojave yucca (*Yucca shidigera*), beargrass (*Nolina bigelovii*), jointfir (*Ephedra aspera*), buckhorn cholla (*Cylindropuntia acanthocarpa*), teddy bear cholla (*Cylindropuntia bigelovii*), and white ratany (*Krameria grayi*).

Some xeroriparian vegetation exists in the east-southeast portion of the Analysis Area that provides some slightly wetter conditions during portions of the year. Species included occurrences of smoketree (*Psorothamnus fremontii*) and blue palo verde (*Parkinsonia florida*). Further information on native plant species is included in the Draft Biological Evaluation (**Appendix H,** [currently under agency review])

7.7 Cultural Resources Overview [43 CFR 3809.420]

7.7.1 Introduction

A Class III (full-coverage pedestrian) survey and inventory has been completed for a wide area (approximately 2,429 acres surrounding Moss Mine) that is inclusive of the area covered in this MPO. The Class III inventory survey was designed to cover large buffers around the proposed activities described in this MPO to provide some leeway in the avoidance of historic properties. Large blocks were surveyed around exploration and mine development areas and wide swaths were surveyed along proposed exploration access roads. The draft cultural report entitled *A Cultural Resources Inventory of 2,429 Acres in the Black Mountains Foothills, Mohave County, Arizona: the Moss Mine Exploration and Mine Plan Survey* (WestLand 2018) has been provided to BLM for review under a separate cover.

The following review of cultural resources within the Project area is provided to facilitate evaluating the Project in conjunction with BLM's RMP objectives: to manage cultural resources for their scientific and public use values; to maintain representative examples of all archaeological site types; and to maintain cooperative relationships with public land users, interest groups and other government agencies (BLM 1993). The reclamation plan provided in Section 17 addresses actions that facilitate BLM RMP objectives for cultural, archaeological, and visual resources (i.e., potential impacts on Traditional Cultural Places/Properties) as well as coordination with other government agencies for cultural and visual resources.

7.7.2 Results of Cultural Resources Inventory

The cultural resources inventory resulted in the assessment of three previously recorded archaeological sites, the identification of 27 previously unknown archaeological sites, and 870 isolated occurrences of cultural materials. Prehistoric occupation of the survey area is represented by 10 of the isolated occurrences,

which correlate to use of the landscape during prehistoric times by Native American groups who left a minimal material signature behind. Historic occupation of the Area of Potential Effects was of a much broader scale and greater intensity than the prehistoric occupation. The historical occupation is represented by the 30 archaeological sites and hundreds of historical isolated occurrences, all related to historical lode-gold mining, mineral beneficiation, and transportation related to mining.

Of the 30 archaeological sites, 25 have been recommended eligible by WestLand for inclusion on the National Register of Historic Places (NRHP), while the remaining five sites and all of the isolated occurrences are recommended ineligible for NRHP. The NRHP-eligibility determinations for the sites will be made by BLM in consultation with the Arizona SHPO following review of the report.

7.7.3 Avoidance of Historic Properties and Mitigation

GVC intends to avoid all NRHP-eligible cultural resources for the activities outlined in this MPO. If avoidance is not possible, a Historic Properties Treatment Plan to mitigate adverse effects to historic properties will be prepared and implemented.

7.7.4 Tribal Consultation

BLM will initiate tribal consultation related to this MPO, future attendant NEPA analysis, the results of the cultural resources survey and inventory, and other items of tribal concern.

7.8 Recreation and Public Access

7.8.1 Overview

The Project proposes expansion of mining activities outside of existing Moss Mine patented claims and onto BLM-administered lands as documented in this MPO and proposes to conduct exploration drilling within 3 miles of the Moss Mine patented lands. OHV use is the primary recreational opportunity in the immediate area. Existing recreational routes, including BLM routes and local OHV club routes, are depicted on **Figure 12**. Both proposed Project activities (mining and exploration) would require the use of existing roads and development of new roads. Wherever and whenever possible, the mine is committed to using existing roads to minimize resource impacts including, but not limited to: route proliferation; avoidance of impacts to existing roads, jeep trails, and navigable washes including technical 4WD opportunities; closure or removal of some routes during mining activities; and minimizing mine vehicle-recreational vehicle conflicts on existing BLM-designated system routes.

7.8.2 BLM Resource Management Plans

The majority of the Project is located within the KFO resource area with approximately one-third of the remaining Project located in the LHFO resource area. Guidance for recreational management on these BLM-administered lands is governed by the 1995 KFO Record of Decision (ROD) and Resource Management Plan (RMP) (BLM 1995) for the KFO portion of the Project, and the 2007 LHFO RMP and 2009 Bullhead Travel Management Plan (TMP) (BLM 2009) for the LHFO portion of the Project. OHV routes under the management of KFO are managed under the KFO ROD and RMP (BLM 1995).

Under the 1995 KFO RMP, the Project area is not located in or near any designated Special Recreation Management Areas (SRMAs) or designated recreation sites. OHV use is designated as "limited to existing

roads, trails, and navigable washes" for the Project area and surrounding areas, with specialized limitations for ACECs and Special Management Areas (SMAs). Within the KFO resource area, there are no designated ACECs or SMAs within 1 mile of the Project area; the Black Mountains ACEC is located 1 mile southeast of the Project area.

The Project area is located in the LHFO Extensive Recreation Management Area (ERMA), which includes all areas of the LHFO not included otherwise in a specific SRMA. The ERMAs are managed with less intensity than the SRMAs but are still managed to enhance recreational experiences while protecting resources, resolving user conflicts, and ensuring public safety. The LHFO prescribed recreation setting for the Project area is "Rural Natural," which provides for an "opportunity to relieve stress and to get away from built environment … while (the) prospect of using motorized equipment to explore natural environment is valued" (BLM 2007). It is expected in this prescription that user concentration is generally low, but there may be evidence of contact with other users or land managers (BLM 2007). Potential activities in this recreation setting that are pertinent to the Project area would include non-motorized recreation such as backpacking, equestrian use, hiking, climbing, remote camping, mountain biking, hunting, enjoyment of scenery or natural features, nature study, and photography. Motorized uses include dispersed camping or from vehicles (car camping) and auto touring, including OHV, 4WD, dune buggy, and dirt bike uses.

Where the Project occurs on LHFO-managed lands, it is located within Bullhead's TMA #30A, as described in the LHFO RMP (2007). This TMA includes recreational usage on the nearby Bullhead Bajada ACEC, whose northeast corner creates a boundary with the Project area. The TMP provides a framework from which to establish a comprehensive travel network of route designations in the TMA, which are needed to respond to growing public demand for access and to address, minimize, or avoid impacts of both motorized and non-motorized use on recreational, cultural, and natural resources.

7.8.3 Recreational Use in the Project Area

7.8.3.1 OHV Recreation

Silver Creek Road is a county-maintained road that provides the main access for all types of recreational users into the area surrounding the mine. Though it primarily travels a distance away from any existing mine activities or the proposed Project area, 1.8 miles of roadway does occur within proposed exploratory drilling areas.

A network of motorized OHV routes, primarily accessed from Silver Creek Road, occurs across the Project area in both KFO and LHFO jurisdictions (**Figure 12**). The route network in the Project area connects to existing routes on adjacent BLM and private lands. Within the extent of the Project area, there are approximately 1.3 miles of existing system roads in the LHFO resource area under the Bullhead TMP. On the KFO resource area, approximately 17.5 miles of routes have been inventoried to date. In addition, approximately 1.8 miles of county-maintained roadways (e.g., Silver Creek Road) occur within proposed exploratory drilling areas. These are summarized in **Table 11**, below.

Table 11: Approximate Existing Route Lengths within the Project Area

Road Management Agency	Approximate Length of Routes/ Roads in Project Area (ft)	Approximate Length of Routes/ Roads in Project Area (miles)
BLM KFO	92,582	17.5
BLM LHFO	6,835	1.3
County[1]	9,503	1.8
TOTAL	**108,920**	**20.6**

[1] *All county-maintained roadways within the Project area occur within exploratory drilling areas.*

It is important to note that though approximately 20.6 miles of existing system routes or county-maintained roads within the Project area may be affected by the proposed mine expansion and exploratory drilling activities, the majority of routes or roads in the Project area would not be directly impacted by proposed Project activities, and the ultimate amount of linear route impacts would depend heavily on the final alignments decided for the exploratory drilling routes. In addition, BLM's system routes that may be affected have alternative routes that would allow access to be maintained to all other OHV system routes outside the proposed Project area.

Portions of the routes mapped within KFO and LHFO administrative areas have sections considered by BLM to be technical 4WD in nature, providing unique 4WD challenges and recreational experiences, and limited in their distribution in the region surrounding Moss Mine. All identified technical 4WD sections are located outside of the footprint of the proposed mine expansion, but some occur within areas mapped for exploration, and have the potential to be temporarily disturbed during exploration activities (see **Figure 12** for route depiction). As previously stated, GVC is committed to avoiding impacts to existing routes as well as avoiding creation of new routes. The MPO would not have any deleterious effects on any identified technical 4WD sections. As exploration planning moves forward, GVC would work directly with BLM to identify conflicts and balance these concerns in locating their exploration routes.

7.8.3.2 Hunting

The proposed Project area is located within the northwest corner of Game Management Unit (GMU) 15D, administered by the AZGFD. At approximately 560,000 acres, GMU 15D is large but supports only a limited variety of primary and secondary game species. Primary species include desert bighorn sheep (*Ovis canadensis nelsoni*), mule deer (*Odocoileus hemionus*), and Gambel's quail (*Callipepla gambelii*). Secondary species in the GMU are mourning dove (*Zenaida macroura*), white-winged dove (*Zenaida asiatica*), and waterfowl. No habitat occurs within the Project area for waterfowl. For mule deer and dove species, AZGFD recommends that hunters focus their hunting areas at or near perennial water sources such as springs and stock tanks, none of which are located within the Project area, including exploration areas. However, Silver Creek Spring and an unnamed spring upstream of it are located just outside the north boundary of the West Oatman Exploration Area. Quail are known to occur within the Project area especially along washes. Bighorn sheep are not expected to be found within the Project area due to elevation and human activity; however, sheep habitat at Grapevine Canyon, Cottonwood Canyon, and Battleship Mountain – all located within 2 miles east of the Project area – may be accessed by hunters using recreational routes within or adjacent to the Project area. **Table 12** provides the most recent available hunter success data (for 2017) for big-game species that occur within the GMU 15D Project area, reflecting the low level of hunter use in the GMU. Harvest data was not available for quail or dove species.

Table 12: 2017 Hunter Success for GMU 15D Big Game

Species	Permits Issued	Hunter Days	Total Harvest
Desert bighorn sheep	4	13	4
Mule deer[1, 2]	28	68	6

Source: https://www.azgfd.com/hunting/surveydata/
[1] Harvest data only reported by AZGFD for a combined area of GMU 15C and 15D
[2] Harvest data for over-the-counter hunts only

7.8.3.3 Other Recreation

No developed campgrounds are located within 7 miles of the Project area; however, BLM allows dispersed camping on public lands for up to 14 days, including those surrounding the Moss Mine patented lands. Dispersed camping (in undeveloped areas) is allowed without permit for no longer than 14 days within any 28-day period unless otherwise noted. After the 14th day, campers must move beyond a 25-mile radius of their previous camp.

7.8.4 BLM Travel Management and Moss Mine

7.8.4.1 Exploratory Drilling Routes

Under LHFO Management Action RR-42, no new exploratory drilling routes would be constructed in the floodplain of washes unless for public health and safety, or resource protection (BLM 2007). Due to the difficulty in locating routes and drill stations before exploration activities reveal the location of the ore body, GVC would first identify the general target area and access routes. Then prior to any annual or semi-annual exploration program, GVC would review actual road locations and drill sites with BLM resource specialists to select the best routes, timing, mitigation factors, etc. Whenever possible, existing BLM routes would remain open to public use during exploratory drilling operations. GVC would work with BLM on a case-by-case basis to determine if short-term, temporary closures of system routes are more beneficial to resources than creating new routes to avoid OHV traffic conflicts.

Following completion of exploration activities, all exploration routes and drill sites would be reclaimed with OHV deterrents unless exploration routes are deemed to be necessary for future work under the MPO. Section 17 describes reclamation activities associated with various features of the proposed Project. On the LHFO resource area, all roads and trails existing at the time the Bullhead TMP was being developed were inventoried and designated as system routes under that TMP. Any new route created after the TMP (2007), including any exploratory drilling routes not reclaimed immediately following exploration, would have to go through a Categorical Exemption process, and if approved, they could be added to the existing TMP as a system route. GVC would work with BLM's LHFO to designate any new exploratory routes remaining after exploration as a new route under the Bullhead TMP.

7.8.4.2 Potential Conflicts

BLM has raised concerns about potential mine vehicle traffic – recreational traffic conflicts on BLM 7717, the main road leading from Silver Creek Road to both the mine and the popular Mossback Wash OHV route. Re-routing or encouraging recreationists to use existing alternate routes to bypass most or all travel on BLM 7717 to reach Mossback Wash would reduce traffic conflicts on BLM 7717. GVC supports a "7717 Bypass" as an option to minimize conflicts and would work in conjunction with LHFO and KFO to identify

the appropriate existing alternative routes and to provide additional recreational signage to encourage use of the bypass. Additional warning or safety signage such as speed limit signs, "Watch for Other Vehicles," or "Share the Road" would be placed along BLM 7717 to remind both mine traffic and recreationists to respect other traffic on the road.

Mine-related traffic volumes on Silver Creek Road are not expected to have a long-term increase with the proposed Project. Once the proposed municipal source water pipeline has been installed and is functional, there would not be a need to truck water out to the mine, thereby reducing large truck traffic volume by up to 30 trips per day. GVC does not plan a change in employment numbers, so the current number of approximately eight mine staff transportation trips per day on Silver Creek Road would not be expected to increase. Since no long-term mine-related traffic volume increases are expected, there should not be any noticeable changes to OHV traffic patterns associated with Silver Creek Road in the vicinity of the mine. However, if unauthorized use or route proliferation adjacent to Silver Creek Road is identified and caused by OHV users avoiding traffic on Silver Creek Road, GVC would work with BLM to address/mitigate the issue as appropriate. For example, signage and OHV deterrents may be placed on any such non-system or closed routes that are receiving unauthorized use.

7.8.5 Reclamation

7.8.5.1 Off-Highway Vehicle Deterrents

Operation of OHVs can cause mechanical damage to stabilization structures and soils as well as the mortality of plants. OHV access would be limited or prohibited in areas of reclamation, including new exploration roads that would be reclaimed following exploration activities. Site-specific measures to control OHVs and other unauthorized vehicle use in the Project area would be determined in consultation with BLM KFO and LHFO. OHV users have historically utilized any alignments that appear to be routes, even following reclamation, causing route proliferation where it was not intended. Where the disturbed areas of reclamation during the revegetation period may appear enticing to OHV users, these areas would be identified and measures to minimize or eliminate access (as appropriate) would be developed with BLM consultation. These measures may include but would not be limited to: the installation of signage warning that the area is off-limits to motorized uses; permanent post and cable fencing; fences with locking gates; selectively placed boulders; and/or vertical mulch of heavy woody or large cactus materials. Based on BLM requirements, development of OHV deterrents would be determined on a case-by-case basis.

7.8.5.2 Reclamation of Drilling Roads

Existing routes used during exploratory drilling and not needed for further exploratory or mining activities would be reclaimed to the same condition as the route was prior to exploratory use, to the extent practicable, following guidance provided in Section 17 and this paragraph. If new routes need to be constructed to access exploratory drilling sites, upon abandonment, these routes would be fully reclaimed and signed "No Vehicular Access Permitted" (or similar) to prevent usage by OHV recreationists as outlined in the previous section. Overland routes used by the percussion drill would be hand-raked out, signed, and deterrents placed in a similar manner. Routes determined as needed for additional exploratory activities or future mining operations would be brought to the attention of the appropriate BLM field office and GVC would work with BLM resource specialists on a case-by-case basis to determine the best route and interim reclamation measures. Interim measures may include actions such as placing signage and/or deterrents at locations accessible from system routes until the next phase of activities continues.

7.8.5.3 Reclamation of Historic Public Access

During final reclamation activities on Phase III mine features located on BLM-administered lands, GVC would work with each BLM Field Office to determine what routes or access to public lands were lost during the mining operation and restore that historic access. If GVC and BLM agree on restoring route alignments across reclaimed heap leach piles, barren rock piles, and other hill-type remaining post-mining features, these routes may require post and cable fencing along the sides of the route and signage, to prevent unauthorized OHV travel across hill features. In addition, post and cable fencing and signage may be required along the toe of these created hillslopes and along the crest of any remaining open pit areas to ensure the safety of recreational users and to prevent similar route proliferation and damage from unauthorized OHV use.

7.8.6 Mitigation

To mitigate for any route impacts or loss, GVC would work in conjunction with BLM resource specialists to identify alternative travel routes, either by using existing route network connections, or by developing new routes. Any new routes on LHFO would be required to go through the Categorical Exclusion process to amend the Bullhead TMP and add the new route. Until KFO completes a TMP for their resource area, new routes would need to be approved by KFO to be added to their pre-TMP ground transportation linear feature inventory.

To maintain or replace specific access through Moss Mine private property that may be lost to proposed mine expansion activities, GVC would work in conjunction with KFO to identify and construct a suitable alignment for a new recreational route in Section 29 T20N R20W joining the Mossback 3D technical 4WD route to Razzle Dazzle 3; and extending Razzle Dazzle 3 to Doug's Obsession north of the Moss Mine patented lands in Section 20 T20N R20W.

Mitigation for impacts to 4WD technical sections of routes in exploration areas would be to avoid areas of technical 4WD opportunities for route maintenance and/or construction to the maximum extent possible. Most of the 4WD technical sections occur in rocky wash bottoms rather than in upland areas, and large drill equipment would be better suited to upland routes anyway.

In the long-term, when mining operations cease and during final reclamation activities, GVC would work directly with BLM resource specialists to determine what routes, access to public lands, or recreational opportunities were lost during the mining operation and restore access to the public lands for OHV and technical 4WD drive routes, hunting, and other dispersed recreational uses per 2017's DOI Secretarial Order 3356.

7.9 Visual Resources

7.9.1 Agency Framework

Visual Resource Management (VRM) is a process BLM uses to identify and manage scenic values to reduce visual impacts of development or other surface-disturbing activities on public lands. BLM first completes a visual resource inventory (VRI) of their resource area, from which VRM classes (I to IV) are mapped. These VRM classes and their definitions provide BLM land managers with a prescription from which to guide management decisions affecting visual resources.

As a result of the VRI completed in 2007 for the LHFO's Record of Decision (ROD) and Approved Resource Management Plan (ARMP) (BLM 2007), LHFO has assigned a VRM Class IV on the west side of BLM's field office boundary, applicable to the following proposed Phase III elements: the Far Western Extension Pit, the Barren Rock Stockpile West, the Heap Leach Pad, and the Event and Pregnant Ponds, as well as the Old Timer and Far Western Extension exploration areas.

KFO assigned a VRM Class II rating on the east side of BLM's field office boundary under their 1995 ROD and RMP (BLM 1995), which as of the date of this report is 24 years old. Newer technology and a clarified VRI and VRM process has evolved since the original work was completed for the ROD and RMP. KFO completed a new VRI in 2016 but has not yet updated or amended the 1995 ROD and RMP to reflect the results of that landscape-scale VRI. KFO's VRI and the VRM classifications are applicable to all other proposed Phase III project features.

BLM's VRI and the VRM analyses and classifications are made across BLM's landscape-scale resource areas. At this scale, they provide categorization of areas of similar visual resources and visual values (VRI classifications), upon which similar management prescriptions can be applied (VRM classifications). However, site-specific conditions may not be reflected at this scale, as is the case with the Moss Mine location.

7.9.2 Methodology

To evaluate the potential effects on visual resources from the proposed Phase III Project, a Visual Resource Assessment was completed in the spring of 2019 (**Appendix I**) (Ecosphere Environmental Services, Inc. 2019). As part of the assessment:

- A review was made of existing BLM management prescriptions (VRI and VRM classifications) assigned under each field office's ROD and RMP
- A visibility analysis was completed to illustrate from what locations within a 5-mile radius of the proposed Phase III Project the Project's features would be visible
- A site-specific confirmation of BLM-assigned VRI ratings was completed at each KOP location to determine whether, if using BLM's VRI methodology in a site-specific manner, a different VRI rating than those assigned at the landscape scale by each of BLM's field offices would be concluded
- Contrasts in visual resource quality and value between the mine's expected Phase II build out condition and the buildout of the proposed Phase III activities were analyzed to determine the degree of contrast and level of change the proposed Project would affect to the visual resource

7.9.3 Visibility Analysis

A visibility analysis was completed as part of the Visual Resource Assessment, and the resulting map is included in **Appendix I**. The map shows areas from which key Phase II mine features will be visible at build out, in comparison to areas from which key proposed Phase III mine features would be visible. Through consultation with BLM's field offices' resource specialists, the visibility analysis was conducted out to 5 miles, based on input from BLM's KFO resource specialist. The visibility analysis initially was extended out to 15 miles, which included Laughlin, Nevada, and other viewpoints west of the Colorado River. Evaluation of topography, distance from the Project area, and the scale of the proposed Project within the panoramic landscape views was made. It was concluded that potential views of the mine west of the Colorado River

would not be impacted, and BLM concurred (Matt Driscoll, BLM Kingman Field Office, pers. comm., May 2, 2019).

The visibility analysis was used to determine eight key observation points (KOPs) (sensitive locations and/or important viewpoints). GVC is awaiting BLM tribal coordination for tribal input, which had not been completed as of the date of this report. Selected KOPs described in this report may not reflect all tribal concerns but would be addressed as part of future NEPA disclosures. The KOPs used in the Visual Resource Assessment and how those KOPs relate to where most of the public or casual observers would view the project are:

1. Arizona Peace Trail
2. Sitgreaves Pass (Historic Route 66 Backcountry Byway)/Black Mountains ACEC
3. OHV High Use Route (BLM #7748)
4. Historic Route 66 Backcountry Byway
5. BLM Field Office Boundary – KFO and BLM Field Office Boundary – LHFO
6. Bullhead Bajada ACEC/Silver Creek Road
7. Fox Creek Residential Development (Bullhead Parkway)
8. Silver Creek Road

7.9.4 VRI Confirmation

The VRI confirmation was completed at each KOP to compare results of site-specific VRI evaluation (using the VRI components of scenic quality, sensitivity level, and distance zone) (BLM 1986b) against BLM-assigned VRI class for that KOP location.

One of the KOPs (KOP 5) was located on the field office boundary between KFO and LHFO (see maps in **Appendix I**) and was used solely to compare the VRM classifications from each office on either side of the line (Class II [KFO] versus Class IV [LHFO]). A VRI confirmation was performed at that KOP to reflect that the quality and value of visual resources at that location was not as dichotomous as the two assigned VRM classifications indicated. The results at this KOP showed that the VRI components—which were evaluated independently when viewing the LHFO resource area (looking west) or the KFO resource area (looking east) from the KOP—each combined to show a VRI Class III rating on either side of the line. Photographs illustrating the landscape condition on each side of the field office boundary, as well as views from the KOP onto each field office resource area (east and west) are included in **Appendix I**.

From the remaining seven KOPS, a VRI confirmation was also completed to reflect site-specific conditions and conclude whether BLM-assigned landscape-scale VRI rating at each given KOP reflected the site-specific conditions. Overall, the VRI confirmation at the KOPs found that for the KFO—except for the two KOPs along the Historic Route 66 Backcountry Byway—the site-specific VRI ratings reflected a Class III rating, rather than the landscape-scale assigned VRM Class II rating (**Table 13**). This simply means that the site-specific area had a slightly lower scenic value and quality than determined at the landscape scale, and that perhaps management objectives in those areas at a site-specific scale may be more stringent as a result of modifications to the characteristic landscape since the VRI was completed for both the 1995 Kingman ROD and RMP and the 2016 VRI (BLM 1995, BLM 2016). The KOPs along the Historic Route 66 Backcountry Byway reflected a match to the assigned VRM Class II rating.

In LHFO, the opposite was generally true; the site-specific VRI ratings generally found that the LHFO's landscape-scale Class IV rating did not capture the site-specific visual quality and value found, and the VRI

confirmation process resulted in a Class III rating indicating that perhaps management objectives in those areas may be less stringent than needed.

Table 13: VRI Site-Specific Confirmation Results

		KOP 1	KOP 2	KOP 3	KOP 4	KOP 5	KOP 6	KOP 7	KOP 9[1]
		Arizona Peace Trail	Sitgreaves Pass (Historic Route 66 Back-country Byway)/ Black Mountains ACEC	OHV High Use Route (BLM #7748)	Historic Route 66 Backcountry Byway	BLM Field Office Boundary KFO/LHFO	Bullhead Bajada ACEC/ Silver Creek Road	Fox Creek Development (Bullhead Parkway)	Silver Creek Road
VRM	**BLM Rating**	II	II	II	II	II/IV [2]	IV	IV	II
VRI Class	**BLM Rating**	II	II	II	II	II/IV [2]	IV	IV	II
	Site-Specific Rating	III	II	III	II	III	III	IV	III

ACEC = Area of Critical Environmental Concern, BLM = Bureau of Land Management, KFO = Kingman Field Office, KOP = Key Observation Point, LHFO = Lake Havasu Field Office, OHV = Off-highway Vehicle, VRI = Visual Resource Inventory, VRM = Visual Resource Management.

[1] KOP 8 was to be located on Bullhead Parkway but was eliminated due to time constraints.

[2] KOP 5 does not actually have views to the existing mine; however, it was used as a site-specific comparison between the two BLM field offices' VRI/VRM ratings.

[3] Note that the VRM rating considers that this KOP is on the edge of the Bullhead Bajada ACEC; the VRI rating does not.

7.9.5 Visual Resource Contrast Rating Analysis

A visual resource contrast rating (VRCR) was completed for seven of the KOP locations (KOP 5 was not included, as it did not have views to the mine). These KOP locations ranged from within 1 mile to over 5 miles away from the mine and attempted to capture the experience of the casual observer on various types of roads/routes, viewpoints, and residences.

BLM's VRCR methodology used in visual analysis involves determining whether the potential for visual effects from proposed Project would meet the assigned VRM Class objectives (i.e., the management prescriptions) established for the area, and if not, whether design techniques or mitigation could be applied to help the Project meet the VRM class objectives. The principal measure for assessing these effects lies in BLM's use of contrast ratings, which entails comparing proposed Project features with the major features in the existing landscape using the basic design elements of form, line, color, and texture (BLM 1986a). Indirect visual impact assessment from sources like dust would be evaluated during the NEPA compliance portion of the proposed Project.

Note that Moss Mine Phase II activities (located on patented claims) are not subject to VRM class-mapping and associated prescriptions or adherence to VRM class objectives. For this visual resource assessment, the

activities proposed for the proposed Phase III expansion and exploration of the mine onto BLM lands have been evaluated for their contrast against the expected conditions at the completion of Phase II mining on the private, patented claims. To reach Phase II build out conditions from current conditions in 2019, the mine will be increasing the size and height of the Barren Rock Stockpile East, the size and height of the existing Heap Leach Pad, and the extent of the Pit including the height of the pit highwall. All VRCR analysis was completed using Phase II buildout conditions as the baseline from which to compare the level of change and degree of contrast for proposed Phase III expansion and exploration activities.

Some of the factors considered during the evaluation of contrast include but are not limited to: distance to the Project; angle of observation; length of time the project is in view; project size relative to landscape scale and spatial relationship; potential observer season(s) of use; light conditions (time of day, shadow casting); and atmospheric conditions (including heat waves). The degree of contrast (i.e., strong, moderate, weak, or none) is defined in the Visual Resource Assessment with **Table 14** showing how it relates to the VRM Classes.

Table 14: Visual Resource Management Classification-Degree of Contrast Compliance Matrix

Degree of Contrast	VRM Class			
	I	II	III	IV
Strong	Not Compliant	Not Compliant	Not Compliant	Compliant
Moderate	Not Compliant	Not Compliant	Compliant	Compliant
Weak	Not Compliant	Compliant	Compliant	Compliant
None	Compliant	Compliant	Compliant	Compliant

VRM = Visual Resource Management

A detailed description of the VRCR results from each KOP is provided in the Visual Resource Assessment (**Appendix I**). A summary of the results of the VRCR is provided in **Table 15**, with a brief description of each KOP's rating below the table (except for KOP 5, at which a VRCR was not completed).

Table 15: Visual Resource Contrast Rating Site-Specific Results

KOP Location	Project's Assigned VRM Class (KFO/LHFO)	Degree of Contrast Allowed under Assigned VRM Class	Site-Specific Degree of Contrast Rating	Compliance with Assigned VRM Class Objectives
1 – Arizona Peace Trail	II / IV	Weak / Strong	Weak	Compliant
2 – Sitgreaves Pass (Historic Route 66 Backcountry Byway)/ Black Mountains ACEC	II / IV	Weak / Strong	Weak	Compliant
3 – OHV High Use Route (BLM #7748)	II / IV	Weak / Strong	Weak	Compliant
4 – Historic Route 66 Backcountry Byway	II / IV	Weak / Strong	Weak	Compliant

KOP Location	Project's Assigned VRM Class (KFO/LHFO)	Degree of Contrast Allowed under Assigned VRM Class	Site-Specific Degree of Contrast Rating	Compliance with Assigned VRM Class Objectives
5 – BLM Field Office Boundary-KFO and BLM Field Office Boundary-LHFO	II / IV	Weak / Strong	--[1]	--[1]
6 – Bullhead Bajada ACEC/Silver Creek Road	II / IV	Weak / Strong	Moderate	**Not Compliant for VRM Class II, see description below**
7 – Fox Creek Residential Development (Bullhead Parkway)	II / IV	Weak / Strong	Weak	Compliant
9 – Silver Creek Road	II / IV	Weak / Strong	Moderate	**Not Compliant for VRM Class II, see description below**

ACEC = Area of Critical Environmental Concern, BLM = Bureau of Land Management, KFO = Kingman Field Office, KOP = Key Observation Point, LHFO = Lake Havasu Field Office, OHV = Off-highway Vehicle, VRM = Visual Resource Management
[1] KOP 5 does not actually have views to the existing mine; however, Phase II and Phase III features would be ultimately visible, and it was used as a site-specific comparison between the two BLM field offices' VRI/VRM ratings.

KOP 1 – Arizona Peace Trail: Proposed Phase III mine activities would have a weak contrast with the conditions at Phase II buildout. This degree of contrast would meet the visual management objectives for KFO VRM Class II and LHFO VRM Class IV from KOP 1.

KOP 2 – Sitgreaves Pass (Historic Route 66 Backcountry Byway)/Black Mountains ACEC: Proposed Phase III mine activities would have a weak degree of contrast with the conditions at Phase II buildout. This degree of contrast would meet the visual resource management objectives for KFO VRM Class II and LHFO VRM Class IV from KOP 2.

KOP 3 – OHV High Use Route (BLM #7748): The degree of contrast between Phase II and proposed Phase III mine features would be weak, which would meet the visual resource management objectives for KFO VRM Class II and LHFO VRM Class IV from KOP 3.

KOP 4 – Historic Route 66 Backcountry Byway: The degree of contrast would be weak between Phase II and proposed Phase III mine features, which would meet the visual resource management objectives for KFO VRM Class II and LHFO VRM Class IV from KOP 4.

KOP 6 – Bullhead Bajada ACEC/Silver Creek Road: The degree of contrast between Phase II and proposed Phase III mine features would be moderate, which would meet the visual resource management objectives for KFO VRM Class II and LHFO Class IV from KOP 6 with the design and reclamation processes incorporated into the Project (see Reclamation Sections 17 and 18 of this MPO). Long-term visual contrast would be present within the Project area throughout the course of the expected 10-year life of the proposed Phase III mining activities. Although long-term contrast may not meet KFO's VRM Class II rating for the area, active reclamation throughout the life of the mine and final reclamation upon mine closure would decrease the

amount of contrast (see photographic simulation in **Appendix I**), meeting the overarching objectives of KFO's VRM Class II management.

KOP 7 – Fox Creek Residential Development (Bullhead Parkway): The degree of contrast between Phase II build out and proposed Phase III features would be weak from this KOP and would meet the visual management objectives for KFO Class II and LHFO VRM Class IV. Revegetation and other proposed reclamation and mitigation measures will further minimize contrast following reclamation of Phase III elements.

KOP 9 – Silver Creek Road: The degree of contrast between Phase II and proposed Phase III mine features would be moderate. This moderate degree of contrast is in conformance with LHFO's VRM Class IV objective. However, a moderate degree of contrast is not compliant with the allowable degree of contrast for KFO's assigned Class II VRM objectives at KOP 9. The site-specific VRI confirmation found that the visual components that make up the VRI class rating at KOP 9, when combined, would place KOP 9 in a VRI Class III area, rather than the VRI Class II that it had been assigned on a larger landscape scale during the VRI process for BLM's resource area (BLM 2016). Under visual resource Class III, the objective is to partially retain the existing character of the landscape. The level of change should be moderate and activities may attract attention but should not dominate the view of the casual observer. The site-specific rating reflects that the area close to the mine is a transition zone between the current KFO Class II VRI rating and the LHFO Class IV VRI rating. Long-term visual contrast would be present within the Project area throughout the course of the expected 10-year life of the proposed Phase III mining activities. Although long-term contrast may not meet KFO's VRM Class II rating for the area, active reclamation throughout the life of the mine and final reclamation upon mine closure would decrease the amount of contrast overall meeting the overarching objectives of KFO's VRM Class II management.

7.9.6 Visual Simulation

An initial visual simulation was developed to model how the Moss Mine appears currently, how it is expected to appear at the end of Phase II, how the proposed Project would appear near the end of Phase III, and at final reclamation following completion of Phase III (**Appendix I**). The simulation uses a drone-captured image from several hundred feet above the ground southwest of the mine, looking northeast toward the proposed Project area. Following consultation with BLM resource specialists, further visual simulations would be completed as part of the NEPA analysis for the Project. Future simulations would show similar conditions (e.g., existing, Phase II, proposed Phase III) from on-the-ground-views at selected KOP locations.

8.0 GEOTECHNICAL STABILITY: ROCK CHARACTERIZATION AND HANDLING PLANS [43 CFR 3809.401 (B) (2)]

The following section provides an overview of the geologic setting of the region and Project site. Additionally, pursuant to 43 CFR 3809.401(b)(2), this section includes discussion of barren rock characterization and rock handling plans. A more detailed description of soils within the Analysis Area is provided in the Draft Biological Evaluation (**Appendix H,** [currently under agency review under separate cover]).

8.1 Regional Surface Geology

The Moss Mine is located within the Basin and Range physiographic province, a region characterized by generally north- to northwest-trending, fault-bounded mountain ranges and broad, interconnected alluvial

basins that form regional aquifers. The Moss Mine is located in the western foothills of the Black Mountains in the southeastern part of the Lake Mohave Basin, which extends approximately 100 miles along the Colorado River from Lake Mead to Topock, Arizona. Mohave Valley is located in the southern part of the Lake Mohave Basin, below Davis Dam. The Lake Mohave Basin is separated from the Sacramento Valley Basin to the east by the Black Mountains.

