U.S. Department of the Interior

Bureau of Land Management

Environmental Assessment

DOI-BLM-NV-B020-2014-0002-EA

February 2014

An Environmental Assessment of
Mineral Ridge Gold's Proposed Plan of Operations
Amendment

Location:

Esmeralda County

Applicant/Address:

Mineral Ridge Gold, LLC

1515 7th Street

Elko, NV 89801

U.S. Department of the Interior
Bureau of Land Management
Tonopah Field Office
Phone: 775-482-7800
Fax: 775-482-7810

BLM
Tonopah Field Office

TABLE OF CONTENTS

1.0 INTRODUCTION 1

1.1 PURPOSE AND NEED FOR ACTION AND DECISION TO BE MADE 1
1.2 SCOPING AND ISSUES 2
1.3 LAND USE PLAN CONFORMANCE STATEMENT 2
1.4 RELATIONSHIP TO OTHER STATUTES, REGULATIONS, AND PLANS 3
1.4.1 Esmeralda County Public Lands and Policy Plan 3
1.5 RELATIONSHIP TO PRIOR AUTHORIZATIONS 4

2.0 PROPOSED ACTION AND ALTERNATIVES 5

2.1 LOCATION OF THE PROPOSED ACTION 5
2.2 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES 5
2.2.1 History 5
2.2.2 Existing Authorizations 6
2.2.3 Summary of Proposed Action 7
2.2.4 Proposed Action 7
2.2.4.1 Project Boundary 11
2.2.4.2 Project Schedule 11
2.2.4.3 Open Pits 11
2.2.4.4 Waste Rock Disposal Areas 12
2.2.4.5 Stacking Height Plan 13
2.2.4.6 Exploration 13
2.2.4.7 Communication Equipment 14
2.2.4.8 Power Line Reroute 14
2.2.4.9 Disturbance Area Updates 14
2.2.4.10 Reclamation 15
2.2.5 Additional Environmental Protection Measures 20
2.2.6 Alternatives to the Proposed Action 25
2.2.6.1 Alternatives Considered but Eliminated from Further Analysis 26
2.2.6.2 No Action Alternative 26

3.0 AFFECTED ENVIRONMENT, ENVIRONMENTAL CONSEQUENCES, AND PROPOSED MITIGATION OR AVOIDANCE MEASURES 27

3.1 AIR QUALITY 30
3.1.1 Affected Environment 30
3.1.1.1 Climate and Meteorology 31
3.1.1.2 Climate Change 31
3.1.2 Environmental Consequences of the Proposed Action 32
3.1.2.1 Surface Disturbance 32
3.1.2.2 Mobile Equipment 33
3.1.2.3 Stationary Sources 34
3.1.3 Environmental Consequences of the No Action Alternative 34
3.2 CULTURAL RESOURCES 34
3.2.1 Affected Environment 34
3.2.2 Environmental Consequences of the Proposed Action 35
3.2.3 Environmental Consequences of the No Action Alternative 35
3.3 NOXIOUS WEEDS, INVASIVE AND NON-NATIVE SPECIES 35
3.3.1 Affected Environment 35
3.3.2 Environmental Consequences of the Proposed Action 35
3.3.3 Environmental Consequences of the No Action Alternative 36
3.4 NATIVE AMERICAN TRADITIONAL VALUES 36
3.4.1 Affected Environment 36
3.4.2 Environmental Consequences of the Proposed Action 36
3.4.3 Environmental Consequences of the No Action Alternative 36

3.5 MIGRATORY BIRDS 36
3.5.1 Affected Environment 37
3.5.2 Environmental Consequences of the Proposed Action 38
3.5.3 Environmental Consequences of the No Action Alternative 39
3.6 WASTE, HAZARDOUS OR SOLID 39
3.6.1 Affected Environment 39
3.6.2 Environmental Consequences of the Proposed Action 39
3.6.3 Environmental Consequences of the No Action Alternative 39
3.7 WATER (SURFACE AND GROUND) 40
3.7.1 Affected Environment 40
3.7.1.1 Surface Hydrology 41
3.7.1.2 Surface Water Quality 41
3.7.2 Environmental Consequences of the Proposed Action 42
3.7.3 Environmental Consequences of the No Action Alternative 43
3.8 GRAZING MANAGEMENT 43
3.8.1 Affected Environment 43
3.8.2 Environmental Consequences of the Proposed Action 43
3.8.3 Environmental Consequences of the No Action Alternative 44
3.9 LAND USE AUTHORIZATIONS 44
3.9.1 Affected Environment 44
3.9.2 Environmental Consequences of the Proposed Action 44
3.9.3 Environmental Consequences of the No Action Alternative 44
3.10 GEOLOGY AND MINERALS 45
3.10.1 Affected Environment 45
3.10.2 Environmental Consequences of the Proposed Action 46
3.10.3 Environmental Consequences of the No Action Alternative 46
3.11 PALEONTOLOGICAL RESOURCES 46
3.11.1 Affected Environment 46
3.11.2 Environmental Consequences of the Proposed Action 46
3.11.3 Environmental Consequences of the No Action Alternative 46
3.12 RECREATION 47
3.12.1 Affected Environment 47
3.12.2 Environmental Consequences of the Proposed Action 47
3.12.3 Environmental Consequences of the No Action Alternative 47
3.13 SOCIO-ECONOMIC VALUES 47
3.13.1 Affected Environment 47
3.13.2 Environmental Consequences of the Proposed Action 47
3.13.3 Environmental Consequences of the No Action Alternative 48
3.14 SOILS 48
3.14.1 Affected Environment 48
3.14.2 Environmental Consequences of the Proposed Action 49
3.14.3 Environmental Consequences of the No Action Alternative 49
3.15 SPECIAL STATUS SPECIES 49
3.15.1 Affected Environment 49
3.15.2 Environmental Consequences of the Proposed Action 51
3.15.2.1 Plants 51
3.15.2.2 Wildlife 51
3.15.3 Environmental Consequences of the No Action Alternative 52
3.15.4 Proposed Mitigation Measures 52
3.16 VEGETATION 53
3.16.1 Affected Environment 53
3.16.2 Environmental Consequences of the Proposed Action 53
3.16.3 Environmental Consequences of the No Action Alternative 53
3.17 VISUAL RESOURCES 53
3.17.1 Affected Environment 53
3.17.2 Environmental Consequences of the Proposed Action 54

3.17.3 Environmental Consequences of the No Action Alternative 54
3.18 WILD HORSES AND BURROS 54
3.18.1 Affected Environment 54
3.18.2 Environmental Consequences of the Proposed Action 55
3.18.3 Environmental Consequences of the No Action Alternative 55
3.19 WILDLIFE 55
3.19.1 Affected Environment 55
3.19.2 Environmental Consequences of the Proposed Action 57
3.19.3 Environmental Consequences of the No Action Alternative 57

4.0 CUMULATIVE IMPACTS 58

4.1 DESCRIPTION OF CUMULATIVE EFFECTS STUDY AREA BOUNDARIES 59
4.2 PAST AND PRESENT ACTIONS 59
4.2.1 Exploration and Mining 59
4.2.2 Land Sales, Acquisitions, and Land Exchanges 60
4.2.3 Renewable Energy Projects 61
4.2.4 Livestock Grazing 62
4.2.5 Wildlife Habitat Improvements 62
4.2.6 Transportation Networks and Rights-of-Way (ROWs) 62
4.2.7 Dispersed Recreation 63
4.2.8 Wild Horse and Burros Gathers 63
4.3 REASONABLY FORESEEABLE FUTURE ACTIONS (RFFAS) 63
4.4 CUMULATIVE IMPACTS ASSOCIATED WITH PAST, PRESENT AND REASONABLY FORESEEABLE FUTURE ACTIONS, INCLUDING THE PROPOSED ACTION 64
4.4.1 Air Quality 64
4.4.2 Cultural Resources 65
4.4.3 Noxious Weeds, Invasive and Non-native Species 66
4.4.4 Migratory Birds 67
4.4.5 Wastes, Hazardous and Solid 69
4.4.6 Water (Surface and Ground) 69
4.4.7 Socio-Economic Values 70
4.4.8 Soils 71
4.4.9 Special Status Species 72
4.4.10 Vegetation 73
4.4.11 Wild Horses and Burros 73
4.4.12 Wildlife 75

5.0 CONSULTATION AND COORDINATION 77

5.1 LIST OF PREPARERS 77
5.1.1 BLM – Tonopah Field Office 77
5.1.2 SRK Consulting (U.S.), Inc. 77

6.0 REFERENCES 78

LIST OF TABLES

TABLE 2-1: ASSOCIATED NEPA AND 43 C.F.R. 3809 ACTIONS 6
TABLE 2-2: DISTURBANCE SUMMARY 9
TABLE 2-3: SUMMARY OF ORE AND WASTE QUANTITIES 11
TABLE 2-4: PIT DESIGN PARAMETERS AND DIMENSIONS SUMMARY 12
TABLE 2-5: WASTE ROCK DESTINATION SUMMARY 12
TABLE 2-6: BLM RECOMMENDED RECLAMATION SEED MIXTURE 16
TABLE 3-1: ELEMENTS ASSOCIATED WITH SUPPLEMENTAL AUTHORITIES AND RATIONALE FOR DETAILED ANALYSIS FOR THE PROPOSED ACTION 27
TABLE 3-2: ADDITIONAL ELEMENTS REVIEWED 29

TABLE 3-3: SUMMARY OF CRITERIA POLLUTANTS 30
TABLE 3-4: EMISSIONS FROM MOBILE SOURCES 33
TABLE 3-5: FACILITY-WIDE EMISSION SUMMARY – SEPTEMBER 2013 34
TABLE 3-6: MIGRATORY BIRD SPECIES POTENTIALLY OCCURRING WITHIN THE PROJECT AREA 37
TABLE 3-7: SPRING WATER QUALITY 41
TABLE 3-8: EXISTING RIGHTS-OF-WAY WITHIN PROJECT AREA 44
TABLE 3-9: SOIL UNITS WITHIN THE PROJECT AREA 48
TABLE 4-1: CUMULATIVE EFFECTS STUDY AREAS 59
TABLE 4-2: PAST AND PRESENT MATERIALS, MINERALS, AND SAND & GRAVEL ACTIONS 60
TABLE 4-3: LAND SALES AND EXCHANGES 61
TABLE 4-4: PAST AND PRESENT ROW ACTIONS 62
TABLE 4-5: PENDING ACTIONS WHOLLY OR PARTIALLY WITHIN CESA BOUNDARIES 64

LIST OF FIGURES

(Figures located at end of document)

Figure 1 General Location
Figure 2 Authorized Facilities
Figure 3 Proposed Action
Figure 4 Bat Exclusion Locations
Figure 5 Hydrographic Area Boundaries
Figure 6 Water Resources
Figure 7 Grazing
Figure 8 Land Use
Figure 9 Soils
Figure 10 Wildlife
Figure 11 Silver Peak HMA
Figure 12 Cumulative Effects Study Areas

LIST OF APPENDICES

Appendix A: Mobile Mining Equipment Annual Emissions
Appendix B: Public Comments and Responses

LIST OF ACRONYMS AND ABBREVIATIONS

§	Character *signum sectionis*, used to refer to a particular section of a document
amsl	above mean sea level
APLIC	Avian Power Line Interaction Committee
ARDML	acid rock drainage and metals leaching
bgs	below ground surface
BLM	Bureau of Land Management
BMP	Best Management Practice
C.F.R.	Code of Federal Regulations
CESA	Cumulative Effects Study Area
CO	carbon monoxide
CO_2	carbon dioxide
DOI	Department of the Interior
EA	Environmental Assessment
EPA	Environmental Protection Agency
E-T cell	evapo-transpiration cell

FOS	Factor of Safety
FLPMA	Federal Land and Policy Management Act
GHG	greenhouse gas
gpm	gallons per minute
GPMI	Golden Phoenix Minerals, Inc.
HMA	Herd Management Area
H_2S	hydrogen sulfide
IM	Instruction Memorandum
kWh/m^2	kilowatt hours per square meter
MBTA	Migratory Bird Treaty Act
Mining Law	General Mining Law of 1872
MRG	Mineral Ridge Gold, LLC
MRM	Mineral Ridge Mine
MRRI	Mineral Ridge Resources, Inc.
NAC	Nevada Administrative Code
NDWR	Nevada Division of Water Resources
NDOW	Nevada Department of Wildlife
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NOx	nitrogen oxides
NO_2	nitrogen dioxide
NREL	National Renewable Energy Laboratory
NRHP	National Register of Historic Places
NRS	Nevada Revised Statutes
NV	Nevada
PA	Programmatic Agreement
$PM_{2.5}$	particulate matter smaller than 2.5 microns in aerodynamic diameter
PM_{10}	particulate matter smaller than 10 microns in aerodynamic diameter
ppb	parts per billion
ppm	parts per million
RFFA	Reasonably Foreseeable Future Actions
RMP	Resource Management Plan
ROW	right-of-Way
SHPO	State Historic Preservation Office
SO_2	sulfur dioxide
SRK	SRK Consulting, (U.S.), Inc.
T1S, R39E	Township 1 South, Range 39 East
TGW	temperature gradient well
U.S.	United States
U.S.C.	United States Code
VRM	visual resource management
W/m^2	watts per square meter
Wh/m^2	watt hours per square meter
WPCP	Water Pollution Control Permit
$\mu g/m^3$	micrograms per cubic meter

1.0 INTRODUCTION

Mineral Ridge Gold, LLC (MRG) is the operator of the Mineral Ridge Mine (MRM) authorized under NVN-73109. The mine is located approximately five air miles northwest of the town of Silver Peak in Esmeralda County, Nevada (NV). This area is approximately equidistant from Reno to the north and Las Vegas to the south and is approximately 30 air miles southwest of Tonopah and 20 air miles from the California border. The general location is portrayed in Figure 1. The proposed project is located on public lands, administered by the United States (U.S.) Department of the Interior (DOI), Bureau of Land Management (BLM), Tonopah Field Office and on private lands controlled by MRG.

MRG is proposing modifications to authorized operations as described in the *Mineral Ridge Mine (NVN-73109/Reclamation Permit 0103) Pit Expansion Plan of Operations Amendment* (Plan Amendment). The proposed modifications include:

- Expansion of the Plan of Operations boundary (Plan Boundary);
- Inclusion of the Missouri Claim as a patented claim within the Plan Boundary;
- Expansion of the Drinkwater Pit;
- Expansion of the Mary Pit to become the Mary Last Chance Pit;
- Change of the project schedule and tons of ore and waste produced per year;
- Addition of waste rock disposal areas WD-10 and WD-11, and changes to waste rock disposal areas WD-1, WD-2, WD-5, WD-6, WD-7, and WD-9 footprints and disturbance areas;
- Increasing the ore stacking height on the leach pad;
- Continue exploration activities within the proposed Plan Boundary;
- Addition of communication equipment;
- Rerouting a power line;
- Addition of general disturbance acreage; and
- A decrease in road disturbance.

The proposed expanded Plan Boundary is referred to in this Environmental Assessment (EA) as the Project Area.

The BLM has prepared this EA in conformance with the Council on Environmental Quality (CEQ) (CEQ 1997) regulations for implementing the National Environmental Policy Act (NEPA) (40 C.F.R. §1500-1508) and the BLM NEPA Handbook H-1790-1. The EA describes a Proposed Action and No Action alternative, and evaluates the impacts to the affected environment associated with their implementation. The document further describes mitigation measures specifically designed to eliminate or reduce potential environmental impacts.

1.1 Purpose and Need for Action and Decision to Be Made

The purpose of the action is to provide MRG the opportunity to explore, locate, and delineate gold deposits, and to extract additional economically recoverable gold and other metals determined to exist in the Project Area as provided by the General Mining Law of 1872 as

amended (Mining Law) and in compliance with the Federal Land and Policy Management Act of 1976 (FLPMA) and other applicable federal and state laws.

The need for the action is established by the BLM's responsibility under Section 302 of the FLPMA and the BLM Surface Management Regulations at 43 CFR§3809 to respond to a plan of operations proposal that would allow an operator to prospect, explore, and assess locatable mineral resources on public lands, and to take any action to prevent unnecessary or undue degradation of the public lands.

The decision the BLM would make, based on analysis conducted pursuant to the National Environmental Policy Act of 1969 (NEPA), includes the following: 1) approve the Plan Amendment with no modifications; 2) approve the Plan Amendment with additional mitigation measures that are needed to prevent unnecessary or undue degradation of public lands; or 3) deny the approval of the Plan Amendment as currently written and not authorize the Project if it is found that the Proposed Action does not comply with the 3809 regulations and the FLPMA mandate to prevent unnecessary or undue degradation.

1.2 Scoping and Issues

A BLM ID Team meeting was held on July 26, 2013 at the Tonopah Field Office. Substantive issues discussed and potential impacts resulting from the Proposed Action are presented in Section 3.

The EA was made available for public comment on the Battle Mountain District website from December 23, 2013 to January 21, 2014. One interest group, one state agency and one private party commented on the proposal (Appendix B). The comments from the interest group, the American Wild Horse Preservation Campaign, resulted in minor revisions to the EA that provide more detailed information on wild horse and burro use of the proposed project area and clarifications on potential impacts resulting from its implementation.

Comments submitted by the Nevada Department of Wildlife expressed concerns relative to potential impacts to desert bighorn sheep and suggested that mitigation measures relating to water distribution may be necessary in the future. The department's comments also resulted in the removal of one avian species from the list of wildlife occurring in the proposed project area. Comments from the private party did not result in any changes to the EA.

On August 6, 2013, a consultation invitation letter was mailed from the BLM to the Timbisha Shoshone Tribe. To this point in time, the Tribe has not expressed concerns with regard to the project. However, the BLM continues to provide opportunities for participation and input.

1.3 Land Use Plan Conformance Statement

The Proposed Action and the No Action Alternative are in conformance with the Tonopah Resource Management Plan (RMP) and Record of Decision, approved on October 6, 1997 (BLM 1997). "A total of 6,028,948 acres (99 percent of the Tonopah Planning Area) would be open to the operation of the mining laws," (page 23). The "BLM provides for mineral entry, exploration, location and operations pursuant to the mining laws in a manner that 1) would not unduly hinder the mining activities, and 2) assures that these activities are conducted in a manner which would prevent undue or unnecessary degradation of the public land," (page 35). "All operations shall comply with all federal and state laws, including those relating to air

quality, water quality, solid waste, fisheries, wildlife and plant habitat, and archeological and paleontological resources," (page 36).

1.4 Relationship to Other Statutes, Regulations, and Plans

MRG proposes to undertake activities as part of the Plan Amendment under the authority of Federal Land and Policy Management (FLPMA) (43 United States Code [U.S.C.] §302(b)). Other federal statutes, regulations, executive orders, and plans that must be complied with include:

- American Indian Religious Freedom Act 1978 (42 U.S.C. 1996);
- Archaeological Resources Protection Act of 1979 (16 U.S.C. 470aa to 47011);
- Clean Air Act, as amended (42 U.S.C. 7401 et seq.);
- Clean Water Act of 1977 (33 U.S.C. 1251 et seq.);
- Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (42 U.S.C. 9615);
- Council on Environmental Quality (40 Code of Federal Regulations [C.F.R.] §1500);
- Eagle Protection Act (16 U.S.C. §668-668d);
- E.O. 11988, as amended, Floodplain Management, May 24, 1977;
- E.O. 11990, Protection of Wetlands, May 24, 1977;
- E.O. 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, February 11, 1994;
- E.O. 13186, Responsibilities of Federal Agencies to Protect Migratory Birds, January 10, 2001;
- Endangered Species Act of 1973, as amended (16 U.S.C. 1531);
- Magnuson-Stevens Act Provision: Essential Fish Habitat: Final Rule (50 C.F.R. Part 600; 67 FR 2376, January 17, 2002)
- Migratory Bird Treaty Act of 1918, as amended (16 U.S.C 703 et seq.);
- National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.);
- National Historic Preservation Act, as amended (16 U.S.C. 470);
- Omnibus Public Lands Act of 2009-Paleontological Resources Preservation (OPLA-PRP); P.L. 111-11, Title VI, Subtitle D, Sections 6301-6312, 123 Stat. 1172, 16 U.S. C. 470aaa;
- Public Rangelands Improvement Act of 1978;
- Resource Conservation and Recovery Act of 1976 (42 U.S.C. 6901 et seq.);
- Safe Drinking Water Act, as amended (42 U.S.C. 300f et seq.);
- Surface Management (43 C.F.R. §3809 et seq.);
- Wild and Scenic Rivers Act as amended (16 U.S.C. 1271); and
- Wilderness Act of 1964 (16 U.S.C. 1131 et seq.).

1.4.1 Esmeralda County Public Lands and Policy Plan

On April 3, 1985, the Esmeralda County Board of Commissioners adopted a county policy plan for public lands under the Nevada Statewide Policy Plan for Public Lands authorized by Senate Bill 40. Senate Bill 40 directs the State Land Use Planning Agency to work together with local planning entities to prepare local plans and policy statements regarding the use of

federal land in Nevada. The Esmeralda County Public Lands Policy Plan was finalized in 2013 (Esmeralda County 2013). The Proposed Action is consistent with the following policies found in the plan:

Policy 7-1: Encourage the careful development and production of Esmeralda County's metal, mineral, and geothermal resources while recognizing the need to protect the environment and ecologic resources. Esmeralda County recommends Federal and State agencies take into consideration the potential economic or social impact of any proposed land management changes or natural resource related plans to the minerals industry, and on the citizens. Any economic impacts to the mineral industry directly impacts County tax revenues and County supported programs, such as the Esmeralda County School District. Therefore, Federal and State agency plans or management recommendations shall include a minerals and industry economic, social, and environmental impact description.

Policy 7-3: Support State and Federal policies that encourage both large and small-scale mining and geothermal operations. Regulatory requirements, e.g., documentation, permitting, should be minimized and expedited in order to maintain the principles of the existing mining and leasing laws, including the Mining Law of 1872.

Policy 7-4: Metal, mineral, and geothermal operations should be consistent with best management practices for the protection of the environmental qualities and the multiple uses of public lands.

Policy 7-5: Federal land management and state agencies should continue to enforce existing reclamation standards to ensure there is no undue degradation of the public lands.

Policy 7-6: Geothermal, mine, and exploration sites reclamation standards should be consistent with the best possible post site use for each specific area. Specific reclamation standards should be developed for each property rather than using broad based generic standards.

1.5 Relationship to Prior Authorizations

MRG has submitted previous proposals to the BLM which have been approved. This document seeks to build from these prior approvals by referencing previous approved documents.

This document incorporates by reference:

- BLM. 2013. *Mineral Ridge Mine: Plan of Operations Amendment II Environmental Assessment*. DOI-BLM-NV-B020-2012-0230-EA. February, 2013; and
- BLM. 2011. *Amendment to the Mineral Ridge Mine Plan of Operations Environmental Assessment.* DOI-BLM-NV-B020-2010-0135-EA. August, 2011.

2.0 PROPOSED ACTION AND ALTERNATIVES

2.1 Location of the Proposed Action

The Project Area is accessed by traveling south on State Highway 265 to Silver Peak, NV. Truck traffic to and from the Project uses a county road from State Route 264 via Fish Lake Valley (Hot Springs Road N-54397 and Rhyolite Ridge Road N-54403). Light vehicles utilize the Coyote Road (N-62084) in addition to the truck route (Figures 1 and 2).

Activities presented under the Proposed Action would take place within the proposed Plan Boundary (Project Area) portrayed in Figure 3 and located within portions of:

- Township 1 South, Range 39 East (T1S, R39E), Section 31;
- T1S, R38E, Section 36;
- T2S, R38E, sections 1, 2, 11, and 12; and
- T2S, R39E, sections 5, 6, and 7.

2.2 Description of Proposed Action and Alternatives

2.2.1 History

Mining began in the Mineral Ridge area in 1865 and has since experienced periods of exploration, mining, and inactivity. In July of 1993, Cornucopia Resources Ltd. entered into a mining lease on the Mary and Drinkwater claims with the Mary Mining Trust and in May, 1995 entered into an option agreement with Benguet Corp. USA on the Oromonte claims. From July, 1993, Cornucopia Resources Ltd. conducted extensive exploration and development programs on the Mineral Ridge Property through its wholly-owned subsidiary Mineral Ridge Resources, Inc. (MRRI).

The property was acquired by Vista Gold in 1998. The general operating plan is assumed to have included increased placement of ore on the pads, albeit at a somewhat lower grade, and mining of both ore and waste with large equipment. The Vista operation ran less than a year and failed, reportedly from a combination of excessive ore dilution, improperly sized equipment, and lack of capital.

Golden Phoenix Minerals, Inc. (GPMI) purchased the property in 2000 from the Vista Section 11 bankruptcy trustee. GPMI began operations in January, 2004 and operated the mine through December, 2004. Drain down and rinsing of the heap continued into 2005. The site entered temporary closure in 2005. MRG started crushing oversized ore left on the pad by previous operators in February 2011, and began leaching and operation of carbon columns adsorption/desorption and recovery process in March 2011. The site was considered to be out of temporary closure and back in operation as of March 29, 2011. Mining of new ore from the Drinkwater Pit began in May, 2011.

2.2.2 Existing Authorizations

The authorized Plan Boundary consists of about 995 acres of which 509 acres are owned by MRG and 486 acres are public land administered by the BLM. Existing and authorized facilities are shown on Figure 2 and include:

- Crushing facilities;
- Stormwater control features (i.e. diversion ditches);
- Growth media stockpiles;
- Haul roads and other constructed roads;
- Laydown areas;
- Heap leach and related process facilities;
- Borrow areas;
- Pits;
- Waste rock disposal areas;
- Plant site;
- Security areas;
- Production wells;
- Exploration activities; and
- Ancillary facilities.

The NEPA and 43 CFR§3809 actions associated with the authorized Plan Boundary are summarized in Table 2-1.

