



U.S. Department of the Interior  
Bureau of Land Management

# Goldrush Mine Project

## Draft Environmental Impact Statement

DOI-BLM-NV-B010-2021-0006-EIS

### June 2022

Bureau of Land Management  
Battle Mountain District Office  
Mount Lewis Field Office  
50 Bastian Road  
Battle Mountain, Nevada 89820

### Cooperating Agencies:

United States Fish and Wildlife Service  
United States Environmental Protection Agency  
Nevada Department of Conservation and Natural Resources  
Nevada Division of Environmental Protection  
Nevada Department of Transportation  
Nevada Department of Wildlife  
Eureka County Board of Commissioners

Estimated Cost to Prepare  
Proponent: \$22,000,000  
BLM: \$60,000  
Total: \$22,060,000

It is the mission of the Bureau of Land Management to sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations.

DOI-BLM-NV-B010-2021-0006-EIS



# Contents

<b>Executive Summary .....</b>	<b>1</b>
<b>1.0 Introduction .....</b>	<b>1-1</b>
1.1 Introduction and General Information .....	1-1
1.2 Purpose of and Need for the Action.....	1-1
1.3 Decision to be Made .....	1-1
1.4 Conformance and Permits .....	1-2
1.4.1 Other Project Permits.....	1-2
1.4.2 Land Use Plan Conformance.....	1-2
1.4.2.1 Shoshone-Eureka Resource Management Plan .....	1-2
1.4.2.2 Elko Resource Management Plan .....	1-3
1.4.2.3 Greater Sage-Grouse Resource Management Plan Amendment .....	1-3
1.4.2.4 County Plans.....	1-3
1.5 Incorporation by Reference.....	1-4
1.6 Issues.....	1-5
<b>2.0 Alternatives.....</b>	<b>2-1</b>
2.1 Proposed Action.....	2-1
2.1.1 Proposed Goldrush Mine Plan Boundary .....	2-1
2.1.1.1 Horse Canyon Mine Plan .....	2-3
2.1.1.2 HC/CUEP Plan.....	2-3
2.1.1.3 West Pine Valley Exploration Plan .....	2-3
2.1.1.4 Cortez Mine Plan .....	2-3
2.1.2 Proposed Disturbance .....	2-4
2.1.3 Underground Mining Operations.....	2-4
2.1.3.1 Mine Ventilation .....	2-5
2.1.3.2 Ore and Waste Rock Handling .....	2-8
2.1.3.3 Mine Backfill.....	2-9
2.1.4 Surface Mining Operations .....	2-9
2.1.4.1 Portal Pad Extension .....	2-9
2.1.4.2 Aggregate Paste Plant.....	2-9
2.1.4.3 Growth Media Stockpiles .....	2-9
2.1.4.4 Water Management .....	2-10
2.1.4.5 Roads and Transportation .....	2-11
2.1.4.6 Ancillary and Support Facilities.....	2-12
2.1.5 Surface Exploration.....	2-15
2.1.6 Waste Management.....	2-15
2.1.7 Bridge Crossings.....	2-15
2.1.8 Work Force and Schedule .....	2-15
2.1.9 Reclamation .....	2-16
2.1.10 Proposed Applicant Committed Environmental Protection Measures .....	2-16
2.1.10.1 Air Quality.....	2-16
2.1.10.2 Cultural Resources .....	2-17
2.1.10.3 Erosion and Sediment Control.....	2-17
2.1.10.4 Geology and Minerals .....	2-18
2.1.10.5 Hazardous Materials and Solid Waste.....	2-19
2.1.10.6 Land Use, Transportation and Access.....	2-20
2.1.10.7 Monitoring .....	2-21
2.1.10.8 Native American Traditional Values.....	2-21
2.1.10.9 Noise .....	2-22
2.1.10.10 Paleontological Resources .....	2-22
2.1.10.11 Public Safety, Fire Protection, and Access.....	2-22
2.1.10.12 Range Resources .....	2-22
2.1.10.13 Recreation.....	2-23

	2.1.10.14	Social and Economic .....	2-23
	2.1.10.15	Soils, Vegetation, and Invasive and Non-Native Species.....	2-23
	2.1.10.16	Survey Monuments .....	2-24
	2.1.10.17	Sustainability Activities.....	2-24
	2.1.10.18	Vegetation .....	2-25
	2.1.10.19	Visual Resources .....	2-25
	2.1.10.20	Water Resources .....	2-25
	2.1.10.21	Wetlands and Riparian Areas .....	2-26
	2.1.10.22	Wildlife.....	2-26
2.2		No Action Alternative (Currently Authorized Activities).....	2-29
	2.2.1	Authorized Horse Canyon Mine Plan.....	2-29
	2.2.2	Authorized Horse Canyon/Cortez Unified Exploration Project Plan .....	2-30
	2.2.3	Authorized West Pine Valley Exploration Project Plan .....	2-30
	2.2.4	Authorized Cortez Mine .....	2-30
	2.2.5	Authorized Reclamation.....	2-30
	2.2.6	Authorized Applicant-Committed Environmental Protection Measures and Mitigation Measures .....	2-31
2.3		Alternatives Considered but Eliminated from Detailed Analysis .....	2-31
	2.3.1	Road Design Alternatives .....	2-32
		2.3.1.1 Post-Mining Road Alternatives.....	2-32
		2.3.1.2 Road Construction Within Jurisdictional Waters Alternative.....	2-32
	2.3.2	Design Component Alternatives .....	2-32
		2.3.2.1 Open Mine Pit Alternative .....	2-32
		2.3.2.2 Dewatering Well Design Component Alternative.....	2-33
		2.3.2.3 Process Facility Design Component Alternative .....	2-33
		2.3.2.4 Vent Raises/Fans Design Component Alternative.....	2-33
		2.3.2.5 Power Line Route Design Component Alternative .....	2-33
		2.3.2.6 Alternative Water Disposal Via Injection Wells Alternative .....	2-34
		2.3.2.7 Alternate Underground Access Alternative.....	2-35
		2.3.2.8 Rapid Infiltration Basin Alternative .....	2-35
		2.3.2.9 Consolidating or Relocation of Laydown Yards Alternative.....	2-36
	2.3.3	Transportation Alternatives .....	2-36
		2.3.3.1 Off-Site Ore Transportation Alternative via Rail, Slurry Line, or Dedicated Haul Road.....	2-36
		2.3.3.2 Ore Transport by Rail from Goldrush Underground Mine to the Surface at the Cortez Mine Open Pit Alternative .....	2-36
		2.3.3.3 On-Site Processing Alternative .....	2-37
		2.3.3.4 Pediment Backfill Alternative .....	2-37
2.4		Comparison of Effects by Alternative.....	2-38
2.5		BLM-Preferred Alternative .....	2-38
<b>3.0</b>		<b>Affected Environment.....</b>	<b>3-1</b>
	3.1	Air Quality and Climate Change.....	3-2
		3.1.1 Greenhouse Gases and Climate Change .....	3-3
	3.2	Cultural Resources.....	3-4
	3.3	Environmental Justice .....	3-5
		3.3.1 Minority Populations.....	3-5
		3.3.2 Low-Income Populations.....	3-5
	3.4	Geology and Minerals .....	3-6
	3.5	Bald and Golden Eagles .....	3-6
	3.6	Hazardous Materials and Solid Waste.....	3-8
	3.7	Land Use and Realty.....	3-9
	3.8	Native American Traditional Values.....	3-10
		3.8.1 Bands and Territory .....	3-11
		3.8.2 Governmental Organization .....	3-11
		3.8.3 Habitation Patterns .....	3-12
		3.8.4 Villages.....	3-12



3.8.5	Subsistence.....	3-12
3.8.6	Plant Resources.....	3-12
3.8.7	Animal Resources.....	3-12
3.8.8	Ceremonies and Religion.....	3-12
3.8.9	Burials	3-13
3.8.10	Euro-American Contact.....	3-13
3.9	Noise .....	3-14
3.10	Grazing Management.....	3-15
3.11	Recreation.....	3-15
3.12	Social and Economic Values .....	3-16
3.12.1	Population and Demography .....	3-16
3.12.2	Economy and Employment.....	3-17
3.12.3	Income.....	3-18
3.12.4	Housing .....	3-18
3.12.5	Community Facilities and Services.....	3-19
3.12.6	Public Safety .....	3-20
3.12.7	Healthcare.....	3-20
3.12.8	Education .....	3-20
3.12.9	Local Government.....	3-21
3.12.10	Public Finance.....	3-21
3.13	Soils.....	3-21
3.14	Transportation and Access .....	3-23
3.15	Vegetation, Including Noxious and Invasive Non-native Species and Special Status Plants.....	3-24
3.15.1	Noxious and Invasive, Non-native Species .....	3-25
3.15.2	Special Status Species .....	3-25
3.15.3	Ethnobotanical Plant Species .....	3-25
3.16	Visual Resources .....	3-25
3.17	Water Resources and Geochemistry.....	3-26
3.17.1	Surface Water Resources.....	3-26
3.17.2	Groundwater Resources .....	3-28
3.17.3	Floodplains.....	3-29
3.17.4	Water Rights .....	3-29
3.17.5	Surface Water Quality.....	3-29
3.17.6	Groundwater Quality .....	3-30
3.17.6.1	Waste Rock Geochemical Characterization .....	3-30
3.18	Wetlands and Riparian Areas .....	3-31
3.18.1	Wetlands .....	3-32
3.18.2	Riparian Areas and Springs.....	3-33
3.19	Wildlife Resources, Including Migratory Birds and Special Status Wildlife.....	3-34
3.19.1	General Wildlife.....	3-34
3.19.1.1	Fish and Aquatic Invertebrate Species .....	3-34
3.19.1.2	Avian Species, Including Migratory Birds and Raptors.....	3-34
3.19.1.3	Insect Species.....	3-35
3.19.1.4	Mammal Species .....	3-35
3.19.1.5	Big Game .....	3-35
3.19.1.6	Reptile Species .....	3-35
3.19.2	Special Status Species .....	3-35
3.19.2.1	Fish and Aquatic Invertebrate Species.....	3-35
3.19.2.2	Avian Species, Including Migratory Birds and Raptors.....	3-35
3.19.2.3	Insect Species.....	3-36
3.19.2.4	Mammal Species .....	3-36
3.19.2.5	Reptile Species .....	3-36
3.19.2.6	Amphibian Species .....	3-36
<b>4.0</b>	<b>Environmental Consequences .....</b>	<b>4-1</b>
4.1	Air Quality and Climate Change.....	4-1