The Black Mountains form a surface water divide between Mohave Valley and Sacramento Valley. Ephemeral streams on the east side of the mountains flow toward Sacramento Valley then south, along Sacramento Wash, and streams on the west side of the mountains flow toward the Colorado River. Surface water runoff from Moss Mine drains southwest to Silver Creek Wash, an ephemeral stream that originates in the Black Mountains north of Oatman and flows into the perennial Colorado River near Bullhead City.

Surface elevations range from less than 500 ft along the Colorado River south of Bullhead City to more than 5,000 ft in the Black Mountains east of the mine. Elevations at Moss Mine range from about 1,900 to 2,700 ft.

8.2 Regional Sub-Surface Geology

The Black Mountains are composed of Precambrian metamorphic and granitic rocks, and Tertiary volcanic rocks and basalt. The Tertiary volcanic rocks are offset by numerous northwest- to west-northwest-trending normal faults and have been intruded by Tertiary granitic rocks in the vicinity of Moss Mine.

The Lake Mohave Basin consists of late Tertiary to Quaternary basin-fill deposits, and Quaternary to Recent alluvial deposits in ephemeral washes and along the Colorado River. Depth to bedrock ranges from a few feet near the basin margins to more than 800 ft bgs southeast of Bullhead City and more than 8,000 ft bgs south of the town of Mohave Valley (Richard et al. 2007 as cited in Golder 2016). The Sacramento Basin similarly consists of late Tertiary to Quaternary basin-fill deposits, and Quaternary to Recent alluvial deposits in ephemeral washes. Depth to bedrock ranges from a few feet near the basin margins to more than 3,200 ft bgs near the center of Sacramento Valley, west of Kingman (Richard et al. 2007 as cited in Golder 2016).

8.3 Oatman Mining District

Regionally, the Oatman Mining District (District) lies within a large Tertiary volcanic field, developed on a basement of Precambrian granitic and metasedimentary rocks (see **Figure 11**). The Moss Mine lies within an alkalic to sub-alkalic silicic volcanic center, the Silver Peak caldera, a large tectono-volcanic collapse feature, which was the source for the Peach Springs tuff. The Peach Springs tuff fills the caldera and its outflow ash-flow sheet extends for more than 15,000 square miles across northwest Arizona and California (Glazner, et al. 1986 as cited in M3 2017). The main Oatman district lies just outside of the caldera rim, where mineralization is hosted in pre-caldera intermediate composition lava flows, whereas Moss Mine lies inside the caldera.

Calderas are often excellent areas of epithermal precious metals deposits due to the combination of deep-seated structures (e.g., concentric and radial fractures), permeable volcanic and volcanoclastic host rocks, intrusive activity, and abundant water for development of hydrothermal fluids. Examples include Round Mountain, Nevada; Silverton, Colorado; Goldfield, Nevada; and Creede, Colorado. The District is immediately to the east-southeast of Moss Mine and produced more than two million ounces of gold from northwest to west-northwest-trending epithermal quartz calcite veins, some of which contained bonanza grade ores and averaged more than 1 oz/t gold (M3 2017; **Appendix E**).

Primary exploration targets outside the existing Moss Mine area patents include as yet to be discovered resources and are discussed in Section 16. A considerable variation in geology occurs over the District. Numerous drill targets, within the six defined exploration areas, have been identified along geologic structures that appear to contain locatable gold and silver ore and are primarily located within and adjacent to this geologic network. The surface expression of these structures appears to host mineralization characteristic of other epithermal mineralization in the District. In order to test mineralization, GVC intends to explore areas surrounding Moss Mine as a part of this Project.

Lithology over the District exerts significant influence over fracture conditions and thus hydrothermal fluid control at the time of mineralization. A major lithologic unit chief found in the District is referred to as the Peach Springs Tuff and mapped as "Tpt" in Ferguson et al. (2017). Unlike the above-mentioned intrusive Moss porphyry, the Peach Springs Tuff has highly variable lithology of extrusive origin. Near the Moss Mine, the lower strata of Tpt is characteristic of a high energy caldera environment. Lithologic units preserved, such as conglomerates and megabreccias, reside in the lower stratigraphy near/on older basement rocks. Above this, Tpt generally is characterized by lithic tuffs and ignimbrite flows. This sequence is affected by later extensional related faulting. Contrasting strata related conductivity and lithologic variability appears to have exerted some control of fluid movement outside of the major veins.

8.4 Moss Mine Metallurgical Testing

Metallurgical test work to date, completion of Phase I, and the continuation of Phase II operations, has validated that the Moss Mine ore body is amenable to gold and silver recovery via cyanidation. The plant process consists of heap leaching of crushed and agglomerated ore, followed by the Merrill Crowe precipitation of precious metals and melting of the precipitate to produce gold and silver doré bars on-site.

Locally, the host rock for the Moss deposit is the Moss porphyry, a uniform monzonite to quartz monzonite porphyry intrusion. It is coarse grained with 4-millimeter (mm) to 10-mm diameter plagioclase phenocrysts with biotite and lesser hornblende. There is also a fine-grained quartz monzonite porphyry, with 1- to 2-mm diameter plagioclase phenocrysts with minor biotite and minor magnetite, which is a later phase intrusive that cross-cuts the coarse porphyry and forms an intrusive breccia matrix in places.

The gold-silver mineralization is contained within three main veins and their associated stockworks: the dominant Moss Vein; a western extension of the Moss Vein (expanded to also include the "Far Western Extension"); and the Ruth Vein to the south of the Moss Vein. Moss Mine drill hole logs and assay database indicate a potential for other mineralized veins that are both similar to and sub-parallel with the Ruth Vein.

Mineralization at the Moss Mine deposit currently being extracted is unique in comparison to many other epithermal deposits subject to heap leaching. Specifically, within the depths being mined, the traditional oxide-transition sulphide boundaries are not present. The sulphide zone is well below the maximum depth of currently planned mining. The primary mineralization consists of free gold in quartz and calcite veins. Sulphides present are less than one%.

8.5 Moss Mine Geotechnical Stability and Whole Rock Analysis

8.5.1 Geotechnical Stability

Moss Mine will generate over 31 million tons of barren rock over the life of the mine. This tonnage will exceed the capacity that can be stored on the patented lands by January 2020, thus the proposed barren

rock stockpiles (east and west barren rock stockpiles) have been designed to accommodate up to 35 million tons, combined capacity for both proposed barren rock stockpiles. This was accomplished by expanding the barren rock stockpile footprint to the east and south onto BLM lands (i.e., proposed barren rock stockpile east), as well as development of the proposed barren rock stockpile west/temporary growth medium storage area (see **Figure 1**).

The barren rock generated by mining operations has undergone extensive testing for both chemical composition and physical characteristics. It is amenable for use as road and general construction aggregate as well as concrete and asphalt aggregates. Presently, local companies are trucking Phase II aggregate to their Bullhead City operations for off-site uses. The greater the use of Phase III barren rock as aggregate, the smaller the resulting storage area requirement on BLM lands. It is planned to backfill areas of the open pits (east and west) with barren rock as each specific area is exhausted of ore. The greater the amount of backfill of barren rock that can be accomplished, the less the barren rock storage requirement will be on BLM lands.

Several geotechnical studies have been completed on the Moss Mine property. The most recent geotechnical report was produced by Golder (2017b) and is the geotechnical basis for the design of the Moss Mine open pits. Information available to Golder included:

- Phase I Geotechnical Study (CDM Smith 2013) - this study included uniaxial compression testing, and direct shear testing of representative samples of the pit wall rock
- Underground structural mapping of the underground workings accessible from the Level 65 adit - data are primarily within the hanging wall
- Downhole tele-viewer data in water wells WW-16 and WW-17
- Property wide surface structural mapping of exposed bedrock - data are primarily within the Moss Vein, and do not contain much host rock fabric data
- Core photographs for drill-holes AR-172C through AR-194C and AR-196C
- Geotechnical Logs with rock mass rating for rock core logs AR-69C through AR-77C, and AR-100C (Black Eagle Consulting 2011)
- Results from the Preliminary Groundwater Resource Evaluation (Golder 2016)
- Groundwater Flow Model Update (Golder 2017a)

The geotechnical report provides summaries of Golder's understanding of mine conditions, barren rock characterization, and proposed mining objectives. The report discusses the above sources of geotechnical information that have been acquired, summarizes the collected data and outlines the development of the geotechnical model. The geotechnical model was developed by combining the geologic model of the mine with structural and geo-mechanical data to define geotechnical units (i.e., units with similar mechanical properties and structural characteristics).

Following a Golder stability analysis, a design approach was implemented to develop pit slope and bench design recommendations that is reflected in this MPO. Operational considerations including multi-bench excavation practices and controlled blasting techniques were recommended. Guidelines for future geotechnical work and slope performance monitoring were provided within the Golder geotechnical report. A copy of the Golder geotechnical report is attached as **Appendix J.**

8.5.2 Whole Rock Analysis of Ore and Barren Rock

Arizona Aquifer Protection Program Best Available Demonstrated Control Technology (BADCT) regulations require that the characteristics of both ore and barren rock be determined through whole rock analysis of 20 samples for the initial 1,000,000 tons of material (ore and barren rock) to be mined, and one additional sample for every additional 1,000,000 tons to be mined. Thirty-five (35) samples representing different lithologies from different areas of the mine and from different elevations were submitted for Acid-Base Accounting (ABA) and Synthetic Precipitation Leaching Potential (SPLP) EPA Method 1312 analysis (see **Appendix K**). An excerpt of the Arizona Aquifer Protection Program BADCT Guidance Manual *Appendix B, Characterization of Tailing, Spent Ore and Waste Rock* is also provided in **Appendix K**.

The sampling and testing program showed that the mined material (both ore and barren rock) was non-acid generating and contained significant amounts of buffering capacity in several forms of carbonate containing rocks. GVC has established a program of sample collection for taking a sample, and submitting it for whole rock analysis, in advance of each 1,000,000 tons of material being mined.

The barren rock being mined and stockpiled is particularly well-suited as an aggregate source for concrete and asphalt. Extensive testing by Cemex Industries of samples from different areas of the existing open pit, show that the material is non-acidic; therefore, non-reactive with cement. Test results from the Cemex program are provided in **Appendix K.**

9.0 DESCRIPTION OF OPERATIONS – [3809.401 (B) (2)]

Pursuant to 43 CFR 3809.401(b)(2) this section discusses:

1. All operational and exploration activities
2. Preliminary designs and operating plans
3. Water management plans
4. Quality assurance plans
5. Spill contingency plans
6. Schedule of operations from start through closure and reclamation
7. Schedule of Phase III construction
8. Exploration activities (Section 16)
9. Plans for access, power, water, or support services

Rock characterization and handling are described in Section 8.5.2.

Proposed Phase III exploration plans and activities are described in detail in Section 16 and shown in **Figure 3A through Figure 3F**.

9.1 Operating Plans and Practices

The following operating plans are included in this MPO as follows:

- Water Management Plan (**Section 9.3**)
- Barren Rock Management (**Section 9.11**)
- Reclamation Plan (**Section 17**)
- Reclamation Monitoring Plan (**Section 18**)

- Quality Assurance Plan (**Section 20**)
- Interim Management Plan (**Section 21**)

9.1.1 Introduction

GVC mining activities to date have focused on the exploitation of the Moss Vein, and the associated hanging wall stockworks that contain gold and silver mineralization of interest within the 15 patented lode claims (254 acres) owned by GVC. From 2013 to 2014, GVC's primary focus was on its Phase I activities ("Phase I") that was comprised of open pit mining, and on-site crushing, agglomeration, stacking, and heap leaching of a 125,000-ton bulk sample of Moss Vein mineralized material, with off-site carbon stripping and doré production. All Phase I activities were completed during the fourth quarter of 2014. The leach solutions and stacked ore were neutralized in 2015 utilizing hydrogen peroxide, sunlight, and flushing with fresh water to reduce the cyanide levels to approximately one-third of the Arizona drinking water standard of 200 parts per billion.

The second phase, or Phase II as referred to in GVC literature, was the subject of a 2015 Feasibility Study ("Moss Gold Silver Project NI 43-101 Feasibility Study Technical Report") dated June 15, 2015 and filed on SEDAR. Phase II involves the mining and processing of ores wholly contained within the patented land boundaries, and which can be mined and processed completely on the patented land. Subsequent to the 2015 Feasibility Study, the Project received the necessary permits and regulatory approvals, along with financing, to allow construction to proceed. Phase II encompasses open-pit mining, crushing, agglomeration and stacking of ore onto a conventional heap leach pad. Phase II gold and silver recovery from leach solution is achieved by a Merrill Crowe process and gold/silver doré bars are poured at the mine. The Phase II mine was designed to have a five-year mine life at a projected mining rate of 5,500 US tons per day (TPD). Phase II activities are on-going.

9.1.2 Proposed Eastern Pit and Far Western Pit

Phase III includes expanding the heap leach pad, barren rock stockpiles, open pits, and exploration activities off of the patented claims and onto BLM managed lands. Phase III includes an expanded open-pit to the east and west of patented claims, an expanded heap leach pad to accommodate additional mineralized material and expanded barren rock stockpiles to accommodate additional barren rock that must be mined concurrent with mining the ore. The existing open pit will be deepened on the patented lands and expanded east and north onto BLM managed lands. The proposed Far Western Pit would be located on the western edge of the patented claims and onto BLM managed lands and is approximately 17 acres in size. The anticipated mining rate for Phase III is 8,493 TPD. The expanded heap leach pad and the barren rock stockpiles will be developed on BLM land adjacent to Moss Mine patented claims, see **Figure 1**. The crushing and agglomeration operations will be moved in the future to accommodate pit expansion but will remain on patented lands. The Merrill Crowe operations would not be moved.

9.1.3 Estimated Surface Disturbance

The Proposed Project-related surface disturbance areas by acreage and land status are outlined in **Table 16** (note, Table 16 is identical to Table 1 and is repeated here to facilitate review).

Table 16: Proposed Disturbance by Land Status

Facility	Disturbance (Acres)		
	BLM	Private	Total
Exploration			
Estimated Exploratory Roads and Drill Sites within six exploration areas[1]	110.31	0	**110.31**
Open Pit			
Proposed Far Western Pit	16.70	0	**16.70**
Proposed Eastern Pit	84.55	1.20	**85.75**
Ancillary Facilities			
Proposed Heap Leach Pad (approximate height above ground elevation 75 to 115-ft)	109.0	14.95	**123.95**
Proposed Heap Leach Pad Buffer/Road	0.75	0	**0.75**
Proposed Pregnant and Event Ponds	4.20	0	**4.20**
Proposed Barren Pond	1.19	0.90	**2.09**
Proposed Barren Rock Stockpile West/Temporary Growth Medium Storage (approximate height above ground elevation 195 to 210-ft)	15.50	0	**15.50**
Proposed Barren Rock Stockpile West Buffer/Road	2.50	0	**2.50**
Proposed Barren Rock Stockpile East (approximate height above ground elevation 170-ft)	111.75	23.70	**135.45**
Proposed Barren Rock Stockpile East Buffer/Road	5.80	4.10	**9.90**
Proposed Assay Lab/Core Shack	2.01	0.21	**2.21**
Proposed Maintenance Shop/Office Complex	10.98	0	**10.98**
Proposed Municipal Source Water Pipeline (4" to 6" diameter)[2]	14.32	13.25	**27.57**
Proposed Water Wells (6) and Monitoring Wells (3) and Water Well Pipeline (4" to 6" diameter)[3]	6.38	0	**6.38**
Totals	**495.94**	**58.31**	**554.25**

[1] *Acreage includes Arizona State Land Department-owned land because BLM has subsurface rights. Proposed exploration disturbance is detailed in Section 16.*

[2] *The proposed municipal source water pipeline would be co-located with BLM-approved 24.9 kV power line right-of-way (ROW) (BLM AZ 037253). This proposed water pipeline would consist of 4-inch (4") to 6" pipeline and includes 0.91 miles along BLM 7717, 0.82 miles along BLM 7922, and 1.91 miles along Silver Creek Road, for a total of 3.64 miles on BLM land. The proposed water pipeline disturbance was calculated using an average 33-ft wide ROW corridor. The approved 24.9 kV power line area of disturbance (approximately 2.86 acres on BLM land) is not provided in the table above because the ROW has already been approved by BLM. The power line is discussed in this MPO because it is closely associated with Phase III activities. The power line disturbance area was calculated to be 20% of the water pipeline disturbance on BLM land based on: the power line being be built using existing roads and within the same corridor as the water pipeline; and ground-disturbing activities would consist primarily of utility pole placement and power line tensioning/pulling sites. Reclamation associated with construction of the power line has been previously defined within BLM's Grant of ROW and will be implemented as directed by BLM.*

[3] *The proposed water well pipeline would consist of 4"-6" pipeline along the BLM 7717 realignment to convey groundwater from the three proposed water wells south of Moss Mine. The proposed water well pipeline disturbance was calculated using 35-ft temporary disturbance corridor.*

9.2 Permitted Discharging Facilities

In accordance with ARS 49-241 through 49-252, an APP is required if a facility that discharges a pollutant either directly to an aquifer, the land surface, or the vadose zone in such a manner that there is reasonable probability that the pollutant will reach the aquifer. Arizona statutes require that an individual APP discharging facility "be so designed, constructed and operated as to ensure the greatest degree of discharge reduction achievable through application of the BADCT" (ARS 49-243.B.1).

A detailed description of the APP associated with the heap leach pad, pregnant leach solution pond, west event pond and south event pond is contained in the Phase II APP that was approved by ADEQ on April 6, 2016 (No. P-511225 [LTF No. 64007]). These four facilities will be regulated under the APP and follow stipulations as described in the permit.

For Phase III, GVC will amend the Phase II APP permit to incorporate both the Phase II facilities and the proposed Phase III expansion facilities.

9.2.1 Analysis of Well Water

Hydrological modeling predicted that much of the water from wells in the vicinity of the Moss Mine was coming from fractures within the bedrock in and around the Moss Mine (Golder 2016 and 2017a; see **Appendix G**). The water from these wells is non-acidic, exhibiting a pH of 7.2 to 7.5. Water quality analyses conducted indicate most elements analyzed were below the method detection limit. The results of this testing are shown in **Table 17** and **Table 18**. Although total dissolved solids were high in the samples, no individual constituents exceeded the Arizona clean water standards guidelines. High total dissolved solids are not unusual for wells in the Bullhead City area. GVC has established a program of quarterly testing of well water from several areas of the open pit and proposed open pit expansions (east and west) to continue to monitor groundwater quality and track changes that may occur during the mine life.

Specifically, water quality samples have been collected during recent hydrogeological investigations and they serve as a benchmark for water quality at the mine (**Appendix K**). Water quality testing shows the water to be slightly alkaline with a pH of 7.2. No anomalous elemental values were detected and in summary, the water appears to be very suitable for use as process water. Upon cessation of mining activities, there is potential for a pit lake to form within the open pit footprint on the patented land (see Section 8.5.2 for discussion on whole rock analysis and acid-base accounting.) In accordance with ARS 49-243 (G)(1) and the APP, GVC is required to demonstrate, through modeling, that final open pits are sufficient to capture pollutants discharged and is hydrologically isolated so that it does not allow pollutant migration to groundwater. The demonstration of passive containment will be updated every five years and reviewed by ADEQ.

Table 17: Wet Chemistry Test Results

Test	Source	Value	ADEQ Drinking Water Standards[1]	Unit
Alkalinity	SM2320-B	160		mg/L
Bicarbonate	SM2320-B	160		mg/L
Carbonate	SM2320-B	<4.0		mg/L
Chloride	EPA 300.0	58		mg/L
Fluoride	SM4500-F-C	2.9	4.0	mg/L
Hydroxide	Calculation	<4.0		mg/L
Nitrogen, Nitrate	EPA 300.0	0.52	10.0	mg/L
Nitrogen, Nitrite	EPA 300.0	0.20	1.00	mg/L
pH	SM4500-H-B	7.2 H1		pH Units
Temperature	SM4500-H-B	22		°C
Phosphate, Ortho	EPA 300.0	<0.50		mg/L
Solids, Total Dissolved	SM2540-C	1,400		mg/L
Sulfate	EPA 300.0	740		mg/L

*From Preliminary Economic Analysis (M3 2017; see **Appendix E**)*
[1] Drinking Water Standards from Arizona Administrative Code R18-4-108, Safe Drinking Water Regulations Maximum Contaminant Levels.

Table 18: Metal Content Chemistry Test Results

Test	Result	Reporting Limit	ADEQ Drinking Water Standards[1]	Unit
Aluminum	<0.10	0.10		mg/L
Antimony	<0.040	0.040	0.006	mg/L
Arsenic	<0.10	0.10	0.010	mg/L
Barium	0.022	0.010	2.000	mg/L
Beryllium	<0.0010	0.0010	0.0040	mg/L
Cadmium	<0.0010	0.0010	0.005	mg/L
Calcium	240	2.0		mg/L
Chromium	0.014	0.010	0.100	mg/L
Cobalt	<0.010	0.010		mg/L
Copper	<0.010	0.010		mg/L
Iron	<0.10	0.10		mg/L
Lead	<0.015	0.015	0.05	mg/L
Magnesium	55	2.0		mg/L

Test	Result	Reporting Limit	ADEQ Drinking Water Standards[1]	Unit
Manganese	<0.010	0.010		mg/L
Nickel	<0.010	0.010	0.1	mg/L
Potassium	4.8	0.50		mg/L
Selenium	<0.10	0.10	0.05	mg/L
Silver	<0.010	0.010		mg/L
Sodium	96	0.50		mg/L
Thallium	<0.10	0.10	0.002	mg/L
Zinc	<0.50	0.50		mg/L

*From Preliminary Economic Analysis (M3 2017; see **Appendix E**)*

[1] Drinking Water Standards from Arizona Administrative Code R18-4-108, Safe Drinking Water Regulations Maximum Contaminant Levels.

9.3 Water Use and Management Plan [3809.401 (b) (2) (iii)]

GVC operates the fluid management system and operations for the mine under the approved, zero-discharge, Phase II APP. Stormwater management is addressed under the federal CWA through the mine stormwater pollution prevention plan (SWPPP). For Phase III, GVC will amend the Phase II APP (Approved by ADEQ on April 6, 2016 (No. P-511225 [LTF No. 64007]) to incorporate both the Phase II facilities and the proposed Phase III expansion facilities.

9.3.1 Groundwater

GVC has established a program of quarterly testing of well water from several areas of the existing open pit and would continue to monitor proposed open pit expansions (east and west) for groundwater quality and track changes that may occur during the mine life.

9.3.2 Hydrogeology

In accordance with ARS 49-243 (G)(1) and the APP, GVC is required to demonstrate, through modeling, that final open pits are capable of capturing discharged pollutants and is hydrologically isolated so that it does not allow pollutant migration to groundwater. The demonstration of passive containment will be updated every five years and reviewed by ADEQ. The monitoring wells located downgradient (hydraulic gradient) will be monitored quarterly as specified in the APP provided in **Appendix L**. Climatic conditions such as heavy rains are not anticipated to have an effect as the depth of the pit below an outfall location/flooding elevation would provide a very large area to contain water. See Section 8.5 for additional discussion of groundwater monitoring and modeling.

In the event that the water level in open pits rises above the level of the barren rock backfill there may be concerns regarding wildlife and human access to the water. Open pits will be bermed and fenced (with signage) to prevent accidental human and terrestrial wildlife access, as necessary, where there are steep walls and slopes. Safe access to the pit by wildlife will be possible down the final pit roads. Water quality within a possible pit lake will be continually monitored to ensure that water quality meets applicable standards and there is no harm to wildlife.

9.3.3 Process Fluid Management

Process fluid at the Project consists of a weak cyanide solution (0.32 pounds per ton with pH of 10.5). Process solutions are recycled and contained on permitted lined pads and ponds (non-discharging facilities). Facilities have been designed, constructed, and operated to ensure zero discharge achievable through application of BADCT demonstrations. Operation of the facilities is conducted in accordance with the APP. The only discharging facilities are related to stormwater runoff. Monitoring of the discharging facilities is conducted on a weekly basis, during construction, and on a quarterly basis during normal operations. Any failures or breaches are repaired immediately; such plans are contained within Section 2.6.3 of the APP (see **Appendix L**).

9.3.4 Stormwater Management

The Phase II SWPPP has been prepared to meet the applicable requirements for coverage under ADEQ Multi Sector General Permit (MSGP) for authorized stormwater discharges associated with industrial activities. Only a portion of the GVC property is subject to coverage under the MSGP.

9.3.4.1 Pollutant Sources

The source of potential pollutants on the GVC property are related to industrial activity. Industrial activities include but are not limited to: material handling equipment operation; industrial machinery operation; raw materials storage and handling; industrial production and processes activities; and intermediate products, by-products, final products, and waste products storage and handling. Material handling activities include, but are not limited to the storage, loading and unloading, transportation, disposal or conveyance of any raw material, intermediate product, final product or waste product required in the mining or ore.

9.3.4.2 Best Management Practices

GVC prevents the potential to discharge stormwater through best management practices, which includes good housekeeping, maintenance of engineered control structures, spill prevention and response awareness, use of temporary best management practices (BMPs) where warranted, and employee training.

GVC implements good housekeeping measures for exposed areas that are potential sources of pollutants that may drain into tributaries of Silver Creek. Measures within active mining areas will include keeping materials orderly and labeled as determined by GVC to be necessary. Storing materials will be put in appropriate containers as practical and required. Floatable debris, such as dead trees and other materials that may be carried with stormwater and has potential to constrict or impede flow through culverts and at rock gabion will be identified and removed as applicable.

GVC inspects and maintains engineered control structures that have been identified in the SWPPP including the west event pond, the south event pond, and other stormwater controls. Routine inspections ensure there are no unauthorized discharges of stormwater and that control devices are functioning as per their intended design and operation.

GVC maintains emergency response and spill prevention, control, and countermeasures (SPCC) plans that can be implemented immediately in the event of an unplanned release. SPCC plans are described in Section 14.9.

Task specific training is provided to employees who are responsible for implementation activities necessary to meet the conditions of the SWPPP. General stormwater awareness training is provided to all employees and contractors at the time of hire and refreshed on an annual basis.

9.4 Permitted Air Emitting Facilities

ADEQ administers requirements to obtain a Class I Air Quality General Permit, which governs both construction and operations as required by AAC R18-2-304.I.1. A Class I Air Quality General Permit Application was developed by GVC in June 2016 for Phase II facilities and operations. On February 15, 2017, this application was approved by ADEQ (Permit No. 64302). In February 2018, a revision to this application was approved by ADEQ (minor permit revision No. 69453).

Phase II permitted air emitting facilities include:

1. Crushing and Heap Stacking Operations
2. Merrill Crowe Processes
3. Unclassified Sources
4. Melt Furnace (diesel oil fired)
5. Reciprocating Internal Combustion Engines
6. Mobile Sources

GVC will apply for a minor permit revision for Phase III.

9.5 Pit Mining Methodology

Extraction of the mineral resources in the Moss Mine vein and adjacent stockworks on the patented and unpatented lands will be by open pit mining methods with a conventional drill-blast-load-haul mining fleet. The mining will be carried out by a contract miner (presently) or by company internal crafts. A schematic view of the mining is shown in **Figure 13**. The mine is presently operational and on track to produce gold-silver doré bars over an expected four- to five-year life (Phase II). The Phase III expansion of operations onto public lands will increase the reserves by 212,890 troy ounces of gold and 2,394,290 troy ounces of silver and extend the mine life out to an estimated 10 years.

9.5.1 Open Pit Design

As noted by Golder (2017b; see **Appendix J**), achievable open pit slope angles at the Moss Mine will be determined by the bench configurations that can be safely developed and maintained. Bench configurations are defined by production bench height, achievable bench face angle (BFA), and catch bench width, all of which combine to define the inter-ramp angle (IRA). The following recommendations from Golder (2017b) have formed the basis for mine design:

- Production bench height is 20 ft.
- Maximizing slope angles will require that a multiple bench configuration be mined. A triple bench configuration is recommended as this has been successfully implemented at a number of operations under similar geological conditions to the Moss Mine using successful pre-split blasting and thorough scaling to limit rockfall hazards from the upper two benches.

- Minimum design catch bench widths in the mining industry are commonly taken as 20 ft to allow for back-break and hard toes due to imperfect blasting, and local bench crest failures due to structural conditions. At Moss Mine, steep open pit slope design is predicated on implementing best practices for blasting and scaling, which will result in reduced rockfall hazards. A 20-ft design catch bench width is therefore considered to be adequate, given the implementation of these BMPs for blasting and scaling to reduce rockfall potential to low levels.
- BFA and IRA are limited by structural control for slopes oriented within +/-20° of the dip direction of structures involved in planar failure modes, and +/-45° of the trend of potential wedge failure modes.
- If strong structural control is lacking, the following BFA ranges are typically achievable, depending on rock quality and blasting methods:
  - Standard production blasting – 55°-65°
  - Effective controlled blasting – 65°-70°
  - Best-case controlled blasting – 70°-75°

9.5.2 Open Pit Monitoring Program

A Pit Slope Monitoring Program has been initiated at Moss Mine to ensure that optimal safe slopes can be achieved. The program includes the purchase of a laser scanner and a training program for key employees. **Table 19** summarizes the Trigger Action Response Plan employed as a basis for the monitoring program.

Table 19: Wall Movement Monitoring Trigger Action Response Plan

Trigger Action Response Plan	Normal State	Level 1 (Caution) Triggers	Level 2 (Watch) Triggers	Level 3 (Alert) Triggers
	<0.25" movement per day	>0.25"to 1" movement per day	1" to 6" movement per day	>6"movement per day
Persons Affected	**Action/Response**			
Surveyor/Geotech Team	Bi-monthly survey of walls and plot movement rates Walk active open pit crests and perform visual inspection for areas not containing prisms	Weekly survey of walls, plot movement rates and analyze trends Include discussion in daily 8:00 am mine production meeting that includes Pit Supervisor and Mine Superintendent	Daily survey of walls, plot movement rates and analyze trends Include discussion in daily 8:00 am mine production meeting that includes Pit Supervisor and Mine Superintendent Email Pit Supervisors and Mine Superintendent	Daily survey of walls, plot movement and analyze trends Include discussion in daily 8:00 am mine production meeting that includes Pit Supervisor and Mine Superintendent Email Pit Supervisors and Mine Superintendent with SharePoint alert for hazard zone(s) identification Communicate need for all work to be immediately stopped in the area

Trigger Action Response Plan	Normal State	Level 1 (Caution) Triggers	Level 2 (Watch) Triggers	Level 3 (Alert) Triggers
	<0.25" movement per day	>0.25"to 1" movement per day	1" to 6" movement per day	>6"movement per day
			with SharePoint alert for hazard zone(s) identification	
Pit Supervisor	Conduct visual inspections of highwall at beginning and end of shift during mining activities in area Ensure Standard Operating Procedures for working under highwalls are known and communicated to workforce	As per normal state	Communicate increased wall movement to potentially affected workers Implement any additional controls necessary for safety	Stop all mining activities and barricade/berm off access into the affected at-risk area Continue visual inspections from outside the affected area Restrict access to the area

9.5.3 Open Pit Hydrology

ADEQ allows mines in Arizona to use the concept of "passive containment" due to the arid climate found in Arizona, as part of their BADCT to control water pollution from an open pit. If a pit lake forms at the bottom of the open pit after the mine closes, passive containment occurs when a natural hydrologic sink develops in the subsurface around the open pit that prevents pollutants in the lake (such as dissolved metals, low pH water) from migrating away from the pit lake into the aquifer. The hydrologic sink can develop due to the high rates of evaporation from the pit lake, which match or exceed the inflow of groundwater into the open pit. If more water flows into the open pit than evaporates, a pit lake forms and without a hydrologic sink and flow-through, conditions can result with the potential for impacts to groundwater pollution to migrate into the area's aquifer. Companies that operate mines in Arizona must make a very rigorous demonstration to ADEQ that a hydrologic sink exists, now and/or after the mine closes.

Hydrological modeling (Golder 2016, 2017a; see **Appendix G**) of the aquifer in the vicinity of the Moss Mine open pit predicted difficulties in de-watering the open pit due to the expected inflow from the fractured controlled groundwater aquifer. Sourcing water from wells located inside and immediately adjacent to the projected Phase II open pit (required for initial mining and processing operations during 2018) showed a more rapid drawdown in the water levels, with a slower re-charge response than had been predicted by the hydrological model. The shortfall in water was so acute that a major trucking campaign was initiated by GVC to haul water from the Cemex Industries water well in Bullhead City. Further hydraulic modeling will be conducted by GVC as additional hydrological information becomes available.

When more accurate properties such as actual groundwater inflow rates and other losses or additions are determined, a mass water model can be updated and a better estimate can be made for the eventual water surface elevation of a possible pit lake. GVC will periodically review and update the hydrology studies to incorporate new information accumulated during operations. These updates would include the present practice of collecting both ore and barren rock samples on a quarterly basis and sending these samples for ABA analysis and soluble minerals content to provide quantitative predictions of water quality during the

operational and post-closure period. Additionally, the continual recording of water levels in both the water supply wells and the monitoring wells and quantities of water pumped on a daily basis will enable GVC to further understand the groundwater and surface water hydraulics and any potential impacts to waters of the State. Based on further monitoring and evaluation, additional mitigation measures may be implemented at any time.

The nature of the ore bodies determined to date and the design of the main pit and the eastern extension of the main pit is such that the portion of the main pit on the patented land is much deeper than the eastern portion of the pit on public lands. By sequencing of the mining and backfilling of the pit, GVC will be able to ensure that there is no pit lake on public lands. The potential exists for a pit lake to form on the patented lands.

The bottom of the Far Western Extension Pit is well above the static water level in this area. Water well 20 (WW-20) is located approximately 1,400 ft south of the proposed Far Western Extension Pit and was drilled to a depth of 1,000 ft bgs without intersecting water.

9.6 Ore Processing

Metallurgical test work to date, and results from Phase I, validated that the Moss Mine orebody is amenable to gold and silver recovery via heap leaching using a weak cyanide solution. The most economically effective process has been identified as one that consists of heap leaching of crushed and agglomerated ore, followed by a Merrill Crowe metal recovery plant that produces a precipitate that can be melted on-site to produce gold and silver doré bars. The Merrill Crowe facility is currently operational at Moss Mine and doré bars are being shipped to a refinery in Salt Lake City, Utah. **Figure 14** is a conceptual representation of the crushing, leaching, and Merrill Crowe process.

For Phase II, the design of the crushing circuit and the metal recovery plant was based on 365 days of operation per calendar year. The nominal crushing and ore stacking tonnage was designed to be 2,750 TPD for the first two months of operation, increasing to 3,850 TPD in month three, followed by a tonnage increase to 5,500 TPD in month five. Current production is at 6,500 TPD.

For Phase III, the nominal crushing and ore stacking tonnage is expected to grow to a maximum of 8,493 TPD through the end of the mine life. The mine life is expected to be ten years at this rate provided that permits are obtained to work outside of the patented claims. Dependent on exploration results, the life of the mine may be extended beyond 10 years.