Table 2-1: Associated NEPA and 43 C.F.R. 3809 Actions

Project	43 C.F.R. 3809 / NEPA Action	Date	No.
Mineral Ridge Mine	Environmental Assessment	June 1996	N65-96-001P
	Decision Record	July 1996	NV65-EA96-024
	Plan of Operations / Reclamation Permit	February 2001	NVN -73109 / 0103
	Plan of Operations / Reclamation Permit Amendment	July 2002	NVN -73109 / 0103
	Plan of Operations / Reclamation Permit Amendment	February 2003	NVN -73109 / 0103
	Plan of Operations / Reclamation Permit Amendment	April 2003	NVN -73109 / 0103
	Plan of Operations / Reclamation Permit Amendment	December 2010	NVN -73109 / 0103
	Amendment to the Mineral Ridge Mine 2003 Plan of Operations Environmental Assessment	October 2011	DOI-BLM-NV-B020-2010-0135-EA
Mary Drinkwater	Exploration Permit	1994	0034

Project	43 C.F.R. 3809 / NEPA Action	Date	No.
Exploration	Exploration Permit Amendment	2003	-
	Exploration Permit Amendment	2005	-
	Exploration Permit Amendment	2008	-
Mineral Ridge Mine (combined with the Mary Drinkwater Exploration)	Mineral Ridge Mine (NVN 73109/Reclamation Permit 01030 and Mary Drinkwater (Reclamation Permit 0034): Plan of Operations Amendment	October 2011	NVN -73109 / 0103
	Mineral Ridge Mine (NVN-73109/Reclamation Permit 103): Plan of Operations Water Well Amendment	December 2011	-
	Mineral Ridge Mine: Plan of Operations Amendment II Environmental Assessment (water well)	February 2013	DOI-BLM-NV-B020-2012-0230-EA

2.2.3 Summary of Proposed Action

MRG has identified additional economically viable reserves near the Mary Pit. This Plan Amendment includes an expansion of the Mary Pit to become the Mary Last Chance Pit to incorporate these known reserves into the mine plan. As a result of the increase in waste rock production quantities, MRG proposes related changes to the authorized waste rock disposal areas including the addition of WD-10 and WD-11. The additional ore would be placed on the existing leach pad but at a greater height than previously authorized. Additional changes to ancillary facilities are also proposed to better accommodate site needs.

In addition, MRG recently purchased the Missouri Claim which is located within the authorized Plan Boundary but was not part of the authorized actions due to ownership by another private party. The proposed Project Area would accommodate continued mineral reserve exploration as well as facility footprint changes.

2.2.4 Proposed Action

MRG is proposing to undertake the following activities as part of the Proposed Action as shown on Figure 3:

- Expansion of the Plan Boundary by 508 acres;
- Inclusion of the Missouri Claim as a patented claim within the Plan Boundary;
- Expansion of the Drinkwater Pit;
- Expansion of the Mary Pit to become the Mary Last Chance Pit;
- Changes in the project schedule and an increase in the tons of ore and waste produced per year;

- Addition of waste rock disposal areas WD-10 and WD-11, and changes to the footprints and disturbance areas of waste rock disposal areas WD-1, WD-2, WD-5, WD-6, WD-7, and WD-9;
- An increase in the ore stacking height on the leach pad;
- Conduct exploration activities within the proposed Plan Boundary;
- Addition of communication equipment;
- Rerouting the power line;
- Addition of general disturbance acreage; and
- A decrease in road disturbance.

The proposed changes would increase the Project disturbance area from approximately 548 acres to 620 acres. Authorized and proposed surface disturbances within the Project Area are summarized in Table 2-2 with the proposed disturbance acres rounded to the nearest tenth of an acre in the last columns.

Table 2-2: Disturbance Summary

Description	Authorized Disturbance (total acres)			Proposed Developments (acres of change)			Proposed and Authorized Disturbance (total acres)			Proposed and Authorized Disturbance (total acres rounded to the nearest tenth of an acre)[2]		
	Public (BLM)	Private	Total	Public (BLM)	Private	Total	Public (BLM)	Private	Total	Public (BLM)	Private	Total
Mineral Ridge Mine												
Crusher/Conveyor	0.13	0.27	0.4	0	0	0	0.13	0.27	0.4	0.1	0.3	0.4
Diversion Ditches	-0.56	1.25	0.69	Included Under Yards								
General Disturbance	31.35	37.48	68.83	-1.06	1.99	0.93	30.29	39.47	69.76	30.3	39.5	69.8
Growth Med. Stockpiles	0	0.93	0.93	0	0	0	0	0.93	0.93	0	0.9	0.9
Roads[1]	30.7	32.83	63.53	-3.83	-10.85	-14.68	26.87	21.98	48.85	26.9	22	48.9
Leach Pad	23.91	14.45	38.36	0.03	-0.03	0	23.94	14.42	38.36	23.9	14.4	38.3
Borrow Pit	3	0.52	3.52	0	0	0	3	0.52	3.52	3	0.5	3.5
Buildings	0.24	0.26	0.5	-0.05	0.06	0.01	0.19	0.32	0.51	0.2	0.3	0.5
Pits	1.37	93.66	95.03	-0.91	21.96	21.05	0.46	115.62	116.08	0.5	115.6	116.1
Ponds	2.5	0.19	2.69	0	0	0	2.5	0.19	2.69	2.5	0.2	2.7
Sediment Traps	0.06	0.06	0.12	0	0	0	0.06	0.06	0.12	0.1	0.1	0.2
Stockpile (existing)	3.26	0	3.26	0	0	0	3.26	0	3.26	3.3	0	3.3
WD-1	31.27	10.98	42.25	1.22	-0.14	1.08	32.49	10.84	43.33	32.5	10.8	43.3
WD-2	6.77	39.92	46.69	0.15	-6.57	-6.42	6.92	33.35	40.27	6.9	33.4	40.3
WD-4	5.95	7.51	13.46	0	0	0	5.95	7.51	13.46	6	7.5	13.5
WD-5	0	24.35	24.35	0	-2.26	-2.26	0	22.09	22.09	0	22.1	22.1
WD-6	0	12.21	12.21	0	6.15	6.15	0	18.36	18.36	0	18.4	18.4
WD-7	4.3	5.2	9.5	2.36	0.2	2.56	6.66	5.4	12.06	6.7	5.4	12.1

Description	Authorized Disturbance (total acres)			Proposed Developments (acres of change)			Proposed and Authorized Disturbance (total acres)			Proposed and Authorized Disturbance (total acres rounded to the nearest tenth of an acre)[2]		
	Public (BLM)	Private	Total	Public (BLM)	Private	Total	Public (BLM)	Private	Total	Public (BLM)	Private	Total
WD-8	0	3.97	3.97	0	-0.01	-0.01	0	3.96	3.96	0	4	4
WD-9	4.37	12.88	17.25	-0.27	-0.01	-0.28	4.1	12.87	16.97	4.1	12.9	17
WD-10	0	0	0	28.72	13.86	42.58	28.72	13.86	42.58	28.7	13.9	42.6
WD-11	0	0	0	10.16	13.59	23.75	10.16	13.59	23.75	10.2	13.6	23.8
Water Well	2	0	2	Included Under General Disturbance								
Yards	5.8	13.82	19.62	-0.15	-0.03	-0.18	5.65	13.79	19.44	5.7	13.8	19.5
Subtotal	***156.42***	***312.74***	***469.16***	***36.37***	***37.91***	***74.28***	***191.35***	***349.4***	***540.75***	***191.6***	***349.6***	***541.2***
Exploration	37	42.5	79.5	0	0	0	37	42.5	79.5	37	42.5	79.5
Total	**193.42**	**355.24**	**548.66**	**36.37**	**37.91**	**74.28**	**228.35**	**391.9**	**620.25**	**228.6**	**392.1**	**620.7**

Notes:

[1] Haul roads are calculated to be 2.8 miles long by 80 feet wide, and light duty roads are calculated to be three miles long by 60 feet wide for reclamation cost calculations associated with this Plan amendment. The road calculations include an additional 0.92 acres of existing road disturbance located on the Missouri Claim.

[2] Slight changes to disturbance totals are due to rounding to the nearest tenth of an acre.

2.2.4.1 Project Boundary

MRG is proposing to increase the authorized Plan Boundary from the existing 995 acres to approximately 1,503 acres. The proposed Plan Boundary (Project Area) would include approximately 938 acres of public lands administered by the BLM and 565 acres of private land. No U.S. Forest Service-administered land or state lands are located within the Project Area.

2.2.4.2 Project Schedule

Mining would generally be on a schedule of five 12-hour days per week. MRG proposes to increase the processing of ore and handling of waste rock. The Proposed Action is expected to increase the mine life by approximately one year for a total of four years. Reclamation activities could last for an additional ten years.

2.2.4.3 Open Pits

MRG proposes to expand the Mary Pit from approximately 23 acres to approximately 43 acres. This expanded pit would be renamed the Mary Last Chance Pit. MRG also proposes to expand the Drinkwater Pit from 61 acres to approximately 64 acres. Open pit mining activities would continue as previously authorized.

MRG proposes to increase processing from approximately 2,500 tons of ore per day to 2,675 tons of ore per day and the tons of waste rock produced from approximately 9,146 tons per day to 14,529 tons per day for the remaining life of the mine.

Authorized and proposed total ore and waste rock tons from the Drinkwater, Mary, and Mary Last Chance pits are summarized in Table 2-3, and approximate pit dimensions are summarized in Table 2-4. No changes in ore or waste tons are proposed for the Drinkwater Pit. Proposed pit footprints are shown on Figure 3.

Table 2-3: Summary of Ore and Waste Quantities

Open Pit	Authorized		Proposed Change		Proposed	
	Ore Tons	Waste Tons	Ore Tons	Waste Tons	Ore Tons	Waste Tons
Drinkwater	2,117,000	7,674,000	0	0	2,117,000	7,674,000
Mary[2]	911,000	5,679,000	0	0	911,000	5,679,000
Mary Last Chance	-	-	877,300	7,858,900	877,300	7,858,900
Total[1]	**3,028,000**	**13,353,000**	**877,300**	**7,858,900**	**3,905,300**	**21,211,900**

[1] Quantities are estimated based on a four-year period

[2] The Mary Pit would become the Mary Last Chance Pit. Proposed tons shown in this table for the Mary Pit are those which would be extracted from the extent of the authorized Mary Pit within the proposed Mary Last Chance Pit.

Table 2-4: Pit Design Parameters and Dimensions Summary

Open Pit	Authorized				Proposed			
	Length (ft)	Width (ft)	Depth (ft)	Pit Bottom Elevation (ft amsl)	Length (ft)	Width (ft)	Depth (ft)	Pit Bottom Elevation (ft amsl)
Drinkwater	1,975	1,450	670	6,480	2,381	1,674	680	6,470
Mary and Mary Last Chance	1,475	725	455	6,395	2,470	1,502	515	6,350

The formation of pit lakes is not anticipated due to their location above the water table. Pit walls would be exposed during operations and closure. Static and kinetic geochemical test work demonstrate that the Mineral Ridge waste rock is anticipated to be net neutralizing and presents a low risk for acid rock drainage and metals leaching (ARDML). Results of the study also indicate that stockpiled ore geochemistry is similar to the waste rock material and presents a low risk for ARDML (SRK 2013c). The same material types would be present in the pit walls and would therefore present a low risk for ARDML.

2.2.4.4 Waste Rock Disposal Areas

The waste rock disposal areas utilized would be WD-2, WD-6, and the proposed WD-10 and WD-11. Proposed facility footprints are shown on Figure 3. Authorized and existing tonnages are summarized in Table 2-5 along with the proposed additions.

Table 2-5: Waste Rock Destination Summary

Waste Rock Disposal Area	Previously Authorized	Existing Tonnage[1]	Proposed Additions by Source Pit		Total
			Drinkwater (tons)	Mary Last Chance (tons)	
WD-1	6,288,500	5,870,400	0	0	5,870,400
WD-2	11,870,400	7,033,600	2,727,000	0	9,760,600
WD-4	441,300	510,400	0	0	510,400
WD-5	3,039,300	3,133,400	0	0	3,133,400
WD-6	2,293,800	0	0	1,921,000	1,921,000
WD-7	730,300	805,300	0	0	805,300
WD-8	286,600	286,600	0	0	286,600
WD-9	1,480,100	1,480,100	0	0	1,480,100
WD-10	0	0	0	7,858,900	7,858,900
WD-11	0	0	0	2,721,000	2,721,000
Total[1]	**26,430,300**	**19,119,800**	**2,727,000**	**12,500,900**	**34,347,700**

[1] Tonnage is as of the end of December 2012.

In addition to the changes in tonnage sources and destinations described above, there would be some slight changes in the waste rock disposal area footprints to accommodate changes in adjacent facilities or to rectify facility mapping updates. In summary, the total disturbance area for WD-1, WD-6, and WD-7 would increase slightly, and the disturbance area for WD-2, WD-5, WD-8, and WD-9 would decrease slightly.

WD-10 would be added with a reclaimed footprint of approximately 43 acres, and WD-11 would be added with a reclaimed footprint of approximately 24 acres. WD-11 would also serve as a haul truck ramp for material being hauled to WD-10. Proposed waste rock disposal area acreages can be viewed in more detail in Table 2-2.

Movement of waste rock material from existing waste rock disposal areas may occur in small amounts to make room for adjacent facilities with appropriate buffer areas for access and safety. Under these circumstances, the material would be moved to adjacent waste rock disposal area lifts using front-end loaders and mine haul trucks. A geochemical analysis was carried out to assess for potential impacts related to waste rock and ore types to be encountered. The results of the static and kinetic geochemical test work demonstrate that the Mineral Ridge waste rock material anticipated to be generated from the proposed pit expansions is net neutralizing and presents a low risk for ARDML (SRK 2013c).

Slope stability and erosional model results previously approved would remain unchanged and applicable to the proposed waste rock disposal facility sites and designs. The constructed slopes for changed or proposed waste rock disposal areas would measure 1.4H:1.0V for WD-2, WD-10, and WD-11 and 1.5H:1.0V for WD-6. Their final regraded slopes after reclamation would measure about 2.5H:1.0V.

2.2.4.5 Stacking Height Plan

MRG proposes to increase the stacking height of ore on the heap leach pad in order to maximize capacity on the pad. The original stacking plan which was approved by the NDEP allowed for a maximum ore height of 120 feet above the pad liner. Subsequent design work increased the height to 140 feet and ore capacity to 5.5 million tons. The proposed heap stacking height increase would allow for a stacking height to 190 feet above the liner in 15-foot lifts and would increase the total ore capacity to approximately 7.6 million tons (AMEC 2012). The proposed stacking height plan has been accepted under the 2013 Water Pollution Control Permit (WPCP) NEV0096106 renewal and minor modification submittal.

The proposed stacking plan is based on an assumed ore density of 95 pounds per cubic feet and overall side slopes of 2.5H:1.0V. Stability analyses were conducted under both static and seismic loading conditions and a cross-section was developed to represent the most critical section through the proposed heap leach configuration. Conservative assumptions were made for the model (AMEC 2012).

Circular and block failures were modeled under both static and seismic conditions for the section under consideration. Stability model results indicated a factor of safety (FOS) of 1.5 and 1.1 for static and pseudostatic conditions respectively under circular failures, and a FOS of 1.4 and 1.0 for static and pseudostatic conditions respectively under block failures.

Although the pseudostatic stability evaluation met the prescriptive FOS, localized sloughing of the embankment may occur during an earthquake and could require some degree of maintenance after such an event (AMEC 2012).

Puncture testing was performed by WESTEC to simulate a load equivalent of 300 feet of ore at a density of 110 pounds per cubic feet. The geomembranes tested passed the test results with no signs of puncture or unacceptable stresses (WESTEC 1995).

2.2.4.6 Exploration

MRG is authorized to drill up to 469 holes and disturb up to 79.5 acres related to exploration. To date, approximately 26.41 acres have been disturbed by exploration activities, of which 21.48 acres of disturbance has occurred on private land and 4.93 acres of disturbance has occurred on public land administered by the BLM. Approximately 150 holes have been drilled.

MRG proposes to conduct exploration within the proposed expanded Plan Boundary (Project Area), with the remaining holes and 53 acres of disturbance potentially occurring anywhere within the Project Area. Siting and construction of exploration pads and roads would be undertaken with regards to the applicant committed environmental protection measures described in Section 2.2.5. Exploration would be conducted as previously authorized.

2.2.4.7 Communication Equipment

MRG proposes to improve site communications by installing additional communication equipment on a high point within the Project Area. The equipment would be installed to the east of the heap leach facility as shown on Figure 3. Installation of equipment at this site would allow for direct line-of-sight communication with Tonopah.

Communication equipment would consist of a communications relay tower fitted with two, two to three-foot diameter communication dishes. A battery bank with solar panels would be located on a four by four-foot concrete pad. Three guy wires would be used to secure the tower. The equipment would be installed using standard industry practices and would incorporate the environmental protection measures described in Section 2.2.5 including the use of anti-perching devices as appropriate. Disturbance associated with this site would include the construction of a maintenance road (which would be reclaimed after installation of the tower) and a disturbance area around the base of the tower. This disturbance area would equal approximately one acre and has been added to Table 2-2 under the "Roads" category.

2.2.4.8 Power Line Reroute

MRG proposes to reroute the existing 69-kilovolt power line to avoid conflicts with future mining activities. The existing power line was moved to its current location in October 2011. As shown on Figure 2, the existing power line is located to the south of the Mary Pit. The proposed power line would be located to the north of the Mary Last Chance Pit and across WD-2 and WD-5. Most of the poles would be located on existing disturbance. The length of the proposed power line is approximately 4,800 feet, of which approximately 3,800 feet would be located on existing disturbance. An access/maintenance road measuring approximately 510 feet in length would be constructed on undisturbed land to a width of approximately 12 feet (Figure 3). This road would access the site of the three-pole setup required for the proposed power line alignment angle. The realignment would result in approximately 0.3 acres of disturbance which has been included in Table 2-2 under the "Road" category.

The proposed route has been reviewed and approved by NV Energy and has been designed to avoid cultural resources. MRG would contract with NV Energy to implement the relocation. Standard raptor protection designs as outlined in *Suggested Practice for Avian Protection on Power Lines* (Avian Power Line Interaction Committee [APLIC] 2006) would be incorporated.

2.2.4.9 Disturbance Area Updates

As shown on Table 2-2 changes to disturbance acreages are proposed for a variety of facility categories. Changes to disturbance areas not associated with the previously discussed facilities are described below.

General Disturbance

Mapping exercises resulted in MRG including spaces between facilities under the General Disturbance category. The two main general disturbance areas which have been enlarged are the spaces located south of WD-1 and north of the Drinkwater Pit, and the area located southeast of the proposed Mary Last Chance Pit and west of proposed WD-11. Disturbance associated with the installation of PW-2 has been included under the "General Disturbance" category, and areas previously categorized as diversion ditches have been included under the "Yards" category.

Roads

Disturbance areas associated with roads has decreased by approximately 15 acres as shown in Table 2-2. The expanded Drinkwater Pit and Mary Last Chance Pit footprints have encroached over areas previously mapped as roads as shown on Figure 2 and Figure 3. New road disturbance areas have also been proposed as part of the proposed power line realignment as shown on Figure 3, and existing road disturbance within the Missouri Claim have been added. Since the main road crossing the Project Area (Mineral Ridge Mine Road) would remain as a post-reclamation feature within the Esmeralda County right-of-way (ROW) (N-89441), a road with a width of 35 feet has been removed from the road disturbance category.

2.2.4.10 Reclamation

The post-mining land uses for the area disturbed by the Proposed Action are expected to be similar to the pre-mining land uses which include mineral exploration, mining, wildlife and wild horse habitat, and recreation. Reclamation would be in conformance with the BLM and Nevada state reclamation regulations. Experience from past reclamation efforts would be considered for designing reclamation of the proposed disturbance.

General reclamation procedures and details for proposed new or changed facilities are described in the following sections.

Revegetation, Seeding, and Planting

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

A reclamation seed mixture has been approved by the BLM and is shown in Table 2-6. The proposed seed mixture and application rates are subject to modification based upon the actual results of concurrent reclamation in the Project Area, revegetation test plots, or changes by the BLM in the seed mix recommendations. Modifications would be undertaken after consultation with the BLM.

Table 2-6: BLM Recommended Reclamation Seed Mixture

Common Name	Scientific Name	Broadcast Application Rate[1]
Indian rice grass	*Oryzopsis hymenoides*	2.00
Streamband wheatgrass	*Agrpyron riparium*	2.25
Sandberg bluegrass	*Poa secunda*	2.00
Palmer penstemon	*Penstemon palmeri*	0.25
Basin sagebrush	*Atemisia tridentata*	1.50
Mormon Tea	*Ephedra nevadaensis (viridis)*	1.00
Globemallow	*Sphaeralcea ambigua*	0.50
Galleta grass	*Hilaria jamesii*	2.00
Total		**11.5**

[1] Pure live seed

Post-Mining Contours and Topography

Large constructed topographic features, such as rock disposal areas and the spent heap, would have rounded tops to prevent water ponding on flat surfaces and to promote surface water run-off from the top of the rock disposal areas. When feasible, large constructed topographic features would have variable slope angles to resemble natural landforms as well as interspersed rock piles or rock features. The final reclamation configuration would provide a stable post-mining landform as determined by both seismic and erosion performance. Slopes would be regraded to 2.5H:1.0V. To limit erosion, growth media would be placed and seeded on the regraded surfaces with priority given to the heap leach facility. The open pits would remain as post-mining features. Safety berms would be constructed around their edges to preclude vehicular access.

Reclamation of Rock Disposal Areas

The rock disposal areas would be reclaimed to meet general objectives including reduced slope erosion, mass stability, rounded edges, revegetated surfaces, and rates of soil loss consistent with the surrounding topographic features. The final slopes of the reclaimed rock disposal areas would vary, with slopes of 2.5H:1.0V or shallower and slight benches remaining at practical intervals to reduce surface water flow velocities and erosion.

The rock disposal areas would be revegetated with the recommended seed mix to reduce their erosion potential and assist in establishing post-mining land use goals. Growth media would not be applied to the waste rock disposal area surface, so that use of salvaged growth media can be prioritized for reclamation of the heap leach facility.

The tops of the rock disposal areas would be ripped/scarified to a depth of 12 to 18 inches to alleviate surface compaction. The surface would be left in a rough condition to facilitate plant growth. Seed would be applied to the rock disposal areas by broadcast methods and set in place by dragging a wire mesh or other acceptable implement over the seeded surface. Depending on seasonal conditions, seeding would be completed between October 1 and March 15 to optimize germination and vegetative success.

Revegetation goals for the rock disposal areas would be determined from the existing baseline vegetation sampling program (CCA 1995) and from the results of ongoing revegetation test programs. Vegetation research sites would include exploration drill sites, roads already

reclaimed, and areas suitable for concurrent reclamation. The lower slopes of other rock disposal areas would become available for concurrent reclamation as they are converted to rock disposal areas constructed with lifts rather than the existing free-fall structures. Data from these programs would be incorporated into final closure plans, and revegetation standards for the rock disposal areas would be in accordance with the guidelines contained in the Nevada Standards for Successful Revegetation issued by the BLM and the BMRR.

The seed mix shown in Table 2-6, developed by the BLM, is based on known soil and climatic conditions and was selected to establish a plant community which would support post-mining land use. The seed mix provides plant species that can: exist in the environment of west-central Nevada; species approved for revegetation; and/or are native species found in the plant communities prior to disturbance. Modifications in the seed mix, application rates, and cultivation methods and techniques could occur based on monitoring and concurrent reclamation. Changes and/or adjustments to the seed mixtures and application rates would be developed in consultation with and approval by the BLM and the BMRR. The seed mix selected in consultation with the BLM and the BMRR would represent a reclaimed desired plant community and would be appropriate for each ecological site description identified by the BLM in the Project Area.

Reclamation of Heap Leach Facility

A final plan for permanent closure would be completed and submitted to the NDEP at least two years prior to heap leach facility closure. The sections below describe the basic closure procedures.

Chemical Stabilization

Rinsing of the heap leach facility with fresh water would provide no added benefit other than the reduction of cyanide which can be achieved simply by recirculation of remaining heap solution during residual gold recovery and fluid management during closure. This has been demonstrated by the Gold Acres heap rinsing case study (Bowell 2009). The results of this study indicate that rinsing of the heap with fresh water could actually result in an increase in the release of constituents by changing the pH-redox conditions within the heap.

Furthermore, rinsing would result in the consumption of a large quantity of freshwater that would then need to be managed by evaporation. Consequently, fresh water rinsing of the heap material is not proposed.

Regrading

The heap leach facility would be completed in lifts to an overall stable slope configuration of 2.5H:1.0V and is expected to contain up to 7.6 million tons. At the conclusion of leaching, solution neutralization, and evaporation, the lift crests would be rounded off to produce slope breaks and a slightly shallower overall final slope configuration, which would maintain or increase the designed slope stability. The heap top would be rounded and contoured to prevent ponding. Reshaping would be completed within the leach pad containment.

The final surface of the reshaped heap leach facility compacted by equipment during reshaping would be ripped or scarified and covered with approximately 24 inches of growth media prior to seeding. The growth media layer depth would be approved by state and federal authorities prior to final reclamation. The resulting growth media is generally considered adequate to capture rainfall for evaporation or uptake by vegetation.

The heap would be revegetated with the seed mix listed in Table 2-6 to reduce wind and water erosion, and infiltration of meteoric waters into the spent heap, and to establish the post-mining land use. Seed would be applied by broadcast methods or by hydro-seeding and set in place by dragging a wire mesh or other acceptable implement over the seeded surface between October 1 and March 15.

Revegetation goals for the heap would be determined from the completed baseline vegetation studies (CCA 1995) and from the results of ongoing revegetation test programs. Data from these programs would be provided to the BLM and the NDEP. Revegetation standards for the spent heap would be consistent with the existing guidelines contained in the Nevada Interim Standards for Successful Revegetation issued by the BLM and the BMRR.

Stabilization of the spent heap would be accomplished by regrading and revegetating the surface according to the guidelines issued by the BLM and the BMRR.

Treatment of Outflows, Residual Chemicals, or Fluids in the Heaps

After operations cease, solution in the heap leach facility would be allowed to drain down until the rate of flow from these facilities can be passively managed through evaporation from the ponds. The time required to reach a residual flow rate sufficiently low to be passively managed in the ponds is mainly a function of the final reclamation strategy rather than drain down rate and depends upon the fluid management measures taken to reduce solution inventory.

Fluid management would include an active and passive phase. During the active phase, solution would be recirculated and evaporated through a forced spray evaporation system located on the heap leach facility not closer than 500 feet from the edge. Heap solution may also be re-applied to the heap leach facility using the existing drip and/or sprinkler system.

The purpose of the active phase would be to rapidly reduce solution inventory in the heap leach facility and associated ponds to allow transition to the passive management phase. The evaporation program would be continued until drain down from the heap leach facility has reached levels that can be handled through a passive management system.

Evaporation on the heap surfaces may extend up to one year after closure begins. Until active evaporation on the facility surfaces ceases, growth media would not be placed on those portions of the facility's surfaces that are being used for evaporation, but may be staged nearby.

Management of drain down solution during the passive phase would include converting the process ponds into an evapo-transpiration cell (E-T cell). These cells would be created by backfilling the ponds and seeding them with the reclamation seed mix or a seed mix designed to be effective in moist conditions.

The bond cost calculation assumes that the pond would be converted to an E-T cell in order to shorten the active management period and allow passive management to begin sooner.

The closure of the heap would be consistent with the requirements of the facility's WPCP. The detailed design for the final closure are required to be presented in a final closure plan for review and approval by the BMRR and the BLM two years prior to closure.

Reclamation of Process Pond

Solutions in the process pond would be managed during the residual gold recovery operation and treated as described for reclamation of the heap leach facility.