4.1.1	Proposed Action.....	4-1
4.1.2	No Action Alternative .....	4-3
4.2	Cultural Resources.....	4-4
4.2.1	Proposed Action.....	4-4
4.2.2	No Action Alternative .....	4-5
4.3	Environmental Justice.....	4-5
4.3.1	Proposed Action.....	4-5
4.3.2	No Action Alternative .....	4-6
4.4	Geology and Minerals .....	4-6
4.4.1	Proposed Action.....	4-6
4.4.2	No Action Alternative .....	4-7
4.5	Bald and Golden Eagles .....	4-8
4.5.1	Proposed Action.....	4-8
4.5.2	No Action Alternative .....	4-9
4.6	Hazardous Materials and Solid Waste.....	4-9
4.6.1	Proposed Action.....	4-9
4.6.2	No Action Alternative .....	4-11
4.7	Land Use and Realty.....	4-11
4.7.1	Proposed Action.....	4-11
4.7.2	No Action Alternative .....	4-13
4.8	Native American Traditional Values.....	4-13
4.8.1	Proposed Action.....	4-13
4.8.1.1	Cultural Resources .....	4-13
4.8.1.2	Access.....	4-13
4.8.1.3	Visual .....	4-14
4.8.1.4	Spring Sites.....	4-14
4.8.1.5	Spiritual and Religious Use.....	4-14
4.8.1.6	Plants .....	4-14
4.8.1.7	Pine Nut Harvesting .....	4-15
4.8.1.8	Wildlife.....	4-15
4.8.1.9	Regional Environmental Impact .....	4-15
4.8.2	No Action Alternative .....	4-16
4.9	Noise .....	4-16
4.9.1	Proposed Action.....	4-16
4.9.2	No Action Alternative .....	4-17
4.10	Grazing Management.....	4-18
4.10.1	Proposed Action.....	4-18
4.10.2	No Action Alternative .....	4-20
4.11	Recreation.....	4-20
4.11.1	Proposed Action.....	4-20
4.11.2	No Action Alternative .....	4-21
4.12	Social and Economic Values .....	4-22
4.12.1	Proposed Action.....	4-22
4.12.1.1	Population and Demography .....	4-22
4.12.1.2	Economy and Employment.....	4-22
4.12.1.3	Income .....	4-23
4.12.1.4	Housing .....	4-23
4.12.1.5	Community Facilities and Services.....	4-24
4.12.1.6	Public Safety .....	4-25
4.12.1.7	Healthcare.....	4-25
4.12.1.8	Education .....	4-25
4.12.1.9	Public Finance .....	4-25
4.12.2	No Action Alternative .....	4-26
4.13	Soils .....	4-26
4.13.1	Proposed Action.....	4-26
4.13.2	No Action Alternative .....	4-27
4.14	Transportation and Access .....	4-27



4.14.1	Proposed Action.....	4-27
4.14.2	No Action Alternative .....	4-29
4.15	Vegetation, Including Noxious and Invasive Non-native Species and Special Status Plants.....	4-29
4.15.1	Proposed Action.....	4-29
4.15.1.1	Noxious and Invasive, Non-native Species .....	4-29
4.15.1.2	Special Status Species .....	4-30
4.15.1.3	Ethnobotanical Plant Species .....	4-30
4.15.1.4	Water Management Activities .....	4-30
4.15.2	No Action Alternative .....	4-31
4.16	Visual Resources .....	4-31
4.16.1	Proposed Action.....	4-31
4.16.1.1	KOP 1.....	4-31
4.16.1.2	KOP 2.....	4-32
4.16.1.3	KOP 3.....	4-33
4.16.1.4	Dark Sky Resources .....	4-33
4.16.2	No Action Alternative .....	4-34
4.17	Water Resources and Geochemistry .....	4-34
4.17.1	Proposed Action.....	4-34
4.17.1.1	Surface Water Quantity.....	4-34
4.17.1.2	Groundwater Quantity.....	4-35
4.17.1.3	Floodplains.....	4-36
4.17.1.4	Water Rights .....	4-36
4.17.1.5	Surface Water Quality.....	4-37
4.17.1.6	Groundwater Quality .....	4-37
4.17.2	No Action Alternative .....	4-39
4.18	Wetlands and Riparian Areas .....	4-40
4.18.1	Proposed Action.....	4-40
4.18.1.1	Wetlands .....	4-40
4.18.1.2	Riparian Areas and Springs .....	4-41
4.18.2	No Action Alternative .....	4-41
4.19	Wildlife Resources, Including Migratory Birds and Special Status Wildlife.....	4-42
4.19.1	Proposed Action.....	4-42
4.19.1.1	General Wildlife.....	4-42
4.19.1.2	Special Status Species .....	4-46
4.19.2	No Action Alternative .....	4-49
4.20	Cumulative Effects Analysis.....	4-49
4.20.1	Air Quality and Climate Change.....	4-51
4.20.1.1	CESA Boundary Description.....	4-51
4.20.1.2	Past, Present, and Reasonably Foreseeable Future Actions .....	4-51
4.20.1.3	Cumulative Effects .....	4-52
4.20.2	Cultural Resources .....	4-53
4.20.2.1	CESA Boundary Description.....	4-53
4.20.2.2	Past, Present, and Reasonably Foreseeable Future Actions .....	4-53
4.20.2.3	Cumulative Effects .....	4-55
4.20.3	Environmental Justice .....	4-55
4.20.3.1	CESA Boundary Description.....	4-55
4.20.3.2	Past, Present, and Reasonably Foreseeable Future Actions .....	4-56
4.20.3.3	Cumulative Effects .....	4-56
4.20.4	Geology and Minerals .....	4-56
4.20.4.1	CESA Boundary Description.....	4-56
4.20.4.2	Past, Present, and Reasonably Foreseeable Future Actions .....	4-56
4.20.4.3	Cumulative Effects .....	4-59
4.20.5	Bald and Golden Eagles .....	4-59
4.20.5.1	CESA Boundary Description.....	4-59
4.20.5.2	Past, Present, and Reasonably Foreseeable Future Actions .....	4-59
4.20.5.3	Cumulative Effects .....	4-61

4.20.6	Hazardous Materials and Solid Waste.....	4-62
4.20.6.1	CESA Boundary Description.....	4-62
4.20.6.2	Past, Present, and Reasonably Foreseeable Future Actions.....	4-62
4.20.6.3	Cumulative Effects.....	4-62
4.20.7	Land Use and Realty.....	4-63
4.20.7.1	CESA Boundary Description.....	4-63
4.20.7.2	Past, Present, and Reasonably Foreseeable Future Actions.....	4-63
4.20.7.3	Cumulative Effects.....	4-65
4.20.8	Native American Traditional Values.....	4-65
4.20.8.1	CESA Boundary Description.....	4-65
4.20.8.2	Past, Present, and Reasonably Foreseeable Future Actions.....	4-66
4.20.8.3	Cumulative Effects.....	4-68
4.20.9	Noise 4-69	
4.20.9.1	CESA Boundary Description.....	4-69
4.20.9.2	Past, Present, and Reasonably Foreseeable Future Actions.....	4-69
4.20.9.3	Cumulative Effects.....	4-70
4.20.10	Grazing Management.....	4-70
4.20.10.1	CESA Boundary Description.....	4-70
4.20.10.2	Past, Present, and Reasonably Foreseeable Future Actions.....	4-70
4.20.10.3	Cumulative Effects.....	4-72
4.20.11	Recreation.....	4-73
4.20.11.1	CESA Boundary Description.....	4-73
4.20.11.2	Past, Present, and Reasonably Foreseeable Future Actions.....	4-73
4.20.11.3	Cumulative Effects.....	4-75
4.20.12	Social and Economic Values.....	4-76
4.20.12.1	CESA Boundary Description.....	4-76
4.20.12.2	Past, Present, and Reasonably Foreseeable Future Actions.....	4-76
4.20.12.3	Cumulative Effects.....	4-76
4.20.13	Soils 4-76	
4.20.13.1	CESA Boundary Description.....	4-76
4.20.13.2	Past, Present, and Reasonably Foreseeable Future Actions.....	4-76
4.20.13.3	Cumulative Effects.....	4-78
4.20.14	Transportation and Access.....	4-79
4.20.14.1	CESA Boundary Description.....	4-79
4.20.14.2	Past, Present, and Reasonably Foreseeable Future Actions.....	4-79
4.20.14.3	Cumulative Effects.....	4-79
4.20.15	Vegetation, Including Noxious and Invasive Non-native Species and Special Status Plants.....	4-80
4.20.15.1	CESA Boundary Description.....	4-80
4.20.15.2	Past, Present, and Reasonably Foreseeable Future Actions.....	4-80
4.20.15.3	Cumulative Effects.....	4-82
4.20.16	Visual Resources.....	4-82
4.20.16.1	CESA Boundary Description.....	4-82
4.20.17	Past, Present, and Reasonably Foreseeable Future Actions.....	4-82
4.20.17.1	Cumulative Effects.....	4-84
4.20.18	Water Resources and Geochemistry.....	4-85
4.20.18.1	CESA Boundary Description.....	4-85
4.20.18.2	Past, Present, and Reasonably Foreseeable Future Actions.....	4-85
4.20.18.3	Cumulative Effects.....	4-87
4.20.19	Wetlands and Riparian Areas.....	4-88
4.20.19.1	CESA Boundary Description.....	4-88
4.20.19.2	Past, Present, and Reasonably Foreseeable Future Actions.....	4-88
4.20.19.3	Cumulative Effects.....	4-90
4.20.20	Wildlife Resources, Including Migratory Birds and Special Status Wildlife, Big Game, and Greater Sage-Grouse.....	4-90
4.20.20.1	Wildlife Resources, Including Migratory Birds and Special Status Wildlife.....	4-90