9.6.1 10-Year Mine Production Schedule

The mine operates 24 hours per day, 7 days per week, 365 days per year. The mine uses rotating crews to provide continuous operational coverage. The mine production schedule, shown in **Table 20**, was created using MineSched software (version 9.0). The scheduling goals and constraints were provided by GVC. Production was modeled using locations for the 10 open pit phases. Dumps were modeled using a static stockpile location. Conceptual open pit maps for Years 1 through 7 are shown on **Figure 15A through Figure 15G**.

Table 20: 10-Year Mine Production Schedule

	Units	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Total
Ore	K Tons	1,267	1,927	2,691	2,381	3,099	1,840	1,534	2,037	1,055	2,206	20,037
	Au opt	0.024	0.025	0.028	0.017	0.014	0.018	0.030	0.023	0.013	0.015	0.021
	K Au Oz	30	47	75	41	44	33	46	47	13	34	412
	Ag opt	0.22	0.269	0.321	0.208	0.170	0.282	0.356	0.275	0.144	0.248	0.238
	K Ag Oz	28	519	865	496	526	518	546	561	152	548	4,759
Barren Rock	K Tons	2,266	5,580	5,371	5,719	4,939	6,260	6,566	6,062	7,045	3,322	53,131
Total Mined	K Tons	3,533	7,507	8,063	8,100	8,039	8,100	8,100	8,098	8,100	5,528	73,168
Strip Ratio	W:O	1.79	2.90	2.00	2.40	1.59	3.40	4.28	2.98	6.68	1.51	2.65

9.7 Blasting

Presently, mining contractor N. A. Degerstrom performs the drilling and blasting within the open pit mine. The bulk of the production blast hole drilling is performed by using DM-45 drill rigs with downhole hammers drilling 6.75" diameter, 23-ft-deep blast holes. Ammonium nitrate and fuel oil (ANFO) blasting agents are used for nearly all rock breakage in dry ground, comprising an estimated +95% of the total explosive use. Ammonium nitrate emulsions will be employed when wet conditions are encountered. Based on an anticipated maximum 17,500 blasting holes in Year Two, Phase III, and 150 pounds of ANFO agent used per blast hole, the maximum ANFO blasting agent use will average about 3,100 tons per year.

GVC and contractor employees are sent out prior to and during blasting to serve as guards to ensure no humans or wildlife encroach into the blasting area. A description of the health and safety information that GVC currently utilizes specifically associated with mining activities, such as blasting, is contained within **Appendix N**.

9.8 Primary Crushing and Fine Crushing

Run-of-Mine ore is trucked from within the mine to the primary crushing stockpile. A CAT 988 loader loads the ore into a hopper feeding a jaw crusher. Primary crushed ore, at approximately 80% passing 4", is conveyed to a 70-ton surge bin ahead of the secondary crushing circuit. A belt feeder draws ore from the surge bin and feeds a vibrating, inclined, triple-deck screen. The undersize fraction (-0.25") from the screen will bypass the secondary and tertiary crushing circuit and will report to the fine crushing product belt conveyor. Screen oversize will report to the 54" diameter secondary cone crusher, equipped with a 400-horsepower electric motor. Material retained on the bottom deck of the screen bypasses the secondary crusher but combines with the secondary crusher discharge product and reports to the tertiary crushing circuit.

Secondary discharge product (at approximately 80% passing 1.3 inches) is conveyed to a 140-ton double wide surge bin ahead of the tertiary crushing circuit. Two belt feeders draw ore from the surge bin and independently feed the two vibrating, inclined, triple-deck screens above the two tertiary crusher units. Each

unit consists of a 500-horsepower, 60" diameter tertiary cone crusher. The undersize fraction (-0.25") from each screen is the product of the fine crushing circuit and reports to the fine crushing product belt conveyor. Each screen oversize reports to one of the two tertiary cone crushers. The discharge from the tertiary cone crushers is recycled back through the 140-ton surge bin and back onto the tertiary screens and cones. The product of the fine crushing circuit, at nominal -0.25", is conveyed to the agglomeration circuit.

Water sprays are utilized for dust suppression at the truck dump into the crusher feed hopper and at transfer points for the screen undersize material. All other transfer points within the crushing circuit are connected to the dust collection system consisting of baghouses and/or single-point, cartridge-type dust collectors.

9.9 Agglomeration and Ore Stacking

Crushed ore is conveyed to an impeller chute. Cement is added to the impeller feed conveyor at the rate of 4 pounds per ton of ore and raw water is added in the chute for the binding process, at a moisture content of approximately 7% by weight. The agglomerated, crushed ore is discharged from the chute onto a conveyor, which feeds the overland conveyor and subsequently a series of grasshopper conveyors that feeds onto the radial stacker.

Units of grasshopper-type conveyors are added or removed as required, dependent upon the stacking location on the pad. Cyanide solution is added onto the ore at one of the grasshopper transfer points within the lined leach pad footprint. Conveyor belts are 36" wide. Stacking heights are a nominal 30 ft.

9.10 Barren Rock and Heap Leach Pad Management

9.10.1 Process Ponds and Sludge Solutions

The Moss Mine is designed as a zero-discharge facility. All process solutions are recycled through a repeating cycle consisting of: heap leach – pregnant pond – Merrill Crowe plant – barren tank (pond) – heap leach. Excess rainwater could cause the pregnant pond to overflow into one or all of the southeastern event pond, western event pond or proposed southwestern event pond. Upon completion and commissioning of the Phase III heap leach pad and the southwestern event pond and pregnant pond, the Phase II western event pond is planned for removal. In compliance with Arizona BADCT regulations, the event ponds have been, and will be, designed and constructed to be of sufficient size to handle the precipitation from a 100-year storm event.

Sludges from the ponds will be detoxified by hydrogen peroxide rinsing and then encapsulated in a section of the heap to ensure metals or compounds are not released into the environment. Upon termination of operations the process solutions will be de-toxified by rinsing with a hydrogen peroxide solution followed by a fresh water rinse to reduce deleterious materials in the process water to a level meeting State of Arizona drinking water standards. This procedure was performed with the Phase I heap leach pad, and resultant cyanide levels in the solutions were reduced to one-third of the allowable drinking water level.

9.10.2 Heap Leach Pad – Stability and pH Control

Test work was conducted during 2012 and 2013 by McClelland Labs and civil engineering firms to confirm the stability of the -0.25" material (ore) being stacked on the heap leach pad. A recommended addition of 4 pounds of Portland cement is added per ton of ore and mixed by impeller chute to both increase stability and provide basic material for pH control.

9.10.3 Heap Leach Pad, Solution Ponds, Event Ponds

The Phase II heap leach pad geotechnical design is in accordance with ADEQ prescriptive design guidance for heap leach facilities (i.e., BADCT), process solution ponds, and non-stormwater (contingency stormwater storage) ponds except as noted below. During Phase II peak operations, some 400,000 square-ft of ore will be under leach.

The expanded Phase III heap leach pad will share some of the Phase II facilities for solution collection and circulation since the solution application rates will be the same. The solutions collected from the Phase III heap leach pad expansion will be pumped over to the Phase II pregnant solution pond.

9.10.3.1 Proposed Heap Leach Pad

The Phase III heap leach pad expansion is intended to operate in parallel with the Phase II heap leach pad to allow an increase in leach time for the upper lifts of the Phase II heap leach pad. The intention is to construct the Phase III heap leach pad expansion before the Phase II pad is fully loaded. This should allow material to be stacked on the leach pad as soon as the end of Year Three. Material will be stacked on the Phase III leach pads after all permits are obtained and construction is completed.

The liner systems for the Phase III heap leach pad and process solution ponds are being designed in accordance with ADEQ prescriptive design guidance for heap leach facilities (i.e., BADCT). The preferred design of the Phase III leach pad lining system will consist of a low permeability soil layer (assuming that suitable native material with a permeability of 10^{-6} cm/sec can be economically sourced) and an overlying 2.0-mm linear low-density polyethylene (LLDPE) geomembrane liner. Alternatively, the Phase III heap leach pad could be constructed with alternative lining systems that meet the intent of the BADCT. In the absence of a local source of low permeability materials, the majority of the Phase III leach pad will be lined with a single 2.0-mm LLDPE geomembrane liner placed over a geosynthetic clay liner (GCL) base. The GCL will be placed on a prepared foundation of graded and compacted materials. GCL will be used as a substitute for the low permeability liner bedding fill material specified in ADEQ/BADCT prescriptive design guidance. ADEQ accepts GCL as meeting prescriptive design guidance. If it becomes necessary to enhance stability, alternative lining systems meeting ADEQ/BADCT requirements will be designed in selected areas of the leach pad. Prior to ore stacking and routing equipment traffic over the constructed leach pad lining system, the leach pad will be covered with a minimum 18" thickness of crushed ore over-liner cover. The over-liner cover layer will contain an internal leach solution collection pipe network.

9.10.3.2 Proposed Event, Pregnant Ponds and Barren Ponds

The Phase III proposed heap leach pad will be constructed in stages as required, for a total pad area of 124 acres. The initial Phase III construction will include the lower elevations of the pad to the southwest, along with the Phase III pregnant solution pond and event pond. The pond constructed on the west side of the existing Phase II leach pad will be removed during the later stage of the Phase III pad development. The solution that would report to the Phase II west pond will flow to the Phase III heap leach pad and ultimately report to the Phase III pond system located to the southwest of the heap leach pad. Once the Phase III pad is fully developed, the ore placement for Phase II and Phase III will be merged. The Phase III event pond will be of sufficient size to handle the contributing flow area of Phase II west and Phase III heaps. Additionally, the proposed barren pond will be constructed on approximately 2 acres of land east/southeast of the existing Merrill Crowe facility to address increased process solutions flows during Phase III operation, **Figure 1**.

As with Phase II, Phase III leach pad rough grading will be completed (in appropriate stages) as part of the Phase III construction. In Phase III, the heap leach pad will be extended to the south and west. Phase III construction will include fine grading, a low permeability soil layer, lining system installation, anchor trenching and backfilling, over-liner cover placement, and extension of the solution collection pipe network.

The Phase II leach pad footprint contains a central ridge that causes the leach pad leak collection recovery system (LCRS) and solution collection systems to drain to the south and west. Separate LCRS and leach solution collection systems that drain to the west and south have been constructed. The Phase III heap leach pad will drain to the southwest.

Risers for collection of leakage from the Phase II leach pad LCRS were constructed on the south and west limits of the Phase II leach pad. LCRS risers are fitted with submersible pumps to recover accumulated leakage, which will be pumped to the existing pregnant solution pond. The existing pregnant solution pond is located on the south leach pad boundary of Phase II, and new ponds will be constructed on the southwest heap leach pad boundary of Phase III. For Phase II, the leach solution from the eastern portion of the leach pad drains by gravity to the pregnant solution pond through the internal solution collection piping network. A steel wet well has been constructed within the ore heap to collect the leach solution that drains from the western portion of the Phase II heap leach pad. A submersible pump has been installed in the wet well and the leach solution is pumped to the pregnant solution pond.

Phase III will drain by gravity to the Phase III pregnant leach solution pond and will be pumped to the Phase II pregnant leach solution pond. A berm constructed across the western side of the Phase II heap leach pad develops the in-heap storage capacity. A portion of this berm will be removed as part of the last stage of the Phase III heap leach pad development to allow for gravity flow from Phase II to Phase III.

The Phase II pregnant solution ponds were constructed with upper and lower 1.5-mm high-density polyethylene (HDPE) geomembranes placed on a GCL base. An HDPE drainage net (geonet) was placed between the geomembranes to serve as a pregnant solution pond LCRS. The pregnant solution pond design meets ADEQ/BADCT prescriptive design criteria for a process solution pond.

The proposed pregnant solution pond and event pond, situated on the southwest edge of the Phase III heap leach pad, has been designed to contain sufficient volume to support recovery pumping operations and additional storage as a safety factor. The pregnant solution ponds have been designed to contain 24 hours of heap leach pad drain-down plus direct precipitation resulting from the 100-year, 24-hour design storm event of 98 mm.

Flow into the proposed event pond will occur when the pregnant solution pond water surface reaches the level of the spillway to the proposed event pond. Flow into the west event pond will occur when the in-heap storage and wet well pregnant solution pumping capacity are exceeded. Stormwater will be routed to the west event pond via an HDPE geomembrane lined channel and spillway and will be routed to the south and Phase III event ponds by spillway from their respective pregnant solution ponds. Event ponds will be constructed with a single 1.5-mm HDPE geomembrane placed over a prepared bedding layer.

9.10.4 Chemical Reagents

Reagent systems include delivery of reagents to the mine, mixing and/or preparation of reagents, storage, and distribution to a process stream. Some of the reagents delivered to the facility are solid and will be mixed with water at the mine. The composition of liquids reagents, coupled with their chemical properties,

are not likely to produce emissions. Passive bin vents (considered inherent to the process) are employed to collect and prevent the loss of material during the filling of certain storage vessels**.**

9.11 Proposed Barren Rock Stockpiles East and West

During Phase III mining operations, barren rock would be placed initially in the proposed barren rock stockpile east that is located east/southeast and adjacent to the existing open pit. The stockpile would receive pit-run barren rock. The proposed barren rock stockpile east will be extended onto BLM lands as Phase III mining progresses and be approximately 135 acres in size, total. A second barren rock stockpile is proposed west of the patented claims and would be located wholly on BLM lands at approximately 15.5 acres in size. This area would be utilized as a temporary growth medium storage area to accept and store growth medium from construction of the proposed heap leach pad.

Construction of the barren rock stockpiles would comply with Mine Safety and Health Administration (MSHA) and Arizona Office of the State Mine Inspector (ASMI) requirements for slope stability. Final design, construction and configuration of the stockpiles may vary in order to accommodate adjustments to the engineering design as well as factors such as slope stability, safety, access, water management, or other construction, operational, close or post-closure needs. Present plans stipulate that the barren rock be placed in 50-ft high lifts at the natural angle of repose (approximately 45 degrees), with 50-ft wide berms. This would result in an overall slope angle of 2H:1V (27 degrees) which would not require major reshaping in the future to meet reclamation needs. The proposed limit of the stockpiles identified in this MPO are the anticipated maximum area of ground disturbance.

9.12 Merrill Crowe Processing

Pregnant solution from the Phase III ponds will be pumped to the Phase II pregnant solution pond. Pregnant solution from the Phase II pond will continue to be pumped to the clarification filters in the Merrill Crowe facility to remove suspended solids. The filtered pregnant solution will then flow to the deaeration column where dissolved oxygen will be reduced to a concentration of less than 1 part per million. The column will be operated at a near full vacuum condition.

Zinc powder will be added to the pipeline from the deaeration column to precipitate the solubilized gold and silver. An inline, vertical turbine pump will transfer the solution with the precipitated gold and silver to plate and frame pressure filters coated with diatomaceous earth. The diatomaceous earth with the gold and silver precipitate (approximately 40-50% solids by weight) will be stripped from the filters and dried in drying ovens. The filtrate (barren solution) will report to the barren solution storage tank, where cyanide will be added to achieve an operator defined cyanide concentration (0.32 pounds per ton with pH of 10.5). The cyanide bearing solution will be pumped back to the heap leach pad for re-application to dissolve gold and silver from the ore placed on the pad.

The dried precipitate is mixed with fluxes and charged to a diesel fired, crucible furnace. Slag, containing fused fluxes and impurities, is poured first into conical pots. Once slag has been removed, the melted gold and silver is poured into molds to form doré (silver/gold alloy) bars. Bars are cooled, cleaned, weighed, and stamped with an ID number and weight. Doré bars are the final product of the plant. The doré bars are trucked to an off-site refinery.

Slag is crushed and screened to recover high-grade chips that are returned to the melting furnace. Remaining slag is stored for transfer to a third party for sale. Fumes from the melting furnace are collected

through ductwork and cleaned in a bag house dust collector system, followed by a wet scrubber, before discharging to atmosphere.

9.13 Transportation of Crafts

Ground travel is the primary means of transporting operations, construction and maintenance crews, and equipment during mining, project construction, and exploration activities. All vehicles will obey jurisdictional traffic speed regulations and the posted speed limit. Speeds along roads controlled by GVC will be limited to 15 miles per hour (mph) in some areas to prevent excessive amounts of construction related dust, as necessary.

Before construction of Phase III facilities on BLM land (e.g., Phase III heap leach pad and barren rock stockpiles), authorized access routes will be clearly marked in the field with signs or flagging to minimize unnecessary disturbance. GVC will review the location of proposed access and will be responsible for ensuring that construction travel is limited to designated areas that clearly identify the limits of disturbance.

At the appropriate time, BLM in coordination with GVC, will determine which of the newly constructed access roads, if any, will be closed, restored, or retained for long term mining operations and exploration activities. New access roads not required for operations and exploration would be closed using the most effective and least environmentally damaging methods appropriate to that area.

All field personnel will participate in a worker environmental awareness program (WEAP). Through this program, field personnel will be instructed to use only approved access roads, drive within the delineated road limits, and obey jurisdictional and posted speed limits to minimize potential impacts to environmental resources.

Every effort will be made to minimize the effects of Project construction and exploration activities on public roads and to provide for public safety. GVC and third-party crafts and staff will maintain a communications network that consists of one or both of the following devices: two-way radios and/or cellular phones. This will allow for coordination of equipment traffic along existing access roads; such that public safety and traffic impacts are minimized.

All access to mining areas, barren rock stockpiles and heap leach pads will be controlled by entry through the main gate. There will be no other authorized access to these areas.

In general, the number of construction vehicles needed for Project implementation is not expected to substantially increase traffic volumes on regional road networks.

GVC will continue to use crew vans for all contractor and GVC staff to limit traffic on the main mine access road. The transport of crafts to the mine includes the use of crew vans for all contractor and GVC staff, and parking at the GVC Office and warehouse in Bullhead City. No employee parking will be allowed at the mine site. GVC will also maximize the use of carpooling for senior staff and management to reduce traffic on Silver Creek Road. It is anticipated that 42 crafts would be transported daily to/from the mine from the GVC Office in Bullhead City.

9.13.1 Proposed BLM Road 7717 Realignment

In May 2017, GVC submitted plans for design approval to Mohave County to upgrade the Moss Mine Access Road to an American Association of State Highway and Transportation Officials (AASHTO) Class IV Rural Road with two 12-ft-wide travel lanes and 5-ft-wide shoulders. The County approved the design and GVC filed a ROW Permit Application with BLM's KFO for realignment of the road. The ROW grants were issued in June 2018. ROW varies between 100 and 150 ft, depending on the heights of backslopes.

The construction standards of BLM Road 7717 will follow the BLM Manual Handbook 9113 and AASHTO – *Guidelines for Geometric Design of Very Low-Volume Local Roads (Average Daily Traffic less than 400)* (2001). The maximum grade of the road will be 13.5% with an average road grade of approximately 1.4%. Drainage ditches, culverts, bridges, or retaining walls are not planned in the design of the access road. There will be no temporary areas used during the construction or during operation of the road.

9.14 Phase III Required Equipment

The following mobile equipment will be utilized for implementation of Phase III:

- Up to two cranes
- Up to five bulldozers
- Up to four drills
- Up to four excavators
- Up to two forklifts
- Up to two graders
- Up to ten haul trucks
- Up to four loaders
- Up to ten transportation vehicles
- Up to ten service and utility vehicles
- Up to five exploration drills (core drill, percussion drill, or reverse circulating drill)

9.15 Phase III Construction and Exploration Schedule

Table 21 describes the implementation schedule for Phase III Construction and Exploration activities.

Table 21: Phase III Construction and Exploration Schedule

Activity	Start	Finish
Phase III Heap Leach Pad	June 2020	December 2020
Phase III Barren Rock Stockpile East	January 1, 2020	Cessation of Mining Activities
Exploration Activities	January 1, 2020	December 2024

10.0 MINE SITE FACILITIES [43 CFR 3809.401 (B) (2)]

The following sections describe the Project infrastructure required for Phase II operations, Phase III operations and Phase III exploration activities, pursuant to 43 CFR 3809.401(b)(2).

10.1 Warehousing

Due to space constraints at the mine site and the proximity to Bullhead City, a 1,500 square-ft warehouse and 2-acre laydown yard on Plata Caleta Street has been leased in Bullhead City for less than truckload deliveries.

10.2 Proposed Maintenance Shop and Office Complex, Assay Lab/Core Shack and Office Complex

Phase III expansion includes construction of a small vehicle repair maintenance shop and office complex (on a designated 10.98-acre parcel of land) just to the south of the existing mine entrance on BLM land. To the west of the proposed maintenance shop/office, an assay lab/core shack will be located on a designated 2.2-acre parcel of BLM land. These facilities will be portable trailer-type and Conex buildings (see **Appendix F** for typical design drawings of modular buildings). Building footprints will be approximately 5,000 square-ft for the maintenance shop and office complex and approximately 1,000 square-ft for the assay lab/core shack. The maintenance shop will include lifts for vehicle repair, supplies and parts supporting mine vehicle maintenance, as well as a number of small offices for GVC and contractor staff. Additionally, a vehicle wash station will be included within the maintenance shop to mitigate the spread of noxious weeds and removal of loose dirt and rock from outbound trucks.

The assay laboratory and core shack facilities will be housed in three, single story pre-engineered buildings consisting of a sample preparation building, a wet metallurgical laboratory, and a fire-assay analytical laboratory. The sample preparation building (i.e., core shack) will contain a sample jaw crusher, a ring pulverizer, splitters, and balance. The new buildings will provide workspace for the technical services staff, which includes engineering, geology, and survey. The laboratory facilities will be capable of processing up to 150 samples per day during two shifts.

The main administration offices for the mine are currently located at 2440 Adobe Road, Suite 101, Bullhead City, Arizona 86442. This office includes management staff, human resources, and accounting personnel. A warehouse facility, including a purchasing agent and warehouseman, is located on Plata Caleta Street off of Silver Creek Road.

10.3 Water Supply – Water Wells and Proposed Water Pipeline

Phase II water is supplied to the Project by five water wells (WW-02, WW-09, WW-16, WW-17, WW-19 and WW-21) as shown on **Figure 10** and augmented as required by trucked-in water. All water wells are contained within the patented claim area except for water well 19, 200 ft east of the patented claims.

Due to seasonal variations, water from these wells needs to be augmented by trucked-in water. Water wagons (4,000 to 8,000-gallon capacity) make up to 30 trips per day to the mine as required. As the open pit is deepened, it is anticipated that water from the open pit could be used in ore processing.

To allow for future water shortages and to eliminate the trucking of water, GVC is proposing six additional water wells and three monitoring wells to continue to support operations (see **Figure 1** for proposed well locations). Three of these proposed water wells are located south of Moss Mine. Groundwater from these wells would be conveyed via the proposed water well pipeline to bring water north to the mine. This proposed water well pipeline would consist of 4”-6” pipeline and would be located within a 15-ft utility corridor within the ROW of the approved BLM 7717 Realignment (see **Figure 6**). This proposed water well pipeline would result in approximately 5.48 acres of temporary ground disturbance, of which 2.33 acres

would be permanent for pipeline placement; these disturbances have been approved in the BLM 7717 Realignment ROW permit (No. AZ 037253).

To provide further insulation against future water shortages and to eliminate the trucking of water, GVC is also proposing approximately 3.64 miles of 4" to 6" diameter municipal source water pipeline within the same ROW as that approved for a 24.9kv power line (described in the following Section 10.4). This ROW generally parallels Silver Creek Road to BLM Road 7922 to BLM Road 7717 from Bullhead City to the mine (**Figure 6** and **Appendix O**). The proposed municipal water source pipeline would be constructed to bring water from wells owned by ready-mix and paving companies located near the intersection of Silver Creek Road and the Bullhead Parkway, discharged into the barren pond, and include a junction to also allow discharge into the crusher storage tanks.

Portions of the municipal source water pipeline will be underground to allow for passage of Sonoran Desert tortoise. Placement of the proposed water pipeline will be designed such that every 1,000 ft of length would have at least 100 ft of underground pipeline along Silver Creek Road, BLM Road 7922, and BLM Road 7717 as well as at all crossings of existing roads, trails, washes and high use target shooting areas. Further, all contributing elements of historic properties along the proposed pipeline alignment would be avoided by at least 50-ft.

This proposed municipal source water pipeline may augment Phase III operations in addition to on-site water wells. Water from existing wells, trucked water, and the proposed pipeline will be used for:

- Ore crushing and agglomeration plant
- Process water pond and process use points on the heap leach pad system
- Fire water distribution system
- Dust control

As stated previously, the principal source for water supply at the Moss Project will be from wells drilled on site to access groundwater supplies (**Figure 10**). To supplement the water requirements, GVC has hired trucking companies to truck water from wells owned by ready-mix and paving companies located near the intersection of Silver Creek Road and the Bullhead Parkway. The need to truck water was suspended in January of 2019. Currently all operations water is being provided by on-site water wells. Heap leaching, by its nature, requires water that is needed to pre-wet the ore prior to leaching. Pre-wetting requires 17% moisture content, so for every 100 tons of ore crushed and agglomerated, 17 tons of water are required for pre-wetting.

The water consumption of 360 gpm (518,400 gallons per day or 580.7 acre-ft per year) for Phase III, with a projected crushing rate of 8,493 TPD, has been estimated as follows:

- Pre-wet 8,493 tons x 0.17 = 1,444 tons of water, equivalent to 270 gpm for a 24-hour period
- 50 gpm for dust control on roads and rock stockpiles
- Evaporation losses for 400,000 square-ft under leach = 20 (January) to 50 (July) gpm; average of 40 gpm
- Total average = 270 + 50 + 40 = 360 gpm.

The evaporation losses at Moss Mine are seasonal due to variations in the temperature, humidity, and precipitation over the year. The wettest months are January, February, and March. The driest months are May and June. The highest evaporation months are June and July. The peak demand of 370 gpm will be in

June and July every year, with the lowest water demand of 340 gpm in either January or February. The evaporation losses are based on actual recordings of make-up water during the Phase I operations from January 16 through July 15, 2014 when 500 gpm of solution was being applied to the leach pad and extrapolated by a factor of four to represent the 2,000 gpm of solution application for Phase II and Phase III.

10.4 Electrical Power and Proposed 24.9kV Power Line

Currently, power for the mine is supplied by diesel powered generators. The operating peak load for Phase II is approximately 2,300 kilowatts (kW). Eight 450 kW generators are on-site. Six generators can provide the power demand for Phase II and Phase III operations. Two generators are on standby or down for maintenance while six are producing power when all equipment is on-line.

BLM recently approved a ROW grant (No. AZ 037253) for Moss Mine associated with a 24.9kV power line that would parallel Silver Creek Road from Bullhead Parkway to BLM Road 7922 then traverse northward along the west side of BLM Road 7717 to the mine. Total length of the power line is approximately 6.9 miles (of which 3.64 miles is on BLM land) that occurs within a varied ROW ranging from 30 ft to 50 ft in width. It is anticipated that this power line will supply the mine with continuous electrical power by the fourth quarter of 2019. GVC would install a power line extension to provide power to the proposed Phase III leach pad pond area (**Figure 2**). At the time of construction, the power line extension would be across previously disturbed land across Moss Mine property and the Phase III leach pad area; no additional ground disturbance would occur on private or BLM land.

The expected power demand for Phase III, based on motor sizes, is listed in **Table 22** below. The calculations show, that at full load, the project has about 4.2 megawatts of motors installed; however, due to cyclic demands, the actual operating load is estimated to be 2,460 kW.

Table 22: Phase III Anticipated Electrical Power Demand

Equipment/Facility	Estimated Load (kW)	Operating Load (kW)	Monthly Usage kW/hr
Primary Crusher	218	152	72,555
Fine Crushing	1,398	1,088	519,198
Crushed Ore Transfer	252	183	87,561
Leach Pad	440	251	119,783
Ponds	216	77	53,439
Merrill Crowe	797	302	210,971
Refinery	293	189	131,609
Water Systems	388	144	100,197
Reagents	21	5	3,757
Totals	**4,184**	**2,464**	**1,350,282**

Note:
*From Preliminary Economic Analysis (M3 2017; see **Appendix E**)*

10.5 Fuel Storage and Transportation

Fuel storage will be needed on-site. Fuel will be consumed through use of heavy equipment (e.g., loaders and dump trucks), miscellaneous fuel needs in the refinery furnace, on-site electrical generation, and small mobile equipment owned by GVC. On-site storage capacity of fuel is shown in **Table 23**.

Table 23: On-site Fuel Storage Capacity

Type	Number on Site	Capacity (gallons)
Diesel Fuel Storage Tanks for Mobile Equipment	3	10,000
Diesel for Generators	4	10,000
Furnace Fuel Oil – Day Tank	1	1,000

Fuel will be delivered to the site on a regular basis. GVC will contract with local or regional suppliers to deliver the required fuel. A receiving station for fuel delivery trucks will be located near the storage tanks currently located within Moss Mine patented claims. Both the dispensing pumps and the receiving station will be on concrete pads, with any spills collected in a sump within the containment area. GVC will continue to maintain its SPCC Plan, and all fuel storage will be in compliance with those requirements. The fuel delivery trucks will enter the mine from the main gate on BLM Road 7717 when delivering fuels.

The average quarterly diesel consumption for Phase II operations is approximately 206,200 gallons. The proposed 24.9kV power line is anticipated to supply the mine with continuous electrical power upon completion of construction, and the use of generators would be discontinued. The resultant rate of diesel consumption is anticipated to markedly decrease once the power line is functional.

10.6 Powder Magazines and Ammonium Nitrate Storage

The explosives magazine permit held by N.A. Degerstrom is numbered 9-WA-063-22-1C-00112. Permit expiration is March 1, 2021. The designated explosive storage area is currently fenced, and mobile storage containers are located within the secured area. Separate magazines are provided for explosives and detonators. The magazines have a total storage capacity of 15,000 pounds of booster, cap sensitive packaged emulsion and non-electric detonators. Blasting agents are stored separately. The magazines meet all code requirements and are rented from the explosive manufacturing company.

Silos will hold up to 95,000 pounds of ammonium nitrate. The ammonium nitrate and diesel are mixed to produce an explosive agent (ANFO) but are not mixed until placed into the blast holes. All explosive and ammonium nitrate deliveries are escorted on and off the mine site by authorized mine personnel.

The fenced explosive storage area is only accessible through the mine property. The nearest occupied building at the mine from the explosive storage area is 2,500 ft away.

11.0 MINE SECURITY AND SAFETY REQUIREMENTS

11.1 Safety Training

GVC will be responsible for providing safety training, as required, to all staff and personnel associated with the proposed Project. Specific health and safety information that GVC currently utilizes is contained within

Appendix N, including a description of the safety requirements specifically associated with mining activities (e.g., first aid, blasting, fire protection, etc.). All construction, operation, and maintenance activities will be required to comply with MSHA regulations.

Planning for emergencies is an important part of ongoing mining operations at the site. For Phase II, several types of plans have been prepared including the SPCC, an Emergency Response and Contingency Plan, a SWPPP, a Fire Plan, and others that are incorporated by reference into the proposed Phase III Project. These plans identify emergency preparedness and emergency contact protocols for most conceivable situations.

Extensive training of emergency personnel and on-site availability of appropriate equipment and supplies has ensured a successful emergency management program for Phase II operations. Phase III operations will continue to expand on safety procedures at the mine. Staffing for the Project includes safety, industrial hygiene, and environmental technical professionals. Some of the facilities and equipment for emergency planning include: a fully equipped environmental sampling and spill response station; Resource Conservation and Recovery Act (RCRA) compliant waste storage and accumulation areas; and safety and training building.

11.2 Mine Security

For mining operations to run smoothly, it is important that the mine be secure. Theft and vandalism can potentially have a negative effect on worker safety and on operating efficiency. Therefore, access to the mine is controlled by fencing and by limiting the point of entry into the mine to the front gate. Signs are posted along the fence and at strategic locations along the main access road warning people that entering the site is prohibited.

11.3 Public Safety

In addition to protecting the site from potential vandalism or theft, it is also important to protect the public from interfacing with the mine operations and to prevent potential injury. Hazards of a typical mining operation include but are not limited to: traumatic injury from large equipment; getting entangled in machinery; driving over steep embankments; slipping or falling on uneven ground or slippery surfaces; encountering high voltage electricity; exposure to chemicals or reagents while not wearing proper personal protective equipment; and exposure to loud noises while not wearing hearing protection. Employees working at the site are required to receive specific training in accordance with federal and state requirements, such as MSHA rules, covering all aspects of site safety, whereas, recreationists will likely have no such training and may not recognize the hazards. Therefore, it is imperative that access is controlled and that trespassing rules are enforced. Closed gates, fencing, and danger signage serve to warn recreationists and others in the area of potential dangers. In addition, employees are trained to be aware of trespassers in the course of their normal duties and report any suspicious activity to mining safety supervisors.

Authorized supply truck drivers will receive site orientation training and will be familiarized with their specific loading/unloading locations and procedures before entering the mine.

11.4 Mine Safety Plan

Specific health and safety information that GVC currently utilizes is contained within the Mine Safety Plan (**Appendix N**), including a description of the safety requirements specifically associated with mining activities (first aid, blasting, fire protection, etc.).

The Project site has been fenced to restrict access to the public, in particular off-road recreational vehicles. The heap, ponds, and other facilities containing cyanide (adjacent to Merrill Crowe plant) have secondary fencing to restrict wildlife access to these areas. The Cyanide Management Plan is provided in **Appendix P**. The open pit will be bermed off with an earth berm to prevent accidental entry from the adjacent un-patented ground. Warning signs are posted at key locations to warn of the hazard of entry into the mine site. Currently, a 10-ft x 40-ft trailer is located within the patented claim area, at the main access gate, which also serves as a first-aid room in the event of an emergency.

The Project is located within the range of emergency services from Bullhead City. The Bullhead City Fire Department has agreed to provide emergency services; therefore, an on-site ambulance is not included in this Plan. GVC does not intend to hire paramedics to staff the first-aid room; however, selected company and contractor staff have been trained in first aid and cardiopulmonary resuscitation (CPR) in the event of an incident.

A helicopter landing area has been constructed at the mine site to allow for a medical evacuation in the event of a serious injury. All MSHA training programs and certifications are kept current.

Communications at the mine have been upgraded to allow an ultra-high frequency/very high frequency (UHF/VHF) multi-channel mine radio system to be utilized. Dedicated channels are provided for security, processing, crushing, operations, and technical services. The upgrade included microwave-based voice and data communications over a Voice over Internet Protocol (VoIP) network, which provides an internet connection at the mine site allowing the use of mobile devices, such as cell phones and other mobile computers.

11.5 Main Entrance Security Gate/Security Post

An electronically operated main gate with surveillance camera is located at the entrance of the mine property (BLM Road 7717). A chain-link fence is connected to the gate with the employee and visitor parking lot located outside the gate.