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

Solution transfer channels would be reclaimed in the same manner as the process ponds; therefore, solutions draining from the reclaimed leach facility would be directed into the E-T cell. Residues would be tested and either removed to an appropriate disposal area or buried in the channels. The channels would be backfilled with the original excavated material stockpiled in the channel berms. This soil would provide suitable growth media for final vegetation.

The channels would be revegetated with the seed mix listed in Table 2-6. MRG would determine revegetation goals for the channels based on baseline vegetation sampling information already collected and the results of ongoing revegetation test programs. Data from these programs would be coordinated with the BLM and the NDEP. The revegetation standards for ditches would be in accordance with the existing guidelines contained in the Nevada Interim Standards for Successful Revegetation issued by the BLM and the BMRR. Reclamation of all surfaces would be in accordance with the requirements of NAC 445A.350 through NAC 445A.447.

Reclamation of Roads

At the request of Esmeralda County, the main access roads and certain haul roads crossing the Project Area would not be reclaimed in order to maintain access through the Project Area for post-reclamation monitoring and long-term use by Esmeralda County. Esmeralda County holds the right-of-way (N-89441) for the access road from State Route 265 to the Mineral Ridge Mine and west to Coyote Road.

Roads specified for reclamation would have surfaces ripped to depths ranging between 12 to 18 inches in order to reduce compaction. Road surfaces at grade would be regraded to approximate pre-mining contours, and roads with significant cut would be recontoured to blend with surrounding areas.

Culverts not needed in the post-mining landscape would be removed. These sites would be reclaimed to a stable, free-draining configuration. Roads specified for reclamation would be stabilized by channeling runoff into ditches through recontouring, by installing water bars, and by revegetation.

Reclaimed roads would be revegetated with the seed mix listed in Table 2-6. MRG would determine revegetation goals for the roads based on the preliminary vegetation information program and the results of revegetation test programs. Data from these programs would be provided to the BLM and the NDEP. The revegetation standards for the ditches would be in accordance with the existing guidelines contained in the Nevada Interim Standards for Successful Revegetation issued by the BLM and the BMRR.

Drainage sites affected by road construction would be restored to a stable free-draining configuration to the extent possible. These sites would be stabilized to prevent erosion using techniques that include revegetation or the placement of riprap in erosion-prone areas of the drainages.

Drainages crossed by access and haul roads would remain open during regrading. The resulting channels would contain the same capacity as upstream and downstream reaches. Erosion would be controlled by using surface stabilization techniques and ultimately, revegetation. Sediment control measures would be followed during construction, operation, and reclamation to minimize sedimentation from the disturbed areas. MRG would be responsible for maintenance and removal of sediment control structures utilized during operations.

Reclamation of Open Pits

Reclamation of open pits would include construction of a physical perimeter barricade to prevent vehicular access and to deter livestock. Access to the open pits would be controlled by a four-foot high safety rock berm and a catch bench. Select pit access and haul roads would be bermed and left in place to allow for wildlife ingress and egress.

Concurrent Reclamation

MRG would conduct concurrent reclamation of facilities no longer required for operational purposes. This reclaimed acreage and the status of growth media storage would be reported annually to the regulatory agencies.

2.2.5 Additional Environmental Protection Measures

Applicant-committed environmental protection measures and best management practices (BMPs) have been developed as a means of minimizing or avoiding environmental impacts. They are discussed below by subject.

Air Quality

Air emissions, including point and fugitive sources, would continue to be controlled in accordance with the air quality operating permits for the Project and would be controlled in accordance with present BMPs. For example, dust control would be provided for roads through water or a binder application. Treatment of the roads would occur primarily near the administrative building and process area. Vehicles and other equipment would be maintained to assure proper performance.

Cultural Resources

Avoidance is the MRG-preferred treatment for preventing effects to historic properties (an historic property is any prehistoric or historic site eligible to the National Register of Historic Places (NRHP) or unevaluated cultural resources. Site area borders would be staked and/or flagged with buffer areas as needed. If avoidance is not possible or is not adequate to prevent adverse effects, MRG would undertake data recovery at the affected historic properties in accordance with the *Programmatic Agreement between the Bureau of Land Management, Tonopah Field Office, and the Nevada State Historic Preservation Office, Regarding the Treatment of Historic Properties During Scorpio Gold Corporation's Mineral Ridge Mine Expansion in the Mineral Ridge Mining District, Esmeralda County, Nevada* (PA).

Development of a treatment plan, data recovery, archaeological documentation, and report preparation would be based on stipulations delineated in the PA. If an unevaluated site cannot be avoided, additional information would be gathered, and the site would be evaluated. If the site does not meet eligibility criteria as defined by the State Historic Preservation Office (SHPO), no further cultural work would be performed. If the site meets eligibility criteria, a data recovery plan or appropriate mitigation would be completed and approved. Once data recovery has been completed at a historic property, the BLM would issue a Notice to Proceed for work at that location.

Public Safety

Locked gates have been installed near the active mine area entrances on the Coyote Road and the Eagle Canyon Road. Active exploration sumps would be flagged for visibility until they are backfilled. Existing roads would not be blocked by drilling equipment.

Following completion of mining, soil/rock berms would be placed around each pit. Although the pit walls would remain relatively stable following closure, some sloughing would occur over time. The berms would be placed so that sloughing would not affect their integrity.

Water Quality

Monitoring the facility fluid management systems through leak detection systems and vadoze zone wells would continue as stipulated under WPCP NEV0096106.

Drilling activity would be kept to a minimum distance of 100 feet from drainages, seeps, or springs that are actively flowing. Roads would be designed to the minimum standards needed to accommodate intended safe use and to maintain surface resource protection; exploration roads would generally be constructed along existing contours. Exploration road construction would be conducted in such a manner as to minimize cuts and fills, including limiting road construction on steep slopes, where possible. Access across drainages, seeps, and springs would be avoided where possible.

Accepted engineering practices and BMPs for sediment control would be employed during construction, operation, and reclamation to minimize sedimentation of disturbed areas. Sediment control structures may include, but are not be limited to, fabric and/or certified weed-free straw bale filter fences, siltation or filter berms, mud sumps, and down gradient drainage channels in order to prevent unnecessary or undue degradation to the environment. Sediment traps (sumps), constructed as necessary adjacent to drill sites, would be used to settle drill cuttings and prevent release. In order to control erosion from roads and drill sites, and from the unlikely event of drill cuttings being released, certified weed-free straw bales and silt fences would be placed in drainages to capture sediment, where required.

Drainage structures would be constructed or installed where necessary to prevent or minimize erosion and sedimentation. Drainage structures may consist of, but not be limited to, water bars, borrow ditches, contour furrows, and culverts sized to handle maximum seasonal water flows.

Spills would be managed according to the spill contingency plan described in the *Spill Prevention, Control, Containment, and Countermeasure Plan* included as Appendix D of the Plan Amendment. Materials and equipment necessary for spill cleanup would be kept on-site at appropriate locations. Notifications to appropriate agencies would be undertaken.

Exploration drilling sumps for drill water, fluids, and cuttings would be excavated within the limit of the drill site. Anticipated sump dimensions would be about ten feet by four feet by five feet deep or smaller. Final sump dimensions would be designed to meet the estimated required capacity of drill fluids and cuttings with one foot of freeboard.

Mineral exploration and development drill holes subject to Nevada Division of Water Resources (NDWR) regulations would be abandoned in accordance with Nevada Revised Statutes (NRS) 534.425 through 428.

Wildlife and Vegetation

To minimize impacts to wildlife and plant resources within the Project Area, MRG would utilize existing access and exploration roads to the maximum extent possible. In addition, new surface disturbance would be kept to the minimum required to provide safe equipment access and crew working areas. Disturbed areas would be reclaimed by recontouring and revegetating at the earliest practical time upon the completion of operations. If necessary, MRG, in coordination with the BLM, would implement measures to avoid or protect special status plant or wildlife species that could potentially be impacted.

Land clearing and surface disturbance would be timed to prevent destruction of active bird nests or of young birds during the avian breeding season (March 1 through July 31) in accordance with Tonopah Field Office policies and with the Migratory Bird Treaty Act (MBTA). If surface-disturbing activities are unavoidable, MRG would have a qualified biologist survey areas proposed for disturbance for the presence of active nests immediately prior to the disturbance.

If active nests are located in an area which would be disturbed, or if other evidence of nesting are observed (mating pairs, territorial defense, carrying nesting material, transporting of food), the area would be avoided to prevent destruction or disturbance of nests until the birds are no longer present. Avian surveys would be performed only during the avian breeding season and immediately prior to MRG conducting activities that would result in disturbance. After such surveys are performed, and disturbance has been created, MRG would not conduct any additional disturbance during the avian breeding season without first conducting another avian survey. After July 31, in compliance with the Tonopah Field Office guidelines, no further avian surveys would be required until the next avian breeding season.

Bald and Golden Eagles are protected under the *Bald and Golden Eagle Protection Act* (16 U.S.C. 668-688d). The *Bald and Golden Eagle Protection Act* prohibits the taking or possession of and commerce in Bald and Golden Eagles, parts, feathers, nests, or eggs with limited exceptions. The definition of "take" includes pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb. "Disturb" means to agitate or bother a Bald or Golden Eagle to a degree that causes, or is likely to cause, based on the best scientific information available:

- Injury to an eagle;
- A decrease in its productivity by substantially interfering with normal breeding, feeding, or sheltering behavior; or
- Nest abandonment by substantially interfering with normal breeding, feeding, or sheltering behavior.

This definition also applies to impacts that may result due to human activities to or around a nesting site during times when eagles are not present if, when the eagles return, the alterations or activities interrupt their normal breeding, feeding, sheltering, or cause death, or nest abandonment (USFWS 2010).

MRG's existing and proposed construction, operation, and reclamation procedures incorporate measures to protect eagles. Surveys would be conducted prior to ground disturbance in the breeding and nesting seasons to determine the presence or absence of eagles as well as other migratory avian species protected under the MBTA. If nesting or brooding eagles are determined to be present, MRG would avoid the area using a buffer zone developed in coordination with the BLM and Nevada Department of Wildlife (NDOW).

Standard raptor protection designs as outlined in *Suggested Practice for Avian Protection on Power Lines* (APLIC 2006) would be incorporated into the design and construction of power lines.

Project-related traffic would observe prudent speed limits, 25 miles per hour or less, to protect wildlife. The solution pond is fenced with an eight-foot high chain-link fence to limit terrestrial wildlife access and the pond water is covered by bird balls. An eight-foot high chain-link fence has also been installed around the electrical sub-station.

For exploration activities, one end of each sump would be sloped to provide an escape route in the event an animal enters the sump. Sumps would be backfilled after completion of drilling. Select pit access and haul roads would be bermed and left in place to allow for wildlife ingress and egress.

In order to minimize impacts to bat habitat, MRG would close affected mine workings after taking measures to exclude bats. Bat exclusions would be installed in the early spring between cessation of hibernation and the onset of maternity activities (early April) or late summer/early fall (between September 1 and October 31) after the cessation of maternity activities and prior to the onset of hibernation. One-inch mesh would be installed to cover the openings to allow for bat egress while discouraging bat entrance.

MRG would be responsible for the installation of bat exclusions at four sites (shown as sites 48, 56, 57, and 843 on Figure 4) prior to their disturbance during mining activities. MRG would also be responsible for the installation of bat exclusions at sites 50, 55, and 58 prior to their disturbance during reclamation activities. Exclusions would be installed by experienced contractors in coordination with the NDOW. The openings would be permanently closed immediately following confirmation of successful bat exclusion. This work would be undertaken in consultation with NDOW wildlife specialists to assure bat mobility and to avoid the taking of non-volant young. This work would also be carried out in compliance with Mine Safety and Health Administration regulations and with due consideration for human safety.

Livestock and Range Allotments

MRG would protect fences, gates, stock ponds, and other range improvements within the Project Area. Gates would be closed and/or locked as appropriate. Project-related traffic would observe prudent speed limits, 25 miles per hour or less, to protect livestock.

Survey Monuments

Survey monuments, witness corners, or reference monuments would be protected to the extent economically and technically feasible. Should moving such a feature be required, MRG would ensure that a licensed Professional Land Surveyor oversees and executes the relocation in a manner consistent with applicable laws. The BLM would be notified in writing prior to the moving of any such survey monuments.

Solid Wastes

Non-hazardous Project-related refuse would be collected in approved trash bins or containers and removed from the site for disposal in accordance with county, state, and federal regulations, or disposed in the on-site permitted landfill. The bins and/or containers would be equipped with lids. Debris that may have hazardous characteristics, residues, or fluids would not be disposed of in these trash bins.

Two Class III-waivered landfills have been permitted for the site. The original landfill is located on WD-4 and has been covered with waste rock material and is no longer in use. The currently used Class III landfill is located on WD-5. These landfills have been designed, permitted, and constructed in accordance with applicable local, state, and federal regulations.

Hazardous Substances

Hazardous substances employed for the Project would be transported in accordance with applicable regulatory guidelines. Upon request, MRG would provide the BLM with MSDS or equivalent safety information. Spill prevention and spill reporting measures are outlined in the site *Spill Prevention, Control, and Countermeasures Plan and Spill Contingency and Emergency Response Plan* submitted with the Plan Amendment.

Hazardous wastes would be stored and disposed of in accordance with federal, state, and local regulations and MRG's hazardous waste management plan. Petroleum-contaminated soils would be shipped off-site to a licensed disposal facility. A petroleum-contaminated soils plan is not required at the MRM.

Fire Prevention and Control

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

The mine buildings are equipped with fire extinguishers and fire hydrants as described in the site Emergency Response Plan. Mobile equipment on the mine site would be equipped with fire extinguishers as required by the Mine Safety and Health Administration. During welding operations, flammable materials would be cleared within 20 feet of the welding operation and fire extinguishers and hand tools would be readily accessible to prevent fires.

Vehicles and equipment operated on BLM-administered public lands and roads would meet proper wildfire prevention requirements including, but not limited to, being equipped with approved spark arrestors, fire suppression tools, and other appropriate supplies. During fire

season, MRG would contact BLM Fire Dispatch to determine if restrictions are in place in the Project Area. MRG acknowledges that MRG may be held liable for costs incurred to extinguish fires directly caused by MRG or its contractors.

Growth Media

Growth media stockpiles would continue to be managed so as to prevent the loss of growth media through wind or water erosion and to prevent its disturbance or burial. Approximately 121,850 cubic yards are currently stored in the on-site growth media stockpile constructed with angle of repose slopes. MRG would attempt to salvage additional material that could be used as growth media. If new stockpiles are created that would remain in place throughout a growing season they would be seeded with an interim seed mixture to help stabilize the material and minimize non-native species establishment. New stockpiles would be strategically located to reduce reclamation costs associated with reuse.

Noxious Weed / Undesirable Plant Control

As of 2013, no listed noxious weeds were identified within the Project Area (Knight & Leavitt 2012 and 2013, and SRK 2013a and 2013b). Since no listed noxious weeds have been identified within the Project Area to date, the current priorities for weed management are controlling the introduction of weeds along access routes and preventing infestations on planned disturbances.

Employees and contractors would be educated to identify noxious weeds that could occur in the proposed disturbance areas. MRG would report the occurrence of noxious weeds to the BLM authorized officer and take appropriate measures to prevent the spread of noxious weeds. BMPs include the following:

- Flagging areas of concern to prevent employees and contractors from driving through a stand of listed noxious weeds;
- Using certified weed-free hay and straw;
- Using an approved seed mix to reduce invasive species over time by developing and maintaining desired plant communities; and
- Washing down construction equipment in accordance with the BLM standard operating procedures to prevent the transfer of noxious and undesirable weed seed from other areas.

Employee Training

MRG would train employees, contractors, and other related personnel as to the environmental and cultural resources responsibilities required under the Plan Amendment as well as state and federal law.

2.2.6 Alternatives to the Proposed Action

In accordance with BLM NEPA Handbook H-1790-1, Chapter 6 (BLM 2008), this EA evaluates a No Action Alternative which is a reasonable alternative to the Proposed Action. The objective of the No Action Alternative is to describe the environmental consequences that would result if the Proposed Action were not implemented. The No Action alternative forms

the baseline from which the impacts of all other alternatives can be measured. No alternatives other than the No Action alternative are analyzed in this EA.

2.2.6.1 Alternatives Considered but Eliminated from Further Analysis

Pit backfill was an alternative considered but eliminated from further analysis due to the associated cost and the limitations that pit backfill would impart on future resource extraction from the pits.

The location and configuration of proposed waste rock disposal areas was also investigated but found to be limited by site topography and reclamation costs.

2.2.6.2 No Action Alternative

Under the No Action Alternative, the Proposed Action would not be approved by the BLM. MRG would continue mining operations in accordance with previously authorized actions.

3.0 AFFECTED ENVIRONMENT, ENVIRONMENTAL CONSEQUENCES, AND PROPOSED MITIGATION OR AVOIDANCE MEASURES

This section describes the status of supplemental authorities and resources that may be affected by either the Proposed Action or No Action Alternative.

The purpose of this section of the EA is to describe the existing environment of the Project Area. Supplemental Authorities that are subject to requirements specified by statute or Executive Order must be considered in all BLM environmental documents. The elements associated with the supplemental authorities listed in Appendix 1 of the NEPA Handbook (BLM 2008) and in the Nevada Instruction Memorandum (IM) 2009030, Change 1, are listed in Table 3-1. The table lists the elements and the determination of whether the element is present in the Project Area and if the element would be affected by the Proposed Action. Those elements listed under the supplemental authorities that do not occur in the Project Area and would not be affected are not discussed further in the EA based on the rationale provided in the following table. The elimination of non-relevant issues follows CEQ regulations, as stated in 40 CFR §1500.4. The potential effects of the No Action Alternative are also discussed.

Table 3-1: Elements Associated with Supplemental Authorities and Rationale for Detailed Analysis for the Proposed Action

Supplemental Authority[1]	Not Present[2]	Present/Not Affected	Present/May be Affected[3]	Rationale
Air Quality			•	Air quality would be affected by combustion and fugitive emissions related to land disturbance; carried forward for further analysis. See discussion in Section 3.1.
Area of Critical Environmental Concern (ACEC)	•			No ACECs are located within the Project Area.
Cultural/ Historical			•	Land clearing and disturbance would occur potentially affecting cultural resources; carried forward for further analysis. See discussion in Section 3.2.
Environmental Justice	•			No minority or low-income populations would be disproportionately affected by the Proposed Action.
Farmlands Prime or Unique	•			No prime or unique farmlands are located within the Project Area.
Noxious Weeds/Invasive Non-native			•	Potential for invasive and nonnative species in the area; carried forward for analysis. See discussion in Section 3.3.

Supplemental Authority[1]	Not Present[2]	Present/Not Affected	Present/May be Affected[3]	Rationale
Species				
Native American Traditional Values			●	Information sharing with tribal representatives is ongoing; carried forward for analysis. See discussion in Section 3.4.
Floodplains	●			No flood zones have been identified by the Federal Emergency Management Agency for the Project Area.
Riparian/Wetlands	●			No riparian or wetland areas have been identified in the Project Area.
Threatened and Endangered Species	●			No threatened or endangered species are found within the Project Area. Although potential habitat may occur for threatened and endangered species, no individuals or sign were observed during baseline biological surveys.
Migratory Birds			●	The Project Area provides habitat for migratory birds; carried forward for analysis. See discussion in Section 3.5.
Waste – Hazardous/Solid			●	Hazardous materials use would not change under the Proposed Action but could be accidentally spilled; carried forward for analysis. See discussion in Section 3.6.
Water Quality			●	Activities under the Proposed Action have the potential to affect water resources; carried forward for analysis. See discussion in Section 3.7.
Wild & Scenic Rivers	●			No wild and scenic rivers are located within the Project Area.
Wilderness	●			No designated wilderness, wilderness study areas, or Lands with Wilderness Characteristics are located within the Project Area.
Forests and Rangelands	●			This Project does not meet the requirements to qualify as a Healthy Forest Restoration Act project.
Human Health and Safety	●			The Proposed Action does not involve herbicide treatment. The resource has not been carried forward for analysis.

[1] See H-1790-1 (January 2008) Appendix 1 Supplemental Authorities to be Considered.

[2] Supplemental Authorities determined to be Not Present or Present/Not Affected need not be carried forward for analysis or discussed further in the document.
[3] Supplemental Authorities determined to be present/May be Affected ***must*** be carried forward for analysis in the document.

Other elements that may be affected are further described in the EA. Rationale for those elements that would not be affected by the Proposed Action and alternative is listed in Table 3-2 below.

Table 3-2: Additional Elements Reviewed

Other Resources	Not Present[1]	Present/Not Affected	Present/May be Affected	Rationale
Grazing Management			●	The Project is within the Silver Peak grazing allotment and some loss of vegetation is anticipated; carried forward for analysis. See discussion in Section 3.8.
Land Use Authorization			●	Rights-of-way exist within the Project Area; carried forward for analysis. See discussion in Section 3.9.
Geology and Minerals			●	The Project Area is located on patented and unpatented mining claims; carried forward for analysis. See discussion in Section 3.10.
Paleontological Resources			●	The Proposed Action has the potential to affect paleontological resources within the Project Area; carried forward for analysis. See discussion in Section 3.11.
Recreation			●	Dispersed recreation is present in the area; carried forward for analysis. See discussion in Section 3.12.
Socio-Economic Values			●	The Proposed Action would extend the mine life and employment by approximately one year; carried forward for analysis. See discussion in Section 3.13.
Soils			●	Soils in the Project Area would be affected by the proposed activities; carried forward for analysis. See discussion in Section 3.14.
Special Status Species			●	There is the potential for various special status species to occur within the Project Area; carried forward for analysis. See discussion in Section 3.15.
Vegetation			●	Vegetation would be removed under the Proposed Action; carried forward for analysis. See discussion in Section 3.16.
Visual Resources			●	Modifications to the landscape would occur under the Proposed Action; carried forward for analysis. See

Other Resources	Not Present[1]	Present/Not Affected	Present/May be Affected	Rationale
				discussion in Section 3.17.
Wild Horses and Burros			•	Proposed Action is located within the Silver Peak Herd Management Area; carried forward for analysis. See discussion in Section 3.18.
Wildlife			•	Wildlife habitat would be removed or altered under the Proposed Action; carried forward for analysis. See discussion in Section 3.19.

[1] Other Resources determined to be Not Present or Present/Not Affected need not be carried forward for analysis or discussed further in the document based on the rationale provided.

For the analysis carried out in this EA, "short-term" is defined as lasting for the duration of the Proposed Action including the mining, reclamation, and revegetation phases. "Long-term" is defined as lasting beyond the duration of the Proposed Action and beyond the time it would take for native plants to colonize revegetated areas, returning the reclaimed areas to pre-mining vegetation communities.

3.1 Air Quality

3.1.1 Affected Environment

The U.S. Environmental Protection Agency (EPA) Office of Air Quality Planning and Standards and the NDEP have set National Ambient Air Quality Standards (NAAQS) and Nevada ambient air quality standards for the following criteria pollutants: nitrogen dioxide (NO_2), sulfur dioxide (SO_2), carbon monoxide (CO), particulate matter smaller than 10 microns in aerodynamic diameter (PM_{10}), particulate matter smaller than 2.5 microns in aerodynamic diameter ($PM_{2.5}$), ozone, and lead. In addition to the above-listed criteria pollutants, NDEP has established an ambient air quality standard of 0.08 parts per million or 112 micrograms per cubic meter for hydrogen sulfide. The minimum ambient air quality standards for Nevada are provided in NAC 445B.22097, as are the national standards. Table 3-3 presents a summary of the criteria pollutants for Nevada.

Table 3-3: Summary of Criteria Pollutants

Pollutant		Averaging Time	Level[1]
Carbon Monoxide (CO)		8-hour	9 ppm
		1-hour	35 ppm
Lead		Rolling 3 month average	0.15 µg/m^3
Nitrogen Dioxide (NO_2)		1-hour	100 ppb
		Annual	53 ppb
Ozone (O_3)		8-hour	0.075 ppm
Particle Pollution	$PM_{2.5}$	Annual	12 µg/m^3
		Annual	15 µg/m^3
		24-hour	35 µg/m^3
	PM_{10}	24-hour	150 µg/m^3
Sulfur Dioxide (SO_2)		1-hour	75 ppb

Pollutant	Averaging Time	Level[1]
	3-hour	0.5 ppm
Hydrogen Sulfide (H_2S)	1-hour	0.08 ppm

Source: EPA 2013a
[1] Levels include: parts per million (ppm); micrograms per cubic meter (μg/m^3); and parts per billion (ppb).

Air quality in the Project area is governed by pollutant emissions and meteorological conditions. Wind speeds, mixing heights, and stability affect the circulation, distribution, and dilution of emissions in the area. Esmeralda County and hydrographic area 143 (Clayton Valley) shown on Figure 5 is considered "unclassifiable/attainment" (40 C.F.R. § 81.329 Nevada). An unclassified area is one for which insufficient ambient air quality data are available, and the area may be above or below ambient standards. Unclassified areas are managed as attainment areas. Attainment is achieved when the existing background concentrations for criteria air pollutants are less than the minimum allowable ambient concentrations defined in the NAAQS.

The Final Mandatory Reporting of Greenhouse Gases Rule issued by the EPA, as signed on September 22, 2009, requires suppliers of fossil fuels or industrial greenhouse gases (GHG), manufacturers of vehicles and engines, and facilities that emit 25,000 metric tons or more per year of GHG emissions to submit annual reports to the EPA. GHG as defined by the EPA include carbon dioxide (CO_2), methane, NO_2, and fluorinated gases (EPA 2013b). MRG is not required to submit GHG annual reports.

Emission sources within the existing Project Area include vehicles, crushing and screening facilities, conveyors, processing, earth moving, and travel on unimproved roads.

3.1.1.1 Climate and Meteorology

The climate in the Project Area is classified as semiarid to arid. An arid climate is characterized by hot to very hot summers, and mild or cold winters, depending if the area is located within a subtropical or mid-latitude region. Mid-latitude deserts are found at the interior of continents and have hot summers with scarce precipitation. The winters are cold with erratic precipitation, sometimes in the form of light snow. Semiarid climates are more moderate, experiencing less of the extreme high to low temperatures. These areas typically surround desert areas, with rainfall totals slightly higher than in the arid climates (NOAA 2013).

The average annual precipitation is 4.41 inches as measured at the Silver Peak Meteorological Station between 1967 and 2012 (WRCC 2012). Winters are generally cool with very cold periods while the summers are hot and dry. The Silver Peak Meteorological Station average minimum temperature in January is 18.8 degrees (°) Fahrenheit (F) while the highest average monthly temperature in July is 97.5°F (WRCC 2012). Elevation in the Project Area is approximately 7,150, feet amsl, approximately 2,850 feet higher than the Silver Peak Meteorological Station. Therefore, lower average temperatures can be expected at the site.