	4.20.20.2	Big Game Species .....	4-93
	4.20.20.3	Greater Sage-Grouse .....	4-96
4.21		Mitigation and Monitoring .....	4-98
	4.21.1	Proposed Action Alternative.....	4-98
	4.21.1.1	Mitigation.....	4-98
	4.21.1.2	Monitoring .....	4-99
	4.21.1.3	Residual Impacts .....	4-99
	4.21.2	No Action Alternative .....	4-99
<b>5.0</b>		<b>Consultation, Coordination, and Public Involvement .....</b>	<b>5-1</b>
	5.1	Consultation and Coordination with Agencies and Tribal Governments .....	5-1
	5.2	Government-to-Government Consultation with Native American Tribes .....	5-1
	5.3	Cooperating Agencies.....	5-1
	5.4	Public Involvement.....	5-2
	5.4.1	Scoping .....	5-2
	5.4.2	Draft EIS Comment Period .....	5-2
	5.4.3	Final EIS Availability Period .....	5-2

## List of Tables

Table 1-1	Issues Identified .....	1-5
Table 2-1	Legal Description of the Proposed Action .....	2-2
Table 2-2	Summary of Proposed Surface Disturbance under the Proposed Action .....	2-6
Table 2-3	Summary of Waste Rock Movement .....	2-8
Table 2-4	No Action Disturbance .....	2-29
Table 2-5	Alternatives Considered but Dismissed from Detailed Analysis.....	2-31
Table 2-6	Comparison of Effects .....	2-39
Table 3-1	Supplemental Authorities and Other Resources .....	3-1
Table 3-2	Summary of Nest Surveys from 2013 to 2021.....	3-8
Table 3-3	Administrative Land Use Authorizations in the Area of Analysis.....	3-10
Table 3-4	Baseline Noise Levels .....	3-14
Table 4-1	Proposed Action Air Emissions (tons/year) .....	4-2
Table 4-2	Off-site Ore Transport to Goldstrike and Gold Quarry Mines (tons/year).....	4-2
Table 4-3	Predicted Noise Level Increases Under the Proposed Action.....	4-17
Table 4-4	Ancillary Features Providing Predator Perching Opportunities and Distance to Leks .....	4-46
Table 4-5	Reasonably Foreseeable Affected Area by Resource .....	4-50
Table 4-6	Model-Predicted Maximum Impacts of the CESA .....	4-52
Table 4-7	CESA Estimated Modeling Concentrations for the No Action Alternative.....	4-53
Table 4-8	Past, Present, and RFFAs in the Native American Traditional Values CESA.....	4-54
Table 4-9	Past, Present, and RFFAs in the Geology and Minerals CESA .....	4-56
Table 4-10	Past, Present, and RFFAs in the Bald and Golden Eagle CESA.....	4-60
Table 4-11	Past, Present, and RFFAs for the Land Use and Realty CESA.....	4-63
Table 4-12	Past, Present, and RFFAs in the Native American Traditional Values CESA.....	4-66
Table 4-13	Past, Present, and RFFAs in the Grazing Management CESA .....	4-70
Table 4-14	Past, Present, and RFFAs in the Recreation CESA.....	4-73
Table 4-15	Past, Present, and RFFAs in the Soils CESA .....	4-77
Table 4-16	Past, Present, and RFFAs in the Vegetation, Including Noxious and Invasive Species CESA .....	4-80
Table 4-17	Past, Present, and RFFAs in the Visual Resources CESA .....	4-82
Table 4-18	Past, Present, and RFFAs in the Water Resources and Geochemistry CESA.....	4-85
Table 4-19	Past, Present, and RFFAs in the Wetland and Riparian CESA .....	4-88
Table 4-20	Past, Present, and RFFAs within the Wildlife Resources Including Migratory Birds and Special Status Species CESA .....	4-91
Table 4-21	Past, Present, and RFFAs within the Big Game Species CESA.....	4-93
Table 4-22	Past, Present, and RFFAs within the Greater Sage-Grouse CESA.....	4-96

## List of Figures

Figure 1-1: Project Vicinity  
Figure 2-1: Authorized Mine and Exploration Plan Boundaries and Proposed Goldrush Mine Plan Boundary  
Figure 2-2: Proposed Changes to Authorized Mine and Exploration Plan Boundaries  
Figure 2-3: Proposed Cortez Mine Shared Facilities  
Figure 2-4: Proposed Project Facilities  
Figure 2-5: Authorized and Proposed Portal Pad Extension  
Figure 2-6: Proposed Water Management System  
Figure 2-7: Proposed Roads  
Figure 2-8: Ore Transportation Route  
Figure 2-9: No Action Alternative  
Figure 2-10: Authorized Cortez Mine Complexes  
Figure 3-1: Areas of Analysis  
Figure 3-2: Areas of Analysis  
Figure 3-3: Predicted Change in Water Table from April 1996 to December 2043 (Scenario 1)  
Figure 3-4: Predicted Change in Water Table from April 1996 to December 2043 (Scenario 2)  
Figure 3-5: Predicted Change in Water Table from April 1996 to December 2043 (Scenario 3)  
Figure 3-6: Predicted Change in Groundwater Levels No Action Alternative (End of Dewatering 2032)  
Figure 4-1: Cumulative Effects Study Areas Part 1  
Figure 4-2: Cumulative Effects Study Areas Part 2

## List of Appendices

Appendix A: Figures  
Appendix B: Major Permits and Approvals  
Appendix C: Previous NEPA Actions  
Appendix D: Details on Authorized Plan Modifications Under the Proposed Action  
Appendix E: ACEPMs and Mitigation Required under Currently Authorized Actions (No Action Alternative)  
Appendix F: 2018 Programmatic Agreement  
Appendix G: Impact Definitions  
Appendix H: List of Preparers  
Appendix I: References

## List of Acronyms and Abbreviations

<b>ACEPM</b>	Applicant-Committed Environmental Protection Measure
<b>ACS</b>	American Community Survey
<b>AGP</b>	Acid Generation Potential
<b>AMSL</b>	Above Mean Sea Level
<b>ANP</b>	Acid Neutralization Potential
<b>APE</b>	Area of Potential Effects
<b>ARMPA</b>	Nevada and Northeastern California Greater Sage-grouse Approved Resource Management Plan Amendment
<b>AUM</b>	Animal Unit Month
<b>BAPC</b>	Bureau of Air Pollution Control
<b>BBCS</b>	Bird and Bat Conservation Strategy
<b>BSC</b>	Biological Soil Crust
<b>BEA</b>	Bank Enabling Agreement
<b>BGEPA</b>	Bald and Golden Eagle Protection Act of 1940
<b>bgs</b>	Below Ground Surface
<b>BLM</b>	Bureau of Land Management
<b>BMP</b>	Best Management Practice



<b>CaCO<sub>3</sub></b>	Calcium Carbonate
<b>CCS</b>	Conservation Credit System
<b>CDP</b>	Census-Designated Place
<b>CEQ</b>	Council on Environmental Quality
<b>CESA</b>	Cumulative Effects Study Area
<b>CFR</b>	Code of Federal Regulations
<b>cfs</b>	Cubic Feet Per Second
<b>Ch</b>	Cambrian Hamburg Dolomite
<b>CO</b>	Carbon Monoxide
<b>CO<sub>2</sub></b>	Carbon Dioxide
<b>CO<sub>2</sub>e</b>	Carbon Dioxide Equivalent
<b>CR</b>	County Road
<b>CRF</b>	Cemented Rock Fill
<b>CWA</b>	Clean Water Act
<b>Dhc</b>	Devonian Horse Canyon Siltstone
<b>Dw</b>	Devonian Wenban Limestone
<b>EIS</b>	Environmental Impact Statement
<b>FEMA</b>	Federal Emergency Management Agency
<b>FLPMA</b>	Federal Land Policy Management Act
<b>GHG</b>	Greenhouse Gas
<b>GHMA</b>	General Habitat Management Area
<b>gpm</b>	Gallons Per Minute
<b>GRSG</b>	Greater Sage-Grouse
<b>HA</b>	Hydrographic Area
<b>HAP</b>	Hazardous Air Pollutant
<b>HC/CUEP</b>	Horse Canyon/Cortez Unified Exploration Project
<b>HCT</b>	Humidity Cell Test
<b>HDPE</b>	High Density Polyethylene
<b>HPTP</b>	Historic Properties Treatment Plan
<b>HSA</b>	Hydrologic Study Area
<b>I-80</b>	Interstate 80
<b>IM</b>	Instruction Memorandum
<b>IMPLAN</b>	IMPLAN Group, LLC
<b>InSAR</b>	Interferometric Synthetic Aperture Radar
<b>IT</b>	Information Technology
<b>KOP</b>	Key Observation Point
<b>kV</b>	Kilovolt
<b>L<sub>50</sub></b>	Sound Level Exceeded for 50 Percent of the Time
<b>MACT</b>	Maximum Achievable Control Technology
<b>Ldn</b>	Day-Night Average Sound Level
<b>LOS</b>	Level of Service
<b>mg/L</b>	Milligrams Per Liter
<b>MLFO</b>	Mount Lewis Field Office
<b>MOU</b>	Memorandum of Understanding
<b>mph</b>	Miles Per Hour
<b>MSHA</b>	Mine Safety and Health Administration
<b>Mt</b>	Million Tons
<b>Mtpy</b>	Million Tons Per Year
<b>MWMP</b>	Meteoric Water Mobility Procedure
<b>NAAQS</b>	National Ambient Air Quality Standards
<b>NAC</b>	Nevada Administrative Code
<b>NAICS</b>	North American Industry Classification System
<b>NDEP</b>	Nevada Division of Environmental Protection
<b>NDOT</b>	Nevada Department of Transportation