11.6 Worker Environmental Awareness Program

As stated previously, prior to Project implementation, all construction and mining staff will be required to participate in a WEAP. The format of the WEAP is anticipated to be a 15-30 minute video. This program will be developed by a qualified biologist and archaeologist prior to the start of construction for the Phase III expansion facilities and/or exploration activities and will be submitted to BLM for review and approval prior to its implementation. At a minimum, the program will include the following topics: biological (with emphasis on desert tortoise, Gila monster, and desert bighorn sheep); cultural (with an emphasis on not disturbing or removing archaeological materials as well as inadvertent discovery protocols); paleontological; paleontological; stormwater; dust control; and other environmental requirements and protection measures. All new staff, contractors, or visitors will receive this training as a part of their initial site-specific training. GVC will be responsible for ensuring that all personnel have received the required training that will include a WEAP sticker that is given to each person receiving WEAP training. This sticker would be placed on the helmet of the individual that received the training. Employees at the mine would take WEAP refresher training every two years.

11.7 Fire and Emergency Planning

11.7.1 Introduction

This section details measures that should be implemented to: 1) reduce the risk of starting a fire; and 2) suppress a fire in the event one does occur within construction areas during Project construction, operation, exploration, and maintenance. The risk of fire danger during construction is related largely to the use of vehicles and other motorized equipment operating off roadways and human caused (e.g., smoking).

The purpose of this section is to outline responsibilities, notification procedures, fire prevention measures and precautions, fire suppression equipment, initial response procedures, and post-fire rehabilitation strategies related to the Project. The goal is to minimize risk of Project-related fires and, in case of fire, provide for immediate suppression within construction or exploration areas. In addition, it is the intent of this planning to support BLM's RMP objective to suppress and manage wildfires (BLM 1993). This Project will be subject to federal, state, and county enforced laws, ordinances, rules, and regulations that pertain to fire prevention and suppression activities. Key regulatory agencies include BLM and local fire protection agencies.

11.7.2 Responsibilities

Bureau of Land Management

The BLM Fire Management Officer (FMO) will oversee all fire control activities in his or her administrative unit. The FMO will discuss fire protection stipulations at the notice-to-proceed meeting, which will be attended by BLM and GVC. When fire suppression is the responsibility of BLM, current BLM standard firefighting rates for labor will be used. Equipment will be paid for at negotiated rates established in BLM rental agreement contracts.

GVC

It will be the responsibility of GVC to notify BLM when a Project related fire occurs within, or adjacent to, mining, construction, or exploration areas. GVC will be responsible for any fire started, in or out of the Project areas, by its employees or operations during mining, construction, or exploration activities. GVC will be responsible for taking immediate steps to suppress a Project-related fire and will be responsible for postfire rehabilitation. GVC will take aggressive action to prevent and suppress fires on and adjacent to the Project areas.

All federal, state, and county laws, ordinances, rules, and regulations that pertain to prevention, pre-suppression, and suppression of fires will be strictly adhered to by GVC. All personnel will be advised of their responsibilities under the applicable fire laws and regulations. Costs involved with Project-caused fires will be charged to GVC. Specific construction related activities and safety measures will be implemented during construction of the Project in order to prevent fires and to ensure quick response and suppression in the event a fire occurs.

11.7.3 In the Event of a Fire

If a fire does start in the Project area and is manageable, Project personnel will safely attempt to control it with a fire extinguisher or other available equipment (e.g., using shovel to throw dirt on the fire or remove

small patches of vegetation). As part of the environmental compliance training program, workers will receive training on: initial fire suppression techniques; reporting requirements; how to determine if a fire is manageable and what control measures should be implemented by on-site field crews; and at what point field crews should evacuate. The training will also address how to respond to wildfires in the area and maintain knowledge of and plans for evacuation routes.

If the fire is unmanageable, field crews will evacuate and then first call Mohave County Sheriff's Department at **928-768-7055** and BLM's KFO **928-718-3700.** All accommodations will be made to allow immediate safe entry of firefighting apparatus and personnel. All fires must be reported to the jurisdictional fire agency regardless of size and actions taken.

11.7.4 GVC Fire Marshall

GVC has designated **Curtis Millage, Safety Manager,** as the **Fire Marshall** who will be responsible for the following:

- Conducting regular inspections of tools, equipment, and first aid kits for completeness
- Conducting regular inspections of storage areas and practices for handling flammable fuels to confirm compliance with applicable laws and regulations
- Posting smoking and fire rules at centrally visible locations
- Coordinating initial response to contractor-caused fires within the Project area
- Accompanying BLM on fire inspections of the Project area
- Ensuring that all construction workers and subcontractors are aware of the contents of the Fire Prevention Plan
- Remaining on duty when construction activity is in progress and any additional periods where fire safety is an issue
- Reporting all wildfires in accordance with the notification procedures described in the notification section below

11.7.5 Fire Notification Procedures

If a fire starts in the Project area, GVC will initiate and implement fire suppression activities until relieved by the appropriate fire agencies. Fire suppression personnel and equipment, including water trucks, will be dispatched within 15 minutes from the time a fire is reported.

The GVC's Fire Marshall will notify BLM of a fire started in the Project area during mining, construction, or exploration activities. During operation and maintenance activities, GVC's maintenance crews, or contract crews, will be responsible for the immediate notification of a fire started in the Project area. GVC will have notification numbers readily available for all employees in case of fire and will update emergency contact numbers for any changes prior to construction or exploration activities for the Project.

11.7.6 Emergency Fire Contacts

Mohave County Sheriff's Department:	928-768-7055
Prescott Interagency Fire Dispatch Center:	928-777-5700
BLM KFO Non-Emergency Line:	928-718-3700

11.7.7 Fire Prevention Measures

The following fire prevention measures will be implemented at all times by GVC during construction, operation, exploration activities and maintenance of the Project:

- No smoking will be allowed while operating equipment or while walking or working in areas with vegetation.
- Open flame will only be allowed in cleared areas.
- In areas where smoking is allowed, completely extinguish all burning tobacco and matches and discard them in ash trays, not on the ground.
- Do not allow any fires or barbecues within the Project area, at material yards, access roads, or other construction areas, other than the designated lunch areas.
- Instruct all field personnel about emergency response for fire events.
- Clear away all flammable material for a minimum of 10 ft from areas of operation where a spark, fire, or flame could be generated.
- If a fire does start by accident, immediate steps will be taken to extinguish it (if it is safe to do so) using available fire suppression equipment and techniques taught at field crew emergency response training that will be provided by GVC.
- Approved welding or cutting activities will only be performed in areas cleared of vegetation for a minimum of 10 ft around the area. Fire response personnel will remain in the construction area for 30 minutes after conclusion of welding or cutting activities to reduce the possibility of welding activities smoldering and starting a fire. Welder vehicles will be equipped with fire suppression equipment.
- All equipment assigned to the Project will be inspected and approved. Internal combustion engines (stationary or mobile) will be equipped with spark arresters that meet agency standards, and for which the following guidelines will apply:
    - Light trucks and cars with factory installed (type) mufflers (in good condition) may be used on roads where the roadway is cleared of all vegetation
    - On roads where vegetation exists, spark arresters will be used and maintained in good working order
    - Vehicles equipped with catalytic converters may represent potential fire hazards and will be parked on areas cleared of vegetation
- The use of torches, fuses, highway flares, or other warning devices with open flames will be prohibited. GVC will use only electric or battery-operated warning devices within the Project area.
- Equipment parking areas and small stationary engine sites will be cleared of all flammable materials as determined necessary by BLM.
- Gas and oil storage areas will be cleared of all flammable material for a distance of 100 ft with "NO SMOKING" signs posted throughout the area. All used and discarded oil filters, oily rags or other waste will be disposed of in the approved manner. Only MSHA-approved containers will be used as containers for gasoline or other flammable materials.

11.7.8 Minimum Fire Prevention and Suppression Equipment Required

The following fire prevention and suppression equipment will be readily available and maintained in good working order at all times during Project operation, construction, and exploration activities. At least one motorized vehicle in each active construction area (spread) would contain:

- One long handled round point shovel

- One ax or Pulaski fire tool
- One 5-pound ABC Dry Chemical Fire Extinguisher
- One 5-gallon water backpack (or other approved container) full of water or other extinguishing solution
- Hardhat, work gloves, and eye protection

In addition to the fire suppression equipment required in motorized vehicles, construction work sites will comply with the following:

- Power saws, if required for construction, will be equipped with an approved spark arrester and accompanied by one 5-pound ABC dry chemical fire extinguisher and a long handled, round point shovel when used away from a vehicle.
- Fuel service trucks will contain one 35-pound capacity fire extinguisher charged with the necessary chemicals to control electrical and fuel fires.
- Wood cutting, welding, or other construction work sites that have a higher risk of starting fires will have at least two long handled round point shovels and two 5-pound ABC dry chemical fire extinguishers available on-site.
- Every construction work site will have at least one radio and/or cellular/satellite telephone to contact BLM's FMO and GVC.

11.7.9 Post-Fire Rehabilitation Strategies

An Origin and Cause Investigation will be carried out on any human-caused fire by BLM law enforcement or their designated representative. To minimize disturbance of potential evidence located at the fire scene, GVC would properly handle and preserve evidence in coordination with BLM. BLM will pursue cost recovery for all costs and damages incurred from human-caused fires on BLM lands when the responsible party(s) has been identified and evidence of legal liability or intent exists.

Legal liability includes, but is not limited to, negligence and strict liability (including statutory and contractual liability), and products liability, etc. If the cause of a fire is determined to be the result of the Project, GVC will implement rehabilitation measures as required by BLM and the following post-fire rehabilitation measures will be implemented by GVC:

- After a fire has been extinguished, the burn areas will be reclaimed in accordance with BLM requirements. Small burn areas will be revegetated to the native vegetation using appropriate seed mixtures. Larger burn areas may require specific restoration plans. Coordination with BLM is necessary to determine requirements for each particular area, depending upon the size and location of a fire, and the location of sensitive resources.
- To prevent the spread of noxious weeds and invasive species during post-fire rehabilitation, a Noxious Weed Management Plan will be implemented by GVC.

12.0 TRANSPORTATION PLANNING

12.1 Transportation Plan

The following section discusses the management of mining related transportation of all personnel, supplies, materials, exploration, mining and processing components (e.g., drilling, mining, crushing, leaching and Merrill Crowe), doré and wastes to and from the Project. Transport methods will be limited to road

transportation as rail transportation is not available. Incoming materials will include explosives fuel, lubricants, ammonium nitrate, bulk liquid cyanide, caustic, anti-scalant totes, and various vehicle and equipment maintenance items. Further, this section discusses activities that could result in adverse effects from the transportation of materials to and from the Project.

12.2 Main Access Road to Mine – BLM Road 7717

The Moss Mine patented claims are surrounded by federal lands administered by BLM on which unpatented lode claims registered to GVC, or optioned to GVC by third parties, are located. The patented claims are accessed by means of an unimproved dirt road (Moss Mine Access Road) that extends north from Silver Creek Road (a County Regional Road) for approximately 2 kilometers. The unimproved road is identified by BLM as BLM Road 7717 and is designated as open to motor vehicle use in the KFO RMP (1993). This designation creates a safety hazard as the existing road is mostly single lane and terminates at the mine entrance gate.

To alleviate this safety issue, in May 2017, GVC submitted plans for design approval to Mohave County to upgrade the Moss Mine Access Road to an AASHTO Class IV Rural Road with two 12-ft-wide travel lanes with 5-ft-wide shoulders. The County approved the design and GVC filed a ROW Permit Application with BLM. On July 3, 2018, BLM approved a Grant for ROW along BLM Road 7717 (AZ 037252), see **Appendix Q**. The realignment and improvement of BLM Road 7717 occurred in spring 2019.

12.3 Mine Roads/Drilling Roads

Mining roads on patented claims generally measure 24-ft wide with 5-ft wide drainage channels, as required, along both sides of the road. These access roads are for traveling between the ancillary facilities throughout the mine site. Within the active mining areas, haul roads are a minimum of 60-ft wide. Left-hand traffic is required on all roads within the active mining areas, right-hand traffic in all other areas. Speed limits throughout the Moss Mine Project area will be established at a maximum of 15 mph. GVC controls dust on roads through application of water or chemical (e.g., magnesium chloride) suppressants. Exploration drilling activities will use existing roads or overland travel.

Where drilling sites are not immediately accessible from existing roads, short routes of non-graded overland access will be utilized in order to access the drilling site and minimize disturbance. The construction of new spur roads may be required to access drilling sites that lack direct access from existing roads or where topographic conditions (e.g., steep terrain, rock outcrops, and drainages) prohibit safe overland access to the drilling site. New spur roads will be located within previously surveyed (i.e., cultural and biological) areas and will be located to minimize visual and biological impacts. The number of new spur roads will be held to a minimum, consistent with their intended use (e.g., access to drilling location).

Where new drilling access roads need to be constructed they will be limited to 15 ft in width. Additionally, some portions of the existing road network surrounding the Moss Mine may require improvements. Improvements could include clearing overgrown vegetation, re-grading, and filling in wash-outs. Specific mitigative actions will be implemented to reduce construction impacts, see Section 15. Standard design techniques, such as installing water bars and dips to control erosion, will be included. In addition, measures will be taken to minimize impacts in specific locations and during certain periods of the year. For example, construction activities will not occur when weather or other conditions increase potential environmental impacts to unacceptable levels, as determined by BLM. Such conditions could arise during heavy rains or

high winds. To prevent unnecessary impacts during such periods, drilling activities may be restricted or curtailed. Upon completion of exploratory activities, new drilling access roads will be fully reclaimed upon abandonment of the route. Existing access roads that required improvement for exploratory activities will be reclaimed to that of the same character upon abandonment of the route.

12.4 Haul Roads

Mine truck haul roads are designed to safely accommodate 70-ton trucks and include safety berms and ditches that are typically 60-ft wide plus 5-ft berming on either side. Haul trucks have the right-of-way and all mine site traffic crossing the haul roads must yield to the haul trucks. Access to the truck haul roads is limited to specific personnel.

Mine haul roads are constructed from the open pit to the primary crusher and to the barren rock stockpiles. Temporary haul roads will be constructed internally to the ultimate open pit limits as necessary to provide access to all working faces in the open pit and connecting with the primary crusher, and barren rock areas located to the southeast of the open pit for Phase II operations. Expansion of the barren rock area for Phase III will include development of extended haul roads to the southeast and for roads from the proposed Far Western open pit to the proposed barren rock stockpile west and temporary growth medium storage area.

Mine haul roads are constructed using material excavated from the open pit. Road surface material is crushed and screened as needed to produce a smooth-running surface.

Pit haul roads support the traffic of 70-ton off-highway mine haulage trucks. The gradient for the mine haul roads will be 10% although short intervals may be constructed as steep as 12%. Roads are slightly crowned to promote drainage of surface runoff to side ditches or berms. Safety berms are constructed to a minimum height of approximately 4 ft to 8 ft. The standard minimum height is equal to the center of the axle of the largest truck wheel.

Haul truck traffic follows the convention of left-hand traffic in the open pit and barren rock areas. Dust control and suppression is conducted by wetting the road surfaces with water trucks.

12.5 Transportation of Mine Consumables

Phase III materials arriving and leaving the mine will be transported by truck. **Table 24** shows the major products and consumables that are shipped to and from the mine, along with the expected quantities and number of trips. A trip is defined as a round trip for one truck entering the mine site to pick up or leave a load and leaving the mine empty or with the load.

Table 24: Transportation of Products and Consumables

Material	Quantity/Year	Trips/Week
Cement, tons	5,000	3
Diesel fuel, gallons	800,000	2.5
Cyanide, pounds solution	180,000	0.5
Ammonium nitrate, tons	3,100	3
Miscellaneous reagents, tons	30	1
Explosives, tons	100	1

13.0 EMPLOYEES AND OPERATIONAL HOURS

The standard work force for the Project is approximately 150 employees. The GVC work force generally consists of approximately 50 technical, administrative, and security personnel, 20 maintenance employees and up to 42 mining crafts. Mining contractor, N. A. Degerstrom, employs an additional 30 employees. Administrative and technical personnel generally work 8-hour shifts, five days a week. Operations and maintenance personnel work 12-hour shifts, seven days per week. The majority of the skilled mining personnel working at the Project are located in the greater Bullhead City/Laughlin Area. During exploration drilling it is anticipated that an additional 25 drillers, helpers, and supervisors will be employed. A majority of the crafts required for daily mining operations will be shuttled to/from the GVC Office on Adobe Road (approximately 10 miles from the mine) by van.

14.0 WASTE MANAGEMENT/SPILL PREVENTION PLAN [3809.401 (B) (2) VI]

14.1 Introduction

The following Project-specific measures pertain to all vehicle refueling and servicing activities as well as the storage, transportation, production, and disposal of hazardous materials/wastes. These measures are intended to prevent the discharge of fuels, oils, gasoline, and other harmful substances to waterways, groundwater aquifers, and/or other sensitive resource areas during Project construction, maintenance and operations. Hazardous materials used on the Project include petroleum products, such as: gasoline, diesel fuel, hydraulic fluids; lubricating oils and solvents; cleansers; explosives; cyanide; and other substances. The Cyanide Management Plan is provided in **Appendix P**. Some of these materials will be used in relatively large quantities to operate and maintain equipment during construction and mine operations. Explosives will be used for blasting rock during mining operations.

Smaller quantities of other materials, such as pesticides and fertilizers, paints, and chemicals may be used during Project operation and maintenance. Pesticides and herbicides are hazardous materials and they will be used and stored according to labeling and regulatory requirements. GVC maintains an inventory of all hazardous materials used and Material Safety Data Sheets (MSDS) for all materials. GVC would maintain copies of the required MSDS for each hazardous chemical and would ensure that they are readily accessible during each work shift to all employees when they are in their work area(s). The MSDS will provide basic emergency response information for small and large releases of the hazardous materials. In the case that bulk hazardous materials are used, the Emergency Response Guidebook, produced by DOT, is an acceptable reference.

GVC has a well-developed Hazardous Material Program in place associated with Phase II operations and work to use non-hazardous substances in routine construction and maintenance activities, to the extent possible.

The hazardous materials management guidelines for the Project, discussed in this section, are intended to reduce the risks associated with the use, storage, transportation, production, and disposal of hazardous materials (including hazardous substances and wastes). These guidelines address spill prevention, response, and clean-up procedures for the Project. A Phase II amended SPCC Plan, will be developed by GVC for Phase III, which will identify specific legal requirements and practices to achieve these goals.

The term "hazardous materials," as presented in these guidelines, will refer to hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials, and materials designated as

hazardous for transportation as defined in 49 CFR 171.8. The goals of these guidelines are to: 1) minimize the potential for a spill of fuel or other hazardous material; 2) contain any spillage to the smallest possible area; and 3) to protect areas that may be environmentally sensitive.

These guidelines include the following components:

- Spill prevention procedures related to the transportation, storage, and disposal of hazardous materials
- Spill control, response, and clean-up methods
- An overview of the notification and documentation procedures to be followed in the event of a spill
- Construction, operation, exploration and maintenance considerations

In general, hazardous materials, hazardous wastes, and clean-up equipment will be stored in approved containers until they can be properly transported and disposed of at an approved treatment, storage, and disposal facility. Persons responsible for handling or transporting hazardous materials for the Project will be trained and certified in accordance with Arizona Department of Transportation (ADOT) and/or FHWA requirements in the proper use/management of the materials and will be familiar with all applicable laws, policies, and procedures related to such handling or transportation.

It is the responsibility of GVC to maintain file records of proper training/certification for any individual(s) that may potentially handle hazardous materials for the Project. GVC reserves the right to audit any subcontractors to ensure compliance.

14.2 Regulatory Compliance

Major legislation pertaining to hazardous materials includes the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); RCRA; CAA; and CWA. Numerous other federal, state, and local regulations also govern the use, storage, transportation, production, and disposal of hazardous materials. Some of the key requirements of these laws are outlined in:

- Mining Safety and Health Administration (30 CFR)
- Clean Water Act (40 CFR 100-149)
- Clean Air Act (40 CFR 50-99)
- Toxic Substances Control Act (40 CFR 700-799)
- CERCLA/Superfund Amendments and Reauthorization Act (40 CFR 300-399)
- Solid and Hazardous Wastes (40 CFR 239-299)
- Hazardous Materials Transportation Act (49 CFR 100-199)

14.3 Designation of Coordinator/Responsible Person

GVC would identify an emergency coordinator for hazardous materials management and emergency response during Phase III construction and exploration activities. Two alternates would also be identified. Business, residential, and mobile phone numbers would be provided for all three persons, as necessary, to allow for contact on a 24-hour basis. Primary and alternate emergency response coordinators would be knowledgeable of the chemicals and processes involved in construction of the Project and will have the authority to commit GVC resources to implement the plan. They also would have stop-work authority in case of non-compliance or danger to human health or the environment. During the Project's exploration,

operation, and maintenance phase, GVC will ensure that its facilities, personnel, and contractors comply with federal, state, and local laws and regulations pertaining to the use, storage, transport, and disposal of hazardous materials and adhere to required emergency response and clean-up procedures in the event of a hazardous material spill. GVC and all operations and maintenance contractors would develop hazardous materials management and response plans and properly train employees for handling, packaging, and shipping hazardous materials and responding to hazardous materials spills or emergency events.

14.4 Inventory of Hazardous Materials

GVC would provide a complete inventory of all hazardous materials to be utilized in Phase III construction, operation, exploration, and maintenance activities on BLM land. GVC would be responsible for consulting with the relevant agencies if they handle extremely hazardous substances.

14.5 Refueling and Servicing

Construction vehicles (trucks, bulldozers, loaders, excavators etc.), and equipment (pumps, generators, etc.) generally will be fueled and serviced in designated areas at least 100 ft from drainages (including intermittent and perennial). Refueling locations generally should be flat to minimize the chance of a spilled substance reaching a stream. In most cases, smaller rubber-tired vehicles will be refueled and serviced at local gas stations. Tracked vehicles will typically be refueled and serviced on-site. In some cases, pickup trucks or tankers will be used to refuel and service construction equipment. Every effort will be made to minimize the risk of a fuel spill during refueling and servicing. Fuel/service vehicles will carry a suitable absorbent material to collect approximately 20 gallons of spilled materials. In addition, all vehicles will be inspected for leaks prior to being brought on-site, and regularly throughout Project implementation.

14.6 Transportation of Hazardous Materials

Procedures for loading and transporting fuels and other hazardous materials will meet the minimum requirements established by DOT and Arizona Department of Transportation (ADOT) and other pertinent regulations. Prior to transporting hazardous materials, appropriate shipping papers would be completed. Transportation of hazardous materials should be performed by a hazardous material transport firm in accordance with DOT regulations. In addition, GVC will ensure that all handling or packaging of hazardous materials and all paperwork for transport of hazardous materials is performed by properly trained personnel, in accordance with DOT and ADOT regulations.

At all times, all hazardous materials used for the Project will be properly stored in approved DOT containers and labeled, including during transportation. Smaller containers will be used on-site to transport needed amounts of hazardous materials to a specific location. Transfer of materials from large to small containers will be performed using appropriate equipment including pumps, hoses, and safety equipment; hand pouring techniques will not be utilized. These smaller ("service") containers will also be clearly labeled. Special provisions apply to the transportation of explosives.

14.7 Storage of Hazardous Materials

Hazardous materials will be stored only in designated storage areas. Clean-up materials, including absorbent spill pads and plastic bags, will also be stored and available in specified areas. Hazardous materials will not be stored in areas subject to flooding or inundation.

14.7.1 Physical Storage Requirements

The following section describes guidelines for the storage of hazardous materials.

- Storage Containers: containers holding hazardous waste or materials would be compatible with the wastes or materials stored. If the container is damaged or leaks, the waste must be immediately transferred to a container in good condition. GVC would inspect containers at least weekly to verify the integrity of the containers and any containment systems. Containers used for transportation must comply with the DOT and ADOT requirements.
- Incompatible Materials: materials, including hazardous wastes, will not be placed in containers that previously held an incompatible waste or material.
- Ignitable or Reactive Materials: containers holding hazardous wastes or materials that may ignite or are reactive must be located at least 50 ft from the material yard's property line. "NO SMOKING" signs would be conspicuously placed wherever there is a hazard from ignitable or reactive material.
- Container Management: containers holding hazardous wastes will be kept closed at all times, except when it is necessary to add or remove contents. Before the handling and/or transportation of containers carrying hazardous wastes, the containers should be inspected to ensure that they are sealed such that no material spillage occurs.
- Secondary Containment: secondary containment will consist of bermed or diked areas that are lined and capable of holding 110% of the volume of the stored material and will be provided for liquid hazardous materials stored on-site.
- Security: hazardous wastes and materials will be stored in secure areas to prevent damage, vandalism, or theft. All storage containers will remain sealed when not in use and storage areas will be secured (gated, locked, and/or guarded) at night and/or during non-construction periods.

14.7.2 Container Labeling Requirements

GVC will comply with the following labeling requirements for any container (including tanks) used on-site to store accumulated hazardous wastes. The containers will be labeled with the information below and as required in 40 CFR 262.

- The accumulation start date and/or the date the 90-day storage period began
- The words: "Hazardous Waste"
- The composition and physical state of the wastes
- Warning words indicating the particular hazards of the waste, such as flammable, corrosive, or reactive
- The name and address of the facility that generated the waste

14.8 Disposal of Hazardous Wastes

Hazardous wastes will be routinely collected and disposed of in accordance with all applicable laws and regulations. GVC will determine details on the proper handling and disposal of hazardous waste and will assign responsibility to specific individuals prior to construction of the Project. Every effort will be made to minimize the generation of hazardous waste during the Project including, but not limited to: minimizing the amount of hazardous materials needed for the Project; using alternative non-hazardous substances when available; recycling usable material, such as oils, paints, and batteries to the maximum extent; and filtering and reusing solvents and thinners whenever possible.

Any generator of hazardous waste must apply for an EPA identification number. The identification number is needed to complete the Uniform Hazardous Waste Manifest to ship wastes off-site. A generator can accumulate hazardous wastes on-site for a period of up to 90 days without having to obtain a permit as a storage facility.

14.8.1 Contaminated Containers

Containers that once held hazardous materials as products or that held hazardous wastes must be considered as potential hazardous wastes, due to the possible presence of residual hazardous material. Regulations specify certain requirements, listed below, for how the container is to be handled as a nonhazardous waste.

- The containers must be empty. As much of the contents will have been removed as possible using the practices commonly employed to remove materials from that type of container (e.g., pouring, pumping, and aspirating), so that none will pour out in any orientation.
- A container that held compressed gas is empty when the pressure in the container approaches atmospheric.
- If empty containers are less than 5-gallon capacity, they may be disposed of as a nonhazardous solid waste or scrapped.
- If the empty containers are greater than five-gallon capacity, they must be handled in the following manner:
    - Returned to the vendor for re-use
    - Sent to a drum recycler for reconditioning
    - Used or recycled on-site
    - All these actions must occur within one year of the container being emptied

14.8.2 Waste Oil Filters

Used metal canister oil filters can be managed as non-hazardous wastes if:

- Thoroughly drained of “free flowing” oil (oil exiting drop-by-drop is not considered “free flowing”)
- Accumulated, stored, and transferred in a closed, rainproof container
- Transferred for the purposes of recycling
- Not terne-plated (an alloy of tin and lead)

Terne-plated oil filters are a hazardous waste, exhibiting the hazardous characteristic of lead. Terne-plated oil filters that are not recycled must be managed as a hazardous waste.

14.8.3 Used Lubrication Oil

Lubrication oil is considered a used oil, as listed below:

- Any oil that has been refined from crude oil, and has been used; and as a result of use, has been contaminated with physical or chemical impurities
- Any oil that has been refined from crude oil and, as a consequence of extended storage, spillage, or contamination with non-hazardous impurities, such as dirt, rags, and water, is no longer useful to the original purchaser
- Spent lubrication fluids that have been removed from a truck or heavy equipment

Used oil may be a hazardous waste if:

- The concentrations of polychlorinated biphenyls exceed 50 parts per million
- Total halogens exceed 1,000 parts per million
- Mixed with a hazardous waste

Used oil not being burned or recycled must be managed as a hazardous waste unless it is determined to be non-hazardous through laboratory analysis.

14.9 Spill Prevention Control and Countermeasure Plans

Construction, operation, exploration, and maintenance of the Project will require the use of certain potentially hazardous materials, such as fuels, oils, explosives, and herbicides. By definition, hazardous materials (substances and wastes) have the potential to pose a significant threat to human health and the environment based upon their quantity, concentration, or chemical composition. When stored, used, transported, and disposed of properly, as described below, the risks associated with these materials can be reduced substantially.

Pursuant to 43 CFR 3809.401(b)(2), the Project will incorporate spill contingency plans. The following section outlines the physical and procedural steps to be taken in the event of a spill, which will be included in conjunction with any countermeasures identified in GVC's existing SPCC Plan associated with Phase II. In general, GVC will oversee all clean-up activities, including providing necessary materials and labor, and performing all reporting and documentation as required. All spills, regardless of quantity, will be recorded in the log maintained by the GVC Environmental Specialist. All reportable spills will be immediately reported to BLM.

14.9.1 Physical and Procedural Response Measures

Physical response actions are intended to ensure that all spills are promptly and thoroughly cleaned up. However, the first priority in responding to any spill is personal and public safety. Construction personnel will be notified of evacuation procedures to be used in the event of a spill emergency, including evacuation routes. In general, the first person on the scene will:

- Attempt to identify the source, composition, and hazard of the spill
- Notify appropriately trained personnel immediately
- Isolate and stop the spill, if possible, and begin clean-up (if it is safe)
- Initiate evacuation of the area, if necessary
- Initiate reporting actions

Persons should only attempt to clean-up or control a spill if they have received proper training and possess the appropriate protective clothing and clean-up materials. Untrained individuals should notify the appropriate response personnel. In addition to these general guidelines, persons responding to spills will consult the Emergency Response and Contingency Plan or DOT Emergency Response Guidebook (to be maintained by GVC on-site during all construction and operation activities), which outlines physical response guides for hazardous materials spills.

In general, expert advice will be sought to properly clean-up major spills. For spills on land, berms will be constructed to contain the spilled material and prevent migration of hazardous materials toward waterways.

Dry materials will not be cleaned up with water or buried. Contaminated soils will be collected using appropriate machinery, stored in suitable containers, and properly disposed of in appropriately designated and approved areas off-site. After contaminated soil is recovered, all machinery used will be decontaminated, and recovered soil will be disposed of as specified in the SPCC Plan. Contaminated clean-up materials (absorbent pads, etc.) and vegetation will be disposed of in a similar manner. For spills, clean-up may be verified by sampling and laboratory analysis, at the discretion of GVC.

14.9.2 On-Site Equipment

GVC is responsible for designating locations and contents of spill kits to be used during Project construction and exploration activities. The following guidance is provided in developing the contents of a spill kit. The location and minimum inventory for each spill kit must be documented within the SPCC.

Emergency spill response kits will be maintained at all locations where hazardous materials are stored, in sufficient quantities and based on the amount of materials stored on-site. Spill response equipment should be compatible with types of materials stored on-site and should be inventoried regularly to ensure spill response equipment is adequate for the type and quantities of materials being used. The following are equipment examples of spill response equipment for use in clean-up situations:

- Absorbent pads/materials
- Personal protective gear
- Medical first aid supplies
- Bung wrench (non-sparking)
- Phone list with emergency contact numbers
- Storage containers
- Communications equipment

In addition, radios or other communication equipment will be maintained in vehicles as well as other easily accessible locations. Additional clean-up materials may be required, as specified in the SPCC Plan.

14.9.3 Employee Spill Prevention/Response Training and Education

GVC will provide spill prevention and response training to the appropriate construction personnel. Persons accountable for carrying out the procedures specified herein will be designated prior to construction and informed of their specific duties and responsibilities with respect to environmental compliance and hazardous materials. The training will inform the appropriate personnel of the site-specific environmental compliance procedures. Training of personnel should be completed at least once a year. All training events should be documented, including the date and names of those personnel in attendance. These records will be maintained with the SPCC Plan. At a minimum, this training would include the following:

- An overview of regulatory requirements
- Methods for the safe handling/storage of hazardous materials
- Spill prevention procedures
- Emergency response procedures
- Use of personal protective equipment
- Use of spill clean-up equipment
- Procedures for coordinating with emergency response teams
- Procedures for notifying agencies

- Procedures for documenting spills
- Identification of sites/areas requiring special treatment, if any

14.9.4 Spill Notification and Documentation Procedures

Notification and documentation procedures for spills that occur during Project construction, operation, exploration, or maintenance will conform to applicable federal, state, and local laws and regulations. Adherence to such procedures will be the top priority once initial safety and spill response actions have been taken. The following sections describe the notification and documentation procedures and should be implemented in conjunction with the response procedures listed in the SPCC.

14.9.4.1 Spill Notifications

Notification will begin as soon as possible after discovery of a spill. GVC will immediately notify BLM if the spill is over 30 gallons on BLM land. If GVC determines that the spill may seriously threaten human health or the environment, they will orally report the discharge as soon as possible, but no later than 24 hours from the time they become aware of the circumstances, as directed below. Prior to initiating notification, GVC (or individual initiating notification) should obtain as much information as possible.

When notifying BLM or other regulatory agency, the following information should be provided:

- Current threats to human health and safety including known injuries, if any
- Spill location including landmarks and nearest access route
- Reporter's name and phone number
- Time spill occurred
- Type and estimated amount of hazardous materials involved
- Potential threat to property and environmental resources, especially streams and waterways
- Status of response actions

14.9.4.2 Spill Documentation

GVC will maintain records for all spills. State and federal agencies that have been verbally notified of a spill will be informed in writing within 10 days for state agencies and 30 days for federal agencies. GVC would record spill information in a daily log. The following is a list of items that should be included in the daily log (as appropriate, based on the spill incident):

- Time and date of each log entry
- Name of individual recording log entry
- List of all agencies notified including name of individual notified, time, and date
- Type and amount of material spill
- Resources affected by spill
- List of response actions taken including relative success
- Copies of letters, permits, or other communications received from government agencies throughout the duration of the spill
- Copies of all outgoing correspondence related to the spill
- Photographs of the response effort (and surrounding baseline photographs, if relevant)

Maintaining detailed and organized records during a spill incident is an important and prudent task. One GVC representative will be designated to manage the records for an incident. If extensive spill response and clean-up operations are required, GVC may choose to assign an individual to assist in the documentation process. This person will track and manage all expenditures (i.e., equipment, personnel/labor hours, and associated resources) as well as help supplement the information provided in the daily log book.

14.10 Camping/Lodging Accommodations/Parking

Given the mine's proximity to Bullhead City and the limited space on the mine site, GVC does not provide camp facilities for employees currently nor during Phase III construction activities nor for long term operations. GVC provides crew vans for moving staff to and from the mine site. The proposed Phase III expansion will provide limited parking for laboratory staff, grade control personnel, mine geologists, mine engineers, and visitors.

14.11 Sewage and Septic Field

Presently, the mine is serviced by restroom trailer blocks and "Porta-Potties" serviced by a local contractor. The restrooms discharge to a holding tank that is pumped periodically; however, it is anticipated that two septic systems will be developed as part of the Project. One field will be located within the patented claims and the second will be located near the proposed maintenance shop/office complex on BLM land adjacent and south of the mine main entrance. Both systems will be designed to Mohave County Health Department Standards.