3.1.1.2 Climate Change

According to the BLM's IM No. 2008-171, "Guidance on Incorporating Climate Change into Planning and NEPA Documents," dated August 19, 2008, climate change considerations should be acknowledged in EA documents. The IM states that ongoing scientific research has

identified the potential impacts of anthropogenic (manmade) GHG emissions and changes in biological carbon sequestration due to land management activities on global climate. Through complex interactions on a regional and global scale, these GHG emissions and net losses of biological carbon sinks cause a net warming effect of the atmosphere, primarily by decreasing the amount of heat energy radiated by the earth back into space. Although GHG levels have varied for millennia, recent industrialization and burning of fossil carbon sources have caused carbon dioxide equivalent concentrations to increase dramatically, and are likely to contribute to overall global climatic changes. The Intergovernmental Panel on Climate Change recently concluded that "warming of the climate system is unequivocal" and "most of the observed increase in globally average temperatures since the mid-20th century is very potentially due to the observed increase in anthropogenic greenhouse gas concentrations" (IPCC 2007).

Several activities contribute to the phenomena of climate change, including: emissions of GHGs (especially carbon dioxide and methane) from fossil fuel development, large wildfires, and activities using combustion engines; changes to the natural carbon cycle; and changes to radiative forces and reflectivity (albedo). It is important to note that GHGs would have a sustained climatic impact over different temporal scales. For example, recent emissions of carbon dioxide can influence climate for 100 years. Current emissions within the vicinity of the Project Area include vehicle combustion emissions, ranch activities, and wildland fires. Emissions of all pollutants are generally expected to be low due to the extremely limited number of sources in the vicinity of the Project Area.

Existing climate prediction models are global in nature; therefore, they are not at the appropriate scale to estimate potential impacts of climate change within the Clayton Valley Hydrographic Basin in which the Project is located. Due to the nature and scale of the Project, effects on climate change are not further analyzed in this EA.

3.1.2 Environmental Consequences of the Proposed Action

The Proposed Action would result in impacts to air quality related to increased land disturbance, extended life of the mine and use of equipment, and increased rates of ore processing.

3.1.2.1 Surface Disturbance

Surface disturbance would increase from approximately 548 acres to 620 acres. This increase equals approximately 72 additional acres of disturbance or an additional five percent of the proposed 1,503-acre Project Area. Surface disturbances would increase fugitive particulate dust entrainment in the vicinity of the Project Area for the duration of the Project. The construction of pits, waste rock disposal areas, and other disturbance areas would create fugitive dust emissions in the form of PM_{10} and $PM_{2.5}$ that would have a potential impact on air quality. These impacts would last until reclamation and revegetation success has been established. Approximately 21 acres of the proposed pit disturbance would remain unreclaimed as open pit features. The unreclaimed open pit features would not be revegetated and would present a long-term fugitive dust source.

With consideration for the proposed environmental protection measures described in Section 2.2.5, reclamation, and the relatively small size of the Project with an otherwise mostly intact landscape, impacts from dust are considered to be negligible. Dust emissions which are not

controlled on-site through road watering and other dust abatement techniques would not be of sufficient quantity to measurably alter airshed quality.

3.1.2.2 Mobile Equipment

Approximately one additional year of combustion-related emissions would result from operation of internal combustion engines that power mobile equipment and vehicles used under the Proposed Action. Vehicle emissions in the form of $PM_{2.5}$, PM_{10}, nitrous oxides (NO_x), SO_2, CO, and hydrocarbons (HC) would occur any time the internal combustion engines are operating. However, vehicle emissions are regulated by the EPA and are controlled by specific design requirements when the vehicle is manufactured. Table 3-4 summarizes the yearly emissions that may result from the operation of mobile equipment powered by internal combustion engines. A more detailed table of mobile equipment emissions is presented in Appendix A.

Table 3-4: Emissions from Mobile Sources

Equipment	Approximate Yearly Emissions in tons/year[1,2]					
	PM2.5	PM10	SO2 (1)	NOx	CO	HC[3,4]
Haul trucks (7)	7.5	7.5	0.1	141.4	192.0	84.0
Excavators and Loaders	1.5	1.5	0.1	40.1	26.1	35.2
Drill Rigs	0.7	0.7	0.0	13.6	11.9	13.6
Dozers and Graders	0.6	0.6	0.0	20.1	10.9	20.1
Water Truck	0.7	0.7	0.0	11.5	14.2	1.6
Total	**10.9**	**10.9**	**0.2**	**226.7**	**255.1**	**154.4**

[1]Emission Factors obtained from 40 CFR 89, Control of Emissions from New and In-Use Nonroad Compression-Ignition Engines, Section 89.112, Table 1, Emission Standards (g/kW-hour), and converted to g/hp-hr
[2]All equipment combusts red off-road diesel
[3]If specific data are not provided in 40 CFR 89.112, Table 1, NOx and HC (volatile organic compound) emission are assumed equal to the NMHC + NOx standard.
[4]HC is a subset of the volatile organic compound category, resulting from the incomplete combustion of petroleum based fuels.

Emissions of the criteria pollutants lead, ozone, and NO_2 have not been included in this analysis. Lead emissions are most commonly related to lead smelters, processing, and the use of leaded aviation gasoline. Ground-level ozone is created by the chemical reaction between NOx and volatile organic compounds. Although NO_2 is listed as a criteria pollutant, it is an indicator for the larger group of NOx pollutants (EPA 2013a). In addition, hydrogen sulfide is the result of the breakdown of organic matter in the absence of oxygen and is not applicable as a combustion-related emission.

Combustion emissions from mobile equipment are anticipated to be dispersed within close proximity to the Project Area due to wind and relatively minimal concentrations of pollutants as demonstrated in Table 3-4. Additionally, mobile equipment would be operated along various roadways within the Project Area and during varying operational times; concentrated emissions are not likely. Along with natural wind dispersion, the environmental protection measures described in Chapter 2.2.5 would be implemented to minimize the effects of combustion emissions on existing air quality.

Environmental protection measures to mitigate air quality impacts are described in Section 2.2.5 and include actions such as dust suppression, reclamation, and vehicle maintenance. Given the low background concentrations of criteria pollutants in the Project Area and the

limited emissions from combustion associated with the extended use of mobile equipment and vehicles, implementation of the Proposed Action is not anticipated to result in emissions in excess of the federal or state air quality standards.

3.1.2.3 Stationary Sources

MRG proposes to increase processing from approximately 2,500 tons of ore per day to 2,675 tons of ore per day and the tons of waste rock produced from approximately 9,146 tons per day to 14,529 tons per day for the remaining life of the mine. In addition, the mine life is expected to increase by approximately one year. Although the related increase in air emissions have not been modeled, the emissions are within the existing Class II Air Quality Operating Permit (AP1041-2733) limitations for stationary source throughput. Emissions addressed under the Class II Air Quality Operating Permit include PM_{10}, SO_2, NOx, CO, volatile organic compounds, and fugitive emissions. Opacity is also addressed as a qualitative standard. The facility-wide emissions inventory summary from September 2013 is summarized in Table 3-5.

Table 3-5: Facility-Wide Emission Summary – September 2013

Emission Limit Totals in tons/year						
$PM_{2.5}$	PM_{10}	SO_2	NOx	CO	VOC	H_2S
31.06	31.06	0.14	9.07	2.41	4.89	0.00

3.1.3 Environmental Consequences of the No Action Alternative

Under the No Action Alternative no change to air quality in the area would occur beyond impacts related to authorized activities.

3.2 Cultural Resources

3.2.1 Affected Environment

Multiple cultural resource investigations have been conducted within the approved Plan Boundary and along access roads. A total of 13 prior cultural resources investigations have been conducted, which included the Mineral Ridge Project Area, the Coyote Road to the west, and East Canyon Road to the west. These include eight Class III inventories, one treatment plan for eligible sites, and the results of mitigation effects to those eligible sites (Kautz 2010).

The BLM determined that potential impacts to cultural resources would not occur under the two previous site EAs. Previous mitigation for cultural resources involved moving proposed drill sites for cultural resource avoidance for activities occurring within the approved Plan Boundary (BLM 2013 and 2011).

A cultural resource inventory was performed in 2011 and 2013 to cover parcels of land located outside of the authorized Plan Boundary (referred to as Bluelite South, Comm Tower, Custer Canyon, Eagle, Echo, State Bank, Tarantula, and Vulcan). The cultural resources study area covered approximately 2,226 acres and included all areas proposed for inclusion in the expanded Plan Boundary not previously surveyed (Kautz 2013). Together with previous cultural resource surveys, the entire Project Area has been covered by Class III cultural resource surveys.

3.2.2 Environmental Consequences of the Proposed Action

Adverse effects to cultural resources are anticipated under the Proposed Action, as site facilities and activities cannot be designed to avoid NRHP-eligible cultural sites in the NRHP-eligible Mineral Ridge Historic Mining District. Development of a treatment plan, data recovery, archaeological documentation, and report preparation in accordance with stipulations in the PA, and as described in Section 2.2.5, would be undertaken to mitigate adverse effects.

3.2.3 Environmental Consequences of the No Action Alternative

Under the No Action Alternative, the proposed Project would not be developed, and impacts to cultural resources related to the Proposed Action would not occur.

3.3 Noxious Weeds, Invasive and Non-native Species

3.3.1 Affected Environment

Information for noxious weeds, invasive, and non-native species has been accessed from baseline biological survey reports and memos referenced under previously approved EAs (BLM 2011 and 2013) as well as a biological baseline reports covering surveys performed during the spring of 2011 and the summer of 2013, which collectively covered the Project Area (SRK 2013a and 2013b). Annual noxious weed surveys were also accessed, one of which was carried out within the approved Plan Boundary in 2012 (Knight & Leavitt 2012) and the most recent which was carried out within the proposed Plan Boundary (Knight & Leavitt 2013).

No noxious weeds, as identified by Nevada Administrative Code (NAC) 555.010 have been observed within the Project Area. Non-native species cheatgrass (*Bromus tectorum*) and halogeton (*Halogeton glomeratus*) were observed alongside and within disturbed areas (BLM 2011 and 2013, and SRK 2013a and 2013b). Additional non-native species encountered in the most recent survey included Russian thistle (*Salsola tragus*), red brome (*Bromus rubens*), herb sophia (*Descurainia sophia*), lambsquarters (*Chenopodium album*), red stem stork's bill (*Erodium cicutarium*), tansy mustard (*D. pinnata*), and tall tumblemustard (*Sisymbrium altissimum*).

Three of these species were observed to be particularly widespread in the Project Area; halogeteon, cheatgrass, and Russian thistle. These species were most abundant in areas with long-term disturbances and in areas of older disturbances which have not recently been re-disturbed. Halogeton was particularly widespread, showing dominance in many disturbed areas which have had little or no recent activity as well as along the periphery of most disturbance areas and roadways. Russian thistle was also widespread, but was rarely a dominant species. Cheatgrass was most commonly observed among native vegetation than were the other non-native species (Knight & Leavitt 2013).

3.3.2 Environmental Consequences of the Proposed Action

Under the Proposed Action, approximately 72 acres of land or about five percent of the proposed 1,503-acre Project Area would be disturbed, creating favorable conditions for the establishment of noxious, invasive, and non-native plant species. The establishment of

noxious, invasive, and non-native species could change the plant community from complex to more simple over time, competing with native plants for pollinators, nutrients, water, and space.

Considering the size of the proposed disturbance under the Proposed Action, the absence of noxious weeds, and the environmental protection measures proposed by MRG, impacts related to noxious weeds would be negligible while impacts related to other invasive and non-native weeds would not be considered significant.

3.3.3 Environmental Consequences of the No Action Alternative

No further impacts are projected from invasive and non-native noxious weeds under the No Action Alternative beyond those impacts related to the authorized activities.

3.4 Native American Traditional Values

3.4.1 Affected Environment

The Project Area lies within the traditional territory of the Western Shoshone. Various tribes and bands of the Western Shoshone have stated that federal projects and land actions can have widespread effects to their cultural and spiritual beliefs as they consider the landscape as sacred and as a provider. Sites and resources considered sacred to the continuation of tribal traditions include, but are not limited to: prehistoric and historic village sites; sources of water (hot and cold springs); pine nut gathering locations; sites of ceremony and prayer; archaeological sites; burial locations; "rock art" sites; medicinal/edible plant gathering locations; areas associated with creation stories; or any other tribally designated traditional cultural property.

Specific locations within the Project Area have not been identified or shared. On August 6, 2013, a consultation initiation/invitation letter was mailed from the BLM to the Timbisha Shoshone Tribe. The BLM continues to provide opportunities for participation and input. Consultation with potentially affected Tribes is ongoing.

3.4.2 Environmental Consequences of the Proposed Action

As analyzed in the *Amendment to the Mineral Ridge Mine Plan of Operations Environmental Assessment* (BLM 2011), the Proposed Action does not appear to compromise the integrity of traditional, spiritual, cultural, or ceremonial use areas. The Proposed Action would occur on the steep slopes of Mineral Ridge which have been heavily disturbed by historic and recent mining activities. At this time, no impacts related to Native American Traditional Values have been identified and none are anticipated from the implementation of the Proposed Action.

3.4.3 Environmental Consequences of the No Action Alternative

Native American Traditional Values would not be affected under the No Action Alternative as the Project Area's expansion and changes in mining activities would not occur.

3.5 Migratory Birds

Migratory birds are protected by the MBTA which prohibits the taking of migratory birds, their parts, nests, eggs, and nestlings. Information for migratory birds has been collected from

baseline biological reports referenced for previously approved EAs (BLM 2011 and BLM 2013) as well as more recent migratory bird surveys and biological surveys conducted during 2011, 2012, and 2013. These surveys together have covered the Project Area including the recently purchased Missouri Claim. The 2013 baseline survey (SRK 2013b) also included a search for raptors within the Project Area and a one-mile buffer area. Recently performed surveys and reports include the following:

- 2011, 2012, and 2013 migratory bird surveys conducted by Knight & Leavitt Associates (Knight & Leavitt);
- SRK. 2013a. *Mineral Ridge Gold Biological Baseline Survey.* June 2013; and
- SRK. 2013b. *Mineral Ridge Gold Missouri Claim Biological Baseline Survey.* August 2013.

3.5.1 Affected Environment

Migratory birds may be found in the Project Area as either seasonal residents or as migrants. Table 3-6 provides an inventory of migratory birds which may occur in the Project Area or which have been observed within the Project Area or the vicinity. Some of these birds are also listed as special status species and are further described in Section 3.15.

Table 3-6: Migratory Bird Species Potentially Occurring Within the Project Area

Common Name	Scientific Name		Common Name	Scientific Name
American Crow	*Corvus brachyrhynchos*		Lark Sparrow	*Chondestes grammacus*
American Kestrel	*Falco sparverius*		Loggerhead Shrike	*Lanius ludovicianus*
American Robin	*Turdus migratorius*		Long-eared Owl	*Asio otus*
Anna's Hummingbird	*Calypte anna*		Merlin	*Falco columbarius*
Ash-throated Flycatcher	*Myiarchus cinerascens*		Mountain Bluebird	*Sialia currucoides*
Bald Eagle	*Haliaeetus leucocephalus*		Mourning Dove	*Zenaida macroura*
Barn Swallow	*Hirundo rustica*		Northern Flicker	*Colaptes auratus*
Black Rosy Finch	*Leucosticte atrata*		Northern Harrier	*Circus cyaneus*
Black-billed Magpie	*Pica hudsonia*		Northern Mockingbird	*Mimus polyglottos*
Black-chinned Hummingbird	*Archilochus alexandri*		Northern Shrike	*Lanius excubitor*
Black-headed Grosbeak	*Pheucticus melanocephalus*		Peregrine Falcon	*Falco peregrinus*
Black-throated Gray Warbler	*Dendroica nigrescens*		Pinyon Jay	*Gymnorthinus cyanocephalus*
Black-throated Sparrow	*Amphispiza bilineata*		Prairie Falcon	*Falco mexicanus*
Blue-gray Gnatcatcher	*Polioptila caerulea*		Red-tailed Hawk	*Buteo jamaicensis*
Brewer's Blackbird	*Euphagus cyanocephalus*		Red-winged Blackbird	*Agelaius phoeniceus*
Brewer's Sparrow	*Spizella breweri*		Rock Wren	*Salpinctes obsoletus*
Broad-tailed Hummingbird	*Selasphorus platycercus*		Rose-breasted Nuthatch	*Sitta canadensis*
Brown-headed Cowbird	*Molothrus ater*		Rough-legged Hawk	*Buteo lagopus*
Burrowing Owl	*Athene cunicularia*		Sage Sparrow	*Amphispiza belli*
Cassin's Finch	*Carpodacus cassinii*		Sage Thrasher	*Oreoscoptes montanus*
Chipping Sparrow	*Spizella passerina*		Say's Phoebe	*Sayornis saya*
Cliff Swallow	*Petrochelidon pyrrhonota*		Short-eared Owl	*Asio flammeus*
Common Nighthawk	*Chordeiles minor*		Solitary Vireo	*Vireo solitarius*
Common Poorwill	*Phalaenoptilus nuttallii*		Spotted Towhee	*Pipilo maculatues*
Common Raven	*Corvus corax*		Swainson's Hawk	*Buteo swainsoni*
Costa's Hummingbird	*Calypte costae*		Turkey Vulture	*Cathartes aura*

Common Name	Scientific Name		Common Name	Scientific Name
Ferruginous Hawk	*Buteo regalis*		Vesper Sparrow	*Pooecetes gramineus*
Golden Eagle	*Aquila chrysaetos*		Violet Green Swallow	*Tachycineta thalassina*
Gray Flycatcher	*Empidonax wrightii*		Western Kingbird	*Tyrannus verticalis*
Gray Vireo	*Vireo vicinior*		Western Meadowlark	*Sturnella neglecta*
Gray-crowned Rosy Finch	*Leucosticte tephrocotis*		Western Tanager	*Piranga Ludoviciana*
Great Horned Owl	*Bubo virginianus*		Western Wood Peewee	*Contopus sordidulus*
Hermit Thrush	*Catharus guttatus*		White-crowned Sparrow	*Zonotrichia leucophrys)*
Horned Lark	*Eremophila alpestris*		Wilson's Warbler	*Wilsonia pusilla*
House Finch	*Carpodacus mexicanus*)		Yellow-rumped Warbler	*Dendroica coronata*
Lapland Longspur	*Calcarius lapponicus*			

Migratory bird nests observed within or near the Project Area during migratory bird species conducted during 2011, 2012, and 2013 include nests for the following species:

- Black-throated Sparrow; and
- Blue-gray Gnatcatcher.

One active raptor nest, a Red-Tailed Hawk nest, was located to the north of the Project Area during the raptor nest survey carried out within the Project Area and a one-mile buffer around it. No other raptor nests were observed (SRK 2013a).

3.5.2 Environmental Consequences of the Proposed Action

Under the Proposed Action up to 72 acres of potential migratory bird habitat, approximately five percent of the proposed Project Area, would be removed or altered due to land clearing and facility developments. Impacts to migratory bird habitat would persist until reclamation activities are complete, and revegetation has been achieved. Migratory bird individuals would likely move into adjacent areas due to habitat disturbance, potentially competing with other individuals or individuals of other species for foraging and nesting habitat.

Approximately 21 acres of proposed open pit disturbance would not be reclaimed or revegetated and would represent a long-term loss of migratory bird habitat. This area constitutes a little over one percent of the Project Area.

The post-reclamation vegetation community resulting from reclamation and revegetation efforts on the remaining 51 acres would be altered from the existing community but would slowly return to a pre-mining community type in the long-term as seeding from undisturbed areas occurs. The interim post-reclamation vegetation community may benefit some migratory bird species more than others.

The extended mine life and increased mine site activity would result in impacts to migratory birds related to human presence and noise for one year longer than previously assessed. Human presence and noise may further push migratory birds away from areas of disturbance and activity and into adjacent undisturbed and quieter areas.

The taking of migratory bird individuals, nests, or young could occur during earth-clearing activities. As outlined in Section 2.2.5, to reduce this occurrence, MRG would conduct

breeding bird surveys. In addition, prudent speed limits would be observed to limit vehicular collisions.

Considering the size of the proposed disturbance, environmental protection measures, the presence of existing disturbance, and the presence of largely undisturbed migratory bird habitat surrounding the Project Area, impacts to migratory birds are considered to be negligible. Impacts to migratory birds are also considered to be largely transitory, lasting until revegetation success.

3.5.3 Environmental Consequences of the No Action Alternative

No adverse consequences associated with the No Action Alternative are anticipated beyond the impacts related to the approved activities.

3.6 Waste, Hazardous or Solid

3.6.1 Affected Environment

A Class III-waivered landfill is located within WD-5 as shown on Figure 2. A Class III-waivered landfill no longer in use is located on WD-4. Process solutions are either contained within the fluid management system or are evaporated. Diesel, gasoline, and oil storage tanks are above ground with secondary containment to reduce the potential for releases into the environment. Sodium cyanide and sodium hydroxide are kept in a storage location with secondary containment adjacent to the processing plant. Cyanide solutions from the laboratory are conveyed to the heap leach facility process pond, and acid solutions are neutralized prior to disposal.

3.6.2 Environmental Consequences of the Proposed Action

Hazardous and solid waste associated with the Proposed Action would be managed in the same manner as currently managed. Pursuant to 43 C.F.R. § 8365.1-1(b)(3), no sewage, petroleum products, or refuse would be dumped in the area of the Proposed Action. Spills of hazardous materials including petroleum products would be cleaned and reported according to state and federal regulations within the required timeframes.

The only change in potential impacts related to hazardous and solid waste would be the extension of the mine life by approximately one year. With consideration for the management of solid and hazardous wastes on site, the potential for a release to occur into the environment is low. If a release should occur, adherence to the site *Spill Prevention, Control, and Countermeasures Plan* and *Spill Contingency and Emergency Response Plan* would mitigate potential impacts. Furthermore, the lack of water ways and other sensitive receptors within or near the Project Area would make potential impacts minimal.

3.6.3 Environmental Consequences of the No Action Alternative

No additional impacts related to hazardous or solid waste under the No Action Alternative are projected beyond those related to previously authorized activities.

3.7 Water (Surface and Ground)

3.7.1 Affected Environment

The Project Area is located within NDWR Central Region (Hydrographic Region 10), within the Clayton Valley Hydrographic Basin (basin number 143). The western side of the Project Area lies near the border of two other hydrographic sub-basins: Big Smoky Valley-Tonopah Flat (area 137) and Fish Lake Valley (area 117). The Project Area and hydrographic sub-basins are shown on Figure 5.

The majority of the groundwater recharge within the Project Area and the adjacent valleys occurs as precipitation, mainly snow in the mountains. Groundwater discharge occurs as flow from springs and evapotranspiration. On the western end of Clayton Valley groundwater diversions include municipal uses by the town of Silver Peak and mining purposes by Rockwood Lithium. Water rights also exist in the area for domestic, irrigation, and stock watering purposes (NDWR 2013).

The regional groundwater flow consists of interbasin flow directed from north to south and northeast to southwest. The regional flow systems occur within fractured bedrock and volcanic units, and unconsolidated to consolidated basin-fill sediments and alluvium. The perennial yield of the Clayton Valley hydrographic sub-basin has been estimated at 20,000 acre feet per year (NDWR 2013).

The localized flow system underlying the Project Area is characterized by groundwater movement eastward from the Silver Peak Range to the alluvial basin of Clayton Valley (Hydro-Search 1996). In Clayton Valley, production wells, evaporation ponds, and evapotranspiration consume the shallow groundwater.

During previous mineral exploration conducted by MRRI, a temporary groundwater flow of 20 gallons per minute (gpm) from a perched water zone was encountered in borehole MR95385 at a depth of 540 to 565 feet below ground surface (bgs). This site became production well PW-1 (permit number 60036) and has a collar elevation of approximately 7,065 feet above mean sea level (amsl). As drilling continued, the water production dropped off until significant water was encountered at a depth of approximately 900 feet bgs (GPMI 2002). Measurements taken during the first quarters of 2010, 2011, and 2012 as part of the site WPCP monitoring requirements have indicated a static water level of approximately 1,025 feet bgs. Well locations are shown on figures 5 and 6.

The deepest drill hole in the leach pad area was drill hole GW-19-86, drilled to depth of 545 feet; no groundwater was encountered (WESTEC 1995). Two monitoring wells WW94001 and WW94003 (permit number 60034 for both), located approximately 1.2 miles from the mine area, had static water levels of 720 feet bgs and 818 feet bgs respectively as measured after drilling in 1994. The wells have collar elevations of approximately 5,270 feet amsl. Test borehole WW-98A (also referred to as DH-98001 and now abandoned) located to the west of the heap leach facility, had a static water level of approximately 1,059 feet bgs as measured after drilling in 1998.

Test borehole and monitoring well WW12-001 was drilled and installed as part of site investigations for the installation of a second production well. It is located approximately 1,500 feet to the west of the heap leach facility as shown on Figure 6. The test borehole

targeted the high angle Coyote Fault system which dips to the west and is exposed on the southwestern section of the Project Area. The test borehole was drilled to a depth of 2,181 feet bgs. Water was first encountered at a depth of 1,638 feet bgs, and a flow rate test was performed at 1,661 feet bgs resulting in a constant flow of 25 gpm. A peak flow greater than 90 gpm was achieved at 2,121 feet bgs which stabilized to 85 gpm below this depth. The monitoring well was drilled to a total of 2,075 feet bgs with the screen interval from 1,655 to 2,075 feet bgs. The static water level was consistently measured at approximately 820 feet bgs (Lumos 2011).

Production well PW-2 (WW12-003) was drilled to a total depth of 2,150 feet bgs and constructed with a perforated section from approximately 1,859 to 2,119 feet bgs. The static water level was measured at 833 feet bgs. An airlift test resulted in a production rate of approximately 65 gpm and a draw down below the static water level of 700 feet over a two-hour time period.

3.7.1.1 Surface Hydrology

Six drainages are located within one mile of the Project: Great Gulch; Custer Gulch; Echo Canyon; Eagle Canyon; Eagle Nest Canyon; and New York Canyon. Each of these drainages is ephemeral, flowing east into Clayton Valley. The drainages are shown on Figure 6. Evapotranspiration exceeds precipitation during most of the year near the Project Area, so stream flows are of short duration. New York, Echo, and Eagle canyons flow only during significant storm events (Hydro-Search 1996).

Two springs are located within a one-mile radius of the Project: Tarantula Springs (SP-5) and Borgo Springs (SP-4), shown on Figure 6. The measured flow rate at Tarantula Spring in 1995 was approximately 0.1 gpm (Hydro-Search, 1996), and in September

2011 SRK measured the flow rate at 0.2 gpm (SRK 2011). In 1995, Borgo Spring was not flowing (Hydro-Search 1996) and in 2011 only a damp spot was located at the Borgo Spring site (SRK 2011).

3.7.1.2 Surface Water Quality

A baseline hydrological study was carried out in 1996 by Hydro-Search (Hydro-Search 1996) within a five-mile radius study area centered on the MRM area. Of the 18 identified springs in the study area, 15 were inspected, and samples were collected from ten. Spring locations are shown on Figure 6.