<b>NDOW</b>	Nevada Department of Wildlife
<b>NDWR</b>	Nevada Division of Water Resources
<b>NEPA</b>	National Environmental Policy Act of 1969
<b>NGM</b>	Nevada Gold Mines LLC
<b>NHPA</b>	National Historic Preservation Act of 1966
<b>NMCP</b>	Nevada Mercury Control Program
<b>NNP</b>	Net Neutralization Potential
<b>NO<sub>2</sub></b>	Nitrogen Dioxide
<b>NOx</b>	Nitrogen Oxide
<b>NOI</b>	Notice of Intent
<b>NRCS</b>	Natural Resources Conservation Service
<b>NRHP</b>	National Register of Historic Places
<b>NRS</b>	Nevada Revised Statutes
<b>O<sub>3</sub></b>	Ozone
<b>Oe</b>	Ordovician Eureka Quartzite
<b>Ohc</b>	Ordovician Hanson Creek Limestone/Dolomite
<b>OHMA</b>	Other Habitat Management Area
<b>OHV</b>	Off-Highway Vehicle
<b>Ovi</b>	Ordovician Vinini Formation
<b>PA</b>	Programmatic Agreement
<b>PAG</b>	Potentially Acid Generating
<b>PCRI</b>	Property of Cultural and Religious Importance
<b>PCS</b>	Petroleum-Contaminated Soil
<b>PHMA</b>	Priority Habitat Management Area
<b>PFC</b>	Proper Functioning Condition
<b>Plan</b>	Plan of Operations
<b>PM<sub>2.5</sub></b>	Particulate Matter Less Than 2.5 Microns in Diameter
<b>PM<sub>10</sub></b>	Particulate Matter Less Than 10 Microns in Diameter
<b>PMU</b>	Population Management Unit
<b>RIB</b>	Rapid Infiltration Basin
<b>RFFA</b>	Reasonably Foreseeable Future Action
<b>RMP</b>	Resource Management Plan
<b>ROD</b>	Record of Decision
<b>ROW</b>	Right-of-Way
<b>RV</b>	Recreational Vehicle
<b>SER</b>	Supplemental Environmental Report
<b>SHPO</b>	State Historic Preservation Office
<b>SIR</b>	Supplemental Information Report
<b>SO<sub>2</sub></b>	Sulfur Dioxide
<b>SR</b>	State Route
<b>s.u.</b>	Standard Units
<b>SWPPP</b>	Stormwater Pollution Prevention Plan
<b>TCaCO<sub>3</sub>/kT</b>	Calcium Carbonate Equivalent Tons Per Thousand Tons of Rock
<b>TDS</b>	Total Dissolved Solids
<b>tpy</b>	Tons Per Year
<b>Tribes</b>	Te-Moak Tribe of Western Shoshone Indians, Yomba Shoshone Tribe, Duckwater Shoshone Tribe of the Duckwater Reservation, Ely Shoshone Tribe, and Shoshone-Paiute Tribe of the Duck Valley Reservation
<b>U.S.</b>	United States
<b>USACE</b>	United States Army Corps of Engineers
<b>USCB</b>	United States Census Bureau
<b>USDOT</b>	United States Department of Transportation
<b>USEPA</b>	United States Environmental Protection Agency
<b>USFWS</b>	United States Fish and Wildlife Service

<b>VOC</b>	Volatile Organic Compound
<b>VRI</b>	Visual Resource Inventory
<b>VRM</b>	Visual Resource Management
<b>WPCP</b>	Water Pollution Control Permit
<b>WREC</b>	Wells Rural Electric Company
<b>WRF</b>	Waste Rock Facility
<b>WSA</b>	Wilderness Study Area
<b>WTP</b>	Water Treatment Plant

# Executive Summary

In January 2020, Nevada Gold Mines LLC (NGM) submitted a Plan of Operations (Plan) (N 97532) and Nevada Reclamation Permit Application for the proposed underground Goldrush Mine to the Mount Lewis Field Office (MLFO) of the Battle Mountain District Bureau of Land Management (BLM). Following review by the BLM and consultation between BLM and NGM, NGM submitted revised plans in May 2020, August 2020, October 2020, and June 2021 (NGM 2021). The Goldrush Mine is located approximately 30 miles south of Beowawe, Nevada in both Lander and Eureka counties, Nevada and includes the construction, operation, reclamation, and closure of a new underground mine. The BLM's surface mining regulations at 43 Code of Federal Regulations subpart 3809 require that the BLM fulfill its obligation under the National Environmental Policy Act of 1969 (NEPA) by analyzing and disclosing the potential environmental impacts of the Goldrush Mine. The BLM MLFO determined the level of analysis necessary for the Plan was an Environmental Impact Statement (EIS). The BLM MLFO is serving as the lead federal agency for preparing the EIS in compliance with NEPA.

## Proposed Action

The Proposed Action would include construction, operation, reclamation, and closure of a new underground mining project in the Cortez Mining District of Lander and Eureka counties, Nevada. The proposed Plan boundary is a total of 19,853 acres, of which 772 acres would be on private land controlled by NGM and 19,081 acres of public lands administered by the BLM MLFO and BLM Elko District, Tuscarora Field Office. Most of this area is within existing exploration and mine plans approved by the BLM and includes facilities and surface disturbance associated with the authorized plans. To create the new Goldrush Mine Plan boundary, NGM proposes boundary modifications and/or reclassification of acres within the following existing NGM-owned exploration and mine Plan boundaries: Horse Canyon Mine Plan (N-66896) administered by the BLM Elko District; Horse Canyon/Cortez Unified Exploration Project (HC/CUEP) Plan (N-66621) administered by the BLM Battle Mountain District; West Pine Valley Exploration Project Plan (N-77213) administered by the BLM Elko District; and use of existing infrastructure at the Cortez Mine (N-67575) administered by the BLM Battle Mountain District. No proposed boundary modifications or surface disturbance re-classification from the Cortez Mine Plan to the Goldrush Mine Plan would occur. Under the Proposed Action, construction of the 120 kilovolt (kV) power line with two switching stations and contact water pipeline would occur partially within the Cortez Mine Plan boundary and the proposed Goldrush Mine Plan boundary.

The Proposed Action would create an additional 1,658 acres of new surface disturbance on public land administered by the BLM, including approximately 210 acres of exploration disturbance that could occur anywhere within the proposed Goldrush Mine Plan boundary. In addition, approximately 1,024 acres of existing authorized disturbance would be within the Proposed Action footprint, and approximately 12 acres of existing authorized disturbance would be reclassified as part of the Proposed Action.

The proposed underground mining and surface support activities for the Goldrush Mine would include: a materials handling system for transporting ore and waste rock from the underground workings to the surface and transporting aggregate and supplies to the underground workings and surface backfill plant; a dewatering system including: wells, pipelines and pipeline corridors, a water treatment plant, rapid infiltration basins (RIBs), and a multi-use shop; contact water pipeline; ventilation raises; a backfill aggregate paste plant and crusher; a shotcrete/cemented rock fill plant; two new power lines including a 120-kV power line with two switching stations, and a 13.8-kV power line; new ancillary surface facilities including: bulk material storage, access roads, power supply, stormwater controls, laydown and parking areas, lighting, growth media stockpiles, dewatering and monitoring wells, gravel pit expansion, potable water and septic systems, dry facilities (change rooms), service boreholes for electrical and fuel delivery, fire suppression system, water truck refill stations, emergency helipads, fencing, and modular information technology (IT), and communications buildings; dual use of authorized facilities within the close-by Cortez Mine Plan boundary; and continued surface and underground exploration activities.

## No Action Alternative

Under the No Action Alternative, the development of the Goldrush Mine would not be authorized and NGM would not construct, operate, and close a new underground mine (i.e., the Goldrush Mine). Modifications or reclassification of acres as proposed under the Proposed Action would not occur, the dual use of facilities between the Cortez Mine and Goldrush Mine operations would not occur. NGM would continue current authorized mining and exploration activities under the previously approved plans.

NGM is presently conducting authorized mining or exploration activities in the proposed Goldrush Mine Plan boundary under four separate Plans: Horse Canyon Mine Plan (N-66896 and Reclamation Permit No. 0249); HC/CUEP Plan (N-66621 and Reclamation Permit No. 0159); West Pine Valley Exploration Project Plan (N-77213 and Reclamation Permit No. 0229); and Cortez Mine Plan (N-67575 and Reclamation Permit No. 0093). All authorized activities would be expected to continue under the No Action Alternative. Total authorized disturbance under the No Action Alternative is 22,433 acres and the additional disturbance from the Proposed Action would not occur. Descriptions of the anticipated impacts under the No Action Alternative are included per previously authorized NEPA analyses (**Section 2.2**).

## Resource Impacts

### Air Quality

*Proposed Action* – Modeling has determined that impacts from the Proposed Action would not exceed applicable National Ambient Air Quality Standards (NAAQS) for particulate matter 10 microns or less in diameter (PM<sub>10</sub>), particulate matter 2.5 microns or less in diameter (PM<sub>2.5</sub>), carbon monoxide (CO), nitrogen oxide (NO<sub>x</sub>), and sulfur dioxide (SO<sub>2</sub>). The estimated Ozone (O<sub>3</sub>) impact is below the O<sub>3</sub> significant impact level and thus considered insignificant. Total facility-wide Hazardous Air Pollutants (HAPs) are estimated to be 1.8 tons per year (tpy), with 0.5 tpy of the highest single HAP, arsenic. Lead emissions are estimated to be less than 0.05 tpy. The facility wide HAP emissions are within United States (U.S.) Environmental Protection Agency (USEPA) thresholds. Greenhouse Gas (GHG) emissions generated from the Proposed Action, including off-site ore transport, are estimated to be 96,624 tpy. Mercury emissions generated from the Proposed Action are estimated to be 0.014 tpy.

*No Action Alternative* – Modeling has determined that impacts from the No Action Alternative would not exceed applicable NAAQS for PM<sub>10</sub>, PM<sub>2.5</sub>, CO, NO<sub>x</sub>, and SO<sub>2</sub>. Total facility wide HAPs are estimated to be 13.5 tpy, with 8.2 tpy of the highest single HAP, hydrogen cyanide. The facility wide HAP emissions are within USEPA thresholds. GHG emissions generated from the No Action Alternative, including off-site ore transport, are estimated to be 397,919 tpy. Mercury emissions generated from the No Action Alternative are estimated to be 0.04 tpy.