15.0 RESOURCE PROTECTION AND CONTROL PLANS

The resource protection and control commitments described in this section and in **Appendix R** are applicable to Project construction, exploration, operation, maintenance and reclamation of the Project. If new disturbances occur during the operation and maintenance phases of this Project, these measures will be reviewed and, where necessary, reimplementation will occur under the direction of BLM and GVC.

15.1 Air Quality

The current facility Class I General Permit (Permit No. 64302, acquired by GVC in February 2017) would require minor revisions to address Phase III operations. Air quality and current facility permits are discussed in further detail in Section 7.2.2. The specific operating conditions of the air quality permit to limit criteria pollutant emissions (particulate matter, nitrogen oxides, sulfur dioxide, and carbon monoxide) can be found in Attachment B, Section 1, of Permit No. 64302. Requirements for limiting volatile organic compounds from fuel storage and generator combustion are also included in Attachment B of Permit No. 64302. Visible emissions are monitored per EPA Reference Method 9 Opacity measurements that are taken in compliance with permit stipulations. Fugitive dust from blasting, operations, exploration, equipment, and unpaved roads is managed by GVC per ADEQ approved Dust Control Plan, which is included as an integral part of Air Quality Permit No. 64302.

15.1.1 Dust Control

Construction of the Project and ongoing exploration activities will cause a temporary and minimal increase in fugitive dust and air emissions from heavy construction equipment. Air quality control measures are intended to minimize fugitive dust and air emissions and to maintain conditions as free from air pollution

as is practical. GVC will not proceed with any construction or exploration activities without taking reasonable precautions to prevent excessive particulate matter from becoming airborne and creating nuisance conditions.

Excessive exhaust emissions from vehicles and heavy equipment will be prevented by proper maintenance, and no open burning of construction trash will be allowed unless permitted by the authorized officer. Where necessary, water will be used as an approved dust control method during construction and mining, including the grading of roads or the clearing of land, and will be applied on unpaved roads, material stockpiles, and other surfaces that can create airborne dust. A dust collection system with bag houses has been incorporated into the crushing system. Where application of water is not possible, material stockpiles may be enclosed. In addition, open-bodied trucks transporting materials likely to become airborne will be covered.

Water trucks will be the primary means of dust abatement during all phases of construction and exploration, as required. Where soil disturbance occurs, the disturbed soil will be watered to form a crust. Roads will be watered at intervals sufficient to control dust or per direction of the dust control monitor. Water spray will be controlled so that pooling will be avoided to the extent possible. Construction water and water used for dust control will come from permitted sources identified by GVC. If the quality of the water is found to be causing any environmental changes (i.e., dying vegetation), GVC will test the quality of the water and provide the results to BLM for review. All mining personnel will be educated on dust control procedures.

15.2 Waste Management and Hazardous Materials

Please see Section 14.0 for a description of waste management and protection and control measures, including hazardous materials and wastes.

15.3 Geotechnical Stability

Pit wall stability will be monitored to ensure that optimal safe slopes can be achieved; please see Section 9.5.2 for a further description of the open pit monitoring program.

15.4 Cultural Resource Protection

Avoidance is the preferred method by GVC for preventing adverse effects to both unevaluated and evaluated prehistoric or historic sites potentially eligible for listing in the NRHP. If an area is not avoidable for mine facilities or operation, GVC will work with BLM in accordance with applicable preservation office agreements (e.g., Arizona SHPO) to undertake mitigation (e.g., data recovery). If a site meets NRHP eligibility criteria a historic properties treatment plan, data recovery plan, and/or other appropriate mitigation will be completed under applicable agency agreements or memorandum of agreements with BLM. If a site does not meet eligibility criteria as defined by the NRHP Criteria for Evaluation, no further cultural work will be performed.

Any cultural and/or paleontological resource discovered by GVC, or any person working on the behalf of GVC, on BLM administered public lands or Arizona State Trust Land will be immediately reported to BLM authorized representative. Such resources include any historic or prehistoric site, structure, object, artifact, human remains, or vertebrate fossils. GVC will suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the authorized representative. BLM will determine the appropriate course of action to prevent the loss of significant cultural or scientific values. In

the event of the unanticipated discovery of significant cultural remains, where adverse impacts to the resource cannot be avoided, GVC will be financially liable for all resulting costs that may include preparation of a Historic Properties Treatment Plan, data recovery excavations and reporting, and cultural material curation. Failure to notify BLM about a discovery may result in civil or criminal penalties in accordance with the Archaeological Resources Protection Act of 1979 (as amended). GVC will be responsible for assuring that all project personnel and contractors have been instructed on cultural resource avoidance and protection measures.

15.5 Recreational Resources and Public Access

Recreational resources and public access are described in Section 7.9. Environmental protection commitments pertaining to recreational resources and public access are provided in **Appendix R**.

15.6 Visual Resource Protection

Visual resources in the project area are described in Section 7.10 and **Appendix I**. Visual resource protection commitments are described in **Appendix R**.

15.7 Vegetation and Soils

15.7.1 Vegetation Removal

Vegetation removal and soil disturbances (including temporary road improvements, such as: filling pot holes; hand pruning shrubs along roadway for safe travel; repairing damaged existing drainage features; and removing large boulders that may pose a travel hazard) will be minimized in areas where soil constraints occur. In areas of overland construction, where vegetation removal is required, mowing or cutting will be the primary method used. Plants will generally be cut at a height that results in the least damage to the root crown during cutting or subsequent damage by vehicles and equipment.

15.7.2 Construction on Expansive Soils

Expansive soils within the Moss Mine study area are limited. Potential areas containing expansive soils, particularly in the older clay formations, are limited within exploration areas (i.e., peach springs tuff, aycone, illite). The extensive advanced argillic alteration zone, found southwest of Moss Mine, is primarily composed of mainly kaolinite, dickite, sericite, and alunite clays that are mainly at a ratio of 1:1 clay and are non-swelling. Expansive soils have not been identified under the proposed Phase III leach pad or barren rock stockpiles (Newfields 2019). GVC will avoid development of exploration roads on soils with high clay content as well as avoid traveling on all exploration roads in wet weather to prevent undo degradation of the road surface.

15.7.3 Drainage Control

A variety of drainage controls such as straw bales, wattles and other similar controls, may be used on mine roads to direct surface runoff away from the road surface to prevent rill and rut development and to control runoff and sediment discharges. The exploratory and mine road improvements may include water bars at appropriate intervals related to slope and geologic material, ditches, and appropriate grades and inclination.

15.7.4 Working in Wet Soils

Construction, operation, and maintenance activities will be restricted when the soil is too wet to adequately support construction or maintenance equipment (i.e., when heavy equipment creates ruts in excess of five inches deep over a distance of 100 ft or more in wet or saturated soils). This standard will not apply in areas with silty soils, which easily form depressions even in dry weather. Where the soil is deemed too wet, one or both of the following measures will apply:

- When feasible, re-route all construction or maintenance activities around the wet areas so long as the route does not cross into sensitive resource areas.
- Limit access of construction equipment to the minimum area feasible, remove and separate growth medium in wet or saturated areas, and stabilize subsurface soils with a combination of one or more of the following: grading to dewater problem areas; utilize weight dispersion mats; and maintain erosion control measures.
- After construction is complete, re-grade and re-contour the area, replace growth medium or growth medium, and reseed to achieve the required plant densities as required by BLM.

15.7.5 Reducing Short-Term Erosion and Sedimentation

The objectives of these measures are to reduce short-term erosion and sedimentation, as well as quickly restore topography and vegetation to pre-construction conditions in all areas required and approved by BLM. A qualified resource specialist will monitor implementation during construction through the operation phase until successful revegetation is achieved. Monitoring of the project approved erosion control measures will continue until reclamation is completed to the standards required by BLM and the Arizona Office of the State Mine Inspector (AMSI). Implementation of the following practices will minimize the effects of grading, excavation, and other surface disturbances in Project areas.

- Limit disturbance of soils and vegetation removal to the minimum area necessary for access and construction.
- Inform all construction personnel before they are allowed to work on the Project of environmental concerns, pertinent laws and regulations, and elements of the erosion control plan.
- Minimize grading. When required, grading should be conducted away from drainageways (receiving waters) to reduce the risk of material entering the drainage.
- Slope and berm graded material where possible, to reduce surface water flows across the graded area.
- Replace excavated materials in disturbed areas and minimize the time between excavation and backfilling.
- Direct the dewatering of excavations onto stable surfaces to avoid soil erosion.
- Employ temporary construction BMPs such as temporary detention basins, certified weed-free straw bales, or silt fences where appropriate.
- Use drainage controls such as straw bales, wattles and other similar controls, where necessary, to direct surface drainage away from disturbance areas and to minimize runoff and sediment deposition down slope from all disturbed areas. These structures include ditches, water bars (berms and cross ditches), rolling dips, and sediment traps.
- Use non-standard construction equipment and techniques in areas of highly erodible soils that minimize surface disturbance, soil compaction, and loss of growth medium where practicable.

- Minimize vegetation clearing to the degree possible. Erodible slopes that do not require grading should be cleared using equipment that results in little to no soil disturbance to the degree practicable.
- Re-establish native vegetation cover in highly erodible areas as quickly as possible following construction where determined necessary.

After construction and post construction reclamation, monitoring of the erosion control environmental commitments will continue on an annual basis during the operation and maintenance phase until affected soils have been stabilized so that there is no or minimal accelerated erosion and until reclamation efforts are considered complete and successful by BLM.

15.8 Riparian Area Mitigation Plan

Within the Project area, riparian areas are restricted to xeroriparian communities located along ephemeral washes that are represented by only slightly higher plant densities than upland areas. Because the Project does not contain any discernable riparian communities, no specific riparian seed mix for reclamation is included, rather, seed mixes used for upland vegetation communities will be utilized. Impacts on ephemeral non-jurisdictional drainage areas would occur for the development of the proposed open pits, heap leach pad and barren rock stockpiles.

The reclamation plan (Section 17) describes how these areas will be reclaimed after project cessation. For exploration activities, ephemeral drainage areas are not anticipated to be impacted significantly as existing roads and overland travel will be utilized. Drainageways are typically used for ingress and egress into the region either utilizing motorized or non-motorized methods (e.g., horseback).

15.9 Wildlife

An overview of biological resources within the project area is provided in Section 7.7, and further details are provided in the BE (**Appendix H**). Wildlife species that occur within the region are currently protected from mining operations through implementation of various educational, protective, and exclusionary measures, including:

- Installation of game fencing, desert tortoise fencing and berms around leach pads, ponds, and open pit areas, see **Figure 5** (fencing designs provided in **Appendix F**).
- Use of bird deterrent balls/floating tile cover, reflectors, and/or netting on pond surfaces to deter avian use of solution ponds.
- WEAP training for all staff, contractors and visitors to the site.
- Performing pre-construction surveys for desert tortoise in the leach pad, pit and barren rock stockpile areas.
- Reduced speed limit of 15 mph throughout the Moss Mine Project area except along Silver Creek Road where posted speed limits will be adhered to.
- Minimizing ground disturbance to the extent practicable required for mining and exploration activities, specifically methods to reduce ground disturbance may include:
    - Use of 4WD to avoid slippage on loose soil;
    - "One way in one way out" – utilize one overland track in and the same track to exit;
    - Avoid driving over wet soils if rutting of more than 2" occurs;
    - Use of overland travel where practicable.

Further, GVC may consider installation of guzzlers/water basins for bighorn sheep if the need for and suitable locations are identified by AZGFD and BLM. Coordination with BLM and AZGFD will be included as part of the NEPA review and would be used to facilitate identification of additional wildlife protection measures, if necessary. Additionally, GVC will place water tanks outside of the heap leach pad, pit, and barren rock stock pile fence lines for wildlife to utilize as a water source; thus, mitigating wildlife attempting to access process ponds and potentially becoming entrapped.

15.10 Noxious Weed Management Plan

Noxious weeds are generally defined as "a plant that interferes with management objectives for a given area of land at a given point in time." Noxious weeds are opportunistic plant species that readily flourish in disturbed areas; thereby preventing native plant species from re-establishing communities. This plan discusses: 1) the plan purpose, goals, and objectives; 2) the noxious weed inventory; 3) noxious weed management practices; 4) monitoring; and 5) the use of pesticides.

15.10.1 Plan Purpose

This Noxious Weed Management Plan provides methods to control the potential occurrence/infestation of noxious weeds during and following construction of the Project and during exploration activities. It is the responsibility of GVC, working with BLM, to ensure that noxious weeds are identified and controlled during the construction of Project facilities and during exploration activities. All federal, state, county, and other local requirements must also be satisfied, with respect to noxious weeds.

15.10.2 Goals and Objectives

The goal of this Noxious Weed Management Plan is to implement early detection, containment, and control of noxious weeds during Project construction and exploration activities. These preventative and treatment measures are described below. An evaluation of the effectiveness of the prescribed control measures will also be implemented during the operational and exploration phases of the Project.

The management of noxious weeds will be considered throughout all stages of the Project, including:

- Educating all construction personnel regarding the problem areas that may be identified and the importance of preventative measures and treatment methods
- Specific preventative measures to prevent the spread of noxious weeds
- Pre- and post-construction treatment methods to be applied to areas of noxious weed infestation

The following is a description of the measures that may be required for noxious weed management as directed by BLM. Applicable measures will be agreed upon prior to the onset of any ground disturbing activities and this Noxious Weed Management Plan may be modified accordingly.

15.10.3 Identification of Problem Areas

Prior to the initiation of construction, exploration, or mining activities, all personnel will be instructed on the importance of controlling noxious weeds. This instruction will be included in the Project WEAP. As part of start-up activities, GVC will provide information and training regarding noxious weed management. The importance of preventing the spread of noxious weeds in areas not infested, and controlling the proliferation of weeds already present, will be emphasized. Prior to construction, areas of concern will be

flagged, if required, by GVC and reviewed by BLM. A qualified botanist or weed specialist will survey proposed disturbance areas and identify areas of concern. This flagging will alert GVC personnel and prevent access into areas until noxious weed management control measures, as described below, have been implemented.

15.10.4 Preventive Measures

As part of the weed management program, the following preventative measures will be implemented to prevent the spread of noxious weeds during mining, construction, and exploration activities as well as during reclamation efforts. The following preventative measures are to be applied on a case-by-case basis, where applicable and necessary. Prior to ground-disturbing activities, including those known to support noxious weeds, a qualified botanist or weed specialist will survey the proposed disturbance area. The biologist or weed specialist will survey the proposed disturbance area. The weed specialist, working in conjunction with BLM, will identify areas where the following measures will be implemented:

- Where feasible, construction will begin in weed-free areas before operating in weed-infested areas.
- All movement of construction vehicles will be restricted to predesignated access, GVC acquired access, or public roads. All construction sites and access roads will be clearly marked or flagged at the outer limits prior to the onset of any surface disturbing activity.
- All personnel will be informed that their activities must be confined within the marked or flagged areas. GVC will locate equipment storage, machine and vehicle parking, or any other area needed for the temporary placement of people, machinery, and supplies in areas that are relatively weed-free.
- Before moving into relatively weed-free areas or out of relatively weed-infested areas, if identified, all GVC vehicles and equipment will be cleaned using high-pressure equipment (i.e., compressed air). The cleaning activities will concentrate on tracks/tires and on the undercarriage, with special emphasis on axles, frame, cross members, motor mounts, and on and underneath steps, running boards, and front bumper/brush guard assemblies. Vehicle cabs will be swept out and refuse will be disposed in waste receptacles.
- GVC will ensure that vehicles and equipment are free of soil and debris capable of transporting noxious weed seeds, roots, or rhizomes before the vehicles and equipment are allowed use of access roads on BLM land.
- GVC would avoid or minimize all types of travel through state listed noxious weed-infested areas that can be carried to the Project area or restrict major activities to periods of time when the spread of seed or plant parts are least likely.
- In areas where infestations are identified or noted, GVC will stockpile cleared vegetation and salvaged growth medium adjacent to the area to eliminate the transport of soil-borne noxious weed seeds, roots, or rhizomes.
- Where necessary, GVC will return weed-free growth medium and vegetative material during reclamation from infestation sites.
- GVC will ensure that straw or hay bales used for sediment barrier installations or mulch distribution are obtained from state-cleared sources that are certified free of primary noxious weeds. Reclamation post construction contractors would retain “weed free” tags as part of documentation.
- Immediately following construction, GVC will implement the reclamation of disturbed land as required. Continuing revegetation efforts will ensure adequate vegetative cover, preventing the spread of noxious weeds.
- Specific on-site weeds will be identified by a qualified weed specialist.

15.10.5 Treatment Methods

GVC will implement noxious weed treatment measures in accordance with existing regulations and BLM requirements. Before construction, only pesticides that are approved by BLM will be applied to the identified weed infestations on federal land to reduce the spread or proliferation of weeds. Post-construction and exploration control measures can include one or more of the following methods (that may be implemented during restoration activities):

- Treatment methods will be based on species-specific and area-specific conditions (e.g., proximity to drainages) and will be coordinated with BLM or other appropriate agency representatives. If areas are not seeded until the following spring, because of weather or scheduling constraints, undesirable vegetation will be eradicated before seeding.
- Mechanical methods rely on equipment that can be used to mow or disc weed populations. If such a method is used in areas to be restored, subsequent seeding will be conducted to reestablish a desirable vegetative cover that will stabilize the soils and slow the potential reinvasion of noxious weeds.
- Discing or other mechanical treatments that would disturb the soil surface within native habitat will be avoided in favor of pesticide application, which is an effective means of reducing the size of noxious weed populations as well as preventing the establishment of new colonies.
- Seed selection will be based on site-specific conditions and the appropriate seed mix identified for those conditions as directed by BLM.
- Pesticide applications will be controlled to minimize the impacts on the surrounding vegetation. In areas of dense infestation, a broader application will be used and a follow-up seeding program will be implemented.

15.10.6 Pesticide Use on BLM Land

The *Final Environmental Impact Statement on Vegetation Treatment on BLM Land in Thirteen Western States* lists 19 pesticides acceptable for use on BLM lands (DOI 1991). The pesticides approved for use on the Project will be reviewed and approved by BLM prior to initiation of construction. Guidelines for the use of chemical control of vegetation on BLM land are presented in BLM's Chemical Pest Control Manual. These guidelines require submittal of a Pesticide Use Proposal (PUP), which will be prepared by GVC and submitted to BLM for review and approval prior to initiation of construction activities. Once approved, any use of pesticides will require Pesticide Application Records (PARs) that detail the use and application. The PARs will then be submitted to BLM in a timely manner.

The occurrence of noxious weeds within the Project area will be reported to BLM's KFO. The appropriate weed control procedures including target species, timing of control, and method of control will be determined in consultation with BLM by GVC, based on the procedures outlined in this Noxious Weed Plan. GVC may be able to take advantage of any existing cooperative agreements between BLM and Mohave County by providing the funds required for county personnel to implement the necessary weed control procedures. If not, GVC will be responsible for providing the necessary personnel or hiring a contractor to implement the weed control procedures with the qualifications and equipment described below.

15.10.7 Personnel Requirements

Weed management actions would be carried out by a weed management specialist with the following qualifications:

- Training and experience in native plant taxonomy/identification
- Training and experience in field ecology and plant community mapping
- Possession of a Commercial Applicator's License for pesticides from the Arizona Department of Agriculture (ASA)
- Training in weed management or Integrated Pest Management, with an emphasis in noxious/invasive weeds

15.10.8 Equipment Requirements

Weed management would require the following equipment for weed control:

- Backpack sprayer
- 4WD truck and trailer
- All-terrain vehicle
- Chemical or biological supplies
- Tractor and disc, or dozer equipped with ripper (in conjunction with restoration and reclamation practices), if required

15.10.9 Noxious Weed Monitoring

A weed management specialist, contracted by GVC, will monitor the Project annually for noxious weeds. Monitoring will be conducted during the lifecycle of the species. This monitoring may coincide with the restoration monitoring. During monitoring, GVC will initiate monitoring of previously identified affected/disturbed areas during the first spring following construction and proceed with monitoring during subsequent intervals.

Noxious weed monitoring will occur annually following completion of the Project and during exploration activities. In addition, noxious weed conditions will be included in the evaluations of revegetation success. GVC will implement this schedule on BLM land. GVC will document its observations following the above noted field inspections and make these monitoring reports available to BLM and Mohave County, as required.

Areas where the spread of a noxious weed infestation is noted, particularly in previously unaffected locations, will be further evaluated to determine if these areas require remedial action and additional treatment. GVC will identify such areas to BLM and will record any additional noxious weed control treatments required. A report summarizing revegetation progress, percent cover, and weed infestation will be provided to BLM annually.

15.10.10 Ongoing Noxious Weed Monitoring

GVC will consult with BLM and Mohave County should they have a concern pertaining to noxious weeds within their jurisdictions. BLM may also contact GVC to report on the presence of noxious weeds. Operations personnel will be trained in the identification of predominant noxious weed populations, and GVC will control the weeds on a case-by-case basis. If determined necessary, a report on actions taken will be provided in the form of monitoring reports to BLM on a predetermined schedule, as required.

15.10.11 Pesticide Application, Handling, Spills, and Cleanup

The use of pesticide treatment requires GVC to coordinate with a BLM weed management specialist and prepare, submit, obtain, and maintain a PUP to utilize pesticides for Project activities. A certified pesticide applicator, approved in the State of Arizona, will perform the application using BLM selected and approved pesticides in accordance with applicable laws, regulations, and permit stipulations.

All pesticide applications must follow EPA label instructions. Application of pesticides will be suspended when any of the following conditions exist:

- Wind velocity exceeds 6 mph during application of liquids
- Wind velocity exceeds 15 mph during application of granular pesticides
- Snow or ice covers the foliage of noxious weeds
- Precipitation is occurring or is imminent within 24 hours of application

Vehicle-mounted sprayers (e.g., handgun, boom, and injector) may be used in open areas that are readily accessible by vehicle. Hand application methods (e.g., backpack spraying) that target individual plants will be used to treat small or scattered weed populations in rough terrain. Calibration checks of equipment will be conducted at the beginning of spraying and periodically during spraying, to ensure that proper application rates are achieved. Pesticides will be transported to the Project site with the following provisions:

- Concentrate will be transported in approved containers only, in a manner that will prevent tipping or spilling, and in a location that is isolated from the vehicle's driving compartment, food, clothing, and safety equipment.
- Mixing will be done off-site, over a drip catching device, and at a distance greater than 200 ft from drainageways or other sensitive resources. No pesticides will be applied at these areas unless authorized by appropriate regulatory agencies.
- All pesticide equipment and containers will be inspected for leaks daily.
- Disposal of spent containers will be in accordance with the pesticide label.

15.10.12 Pesticide Spills and Cleanup

All reasonable precautions will be taken to avoid pesticide spills. In the event of a spill, cleanup will be immediate. GVC will keep spill kits in their vehicles and in pesticide storage areas to allow for quick and effective response to spills. Items to be included in the spill kit are:

- Protective clothing and gloves
- Absorptive clay, "kitty litter," or other commercial absorbents
- Plastic bags and a bucket
- Shovel
- Fiber brush and screw-in handle
- Dust pan
- Caution tape
- Traffic warning markers (use on established roads only)
- Detergent

The response to a pesticide spill will vary with the size and location of the spill, but general procedures include:

- BLM notification
- Traffic control, if required
- Dressing the clean-up team in protective clothing
- Stopping any leaks
- Containing spilled material
- Cleaning up and removing spilled pesticide and contaminated absorptive material and soil
- Transporting spilled pesticide and contaminated material to an authorized disposal site

16.0 EXPLORATION PROGRAM

GVC has developed an exploration program that identifies six specific target areas that will comprise the proposed disturbance being permitted under this MPO. These target areas will allow GVC to focus its baseline data collection efforts to only those portions of the Project where disturbance proposed in this exploration plan would occur. No private or State of Arizona surface lands are present within the exploration areas boundaries (State of Arizona owns the mineral estate in Section 3, Township 20N Range 20W.) These six target areas are shown in **Figure 3A through Figure 3F** of the MPO and include the following areas:

1. Far Western Extension
2. East Extension
3. Grapevine
4. Florence Hill
5. West Oatman
6. Old Timer

Activities proposed in this exploration program include: the use of existing roads and construction of new access roads and overland access as described in Section 12.3, and further detailed in the following Section 16.4; construction of exploration drill pads and sumps; core drilling; and reclamation (addressed in Section 17). **Table 25** below presents a summary of the proposed surface disturbance associated with this exploration program for each of the exploration areas shown on **Figure 3A through Figure 3F**.

It should be noted that **Table 25** is an estimate of the amount of disturbance that would potentially occur within each exploration area. The maximum dimension of an individual drill pad is 85-ft in diameter or 5,675 square feet (ft^2)of disturbance (i.e., .13 acres). Disturbance for sumps associated with drill sites is included in the 85-ft diameter disturbance area. The intent of GVC is to draft an exploration plan for BLM review the year prior to exploration activities. This exploration plan will identify where roads and drill sites are required. Cultural and biological surveys and reporting will be developed and amended to the yearly exploration plan. It is anticipated that exploration areas Far Western Extension and East Extension would be the first areas GVC will explore for future mining activities. Reclamation bonds associated with exploration activities would be paid as each yearly exploration program is executed.

Table 25: Anticipated Exploration Proposed Disturbance Areas

Exploration Area	Site/Activity	Proposed Disturbance (acre)
Far Western Extension	Drill site/pad – 100 drill sites	13.03
	L1 Access road – existing major road	NA

Exploration Area	Site/Activity	Proposed Disturbance (acre)
	L2 Access road – existing road	NA
	L3 Access road – existing road with improvements	0.28
	L4 Access road – new road	5.79
	L5 Overland access	NA
	TOTAL	**19.1**
East Extension	Drill site/pad – 142 drill sites	18.50
	L1 Access road – existing major road	NA
	L2 Access road – existing road	NA
	L3 Access road – existing road with improvements	0.37
	L4 Access road – new road	9.08
	L5 Overland access	NA
	TOTAL	**27.95**
Grapevine	Drill site/pad – 44 drill sites	5.73
	L1 Access road – existing major road	NA
	L2 Access road – existing road	NA
	L3 Access road – existing road with improvements	0.29
	L4 Access road – new road	2.48
	L5 Overland access	NA
	TOTAL	**8.50**
Florence Hill	Drill site/pad – 103 drill sites	13.42
	L1 Access road – existing major road	NA
	L2 Access road – existing road	NA
	L3 Access road – existing road with improvements	0.18
	L4 Access road – new road	9.61
	L5 Overland access	NA
	TOTAL	**23.21**
West Oatman	Drill site/pad – 63 drill sites	8.21
	L1 Access road – existing major road	NA
	L2 Access road – existing road	NA
	L3 Access road – existing road with improvements	0.16 (BLM)/0.17 (ASLD)
	L4 Access road – new road	1.99 (BLM)/3.93 (ASLD)
	L5 Overland access	NA
	TOTAL	**14.46**

Exploration Area	Site/Activity	Proposed Disturbance (acre)
Old Timer	Drill site/pad – 86 drill sites	11.20
	L1 Access road – existing major road	NA
	L2 Access road – existing road	NA
	L3 Access road – existing road with improvements	NA
	L4 Access road – new road	5.89
	L5 Overland access	NA
	TOTAL	**17.09**
TOTAL: ALL NEW ROADS; ROADS REQUIRING IMPROVEMENTS AND DRILL SITES		**110.31**

Note: Proposed new disturbance for L3 Access roads (existing road with improvements) was calculated assuming 15% of the road length would require improvements that disturb soil or additional grading in steep terrain, at a width of 15-ft. Proposed disturbance for L4 Access roads (new road) was calculated at 15-ft wide with an additional 15% to account for additional grading in steep terrain.

16.1 Exploration Drilling

16.1.1 Introduction

Exploration by definition, is the act of investigating, examining, and analyzing. The optimal exploration plan would be one that minimizes costs, disturbances, and environmental impact while maximizing the acquisition of knowledge and information. The details of the proposed exploration plan that form an integral part of this MPO are based on the most current knowledge available to GVC. The sources of the knowledge utilized in preparing the program include the following assessments and data:

- GVC pedestrian reconnaissance surveys
- GVC soil sampling surveys
- GVC rock chip sampling surveys
- GVC airborne geophysical surveys
- GVC geological mapping programs
- GVC trenching and sampling programs under Notice level permit
- GVC core drilling and percussion drilling under Notice level permit
- On the claims optioned by GVC from La Cuesta International (LCI)
  - LCI pedestrian reconnaissance surveys
  - LCI soil sampling surveys
  - LCI rock chip sampling surveys
  - LCI pedestrian geophysical surveys
  - LCI geological mapping programs
- Westland Resources Cultural Resources Inventory
- Westland Resources Biological Examination
- Reynolds Metals reverse circulation (RC) drill program on West Oatman
- Reynolds Metals RC drill program on Far West Extension
- Lac Minerals RC and core drill programs on Far West Extension
- Arizona Geological Survey Mining Data Website

- USGC Geological Reports & Maps
- Academic, Government & Industry Research Reports and Technical Presentations

However, as each exploration program progresses and new data is acquired and analyzed, the considered technical opinions of the professionals leading the programs as to the optimal location of drill holes, access and reclamation will change. The effects of disturbance activities such as access trails, roads and drill sites/pads on biological, recreational, cultural, visual and other resources might be assessed differently by BLM specialists as programs progress. It is a tenet of this MPO that there be allowances for minor changes (+/- 200 ft) in actual drill hole locations, access factors, and levels of disturbance as additional geological and environmental information is obtained. All proposed changes would be submitted to BLM well in advance of planned program changes. There would be no material changes in the overall scope of the exploration program.

Changes would be focused on: lessening disturbances; lessening costs, materials, and energy consumption; optimizing data collection; and easing mitigation requirements. Any areas not previously cleared in the Cultural or Biological surveys would be surveyed in advance of the change submission by third party contractors.

The intent of GVC is to advise BLM, in advance, of the priority areas for yearly exploration activities so that both GVC and BLM can be as efficient as possible in allocation of resources. It is anticipated that exploration areas Far Western Extension and East Extension would be the first areas that GVC will explore as these are tied to planned mining activities. Reclamation bonds associated with the exploration program activities will be approved by BLM and supplied by GVC in advance of exploration program commencement.

16.1.2 Drilling Methodology

Approximately 538 exploration drill sites are proposed across the six exploration areas. Exploration drilling will be conducted by RC rigs, core rigs, and track-mounted (air trac) rigs. Each rig will be supported by at least two rubber-tired vehicles. The number of drill rigs on-site will vary depending on seasonal conditions and the type of drilling conducted (RC drilling/percussion drilling/core versus core rigs). GVC anticipates that the maximum number of drill rigs on-site at any one time could be five drill rigs. No more than five drill holes will be left open at a time, and reclamation bond estimate was developed to reflect this level of disturbance. Drill hole depths will range between 90 ft below ground surface (bgs) and 1,000 ft bgs, with an average depth of approximately 300 ft bgs. The depth to groundwater is estimated to range between 100 ft bgs and 800 ft bgs.

Drill pads will be constructed to maintain sufficient space for safe operation of equipment. Drill pads and the associated sumps will vary in size depending on the type of drill rig used. The drill pads will be constructed with an adjacent sump to contain drill water and drilling mud. In some areas, a common sump will be used to manage drill water from several drill sites. The sumps are designed to prevent discharge of pollutants; however, certain sumps will be designed for controlled discharge of clear water in compliance with state regulations. The reclamation cost estimate includes the anticipated surface disturbance for the drill pads and sumps.

Sumps for drill fluids and/or mud, and cuttings will be excavated within the limit of the drill site. Sumps/mud pits will be 5-ft by 5-ft in size, by 5-ft deep, and would have a ramp at 2:1 slope on one end, resulting in ramp dimensions of 5-ft wide and 10-ft long, and tapering from 5-ft deep to 0-ft deep. The sumps would be lined. Sumps would be backfilled after completion of drilling for safety reasons and to ensure protection

of the environment. Sumps would be backfilled with original material from the excavation and re-seeded. If mud tanks are to be cleaned at the site, the contents will be contained in the sump and covered with backfilled soil materials. Panel, wire fencing, snow fencing, electric fencing, and other types of barriers that will preclude access will be installed around each sump to prevent access by larger wildlife, horses, and livestock. Nevertheless, one end of each sump will be sloped to provide an escape route in the event an animal enters the sump.

Resource protection measures, including required permits, are addressed in Section 15 and reclamation is addressed in Section 17 of the MPO. Appropriate permits will be obtained from ADEQ for temporary discharge of water into ephemeral drainages. Discharge points will be constructed in native ground rather than fill, and discharge sumps will be designed, if necessary, to allow suspended solids to settle out of produced water to minimize down-drainage surface flow. Temporary BMP erosion controls, such as straw bales, wattles, and other diversion controls, called for in the SWPPP, will be utilized for exploration activities.

16.1.3 Access Roads and Design Specifics

Five categories of access roads will be used for this Project that will include existing roads, overland construction, and new bladed construction. Surface access to each exploratory drilling site is required. This Project will use existing access roads wherever available and/or practical. Maximum use will be made of existing roads, thus keeping new construction to a minimum. The five road categories are defined as follows:

- Level 1 - Major Thoroughfares; Paved Roads, or County Maintained Roads:
  These roads are typically interstates, highways, and state routes (e.g., I-40, Bullhead Parkway) and will be used for travel to Silver Creek Road.
- Level 2 - Existing Unpaved BLM, City or County Roads Not Requiring Improvements:
  These are existing BLM dirt or gravel roads that generally will not require any improvements outside of the current road footprint to support construction vehicles to access the expansion areas or drilling sites. Regular maintenance for construction (regarding washout areas, graveling, regrading, and installation of gravel pads for controlling trackout) may be required in these areas. Typically, these roads are 24-ft wide.
- Level 3 - Existing Unpaved Roads Requiring Improvements:
  These are existing dirt or gravel roads that may require improvements to support construction vehicles or exploratory drilling rigs and may be widened up to 15 ft total width. Improvements to these existing roads may include mowing, blading, realignment, widening cut/fill, and vegetation removal. Improvements to these roads may require restoration depending on the needs of long-term maintenance or ongoing drilling activities. Access roads that require improvement will be staked to a maximum width of 15 ft wide. In rough terrain conditions, improved roads may require increased grading, including cuts and fills, for access along steep slopes (side-hill roads). Spoil piles will be on the uphill sides of the roads. Existing access roads required for drilling will be evaluated for areas that require repairs prior to implementing drilling activities. Photographs and locational data will be obtained for areas along existing access roads that require repairs. Repairs along existing access roads would include: filling pot holes; hand pruning shrubs along roadway for safe travel; repairing damaged existing drainage features; and removing large boulders that may pose a travel hazard.
- Level 4 - New Access/Drilling Roads:
  These roads are generally less than 15 ft wide. Construction of these new access roads may include mowing, blading, and vegetation removal. These new roads may require restoration to pre-construction condition if they are not required for future exploration activities. Approved new

access roads will be staked to a standard width of up to 15 ft wide but may be extended up to 24 ft in width in side hill areas or in exceptionally rough terrain.