Coyote Spring (SP-9), Tarantula Spring (SP-5), and Borgo Spring (SP-4) were visited again during 2011 to assist in baseline investigations for a new water well. Two samples were collected from Tarantula Spring (SP-5) in 2011, and one was collected in 2012. Not enough water was present at Borgo Spring (SP-4) and Coyote Spring (SP-9) for sampling (SRK 2011). Tarantula Spring was surveyed again during 2012 by MRG. The findings are summarized in Table 3-7.

Table 3-7: Spring Water Quality

Spring Name	Standard - Met or exceeded state and federal standards established for drinking water, irrigation, and livestock.

Minnesota Spring, Macaroni Spring, Valcalda Spring (SP-8)	Met these standards
North Spring, SP-7, and SP-14	Met these standards with the exceptions of iron and aluminum.
Coyote Spring (SP-9)	Met these standards with the exceptions of iron, aluminum, sulfate, and total dissolved solids
Tarantula Spring (SP-5)	Met these standards with the exceptions of magnesium, sulfate, and total dissolved solids

3.7.2 Environmental Consequences of the Proposed Action

The proposed expanded pit footprints would include a resource area not previously analyzed for geochemical characteristics. Exposure to previously buried rocks and formation types to meteoric water and atmospheric conditions can cause the release of chemicals and creation of compounds and acids. MRG contracted with SRK Consulting (U.S.), Inc. (SRK) to prepare a waste rock and ore geochemical characterization report to analyze the potential for this to occur and thus the potential for waste rock and ore to impact water resources.

SRK utilized existing geochemical data from WPCP applications, quarterly reports, and updates along with a new data set from samples collected as part of the 2012 characterization program. The geochemical characterization report concluded that the geology and types of mineralization found in the expanded Drinkwater and Mary Last Chance pits are similar to the geology and mineralization encountered in the existing pits.

The results of the static and kinetic geochemical test work demonstrate that the Mineral Ridge waste rock material anticipated to be generated from the proposed pit expansions is net neutralizing and presents a low risk for ARDML (SRK 2013c). No special handling or changes to waste rock management practices are proposed. Furthermore, based on the acid base accounting and net acid generating results, kinetic testing was determined not to be necessary to demonstrate the Mineral Ridge waste rock material's low ARDML potential (SRK 2013c).

Results of the study indicate the stockpiled ore geochemistry is similar to the waste rock material and presents a low risk for ARDML. The spent ore collected from the active heap also has a low potential for acid generation; however, several constituents are likely to be mobile under the neutral to alkaline pH conditions and would likely be present in the long-term heap draindown, including arsenic, mercury, sulfate, nitrate, and WAD cyanide (SRK 2013c). Management of the heap solution and draindown would continue within containment as authorized.

Based on these results, impacts to surface or groundwater related to ARDML would be unlikely to occur.

Proper drilling methods would be used to prevent contamination of groundwater. Bentonite would be used to drill and plug holes. The core holes would be cased and plugged, as specified in NAC 534.4371 and as described under Section 2.2.5. Given adherence to these environmental protection measures, impacts to groundwater related to drilling are not anticipated to occur.

Pit depths under the Proposed Action would increase from 670 to 680 feet bgs for the Drinkwater Pit and from 455 to 515 feet bgs for the Mary Last Chance Pit. The open pits are not expected to encounter groundwater. Static water elevations for wells in the area are well below the proposed deepest pit depth of 680 feet bgs, with the shallowest static water level measured at 820 feet bgs (PW-2) and the deepest measured at 1,059 feet bgs (WW 98A).

Up to 72 acres of land would be disturbed under the Proposed Action increasing erosional potential within these disturbed areas; wind and water erosion of disturbed lands could impact ephemeral surface water features through increased sedimentation and nutrient loading. These impacts would last until reclamation efforts are completed and revegetation success attained. Approximately 21 acres of open pit features would remain unreclaimed as long-term sediment sources. Erosion from these sources, however, would be unlikely to impact surface waters as meteoric water would drain to the pit bottoms where the water would infiltrate or evaporate.

Given the relative size of the Proposed Action, its location in relation to surface water features and the environmental protection measures proposed by MRG, potential impacts to surface water resources would not be significant.

3.7.3 Environmental Consequences of the No Action Alternative

Surface water and groundwater resources would not be impacted under the No Action Alternative beyond impacts related to previously authorized activities.

3.8 Grazing Management

3.8.1 Affected Environment

The Project Area is located within the Silver Peak Allotment as shown on Figure 7. This allotment encompasses approximately 299,900 acres within Esmeralda County. The Silver Peak Allotment is in management category "M" where the objective is to maintain current resource conditions. The only allotment resource management objective listed in the Tonopah RMP for the Silver Peak Allotment is to maintain riparian spring habitat (BLM 1997). No range improvements are located within the Project Area.

3.8.2 Environmental Consequences of the Proposed Action

Under the Proposed Action, the Plan boundary would be extended to include an additional 508 acres. Up to 72 acres of previously undisturbed intermountain semi-desert shrub steppe, semi-desert grassland, mixed salt desert scrub, big sagebrush shrubland, xeric mixed sagebrush shrubland, pinion juniper woodland, non-specific barren desert vegetation would be disturbed related to site facility developments. These disturbances would persist on 51 acres until reclamation activities have occurred and revegetation success established; 21 of the proposed disturbance acres would remain unreclaimed and unvegetated as open pit features.

A loss of vegetation would constitute a reduction of forage for cattle which would remain until successful establishment of vegetation. Initial post-reclamation vegetation communities would be of a grassland type rather than a shrubland type which may be beneficial for grazing cattle. Over time, the vegetation would return to more closely resemble the pre-mining communities.

The Proposed Action would not result in a decrease in Animal Unit Months (AUMs). Based on the size of the proposed disturbance, the size of the Silver Peak Allotment, and forage type within the Project Area, potential impacts to grazing management as a result of the Proposed Action are considered to be not insignificant.

3.8.3 Environmental Consequences of the No Action Alternative

Under the No Action Alternative no further loss of forage would occur within the Project Area beyond those resulting from the authorized activities.

3.9 Land Use Authorizations

3.9.1 Affected Environment

Entities with an interest in the location or general vicinity of the Proposed Action are Sierra Pacific Power Company (now known as NV Energy), and Homestead Minerals. Table 3-8 lists ROW holders adjacent to or within the proposed Project which are required to be notified of the Proposed Action (43 CFR § 2807.14). Existing ROWs are shown on Figure 8.

Table 3-8: Existing Rights-of-way within Project Area

ROW Holder	Case File	Type	Case Disposition
Sierra Pacific Power Company (NV Energy)	N-60662	ROW - Power Transmission - FLPMA	Authorized
Homestead Minerals	N-51529	ROW – Roads	Authorized
Esmeralda County	N-89441	ROW – Roads	Authorized

Other ROWs in the vicinity of the Project Area are N-54403 (Rhyolite Ridge Road and Coyote Road) and a road (N-54409) leading to the northwest part of the Project Area. These roads are currently used as access roads by MRG and are managed by Esmeralda County under ROW N-89441.

3.9.2 Environmental Consequences of the Proposed Action

A realignment of the existing power line is included under the Proposed Action as shown on Figure 3. The portion of the new alignment located on public land is within the proposed Plan boundary. A new ROW alignment would not be sought. The main road crossing the Project Area would remain as a post-reclamation feature within the Esmeralda County ROW N-89441. Impacts to land use authorizations would not occur.

3.9.3 Environmental Consequences of the No Action Alternative

No impacts to land use associated with the No Action Alternative are expected to occur.

3.10 Geology and Minerals

3.10.1 Affected Environment

The Walker Lane Belt of western Nevada and eastern California forms a transition between the northwest trending Sierra Nevada block to the west and the north-northeast trending ranges of the Great Basin Province to the east. The rocks exposed in the Mineral Ridge Mine area range in age from Precambrian to Quaternary and consist of metamorphosed sedimentary rocks, limestones and dolomites, granitic intrusive rocks, and volcanic rocks. The geologic structure of the Mineral Ridge area is complex due to the overlap of the two structural trends. Generally, the structure of the Mineral Ridge area is that of a gentle open anticline plunging at a low angle to the southeast. High-angle normal faults and strike slip faults are present in rocks of all ages. Early Quaternary deposits present in the Mineral Ridge area consist of colluvium, alluvium, and talus and fan deposits. They are distinguished from older units by their lack of lithification or consolidation. In addition, most of these deposits have not been uplifted or dissected.

The Mineral Ridge region has been described as an anticlinal dome interpreted as an uplifted contact metamorphic core complex where the unmetamorphosed and unfolded Cambrian strata are in detached-fault contact with underlying deformed granitoids and Precambrian metamorphic rocks. The Cambrian rocks generally consist of limestone and slates, with some dolomite marble beds that have been intruded by numerous alaskitic sheets and quartz veins, which have become largely locally schistose and gneissic (Bercaw 1986).

In general, the Project Area is underlain by Quaternary colluvium and alluvium, Tertiary intrusive rocks, Precambrian sedimentary rocks, and metamorphosed sedimentary rocks. Quaternary residual soil and alluvium is the dominant lithology present at the surface near the processing area. This lithology has been classified as ranging from sandy silt with gravel to gravel with silt and sand from five WESTEC geotechnical borings and six WESTEC geotechnical test pits. The depths of these soils ranged from ten inches to 15 feet. Outcrops of Tertiary tuff, Precambrian Reed Dolomite, and Precambrian Deep Springs Formation are also present over limited areas (WESTEC 1995).

A series of north-northeast striking faults run through the Project Area. A thrust contact is located between the Deep Springs Formation and the Reed Dolomite, and the Reed Dolomite and the Wyman Formations. A local unconformity is also located between the Reed Dolomite and the Wyman Formation, characterized by an iron-stained zone up to 50 feet wide accompanied by occasional conglomerates of grit and pebbles (Micon 2009).

The underlying geologic structural zones beneath the process facilities, Wedge B Pit, and Brodie Pit area dips at approximately 10 degrees to the south-southeast while the geologic structural zone beneath the Drinkwater Pit and the Mary Pit area dips at approximately 25 to 30 degrees to the north-northeast as indicated by the Mineral Ridge Mine drill logs. The anticline fold axis located to the south of the Mary Pit and the Drinkwater Pit strikes to the west-northwest with a syncline fold axis located to the north of the Mary Pit and Drinkwater Pit.

Both patented lands owned by MRG and lands administered by the BLM are located within the approved Project Area. BLM-administered lands within the Project Area are within MRG

unpatented claims, and MRG holds the mineral right patents to all lands within the Project Area.

3.10.2 Environmental Consequences of the Proposed Action

Under the Proposed Action, the Mary Pit would be extended to become the Mary Last Chance Pit and approximately 877,000 tons of ore and 7,858,900 tons of waste rock would be removed. Direct impacts would include the permanent removal of ore to the heap leach pad and waste rock to the waste rock disposal areas. There are no identified geologic conditions that would be exacerbated by Project activities which would result in geological hazards. Facilities associated with the Project and the proposed expansion would be constructed in conformance with regulatory standards to minimize instability.

3.10.3 Environmental Consequences of the No Action Alternative

Under the No Action Alternative, the proposed developments including the Plan boundary expansion and pit extension would not occur. Mining would continue as authorized under the authorized Plan.

3.11 Paleontological Resources

3.11.1 Affected Environment

The Project Area is located in Precambrian period strata. Algal mats as well as body and trace fossils have been identified in the middle member of the Precambrian Deep Springs Formation at other locations. They have not been identified within the Project Area but may be present. The Precambrian Wyman and Reed formations are also known to contain fossils or fossil traces. These formations are of great interest to paleontologists studying the transition between Precambrian and Cambrian assemblages. However, there are no known outcrops of Precambrian and Cambrian strata sequentially displayed in the Project Area. Sequential strata are present in the White-Inyo area of California and the Gold Point area of Nevada.

The main access road leading from Coyote Road and Rhyolite Ridge Road goes through the Campito, Poleta, and Harkless formations known to contain Cambrian period fossils; no known index or significant Cambrian fossils have been identified at this location.

3.11.2 Environmental Consequences of the Proposed Action

No scientifically significant paleontological resources have been identified within the Project Area. Furthermore, the Project Area does not contain known outcrops of sequentially displayed Precambrian and Cambrian strata. Damage or destruction of the existing formations within the Project Area is not anticipated to adversely affect paleontological resources.

3.11.3 Environmental Consequences of the No Action Alternative

Under the No Action Alternative, no areas or formations would be mined which have not already been approved for disturbance. No unevaluated effects to paleontological resources are anticipated.

3.12 Recreation

3.12.1 Affected Environment

The Project Area is not located within an area designated as a special BLM recreation management area. Motorized recreation on BLM-administered lands in the areas surrounding and within the Project Area are limited to existing roads and trails (BLM 1997). Recreation within the Project Area is limited and dispersed and may include mountain biking, horseback riding, sightseeing, pine-nut gathering, outdoor photography, nature study, wildlife viewing, bird watching, hunting, hiking, and rock collecting.

3.12.2 Environmental Consequences of the Proposed Action

Activities under the Proposed Action would occur primarily on BLM-administered lands located adjacent to MRG patented lands. The presence of equipment, vehicles, and personnel could indirectly affect the recreational experience in these immediate areas on a temporary basis. Based on the low recreational use within the Project Area, potential impacts to recreation as a result of the Proposed Action would be considered negligible.

3.12.3 Environmental Consequences of the No Action Alternative

No impacts to recreation would occur besides those associated with the prior authorized activities of the MRM.

3.13 Socio-Economic Values

3.13.1 Affected Environment

MRG is currently the largest employer in Esmeralda County, followed by Rockwood Lithium, also located near the town of Silver Peak. The Mineral Ridge mine currently employs approximately 90 people. In addition, the contract mining company has approximately 20 people working at the site. The Mineral Ridge Mine and the contract mining company employees are residents of Elko, Tonopah, and Goldfield, Nevada as well as Bishop, California. Most of the employees stay at MRG-owned mobile homes and RV spaces in the town of Silver Peak during their eight-day shifts. Site managers usually stay in hotels in the town of Tonopah during site visits (Telesto 2013 and Scorpio 2013).

3.13.2 Environmental Consequences of the Proposed Action

Under the Proposed Action, additional ore resources would be extracted and the mine life would be extended by approximately one year for a total active mine life of approximately four years. This would extend the employment of approximately 110 people for an additional year. Mine employment impacts the local economies of Silver Peak and Tonopah. Under the Proposed Action, these communities would receive positive economic benefits related to the extended presence of the Mineral Ridge Mine and contract mining company employees. The economic benefits would be in the form of purchased hotel nights, food, drink, fuel, and other amenities.

3.13.3 Environmental Consequences of the No Action Alternative

Under the No Action Alternative, the Mineral Ridge Mine life would be approximately three years rather than four years. Being the largest employer in Esmeralda County, a shortened mine life would negatively affect the local economies of Tonopah and Silver Peak.

3.14 Soils

3.14.1 Affected Environment

According to the Natural Resources Conservation Service (NRCS 2010) soil resource report for Esmeralda County, soils in the Project Area affected by the Proposed Action consist of the following units as shown on Figure 9 and listed in Table 3-9.

Table 3-9: Soil Units within the Project Area

Map Unit Symbol (MUSYM)	Map Unit Name
490	Weepah-Kyler-Rock outcrop association
610	Ubehebe-Logring-Penelas association
701	Armoine-Tulecan association
705	Armoine-Penelas association

The Weepah-Kyler-Rock outcrop association occurs at elevations between 6,500 and 7,800 feet amsl on 15 to 50 percent slopes. This association is comprised of approximately 20 percent rock outcrops which are normally found along ridges. The Kyler soil has a profile of very gravelly fine sandy loam to gravelly loam with unweathered bedrock located at approximately nine to 13 inches bgs. The Weepah soil has a profile of very gravelly loam and weathered bedrock located approximately eight to 12 in bgs. Their ability to transmit water is very low.

The Ubehebe-Logring-Penelas association is located on mountainsides with slopes of 15 to 50 percent between elevations of 6,500 and 8,000 feet amsl. The average precipitation is about 11 to 13 in with average annual air temperatures of approximately 48 to 50 degrees Fahrenheit and an average frost free period of approximately 100 to 120 days.

The Armoine-Tulecan association occurs at elevations between 6,000 and 7,600 feet amsl on 15 to 50 percent slopes. The Armoine soil has a profile of very gravelly sandy loam to very sandy clay loam with weathered bedrock located approximately 15 to 19 in bgs. The Tulecan soil has a profile of very cobbly coarse sandy loam to very cobbly sandy clay loam with weathered bedrock located approximately 15 to 19 in bgs. Their ability to transmit water is very low.

The Armoine-Penelas association occurs at elevations from 6,200 to 7,000 feet amsl. The Armoine soil in this association is found on eight to 30 percent slopes. The Penelas soil is found on eight to 50 percent slopes and has a profile of very channery loam to extremely channery clay loam with weathered bedrock located nine to 13 in bgs. The ability of soil to transmit water is very low.

While the soil units within the Project Area have been defined, previously disturbed soils may not fit the above soil association descriptions.

3.14.2 Environmental Consequences of the Proposed Action

Under the Proposed Action, approximately 72 acres of previously undisturbed soil would be disturbed. Removed soils, where present, would be stockpiled and used during reclamation as growth media. The proposed disturbance areas would remain until reclamation efforts are complete, and revegetation success has been established. Approximately 21 acres of the proposed disturbance would remain unreclaimed as open pit features. The unreclaimed open pit features would not be revegetated and would represent a long-term erosion source. Water-eroded mineral particles would be unlikely to travel far from their source as the meteoric water carrying them would drain to the pit bottoms where it would infiltrate or evaporate. Available soil would have been previously removed from this area.

Soil disturbance would impede maturation of soil development, degrade soil structure, and hinder soil biological activity. Additionally, exposed soils would be susceptible to wind and water erosion; however, the potential impacts to the disturbed and reclaimed soils would be reduced by the applicant committed environmental protection measures and BMPs outlined in Section 2.2.5. Based on the existing level of activity at the site and environmental protection measures proposed by MRG, the Proposed Action is not anticipated to result in substantial impacts to soil.

3.14.3 Environmental Consequences of the No Action Alternative

No impacts to soils associated with the No Action Alternative would occur beyond those resulting from the prior authorized activities of the MRM.

3.15 Special Status Species

3.15.1 Affected Environment

Special status species are those species for which state or federal agencies afford an additional level of protection by law, regulation, guidance, or policy. Agencies were queried to obtain lists of species which may occur within the Project Area. Habitat requirements were then reviewed for each species, and an initial determination was made by consultants and BLM specialists regarding their potential presence or absence within the Project Area (BLM 1996 and 2011, and SRK 2013a and 2013b). On this basis, the following special status species were determined to have the potential to occur within the Project Area:

- Beatley buckwheat (*Eriogonum beatleyae*);
- Townsend's big-eared bat (*Corynorhinus townsendii*);
- Brazilian free-tailed bat (*Tadarida brasliensis*);
- western pipistrelle (*Parastrellus hesperus*);
- long-eared myotis (*Myotis evotis*);
- fringed myotis (*Myotis thysanodes*);
- long-legged myotis (*Myotis volans*);
- western small-footed myotis (*Myotis ciliolabrum*);
- Yuma myotis (*Myotis yumanensis*);
- pallid bat (*Antrozous pallidus*);
- big brown bat (*Eptesicus fuscus*);

- California myotis (*Myotis californicus*);
- little brown bat (*Myotis lucifugus*);
- silver-haired bat (*Lasionycteris noctivagans*);
- desert bighorn sheep (*Ovis canadensis nelsoni*);
- Pygmy rabbit (*Sylvilagus idahoensis*);
- dark kangaroo mouse (*Microdipodps megacephalus*);
- Golden Eagle;
- Western Burrowing Owl;
- Ferruginous Hawk;
- Prairie Falcon;
- Loggerhead Shrike; and
- Vesper Sparrow.

NDOW and BLM Greater Sage-grouse habitat data indicate that the Project Area is located within both category 5 (unsuitable habitat), category 4 (low value habitat/transitional range), or non-habitat areas. No preliminary general or preliminary priority habitat is located within the Project Area. The closest area of higher value habitat is an area of category 3 (Preliminary General Habitat) located approximately six miles to the west-southwest of the Project Area.

The NDOW data also indicates the Project Area is within occupied bighorn sheep habitat as shown on Figure 10 (SRK 2013a and SRK 2013b).

Various field surveys have been conducted in the Project Area including an eagle and raptor nest survey which covered the Project Area plus a one-mile buffer. No special status avian species nests were observed. An acoustic bat survey was also carried out within the Project Area. This is discussed in more detail below. During field surveys, focus was given to areas which provided suitable habitat for special status species (BLM 1996 and 2011, and SRK 2013a and 2013b). Special status species observed within the Project Area, or which were determined to be present in the Project Area due to the presence of sign include the following:

- Townsend's big-eared bat;
- Brazilian free-tailed bat;
- western pipistrelle;
- western small-footed myotis;
- long-eared myotis;
- California myotis;
- pallid bat;
- big brown bat;
- little brown bat;
- silver-haired bat;
- desert bighorn sheep;
- Golden Eagle; and
- Loggerhead Shrike.

Special status animal species listed above having the potential to occur in the Project Area but not observed may still be present within or utilize the Project Area (BLM 1996 and 2011).

3.15.2 Environmental Consequences of the Proposed Action

3.15.2.1 Plants

No Beatley buckwheat was identified within the Project Area during the surveys (SRK 2013a and 2013b); therefore, impacts to Beatley buckwheat are not expected to occur.

3.15.2.2 Wildlife

Bats

Rock outcrops, caves, mine workings, and abandoned buildings provide day roost sites for bats while caves and mines can provide for hibernation sites, maternity roosts, or bachelor roots. Acoustic surveys were used to survey for the presence of bats, and echolocation call recordings were used to identify individual bat species. The surveys were conducted at 27 distinct mine workings including four shafts, two inclined shafts, and 21 adits. Bats were recorded at 24 of the sites. The predominant special status bat species detected were the western small-footed myotis, western pipistrelle, and California mytois, while the Townsend's big-eared bat occurred at one site (SRK 2013a).

Under the Proposed Action, disturbance would occur to six surveyed and previously undisturbed underground workings and one shaft not surveyed for bats (site 843). Site 843 was not surveyed for bats due to its proximity to active mining activities. Sites labeled as numbers 48, 56, 57, and 843 on Figure 4 would be disturbed during mining, while sites 50, 55, and 58 would be disturbed during reclamation activities. Although three of these sites are known to host bats, the number of individuals using the sites and the types of usage are not fully understood. Bat species detected as utilizing these sites are:

- silver-haired bat;
- small-footed myotis;
- California myotis;
- Western pipistrelle;
- Townshed's big-eared bat; and
- Pallid bat.

Under the Proposed Action, bats would be directly impacted by the loss of identified mine workings used as roosting sites. This impact would be minimized by the installation of bat exclusions and closure of the identified sites carried out as described in Section 2.2.5. Exclusion material would be installed over sites to be closed simultaneously and left in place for approximately one week. Difficulties in navigating through exclusion material would cause the bats not to return to these sites and to seek alternate roost sites (Sherwin, et al. 2009). Potential mortality related to bat exclusions is unknown.

Excluded bats would be displaced into the landscape to find other suitable roosting sites. Case studies have shown that bats displaced during the appropriate season have been successfully absorbed into adjacent colonies and roosting sites which provide adequate room and which meet their habitat needs (Sherwin et al. 2009 and 2003).

The availability of suitable roost sites for displaced bats can only be estimated. According to the survey, bats were determined to be present at 24 of the 27 investigated sites including two disturbed sites and sites located close to mining activity (SRK 2013a). Over the life of the mine, one unsurveyed site and six of the documented active sites would be closed, leaving the

remaining 18 active sites unaffected and available for potential use by displaced bats. Additional unsurveyed features may also provide bat roosting habitat. According to Nevada Division of Minerals data, three adits and five shafts not included in the bat survey are located within the Project Area on undisturbed ground (NDOM 2013).

Bat foraging habitat would also be impacted as a result of the Proposed Action. Direct impacts to bats would include the removal or alteration of 72 acres of potential foraging habitat equaling approximately five percent of the Project Area. This impact would persist for 51 of the proposed disturbance acres until reclamation activities are complete, and vegetation has been reestablished. Approximately 21 acres would remain unreclaimed and unvegetated as open pit features. This area would constitute a long-term loss of foraging habitat. However, the additional cliff-like features created along the pit wall may serve as day roost sites but would not likely provide additional hibernation, maternity, or bachelor roost sites.

Other Special Status Species

Direct impacts to other special status species could involve the taking of small mammals such as the dark kangaroo mouse. The taking of bird nests and young is not anticipated to occur as breeding bird surveys would be conducted prior to ground disturbance during the breeding bird season as described in Section 2.2.5. Other wildlife protection measures including adherence to speed limits and construction of the power line and communication facilities according to APLIC standards would minimize impacts to wildlife including special status species. Direct impacts to other special status species are expected to be negligible.

Indirect impacts to special status species would include the removal or alteration of 72 acres of potential habitat equaling approximately five percent of the Project Area. This impact would persist for 51 of the proposed disturbance acres until reclamation activities are complete, and vegetation has been reestablished. Approximately 21 acres would remain unreclaimed and unvegetated as open pit features. This area would constitute a long-term loss of habitat, although some species may eventually find the cliff-like pit walls suitable habitat.

The resulting post-mining vegetation community may differ from the existing community, and over time would be expected to return to a composition matching the surrounding undisturbed environment. Considering the stated environmental protection measures, the relatively undisturbed surrounding areas, and the size of the Proposed Action, impacts to special status species would be minimal and not significant.

3.15.3 Environmental Consequences of the No Action Alternative

Under the No Action Alternative, the proposed disturbance activities would not be carried out and no impacts to special status species would occur besides impacts related to the authorized activities.

3.15.4 Proposed Mitigation Measures

The applicant committed environmental protection measures have been deemed adequate. No additional mitigations measures are proposed.

3.16 Vegetation

3.16.1 Affected Environment

Vegetation within the proposed Project Area consists of upland vegetation communities varying between intermountain semi-desert shrub steppe, semi-desert grassland, mixed salt desert scrub, big sagebrush shrubland, xeric mixed sagebrush shrubland, pinion juniper woodland, non-specific barren desert, and cliffs and canyons. A detailed botanical inventory can be found in the baseline reports (SRK 2013a and 2013b).

3.16.2 Environmental Consequences of the Proposed Action

An additional 72 acres of undisturbed vegetation, or about five percent of the proposed Project Area, would be removed or altered under the Proposed Action. Impacts to vegetation would last until reclamation efforts are complete, and revegetation is established on 51 of the proposed disturbance acres. The proposed pit areas, covering approximately 21 acres, would not be reclaimed or revegetated. Impacts to vegetation within this area, approximately 1.4 percent of the Project Area, would be long-term.