### Cultural Resources

*Proposed Action* – 55 National Register of Historic Places (NRHP)-eligible or unevaluated cultural properties within the Direct Area of Potential Effects (APE) would be physically altered, resulting in an adverse effect to these cultural sites. Approximately 396 acres of two Properties of Cultural and Religious Importance (PCRIs) are within the Direct APE but would be avoided as no surface disturbance is proposed within the PCRIs. Although no direct physical effects are anticipated in the PCRIs, the Project would have an effect from visual changes outside the boundaries of the PCRIs and from (authorized and proposed) mining traffic in the boundaries of the PCRIs. Although there are 71 NRHP-eligible and 28 unevaluated/unknown sites within the Visual APE, none would be impacted by the Proposed Action. One NRHP-eligible historic site (lime kiln) within the Vibrational APE would potentially be impacted from increased mining traffic, but this site has previously been mitigated under previous authorizations. No adverse impacts are anticipated for the Shoshone Wells townsite. Adverse impacts to cultural sites would be addressed under the existing September 2018 Programmatic Agreement. Additionally, a Historic Properties Treatment Plan (HPTP) was developed that addresses mitigation of adverse effects to sites eligible or unevaluated for the NRHP.

*No Action Alternative* – Adverse impacts to NRHP-eligible or unevaluated cultural properties resulting from the No Action Alternative are as previously authorized and being mitigated in accordance with existing HPTPs.

#### Environmental Justice

*Proposed Action* – No disproportionate effects to an environmental justice population are anticipated.

*No Action Alternative* – No disproportionate effects to an environmental justice population are anticipated.

#### Geology and Mineral Resources

*Proposed Action* – The Proposed Action would remove and store 19 million tons (Mt) of waste rock which would impact potential future development of mineral resources. Additionally, the Proposed Action would result in an additional 1,658 acres of proposed new disturbance which would alter the natural topographic and geomorphic features. The Proposed Action would remove approximately 34 Mt of ore for off-site processing. In the post-closure period, localized rock collapse would likely occur over open workings and result in the development of localized ground deformation/subsidence-type features. The declines are expected to have localized long-term collapse; however, they are unlikely to impact surface features due to the strength and thickness of the overlying rock in relation to the dimensions of the underground openings and backfilling of the underground workings. Surface deformation/subsidence is anticipated to be local to the immediate mining area.

Additional dewatering for the Proposed Action may add to existing subsidence. At the end of mining, the model-predicted subsidence with the addition of the Proposed Action dewatering predicts a four-inch contour of land subsidence extending 14.5 percent further into the basin fill deposits on the eastern and southern sides of the Pipeline Complex pits, a 29 percent increase in subsidence area in the northern part of Grass Valley, and a 13.2 percent increase in land subsidence in the western part of Pine Valley. This may expand the development of earth fissures.

*No Action Alternative* – The No Action Alternative would dispose of 442 Mt of waste rock, 59.5 Mt of spent heap leach material, and 16 Mt of tailings material which would impact potential future development of mineral resources. Additionally, the No Action Alternative would result in approximately 22,433 acres of disturbance which would alter the natural topographic and geomorphic features. The additional disturbance from the Proposed Action would not occur. The No Action Alternative would remove approximately 88.5 Mt of ore for processing.

Peak subsidence rates from large-scale dewatering at the Cortez Mine has already occurred and annual monitoring of subsidence and earth fissures through the life of the Cortez Mine. At the end of mining, the model-predicted subsidence predicts a four-inch contour of land subsidence extending 14.5 percent less than the Proposed Action into the basin fill deposits on the eastern and southern sides of the Pipeline Complex pits, 29 percent less subsidence area in the northern part of Grass Valley, and a 13.2 percent less in land subsidence in the western part of Pine Valley.

#### Bald and Golden Eagles

*Proposed Action* – The Proposed Action would result in the removal of an additional 1,067 acres of foraging habitat. Eight golden eagle territories occur within one mile of Goldrush Mine Project disturbance, and NGM has committed to obtaining a U.S. Fish and Wildlife Service (USFWS) incidental Eagle Take Permit, including required USFWS mitigation. Increased human presence and noise may cause eagles to avoid areas adjacent to the Goldrush Mine.

*No Action Alternative* – The No Action Alternative would result in the disturbance of 10,880 acres of foraging habitat. NGM is currently working with the USFWS for an incidental take permit associated with the Cortez Complex (part of the Cortez Plan). Increased human presence and noise may cause eagles to avoid areas adjacent to No Action Alternative disturbance.



### Hazardous Materials and Solid Waste

*Proposed Action* – Overall, based upon the small quantities of hazardous waste that would be generated by the Proposed Action, there is anticipated to be a low probability of an accident resulting in a release of hazardous materials to the environment during transportation.

*No Action Alternative* – Impacts would be the same as the Proposed Action.

### Land Use and Realty Resources

*Proposed Action* – Land use authorization N-48321, owned by Sierra Pacific Power Company, crosses the portion of the proposed 120-kV power line located within the Cortez Mine boundary. NGM and/or Wells Rural Electric Company would need to coordinate with the right-of-way (ROW)-holder to ensure no conflicts would occur during construction. The Proposed Action would result in an additional approximately 1,658 acres of new surface disturbance on public lands, which would result in the loss of this area for multiple use authorizations for life of the mining and exploration operations.

*No Action Alternative* – Impacts to ROWs would be as previously authorized under the West Pine Valley Plan, HC/CUEP Plan, Horse Canyon Mine Plan, and Cortez Mine Plan. The No Action Alternative would result in approximately 22,433 acres of authorized surface disturbance on public lands, which would result in the loss of this area for multiple use authorizations for the life of mining and exploration operations. The additional disturbance from the Proposed Action would not occur.

### Native American Traditional Values

*Proposed Action* – 55 NRHP-eligible or unevaluated cultural properties would be physically altered, resulting in an adverse effect to these cultural sites. Approximately 396 acres of the two PCRIs are within the Direct Cultural APE, but would be avoided as no disturbance is proposed within the PCRIs. Although no direct physical effects are anticipated in the PCRIs, the Project would have an effect from visual changes outside the boundaries of the PCRIs and from authorized and proposed mining traffic in the boundaries of the PCRIs. Vegetation communities and water resources are important to Native American traditional values and may be impacted by the Proposed Action.

*No Action Alternative* – Adverse impacts to NRHP-eligible or unevaluated cultural properties resulting from the No Action Alternative are as previously authorized and being mitigated in accordance with existing stipulations, such as HPTPs, and BLM requirements. Vegetation communities important to Native American traditional values may be impacted by the No Action Alternative.

### Noise

*Proposed Action* – Noise levels at greater sage-grouse (*Centrocercus urophasianus*) (GRSG) leks would increase by up to 9.1 A-weighted decibels (dBA) over baseline conditions. Increases at the GRSG sensitive receptor sites would not exceed the 10 dBA Nevada and Northeastern California GRSG Resource Management Plan Amendment (ARMPA) threshold at all locations when the specific applicant-committed environmental protection measures (ACEPMs) are implemented.

*No Action Alternative* – The No Action Alternative would result in increased noise levels at several lek locations when compared to the Proposed Action because the Proposed Action includes ACEPMs that are not part of the No Action Alternatives and are not currently being implemented.

### Grazing Management

*Proposed Action* – The Proposed Action would result in an additional 1,658 acres of new surface disturbance which would impact forage utilized by livestock. A total of 121.4 animal unit months (AUMs) would be impacted in the Carico Lake, Grass Valley, JD, and South Buckhorn allotments. The 210 acres of proposed exploration disturbance may result in an additional impact ranging from nine to 19 AUMs, depending on the allotment within which it occurs. Impacts from proposed disturbance to rangeland

improvements includes: one cattleguard, one well, and 1.9 miles of fence within the Grass Valley Allotment; one spring and 1.5 miles of fence in the South Buckhorn pasture; and 0.8 mile of fence in the JD Allotment. Temporary loss of a total of 121.4 AUMs would equate to up to \$318,711.42 based on a 30-year period of combined active mining and post-mining reclamation. A total of 42.7 AUMs would be permanently impacted, resulting in the loss of \$3,736.68 annually.

*No Action Alternative* – The No Action Alternative would disturb approximately 22,433 acres of forage utilized by livestock. The additional disturbance from the Proposed Action would not occur. Approximately 907 AUMs would be disturbed in the Carico Lake, Grass Valley, JD, and South Buckhorn allotments. Disturbance to range improvements would be as previously authorized under the West Pine Valley Plan, HC/CUEP Plan, Horse Canyon Mine Plan, and Cortez Mine Plan.

### Recreation Resources

*Proposed Action* – The Proposed Action would result in short-term impacts from the loss of land for recreational opportunities for the life of the Goldrush Mine. The Proposed Action would prohibit access in fenced areas within the proposed Goldrush Mine Plan boundary. The Proposed Action would result in an increase in noise and activity near the Goldrush Mine, as well as potential increased population using the local region for recreational activities. Potential impacts to public access routes may occur from Goldrush Mine operations.

*No Action Alternative* – The No Action Alternative would result in short-term impacts from the loss of land for recreational opportunities for the life of the previous authorizations. Potential impacts to access routes would be as previously authorized under the West Pine Valley Plan, HC/CUEP Plan, Horse Canyon Mine Plan, and Cortez Mine Plan. Activity would be as previously authorized under the West Pine Valley Plan, HC/CUEP Plan, Horse Canyon Mine Plan, and Cortez Mine Plan.

### Social and Economic Values

*Proposed Action* – The Proposed Action would directly employ 495 people during the construction phase and 570 people during the operations. Indirect and induced employment is anticipated to be 354 people during construction and 407 people during operations. Direct labor income generated from Goldrush Mine is estimated to be \$108,320,993, and total indirect and induced labor income is estimated to be \$42,695,964. The Proposed Action would generate net proceeds taxes of \$288 million and direct business taxes of \$48 million over the life of the mine. The Goldrush Mine would develop the demand for both temporary and permanent housing, which may result in additional demand for housing that is not currently available.

*No Action Alternative* – Impacts to social and economic values would be as previously authorized under the West Pine Valley Plan, HC/CUEP Plan, Horse Canyon Mine Plan, and Cortez Mine Plan.

### Soil Resources

*Proposed Action* – The Proposed Action would result in an additional 1,658 acres of proposed new surface disturbance to native soils. Biological Soil Crusts (BSCs) could be impacted by removal of topsoil during salvage operations, changing the soil structure and reducing soil quality.

*No Action Alternative* – The No Action Alternative would result in surface disturbance of approximately 22,433 acres of native soils. The additional disturbance from the Proposed Action would not occur. Impacts to BSCs would be as previously authorized under the West Pine Valley Plan, HC/CUEP Plan, Horse Canyon Mine Plan, and Cortez Mine Plan.