- Level 5 - Overland Access:
  In areas where no grading will be needed to access construction areas or drill sites, GVC may use overland access for remote drilling sites inaccessible by road. Overland access will consist of drive-and-crush and/or clear-and-cut travel. Drive-and-crush is vehicular travel to access a drilling site without significantly modifying the landscape. Vegetation is crushed but not cropped; soil is compacted but no surface soil is removed. Even though vegetation may be damaged or destroyed, this creates vertical mulch upon the surface soil and leaves the seed bank in place. Crushed vegetation will likely re-sprout after temporary use is stopped. Clear-and-cut is considered as brushing off (removal) of all vegetation in order to improve or provide suitable access for equipment. All vegetation is removed using above ground cutting methods that leave the root crown intact. Soils are compacted, but no surface soil is removed. Prior to work beginning, overland access routes will be staked to a maximum width of 15 ft wide. GVC will make every effort to minimize the footprint of these overland access routes. Hand raking will be implemented to remove traces of overland access at the completion of exploration activities.

16.2 Exploration Areas

The following sections provide a brief characterization of the biological, surface hydrological, and cultural resource features within each exploration area. Please refer to Section 7 of the MPO for additional information on these features within the Project area. Additionally, the proposed exploration activities for each exploration area is described in the following sections. Please refer to **Table 25** and **Figure 3A through Figure 3F** for a summary of proposed exploration activities.

16.2.1 Far Western Extension

The Far Western Extension exploration area is located west of the existing Moss Mine, within Sections 24 and 25 of Township 20N, Range 21 W and Sections 19 and 30 of Township 20N, Range 20W (**Figure 3A**). The Far Western Extension exploration area is located primarily within BLM's LHFO region. The boundary of BLM's Bullhead Bajada ACEC lies south of the boundary of the Far Western Extension exploration area. No activities are proposed within the Bullhead Bajada ACEC.

Slopes in the Far Western Extension area are predominantly south-facing and typically not as steep as the terrain to the west and east. Slopes in the area range from 10% to 40% in the area of the proposed pit and 5% to 20% in the area of the proposed barren rock stockpile. Elevations range from 1,980 ft to 2,120 ft. Vegetation within the Far Western Extension area is typical of Mohave Desert Scrub and species composition is dominated by creosote and brittlebush. Ephemeral drainage features support upland species, including mesquite, desert willow, smoketree, desert baccharis, blue paloverde, catclaw acacia, and burrobush, with larger ephemeral drainages supporting relatively denser vegetation than upland areas. Portions of three USGS blue lines (drainages), named Lower Drainage C, Drainage E, and Drainage F that were identified during jurisdictional delineations previously performed for the Project area, cross through the southern, eastern, and westernmost portion of the Far Western Extension exploration area. Generally, most of Drainages C, E, and F exhibit poorly defined or discontinuous channels, beds, and banks. Upland vegetation commonly persists within the channels, indicating very low and infrequent flows of low energy. Portions of these drainages exhibit defined channels with areas of scour and deposition of finer sediments within the channel beds. Three cultural resource sites have been identified within the Far Western Extension area, all of which are recommended NRHP-eligible. These sites are all related to historical mining activities.

Proposed exploration activities will consist of constructing approximately 100 drill sites with drill hole depths ranging from 200 ft bgs to 600 ft bgs. **Figure 3A** depicts the Far Western Extension exploration area boundary in which exploration activities are proposed and the locations of existing roads that allow ready access to the area. The proposed exploration is estimated to create 19.1 acres of new disturbance (see **Table 25**).

In addition to the proposed exploration disturbance, the proposed Phase III heap leach pad to support Phase III mining activities (see Section 4.0 of MPO) is located in the vicinity of Far Western Extension. Approved drilling activities (BLM Approved Notice AZA-36827) are located in the northeast corner of the Far Western Extension Area and are shown in **Figure 3A**. In addition, the Far Western Extension Pit and barren rock stockpiles are located in the vicinity.

Photographs taken within the Far Western Extension exploration area to provide a representative characterization of the area are provided in **Appendix S**.

16.2.2 East Extension

The East Extension exploration area is located east of the existing Moss Mine, within Sections 20, 21, 27, and 28 of Township 20N, Range 20W (**Figure 3B**). The East Extension exploration area is located within BLM's KFO region.

Slopes in the East Extension area are predominantly south-facing with slopes ranging from 20% to 60%. Elevations range from 2,100 ft to 2,300 ft. Vegetation within the East Extension area is typical of Mohave Desert Scrub and species composition is dominated by creosote and brittlebush. Ephemeral drainage features support upland species, including mesquite, desert willow, smoketree, desert baccharis, blue paloverde, catclaw acacia, and burrobush, with larger ephemeral drainages supporting relatively denser vegetation than upland areas. One USGS blue line, named Drainage D that was identified during jurisdictional delineation efforts for the Project area, lies west of the East Extension exploration area. Several additional small ephemeral drainages occur within the exploration area that have not been formally delineated and do not appear as blue lines on USGS maps. Cultural resource sites have been identified within the East Extension area, including three recommended NRHP-eligible and one recommended as NRHP-ineligible. These cultural resources sites relate to historical mining activities.

Proposed exploration activities will consist of constructing approximately 142 drill sites with drill hole depths ranging from 200 ft bgs to 600 ft bgs. **Figure 3B** depicts the East Extension exploration area boundary in which exploration activities are proposed and the locations of existing roads that allow ready access to the area. The proposed exploration is estimated to create 27.95 acres of new disturbance (see **Table 25**).

In addition to the proposed exploration disturbance, approved drilling activities (BLM Approved Notice AZA-36827) and eastern pit extension are located in the westernmost portion of the East Extension Area and are shown on **Figure 3B**. In addition, a portion of the proposed barren rock stockpile east for Phase III activities is located in the vicinity.

Photographs taken within the East Extension exploration area to provide a representative characterization of the area are provided in **Appendix S**.

16.2.3 Grapevine

The Grapevine exploration area is located southeast of the existing Moss Mine, within Sections 27, 33, and 34 of Township 20N, Range 20W (**Figure 3C**). The Grapevine exploration area is located within BLM's KFO region. The boundary of the Mount Nutt Wilderness Area lies adjacent to the east boundary of the Grapevine exploration area. No activities are proposed within the wilderness area.

Slopes in the Grapevine exploration area are predominantly south-facing with slopes ranging from 20% to 60% and range in elevation from 2,200 ft to 2,600 ft. Vegetation within the Grapevine area is typical of Mohave Desert Scrub and species composition is dominated by creosote and brittlebush. Ephemeral drainage features support upland species, including mesquite, desert willow, smoketree, desert baccharis, blue paloverde, catclaw acacia, and burrobush, with larger ephemeral drainages supporting relatively denser vegetation than upland areas. Two USGS blue lines (drainages) occur in the Grapevine area, one bisecting the area and the second crosses through the northern portion of the exploration area. Drainages in the Grapevine exploration area have not been delineated. No cultural sites have been identified within the Grapevine area; however, cultural resources sites have been identified nearby to the northeast of the exploration area boundary.

Proposed exploration activities in the Grapevine exploration area will include construction of approximately 44 drill sites with drill hole depths ranging from 200 ft bgs to 900 ft bgs. **Figure 3C** depicts the Grapevine exploration boundary in which exploration activities are proposed and the locations of existing roads that allow ready access to the area. The proposed exploration is estimated to create 8.5 acres of new disturbance (see **Table 25**).

Photographs taken within the Grapevine exploration area to provide a representative characterization of the area are provided in **Appendix S**.

16.2.4 Florence Hill

The Florence Hill exploration area is located southeast of the existing Moss Mine, within Sections 33 and 34 of Township 20N, Range 20W and Sections 3 and 4 of Township 19N, Range 20W (**Figure 3D**). The Florence Hill exploration area is located within BLM's KFO region. The boundary of the Mount Nutt Wilderness Area lies adjacent to a portion of the east boundary of the Florence Hill exploration area. No activities are proposed within the wilderness area.

Florence Hill is an escarpment striking west-northwest with steep slopes. Slopes in the area range from 20% to near vertical and range in elevation from 2,300 ft to 2,900 ft. Vegetation within the Florence Hill area is typical of Mohave Desert Scrub and species composition is dominated by creosote and brittlebush. Ephemeral drainage features support upland species, including mesquite, desert willow, smoketree, desert baccharis, blue paloverde, catclaw acacia, and burrobush, with larger ephemeral drainages supporting relatively denser vegetation than upland areas. Two USGS blue lines (drainages) occur in the Florence Hill area, one bisecting the area and the second flowing adjacent to the southwest boundary of the exploration area. Drainages in the Florence Hill exploration area have not been formally delineated. Five cultural resource sites have been identified within the Florence Hill area, all of which are recommended NRHP-eligible. These cultural resources sites are related to historical mining and transportation.

Proposed exploration activities in the Florence Hill exploration area will include construction of approximately 103 drill sites with drill hole depths ranging from 300 ft bgs to 1,200 ft bgs. **Figure 3D** depicts

the Florence Hill exploration area boundary in which exploration activities are proposed and the locations of existing roads that allow ready access to the area. The proposed exploration is estimated to create 23.21 acres of new disturbance (see **Table 25**).

Photographs taken within the Florence Hill exploration area to provide a representative characterization of the area are provided in **Appendix S**.

16.2.5 West Oatman

The West Oatman exploration area is located south of the existing Moss Mine, within Sections 31 and 32 of Township 20N, Range 20W and Section 5 of Township 19N, Range 20W (**Figure 3E**). The West Oatman exploration area is located within BLM's KFO region and abuts the LHFO region boundary. The boundary of BLM's Bullhead Bajada ACEC lies adjacent to the western boundary of the West Oatman exploration area. No activities are proposed within the Bullhead Bajada ACEC.

Slopes in the West Oatman exploration area are predominantly north-facing and range from 20% to 60% slope. Elevation ranges from 2,100 ft to 2300 ft. Vegetation within the West Oatman area is typical of Mohave Desert Scrub and species composition is dominated by creosote and brittlebush. Ephemeral drainage features support upland species, including mesquite, desert willow, smoketree, desert baccharis, blue paloverde, catclaw acacia, and burrobush. The larger ephemeral drainages, particularly in portions of Silver Creek Wash immediately adjacent to Silver Creek Spring and an unnamed spring, support relatively dense xeroriparian vegetation. Based on analysis by Ecosphere, these springs are not perennial. Three USGS blue lines (drainages) cross or partially cross through the West Oatman area, one bisecting the westernmost portion, the second entering only the northern portion of the exploration area along BLM Road 7748, and the third bisecting the exploration area east of BLM Road 7748. One additional drainage flows adjacent to the eastern West Oatman boundary. Drainages in the West Oatman exploration area have not been formally delineated. Cultural sites have been identified within the West Oatman area, including four recommended NRHP-eligible and one recommended as NRHP-ineligible. These cultural resources sites are related to historical mining and transportation.

Proposed exploration activities in the West Oatman exploration area will include constructing approximately 63 drill sites with drill hole depths ranging from 150 ft bgs to 600 ft bgs. **Figure 3E** depicts the West Oatman exploration area boundary in which exploration activities are proposed and the locations of existing roads that allow ready access to the area. The proposed exploration is estimated to create 14.46 acres of new disturbance (see **Table 25**).

Photographs taken within the West Oatman exploration area to provide a representative characterization of the area are provided in **Appendix S**.

16.2.6 Old Timer

The Old Timer exploration area is located north of the existing Moss Mine, within Sections 13 and 24 of Township 20N, Range 21W and Section 18, 19 and 20 of Township 20, Range 20W (**Figure 3F**). The Old Timer exploration area is located in both BLM's LHFO and KFO regions.

Slopes in the Old Timer exploration area are predominantly north-facing and range in slope from 10% to 40%. Elevations range from 1,900 ft to 2,200 ft. Vegetation within the Old Timer area is typical of Mohave Desert Scrub and species composition is dominated by creosote and brittlebush. Ephemeral drainage

features support upland species, including mesquite, desert willow, smoketree, desert baccharis, blue paloverde, catclaw acacia, and burrobush, with larger ephemeral drainages supporting relatively denser vegetation than upland areas. Four USGS blue lines (drainages) cross or partially cross through the Old Timer area. Drainages in the Old Timer exploration area have not been formally delineated. Five cultural sites have been identified within the Old Timer area, all of which are recommended NRHP-eligible. These cultural resources sites are all related to historical mining activities.

Proposed exploration activities in the Old Timer exploration area will include constructing 86 drill sites with drill hole depths ranging from 200 ft bgs to 500 ft bgs. **Figure 3F** depicts the Old Timer exploration area boundary in which exploration activities are proposed and the locations of existing roads that allow ready access to the area. The proposed exploration is estimated to create 17.09 acres of new disturbance (see **Table 25**).

Photographs taken within the Old Timer Extension exploration area to provide a representative characterization of the area are provided in **Appendix S**.

17.0 RECLAMATION PLAN [3809.401 (B) (3)]

Pursuant to 43 CFR 3809.401(b)(3) this section discusses:

1. Drill-hole plugging plans
2. Regrading and reshaping plans
3. Mine reclamation, with open pit backfilling information
4. Wildlife habitat rehabilitation plans
5. Growth medium handling plans
6. Revegetation plans
7. Plans to isolate and control toxic or deleterious material
8. Plans to remove/stabilize buildings, structures, and facilities
9. Provisions for post-closure management

17.1 Introduction

This Reclamation Plan has been developed based on the principles and procedures established by BLM and the Office of the State Mine Inspector. This Reclamation Plan is applicable to the construction and operation of Phase III facilities, exploration activities, and other work areas associated with the Project. The intent of this Reclamation Plan is to prevent unnecessary degradation of the environment during construction, restore temporary use areas, and reclaim disturbed areas such that these areas are ecologically functional and visually compatible with the surrounding environment to the greatest extent practicable.

17.2 Regulatory Authority

Authority for the reclamation practices defined in this Reclamation Plan is provided under the following regulations including:

- BLM Terms and Conditions ROW Grants and Temporary Use Permits 43 CFR 2881.2; "The authorized officer would impose stipulations which would include, but not be limited to requirements for restoration, revegetation, and curtailment of erosion of the surface of the land [and] requirements

designed to control or prevent damage to the environment (including damage to fish and wildlife habitat)..."

- FLPMA Sec. 101(a)(8) requires that "public lands be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resources, and archeological values; that, where appropriate, will preserve and protect certain public lands in their natural condition..."
- Arizona Mined Land Reclamation Act and Rules established under ARS Title 27, Chapter 5, R27-973.
- Pre-existing disturbances – under 43 CFR 3809, an operator is responsible for reclaiming all portions of pre-existing disturbances that the mining operation will affect.

17.3 Purpose

The purpose of this Reclamation Plan is to describe and recommend pre-construction, construction, exploration, and reclamation treatment actions that will meet BLM goals and objectives under the KFO RMP (BLM 1993) and LHFO RMP (BLM 2007) for land health standards; to recover habitat for federally listed and sensitive species; to maintain existing visual quality; and to provide protocols and/or requirements for implementing and monitoring required reclamation.

Important actions in mitigating the effects associated with the Project include: 1) minimizing, to the greatest degree practicable, the effects associated with construction of Phase III facilities and exploration activities (i.e., minimizing construction disturbance); and 2) stabilizing temporarily disturbed construction areas resulting from construction and exploration to an acceptable condition in order to accelerate natural recovery (i.e., timely site restoration). The procedures outlined in this Reclamation Plan will assist in: restoring plant communities to near pre-construction conditions and associated wildlife habitat and range; preventing substantial increases in noxious weeds in the Project area; minimizing Project related soil erosion; and reducing visual impacts of sensitive areas caused by construction activities. To achieve these goals, this Reclamation Plan outlines actions to be applied during both the pre-construction and post-construction phases of the Project.

17.4 Project Setting

Reclamation actions will be specific to the setting of the Project and vegetation communities potentially affected during the construction process and ongoing exploration activities. Seeding mixes will be based on the dominant plant species of the existing vegetation communities. The entire Project is located within the Mojave Desert Scrub vegetation community.

17.4.1 Mojave Desert Scrub Vegetation Community

Mojave Desert Scrub is dominated by warm-temperate vegetation that receives limited precipitation and is found on basin floors and some bajadas below 4,000 ft. Creosote bush (*Larrea tridentata*) is the most abundant plant, with white bursage (*Ambrosia dumosa*) as a codominant species. Joshua trees (*Yucca brevifolia*) are the most recognizable plant that distinguishes the Mojave Desert, and may occur in parts of the Project area. Other plants commonly associated with the Mojave Desert biome include box-thorn (*Lycium andersonii*), Mormon tea (*Ephedra* spp.), and ratany (*Krameria* spp.).

Xeroriparian communities are found throughout the Mojave Desert Scrublands vegetative community, located in areas with ephemeral water flow. Plant species in these areas do not differ from those typically found in the Mojave Desert Scrublands, but vegetative density is generally higher in these areas based on

the increased availability of water. Within the Project areas, xeroriparian communities are located along ephemeral washes, but include only slightly higher plant densities.

17.5 Reclamation Plan Methodology

This section of the Reclamation Plan describes the process used to identify reclamation actions that will be required for the expansion aspects of the Project (e.g., heap leach pad, barren rock stockpiles, open pit expansions, exploration activities). Reclamation activities on private land and facilities permitted under the APP are bonded separately through AMSI and ADEQ, respectively.

The facilities addressed in this part of the Reclamation Plan include the Phase III expanded open pits to the east and west of patented claims; Phase III expanded leach pad and barren rock stockpiles (east and west); pregnant/barren/event ponds; drilling sites; drilling roads; core shack/laboratory facility; vehicle maintenance shop and office complex; water pipelines; and haul roads/buffer areas.

The total authorized disturbance associated with expansion activities at the Project would be approximately 554.25 acres. The authorized disturbance on BLM land is approximately 495.94 acres, including 6.54 acres on Arizona State Land Department land. Project-related surface disturbance on public land is outlined in **Table 16**, in Section 9.1.

The intent of the Reclamation Plan is to restore areas within the Project to a beneficial post-mining land use, prevent unnecessary degradation of the environment, and reclaim disturbed areas to ensure visual and functional compatibility with surrounding areas.

Activities on BLM land may undergo concurrent reclamation in the event GVC is no longer using that portion of the Project prior to final closure. However, for the Reclamation Plan, GVC assumes that all Project related components located on BLM land will remain in place and require reclamation at final closure.

Phase II facilities which are located on private land are addressed under the State Mine Land Reclamation Plan (2016), see **Appendix T**. Existing Phase II facilities general arrangement is depicted in **Figure 16**.

17.5.1 Earthwork and Regrading and Reshaping

The crest of the stockpiles will be rounded and variable slope angles will be established to resemble natural landforms. The roads and laydown areas sites will be graded to blend with the surrounding topography. All reclaimed disturbance requiring seeding will use a BLM approved seed mix. Equipment for regrading and reshaping will generally involve the same equipment supporting mining operations, including but not limited to:

- Traditional mine haul trucks (70-ton capacity CAT 775 or similar)
- Track bulldozers (D8-D10 or similar)
- Front-end loaders (CAT 980, 988 or similar)
- Motor graders (CAT 14M or similar)
- Water wagons (typically 4,000-gallon capacity)

17.5.1.1 Heap Leach Pad

The sides of the heaps will be flattened to a 2.5H:1V or a 3.0H:1V slope. The slope angle chosen will be dependent on the adjacent topography to make the least visual impact possible while maintaining slope stability. Generally, the southern slope on the eastern portion of the heaps will be 2.5H:1V and the western portion of the southern slope and the western slopes will be 3.0H:1V. The northern slopes will be graded to blend into the existing natural slopes.

The tops of the leach pad will be reshaped to promote stormwater runoff. The tops will be graded to a 2% slope to remove the potential for ponding, depressions and mounds. The average depth of reworking is assumed to be 2-ft.

Growth medium will be placed on the facility to prevent erosion and promote plant growth where needed. The cover material will be hauled from other locations, as deemed appropriate, based on test plot studies. Grading and seed bed preparation will occur prior to seed application. Experience with the Phase I heap shows that the material in the heap leach pad is readily amenable to revegetation, **Photograph 3**.

Existing diversion ditches and channels will remain at the base of the leach pad for post-closure stormwater control. Diversion ditches will be made non-erosive by use of surface stabilization techniques (rip-rap), where necessary, and then ultimately revegetated.

Photograph 3: Phase I Leach Heap Pad Revegetation

17.5.1.2 Barren Rock Stockpiles

The tops of the barren rock stockpiles will be reshaped to promote stormwater runoff. The tops will be graded to a 2% slope to remove the potential for ponding, depressions and mounds. The average depth of reworking is assumed to be 2 ft.

The harsh dry desert environment of the Moss Mine area necessitates that most disturbed areas be reclaimed by placing a non-erosive rock mulch cover over those areas. For the majority of the Project site, GVC will operate under ARS 27-974 (exception 1) which states, "if there is insufficient soil to make recovery practicable." The majority of the natural ground surface of the Project site is composed of rock cobble with very little vegetation and insignificant soil depth. GVC will be reclaiming most areas by placing rock cover.

Rock quality testing, by GVC and Cemex Inc., of typical rock types comprising the material in the barren rock stockpile has been conducted for suitability as aggregate for concrete, asphalt, granular highway road base and rip rap (**Appendix K**). It is anticipated that a considerable portion of the stockpile will be used in the area centered on Bullhead City. The availability of this aggregate source will reduce long truck hauls from Kingman and Las Vegas, thus reducing costs for construction and reducing truck engine emissions from long hauls from these other sources.

A minimum of 6" of growth medium will be placed on the stockpiles to prevent erosion and promote plant growth where needed. The cover material will be hauled from other locations as deemed appropriate. Grading and seed bed preparation will occur prior to seed application.

Stormwater runoff is either captured in sumps or low-permeability channels constructed along the base of the barren rock stockpiles, which will remain in place for post-closure stormwater management. Diversion channels will be made non-erosive by use of surface stabilization techniques (rip-rap) where necessary, and then ultimately revegetated.

17.5.2 Open Pits

Efforts will be made to backfill as great a percentage as possible of the excavated open pits during the mining sequence. Post-mining, the final open pit walls will be certified by a qualified engineer that they are stable under static and dynamic conditions and site-specific seismic conditions, in conformance with regulations under the AAC Title II, Chapter 2 State Mine Inspector – Mined Land Reclamation.

Grading and other topographic contouring methods would be conducted, as necessary, to establish final land forms consistent with good engineering practices to ensure the safety and security of the site during and after operations. Berms, ditches, fencing, and signage will be used to prevent accidental or deliberate trespassing onto areas that may be dangerous to humans.

17.5.3 Removal or Stabilization of Building, Structures, and Support Facilities

GVC will have the appropriate contractors remove all facilities, equipment, buildings, foundations, fencing, and infrastructure on BLM land upon closure of the mine.

17.6 Reclamation Plan Implementation

This section of the Reclamation Plan describes the process used to identify reclamation actions that will be required for the exploration aspects of the Project (e.g., drill sites and exploration roads).

17.6.1 Identification of Reclamation Levels

Reclamation levels that prescribe the types of required pre- and post-construction actions were determined based on: 1) the type(s) of construction activity, facility features, and the area of associated disturbance; 2)

the duration of disturbance (temporary or permanent) associated with these features; and 3) the type of disturbance associated with each activity as described below.

17.6.1.1 Types of Construction Activities and Facility Features

The activities associated with the construction of the major and ancillary facilities of the Project will include the following tasks:

- Surveying the heap leach pads, barren rock stockpiles (east and west), open pits (east and west), drilling sites and drilling roads
- Upgrading or construction of temporary and permanent, haul, and drilling access roads
- Clearing and grading activities for the proposed heap leach pad and barren rock stockpiles
- Excavating and grading associated with the proposed solutions ponds (i.e., event, pregnant and barren ponds)
- Excavating and trenching associated with the heap leach pad
- Extending the existing open pit excavation to the east and north
- Excavating the proposed Far Western Pit
- Constructing the approved 24.9kV power line
- Excavating and trenching associated with the proposed municipal source and water well (groundwater source) water pipelines
- Clearing and grading associated with the approved realignment of BLM Road 7717
- Clearing and grading associated with the proposed maintenance shop/office complex, including septic field
- Clearing and grading associated with the proposed assay lab/core shack
- Cleanup and reclamation of all disturbed areas, hand raking as required.

17.6.1.2 Duration of Disturbance

This Reclamation Plan defines two broad types of disturbance durations, as described below:

- Long-term/Permanent Use Areas
  The use of these areas is long term and the landscape is permanently altered through removing vegetation, site leveling, modifying natural drainages, installing fencing, and constructing the heap leach pad, barren rock stockpiles and expanded open pit facilities, and other structures. Permanent disturbance also includes constructing access roads needed for regularly scheduled maintenance of facilities and for exploration activities.
- Short-Term/Temporary Use Areas
  These areas are used only for the amount of time it takes to construct the Project. Examples include: work areas where heavy equipment is used to move and install temporary access and vehicular parking areas, and designated staging areas for equipment and materials.

17.6.1.3 Identification of Disturbance Levels

This Reclamation Plan defines four broad disturbance types based on activities associated with the construction of the Project facilities and attendant exploration activities. These include the following:

1. *Disturbance Type 1 (D1) – No New Disturbance*.

These areas include existing access roads and other pre-disturbed locations that do not require improvement outside of the current road footprint but may require road surface improvements and will remain permanent (in place) after Project construction is complete.

2. *Disturbance Type 2 (D2) – Improve Existing Facilities*
   In these areas, disturbance is anticipated to consist of road widening, with no significant modifications to the landscape. These activities would result in moderate to low levels of disturbance and are expected to be permanent.

3. *Disturbance Type 3 (D3) – Temporary Disturbance, No Blading*
   In these areas, disturbance would be caused by new access to the Project site, which requires the brushing of all vegetation in order to improve or provide suitable access for equipment and vehicles. All vegetation would be removed and soils would be compacted by vehicular use. However, no surface soil would be removed (i.e., no blading of growth medium). Examples include: drill holes; temporary access roads where overland access may be used in the construction of facilities; or in areas where roads may be improved for access (selective tree and brush clearing). In select areas, vegetation may be crushed but not trimmed, and soils would again be compacted, but without removal of surface soil. Although vegetation may be damaged and even destroyed by this disturbance type, the surface soil, seed bank, and root structures would remain in place. Some crushed vegetation will likely re-sprout after disturbance ceases. In general, this disturbance type will result in a moderate degree of disturbance.

4. *Disturbance Type 4 (D4) – Clear and Cut with Soil Removal*
   Disturbance in these areas would be caused by removing all vegetation in the affected zone, resulting in both soil compaction and displacement of surface soils (i.e., blading of growth medium). These activities would result in higher levels of disturbance. Examples include new access roads that require grading and filling, clearing and grading that would be associated with the Phase III heap leach pad, barren rock stockpiles, excavation of the open pit to the west and to the east of patented claims, and in some locations, improvements to existing access for exploration activities.

17.6.1.4 Assignment of Reclamation Levels

Five levels of reclamation (RL1-RL5) have been identified based on combinations of the potential types and durations of disturbance associated with the construction of the Project features. These reclamation levels are described below.

1. *Reclamation Level 1 (RL1) – Minimal Level of Disturbance, Minimal Actions – Permanent*
   Construction in these areas would not result in new disturbance, would require minimal pre-construction treatment, and would not normally require post-construction actions (outside of routine maintenance). Examples include maintenance of existing roads with no new disturbance or widening of roads for permanent use.

2. *Reclamation Level 2 (RL2) – Low Level of Disturbance, Few Actions – Permanent*
   Similar to RL1, RL2 would require minimal pre-construction actions and no post-construction actions. Examples include widening of existing roads and creation of ditches or swales for drainage.

3. *Reclamation Level 3 (RL3) – Moderate Level of Disturbance, Several Actions – Temporary*
   Construction and exploration activities in these areas would be temporary and would result in disturbance confined to the clearing of vegetation or overland construction, including vegetative crushing that would require limited reclamation actions, and the plugging of drill holes. In addition,

selective plants may require salvaging and replacement in these areas, as required by BLM (e.g., cactus and yucca). Construction and exploration activities in these areas would result in moderate temporary disturbance, limited to clearing and required cutting of vegetation. Reclamation would include hand-raking of areas and placement of cleared vegetation as vertical mulch. Supplemental mulch, such as straw, may be used to protect cleared areas. Areas of reclamation would be signed "No Vehicular Access" (or similar language) at each end of the route and at any junction with existing system routes, and OHV deterrents placed to prevent usage by OHV recreationists. Exploratory access routes would be fully reclaimed upon abandonment of the route after it is determined the route will not be needed for further exploration activities. Hand raking will be implemented to complete road reclamation.

4. *Reclamation Level 4 (RL4) – High Level of Disturbance, Few Actions – Permanent*
   Construction of Project facilities in these areas would result in a high level of disturbance (e.g., clearing, cutting and soil removal); however, few reclamation actions would be required because these areas are meant to be permanently disturbed. This applies more specifically to new access roads that would serve as long-term maintenance as well as exploratory drilling, the construction of the barren rock stockpiles, heap leach pad, and the open pit mine excavations. In these locations, vegetation would not be replanted rather growth medium utilized.
5. *Reclamation Level 5 (RL5) – High Level of Disturbance, Maximum Actions – Temporary*
   RL5 areas represent the areas for ground disturbance that would result in a high level of disturbance due to vegetation and soil removal and are planned for long-term reclamation. In these areas, actions pertaining to soil salvage and seeding would be necessary to restore the disturbed area.

Table 26 identifies the various reclamation levels to be applied specifically to each of the construction components and associated disturbance levels/durations. In general, the order of preference on the associated disturbance levels is "overland drive and crush" in areas of new temporary disturbance (e.g., drilling roads and sites, etc.); otherwise, "clear and cut" where practical; and finally, if necessary, "clear and cut with soil removal." GVC will contract a qualified biologist to coordinate with BLM Biologist to ensure reclamation success adheres to BLM direction.

Table 26: Construction Components and Reclamation Levels

Construction Component	Disturbance Level	Disturbance Duration		Reclamation Level	Acres Disturbed/ Reclaimed
		Permanent	Temporary		
Exploratory Drilling Sites	D3 - Overland Clear and Cut		X	RL3	70.10
Exploratory Roads	D3 - Overland Clear and Cut		X	RL3	NA
	D4 - Clear and Cut with Soil Removal		X	RL5	40.21
Phase III Heap Leach Pad/Barren Rock Stockpiles (east and west)	D4 - Clear and Cut with Soil Removal	X		RL4	245.30
Phase III Pregnant	D4 – Clear and	X		RL4	5.39

Construction Component	Disturbance Level	Disturbance Duration		Reclamation Level	Acres Disturbed/ Reclaimed
		Permanent	Temporary		
and Event Ponds/Barren Pond	Cut with Soil Removal				
Phase III Open Pits (east and west)	D4 - Clear and Cut with Soil Removal	X		RL4	101.25
Assay Lab/Core Shack and Maintenance Shop/ Office Complex	D4 - Clear and Cut with Soil Removal		X	RL5	12.99
Proposed Municipal Source Water Pipeline	D4 - Clear and Cut with Soil Removal		X	RL5	14.32
Proposed Water Wells/Monitoring Wells and Water Well Pipeline	D3 – Overland Clear and Cut		X	RL3	6.38
				TOTAL	**495.94**

17.6.2 Reclamation Prescriptions

The specific actions required for each of the reclamation levels (RL1 through RL5) are presented in this section of the Reclamation Plan. Reclamation actions are physical treatments and activities that will occur throughout different phases of the Project and are assigned based on the varying levels of reclamation as discussed previously. These actions will facilitate resource protection during construction, recovery for areas temporarily disturbed by Project construction, and re-establishment of vegetation that is similar to the pre-construction conditions in predetermined areas in both species' composition and vegetative cover.

As described below, pre-construction actions are those that occur before construction of the Project is initiated to preserve resources or features of interest, and include activities associated with preparation for reclamation and pre-construction activities. Post-construction actions focus on activities that will occur after Project construction has terminated, and generally include reclamation, exploration activities and maintenance activities.

17.6.2.1 Pre-Construction Actions

Pre-construction activities include general site preparation involving flagging of the limits of disturbance boundaries and construction areas. It also includes identification of plants to preserve in place, weed infested areas, plants intended for salvage, and storage areas for windrowed plant and soil materials. Monitoring sites may also be established during pre-construction activities. Pre-construction actions focus on protection of sensitive areas and resources identified for preservation. Disturbances related to Project construction may begin only after all pre-construction actions have been completed.

17.6.2.1.1 Preserve in Place

This activity includes the preservation of existing vegetation to the degree possible when mature plant specimens are present to enhance habitat recovery and quality and/or screening of the proposed Project is desired to reduce visual impacts. Preservation of specimens may be requested by BLM. Eligible specimens would include mature trees, succulents, or diverse vegetation groupings that would provide seed and a microclimate for seedling germination. Flagging or fencing of specimens to be preserved should be done before the ground is disturbed. GVC will ensure construction activities will not disturb those specimens. If it is determined that construction activity would be detrimental to the plant, salvage should be considered (assuming the specimen meets the qualifications defined in the plant salvage action).

17.6.2.1.2 Plant Salvage

Once the temporary disturbance areas are delineated and flagged, qualified biologists will identify all cacti, yucca, nolina, ocotillo, and agave that meet the plant salvage (health criteria) provided by KFO for previous GVC projects and modified by the discussion below. Succulent plants with potential to be impacted by construction will be considered for salvage if the following criteria are satisfied: 1) the plant is currently in a healthy condition as determined by the qualified botanist; 2) yucca trees must be greater than 1 ft, but less than 6 ft tall; and 3) cacti must be more than 1 ft tall or 1 ft wide (including prickly pear). To increase the likelihood of cactus and yucca survival after transplanting, surveyors will use the following criteria to determine suitability for salvage:

- Plant Condition
  - Excellent – over 80% live branches or stems and stable root system
  - Good – over 60% live branches or stems and mostly stable root system
  - Fair – fewer than 50% live branches or stems and/or mostly stable root system
  - Poor – fewer than 50% live branches or stems and unstable root system
- Plant Size
  - All cacti that measure less than 3 ft tall and are in "excellent" or "good" condition will qualify for consideration for salvage. "Fair" and "poor" specimens will not be salvaged
  - All yucca in "excellent" or "good" condition will qualify for consideration for salvage. "Fair" and "poor" specimens will not be salvaged
  - Chollas (*Cylindropuntia* sp.) over 3 ft in height will be excluded from salvage

Any succulent that cannot be accessed safely due to steep slopes or rocky soil/surface conditions will not be salvaged. Succulents that will not be salvaged will be broken up and windrowed as vertical mulch. GVC will contract a qualified biologist to address salvage of plants. GVC will identify with flagging tape all succulents that qualify for salvage, marking the north orientation for all barrel cacti and yucca species. A list describing quantity and species of plants to be salvaged will be forwarded by GVC to BLM upon completion of reclamation activities. Salvaged plants will be transplanted out of harm's way, in designated areas within the Project area.