For the reclaimed areas, post-reclamation plant communities would differ in species composition and diversity from the adjacent native plant communities. Upon successful reclamation of these areas the existing vegetation communities would be modified to a predominantly grassland community until the shrublands are restored over time through seeding from undisturbed areas. This modification may change habitat values for specific species.

The unreclaimed pit areas may support some sparse vegetation over time. Their post-mining condition may also replicate currently existing barren desert cliff and canyon habitat types present within the proposed Project Area.

As stated in Section 2.2.5, environmental protection measures would be taken to minimize impacts to vegetation. Considering the size of the proposed disturbance, the sparse vegetation types currently present, proposed reclamation, and the surrounding undisturbed areas, the loss and alteration of vegetation related to the Proposed Action is not anticipated to have measurable lasting negative effects.

3.16.3 Environmental Consequences of the No Action Alternative

Under the No Action Alternative no impacts to vegetation would occur beyond the impacts related to the approved activities.

3.17 Visual Resources

3.17.1 Affected Environment

The Proposed Action is located in the Silver Peak Range in a visual resource management (VRM) Class IV area. The objective of the VRM Class IV is "to provide for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high" (BLM 2012).

3.17.2 Environmental Consequences of the Proposed Action

The Proposed Action would result in changes to the landscape through the addition of waste rock to existing waste rock disposal areas, the creation of new waste rock disposal areas, the extension of open pits, and the alteration of a power line location. These activities would result in changes to the basic landscape design elements of form, line, color, and texture. Changes to the landscape would be long-term, lasting beyond the reclamation and revegetation phases. The anticipated changes are within the VRM Class IV objectives, which allows for major modifications to the landscape. Impacts to visual resources would not be significant.

3.17.3 Environmental Consequences of the No Action Alternative

No additional changes to the landscape would occur under the No Action Alternative beyond those previously permitted.

3.18 Wild Horses and Burros

3.18.1 Affected Environment

The Project Area is located within the Silver Peak Herd Management Area (HMA) which encompasses approximately 242,455 acres shown on Figure 11. The Appropriate Management Level (AML) is set at six burros and zero wild horses. With exception of the relatively flat eastern and southeastern flanks of Fish Lake Valley, the HMA provides poor habitat for wild horse and burros due to sharp changes in elevation and relative lack of palatable grasses.

Wild horse distribution is limited to the western and southern portions of the HMA, with the majority of the horses being located on the eastern side of Fish Lake Valley and the western foothills of the Silver Peak Range. Some horse use has been documented south of McAfee Canyon, near White Canyon and the Cow Camp Spring complex. Despite an AML of zero, the 2014 pre-foaling population estimate for Wild Horses within the Silver Peak HMA was 101. It is likely that many of these horses migrated from the Fish Lake Valley HMA to the west and from California to the south. However, there are no current plans to conduct a gather within the HMA.

Wild burro distribution within the Silver Peak HMA is extremely limited. Few accounts of burro sightings have been documented. Those accounts indicate that burro use is limited to the central and eastern portions of the HMA. However, the 2014 pre-foaling population estimate for burros in the HMA is zero, as they have not been documented during population inventory flights.

Extant data indicate that wild horse and burro populations that inhabit the HMA make little or no use of the Project Area. The nearest sighting of wild horse and burros to the Project Area during the last four years of population and monitoring flights was in excess of eight miles. The extremely steep terrain over much of the proposed project area is the most likely reason for the lack of use.

Wild horse and burros have been observed along the access road to the Project Area which runs from Fish Lake Valley east over the Silver Peak Range.

3.18.2 Environmental Consequences of the Proposed Action

Wild horses and burros in the area could potentially be affected by the loss of habitat and fodder. An additional 72 acres, about five percent of the Project Area and a small fraction of the Silver Peak HMA, would be disturbed under the Proposed Action resulting in a reduction of potential wild horse and burro habitat. This impact would persist for approximately three years across 51acres of the proposed disturbance until reclamation has been completed and revegetation success established.

Post-mining reclamation and revegetation efforts would alter the existing plant community from semi-desert shrub steppe, semi-desert grassland, mixed salt desert scrub, big sagebrush shrubland, xeric mixed sagebrush shrubland, pinion juniper woodland, and non-specific barren desert vegetation to a more grassland type. In the long-term, seeding from adjacent undisturbed areas would help reestablish the pre-mining vegetation communities.

Approximately 21 acres of the proposed disturbance area would remain unreclaimed as open pit features. This area would represent a long-term loss of potential wild horse and burro grazing habitat. Based on the lack of use, the existing level of disturbance and activity at the site and the size of the Silver Peak HMA in relation to the proposed disturbance, potential impacts to wild horses and burros as a result of the Proposed Action are considered to be low.

However, wild horse and burros are vulnerable to mortality associated with mine-related traffic moving from the Fish Lake Valley across the Silver Peak Range to the Project Area. The speed limit on these county roads is 25-mile an hour and MRG employees would be required to adhere to this speed limit or less to protect all species of wildlife, including wild horse and burros (see Section 2.2.5 Additional Environmental Protection Measures).

3.18.3 Environmental Consequences of the No Action Alternative

No impacts to wild horses or burros would occur under the No Action alternative beyond the impacts associated with currently authorized activities.

3.19 Wildlife

3.19.1 Affected Environment

Information for wildlife has been collected from baseline biological reports referenced for previously approved EAs (BLM 2011 and BLM 2013) as well as more recent migratory bird surveys and biological surveys conducted during 2011, 2012, and 2013. These surveys together have covered the Project Area including the recently purchased Missouri Claim. The 2013 survey also included a search for raptors within the proposed Project as well as within a one-mile buffer of the Project Area. Recently performed surveys and reports include the following:

- 2011, 2012, and 2013 migratory bird surveys conducted by Knight & Leavitt Associates (Knight & Leavitt);
- SRK. 2013a. *Mineral Ridge Gold Biological Baseline Survey*. June 2013; and

- SRK. 2013b. *Mineral Ridge Gold Missouri Claim Biological Baseline Survey*. August 2013.

In addition to the species discussed previously in Sections 3.5 and 3.15, the following wildlife species or their sign were observed within the Project Area (SRK 2013a and 2013b):

- House Sparrow (*Passer domesticus*);
- European Starling (*Sturnus vulgaris*);
- mule deer (*Odocoileus hemionus*);
- pronghorn antelope (*Antilocapra americana*);
- black-tailed jackrabbit (*Lepus californicus*);
- mountain cottontail (*Sylvilagus nuttallii*);
- least chipmunk (*Eutamias minimus*);
- Townsend ground squirrel (*Citellus townsendii*);
- white-tailed antelope squirrel (*Ammospermophilus leucurus*);
- desert woodrat (*Neotoma lepida*);
- desert horned lizard (*Phrynosorna* platyrhinos);
- desert collared lizard (*Crotaphyutus* insularis); and
- western rattlesnake (*Crotalus viridi*).

Other species likely to occur within the Project Area based on their general habitat requirements and ranges include the following (SRK 2013a and 2013b):

- Botta's Pocket gopher (*Thomomys bottae*);
- northern pocket gopher (*Thomomys talpoides*);
- little pocket mouse (*Perognathus longimembris*);
- great Basin pocket mouse (*Perognathus parvus*);
- Ord kangaroo mouse (*Dipodomys ordii*);
- chisel-toothed kangaroo rat (*Dipodomys microps*);
- deer mouse (*Peromyscus maniculatus*);
- northern grasshopper mouse (*Onychomys leucgaster*);
- sagebrush vole (Lemmiscus curtatus);
- house mouse (*Mus musculus*);
- desert spiny lizard (*Sceloporus magister*);
- gopher snake (*Pituophis melanoleucus*);
- ground snake (*Sonora semiannulata*);
- long-nosed leopard lizard (*Gambelia wislizenii*);
- long-nosed snake (*Rhinocheilus lecontei*);
- night snake (*Hypsiglena torquata*);
- racer (*Coluber constrictor*);
- sagebrush lizard (*Sceloporus graciosus*);
- short-horned lizard (*Phrynosorna douglassii*);
- side-blotched lizard (*Uta stansburiana*);
- striped whipsnake (*Masticophis taeniatus*);
- western fence lizard (*Sceloporus cccidentalis*);
- western rattlesnake (*Crotalus viridi*);

- western skink (*Eumeces skiltonianus*); and
- western whiptail (*Cnemidophorus tigrus*).

NDOW data indicates that the Project Area is located within year-round mule deer habitat as shown on Figure 10.

Information regarding survey protocol and the types of observations made can be found in the separate baseline reports along with species-specific habitat requirements (SRK 2013a and 2013b).

3.19.2 Environmental Consequences of the Proposed Action

Direct impacts to wildlife could involve the taking of small mammals during land clearing activities. The taking of bird nests and young is not anticipated to occur as breeding bird surveys would be conducted prior to ground disturbance during the breeding bird season as described in Section 2.2.5. Other wildlife protection measures including adherence to speed limits and construction of the power line and communication facilities according to APLIC standards would minimize impacts to wildlife including special status species.

Loud and sudden noises associated with the Proposed Action could result in wildlife displacement for the life of the Project. In areas where habitats are at or near their wildlife carrying capacity, displacement could add further stresses to the habitat and/or reductions in wildlife populations in adjacent habitat areas.

Indirect impacts to wildlife would include the removal or alteration of 72 acres of potential habitat equaling approximately five percent of the proposed Project Area. This impact would persist for 51 acres of the proposed disturbance until reclamation activities are complete and vegetation has been reestablished. Approximately 21 acres would remain unreclaimed and unvegetated as open pit features. This area would constitute a long-term loss of habitat, although some species may eventually find the cliff-like pit walls suitable habitat.

The resulting post-mining vegetation community may differ somewhat from the existing vegetation. However, over time, vegetation would be expected to return to a composition matching the surrounding undisturbed environment, creating available habitat for wildlife species. In addition, the applicant committed environmental protection measures outlined in Section 2.2.5 would minimize potential direct impacts to wildlife and reduce impacts to habitat.

3.19.3 Environmental Consequences of the No Action Alternative

Under the No Action Alternative, the proposed activities would not occur and no further impacts to wildlife beyond impacts related to the approved activities would occur.

4.0 CUMULATIVE IMPACTS

Cumulative impacts have been defined under 40 CFR §1508.7 as:

> "The impact which results from the incremental impact of the action, decision, or Project when added to the other past, present, and reasonably foreseeable future actions (RFFAs), regardless of what agency (Federal or non-Federal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time."

This section addresses the cumulative effects on environmental resources within the cumulative effects study areas (CESAs) which could result from past, present and reasonably foreseeable future actions , including the Proposed Action. For the purposes of this analysis and under federal regulations, "impacts" and "effects" are assumed to have the same meaning and are interchangeable.

Environmental consequences of the Proposed Action and the No Action Alternative were evaluated previously in Section 3. The results of the direct and indirect impact analysis indicate that the following resources would be impacted by the Proposed Action and are thus evaluated for cumulative impacts:

- Air Quality;
- Cultural Resources;
- Noxious Weeds, Invasive and Non-native Species;
- Migratory Birds;
- Wastes, Hazardous and Solid;
- Water (Surface and Ground);
- Socio-Economic Values;
- Soils;
- Special Status Species;
- Vegetation;
- Wild Horses and Burros; and
- Wildlife.

Based on the preceding analysis in Section 3, the following resources would not be impacted by the Proposed Action. Therefore, no cumulative impacts are expected for the following resources:

- Native American Traditional Values;
- Grazing Management;
- Land Use Authorizations;
- Geology and Minerals;
- Paleontological Resources;
- Recreation; and
- Visual Resources.

4.1 Description of Cumulative Effects Study Area Boundaries

The CESA boundaries used in this EA are the same as those used for analysis in the *Amendment to the Mineral Ridge Mine Plan of Operations Environmental Assessment* (BLM 2011). The extents of the CESAs vary according to the resource being considered.

The Silver Peak Allotment CESA includes the Silver Peak grazing allotment plus the area around the town of Silver Peak to the eastern border of Range 39. This CESA encompasses approximately 313,300 acres. The Silver Peak Range CESA encompasses most of the Silver Peak Range and portions of adjacent Clayton Valley for a total of approximately 92,160 acres. The Silver Peak Range CESA is contained within the Silver Peak Allotment CESA.

The CESA boundaries are shown on Figure 12, and Table 4-1 outlines the CESA areas by resource.

Table 4-1: Cumulative Effects Study Areas

CESA Name	Resources	CESA Size (acres)
Silver Peak Allotment CESA	Air Quality, Cultural Resources, Migratory Birds, Noxious Weeds, Water Quality, Soils, Special Status Species, Vegetation, Wild Horses and Burros, and Wildlife.	313,300
Silver Peak Range CESA	Socio-Economic Values and Hazardous and Solid Waste	92,160

4.2 Past and Present Actions

Past and present actions in the Silver Peak Range and Silver Peak Allotment CESAs include: exploration and mining, land exchanges and sales, renewable energy projects, livestock grazing, wildlife habitat improvements, transportation networks and ROWs, dispersed recreation and wild horse and burro gathers. The BLM's Land and Mineral Legacy Rehost 2000 System (LR2000) was queried to access reports for actions occurring on BLM land.

Aside from actions occurring on BLM lands within the CESAs, the town of Silver Peak houses families and some businesses. The 2010 census registered a population of 107 individuals with 65 percent of the employed population working in agriculture, forestry, fishing, hunting, or mining (US Census Bureau 2011). Domestic and municipal construction and repair activities are ongoing.

4.2.1 Exploration and Mining

The Silver Peak Range CESA has been extensively disturbed by both underground and surface mining operations which extend from the nineteenth century until the present day. Historic mining operations included mining, milling, and waste rock disposal.

Mineral exploration, mining, and mineral material operations that have occurred or are occurring within the CESAs are summarized in Table 4-2 by case type and disposition. The

total authorized project acres as well as the reported acres disturbed and acres reclaimed are also shown for relevant categories.

Table 4-2: Past and Present Materials, Minerals, and Sand & Gravel Actions

Case Type	Disposition	Total Acres[1]	Acres Disturbed	Acres Reclaimed
Silver Peak Range and Allotment CESAs				
Surface Management – Notices	Closed	31.60	92.60	82.60
Surface Management – Plans	Closed	0.00	29.00	29.00
Material Sites	Authorized	90.00	-	-
Surface Management – Plans	Authorized	660.00	670.00	20.00
Surface Management – Notices	Authorized	2.50	2.70	0.00
Surface Management – Notices	Expired	22.28	21.56	0.00
Sub-Total[1]		**806.38**	**815.86**	**131.6**
Silver Peak Allotment CESA Only				
Surface Management – Notices	Expired	27.24	15.27	0.00
Surface Management – Notices	Closed	43.01	102.24	97.34
Material Sites	Authorized	400.00	-	-
Surface Management – Plans	Authorized	41.00	0.00	0.00
Surface Management – Notices	Authorized	11.36	8.60	0.00
Sub-Total[1]		**522.61**	**126.11**	**97.34**

Source: LR2000 2013

[1]Activities may be located in all or part of the listed sections. Acreage totals may not represent the actual acreage located within the CESA boundary.

Several closed lease actions exist within the CESAs including leases for sodium prospecting and minerals. No disturbance acres are associated with these leases.

Most impacts related to surface management plan activities would be minimized through resource management and reclamation. Surface disturbance related impacts for most projects would generally last for the short-term, until reclamation and revegetation success.

4.2.2 Land Sales, Acquisitions, and Land Exchanges

Land transfers and sales can effectively remove land from BLM management. Actions on land not under BLM management or other federally designated management are not required to meet the same criteria for resource control. Resulting impacts would generally be long-term. Authorized land exchanges and sales within each CESA are summarized in Table 4-3.

Table 4-3: Land Sales and Exchanges

Case Type/Description	Disposition	Total Acres[1]
Silver Peak Range and Allotment CESAs		
Sale - Public Lands FLPMA	Authorized	5
Sale – Recreation and Public Purposes Act	Authorized	20
Sub-Total[1]		**25**
Silver Peak Allotment CESA Only		
Federal Aviation Administration Site	Authorized	135.27
Sale - Section 203 & 209	Authorized	27.50
Sale – Recreation and Public Purposes Act	Authorized	10.00
Sub-Total[1]		**172.77**

Source: LR2000 2013
[1]Activities may be located in all or part of the listed sections. Acreage totals may not represent the actual total located within the CESA boundary.

4.2.3 Renewable Energy Projects

Areas within both of the CESAs have been mapped for alternative energy potentials. The areas within both CESAs have been mapped as having a National Renewable Energy Laboratory (NREL) Wind Potential wind power class of between two (200-300 watts per square meter (W/m^2) and four (400-500 W/m^2), with class four areas found on the higher ridges within the Silver Peak Range. For comparison, the highest wind power class listed by NREL is seven (greater than 800 W/m^2). Both CESAs are located wholly within NREL Photovoltaic Resource Potential areas categorized as having "excellent" potential at 6,310 to 6,452 kilowatt hours per square meter (kWh/m^2) per day. NREL concentrating solar power estimates within the CESAs ranges from six to 7.5 watt hours per square meter (Wh/m^2) per day or an annual direct normal irradiance of 7,247 to 7,449. As a comparison, the NREL concentrating solar power categories go up to greater than eight Wh/m^2 per day (NREL 2010).

Four authorized geothermal geophysical exploration projects exist within the Silver Peak Allotment CESA. They encompass a total project area of approximately 59 acres. No disturbance acres have been recorded for these projects (LR2000 2013).

Twenty-one authorized geothermal leases are present within the Silver Peak Allotment CESA while three are present within the Silver Peak Range CESA. Two exploration projects have been approved by BLM within the Silver Peak Allotment CESA. The first, known as the Silver Peak Geothermal Exploration Project, proposed to drill up to 14 temperature gradient wells (TGWs), and up to six observation and six production/injection wells. To date, 13 TGWs and one observation well have been drilled. Taken together, the drilling of these wells has created less than one acre of disturbance within the Silver Peak Allotment CESA.

The second approved exploration project, Rockwood Lithium's Silver Peak Area Geothermal Exploration Project, proposed the drilling of two observation, two injection, and two production wells within the Silver Peak Allotment CESA. To this point, one observation well has been drilled which has created a nominal amount of ground disturbance.

Rockwood Lithium has also drilled two TGHs under a Notice of Intent. Although six drill holes were approved, the results of tests performed on the two original holes were not

favorable and it is unlikely the company will drill the remaining four holes. Less than one acre of ground disturbance was created by the drilling operations.

4.2.4 Livestock Grazing

Both of the CESAs are located within the Silver Peak Allotment This allotment encompasses approximately 299,900 acres within Esmeralda County. Livestock grazing has occurred within this allotment as a past action and continues to occur as a present action with 264 active AUMs currently permitted for use (RAS 2013).

4.2.5 Wildlife Habitat Improvements

During the spring of 2004, two existing wildlife water developments in the Silver Peak Range were rebuilt, and a third was repaired in 2008, increasing the amount of available habitat in the Silver Peak Range (BLM 2011).

4.2.6 Transportation Networks and Rights-of-Way (ROWs)

Closed ROWs which had resulted in disturbance acres include ROWs for power, telephone, communications, water, geothermal, and other energy facilities.

Authorized ROWs within the CESAs include ROWs for minor roads, county roads, highways, power transmission facilities, a power intertie, communication sites, water facilities, telephone facilities, and other facilities. Most of these ROWs are linear features crossing portions of the landscape. Acreages associated with authorized ROWS are listed in Table 4-4; however, most of these linear features are located only partially within the CESAs, with a length of approximately seven miles being the maximum (crossing from north to south through the Silver Peak Allotment CESA).

Most of the roads located within the CESAs are minor roads which require minimal maintenance including grading and gravelling. Larger roads within the Silver Peak Allotment CESA include Highway 6 and Highway 95 as shown on Figure 12. State Highway 265 is located within both CESAs.

Table 4-4: Past and Present ROW Actions

ROW Type	Disposition	Total Acres[1]	Acres Disturbed[1]
Silver Peak Range and Allotment CESAs			
Power Facilities	Closed	1.00	1.00
Power Transmission Facilities	Closed	2.02	0.47
Telephone Facilities	Closed	112.66	112.66
Geothermal and Other Energy Facilities	Closed	7.30	5.00
Roads	Authorized	344.58	344.58
Federal Aid Highway	Authorized	974.43	974.43
County Roads	Authorized	337.88	337.88
Power Transmission Facilities	Authorized	70.05	70.05
Power Transmission Intertie	Authorized	21,380.07	21,380.07
Communication Site	Authorized	10.10	10.00

ROW Type	Disposition	Total Acres[1]	Acres Disturbed[1]
Water Facility	Authorized	23.61	23.61
Silver Peak Allotment CESA Only			
Communication Site	Closed	1.03	0.50
Federal Communication Site	Closed	135.28	0.01
Water Facilities	Closed	0.14	0.14
Power Facilities	Closed	0.01	0.01
Roads	Authorized	1,018.26	1,018.26
Federal Aid Highway	Authorized	1,624.16	1,624.16
Power Transmission Line	Authorized	64.92	64.92
Communication Site	Authorized	0.07	0.07
Federal Communication Site	Expired	0.001	0.001
Telephone Facility	Authorized	799.65	799.65
Other Facilities	Authorized	0.19	0.19

Source: LR2000 2013
[1]Activities may be located in all or part of the listed sections. Acreage totals may not represent the actual total located within the CESA boundary.

4.2.7 Dispersed Recreation

Developed recreational opportunities are relatively sparse in this part of Nevada and tend to be limited to OHV/ATV use, dirt bike riding, hunting/shooting, and camping. Other recreational activities may include mountain biking, horseback riding, sightseeing, outdoor photography, nature study, pine nut gathering, wildlife viewing, bird watching, and rock collecting. Except for hunting/shooting, these activities are dispersed and occur sporadically in low numbers.

Parks and recreation areas associated with the county and the town of Silver Peak include the Esmeralda County Hot Box Park and the Silver Peak Ballpark.

4.2.8 Wild Horse and Burros Gathers

A wild horse and burro gather was conducted within the Silver Peak HMA portion of the Silver Peak Allotment CESA during the fall of 2006. The objective of the gather was the complete removal of horses due to a lack of appropriate habitat in the HMA. During the course of the gather, which occurred over a six-day period beginning October 2, 2006, 154 wild horse, mules, and burros were removed.

4.3 Reasonably Foreseeable Future Actions (RFFAs)

RFFAs within the CESAs would be dominated by mining activities. Mineral exploration and mining activities can be expected to continue based on current supply and demand of minerals and materials. Livestock grazing, transportation, and dispersed recreational activities are expected to continue consistent into the foreseeable future. It may be reasonably foreseeable that additional geothermal exploration operations will occur within the CESAs given the current acreage that is leased, though no proposals have been submitted for approval. No

additional wild horse and burros gathers are currently being contemplated and, therefore, are no reasonably foreseeable.

Much of the area surrounding the town of Silver Peak is identified as suitable for disposal, utilizing direct sale procedures, in the Tonopah RMP (BLM 1997). The authority for the potential sale of this land would come under Sections 203 and 209 of FLPMA, U.S.C. 1713 and 1719, or disposal through the Recreation and Public Purposes Act, and special legislation.

The following actions summarized in Table 4-5 are pending authorizations and are considered RFFAs.

Table 4-5: Pending Actions Wholly or Partially Within CESA Boundaries

Case Type	Disposition	Total Acres[1]
Silver Peak Range and Allotment CESAs		
Potassium Prospecting Permit	Pending	9,554.02
Sodium Prospecting Permit	Pending	2,420.00
Mineral Materials	Pending	36.00
Surface Management - Notice	Pending	1.10
Surface Management - Plan	Pending	101.30
Silver Peak Allotment CESA Only		
Sale – Recreation and Public Purposes Act	Pending	20.00
Sodium Prospecting Permit	Pending	22,345.82
Surface Management - Notice	Pending	1.00

Source: LR2000 2013
[1]Activities may be located in all or part of the listed sections. Acreage totals may not represent the actual total located within the CESA boundary.

4.4 Cumulative Impacts Associated with Past, Present and Reasonably Foreseeable Future Actions, including the Proposed Action

In accordance with the guidance document, *Considering Cumulative Effects Under the National Environmental Policy Act* (CEQ 1997), potential cumulative impacts for resources presented and evaluated in Section 3 and found to be impacted by the Proposed Action are discussed herein.

4.4.1 Air Quality

The CESA boundary for air quality is the Silver Peak Allotment.

Past and present actions within the Silver Peak Allotment CESA likely to be contributing to air quality impacts include exploration and mining, livestock grazing, transportation networks and ROWs, and dispersed recreation. These activities contribute point source particulate matter emissions and fugitive dust to the air. Fugitive dust emissions arise from roads, cleared areas, disturbed areas (such as may result from grazing and recreation), and earth moving activities. Products of combustion are also emitted into the air primarily from mining operations and transportation.

Past and present surface management plans have associated quantifiable disturbance acres of approximately 816 acres, which is less than one percent of the CESA. Transportation

networks and ROWs also have associated disturbances areas which are not fully contained within the CESA but are estimated to equal less than one percent of the CESA. Past and present air quality impacts from surface management plan disturbances, transportation, and ROWs have not altered the "unclassifiable/attainable" classification of Esmeralda County and hydrographic area 143 (Clayton Valley) meaning that the existing background concentrations for criteria air pollutants are less than the minimum allowable ambient concentrations defined in the NAAQS.

Combustion emissions within the CESA would be created primarily by vehicles travelling along Highway 6, Highway 95, State Highway 265, by mining and exploration equipment, and some recreational uses. Impacts to air quality from these past and present combustion-related sources have not altered the "unclassifiable/attainable" classification of Esmeralda County or Clayton Valley and are considered to be minimal due to low traffic levels and climatic conditions which favor dispersion.

Transportation, livestock grazing, and dispersed recreation are RFFAs expected to continue to occur much as they are occurring today with little change in the degree that these activities impact air quality. New RFFAs which may impact air quality within the Silver Peak Allotment CESA include exploration and mining. These activities would contribute to air quality impacts through fugitive dust and combustion emissions. Disturbance areas have not been identified for the RFFAs and are thus not quantified. Prior to their receiving authorization to commence any future operations, impacts to air quality would be analyzed separately for each new project.

Under the Proposed Action, the mine life would be extended by approximately one year. This would result in approximately one additional year's worth of emissions. The estimated mobile equipment yearly emission totals from the Proposed Action are shown in Table 3-4 and the 2013 facility-wide emission summary is shown in Table 3-5.