### Transportation and Access

*Proposed Action* – The Proposed Action would result in changes in the Level of Service (LOS) at some locations along the ore transportation route over the life of Goldrush Mine operations, but the LOS would remain within acceptable levels. There would be an increase of two additional ore hauling truck per hour,

for a total of up to 20 per hour for 11 years, on the ore transportation route. In addition, up to an additional 89 trips each shift for employees and construction workers during construction and up to 71 trips during operations would occur along the ore transportation route. It is estimated that NGM would contribute 64 percent of equivalent single axle loads along SR 306 and 48 percent of the total equivalent single axle loads along State Route (SR) 766.

*No Action Alternative* – The No Action Alternative would not degrade the LOS below acceptable levels. There would be a continuation of up to 18 ore hauling trucks per hour on public roads, as well as authorized levels of employee trips.

#### Vegetation Resources, Including Noxious Weeds and Special Status Plant Species

*Proposed Action* – The Proposed Action would result in proposed new surface disturbance to an additional 1,694 acres of vegetation. The Proposed Action would result in the potential for establishment and spread of noxious species during construction, operation, and reclamation. Impacts would be reduced with the implementation of the Goldrush Mine Noxious Weed Management Plan (SRK 2019). Pre-disturbance surveys would avoid and minimize potential impacts from exploration to Beatley buckwheat (*Eriogonum beatleyae*) individuals or populations.

*No Action Alternative* – The No Action Alternative would disturb approximately 22,433 acres of vegetation. The additional disturbance from the Proposed Action would not occur. The No Action Alternative would result in the potential for establishment and spread of noxious species during construction, operation, and reclamation. Disturbance of special status vegetation species would be as previously authorized under the West Pine Valley Plan, HC/CUEP Plan, Horse Canyon Mine Plan, and Cortez Mine Plan.

#### Visual Resources

*Proposed Action* – The Proposed Action would add form, line, texture and color to existing landscape, but would not conflict with the established interim BLM Visual Resource Management Class IV objectives. Under the Proposed Action, nighttime lighting at the Goldrush Mine is not anticipated to be a perceptible change from current, authorized operations within the Project area.

*No Action Alternative* – Impacts would be as previously authorized under the West Pine Valley Plan, HC/CUEP Plan, Horse Canyon Mine Plan, and Cortez Mine Plan.

#### Water Resources and Geochemistry

*Proposed Action* – Potential impacts to seep and spring flow and an additional one mile of perennial stream flow may occur from proposed dewatering operations if the source of the water is connected to the regional aquifer. Impacts would be reduced by previously authorized monitoring and contingency mitigation plans. Surface water may be impacted due to mobilization of sediment from expanded construction operations and road networks, but ACEPMs would be implemented to reduce impacts as well as implementation of the Stormwater Pollution Prevention Plan (SWPPP) for the Goldrush Mine and compliance with the Nevada Division of Environmental Protection's (NDEP's) general mining stormwater permit. Predicted maximum extent of the 10-foot drawdown contour at the center of the Crossroads Pit is predicted to reach up to 7.5 miles to the north, 7.7 miles to the east and 13.4 miles to the southwest. The maximum extent of the 10-foot drawdown contour under the Proposed Action would be 14.1 to the southeast. Recovery to a new equilibrium would occur at approximately year 2543. The Proposed Action would have no impacts to Federal Emergency Management Agency (FEMA)-delineated floodplains but would disturb approximately 32 acres of desktop delineated floodplains. For surface water rights that are dependent on groundwater discharge, a potential reduction in groundwater levels may reduce or eliminate the flow available at the point of diversion for the surface water right. However, pursuant to existing agreements, NGM would take action to make the senior water right holders whole as required under Nevada law, if impacts occur. Potential localized impacts would occur from antimony and manganese at 530 years in the immediate vicinity (within 400 feet) of the underground mine. Excess dewatering water would be infiltrated into alluvial deposits at the proposed RIBs in West Pine Valley. Although some major-solute concentrations may initially exceed the NDEP Profile I reference values, exceedances are likely to be temporary and to dissipate after

the passage of a few pore volumes, as has been observed at the RIB sites operated by NGM in Crescent Valley. No impacts are anticipated to surface water quality from waste rock.

*No Action Alternative* – Potential impacts to seep and spring flow may occur from authorized dewatering operations if the source of the water is connected to the regional aquifer. Impacts would be reduced by previously authorized monitoring and contingency mitigation plans. Up to 24 miles of perennial stream flow may be impacted if the source of the water is connected to the regional aquifer. Predicted maximum extent of the 10-foot drawdown contour at the center of the Crossroads Pit would be 7.2 miles to the north, 7.8 miles to the east, and 12.8 miles to the southwest. The maximum extent of the 10-foot drawdown contour to the southeast from the Cortez Hills Pit under the authorized environment would be 13.8 miles to the southwest. Recovery to a new equilibrium would occur at approximately year 2532. The No Action Alternative would impact portions of FEMA-delineated floodplains. For surface water rights that are dependent on groundwater discharge, a potential reduction in groundwater levels may reduce or eliminate the flow available at the point of diversion for the surface water right. Water quality impacts from RIBs would be the same as the Proposed Action. No impacts are anticipated to surface water quality from waste rock.

### Wetland and Riparian Resources

*Proposed Action* – Surface disturbance associated with the Proposed Action would disturb approximately 7.8 acres of isolated field-mapped wetlands (in Horse and Willow creeks) and approximately 31 acres of riparian habitat including eight spring sites with wetland characteristics in the proposed Goldrush Mine Plan boundary that overlap with the proposed surface disturbance. NGM has committed to apply a 30-meter avoidance buffer around wetland and riparian areas, even if existing disturbance occurs within the 30-meter buffer. To avoid impacts to wetlands and riparian areas, NGM would either eliminate or re-locate the proposed disturbance that overlaps the mapped wetlands to existing disturbance. No direct impacts to wetlands or riparian areas from the Proposed Action would occur. If the flow from a perennial spring or stream is controlled by discharge from the aquifer affected by proposed dewatering drawdown, a reduction of groundwater levels could reduce the groundwater discharge to perennial springs or streams with a corresponding reduction in spring flows, lengths of perennial stream reaches, and their associated riparian/wetland areas. Flow in Horse Creek is anticipated to cease as a result of proposed dewatering activities starting in Year 2024 through 2106, starting to recover in Year 2107. All impacts from potential flow reductions in perennial stream reaches attributable to dewatering would be addressed through the authorized contingency mitigation plans, including flow supplementation to Horse Creek for a period of at least 83 years.

*No Action Alternative* – Impacts would be as previously authorized under the West Pine Valley Plan, HC/CUEP Plan, Horse Canyon Mine Plan, and Cortez Mine Plan. Impacts would be associated with direct disturbances, changes in acres of wetlands, changes in the volume of flow to wetlands, and degradation of wetlands. This direct disturbance could lead to erosion and mobilization of sediments but would be minimized through the authorized ACEPMs, reclamation, and compliance with the Stormwater Permits and SWPPPs. The No Action Alternative would continue to implement the authorized contingency mitigation plans to address impact from potential flow reductions to perennial streams from authorized dewatering operations.

### Wildlife, Including Special Status Species and Migratory Birds

#### *Proposed Action*

General Wildlife: The Proposed Action would disturb an additional 1,448 acres of avian nesting and foraging habitat, insect species habitat, mammal species habitat, and reptile habitat. A potential reduction in flow to surface waters within the groundwater drawdown contour plus one-mile buffer as a result of mine dewatering would result in an overall reduction of habitat for aquatic species. All impacts from potential flow reductions in surface waters attributable to dewatering would be addressed through the authorized contingency mitigation plans. Construction of the RIBs may act as an attractant for avian and mammal species, including big game. The use of the Natural Resources Conservation Service wildlife fencing around the RIBs would reduce the potential entanglement of wildlife that may be attracted to the RIBs. Human presence and noise could cause wildlife avoidance and displacement. Vehicles, vertical facilities, and lights

may cause collisions. Small mammals, insects, and aquatic invertebrates may be crushed during construction, operations, or reclamation. The Proposed Action would disturb approximately 1,124 acres of mule deer (*Odocoileus hemionus*) habitat. The Proposed Action would disturb an additional 616 acres of pronghorn (*Antilocapra americana*) habitat. The Proposed Action may disturb an additional 434 acres of preferred pinyon-juniper and mountain mahogany habitat, and 1,050 acres of other habitat available for mountain lions (*Puma concolor*).

Special Status Species: Special status species potentially impacted by the Proposed Action are discussed below. The Proposed Action would disturb GRSG habitat including approximately 1,125 acres of Priority Habitat Management Area (PHMA), 215 acres of General Habitat Management Area (GHMA), and 12 acres of Other Habitat Management Areas (OHMA) of 2019 ARMPA habitat. The Proposed Action would disturb approximately 771 acres of PHMA, 19 acres of GHMA, 615 acres of OHMA habitat, and 79 acres of Non-habitat of 2015 ARMPA habitat. Exploration disturbance could result in up to 210 acres of additional disturbance any of the GRSG habitat types. Impacts to GRSG habitat would be evaluated and mitigated according to the Barrick Bank Enabling Agreement or the State of Nevada Conservation Credit System. The Proposed Action would disturb approximately 1,213 acres of burrowing owl (*Athene cunicularia*) habitat. Exploration disturbance could result in up to 210 acres of additional disturbance in burrowing owl habitat. The Proposed Action would disturb approximately 1,448 acres of bat habitat, including 462 acres of woodland habitat. Exploration disturbance could result in up to 210 acres of additional disturbance of bat habitat. The Proposed Action would disturb approximately 1,051 acres of pygmy rabbit (*Brachylagus idahoensis*) habitat. Exploration disturbance could result in up to 210 acres of additional disturbance of pygmy rabbit habitat. The Proposed Action would result in the disturbance of approximately 1,070 acres of dark kangaroo mouse (*Microdipodops megacephalus*) habitat. Exploration disturbance could result in up to 210 acres of additional disturbance.

*No Action Alternative* – The No Action Alternative would disturb approximately 22,433 acres of avian nesting and foraging habitat, insect species habitat, and mammal species habitat. The additional disturbance from the Proposed Action would not occur. The No Action Alternative would continue to implement the authorized contingency mitigation plans to address impact from potential flow reductions to surface water features from authorized dewatering operations. All other impacts would be as previously authorized under the West Pine Valley Plan, HC/CUEP Plan, Horse Canyon Mine Plan, and Cortez Mine Plan.