Plants salvaged from areas of permanent disturbance will only be moved once and replanted as described under Post-Construction Actions. In areas of temporary disturbance, salvaged plants will be replanted in temporary plant storage sites (i.e., project nursery). The current plant nursery is located on the northeast portion of the patented property and will have to be moved for Phase III activities. The prime location for the new plant nursery is to the west of the new leach pad and southeast of the Far West Stockpile. Should additional nurseries be required for the Project, the locations would be provided by GVC on a site-specific

basis. These areas would provide ease of care and maintenance for the plant material, as well as provide protection from construction activities until final planting. Plant storage areas will be located near the mine. In these areas, salvaged plants will be replanted in an appropriate manner as determined by a qualified biologist. It should be noted that non-native plants will not be introduced on BLM land as a part of the reclamation program. Most commonly salvage plants are replanted in vertical trenches that have a depth of 18 inches or greater. Yucca will be planted with 1-ft spacing.

All succulents approved for salvage will be dug up bare root and replanted within 24 hours. All barrel cacti and yucca species will be planted with the same north orientation as they originally grew. Small cacti will be stockpiled separately from larger plants/clusters and watered thoroughly one time upon being transplanted in a stockpile area. All yucca stems will be thoroughly watered immediately after transplant. Stockpiled plants will also be watered approximately 15 days after transplanting to remove or minimize any air pockets in the soil and ensure proper soil stabilization. Care will be taken to properly stabilize all soil around roots of plants that are directly transplanted in the field. Stockpiled plants will be moved back as close to their original location as possible as described under Post-Construction Actions.

An inventory of plants salvaged and a reference to their original location (by work area location) will be maintained during the salvage efforts.

17.6.2.1.3 Seed Bank Growth Medium Segregation

This activity includes the separation of the seed bank growth medium from subsoils (if subsoils are planned to be disturbed), that will be set aside for post-construction replacement following plant salvage. The Far Western Barren Rock Stockpile has been designated for the temporary stockpile of growth medium accumulated from the construction of the Phase III Heap Leach Pad. Growth medium segregation begins after required plants have been salvaged and consists of removing and storing the growth medium containing organic material (including the seeds of plants growing on and adjacent to the site) for areas of construction disturbance. This growth medium contains a seed bank layer that will be stored in windrows at the edge of the work area, to provide an indigenous seed source for final restoration activities. Where the growth medium depth is less than two inches, the soil surface will be scraped and preserved to the extent practicable.

Growth medium salvage includes all rocks and smaller vegetation that were not salvaged to be used as vertical mulch. The depth at which growth medium separation should occur will be dependent on the soil type within which the reclamation activity will occur. This growth medium should be labeled as such and protected from erosion and inadvertent use as fill. Growth medium would not be mixed with subsoil in areas of temporary disturbance. When stockpiled, growth medium would be tackified with water to a 2" wetting depth, to minimize potential wind and water erosion. If bedrock close to the surface will not allow for full salvage, the contractor would salvage what is available. Overall handling of growth medium should be kept to a minimum. Separation between salvaged growth medium and subsoils must always be maintained.

17.6.2.1.4 Selective Clearing

Selective clearing and trimming are practiced for mitigating vegetation clearing impacts in areas where tree or brush densities have been cleared due to Project activities. GVC would trim trees in preference to cutting trees, and would cut trees in preference to bulldozing them, as directed by BLM. Cut material may be placed in slash piles and/or used as vertical mulch as approved by BLM. Trimming will be accomplished by use of pruning saws, power saws, nippers, bow saws, or cross-cuts. Limbs will be pruned flush with the trunk of

the tree, except for portions of overhanging limbs. Use of axes for trimming will be prohibited. Trimming should occur around the entire tree, so as not to create a flat side.

17.6.2.1.5 Windrow Vertical Mulch

Materials including dead and cut plants are to be temporarily set aside during ground disturbing activities so that they may be shredded, planted, or otherwise placed on the soil surface (post-construction) to increase fertility, provide microclimates for seeds to germinate, and stabilize soil. This will include any succulents that did not meet salvage requirements previously discussed. Large rocks and boulders would also be windrowed for later placement back on the site(s) during post-construction activities. Care should be taken to prevent the disturbance of the natural patina or desert varnish of these rocks. Rocks more than 6" in height can be removed and stockpiled outside the disturbance areas. If an outcrop of boulders will be disturbed, some specimens may be windrowed as recommended by BLM and GVC. In some vegetation communities where mulch density would be very high, removal of excess mulch off-site should be arranged after replacement quantities have been determined. Vertical mulch temporary storage areas should be located near the Project area.

17.6.2.2 Post-Construction Actions

Post-construction actions occur after Project construction has terminated and primarily focus on stabilizing permanent use areas and restoring temporary areas to allow reoccupation of vegetation. Recommended reclamation actions are defined below and are generally organized by their sequence of implementation.

17.6.2.2.1 Earthworks

These activities may include: 1) recontouring; 2) soil decompaction; and 3) application of appropriate soil erosion measures as needed. Earthmoving equipment would replace the removed material as close to the pre-construction contour as possible to restore the visual quality and provide stability to the slope. Soil decompaction may include ripping or scarifying to allow permeation of water into the ground. Erosion control measures, such as water bars, may be installed as recommended by BLM and in conformance with the SWPPP. Recontouring efforts include burying subsurface soils (backfilling holes) excavated during construction activities so that the natural terrain contours are maintained to the extent practicable. Excess subsoil from excavated or graded areas would be evenly spread over disturbed areas and then moistened and compacted to a relative average density comparable to undisturbed adjacent material before re-spreading growth medium. Subsoils would not be spread outside of the flagged construction areas and are restricted to areas of permanent disturbance, if possible.

Excessive subsoils that cannot be reasonably spread must be removed off-site to a BLM-approved disposal site. Where any soil compaction exists, the surface will be ripped or scarified to a depth of six inches, as appropriate (e.g., not applicable to rock faces, severe slopes, or cliff areas) and will retain a 12" buffer from existing vegetation or plants designated to be preserved in place. Depth and area of compaction relief will depend on site-specific conditions. Decompaction or ripping will be conducted to avoid leaving "corn rows" on the surface. Cross-ripping is preferable, and care should be taken to prevent inverting the soil layers and preserving any vegetation in place. Deep sandy soils do not need to be decompacted and would not be ripped.

17.6.2.2.2 Drill Hole Plugging Plan

Once an exploration drill hole is completed, all rods will be removed from the hole and the drill hole will be abandoned with smooth grout and capped with 20 ft of cement and 2 ft of dirt cover, in compliance with the ADWR Well Abandonment Handbook Standard Abandonment Method. The well must be completely filled with neat cement, cement-bentonite grout or high-solids bentonite grout (granular or powder mixtures), except where free-product contamination is present, with a minimum of 25% solids by weight. Materials or mixtures must be emplaced under enough pressure to fill all voids, including all annular space(s), and displace water from the well. A tremie pipe must be used to emplace the grout from the bottom up. The end of the tremie pipe must remain in close proximity to the rising grout surface, as the grout is pumped into the well.

All drilling equipment will be removed from the drill site and moved to either another site or back to Moss Mine on private lands.

17.6.2.2.3 Growth Medium Replacement

Growth medium would be replaced without mixing with subsoil to the extent practicable. The purpose of this practice is to prevent mixing fertile, shallow soils with deeper soils that may be less productive because of rock, gravel, sand, calcareous layers, salinity, or other chemical characteristics that would adversely affect desired vegetation. Growth medium would be dispersed evenly across the disturbed site. Additional erosion control and soil stabilization may be required to minimize soil movement, especially for steeply sloped areas or for fine-textured soils.

The growth medium should not be handled excessively during windy conditions. The growth medium will be wet to a depth of 2" to prevent further erosion. The site will be left adequately rough after surface soil placement to provide micro sites for seed germination, and to reduce soil movement.

17.6.2.2.4 Reseeding of Disturbed Areas

Reseeding involves planting new seed of appropriate indigenous native species to establish vegetation within affected vegetation communities. However, in some cases, as determined by BLM, non-native species may be recommended in seeding mixes as a tool to improve chances of reclamation success when ecological site(s) have large quantities of invasive species, such as cheat grass or red brome.

A BLM specialist (e.g., botanist, range management specialist, or soil scientist designated by BLM) will provide the list of approved type and quantity of seed mixtures, seeding method, and seeding locations. Because the Project does not include disturbance to any of the riparian sub-community, the seed mixtures will be specifically based on the Mojave Desert Scrubland vegetation community.

Seed mixes must be developed in advance of reclamation efforts to ensure seed availability. Seeding would be repeated if a satisfactory stand is not established as determined by BLM upon evaluation after the second growing season.

17.6.2.2.5 Replant Salvage

Succulent plants that were removed from temporary use areas and stored during construction would be replanted in the same general location, as is possible. Barrel cacti and yucca species must also be replanted

at the proper compass orientation that will be noted on individual plants during pre-construction activities. Succulent plants removed from permanent use areas will also be located in pre-approved locations as close as possible to original conditions, and similarly oriented. All salvaged plant material will be replanted in natural patterns. Large yucca will be carefully removed from the ground, taking care to not damage stems, roots, or the base of the plant, and be re-planted in groups of three or more for a natural effect. A hole at least 2 ft deep and 3 ft wide will be prepared for each single stem yucca. Multiple stem plantings will be proportionately larger to accommodate the stem size. The hole will be filled with water and allowed to drain once. The hole will then be re-filled and back-filled with soil to form a muddy matrix to about 18" from the surface. The yucca will be planted and the soil tamped around the plant so that there are no air pockets. At the surface, a "watering basin" will be formed around the plant. Afterward, the plant will be watered thoroughly again. Yuccas will be rewatered approximately three to four weeks after transplanting. All small cacti will be watered thoroughly one time upon being transplanted in the field.

Every effort will be made to transplant the material at the time of year (early spring or fall) when the plants are the least likely to experience environmental stress. The plants will be adequately maintained for one full year to ensure protective measures are intact. If salvaged plants are located in an area susceptible to OHV access, the closure of access roads may be recommended in specific areas, as approved by BLM. Replacement of salvaged succulents may be strategically placed or concentrated in certain areas to deter access. A combination of plants or rocks may be used in these areas, where appropriate, as directed by BLM. Transplanting and maintenance of plant material will be completed such that an agreed upon percent of survivorship is achieved.

17.6.2.2.6 Vertical Mulch

Vertical mulch is not entirely in contact with the soil surface; rather, parts of the mulch rise above the surface. Removed and stored trees and shrubs are the sources of vertical mulch. For areas that have been cleared, vegetation that was windrowed outside of the disturbance boundary would be replaced back onto the site. Mulch should be placed in a naturally appearing random pattern with some scattered on the surface of the soil and some vertically planted back into the soil. Large rocks and boulders removed to the side of the disturbance would be placed back with the darkened/naturally varnished side facing up in a natural appearing pattern. In order to assure that rock placement appears natural, rocks would be partially buried into the soil surface (similar to original conditions), rather than being set on top of the surface. Permeon™ (or equal and approved alternate) may be applied to rocks to enhance the desert varnish when deemed necessary by BLM. Any such product would be applied according to the manufacturer's specifications and only to the extent practicable, given there may be limitations in application from equipment (reach distance), spatial limitations (slope or pit configuration and/or location), or material (substrate may not be appropriate for such product application). Boulder outcrops that were windrowed would be replaced by GVC in a manner that is similar to pre-construction conditions where possible.

Permeon™ (or equal and approved alternate) is an artificial desert varnish that reproduces natural colors similar in appearance to aged desert varnish in a short period of time. It is non-toxic to plants and animals. Depending upon the soil type, Permeon™ may be required if the soil surface contrast is high, due to cut slopes and/or damage to aged/naturally patinaed rocks. Application rates and color tint will be site-specific and may require both a blanket application and spot treatments depending on the adjacent natural landscape. The product is applied via backpack sprayers or a truck-mounted sprayer if access to the area adjacent to the reclamation sites remain open. Product application may be necessary for large boulders that have been windrowed, and application would occur after they have been replaced as recommended by BLM.

17.6.2.2.7 Supplemental Mulch

Mulch usually consists of shredded plant material or straw, but also includes wood fiber, paper mulch, or biodegradable erosion mats. Straw mulch may be utilized as an alternative to vertical mulch when vertical mulch is not available or will not provide adequate coverage in areas that will not be seeded. Hydroseeding, wood fiber, use of tackifiers, or erosion blankets may be a less expensive alternative to straw mulch in areas that require seeding as well. The quantity of mulch to be used would be recommended by BLM based on site conditions and will be installed according to the manufacturer's or supplier's specifications.

17.6.2.2.8 Off-Highway Vehicle Deterrents

Operation of OHVs can cause mechanical damage to stabilization structures and soils, and mortality of plants. Access by such vehicles will be limited in areas of reclamation. Measures to control OHVs and other unauthorized vehicle use in the Project area will be determined in consultation with BLM. Specific areas of potential access by OHVs will be identified and measures to minimize or eliminate access will be developed as appropriate. These measures may include the installation of signs, fences with locking gates, selectively placed boulders, and/or vertical mulch of heavy woody material. Development of OHV deterrents will be determined on a case-by-case basis based on BLM requirements.

17.6.3 Wildlife Habitat Rehabilitation

Wildlife habitat rehabilitation will be achieved primarily through re-establishment of vegetation. Seed bank growth medium replacement, plant salvage, and seeding activities will be performed, as described in the previous sections. The use of salvaged plants from the Project area and seed species native to the Project area will facilitate re-establishment of wildlife habitat and cover similar to that present prior to disturbance. Following project completion, disturbed areas, such as roads, turnouts and drill hole pads, would be re-contoured to match the surrounding landscape. To facilitate natural reclamation, revegetation, and reduce the potential of erosion disturbed areas will be hand raked and seeded.

17.6.4 Reclamation Signage

Reclamation areas may require informational signs pertaining to reclamation efforts with the intent of preventing further disturbance by humans within these recovering areas. Reclamation areas may have signs installed at appropriate intervals to deter vehicular damage to the site. GVC will provide the reclamation signs and t-posts. If determined necessary, sign locations will be identified by BLM, following completion of post-construction reclamation procedures and prior to the initiation of reclamation monitoring.

18.0 RECLAMATION MONITORING PLANS AND POST CLOSURE PRACTICES [43CFR3809.401(B)(4)]

Pursuant to 43 CFR 3809.401(b)(4) this section discusses:

1. Description of resources subject to monitoring plans
2. Type and location of monitoring devices
3. Sampling parameters and frequency
4. Analytical methods
5. Reporting procedures
6. Procedures for responding to adverse monitoring results
7. Reliance on other federal or state monitoring plans

18.1 Introduction

Monitoring will begin prior to construction and continue through post-construction phases for the Project. The monitoring actions described in this plan will be implemented by GVC under the guidance of BLM. Adjustments to reclamation levels or actions by GVC may be necessary if Project conditions change. However, any changes to these levels of reclamation and the associated actions will be reviewed and approved by BLM. This plan is intended to provide flexibility with respect to construction and unknown constraints that may be encountered in the field. Changes to the original disturbance level or duration, as previously described, will be documented by GVC and reclamation levels will be reassessed to ensure that appropriate reclamation actions are implemented.

Consolidation of access within the study area may result in an overall reduction of access related concerns and/or impacts to the environmental resources within and near the mine. BLM, in coordination with GVC and other potential users, will determine which of the newly constructed access roads will be closed, restored, or retained for operation and maintenance activities that are consistent with the BLM RMPs. New access roads not required for operation and maintenance of the Project and/or exploratory drilling may be closed using the most effective and least environmentally damaging methods appropriate to that area.

18.2 Monitoring Objectives and Reporting Procedures

The Monitoring Plan for the Project requires post-construction reclamation monitoring to: evaluate reclamation success (i.e., wildlife and vegetative) of restored areas associated with the construction of Project facilities; identify the need for adaptive management measures; and make a final determination regarding reclamation success to release GVC from further monitoring and reclamation actions. In accordance with BLM's Reclamation Success Standards and Monitoring Plan, the purpose of the monitoring plan is to: 1) present reclamation goals and success standards; 2) describe the monitoring practices to be implemented; and 3) discuss adaptive management and site release from monitoring.

Reclamation success standards will be used by BLM to determine if the implemented reclamation actions have adequately achieved the goals and objectives outlined in the monitoring plan, with consideration of local site conditions. The monitoring practices include standard techniques for monitoring sites, data collection, and the quantitative (numerical) and qualitative (descriptive) measures to be used in monitoring reclamation success. Specific monitoring requirements including the site-specific data analysis protocol will be developed by GVC in cooperation with BLM prior to start of pre-construction activities. This will allow BLM to make more accurate conclusions pertaining to reclamation success based on site specific conditions, such as biotic community and climatic conditions, once construction has been completed.

Adaptive management refers to revising the reclamation approach or techniques when success measures are not being met for particular areas. This may be necessary to determine appropriate remedial actions, based on monitoring observations, for sites that have not demonstrated a trend toward reclamation success. If required, implementation of remedial actions will be determined by BLM based on the monitoring data and annual reports to be submitted for up to five years following completion of construction. After five years of post-construction monitoring, a report will be submitted to BLM summarizing monitoring data, observations, and the overall trend toward reclamation for appropriate vegetation communities and sub-communities. BLM will release GVC from further reclamation and monitoring efforts after the final reports and annual monitoring data are submitted to and approved by BLM based on adequate reclamation success.

18.3 Monitoring Goals and Success Standards

As mentioned previously, the intent of this plan is to prevent unnecessary degradation of the natural environment during construction, restore temporary use areas, and reclaim disturbed areas such that these areas are functionally and visually compatible. Reclamation success, as presented in this Monitoring Plan, is defined by the progression of vegetation and soils toward pre-construction disturbance conditions, to the extent practicable.

GVC will be responsible for monitoring reclamation efforts for the Project. Reclamation success will be evaluated by BLM by comparing Project-affected treatment sites with control site conditions in terms of native species density and cover. Reclamation of treatment sites will be considered successful if they are within a specified percentage of the mean native species density and cover of associated control sites.

Control sites will be representative of areas that exhibit the same target plant community that is located adjacent to or near the Project affected treatment sites. The establishment of control sites within undisturbed communities will allow the monitor to compare the reclamation progress of the treatment sites against the control sites.

Reclamation success is highly dependent on vegetation community type, environmental conditions (e.g., annual precipitation), proper implementation of reclamation actions, and avoidance of future disturbance. If the final monitoring report concludes that typical environmental conditions, proper implementation of reclamation actions, and lack of disturbance is evident, reclamation success will be based on the trend toward native vegetation cover and density for each community type. GVC expects that once this trend is established, wildlife use of reclaimed and surrounding areas will increase. As such, monitoring will also include incidental observations of wildlife use, including tortoise and sheep.

For the Mojave Desert Scrubland vegetative community, success will be measured at 50% of vegetation cover with 20% of species density of the control plot. Percent cover (amount of vegetation canopy per unit) and density (number of plant species per unit) will be based on the quantitative data collected from the control plot for each monitoring site. For example, if a control plot in Mojave Desert Scrubland exhibits an average of 30% native vegetation cover, a treatment plot with 15% native cover would indicate a trend toward reclamation success.

18.4 Monitoring Practices

All monitoring sites will be delineated during pre-construction activities and will include the collection of baseline data for subsequent post-construction monitoring. Post-construction annual monitoring and collection of data will be conducted during the spring or fall, after construction and reclamation actions are completed. An annual summary of monitoring information will be provided to BLM for review and discussion of reclamation conditions. As currently anticipated, construction activities will result in varying disturbance levels that will require two types of monitoring:

- General Monitoring – general field reconnaissance (windshield survey) and reporting of conditions in treated areas within the Project area
- Site Monitoring – detailed field reconnaissance and reporting at designated reclamation monitoring sites and control areas within the Project area

A description of the activities associated with these two monitoring methods (practices) and how these practices will be assigned to areas affected by construction of the Project is presented below. The contractor hired to perform reclamation monitoring will consult with BLM to adapt these protocols, as needed, to meet localized conditions and concerns.

18.5 Monitoring Sites

Preliminary site monitoring locations will be established within the Project area based on Project engineering data provided during pre-construction surveys. Sites will be selected for each vegetation community disturbed by the Project. Site selection will be prioritized to include areas in the vicinity of sensitive plant species, critical habitat areas, and locations with high visual resource values. Where possible, site monitoring locations will meet more than one of these selection criteria. Three paired (treatment and control) monitoring sites will be selected for the Project to ensure the variations of the Mojave Desert Scrub vegetation community is represented. Final determination of monitoring sites will be approved by BLM prior to construction. Once monitoring site locations are finalized, photographs will be taken: 1) prior to any construction-related disturbance; 2) when initial reclamation efforts have been completed; and 3) during each yearly monitoring visit.

For each monitoring site, paired vegetation transects will be installed and documented as treatment or control for quantitative monitoring. In general, the treatment transect will be placed within an affected area and the control transect will be placed immediately adjacent on undisturbed ground. Transect size and quantity will be determined based on the final footprint of disturbed areas, in cooperation with BLM.

Transect pairs will be sized and oriented in a similar manner, for consistency, if terrain or construction conditions require deviation. In addition, the location of transect sites should avoid areas susceptible to future human disturbance (OHV use), where possible, to assure that the integrity of each transect remains intact for the duration of the monitoring period.

Plots will be examined annually with a variety of vegetation data collected including quantitative and descriptive information. Parameters that will be used to measure reclamation success are presented below. Reclamation monitoring sites will also assess noxious and invasive weed establishment that may require remedial actions, such as removal or treatment. However, it should be noted that monitoring for known noxious weed locations may occur independently of reclamation monitoring. Reclamation monitoring will also include the consideration of erosion control as a key indicator to measure the trend toward reclamation success (where applicable), and remedial actions may be taken in conjunction with monitoring efforts to control erosion, as recommended by BLM.

18.6 Monitoring Requirements

In order to address the various construction activities associated with the Project and the disturbance types and duration of disturbance associated with these construction activities, reclamation monitoring will occur according to the reclamation levels (RL1 through RL5) and their associated construction components as described previously. However, all reclamation level areas will follow guidelines for noxious weed monitoring. The highest disturbance level for construction activities is associated with RL 5 areas, which are associated with temporary work areas and new access roads.

The specific location of monitoring sites associated with these different activities in key areas (e.g., sensitive plant locations, visually sensitive areas, and areas of sensitive soils) will be identified, reviewed, and

approved by BLM prior to initiation of pre-construction activities. Once monitoring sites have been approved, GVC will establish the sites in the field and baseline data (i.e., photographs, biometrics, and soil conditions) to be collected for subsequent monitoring up to five years following post-construction activities.

It is understood that GVC must allow BLM access to inspect all aspects of mine operations on public land. Additionally, as a condition of operating on public land, GVC must allow BLM's inspector reasonable access through their private lands in the Project area in order to inspect public lands. It is further understood that any attempt by GVC to restrict or impede inspection is prohibited and subject to enforcement actions by BLM under 43 CFR 3715 and/or 43 CFR 3809.

18.6.1 Data Collection

Reclamation monitoring will include both quantitative (numerical) and qualitative (descriptive) data collection at the designated monitoring sites approved by BLM. Quantitative monitoring will document the trend and degree of change at each site. Qualitative monitoring will detect the degree of change and changes resulting from environmental conditions such as precipitation allowing for a record of change over time.

Reclamation monitoring for the Project will use vegetation as the main indicator of recovery, but observations on soil conditions will also be collected and considered when assessing progress toward functionality. Measurements and descriptions will be accompanied by photographs that will be used to help document the status of recovery at all monitoring sites. Sampling points will be located and mapped according to geographic positioning system (GPS) coordinates. Photographic reference points will be the primary method of qualitative monitoring for the Project. A protocol for taking photographs and a standardized data-recording form will be developed to ensure consistency of monitoring. Qualitative and quantitative information that will be gathered during general route monitoring and site monitoring are described in detail below.

18.6.2 Qualitative (Descriptive) Information

Qualitative data collection will occur annually for both general and site monitoring. The goal of qualitative monitoring is to document site conditions and assess the need for remedial actions to ensure that sites are progressing toward the success standards established by BLM. The Southwest typically has unpredictable weather patterns that may affect reclamation success within the allotted five-year post-construction monitoring timeframe currently established by BLM. Qualitative evaluations that are conducted at predetermined monitoring sites during monitoring will serve as representative indicators for similarly disturbed areas in the same vegetation community or sub-community. These site evaluations will then serve as a baseline when conducting general overall surveys for the remainder of the treated areas within that vegetation community or sub-community.

Any outstanding or non-Project related disturbances that could affect reclamation will also be generally described during the general route monitoring. Recovery from construction-disturbance activities, such as clearing and grading in the semi-arid and arid climactic zones, typically do not occur in a short amount of time. For this reason, the monitoring plan will assess the trend toward reclamation success standards.

Reclamation success may be assessed by the presence or condition of certain site characteristics that encourage recruitment of native vegetation. Reclamation actions of a given site, if implemented

successfully, are anticipated to contribute to the stabilization of soils, seedling or seedbank recruitment, and avoidance of noxious weed infestation. Lack of erosion at a site provides evidence that soils have been adequately stabilized, while natural recruitment and/or reproduction indicate that important functional processes are in place that initiate regeneration, such as pollination and seed dispersal. Noxious weeds could potentially compete with native perennial species, and relatively high abundances can have negative effects on site conditions. Evidence of animal use is also used as an indicator that habitat conditions have been restored.

Patterns of established vegetation help to determine whether large bare areas are indicative of site conditions or simply a result of the patchiness of surrounding vegetation. Each of these site characteristics will help determine trends that relate to reclamation success. Once recruitment conditions have been met, established vegetation is anticipated to contribute to the maintenance and functionality of the community to ensure continued success after monitoring has concluded.

18.6.3 Quantitative (Numerical) Information

Success parameters will be numerically measured on those treatment sites identified by BLM, during the third and fifth growing seasons (or sooner if deemed appropriate), to determine if there is a trend toward reclamation success based on comparison of the control transect for each site. Quantitative assessment during the third year will provide enough time for vegetation establishment of the affected areas based on climatic trends for the area. Trends toward reclamation success, as well as remedial actions (if necessary), will be identified during the fifth year. Quantitative monitoring in Year Five will allow any remedial actions or climatic events to discernibly affect treated areas. Density monitoring will record the number of plants per unit of area. Not all plant species present will be monitored. Monitoring will focus on dominant or indicator perennial species as determined by control-site observations of the adjacent plant community.

Species density will be evaluated by comparing the total number of indicator species in the treatment site to that of the control site. Other plant species will be inventoried, but densities will not be evaluated. Vegetation cover monitoring records the coverage of the vegetation canopy per unit of area. Density and cover data, along with other biometrics, will be recorded on standard field data sheets. Monitoring sites that include salvaged plants or plants that have been preserved in place will also be counted and assessed for mortality, where present. The preservation or salvage of plants is primarily a structural contribution to the long-term maintenance and functionality of the vegetation community. Salvage-plant mortality should not be considered a principal indicator of overall reclamation failure.

18.7 Adaptive Management and Site Release

BLM requires that an adaptive management approach designed to allow frequent review and feedback on the progress of reclamation be implemented as a part of monitoring activities for the Project. Adaptive management greatly increases the potential for reclamation success by providing early detection of problems and the opportunity to implement remedial actions to address these problems. Effective monitoring is an essential element of adaptive management because it provides reliable feedback on the effects of reclamation actions. Adaptive management actions may be recommended on a case-by-case basis where feasible, and as determined by BLM, during the five-year monitoring timeframe.

If it has been determined that adaptive measures are necessary, monitoring data will provide information on reclamation components that are deficient, such as native vegetation cover, soil compaction, or lack of natural surface material. Based on this information, appropriate reclamation actions may include measures,

such as supplemental seeding, mulching, and additional weed and/or erosion control measures. Recommendations could also include waiting a few years prior to taking remedial action to determine if favorable germination/establishment conditions are affected. All adaptive management actions will be subject to the review and approval of BLM.

It is possible that some sites will be incapable of supporting adequate vegetation to progress towards the success standards due to conflicting land management, Project-caused conditions, and environmental limitations not associated with the Project. For instance, reclamation may fail in areas with unmanaged OHV access and/or natural disasters such as fire. If reclamation failure is determined to be caused by these conditions, GVC will consult with BLM to determine level of responsibility for the continued reclamation of these areas.

19.0 MINE MONITORING PLANS [3809.401 (B) (4)]

The reclamation monitoring plan (Section 17) is designed to demonstrate compliance with the 43 CFR 3809 in an effort to ensure reclamation of disturbed areas is effective post construction and post mining activities. As part of operational mining activities, GVC monitors applicable mining components at Moss Mine in compliance with state and federal permits and other required plans. These include air quality, surface and groundwater, reclamation, and slope stability. The current major permits/plans associated with each monitoring component are summarized in **Table 27** and previously in **Table 3. Appendix L** includes approved permits and monitoring plans associated with the current operation of Moss Mine, as well as a schedule table of mandatory compliance checks for federal and state permits.

Table 27: Major Permits and Authorizations with Monitoring Requirements

Operating Permits	Number	Issuing Agency
Air Quality Control Permit	64302/69453 (minor revision)	ADEQ
Aquifer Protection Permit	P-511225 (LTF#64007)	ADEQ
Multi-Sector General Permit (MSGP)[1]	AZMS68804	ADEQ
Mined Land Reclamation Plan[2]	Accepted on 10/24/2016	ASMI
Dust Control Plan	Air Quality Permit No. 64302	Incorporates EPA and ADEQ requirements

Notes:

[1] *The Arizona Pollutant Discharge Elimination System MSGP permits requires GVC to maintain the SWPPP for the Project. The SWPPP for the site is maintained to accurately reflect controls on the Project and is included in* ***Appendix L****.*

[2] *The State Mined Land Reclamation Plan is provided in* ***Appendix T****.*

20.0 QUALITY ASSURANCE PLANS [3809.401 (B)(2) (V)]

GVC maintains a number of quality assurance plans (QAPs) that contribute to the environmental quality of the operation and provide for environmental protection, safety, and on-going monitoring. The QAPs are updated as applicable to remain compliant with changes in environmental regulations. The QAPs are summarized in **Table 28**.

Table 28: Quality Assurance Plans

Types of Quality Assurance Plans	Description
Code of Safe Practice	Mandates all employees and contract employees adhere to proven, safe practices that are common to GVC operations
Water Quality Monitoring Plans	Plans for monitoring the quality of groundwater pursuant to APP requirements
Water Sample Collection QAP	Procedures for assuring the quality of water samples collected for monitoring the quality of groundwater
Air Quality Monitoring Plan	Procedure for ensuring compliance with discharge of emissions and fugitive dust
Laboratory Analytical Protocols	Procedures used to determine the quality of data generated by analyzing rock samples for ore and barren rock control (i.e., non-acid producing)
Equipment Preventative Maintenance Schedule	Schedule for conducting regular servicing for each piece of equipment used at Moss Mine
Environmental Management System	Identifies, monitors, and controls environmental aspects and manages compliance with internal procedures and regulatory obligations

QAPs are often designed and implemented by GVC as facilities are designed, permitted, and brought on-line. In general, all personnel working or visiting Moss Mine are required to follow federal, state, and local regulations associated with environmental protection and quality assurance and control. In addition, it is the responsibility of each contractor to conduct operations in accordance with all applicable laws and regulations and requirements set out by GVC.

GVC has established and maintains an Environmental Management System (EMS), under the supervision of the GVC Environmental Specialist, which provides the framework within which the company evaluates its environmental impacts and performance. The EMS allows GVC to assess environmental risks and issues within its operational structure in order to minimize and mitigate environmental impacts from its activities. Furthermore, the EMS helps demonstrate GVC's due diligence in creating QAPs to comply with environmental regulations including a number of plans, processes, and tools.

21.0 INTERIM MANAGEMENT PLAN [3809.401 (B) (5)]

Pursuant to 43 CFR 3809.401(b)(5) this section discusses:

1. Measures to stabilize excavations and workings
2. Measures to isolate or control toxic or deleterious materials
3. Provisions for the storage or removal of equipment, supplies and structures
4. Measures to maintain the Project area in a safe and clean condition
5. Plans for monitoring site conditions during periods of non-operation
6. A schedule of anticipated periods of temporary closure during which the Interim Management Plan would be implemented, including provisions for notifying BLM of unplanned or extended temporary closures

21.1 Introduction

Certain facilities, equipment, and structures appropriate to the ore deposit and terrain are necessary to effectively and efficiently pursue the development and extraction of valuable minerals on public and private lands surrounding Moss Mine. GVC continues to actively perform all necessary maintenance, inspections, and other regulatory compliance requirements in accordance with the conditions of the existing approved permits and licenses to prevent unnecessary or undue degradation.

Access to the Moss Mine is by US Highway 95, and NV Highway 163 southeast from Las Vegas, Nevada or AZ Highway 68 west from Kingman, Arizona to Bullhead City, Arizona. Both highways intercept with the Bullhead Parkway in the northern portion of Bullhead City. Silver Creek Road, a Mohave County regional road, is 5 miles south on the Bullhead Parkway and leads easterly to the primary mine access road on BLM land (BLM Road 7717) that is designated as open to motor vehicle use in the KFO RMP (BLM 1993). The origination of BLM Road 7717 is at mile 5.7, east of Bullhead Parkway, on Silver Creek Road and is constructed northerly 1.3 miles to the southern boundary of the GVC patented Moss Mine property.

Figure 1 shows the general facility layout, infrastructure, and access roads on public and private land.

21.2 Operations on Public Land

Phase III proposed facilities and exploration activities will be situated on both BLM and private land holdings (i.e., Moss Mine patented claims). As shown in **Figures 1 and 2**, there are portions of facilities that are located on public land. The Phase III heap leach pad, barren rock stockpiles, and open pit extensions (i.e., Eastern and Western), other infrastructure and ancillary facilities, as well as exploration areas that are either partially or wholly contained on BLM land. This Interim Management Plan addresses interim operations describing the operation or facility location on either public or private land, or both.

21.3 Measures to Stabilize Excavations and Workings

21.3.1 Open Pit Surface Mine

The current mine workings have been in place for more than five years. The open pit is located within the private land and can only be accessed through a security gate that is manned 24 hours per day to protect GVC's valuable minerals from theft or loss and the public from safety hazards. Signs are posted declaring the property to be off limits to the general public and fencing is used for the same purpose. Safety considerations require the open pit excavations to be stabilized by best management practices to minimize rock fall.

The following measures will be conducted as necessary to ensure stable and safe surface workings:

1. Regular inspections of the main haulage ways to identify any potential rock fall issues or concerns.
2. Documentation of all inspections conducted, including details on issues addressed and stabilization measures employed, to ensure rock caving or movement will not affect future mining or create safety issues.
3. Chain link fencing and signage limiting entrance to the open pit to authorized personnel only.