The incremental contribution of the Proposed Action's combustion and fugitive dust emissions would be relatively small for both the short-term and long-term. The cumulative emissions resulting from past and present actions, RFFAs, and the Proposed Action would be generally dispersed and are not anticipated to alter Clayton Valley's air quality rating of "unclassifiable/attainment". In addition, applicant committed environmental protection measures for each authorized project occurring on public land would minimize potential cumulative effects to air quality. Reclamation of proposed surface disturbance areas would gradually eliminate most sources of fugitive dust resulting from wind erosion.

Impacts to air quality from previously permitted authorizations would continue to occur under the No Action Alternative. Cumulative impacts occurring from the No Action Alternative would result in no measurable change to Esmeralda County's or Clayton Valley's "unclassifiable/attainment" status. Fugitive dust emissions would result from the disturbance of approximately 549 acres within the Project Area. Mobile and stationary source emissions would be the same as those previously discussed.

4.4.2 Cultural Resources

The CESA boundary for cultural resources is the Silver Peak Allotment.

Cultural resources within the Silver Peak Allotment CESA have had and continue to have the potential for disturbance resulting primarily from ground clearing activities which could

disturb or remove cultural sites. Past and present actions involving surface disturbance include exploration and mining, renewable energy projects, transportation networks and ROWs, recreation, and livestock grazing. Surface management plans have associated quantifiable disturbance areas which total approximately 816 acres or less than one percent of the CESA. Transportation networks and ROWs also have associated disturbances areas which are not fully contained within the CESA, but are estimated to equal less than one percent of the CESA.

Permitted activities occurring on federal lands are required to manage for cultural resources; impacts to cultural resources under these projects have been or are being avoided or mitigated. Unpermitted activities and activities occurring on private lands may impact cultural resources without mitigation.

Land sales have occurred within the Silver Peak Allotment CESA effectively transferring approximately 198 acres from BLM management to other agency, private, or municipal management. Although cultural surveys and mitigation are required for NRHP-eligible sites prior to land sales and exchanges from the BLM, cultural resources which may be discovered later would not be subject to the same management and mitigation as under BLM management.

RFFAs which may impact cultural resources within the Silver Peak Allotment CESA include exploration and mining and land disposals. These activities could contribute to impacts through surface disturbances and through transfer of their long-term management away from the BLM. Disturbance areas have not been identified for the RFFAs and are thus not quantified. Approximately 20 acres are pending sale under the Recreation and Public Purposes Act. Livestock grazing and dispersed recreation are other RFFAs which could impact cultural resources; these activities are expected to carry on at levels comparable to the present.

Impacts under the Proposed Action would occur but would be mitigated through the development of a treatment plan, data recovery, archaeological documentation, and report preparation in accordance with PA stipulations. The incremental contribution of the Proposed Action's impacts to cultural resources would be negligible.

The cumulative impacts to cultural resources resulting from past and present activities, RFFAs, and the Proposed Action would have no known measurable impact to cultural resources given the scope of disturbances and activities as well as adherence to federal regulations for activities occurring on public land. Unknown impacts may still occur; the significance of these potential impacts remains unknown.

Under the No Action alternative, impacts would continue to occur from authorized activities such as mining, transportation, recreation, and grazing. According to past analysis, authorized activities within the Project Area are not anticipated to impact cultural resources due to the implementation of environmental protection measures (BLM 2011 and 2013).

4.4.3 Noxious Weeds, Invasive and Non-native Species

The CESA boundary for noxious weeds, invasive and non-native species is the Silver Peak Allotment.

Past and present actions within the Silver Peak Allotment CESA likely to contribute to the presence or spread of noxious weeds and invasive and non-native species are activities which include surface disturbances, vegetation removal, and movement of vehicles, people, and animals. These activities include exploration and mining, renewable energy projects, livestock grazing, transportation networks and ROWS, and dispersed recreation. Disturbances associated with surface management plans in the CESA equal approximately 816 acres or less than one percent of the CESA. Transportation networks and ROWs also have associated disturbances areas which are not fully contained within the CESA but are also estimated to equal less than one percent of the CESA.

Activities occurring on public lands are required to manage or mitigate for the presence of noxious weeds and non-native invasive species. Lands which are transferred to other entities may not receive the same kind of management for these species as they would under the BLM. Approximately 198 acres of land have been transferred or sold, equaling less than one percent of the CESA. The establishment of noxious weeds, invasive and non-native species may occur uncontrolled on these areas.

RFFAs which may impact noxious weeds, invasive and non-native species within the Silver Peak Allotment CESA include exploration and mining and land disposal. These activities could contribute to the establishment and spread of these species through surface disturbances, the transportation of seeds, and the removal of lands from BLM management. Other RFFAs such as transportation, livestock grazing, and recreation are expected to continue to occur at their current rates, contributing incrementally to noxious weed, invasive and non-native species impacts. Disturbance areas have not been identified for the RFFAs and are thus not quantified. Approximately 20 acres are pending sale under the Recreation and Public Purposes Act.

Impacts to noxious weeds, invasive and non-native species under the Proposed Action would occur but would be minimal due to their current low occurrence within the Project Area and the related applicant committed environmental protection measures which would manage their presence and spread.

Cumulative impacts to noxious weeds, invasive and non-native species would occur from the past, present, and RFFAs as described. The areas within which noxious weeds and non-native, invasive species would be likely to establish is estimated at less than one percent of the CESA although this area may be larger if these species become established on currently vegetated areas. The incremental contribution of the Proposed Action to noxious weeds, invasive and non-native species cumulative impacts within the CESA would be negligible.

Cumulative impacts from previously authorized activities including grazing would continue to occur under the No Action Alternative. To date, approximately 549 acres have been approved for disturbance within the Project Area. Most of this area would be reclaimed upon project completion with the exception of 95 acres of open pit. Previously analyzed cumulative impacts related to authorized activities within the Project Area were determined to result in incremental cumulative impacts to noxious weeds, invasive and non-native species (BLM 2011 and 2013).

4.4.4 Migratory Birds

The CESA boundary for migratory birds is the Silver Peak Allotment.

Impacts to migratory birds generally result from activities involving habitat removal or alteration, human presence, and noise. Past and present actions within the Silver Peak Allotment CESA likely to contribute to migratory bird impacts include exploration and mining, renewable energy projects, transportation networks and ROWs, dispersed recreation, and livestock grazing. Most disturbances would be associated with land clearing and habitat removal or alteration. Disturbances associated with surface management plans in the CESA equal approximately 816 acres or less than one percent of the CESA. Transportation networks and ROWs also have associated disturbances areas which are not fully contained within the CESA but are estimated to equal less than one percent of the CESA.

Activities occurring on public lands are required to manage or mitigate for impacts to migratory birds. In particular, surveys for nesting birds are required prior to land clearing during the migratory bird nesting season, and reclamation of disturbed lands is usually incorporated into surface management plans. Lands which are transferred to other entities may not receive the same kind of management for migratory birds as they would under the BLM. Approximately 198 acres of land (less than one percent of the CESA) have been transferred or sold from the BLM.

RFFAs which may impact migratory birds within the Silver Peak Allotment CESA include exploration and mining and land disposal. These activities may involve the removal or alteration of migratory bird habitat and an increase in human presence and noise which could alter migratory bird use. Land disposal activities may remove lands from BLM management. Disturbance areas have not been identified for the RFFAs and are thus not quantified. Approximately 20 acres are pending sale under the Recreation and Public Purposes Act. Other RFFAs such as transportation, livestock grazing, and dispersed recreation are expected to continue at their current rates, impacting migratory birds primarily through noise and human presence. Habitat alteration may also occur from grazing and recreation.

Impacts to migratory birds would occur under the Proposed Action as analyzed and would be minimized by the implementation of environmental protection measures including reclamation. Impacts would primarily occur during the short-term (disturbance of 72 acres and increased human presence and noise) while some loss of habitat would be long-term resulting from unreclaimed open pit features.

Past and present actions and RFFAs would contribute to cumulative impacts to migratory birds as described primarily through land clearing and habitat removal/alteration. The incremental contribution of the Proposed Action's impacts to migratory birds in both the short- and long-term would be minimal in comparison to the CESA size. It is estimated that less than one percent of the CESA's migratory bird habitat would be cumulatively affected by land clearing, although a larger area may be considered impacted due to habitat alteration and human presence/noise.

Cumulative impacts from previously authorized activities involving vegetation or habitat removal/alteration, noise, and human presence would continue to occur under the No Action Alternative. These cumulative impacts would be less than but similar to those described for the Proposed Action. To date, approximately 549 acres have been approved for disturbance within the Project Area. Most of this area would be reclaimed upon Project completion with the exception of 95 acres of open pit. Approved operations within the Project Area would also

involve noise, human presence, and the presence of various facilities which may pose risks to wildlife.

4.4.5 Wastes, Hazardous and Solid

The CESA boundary for hazardous and solid wastes is the Silver Peak Range.

Impacts to hazardous and solid wastes may occur from past and present actions related to exploration and mining, renewable energy projects, transportation, and municipal activities. Most activities dealing with hazardous wastes are regulated and thus controlled under state and federal authorities. Most of the past and present actions would have measures in place for management of wastes and hazardous materials, their disposal, containment, spill prevention, and cleanup.

RFFAs which may impact hazardous and solid wastes include exploration and mining. However, these permitted activities would also be required to manage for wastes and hazardous materials. Related impacts would be minimal.

Impacts to hazardous and solid wastes would occur under the Proposed Action but would be minimized by the implementation of environmental protection measures and would last until reclamation is complete.

Past and present actions, RFFAs, and the Proposed Action have the potential to contribute to the amount of waste created and handled within the CESA; however, impacts from these wastes would only occur if they are mismanaged and released into the environment. Since most of the activities involving wastes are located on public land and are required to comply with state and federal regulations, it is anticipated that the chance of impacts occurring is low but cumulatively increased for each activity occurring within the CESA. The incremental contribution of the Proposed Action's impacts to hazardous and solid wastes would be minimal.

Cumulative impacts from previously authorized activities would continue to occur under the No Action Alternative. Cumulative impacts from the No Action Alternative would be similar to but slightly less than those described for the Proposed Action; the only measurable difference would be the extended mine life which would increase the time during which hazardous and solid wastes would be managed on-site.

4.4.6 Water (Surface and Ground)

The CESA boundary for water resources is the Silver Peak Allotment.

Past and present actions within the Silver Peak Allotment CESA likely contributing to water resource impacts include exploration and mining, renewable energy projects, transportation networks and ROWs, dispersed recreation, livestock grazing, and municipal activities. Impacts may result from direct contamination or use of surface and groundwater or through land clearing and sedimentation. These activities have the potential to impact surface and ground water quality and quantity through contamination and use. Water use in Clayton Valley is regulated by the NDWR. Furthermore, most of the surface disturbing activities and activities involving potential pollutants are regulated at the federal or state levels, and project proponents are required to practice certain environmental protection measures for water resources.

RFFAs which may impact water resources within the Silver Peak Allotment CESA include mining and exploration. These activities could contribute to water quality and quantity impacts through ground clearing, drilling, water use, and the use of potentially polluting substances. These activities would occur on public land and would be required to undergo impacts analysis and to follow environmental protection measures and/or mitigation measures for the protection of water resources.

Impacts to water resources from past and present actions, RFFAs, and the Proposed Action may result from ground clearing and resulting sedimentation. It is estimated that less than one percent of the CESA would experience surface disturbance. Water use has not been quantified for the listed activities; water use would be regulated by the NDWR. The incremental contribution of the Proposed Action to cumulative water impacts would be minimal.

Cumulative impacts from previously authorized activities would continue to occur under the No Action Alternative. These cumulative impacts would be less than but similar to those described for the Proposed Action. To date, approximately 549 acres have been approved for disturbance within the Project Area. Most of this area would be reclaimed upon project completion with the exception of 95 acres of open pit. Exploration drilling, water wells, monitoring wells, and water use have also been permitted for the mine which has the potential to contribute to water quality impacts.

4.4.7 Socio-Economic Values

The CESA boundary for socio-economic values is the Silver Peak Range.

Past and present actions which may have an effect on socio-economic values include exploration and mining, renewable energy projects, transportation, dispersed recreation, and municipal activities associated with the town of Silver Peak. The main contributors to socio-economic factors are the employment opportunities provided by Mineral Ridge Mine and Rockwood Lithium, the two largest employers in Esmeralda County. The next largest employers in the county are local and federal governments (Nevada Workforce Informer 2013).

The main RFFAs which may impact socio-economic values would include exploration and mining. Implementation of exploration and mining projects would likely provide job opportunities and would bring people into the town of Silver Peak on a temporary basis.

The Proposed Action would extend the life of the mine and associated employment for about 110 people by approximately one year. Within the CESA, mine employment directly impacts the town of Silver Peak's economy since most site employee's stay in Silver Peak during their shifts.

Cumulative impacts to socioeconomics within the CESA resulting from past and present actions, RFFAs, and the Proposed Action would be positive, resulting in increased employment and revenue; these impacts have not been quantified. The incremental contribution of the Proposed Action's impacts to Silver Peak's socio-economics would be moderately important in the short-term considering the low number of employment opportunities and the rural population. However, the Proposed Action does not induce substantial growth or concentration of population, displace a large number of people, cause a substantial reduction in employment, reduce wage and salary earnings, cause a substantial net increase in county expenditures, or create a substantial demand for public services. In the

volatile economy of the foreseeable future, it is expected that the cumulative and incremental socioeconomic effects of the Proposed Action would be beneficial, but not significant.

The positive socio-economic impacts anticipated under the Proposed Action would not occur under the No Action Alternative; employment for about 110 people would be shortened by approximately one year as compared to the Proposed Action. Cumulative impacts from the No Action Alternative have not been quantified and have not been previously analyzed for the site. However, it can be assumed, based on the rural location of the mine and that MRG is one of the two largest employers in Esmeralda County, that the impacts are measurably positive.

4.4.8 Soils

The CESA boundary for soils is the Silver Peak Allotment.

Past and present actions within the Silver Peak Allotment CESA likely to contribute to soil impacts include exploration and mining, renewable energy projects, livestock grazing, transportation networks and ROWs, dispersed recreation, and municipal activities. These actions generally involve some amount of land clearing and ground disturbance which can expose soils to erosive processes or otherwise disturb/remove them. Surface management plans have associated quantifiable disturbance acres which total approximately 816 acres. This is less than one percent of the CESA. Transportation networks and ROWs also have associated disturbances areas which are not fully contained within the CESA but are estimated to equal less than one percent of the CESA.

New RFFAs which may impact soils within the Silver Peak Allotment CESA include exploration and mining. These activities also involve some amount of land clearing and ground disturbance. Transportation on un-paved roads, livestock grazing, and dispersed recreation are additional RFFAs which are expected to continue as presently occurring. Disturbance areas have not been identified for the RFFAs and are thus not quantified.

The Proposed Action would impact soils through the disturbance of 72 previously undisturbed acres. Disturbed areas would be reclaimed with the exception of approximately 21 acres of open pit.

Cumulative surface disturbances and related impacts to soil are estimated to occur from past and present actions, RFFAs, and the Proposed Action on less than one percent of the CESA. A larger area may be impacted when considering soil disturbances caused by dispersed activities such as grazing and some types of recreation and transportation. Cumulative impacts to soils would be generally dispersed throughout the CESA, and the applicant committed environmental protection measures for authorized activities occurring on public lands would minimize potential effects. In addition, reclamation of surface disturbance for authorized activities occurring on public lands would gradually protect most disturbed soil resources from erosion. The incremental contribution of the Proposed Action's increased disturbance area would be minimal and incremental in both the short- and long-term.

Cumulative impacts from previously authorized activities involving ground disturbance and vegetation removal would continue to occur under the No Action Alternative. This includes the existing authorized disturbance of approximately 549 acres. Most of this area would be reclaimed upon Project completion with the exception of approximately 95 acres of open pit.

4.4.9 Special Status Species

The CESA boundary for special status species is the Silver Peak Allotment.

Impacts to special status species would generally occur from activities involving habitat removal or alteration, human presence, and noise. Impacts may also occur from species and human or equipment encounters. Past and present actions within the Silver Peak Allotment CESA likely to contribute to special status species impacts include exploration and mining, renewable energy projects, livestock grazing, transportation networks and ROWs, dispersed recreation, and municipal activities. Disturbances associated with surface management plans in the CESA equal approximately 816 acres or less than one percent of the CESA. Transportation networks and ROWs also have associated disturbances areas which are not fully contained within the CESA but are estimated to equal less than one percent of the CESA.

Activities occurring on public lands are required to manage or mitigate for impacts to special status species. Lands which are transferred to other entities may not receive the same kind of management as they would under BLM management. Approximately 198 acres of land (less than one percent of the CESA) have been transferred or sold from the BLM.

RFFAs which may impact special status species within the Silver Peak Allotment CESA include exploration and mining and land disposal. These activities may involve the removal or alteration of habitat and an increase in human presence and noise which could disrupt special status species use of the area. Land disposal activities may remove lands from BLM management. Approximately 20 acres are pending sale under the Recreation and Public Purposes Act. Transportation, livestock grazing, and dispersed recreation are also expected to continue to occur and may impact special status species through human presence, noise, and habitat disturbance and/or alteration. Disturbance areas have not been identified for the RFFAs and thus have not been quantified.

The Proposed Action would impact special status species through the disturbance of 72 acres of undisturbed land and the extention of operations by approximately one year. Impacts to special status species would occur under the Proposed Action but would be minimized by the implementation of environmental protection measures including reclamation.

Cumulative impacts related to land disturbance and potential special status species habitat loss/alteration would occur from past and present actions, RFFAs, and the Proposed Action. The cumulative surface disturbance expected is estimated at less than one percent of the CESA. This loss cannot be directly related to special species habitat loss or alteration since the areas in which surface disturbances occur have not been analyzed for their habitat potential. However, the incremental contribution of the Proposed Action's impacts to special status species would be minimal in both the short- and long-term.

Cumulative impacts from previously authorized activities involving a change in habitat, noise, and human presence would continue to occur under the No Action Alternative. To date, approximately 549 acres have been approved for disturbance within the Project Area. Most of this area would be reclaimed upon Project completion with the exception of 95 acres of open pit. Approved operations which would occur under the No Action Alternative would also involve noise, human presence, and the presence of various facilities which may pose risks to special status species.

4.4.10 Vegetation

The CESA boundary for vegetation is the Silver Peak Allotment.

Past and present actions within the Silver Peak Allotment CESA likely to contribute to impacts to vegetation include exploration and mining, renewable energy projects, livestock grazing, transportation networks and ROWs, dispersed recreation, and municipal activities. These activities generally involve vegetation removal, alteration, and ground disturbance. Surface management plans have associated quantifiable disturbance acres which total approximately 816 acres. This is less than one percent of the CESA. Transportation networks and ROWs also have associated disturbances areas which are not fully contained within the CESA but are estimated to equal less than one percent of the CESA.

RFFAs which may impact Vegetation within the Silver Peak Allotment CESA include exploration and mining. These activities would likely involve some amount of vegetation removal and land clearing. Disturbance areas have not been identified for the RFFAs and are thus not quantified. Vegetation community alteration may also occur from grazing and recreation.

The Proposed Action would impact vegetation through the disturbance of 72 acres of undisturbed land. Environmental protection measures including reclamation would be implemented to minimize impacts to vegetation. However, open pit features would remain unreclaimed.

Cumulative impacts related to land disturbance and vegetation removal or alteration would occur from past and present actions, RFFAs, and the Proposed Action. The cumulative surface disturbance expected is estimated at less than one percent of the CESA. A larger area may be impacted due to activities such as grazing which would alter vegetation compositions over time. The incremental contribution of the Proposed Action's increased disturbance area would be minimal. Cumulative impacts to vegetation would be generally dispersed throughout the CESA, and the applicant committed environmental protection measures would minimize potential effects to vegetation. Reclamation of surface disturbances would gradually reestablish vegetation on most of the disturbed areas minimizing effects in the short-term but not eliminating long-term effects.

Previously authorized activities within the Project Area involving land disturbance would continue to occur under the No Action Alternative. To date, approximately 549 acres have been approved for disturbance within the Project Area. Most of this area would be reclaimed upon Project completion with the exception of 95 acres of open pit. These activities would continue to contribute incrementally to cumulative impacts to vegetation within the CESA.

4.4.11 Wild Horses and Burros

The CESA boundary for wild horses and burros is the Silver Peak Allotment.

No impacts to burros are anticipated to occur under the Proposed Action since population inventory flights have lacked no burros in the Silver Peak HMA. Impacts to wild horses would generally occur from activities involving habitat removal or alteration, human presence, and noise. Past and present actions within the Silver Peak Allotment CESA likely to contribute to wild horse impacts include exploration and mining, renewable energy projects, livestock grazing, wildlife habitat improvements, transportation networks and ROWs,

dispersed recreation, municipal activities. Disturbances associated with surface management plans in the CESA equal approximately 816 acres or less than one percent of the CESA. Transportation networks and ROWs also have associated disturbances areas which are not fully contained within the CESA but are estimated to equal less than one percent of the CESA.

Past and present wild horse and burro gathers have resulted in a sharp reduction of animal numbers in the CESA. This reduction has proven to be temporary however, as migration from areas to the west and south has replenished wild horse and burro numbers to near pre-gather levels.

Activities occurring on public lands are required to manage or mitigate for impacts to wild horses. Lands which are transferred to other entities may not receive the same kind of management as they would under the BLM. Approximately 198 acres of land (less than one percent of the CESA) have been transferred or sold from the BLM.

Positive impacts to wild horses may have occurred through the rebuilding of two wildlife water developments, effectively increasing the amount of habitat available for wildlife and potentially also for wild horses.

New RFFAs which may impact wild horses within the Silver Peak Allotment CESA include exploration and mining and land disposal. These activities may involve the removal or alteration of habitat and an increase in human presence and noise which could disturb wild horse use of the area. Disturbance areas have not been identified for the RFFAs and are thus not quantified. Land disposal activities may remove lands from BLM management. Approximately 20 acres are pending sale under the Recreation and Public Purposes Act. Other RFFAs such as livestock grazing and dispersed recreation are expected to occur at their current rates and to impact wild horses through habitat alteration/disturbance, human presence, and noise. In addition, vehicles using transportation corridors continue to pose a threat to wild horses.

The Proposed Action would result in the disturbance of 72 acres of vegetation which may provide wild horse habitat/fodder. In addition, the Proposed Action would involve an increased mine life of approximately one year and the expansion of facilities which would increase the area influenced by human presence and noise. Impacts to wild horses would occur under the Proposed Action but would be minimal due to the lack of use and by the implementation of environmental protection measures including reclamation.

Cumulative impacts resulting from land disturbances from past and present actions, RFFAs, and the Proposed Action have been estimated to equal a small fraction of the CESA. However, a larger area may be impacted by human presence, noise, and the alteration of habitats through such activities as livestock grazing. The incremental contribution of the Proposed Action's impacts to wild horses would be minimal.

Cumulative impacts from previously authorized activities involving a land clearing, noise, and human presence would continue to occur under the No Action Alternative. To date, approximately 549 acres have been approved for disturbance within the Project Area. Most of this area would be reclaimed upon Project completion with the exception of 95 acres of open pit. Approved operations which would occur under the No Action Alternative would also involve noise and human presence, influencing areas outside of the disturbance areas.

4.4.12 Wildlife

The CESA boundary for wildlife is the Silver Peak Allotment.

Impacts to wildlife would generally occur from activities involving habitat removal or alteration, human presence, and noise. Impacts may also occur from human or equipment encounters with wildlife. Past and present actions within the Silver Peak Allotment CESA likely to contribute wildlife impacts include exploration and mining, renewable energy projects, livestock grazing, wildlife habitat improvements, transportation networks and ROWs, dispersed recreation, and municipal activities. Disturbances associated with surface management plans in the CESA equal approximately 816 acres or less than one percent of the CESA. Transportation networks and ROWs also have associated disturbances areas which are not fully contained within the CESA but are estimated to equal less than one percent of the CESA.

Activities occurring on public lands are required to manage or mitigate for impacts to wildlife. Lands which are transferred to other entities may not receive the same kind of management as they would under the BLM. Approximately 198 acres of land (less than one percent of the CESA) have been transferred or sold from the BLM.

Positive impacts to wildlife may have occurred through the rebuilding of two wildlife water developments, effectively increasing the amount of habitat available for wildlife within the Silver Peak Range.

RFFAs which may impact wildlife within the Silver Peak Allotment CESA include exploration and mining and land disposal. These activities may involve the removal or alteration of habitat and an increase in human presence and noise which could disturb wildlife use of the area. Land disposal activities may remove lands from BLM management. Disturbance areas have not been identified for the RFFAs and are thus not quantified. Approximately 20 acres are pending sale under the Recreation and Public Purposes Act. Other RFFAs such as livestock grazing and dispersed recreation are expected to occur at their current rates and to impact wildlife through habitat alteration/disturbance, human presence, and noise. In addition, vehicles using transportation corridors continue to pose a threat to wildlife.

The Proposed Action would result in the disturbance of 72 acres of potential wildlife habitat. In addition, the Proposed Action would involve an increased mine life of approximately one year and the expansion of facilities which would increase the area influenced by human presence and noise. Environmental protection measures including reclamation would be implemented to minimize impacts to wildlife.

Cumulative impacts resulting from land disturbances from past and present actions, RFFAs, and the Proposed Action have been estimated to equal less than one percent of the CESA. However, a larger area may be impacted by related human presence, noise, and the alteration of habitats through such activities as livestock grazing. The taking of wildlife may also result from equipment use, land disturbance, and transportation. The incremental contribution of the Proposed Action's impacts to wildlife would be minimal.

Cumulative impacts from previously authorized activities involving vegetation or habitat removal or alteration, noise, and human presence would continue to occur under the No Action Alternative. These cumulative impacts would be less than but similar to those

described for the Proposed Action. To date, approximately 549 acres have been approved for disturbance within the Project Area. Most of this area would be reclaimed upon Project completion with the exception of 95 acres of open pit. Approved operations which would occur under the No Action Alternative would also involve noise, human presence, and the presence of various facilities which may pose risks to wildlife.

5.0 CONSULTATION AND COORDINATION

The scope of this EA was developed through consultation with BLM resource specialists (meeting and subsequent conversations), review of project proponent files, and review of supporting documentation.

5.1 List of Preparers

5.1.1 BLM – Tonopah Field Office

Bruce Andersen	Outdoor Recreation Planner
Mark Ennes	Planning and Environmental Coordinator
Christopher Herr	Range Management Specialist
Dustin Hollowell	Wildlife Biologist
Leighandra Keeven	Mining Engineer and Project Lead
David Price	Wild Horse and Burro Specialist
Katherine Russell	Archaeologist
Christopher Worthington	Planning and Environmental Coordinator

5.1.2 SRK Consulting (U.S.), Inc.

Valerie Sawyer	Project Principal
Carrie Schultz	Project Manager
Sierra Harmening	Staff Consultant
Dave Dixon	AutoCAD/GIS Consultant

6.0 REFERENCES

AMEC. 2012. *Mineral Ridge Leach Pad Stacking Height Increase.* November 16, 2012.