# 1.0 Introduction

## 1.1 Introduction and General Information

In January 2020, Nevada Gold Mines LLC (NGM) submitted a Plan of Operations (Plan) (N-97532) and Nevada Reclamation Permit Application for the new Goldrush Mine to the Mount Lewis Field Office (MLFO) of the Battle Mountain District Bureau of Land Management (BLM). Following review by the BLM and consultation between BLM and NGM, NGM submitted revised plans in May 2020, August 2020, October 2020, and June 2021 (NGM 2021). The Plan was submitted to comply with the BLM's surface mining regulations at Title 43 Code of Federal Regulations (CFR), subpart 3809 (43 CFR 3809.401 *et seq.*, as amended), 43 CFR 3715, State of Nevada regulations governing the reclamation of mined lands (Nevada Administrative Code [NAC] 519A.010-635), and BLM Instruction Memorandum (IM) No. NV-2011-004 – Guidance for Permitting 3809 Plans of Operation. The 43 CFR 3809 regulations require that the BLM fulfill its obligation under the National Environmental Policy Act of 1969 (NEPA) by analyzing and disclosing the potential environmental impacts of the Goldrush Mine.

The Goldrush Mine is located approximately 30 miles south of Beowawe, Nevada in both Lander and Eureka counties, Nevada and includes the construction, operation, reclamation, and closure of a new underground mine (**Figure 1-1**). Note all figures referenced in this document are included in **Appendix A**. The proposed Goldrush Mine Plan boundary would include approximately 19,853 acres, with approximately 772 acres of private land consisting of portions of patented mining claims and the Horse Ranch owned by NGM, and approximately 19,081 acres of unpatented mining claims on public lands administered by the BLM MLFO and in part by the BLM Elko District, Tuscarora Field Office.

The BLM MLFO is serving as the lead federal agency for preparing the Environmental Impact Statement (EIS).

The Nevada Department of Wildlife (NDOW), Nevada Department of Transportation (NDOT), and Eureka County are cooperating agencies on the EIS as outlined in the Memoranda of Understanding (MOUs) for the Goldrush Mine NEPA process. In addition, the United States (U.S.) Environmental Protection Agency (USEPA), Nevada Division of Environmental Protection (NDEP), and U.S. Fish and Wildlife Service (USFWS) are cooperating agencies through applicable MOUs with the BLM.

## 1.2 Purpose of and Need for the Action

The BLM's purpose is to respond to NGM's proposal as described in the Plan and to analyze the environmental effects associated with the proponent's Proposed Action and alternatives to the Proposed Action, consider reasonable alternatives, and develop and consider mitigation, when necessary to mitigate environmental impacts. The NEPA mandates that the BLM evaluate the effects of the Proposed Action and develop alternatives and mitigation, when necessary, to lessen any effects to environmental resources.

The BLM's need for the action is established by the BLM's responsibilities under Section 302 of the Federal Land Policy Management Act (FLPMA) and the BLM Surface Management Regulations at 43 CFR 3809, to respond to a request for a Plan of Operations and to take any action necessary to prevent unnecessary or undue degradation of public lands as a result of the actions taken to prospect, explore, assess, develop, and process locatable mineral resources on public lands.

NGM's purpose for the Goldrush Mine Project is to profitably extract gold from public lands where NGM holds mining claims and private land. NGM's need for the Goldrush Mine Project is to meet the prevailing market demand for gold. The prevailing market demand is regularly adjusted by commodity exchanges throughout the world. This adjustment results from buyers and sellers agreeing on a specific transaction price, which reflects the current supply and demand for the commodity and other factors.

## 1.3 Decision to be Made

The BLM's decision relative to this EIS will consider the following: 1) approval of the Plan to authorize the proposed activities without modifications or additional mitigation measures; 2) approval of the Plan with



additional mitigation measures that the BLM deems necessary to prevent unnecessary or undue degradation of public lands; 3) approval of the Plan with one of the alternatives analyzed in the EIS; or 4) denial of the Plan and associated activities if the BLM determines that the proposal does not comply with 43 CFR 3809 and 43 CFR 3715 regulations.

#### **1.4 Conformance and Permits**

The Proposed Action and alternatives shall be consistent with federal agency laws, regulations, plans, and policies, including: NEPA; Council on Environmental Quality (CEQ) Regulations (40 CFR parts 1500-1508); Department of the Interior NEPA Regulations (40 CFR part 46); BLM NEPA Handbook H-1790-1 (BLM 2008a); FLPMA; Mining and Mineral Policy Act of 1970; Locatable Minerals Surface Management Regulations (43 CFR 3809); Use and Occupancy under the Mining Laws (43 CFR 3715); Nevada BLM Rock Characterization and Water Resources Analysis Guidance for Mining Activities (September 2013); Nevada State Office IM NV-2010-014; Nevada BLM State Office IM NV-2013-046; and BLM Reclamation Standards as referenced in the BLM Manual Handbook H-3042-1. The National Historic Preservation Act of 1966 (NHPA) Section 106 consultation required under 36 CFR 800 will be completed concurrently with the NEPA process.

##### **1.4.1 Other Project Permits**

In addition to this document, implementation of the Proposed Action would require authorizations from other federal, state, and local agencies with jurisdiction over certain aspects of the Goldrush Mine Project. **Appendix B** provides the list of permits and authorizations that may be necessary for the Goldrush Mine Project. NGM is responsible for acquiring permits and authorizations necessary for the Goldrush Mine Project.

##### **1.4.2 Land Use Plan Conformance**

The Goldrush Mine Project is located on public lands within the administrative boundaries of the BLM Battle Mountain District, MLFO and the BLM Elko District, Tuscarora Field Office (**Figure 1-2**). The Goldrush Mine Project would be in conformance with both the Shoshone-Eureka Resource Management Plan (RMP), the Elko RMP, and the Nevada and Northeastern California Greater Sage-grouse Approved Resource Management Plan Amendment (ARMPA).

###### **1.4.2.1 Shoshone-Eureka Resource Management Plan**

Public lands located within the BLM MLFO boundaries are managed under the guidance of the Shoshone-Eureka RMP, as amended, and Record of Decision (ROD). The Shoshone-Eureka RMP ROD includes specific minerals objectives and management decisions for locatable minerals including (BLM 1986a):

- Make available and encourage development of mineral resources to meet national, regional and local needs consistent with national objectives for an adequate supply of minerals.
- Assure that mineral exploration, development and extraction are carried out in such a way as to minimize environmental and other resource damage and to provide, where legally possible, for the rehabilitation of lands.
- Develop detailed mineral resource data in areas where different resources conflict so that informed decisions may be made that result in optimum use of the lands.

Management decisions for locatable minerals and current mineral production areas includes:

- All public lands in the planning areas will be open for mining and prospecting unless withdrawn or restricted from mineral entry.
- Recognize these areas as having a highest and best use for mineral production and encourage mining with minimum environmental disturbance. Make thorough mineral examinations of all sites proposed for other Bureau programs in these areas.

#### **1.4.2.2 Elko Resource Management Plan**

Public lands located with the BLM Tuscarora Field Office, are managed under the guidance of the Elko RMP and ROD (BLM 1986b, 1987a). Specifically, the Elko RMP ROD includes the following objectives for minerals for locatable minerals including:

- Maintain public lands open for exploration, development, and production of mineral resources while mitigating conflicts with wildlife, wild horses, recreation, and wilderness resources.

Management actions and standard operation procedures detailed in the Elko RMP ROD includes (BLM 1987a):

- Designate the resource area open to mineral entry for locatable minerals, except for the districts 11-acre administrative site.
- Locatable mineral exploration and development on public land will be regulated under 43 CFR 3802/3809 to prevent unnecessary and undue degradation of the land. To the extent feasible and allowed by regulation, mineral exploration activities will be restricted during wet ground conditions. In areas of unsuitable or highly erodible soils, consultation with the authorized officer is required prior to entry.

#### **1.4.2.3 Greater Sage-Grouse Resource Management Plan Amendment**

The BLM as the lead agency, together with the U.S. Forest Service as a cooperating agency, prepared amendments and revisions to their land management plans in 2015. The 2015 ARMPA provides guidance on measures to avoid and minimize potential impacts resulting from proposed projects in addition to providing appropriate measures to compensate for impacts that are unavoidable on greater sage-grouse (*Centrocercus urophasianus*) (GRSG) habitat resulting from development projects. These documents provide a set of management alternatives focused on specific conservation measures across the range of the GRSG (BLM 2015a).

#### **1.4.2.4 County Plans**

The Goldrush Mine Project is within the jurisdictional boundaries of both Eureka County and Lander County. It is the responsibility of NGM to work with the counties to demonstrate compliance with county plans and development code requirements. It is the responsibility of the counties to determine if the Proposed Action is in compliance with their master plan policies and development codes. Per CEQ regulations (40 CFR 1506.2(d)), the EIS shall discuss any inconsistency a project may have with any approved state, tribal, or local plan. While the EIS shall discuss any inconsistencies, NEPA does not require reconciliation (CEQ 2020).

##### **Lander County**

Lander County developed a 10-year planning horizon for Lander County in 2010 (Lander County 2010). The Lander County Master Plan is policy-oriented and general in nature, focusing primarily on the areas in and around the county's three major communities: Battle Mountain, Austin, and Kingston (BLM 2019a).

The Lander County Policy Plan for Federally Administered Lands emphasizes the county's support for, and dependence on, mineral resources development (Lander County 2005). Specifically, the plan policy statement for mineral resources includes:

- Policy 13-1: Retain existing mining areas and promote the expansion of mining operations and areas.
- Policy 13-2: Lander County supports the Mining Law of 1872 and opposes any policy or regulatory revisions that may result in overregulation.
- Policy 13-4: Federal land management agencies should continue to enforce existing reclamation standards to ensure there is no undue degradation of the federally administered lands.

- Policy 13-6: Mine site and exploration reclamation standards should be consistent with the best possible post mine use for each specific area. Specific reclamation standards should be developed for each property rather than using broad based universal standards. Private properties (i.e., patented claims) should be reclaimed to the standard and degree desired by their respective owners, following state law and regulations.