21.3.2 Phase III Heap Leach Pad

The Phase III heap leach pad is located on both BLM and private land, see **Figure 1**. This proposed facility will have limited stabilization issues due to engineering design and best management practices implemented to control sloughing of material, such as sloped surfaces to encourage runoff. Regular monthly inspections of the heap leach pad will be undertaken to identify any potential stability issues as per the project's ADEQ APP. Stability inspections will continue, as deemed necessary, to ensure stability for the life of the Project. If areas of instability are identified, they will be stabilized by the most appropriate means.

21.3.3 Merrill Crowe Solution Management

Merrill Crowe Solution Management consists of methods used to circulate pregnant or barren process solutions including leach solution through drainage systems. For proper leach solution management, the existing discharge control technologies (DCTs) will remain in operation until they are not necessary and include the leachate collection ponds (LCP), interceptor drainage systems, seepage cutoff walls, and the flood control basin (FCB). Pregnant leach solution drains from the leached dumps and reports to the LCP. As part of the existing process, pregnant leach solution is pumped to a pregnant solution pond and to the Merrill Crowe facility for gold and silver extraction and refortification and is then circulated back to the dumps using best management practices.

21.3.4 Proposed Barren Rock Stockpiles East and West

Barren rock stockpiles will be required for the Phase III expansion. The primary barren rock stockpile (i.e., barren rock stockpile east) will be expanded from its original location on patented claims to include BLM land on the southeast corner of the patented claims and is approximately 135 acres in size. A smaller barren rock stockpile will also be required to support the Far Western Pit, called barren rock stockpile west. This small barren rock stockpile will be 15.5 acres in size and located on BLM land northwest of the patented claims. This area will be used to temporarily stockpile growth medium from the construction of the proposed heap leach pad.

Two primary considerations associated with barren rock stockpiles include stormwater diversions and dust control. Stormwater diversions are installed on Moss Mine and are being maintained throughout the active mine. Dust control measures, including the application of surface polymer, will be implemented on travel routes to and from barren rock stockpiles. The following actions will be undertaken, as necessary, in compliance with state and federal regulations:

1. Monitoring for visible particulate matter (dust and emissions) as required by the mine's air quality permit
2. Daily monitoring for structural issues and pond level as required by the mine's APP
3. Quarterly inspection by a certified engineer for structural issues and stormwater control effectiveness as required by the MSGP and APP
4. Visual assessments after rain events of stormwater discharged from outfalls below the barren rock stockpiles as required by the SWPPP

21.3.5 Access and Exploration Roads

Authorized access roads (for operations or for exploration) will be maintained within the Project area in a manner that is consistent with resource protection and public safety. For public safety, appropriate signage already in place will be maintained at public access points to provide warning of potential hazards associated with unauthorized access. A 24-hour security guard is in place on the main access road (BLM Road 7717) to the mine to protect the public from mine equipment and operations and to deter theft. Environmental commitments, associated with access and exploration roads (and other facilities), will be adhered to in an effort to avoid or minimize impacts on environmental resources.

21.4 Measures to Isolate or Control Toxic or Deleterious Materials [43 CFR 3809.420 (c) (12) (vii)]

Any toxic substances utilized on BLM land, including diesel fuel, gasoline, and lubricating grease, will continue to be managed in accordance with federal and state regulatory requirements through proper removal and disposal, as necessary. Monthly inspections of areas where petroleum products are stored, on patented claims, will be completed as required by the SPCC. In the event of a release, measures set forth in the SPCC will be followed. The following measures will continue to be implemented to manage toxic materials:

1. All unnecessary maintenance items, lubricants, and mining materials will be removed from the pit and all items returned to the appropriate vendor or placed in appropriate on-site storage.
2. All explosives and ANFO will be returned to the vendor or removed from site. If needed for mineral extraction enhancement, materials will be imported to the site by a contractor having the appropriate licenses and will not be stored on-site.
3. Sludges from the ponds will be detoxified by hydrogen peroxide rinsing and then encapsulated in a section of the heap to ensure metals or compounds are not released into the environment. Upon termination of operations the process solutions will be de-toxified by rinsing with a hydrogen peroxide solution followed by a fresh water rinse to reduce deleterious materials in the process water to a level meeting State of Arizona drinking water standards. This procedure was followed for the Phase I heap leach pad; resultant cyanide levels in the solutions were reduced to one-third of the allowable drinking water level.

21.5 Provisions for Storage or Removal of Equipment, Supplies, and Structures

GVC's equipment at the mine is suitable for the terrain and deposit necessary for the efficient extraction of valuable minerals. GVC's equipment has been routinely maintained, repaired, and/or replaced as needed. As appropriate, the following measures may be undertaken for equipment supplies and structures to ensure public safety and prevent the unnecessary and undue degradation of environmental resources on public and private lands:

1. Mining Equipment (located on private land): To ensure public safety, operational mining equipment, materials, maintenance materials, and maintenance equipment will be stored on site in designated storage facilities.
2. Processing Equipment (located on private land): The process plant, crusher, and Merrill Crowe plant equipment will remain in place on private land and be maintained or repaired as needed. As appropriate, the following measures may be implemented to maintain the equipment and keep GVC personnel and the public safe from any hazards:

a. Motor belts and conveyor belts may be removed and stored in the warehouse or other appropriate facility.
b. All equipment including electrical panels may be mothballed and covered in accordance with the manufacturer's recommendations for long-term storage.
c. All pumps including those at the leach pad may be split open and tank plugs removed to limit water build-up.
d. All water lines may be drained.
e. All high priced or high value items may be removed and appropriately stored.
f. The existing mine water tank will be kept full to maintain appropriate fire readiness.

3. Proposed Maintenance Shop, Office Complex, and Assay Laboratory/Core Shack (located on BLM land): An inventory of the warehouse items will be maintained, and items will be stored as appropriate. Any potential hazardous materials will be isolated or returned to the appropriate vendor and buildings will remain in place.
4. Maintenance of Facility Buildings: The Merrill Crowe facility (located on private land), furnace facilities, and any unnecessary equipment will be maintained. Any potential hazardous materials or items will be isolated and appropriately contained or returned to the appropriate vendor. The tanks, pumps, and piping will remain in place for operations. The facility buildings will also remain in place.
5. Fueling Station (located on private land): All equipment, tanks, and fueling stations will be maintained on-site. Any potential hazardous materials or items will be isolated and appropriately contained or returned to the appropriate vendor.

21.6 Security Operations

The public is currently (Phase II) protected from surface uses, existing and proposed, by security measures including fencing, gates, signs, and 24-hour security surveillance. Additionally, a security guard is stationed, from dusk to dawn 7 days a week, at the confluence of BLM Roads 7717 and 7922. The guard has two-way radio communication with the guard shack *on the mine*, approximately 1.3 miles north. The two locations communicate with each other primarily related to traffic either entering the mine or traffic leaving the mine. BLM Road 7717 is a single lane road in some areas (until it is realigned [previously discussed]) and large 40-ton trucks are limited in their ability to provide additional space. Travelers are advised that the road is gated with no entry to the northern reach of BLM Road 7717. The security guard, at this confluence of BLM Roads 7717 and 7922, can provide a map of local trails to travelers that may occasion the guard post location.

21.7 Measures to Maintain the Project Area in a Safe Clean Condition

GVC will ensure equipment and materials are properly stored or removed from the site to ensure safety. Mine staff will be tasked with equipment and facility maintenance and mine safety procedures on a regular basis. Staff will have sufficient training and resources to maintain the Project area in a safe and clean condition.

Mine employees, guests, and visitors to the mine are required to comply with GVC's mine safety protocols and be equipped with the appropriate safety equipment. Visitors to the site are required to check-in prior to entrance through the main gate, which includes electronic surveillance in the form of a security camera. A safety briefing is provided to visitors prior to entrance into the mine site at GVC's offices on Adobe Road in Bullhead City, Arizona (approximately 10 miles from the mine site). All safety and protection procedures currently in place will continue to be extended to Phase III operations and exploration activities on BLM lands.

21.8 Plans for Monitoring Site Conditions During Periods of Non- Operation or Curtailment

In compliance with applicable local, state, and federal regulations, GVC will monitor site conditions during non-operation or curtailment as follows:

1. Security: A security staff member will be stationed on-site 24 hours per day at the security office located on GVC's private land and will be responsible for maintaining site security and safety. No security personnel or staff will maintain a full- or part-time residence on private or BLM land.
2. Environmental Management and Protection: All required environmental monitoring and inspection activities will continue to be performed, records maintained, and compliance reports filed to maintain compliance and avoid unnecessary and undue environmental degradation.
3. Health and Safety: A health and safety representative will visit the mine regularly to maintain workplace safety systems, provide safety training, conduct MSHA inspections, and complete compliance reporting.
4. Operations Management: The Mine Operation's Manager will provide overall site management with assistance from the operations and maintenance staff.

21.9 Schedule of Anticipated Temporary Closures

In the event of a temporary or planned closure, a temporary closure notice will be provided to the following regulatory agencies:

1. Field Manager, BLM Kingman Field Office, 2755 Mission Boulevard, Kingman, Arizona 86401;
2. Arizona Department of Environmental Quality, Water Quality Division and Air Quality Division, 1110 West Washington Street, Phoenix, Arizona 85007; and
3. Arizona State Mine Inspector, 1700 West Washington, 4th Floor, Phoenix, Arizona 85007.

Updates of the temporary closure status will be provided to BLM's KFO Field Office Manager on a semi-annual basis thereafter and 30 days prior to resuming full mining operations.

21.10 Procedures to Resume Mining Operations

In the case of temporary closure, GVC will maintain all aspects of the operation in good standing order including equipment, the processing areas, and local, state, and federal permits. Within 30 days of a decision to resume full operations, GVC will notify BLM, the State Mine Inspector, and ADEQ of its intention to resume operations. A schedule for facility re-commissioning will be provided. Existing permits will be complied with during the re-start process.

22.0 RECLAMATION COST ESTIMATE/FINANCIAL ASSURANCE 43 CFR 3809.551

GVC will ensure existing financial assurance (Phase II) and future financial assurance (Phase III) for reclamation remains adequate and in good standing during periods of curtailment and operations. GVC will summarize details of the reclamation cost estimate/financial assurance plan at the completion of the NEPA document and prior to the MPO approval. GVC currently has approved reclamation bonds in the total amount of $2,744,926 allocated as follows:

Bureau of Land Management	$ 354,370
Arizona Department of Environmental Quality	$ 1,444,106
Arizona State Mine Inspector	$ 946,450

23.0 GLOSSARY

ACID ROCK DRAINAGE (ARD) (ACID MINE DRAINAGE): The exposure, usually as a result of mining, of sulfide-bearing minerals to air and water, forming sulfuric acid. This acid dissolves metals such as lead, zinc, copper, mercury, and cadmium, into ground and surface water. Acid rock/mine drainage can impact water quality, aquatic life and habitat. Commonly mined ore bodies that pose the risk of acid rock drainage include gold, silver, copper, iron, zinc, and lead.

ACID-BASE ACCOUNTING: (ABA) is the balance between acid production and acid consumption properties of a mine waste material.

ADIT: A nearly horizontal passage in an underground mine, driven from the surface, by which a mine may be entered, ventilated, or dewatered.

AQUIFER: A water-bearing bed or layer of permeable rock, sand, or gravel capable of yielding large amounts of water.

BACKFILLING: The replacement of rock, soil and earth removed during mining.

BARREN ROCK: Rock or material at a mine that is too low in grade to be of economic value. Also referred to as "waste rock".

BASELINE STUDIES: The establishment and operation of a designed surveillance system for continuous or periodic measurements and recording of existing and changing conditions that will be compared with future observations.

BENEFICIATION: The dressing or processing of ores to 1) regulate the size of a desired product, 2) remove unwanted constituents, and 3) improve the quality, purity, or assay grade of a desired product. Beneficiation includes concentration or other preparation of ore for smelting by drying, flotation, or magnetic separation.

BEST AVAILABLE DEMONSTRATED CONTROL TECHNOLOGY (BADCT)The applying of the most advanced systems, techniques, procedures, and controls, determined on a case-by-case basis by the regulatory agency. BADCT is the primary tenet of the State of Arizona permitting regulations.

BIOLOGICAL ASSESSMENT: Information prepared by, or under the direction of, a Federal agency concerning listed and proposed species and designation and proposed critical habitat that may be present in the action area and may be affected by the proposed action. A biological assessment presents the BLM's determination of whether any such species or habitat is likely to be adversely affected by the action.

BULKHEAD: A partition or wall in mines for protection against gas, fire, run of broken rock and water.

BULK SAMPLING: As part of exploration, the removal of large amounts of mineral substances for testing.

CASUAL USE: Mining activities that no or negligible disturbance to Federal lands and resources.

CLAIM: See MINING CLAIM.

CORPORATE GUARANTEES (BONDING): The use of corporate pledge as part or all of the financial assurance for reclamation. The BLM does not accept any new corporate guarantees for bonding purposes.

CULTURAL RESOURCE: A definite location of human activity, occupation, or use identifiable through field inventory (survey), historical documentation, or oral evidence. The term includes archaeological, historic, or architectural sites, structures, or places with important public and scientific uses, and may include definite locations (sites or places) of traditional cultural or religious importance to specified social and/or cultural groups. (Cf. "traditional cultural property;" see "definite location.") Cultural resources are concrete, material places and things that are located, classified, ranked, and managed through the system of identifying, protecting, and utilizing for public benefit described in this Manual series. They may be but are not necessarily eligible for the National Register (See "historic property" or "historic resource.")

CYANIDE LEACHING: The extraction of metal from an ore by dissolution in a cyanide solution.

DAVIS-BACON WAGES: For reclamation cost estimating purposes Davis-Bacon wage determination is applied to applicable construction contracts. Wage determinations are issued by the U.S. Department of Labor under the
Davis-Bacon and related Acts. Information on Davis-Bacon wage rates can be found at www.access.gpo.gov\davisbacon.

DEVELOPMENT (MINERAL): The preparation of a proven deposit for mining.

DISCOVERY: Under the Mining Law, a mining claimant has made a "discovery" on the mining claim "where minerals have been found and the evidence is of such a character that a person of ordinary prudence would be justified in the further expenditure of his labor and means, with a reasonable prospect of success in developing a valuable mine." Castle v. Womble, 19 Pub. Lands Dec. 455, 457; Chrisman v. Miller, 197 U.S. 313, 322 (1905). Mining claims are not valid without a discovery.

DRAINAGE: The removal of excess water from land by surface or subsurface flow. See ACID ROCK DRAINAGE.

ENDANGERED SPECIES: Any species in danger of extinction throughout all or a significant portion of its range. Threatened and endangered species are designated by the U.S. Fish and Wildlife Service or National Marine Fisheries Service under provisions of the Endangered Species Act.

ENDANGERED SPECIES ACT (ESA): A Federal act passed in 1973 to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved and to provide a program for the conservation of such endangered species and threatened species.

ESA CONSULTATION and CONFERENCING: The requirement of Section 7 of the Endangered Species Act that all Federal agencies consult with the U.S. Fish and Wildlife Service or the National Marine Fisheries Service if a proposed action may affect a federally listed species or its critical habitat.

EXPLORATION: The work of investigating a mineral deposit using geological surveys, geophysical surveys, geochemical surveys, boreholes, pits, and underground workings. Exploration is undertaken to gain knowledge of the size, shape, position, characteristics, and value of the deposit. For the surface management regulations, exploration may mean creating surface disturbance that is greater than casual use and that

includes sampling, drilling, or developing surface or underground workings to evaluate the type, extent, quantity, or quality of mineral values present. Exploration does not include activities where material is extracted for commercial use or sale.

FEDERAL LAND POLICY AND MANAGEMENT ACT (FLPMA): The act that (1) provided standards for the BLM in managing the public lands, including land use planning, sales, withdrawals, acquisitions, and exchanges; (2) authorized the setting up of local advisory councils representing major citizens groups interested in land use planning and management; (3) established criteria for review of proposed wilderness areas; and (4) provided guidelines for other aspects of public land management such as grazing. Section 302(b) of FLPMA amended the Mining Law to require the BLM to prevent UUD to the public lands. This provision forms the basis for the surface management regulations.

LEACHATE: The liquid that has percolated through and dissolved minerals out of ore.

LOCATABLE MINERALS: Minerals that may be extracted under the Mining Law of 1872, as amended, consistent with surface management regulations.

MAXIMUM PROCESS SOLUTION INVENTORY: The maximum volume of solutions projected to be present in a leaching process circuit at any given time after considering precipitation, evaporation, runon, draindown of retained solution, addition of make-up water, normal discharge, or loss to ore wetting. Modeling is often done to assess the water balance and to determine the maximum process solution inventory under average operating conditions, during a wet year, or during a dry year. The remaining "free board" or available storage capacity is then compared to the expected solution addition from the design storm event (often the 100-year, 24-hour event) in order to determine whether the storage capacity is adequate to contain the design storm event.

MILL: A processing facility in which ore is treated for the recovery of valuable minerals or valuable minerals are concentrated into a smaller bulk for shipping to a smelter or other reduction works.

MILL SITE: A parcel of non-mineral land located under the Mining Law and used and occupied in support of a mine. See LOCATION and MINING CLAIM.

MINE: An opening or excavation in the earth for extracting minerals.

MINERAL: Any solid or fluid inorganic substance that can be extracted from the earth for profit.

MINERAL ACTIVITY: Mining and mineral exploration.

MINERALIZATION: The processes taking place in the earth's crust resulting in the formation of valuable minerals or ore bodies.

MINING CLAIM: A parcel of land that a miner takes and holds for mining purposes, having acquired the right of possession by complying with the Mining Law and local laws and rules. There are four categories of mining claims: lode, placer, mill site, and tunnel site.

MINING CLAIMANT: A person, association, corporation, or government that claims minerals rights or title in the public lands.

MINING LAW OF 1872 (GENERAL MINING LAW OR MINING LAW): The Federal act that, with its amendments, authorizes the mining of locatable minerals on the public lands.

MINING LAWS: The Lode Law of July 26, 1866, as amended (14 Stat. 251); the Placer Law of July 9, 1870, as amended (16 Stat. 217); and the Mining Law of May 10, 1872, as amended (17 Stat. 91); as well as all laws supplementing and amending those laws, including the Building Stone Act of August 4, 1892, as amended (27 Stat. 348); the Saline Placer Act of January 31, 1901 (31 Stat. 745); the Surface Resources Act of 1955 (30 U.S.C. 611- 614); and the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1701 et seq.).

MINING LOCATION: A mining claim or mill site on the public lands.

MITIGATION: As defined in 40 CFR 1508.20, one or more of the following: (1) avoiding impacts altogether by not taking a certain action or parts of an action; (2) minimizing impacts by limiting the degree or magnitude of an action and its implementation; (3) rectifying impacts by repairing, rehabilitating, or restoring the affected environment; (4) reducing or eliminating impacts over time by preservation and maintenance operations during the life of the action; and (5) compensating for impacts by replacing or providing substitute resources or environments.

NATIONAL ENVIRONMENTAL POLICY ACT (NEPA): The Federal law, going into effect on January 1, 1970, that established a national policy for the environment and requires Federal agencies (1) to become aware of the environmental ramifications of their proposed actions, (2) to fully disclose to the public proposed Federal actions and provide a mechanism for public input to Federal decision-making, and (3) to prepare environmental impact statements for every major Federal action that would significantly affect the quality of the human environment.

NATIONAL HISTORIC PRESERVATION ACT (NHPA): A Federal statute that established Federal program to further the efforts of private agencies and individuals in preserving the Nation's historic and cultural foundations. NHPA (1) authorized the National Register of Historic Places, (2) established the Advisory Council on Historic Preservation and a National Trust Fund to administer grants for historic preservation, and (3) authorized the development of regulations to require Federal agencies to consider the effects of federally assisted activities on properties included on or eligible for the National Register of Historic Places.

NOXIOUS WEED: According to the Federal Noxious Weed Act (PL 93-629), a weed that causes disease or has other adverse effects on humans and their environment and is therefore detrimental to public health and the agriculture and commerce of the United States.

OFF-HIGHWAY VEHICLE (OHV): Any vehicle capable of or designed for travel on or immediately over land, water, or other natural terrain, deriving motive power from any source other than muscle. This definition excludes (1) any non-amphibious registered motorboat; (2) any fire, emergency, or law enforcement vehicle while being used for official or emergency purposes; and (3) any vehicle whose use is expressly authorized by a permit, lease, license, agreement, or contract issued by an authorized officer or otherwise approved.

OPEN PIT MINING: A surface mining method in which overlying rock and soil are removed to expose an ore body, which is then drilled, blasted, and hauled from the pit.

OPERATIONS: All functions, work, facilities, and activities on public lands in connection with prospecting, exploration, discovery, and assessment work, development, extraction, and processing of mineral deposits

locatable under the mining laws; reclamation of disturbed areas; and all other reasonably incident uses, whether on a mining claim or not, including the building of roads, transmission lines, pipelines, and other means of access across public lands for support facilities.

OPERATOR: Any person who manages, directs, or conducts mining operations at a project area, including a parent entity or an affiliate who materially participates in such management, direction, or conduct. An operator on a particular mining claim may also be the mining claimant.

PALEONTOLOGICAL RESOURCES (FOSSILS): The physical remains of plants and animals preserved in soils and sedimentary rock formations. Paleontological resources are important for understanding past environments, environmental change, and the evolution of life.

PATENT: The instrument by which the Federal Government conveys title to the public lands.

pH: A measure of acidity or hydrogen ion activity. Neutral is pH 7.0. All values below 7.0 are acidic, and all values above 7.0 are alkaline.

PIT LAKE: Water body that forms at the bottom of an open pit mine when mining extends below the water table.

PLAN: See PLAN OF OPERATIONS.

PLAN OF OPERATIONS: A plan for mineral exploration, development, and/or mining that an operator must submit to the BLM for approval, when more than 5 acres will be disturbed, when activity greater than exploration will occur on fewer than 5 acres, or when an operator plans to work in an area of critical environmental concern or a wilderness area. A Plan of Operations must document in detail all activities the operator plans to take, from exploration through reclamation and post-mine closure (including any post-mine economic uses) and, if necessary, long-term monitoring. Before commencing operations on an approved Plan of Operations, the operator must also provide the BLM with an acceptable financial guarantee.

PROJECT AREA: The area of land upon which an operator conducts mining operations, including the area needed for building or maintaining of roads, transmission lines, pipelines, or other means of access.

PUBLIC LANDS: Any land and interest in land owned by the United States and administered by the Secretary of the Interior through the Bureau of Land Management, without regard to how the United States acquired ownership, except for (1) land located on the Outer Continental Shelf and (2) land held for the benefit of Indians, Aleuts, and Eskimos.

RECLAMATION: Measures stated in the accepted Notice or approved Plan of Operations as a condition of allowing the disturbance of public lands from mining operations. Reclamation measures must meet performance standards and achieve conditions required by the BLM at the end of operations. Components of reclamation may include 1) isolating, controlling, or removing acid-forming, toxic, or deleterious substances; 2) regrading and reshaping to conform with adjacent landforms, facilitate revegetation, control drainage, and minimize erosion; 3) rehabilitating fisheries or wildlife habitat; 4) placing growth media and establishing self-sustaining revegetation; 5) removing or stabilizing buildings, structures, or other support

facilities; 6) plugging drill holes and closing underground workings; and 7) providing for post-mining monitoring, maintenance, or treatment.

RIPARIAN AREA: A form of wetland transition between permanently saturated wetlands and upland areas. Riparian areas exhibit vegetation or physical characteristics that reflect the influence of permanent surface or subsurface water. Typical riparian areas include lands along, adjacent to, or contiguous with perennially and intermittently flowing rivers and streams, glacial potholes, and the shores of lakes and reservoirs with stable water levels. Excluded are ephemeral streams or washes that lack vegetation and depend on free water in the soil.

ROCK CHARACTERIZATION: A program of testing and evaluating the physical, chemical, and mineralogical nature of rock to evaluate its potential to produce acid rock drainage or other deleterious leachate.

SCARIFY: To break the surface of the soil with a narrow bladed instrument.

SECTION 106 COMPLIANCE: The requirement of Section 106 of the National Historic Preservation Act that any project funded, licensed, permitted, or assisted by the Federal Government be reviewed for impacts to significant historic properties and that the State Historic Preservation Officer and the Advisory Council on Historic Preservation be allowed to comment on a project.

SECTION 7 CONSULTATION: SEE ESA CONSULTATION and CONFERENCING

SPECIAL STATUS AREAS: Areas that the BLM has determined to have resources of unique or distinct value. These lands have a variety of designations, depending on the authority under which they were designated and the resources present. Such areas include (1) lands in the CDCA designated by the CDCA Plan as "controlled" or "limited" use areas, (2) areas in or designated for potential addition to the National Wild and Scenic Rivers System (WSR), (3) areas of critical environmental concern (ACECs), (4) designated wilderness areas administered by the BLM, and (5) areas closed to off-road vehicle use.

SPLIT ESTATE: Land whose surface rights and mineral rights are owned by different entities. The 43 CFR 3809 regulations apply when surface rights are privately owned and the mineral rights are owned by the Federal Government and managed by the BLM. The 43 CFR 2920 regulations apply when surface rights are owned by the Federal government and managed by the BLM and the mineral rights are privately owned.

SUCTION DREDGE: A dredge that lifts material and pumps it through a suction pipe.

THREATENED SPECIES: As described in 16 U.S.C. 1532(20), any plant or animal species likely to become endangered within the foreseeable future throughout all or a part of its range and designated as threatened by the U.S. Fish and Wildlife Service under the Endangered Species Act. See ENDANGERED SPECIES.

TRIBE (TRIBAL): Terms that refer to federally recognized Indian tribes.

UNNECESSARY OR UNDUE DEGRADATION: As defined in the part 3809 regulations, unnecessary or undue degradation results from conditions, activities, or practices that (1) fail to comply with one or more of the following: the performance standards in 43 CFR 3809.420, the conditions of an approved Plan of Operations, operations described in a complete Notice, and other Federal and state laws for environmental and cultural resource protection; (2) are not reasonably incident to prospecting, mining, or processing; or (3) fail to attain

a stated level of protection or reclamation required by law in such areas as the CDCA, wild and scenic rivers, BLM-administered portions of the National Wilderness Preservation System, and BLM-administered national monuments and national conservation areas.

WATERSHED: The total area above a given point on a stream that contributes runoff water to the streamflow at that point.

WHOLE ROCK ANALYSIS (EVALUATION): A test that is designed to provide quantitative determination of rock forming minerals, major oxides, and trace elements.

WILDERNESS AREA: A congressionally designated area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, that is protected and managed to preserve its natural conditions and that (1) generally appears to have been affected mainly by the forces of nature, with human imprints substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least 5,000 acres or is large enough to make practical its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historic value. Wilderness study areas (WSA) are not subject to the 3809 surface management regulations. Management of mineral activity within WSAs is addressed at 43 CFR 3802.

24.0 REFERENCES

24 CFR Part 51, Subpart B - Noise Abatement and Control.

30 CFR 62. Department of Labor: Mine Safety and Health Administration. Health Standards for Occupational Noise Exposure.

Arizona Department of Water Resources (ADWR). 2009. Arizona Water Atlas, Volume 4 – Upper Colorado River Planning Area. Lake Mohave Basin Groundwater Conditions. July 2009.

_____. 2019a. Arizona Ground Water Site Inventory (GWSI) Online Database: Arizona Department of Water Resources. Accessed April 2019 (https://gisweb2.azwater.gov/gwsi).

_____. 2019b. Registry of Wells in Arizona (Wells 55) Online Database: Arizona Department of Water Resources. Accessed April 2019 (https://gisweb2.azwater.gov/WellReg).

Black Eagle Consulting, Inc. 2011. Geotechnical Rock Core Logging, Arizona Open Pit Mine. Revised July 6, 2011.

Bureau of Land Management (BLM). 1986a. Visual Resource Contrast Rating. BLM Manual Handbook H-8431, Rel. 8-30. Washington, D.C. January.

_____. 1986b. Visual Resource Inventory. BLM Manual H-8410-1, Rel. 8-28. Washington D.C. January.

_____. 1993. Kingman Resource Area Proposed Resource Management Plan and Final Environmental Impact Statement. U.S. Department of the Interior Bureau of Land Management Kingman Resource Area. September. 611 pp.

_____. 1995. Kingman Resource Area Record of Decision and Resource Management Plan. U.S. Department of the Interior Bureau of Land Management, Phoenix District, Kingman Resource Area. March.

_____. 2007. Lake Havasu Field Office Record of Decision and Approved Resource Management Plan. Lake Havasu Field Office. May.

_____. 2009. Lake Havasu Field Office Bullhead Travel Management Plan. Lake Havasu Field Office. March. 64 pp. plus appendices.

_____. 2016. Kingman Field Office Visual Resource Inventory. Prepared by Logan Simpson for BLM Colorado River District, Kingman Field Office. July. 284 pp.

_____. 2018. Draft Kingman Field Office Travel Management Plan Environmental Assessment. Kingman Field Office. August.

Brown, D.E. and C.H. Lowe. 1980. *Biotic Communities – Southwestern United States and Northwestern Mexico*. Map. General Technical Report RM-78. Rocky Mountain Forest and Range Experiment Station, Forest Service, United States Department of Agriculture. (Reprinted 1994. University of Utah Press, Salt Lake City, Utah.)

CDM Smith. 2013. Phase I Geotechnical Study, Moss Mine, Arizona. April 16.

Chronic, H. 1983. *Roadside Geology of Arizona*. Mountain Press Publishing Company, Missoula, MT.

Durning. W.P. and L.J. Buchanan. 1984. The Geology and Mineral Deposits of Oatman, Arizona. Arizona Geological Society Digest, Vol. 15, pp. 141-158.

Ecosphere Environmental Services, Inc. (Ecosphere). 2018. Preliminary Jurisdictional Determination, Request for Geographic Jurisdiction on behalf of Golden Vertex Corp. Moss Mine. October 28. 29 pp.

_____. 2019. Phase III Moss Mine Expansion and Exploration Project Visual Resource Assessment. Prepared for Golden Vertex Corp. Durango, CO. May.

Federal Highway Administration (FHWA). 2006. FHWA Highway Construction Noise Handbook. FHWA-HEP-06-015. August 2006.

Ferguson, C.A., Peartree. P.A. Johnson, B.J. Guyan, J., McCosby, J.B. 2017. Arizona Geological Survey (AZGS), Digital Geologic Map DGM 119, Geologic Map of the Oatman 7.5' Quadrangle, Mohave County, Arizona, 1:24,000 scale.

Glazner, A.F., J.E. Nielson, K.A. Howard and D.M. Miller. 1986. Correlation of the Peach Springs Tuff, a large-volume Miocene ignimbrite sheet in California and Arizona. Geology. 14(10): 840-843. *As cited in M3 2017*.

Golder Associates (Golder). 2016. Preliminary Groundwater Resource Evaluation for Moss Gold-Silver Project, Mohave County, Arizona. July 20. 98 pp.

_____. 2017a. Technical Memorandum Regarding Groundwater Flow Model Update, prepared for Dr. David Stone, Golden Vertex Corp. October 13.

_____. 2017b. Pit Slope Design Recommendations – Moss Gold-Silver Project, Mohave County, Arizona. March 10, 2017. 69 pp.

Kirk, J. 2016. Groundwater in Fractured Rock Aquifers: Well Location, Yield and Sustainability. A Water Education Foundation Briefing. Water Year 2016: San Joaquin Valley Groundwater Conditions.M3. 2017. Moss Gold Silver Project, NI 43-101 Technical Report Preliminary Economic Analysis Phase III, Mine Life Extension, Mohave County, Arizona. November 22, 2017.

Malach, R. 1977. Adventurer John Moss: Gold Discovery in Mohave County. Kingman, Arizona, Mohave County Board of Supervisors.

National Oceanic and Atmospheric Administration. 2019. Summary of Monthly Normals. Station: Bullhead City, AZ US USC00021050. Generated on April 26, 2019.

Noise Control Act of 1972, P.L. 92-574, 86 Stat. 1234, 42 U.S.C. § 4901 - 42 U.S.C. § 4918.

Owen-Joyce, S.J., Wilson, R.P., Carpenter, M.C., and Fink, J.B. 2000. Method to Identify Wells that Yield Water that will be replaced by Water from the Colorado River Downstream from Laguna Dam in Arizona and California: United States Geological Survey Water-Resources Investigations Report 00-4085, 3 Plates, 31pp. *As cited in Golder 2016*.

Ransome, F.L. 1923. Geology of the Oatman Gold District, Arizona. United States Geological Survey Bulletin 743.

Richard, S.M., Shipman, L.C., Greene, L.C., and Harris, R.C. 2007. Estimated Depth to Bedrock in Arizona: Arizona Geological Survey Digital Geologic Map DGM-52 v.1.0, 1:1,000,000. April. *As cited in Golder 2016*.

Sherman, J.E. and B.H. Sherman. 1969. Ghost Towns of Arizona. University of Oklahoma Press. 10th Printing.

United States Department of the Interior (DOI). 1991 Final Environmental Impact Statement on Vegetation Treatment on BLM Land in Thirteen Western States. May. 332 pp.

_____. 2008. Managing the NEPA Process – Bureau of Land Management. Section 11.5 – Land Use Plan Conformance. 516 Department Manual 11. May. 17 pp.

United States Geological Survey (USGS). 2014a. *Oatman, Arizona* 7.5-Minute Topographic Quadrangle Map. Scale 1:24,000.

_____. 2014b. *Mount Nutt, Arizona* 7.5-Minute Topographic Quadrangle Map. Scale 1:24,000.

_____. 2014c. *Union Pass, Arizona* 7.5-Minute Topographic Quadrangle Map. Scale 1:24,000.

_____. 2014d. *Secret Pass, Arizona* 7.5-Minute Topographic Quadrangle Map. Scale 1:24,000.

Weile, S.M., Leake, S.A., Owen-Joyce, S.J., and McGuire, E.H. 2008. Update of the Accounting Surface Along the Lower Colorado River: United States Geological Survey Scientific Investigations Report 2008-5113, Prepared in Cooperation with the Bureau of Reclamation, 16pp. *As cited in Golder 2016*.

WestLand Resources, Inc. (Westland). 2019. Draft Biological Evaluation for the Golden Vertex Moss Mine Phase III EPO/MPO. May 2019.

_____. 2018. Draft A Cultural Resources Inventory of 2,429 Acres in the Black Mountains Foothills, Mohave County, Arizona: The Moss Mine Exploration and Mine Plan Survey. Prepared for Golden Vertex Corp. Cultural Resources Report 2018-97. Project Number 1203.05. BLM Project Authorization No. BLM-AZ-310-18-56. November 16, 2018.

Wilson, R.P. and Owen-Joyce, S.J. 1994. Method to Identify Wells that Yield Water that will be replaced by Colorado River Water in Arizona, California, Nevada, and Utah: United States Geological Survey Water-Resources Investigations Report 94-4005, 19 Plates, 36pp. *As cited in Golder 2016*.

Wood Environment and Infrastructure Solutions, Inc. (Wood). 2019. Moss Mine Monthly Water Balance – East Pit Lake and Proposed Far Western Pit Lake.

Varney, P. 1994. Arizona Ghost Towns and Mining Camps: a travel guide to history. Arizona Highways. 10th Edition 2010.