APLIC. 2006. Edison Electric Institute, APLIC, and the California Energy Commission. Washington DC and Sacramento CA.

Bercaw, Louise B. 1986. *Geology and Gold Deposits of Central Mineral Ridge, Esmeralda County, Nevada*.

BLM. 2012. *VRM System. http://www.blm.gov/wo/st/en/prog/Recreation/recreation_national/RMS/2.html*. Accessed October 2013.

BLM. 2013. *Mineral Ridge Mine; Plan of Operations Amendment II Environmental Assessment*. DOI-BLM-NV-B020-2012-0230-EA. February, 2013.

BLM. 2011. *Amendment to the Mineral Ridge Mine Plan of Operations Environmental Assessment.* DOI-BLM-NV-B020-2010-0135-EA. August, 2011.

BLM. 1997. *Tonopah Resource Management Plan and Record of Decision*. BLM Battle Mountain Field Office. October 6, 1997.

BLM. 1996. *Mineral Ridge Resources Incorporated, Environmental Assessment*. NV65-EA96-25. BLM Battle Mountain Field Office. #N65-96-001P. June 18, 1996.

Bowell et al. 2009. *Geochemical Evaluation of Heap Rinsing of the Gold Acres Heap, Cortez Joint Venture, Nevada*. Mineral Engineering. January 30.

Council on Environmental Quality (CEQ). 1997. *Considering Cumulative Effects Under the National Environmental Policy Act*. January 1997.

Cedar Creek Associates, Inc. (CCA). 1995. Unpublished report to MRRI. *Vegetation and Range, Existing Condition*. Technical Memorandum. July 1995.

EPA. 2013b. *National Ambient Air Quality Standards (NAAQS).*Accessed December 2013.http://www.epa.gov/air/criteria.html

EPA. 2013b. *Overview of Greenhouse Gases. http://www.epa.gov/climatechange/ghgemissions / gases.html*. Accessed August 2013.

Esmeralda County. 2013. *Esmeralda County Public Lands Policy Plan. Final 2013.*

GPMI. 2002. *Water Pollution Control Permit Renewal Application, Mineral Ridge Mine, Esmeralda County, Nevada*. June, 2002.

Hydro-Search, Inc. 1996. *Baseline Hydrologic Characterization of the Mary/Drinkwater Project, Esmeralda County, Nevada*. January 10, 1996.

International Panel on Climate Change (IPCC). 2007. *IPCC Fourth Assessment Report: Climate Change 2007 (AR4).*

Knight & Leavitt. 2013. *2013 Annual Noxious Weed Survey of the Mineral Ridge Mine Site, Esmeralda County, Nevada.* June 13, 2013.

Knight & Leavitt. 2012. *A Noxious Weed Survey of the Mineral Ridge Mine Site, Esmeralda County, Nevada.* July 30, 2012.

Kautz Environmental Consultants, Inc. (Kautz). Kautz. 2010. Letter from B. Malinky Harmon (Kautz) to S. Rigby (BLM). *Class I Assessment of Scorpio Gold's Proposed Exploraiton at Mineral Ridge, Esmeralda County, Nevada.* December 21, 2010.

Kautz. 2013. *Class III Inventory for the Expansion of the Mineral Ridge Gold Mine Esmeralda County, Nevada.* March 30, 2011 revised June 7, 2013.

LR2000. 2013. Site managed by the BLM. http://www.blm.gov/lr2000/. Accessed August and September 2013.

Lumos & Associates (Lumos). 2011. *Mineral Ridge Mine Water Rights Assessment.* June 9, 2011.

Micon International Limited (Micon). 2009. *Scorpio Gold Corporation Technical Report on the Mineral Ridge Gold Project, Nevada, USA.* November 30, 2009.

NDEP. 2010. *Mineral Ridge Mine Reclamation Permit*. Casefile #N-0103. September 2010

NDOM. 2013. AML Database. Silverpeak Allotment CESA section received by SRK Consulting (U.S.), Inc. August 2013.

NDWR. 2013. *Hydrographic Area Summary: Hydrographic Area 143*. Accessed August 15, 2012.

National Oceanic and Atmospheric Administration (NOAA). 2013. *National Oceanic Service: Education*. http://oceanservice.noaa.gov/education/. Accessed October 2013.

National Renewable Energy Laboratory (NREL). *MapSearch.* Accessed during the fall of 2010.

Nevada Workforce Informer. 2013. *Current Employment Statistics.* http://www.nevadawork force.com/. Accessed October 2013.

Rangeland Administration System (RAS). 2013. Site managed by the BLM. http://www.blm.gov/ras/. Accessed December 2013.

Scorpio. 2013. Email from Carlene Lancaster (Scorpio) to Carrie Schultz (SRK). *Re: Socio economic.* October 10, 2013.

Sherwin, R.E., Altenback, J.S., and Waldien, D.L. 2009. *Managing Abandoned Mines for Bats.* Bat Conservation International.

Sherwin, R. E., W. L. Gannon, and J. S. Altenbach. 2003. *Managing Complex Systems Simply: Understanding Inherent Spatial and Temporal Variation in the Use of Roosts by Townsend's Big-eared Bat*. Wildlife Society Bulletin, 31:62-72.

SRK. 2013a. *Mineral Ridge Gold Biological Baseline Survey*. June 2013; and

SRK. 2013b. *Mineral Ridge Gold Missouri Claim Biological Baseline Survey*. August 2013.

SRK. 2013c. *Waste Rock and Ore Geochemical Characterization for the Mineral Ridge Mine*. March 2013.

SRK. 2011. *Desktop Analysis of Potential Impact to Local Springs from New Pumping Well.* December, 2011.

Telesto. 2013. *NI 43-101 Technical Report on the Mineral Ridge Satellite Deposits, Esmeralda County, Nevada, USA.* September 25, 2013.

US Census Bureau. 2011. *2007-2011 American Community Survey*. http://factfinder2.census.gov. Accessed October 2013.

USFWS. 2010. *Bald Eagle Management Guidelines and Conservation Measures*. http://www.fws.gov/midwest/eagle/guidelines/bgepa.html. Accessed July 2010.

WESTEC. 1995. *Mary Drinkwater Project Heap Leach Facilities Design Report*. Prepared for Mineral Ridge Resources, Inc. December 1995.

WESTEC. 1996. Mary Drinkwater Project Heap Leach Facilities Design Report. December 1996.

WRCC. 2012. Western Regional Climate Center. Silverpeak, Nevada Meteorological Station 267463. http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?nv7463.

Figures

Appendix A- Mobile Mining Equipment Annual Emissions

MINERAL RIDGE GOLD, LLC
MOBILE MINING EQUIPMENT
ANNUAL EMISSIONS

Equipment	Mfg Year	Manufacturer	Horsepower Rating	Kilowatt Rating	Hourly Fuel Usage gallons/hour	Maximum Operation				Maximum Fuel Usage gallons/year	Emission Factors in g/hp-hr						Yearly Emissions in tons/year					
						Hours/ Day	Days/ Week	Weeks/ Year	Hours/ Year		PM2.5	PM10	SO2	NOx*	CO	HC (VOC)*	PM2.5	PM10	SO2 (1)	NOx	CO	HC (VOC)*
Haul truck	1995	Caterpillar	938	699	49.4	12	5	52	3120	154,128	0.40	0.40	N/A	6.86	8.50	0.97	1.30	1.30	0.016	22.13	27.42	3.13
Haul truck	2002	Caterpillar	938	699	49.4	12	5	52	3120	154,128	0.40	0.40	N/A	6.86	8.50	4.77	1.30	1.30	0.016	22.13	27.42	15.40
Haul truck	2003	Caterpillar	938	699	49.4	12	5	52	3120	154,128	0.40	0.40	N/A	6.86	8.50	4.77	1.30	1.30	0.016	22.13	27.42	15.40
Haul truck	2005	Caterpillar	938	699	49.4	12	5	52	3120	154,128	0.40	0.40	N/A	6.86	8.50	4.77	1.30	1.30	0.016	22.13	27.42	15.40
Haul truck	2005	Caterpillar	938	699	49.4	12	5	52	3120	154,128	0.40	0.40	N/A	6.86	8.50	4.77	1.30	1.30	0.016	22.13	27.42	15.40
Haul truck	2006	Caterpillar	938	699	49.4	12	5	52	3120	154,128	0.15	0.15	N/A	4.77	8.50	2.98	0.48	0.48	0.016	15.40	27.42	9.62
Haul truck	2006	Caterpillar	938	699	49.4	12	5	52	3120	154,128	0.15	0.15	N/A	4.77	8.50	2.98	0.48	0.48	0.016	15.40	27.42	9.62
992G loader	2007	Caterpillar	800	597	44.5	12	5	52	3120	138,840	0.15	0.15	N/A	4.77	2.61	2.98	0.41	0.41	0.015	13.13	7.18	8.21
988G Loader	2003	Caterpillar	530	395	25	12	5	52	3120	78,000	0.15	0.15	N/A	4.77	2.61	4.77	0.27	0.27	0.008	8.70	4.76	8.70
CAT 330 CL excavator	2005	Caterpillar	268	200	12.9	12	5	52	3120	40,248	0.15	0.15	N/A	4.92	2.61	4.92	0.14	0.14	0.004	4.54	2.41	4.54
CAT 6015 excavator	2013	Caterpillar	600	447	45	12	5	52	3120	140,400	0.15	0.15	N/A	2.98	2.61	2.98	0.31	0.31	0.015	6.16	5.39	6.16
Hitachi 850 excavator	2011	Hitachi	532	397	45	12	5	52	3120	140,400	0.15	0.15	N/A	2.98	2.61	2.98	0.27	0.27	0.015	5.46	4.78	5.46
Blast hole drill	2012	Sandvik w/CAT	443	330	22.5	12	5	52	3120	70,200	0.15	0.15	N/A	2.98	2.61	2.98	0.23	0.23	0.007	4.54	3.98	4.54
Blast hole drill	2012	Sandvik w/CAT	443	330	22.5	12	5	52	3120	70,200	0.15	0.15	N/A	2.98	2.61	2.98	0.23	0.23	0.007	4.54	3.98	4.54
Blast hole drill	2012	Sandvik w/CAT	443	330	22.5	12	5	52	3120	70,200	0.15	0.15	N/A	2.98	2.61	2.98	0.23	0.23	0.007	4.54	3.98	4.54
CAT-D9R dozer	2004	Caterpillar	405	302	23.9	12	5	52	3120	74,568	0.15	0.15	N/A	4.77	2.61	4.77	0.21	0.21	0.008	6.65	3.64	6.65
D10R dozer	2004	Caterpillar	570	425	32.1	12	5	52	3120	100,152	0.15	0.15	N/A	4.77	2.61	4.77	0.29	0.29	0.011	9.36	5.12	9.36
14H CAT-D9R grader	2004	Caterpillar	240	179	13.8	12	5	52	3120	43,056	0.15	0.15	N/A	4.92	2.61	4.92	0.12	0.12	0.005	4.06	2.15	4.06
769D CATwater truck	1996	Caterpillar	487	363	27	12	5	52	3120	84,240	0.40	0.40	N/A	6.86	8.50	0.97	0.67	0.67	0.009	11.49	14.24	1.62
IT28 CAT	2004	Caterpillar	125	93	4	12	5	52	3120	12,480	0.22	0.22	N/A	4.92	3.73	4.92	0.10	0.10	0.001	2.12	1.60	2.12
																	10.93	10.93	0.228	226.73	255.15	154.45

NOTE: Emission Factors obtained from 40 CFR 89, Control of Emissions from New and In-Use Nonroad Compression-Ignition Engines, Section 89.112, Table 1, Emission Standards (g/kW-hour), and converted to g/hp-hr
NOTE: All equipmenet combusts red off road diesel
*If specific data are not provided in 40 CFR 89.112, Table 1, NOx and HC (VOC) emission are assumed equal to the NMHC + NOx standard.

Conversion Factors for Sulfur Dioxde emissions:

Diesel sulfur content	0.0015%
Diesel Density	7.1 lb/gal

(1) Yearly Sulfur Dioxide Emissions = (gal/yr) * (7.1 lb/gal) *(0.0015/100) * (64.06 lb SO2/32.07 lb S) / (2000 lb)

Appendix B- Public Comments and Responses

AMERICAN WILD HORSE PRESERVATION CAMPAIGN

The EA fails to adequately assess impacts to wild horse/burros and the environment

The draft EA fails to address the following impacts to the environment which directly impacts the well-being of wild horses in and around the site:

Comment #1 Impacts to water tables

Given the drought conditions, the draft EA fails to address how the use of massive amounts of water by the proposed expansion will impact the already shrinking water tables. Specific documentation must be analyze which accounts for water usage in the area and show the percentage of water usage by the current mining operation and how water usage would increase if the Proposed Action (expansion) is approved.
Specific impacts to springs, wells and all water sources must be individually identified and quantified. Given that the BLM routinely blames wild horses for use of limited water sources, it imperative that the water usage for this proposed expansion be measured against the amounts of water that wild horses in and around the area utilize.
Given that the mine is operational – water sources in and around the area of the current site must be tested for all pollutants and increased mineral levels. These water quality tests must be published in the revised EA to determine the impact on water quality of the proposed expansion.

Response #1:

The analysis to which you refer is presented in an earlier environmental assessment titled, Mineral Ridge Mine: Plan of Operations Amendment II (DOI-BLM-NV-2012-0230-EA) to which the current document incorporates by reference.
Mineral Ridge Gold's (MRG) water demand is estimated to be between 186 and 205 gallons per minute (gpm) or an average of 200 gpm (approximately 323 af/yr). Analysis presented in this earlier document indicates that this level of water usage would have little effect on Silver Peak's Municipal water wells or nearby Tarantula, Borgo, or Coyote Springs and, hence the water table as a whole. Considered from a cumulative perspective, Mineral Ridge's water demand is an extremely small percentage of the total demand from the Clayton Valley sub-basin which is estimated to be approximately 4,227 af/yr. This analysis is not presented in the current document because no increase in water demand is proposed under this Plan of Operations amendment.

Extensive investigations of regional spring water quality have been conducted. These studies have concluded that these springs generally meet or exceed state and federal standards for drinking water, irrigation and livestock watering (page 42). Exceptions to this generalization are related to elevated levels of iron, aluminum, sulfate and total dissolved solids in five regional springs, although these levels are not a consequence of mining activity.
The primary concern with regard to water quality effects of the Proposed Action is related to acid generation associated with waste rock and constituents associated with the leaching operations which include arsenic, mercury, sulfate, nitrate and cyanide. The results of the

static and kinetic geochemical test conducted to date demonstrate the waste rock material is net neutralizing and presents a low risk of acid rock drainage or metal leaching which could negatively affect water quality. Further, the constituents of the heap solution are contained in a lined containment area which will preclude their release to ground or surface waters.

Comment #2:

Impacts of surface disturbance on wild horses

The location of all surface disturbances must be assessed against wild horse usage. The draft EA fails to assess and analyze the surface disturbance that will or may occur based on the proposed expansion. The BLM must revise the EA to outline the location of the mine and all associated surface uses/disturbances in relation to wild horse use including migratory patterns, horse numbers in the areas, water sources used by horses in the area, etc.).

Response #2:

As presented on page 54 of the EA, the proposed mine expansion would result in the disturbance 51 acres of wild horse and burro habitat over the short-term (i.e., until reclamation is completed) and 21 acres would be lost over the long-term as open pit features. Based on the low level of disturbance and activity at the site and the size of the Silver Peak HMA in relation to proposed disturbance, potential impacts to wild horses and burro would be low. However, the BLM recognizes that the EA would benefit from the inclusion of more specific information on wild horse and burro use of the proposed project area and the EA has been revised to include this information (page 54). These data indicate that the proposed project area receives little to no use by wild horse and burros due to the extremely steep terrain. In fact, the nearest sighting of a wild horse or burro to the proposed project area over a period of 4 years of population inventory and monitoring flights was 8 miles.

EA fails to analyze negative Environmental Impacts

Comment #3: The expansion proposal will further drain water from aquifers and water sources for this large-scale operation. By draining water from aquifers, mining operations directly and indirectly impact surface waters.

Response #2:

Please refer to Response #1.

Comment #3:

When disturbing rock that has been buried for a long time, air and moisture set off chemical reactions that produce acid and leach toxic metals. Those substances – sulfuric acid, arsenic and copper, for example-will be released and distributed to the environment-thereby negatively impacting wildlife and the human environment.

Response #3:

This depends on the geochemical properties of the rock that is disturbed. In all mining proposals, the BLM requires a proponent to conduct geochemical studies designed to characterize the potential for acids and toxic metals to be released to the environment as a result of the exposure of rock to air and moisture. In the case of the current proposal, static and kinetic geochemical test work indicates that the risk of acid rock drainage and metals leaching, also known by the acronym ARDML, is quite low.

Comment #4:

Mercury, arsenic, and other heavy metal contamination is a common byproduct of mining operations. New studies indicate that mining operations have the potential to spread mercury in the environment in highly mobile and highly reactive forms-meaning the negative environmental impacts have far-reaching effects than previously thought. The spread of such toxins will negatively impact wild horse herds in the area-not to mention all wildlife including Endangered Species and those animals facing ESA listing.

Response # 4:

Please refer to Response #3.

Comment #5:

While the proposal is to conduct mine exploration, it is important to outline the environmental consequences of gold mining on the environment to fully understand the potential direction of this proposal.

Response #5:

It is also important to note that the environmental consequences of individual mining proposals can vary widely, and as such, impacts to the human environment cannot be discussed in general terms. A site-specific analysis is required for each individual proposal of the type considered here, so that an accurate disclosure of environmental consequences can be made.

Proposed Expansion of Mineral Ridge Mine Threatens Wild Horse

Comment #6:

The site-specific destruction and impact to the surrounding area makes clear that the proposed project area would negatively impact wild horse herds. Due to the documented and unavoidable contamination which results from gold mining operations and further disturbance to the human environment, AWHPC and its supporters would suffer if this proposal is approved due to negative impacts such an operation would have on individual wild horses and

wild horse herds as a whole. Despite permitting such mining and exploration activities for decades, the BLM has failed to collect data or conduct research on the impact, both physical and behavioral, of such mining-related activities on wild horse and burros.

Response # 6:

While it is correct that additional surface disturbance will occur as a consequence of project implementation, the increase will be relatively small in relation to the disturbance that is currently authorized. As the analysis on page 54 of the EA indicates, there is little to no use of the proposed project area by wild horse and burros due to the extremely steep slopes that characterize the area. Due to the lack of use, impacts to wild horses and burros would be negligible.

The BLM does not dispute the claim that contamination associated with gold mining operations has been documented. However, every mining operation has different impacts on the human environment and it is not inevitable that contamination will occur. The analysis presented in Chapter 3 of the EA makes clear that with the implementation of the environmental protection measures presented in Chapter 2, the potential for impacts to the human environment associated with contamination is very low.

The BLM routinely conducts population assessment and monitoring flights to monitor population fluctuations and the movement of wild horse and burros. These flights, in conjunction with ground- based assessments of wild horse and burro use, formed the basis for the impact analysis presented in Chapter 3.

EA fails to take a hard look at impacts to wild horses/burros

Comment #6: NEPA requires federal agencies to conduct environmental analysis that **"include all potentially affected resources, ecosystems, and human communities".** There can be no question here that wild horses, protected under the WFRHBA are an "integral part of the natural system of the public lands," are affected resources within the project area.

Response #8:

The BLM agrees that wild horse and burros are a resource that has the potential to be affected by the Proposed Action. As indicated in Table 3-2 of the EA, wild horse and burros are identified as a resource that is present and may be affected by the Proposed Action and on this basis was brought forward for analysis. The direct and indirect impacts to wild horse and burros are presented in page 54 and cumulative impacts are presented on page 73.

Comment #8:

Further, the BLM's NEPA Handbook advises on page 42: "is there disagreement about the best way to use a resource, or resolve and unwanted resource condition, or **potentially significant effects of a proposed action or alternative?"** If the answer is "yes", you may benefit from subjecting the issue to analysis. Entire resources cannot be issues by themselves,

but concerns over how a resource may be affected by the proposal can be issues" (Emphasis added).

Response #8:

The BLM agrees that the points raised by AWHPC can be considered issues (see Page 2). In some cases, the analysis of these issues resulted in revisions to the EA to more specifically address wild horse and burro use of the proposed project area and clarify associated impacts.

Comment #9:

The Environmental Assessment (EA) for the Proposed Action fails to:

- Describe and identify current horse use of the proposed Project Area and areas which include roads that will be or are utilized by Mineral Ridge Gold, LLC crews-including, but not limited to, census of horse living in the area(please include a census map plotting horse sightings), demographic information about horses living in the area, map outlining;
- Inventory and describe all water sources in the affected HMA (include description of current uses of each water source. Availability, use by wild horses, any and all data which may reveal aquifer relatedness to spring and water sources etc.

Response #9:

The EA has been revised to characterize wild horse and burro use of the proposed project area. These revisions may be found on page 54 of the EA. Water sources near the proposed project area have been identified and characterized (see Section 3.7, **Water (Surface and Ground)**. As presented in Section 3.18, **Wild Horse and Burros,** these animals have not been documented near the proposed project area and, as such, it is unlikely that they use the water sources documented.

Comment #10:

The EA fails to adequately describe and analyze the following impacts to wild horses and/or burros from the proposed action:

- Displacement of wild horses/burros from winter, spring, summer habitat
- Fragmentation of wild horse/burro habitat as projected
- Human presence disturbance to wild horse/burro habitat
- Noise disturbance to wild burro/burro habitat
- Injury or death to wild horse/burros from vehicular collisions due to increased traffic (including listing any previous collisions resulting from the current mining operation)
- Potential impacts to water sources (contamination, reduction in availability, etc) used by wild horse/burros
- Alteration of wild horse/burro migration routes and use of the project area

Response #10:

As presented in Section 3.18, **Wild Horse and Burros,** there is little to no use of the proposed project area due the presence of extremely steep slopes. Due to the lack of use, there would be no displacement of wild horse and burros, fragmentation of their habitat, disturbance from human presence or noise, impacts to water sources that wild horse and burros use or alteration in migration routes. However, there is potential for injury or death from vehicular collision if the 25-mile speed limit on access roads is not adhered to.

Impacts to wild horse and burros associated with past, present and reasonably foreseeable future actions are disclosed in Chapter 4, section 4.4.11, **Wild Horse and Burros.**

Comment #11:

In addition, the EA fails to analyze the following impacts to water quality which must be analyzed including the impacts these consequences would have on wild horses:

- Deduction in ground water
- Increased siltation in streams and rivers resulting from surface disturbances
- Hazardous waste pollution
- Degradation of surface water quality and groundwater quality from point source pollution, non-point source pollution, increased surface water runoff and increased erosion
- Alteration of natural drainage paths and channel morphology
- Removal of vegetation and subsequent erosion leading to loss of channel stability and increased sedimentation
- Effects on peak stream flow and low flow of perennial streams, ephemeral, intermittent rivers and streams and their associate due to the increase in impervious surfaces resulting from the construction of the well pad and road.

Response #11:

There would be no reduction in groundwater associated with the implementation of the Proposed Action because no increase in water use is proposed. With the implementation of the environmental protection measures and Best Management Practices (BMPs) presented in Section 2.2.5**, Additional Environmental Protection Measures,** erosion and siltation would have minimal effects on water quality. While there would be an increase erosion and siltation potential, the effect would be short-term, lasting approximately 3 years or until successful revegetation occurs. Effects to water quality associated the removal of vegetation and increased erosion and sedimentation potential is presented in section 3.7, **Water (Surface and ground)**

Hazardous waste would be managed in accordance with the Spill Prevention, Control, Containment, and Countermeasure Plan which is specifically designed to prevent adverse impacts to water quality.

None of the potential short-term effects to water quality would have an impact on wild horse and burros because there is little to no use of the proposed project area.

NEPA requires BLM to analyze Cumulative Impacts

Comment #12:

The EA currently fails to, and must be revised to, analyze cumulative impacts of the Proposed Action with past, present and reasonably foreseeable future actions. This should include any potential impacts to individual wild horses or wild horse herds-both physical and behavioral-and the impact to resources utilized by wild horses. The EA must also disclose all wild horse/burro roundups that have occurred. In addition, the EA must disclose any scheduled or anticipated wild horse removals that may occur in the future.

Response #12:

Cumulative impacts to wild horse and burros associated with past, present and reasonably foreseeable future actions are disclosed in Chapter 4, section 4.4.11, **Wild Horse and Burros.** As presented in the revised EA, one wild horse and burro gather occurred during the fall of 2006 which removed 154 animals from the HMA. Since that time, wild horse and burro numbers has been replenished, presumably from migration from the east and south. No additional gathers within the HMA are being contemplated at this time.

Comment #13:

Further, the EA should disclose and analyze the cumulative impacts of other activities that affect wild horses in the area, including livestock grazing, other mining activities, oil and gas exploration and/or extraction operations, etc. The EA must disclose, consider and analyze all permitted activities within the affected area in order to determine the current stress on the public lands at issue.

Response #13:

A comprehensive account of impacts to wild horse and burros associated with past, present and reasonably foreseeable future actions is presented in Chapter 4, section 4.4.11, **Wild Horse and Burros.**

NEVADA DEPARTMENT OF WILDLIFE

Comment #1:

Relative to bighorn habitat, the new mine boundaries proposed show a slight pincer effect when the existing mine boundaries are considered. We look to BLM in assisting the Department in monitoring desert bighorn sheep use at Tarantula Spring, understanding that at some future point it may be necessary to augment water availability by mitigation in the form

of a wildlife water development somewhere in the vicinity. This action might also help redistribute some bighorn sheep off of or away from the mine site.

Response # 1:

Mineral Ridge Gold, in coordination with the BLM, will continue to monitor bighorn sheep use at Tarantula Springs. If the results of the monitoring effort indicate the need for mitigation, the BLM will coordinate with NDOW and Mineral Ridge Gold in considering effective strategies to augment water availability.

Comment #2:

Lastly, in Section 3.19 Wildlife on page 55, Gray Partridge (*Perdix perdix)* or its sign is listed as being observed within the Project area. To our knowledge this species does not occur in the Silver Peak Range and is only known to occur in the northeastern corner of Nevada particularly along the Idaho and Utah borders.

Response #1:

The BLM appreciates the department's clarification on this point.

PRIVATE CITIZEN

Comment #1:

I was unable to locate any data on, or information regarding, a condemnation drilling program within the new waste rock disposal areas at the Mineral Ridge Mine. The results of the condemnation drilling program should be included in the environmental assessment (map showing drill sites and subeconomic element concentration) or at least referenced (with the information available in the casefile) as justification for placement of the waste rock in these locations.

Response #1:

Mineral Ridge Gold has not drilled any holes in the area either of WD-10 and WD-11. Previous operators drilled in these areas during 1990's; the results showed low-grade mineralization. The design of the two waste rock dumps was based on the economic viability of the locations in relation to the location of the ore being mined.