In addition, Lander County zoning regulations would be applicable to the Goldrush Mine Project.

### **Eureka County**

Eureka County has not adopted a zoning ordinance, and existing land use patterns within the county are primarily used for mining and agriculture (Eureka County 2010). The largest land use within Eureka County is agriculture and the second is mining. The general goal from the Eureka County Master Plan for natural resources and federal or state land use specifies (Eureka County 2010):

- Facilitate environmentally responsible exploration, development and reclamation of oil, gas, geothermal, locatable minerals, aggregate and similar resources on federal lands.

The Natural Resource and Federal or State Land Use element is an executable policy for natural resource management and land use on federal and state administered lands in Eureka County. Primary planning guidance of the Natural Resource and Land Use Plan is found in Eureka County Code Title 9, Chapters 30, 40 and 50. Specific goals include:

- To maintain and improve the soil, vegetation and watershed resources in a manner that perpetuates and sustains a diversity of uses while fully supporting the custom, culture, and economic stability and viability of Eureka County and its individual citizens;
- Facilitate environmentally responsible exploration, development and reclamation of oil, gas, geothermal, locatable minerals, aggregate and similar resources on federal lands;
- Prevent significant deterioration of the superior air quality found in Eureka County;
- Maintain, improve or mitigate wildlife impacts to habitat in order to sustain viable and harvestable populations of big game and upland game species as well a wetland/riparian habitat for waterfowl, fur bearers and a diversity of other game and non-game species;
- Keeping open all existing access roads and the ability to maintain those same roads or accesses;
- Describe methods of minimizing or mitigating documented use conflicts or damage and define the manner in which each method is expected to accomplish minimization or mitigation; and
- Investigate, validate and document all use conflicts reported to Eureka County and or federal agencies.

### **1.5 Incorporation by Reference**

According to 40 CFR 1501.12, agencies are directed to incorporate material into environmental documents by reference to cut down on bulk without impeding agency and public review of the action. In addition, CEQ regulations state the incorporated material should be cited and briefly described, and that these materials should be reasonably available for public review. The Goldrush Mine Project is proposed within an area that has been disturbed by previous exploration and mining operations analyzed in prior NEPA documents over more than 20 years. In compliance with CEQ regulations, this EIS incorporates by reference previous NEPA analysis for the Horse Canyon Mine Plan, the Horse Canyon/Cortez Unified Exploration Project (HC/CUEP) Plan, the West Pine Valley Exploration Project Plan, the Cortez Mine Plan, and the Deep South Expansion Project. **Appendix C** provides details of the previous NEPA referenced in this EIS. The materials incorporated by reference are available upon request at the respective BLM field offices

## 1.6 Issues

Issues identified during public scoping and internal scoping were documented in the scoping report (BLM 2021). These issues relevant to the NEPA analysis are identified in **Table 1-1** with the section where this issue is discussed in the Draft EIS.

**Table 1-1 Issues Identified**

<b>Issues Identified During Scoping</b>	<b>Section Where Issue is Addressed</b>
<b>Air Quality</b>	
How would air pollutants (including hazardous air pollutants [HAPs] and particulate matter) from on- and off-site Project operations impact air, soil, and water resources?	Section 4.1
How would emissions be monitored, controlled, evaluated, and mitigated?	Sections 2.1.10.1 and 4.1
What would the project's contribution be to carbon dioxide (CO <sub>2</sub> ) and other greenhouse gases?	Section 4.1
<b>Alternatives</b>	
What are the environmental impacts of each alternative and why were some alternatives not evaluated in detail?	Sections 2.3 and 2.4
What is the Environmentally Preferred Alternative and has BLM considered the No Action Alternative?	Sections 2.2 and 2.4
<b>Cultural Resources</b>	
How would the Proposed Action impact the numerous cultural resource sites identified throughout the analysis area?	Sections 2.1.10.2 and 4.2
How would impacts to these sites be avoided or mitigated?	Sections 2.1.10.2 and 4.2
<b>Hazardous Materials and Waste</b>	
What is the potential for contamination of surface water and groundwater?	Section 4.6
Which controls and containment systems would be in place to collect leaks, contain spills, and handle/store hazardous waste?	Section 4.6
How would accidental releases be handled?	Section 4.6
<b>Land Use</b>	
How does the Project comply with applicable land use designations, and the local Master Plan, County Code, and Federal Land Policy Management Act (FLPMA)?	Sections 1.4.2 and 4.7
<b>Grazing Management</b>	
What is the socioeconomic impact of the potential loss of Animal Unit Months (AUMs) from the Project?	Section 4.10
What is the mitigation for the loss of AUMs?	Section 4.10
<b>Native American Concerns and Consultation</b>	
How would the Proposed Action and alternatives affect important tribal sacred or religious sites, settings, or other important tribal values or resources?	Section 4.8
<b>Noise</b>	
What are existing noise levels? How much additional noise would there be from Project construction and operation, and what impacts would this have on GRSG and wildlife?	Sections 3.9 and 4.9
<b>Socioeconomics and Environmental Justice</b>	
How would the Proposed Action and alternatives affect local and regional social and economic conditions through jobs, tax revenues, and local and regional spending?	Section 4.12
How would the Proposed Action and alternatives affect demand on local and regional resources and services (e.g., housing, roads, health care, law enforcement, and emergency response providers)?	Section 4.12
How would the Proposed Action and alternatives affect quality of life and non-market values of local and regional populations?	Section 4.12
How would the Proposed Action and alternatives affect nearby environmental justice populations and local communities?	Section 4.3
<b>Transportation and Access</b>	

<b>Issues Identified During Scoping</b>	<b>Section Where Issue is Addressed</b>
How would the Proposed Action and alternatives impact local and regional traffic volumes, traffic patterns, and public access?	Section 4.14
<b>Vegetation</b>	
How would the Proposed Action and alternatives affect vegetation and vegetation communities through direct removal and also from loss of surface water resources?	Section 4.15
How would the Proposed Action and alternatives affect special status plant species?	Section 4.15
<b>Visual</b>	
How would the Proposed Action and alternatives affect visual resources in the Project area?	Section 4.16
<b>Water Resources</b>	
How will the Proposed Action and alternatives affect surface water features?	Section 4.17
What baseline data, monitoring and mitigation measures, and protocols and procedures will be used for monitoring throughout all phases of the Project?	Sections 3.17 and 4.17
How will current drainage patterns across the Project area change under each alternative?	Section 4.17
How will any water contaminated from potentially acid generating (PAG) waste rock or spills be captured or treated?	Section 4.17
How would the Project impact surface water and groundwater quality from PAG waste rock? How would these impacts be monitored and mitigated?	Section 4.17
What mitigation is required for surface water and groundwater quality?	Section 4.21
<b>Wetland and Riparian Areas</b>	
How will the Proposed Action and alternatives affect wetlands, drainages, and riparian areas?	Section 4.18
<b>Wildlife and Special Status Species</b>	
How would the Proposed Action and alternatives affect GRSG?	Section 4.19
How would the Proposed Action and alternatives affect raptors, including golden eagles?	Section 4.19
How would the Proposed Action and alternatives affect big game use in and movement through the Project vicinity?	Section 4.19
How would the Proposed Action and alternatives affect the availability and quality of habitat for terrestrial game and non-game species?	Section 4.19
How would impacts to surface water features impact wildlife migratory patterns?	Section 4.19
How will the Project impact water-dependent wildlife, ecosystems, and local communities?	Section 4.19
What mitigation is required to minimize impacts to wildlife including special status species?	Sections 4.19 and 4.21
<b>Other Concerns</b>	
How will cumulative analysis be included in the NEPA document?	Section 4.20
What mitigation measures are necessary during operations, closure and post-closure, and which ones are the proponent, the BLM, or other agencies responsible for?	Section 4.21

## 2.0 Alternatives

### 2.1 Proposed Action

NGM is proposing to construct, operate, reclaim, and close a new underground mining project in the Cortez Mining District of Lander and Eureka counties, Nevada. The proposed underground mining and surface support activities for the Goldrush Mine Project would include:

- A materials handling system for transporting ore and waste rock from the underground workings to the surface and transporting aggregate and supplies to the underground workings and surface backfill plant;
- A dewatering system including: wells, pipelines and pipeline corridors, a water treatment plant (WTP), rapid infiltration basins (RIBs), and a multi-use shop.
- Contact water pipeline;
- Ventilation raises;
- A backfill aggregate paste plant and crusher;
- A shotcrete/cemented rock fill (CRF) plant;
- Two above ground power lines including a 120-kilovolt (kV) power line with two switching stations, and a 13.8-kV power line.
- Ancillary surface facilities including: bulk material storage, access roads, power supply, stormwater controls, laydown and parking areas, lighting, growth media stockpiles, dewatering and monitoring wells, gravel pit expansion, potable water and septic systems, dry facilities (change rooms), service boreholes for electrical and fuel delivery, fire suppression system, water truck refill stations, emergency helipads, fencing, and modular information technology (IT), and communications buildings;
- Dual use of existing facilities within the close-by Cortez Mine Plan boundary; and
- Continued surface and underground exploration activities.

A fleet of over-the-road haul truck and trailer units would be used to transport ore north of Carlin, Nevada to either the NGM-operated and existing Goldstrike or Gold Quarry processing facilities.

NGM maintains four authorized Plans and Reclamation Permits in the proposed location of the Goldrush Mine including: the Horse Canyon Mine, the HC/CUEP Plan, West Pine Valley, and Cortez Mine. Under the Proposed Action, the proposed Goldrush Mine Plan boundary would encompass all or portions of each of these Plan areas. The Proposed Action would result in changes to the boundaries of the Horse Canyon Mine Plan, HC/CUEP Plan, West Pine Valley Exploration Plan, and Cortez Mine Plan. A complete description of the proposed modifications and/or reclassification from each authorized Plan boundary are presented below.

#### 2.1.1 Proposed Goldrush Mine Plan Boundary

To create the proposed Goldrush Mine Plan boundary, NGM proposes Plan boundary modifications and/or reclassification of acres within the following existing BLM-approved plan boundaries (**Figures 2-1 and 2-2**):

- The Horse Canyon Mine Plan (N-66896) administered by the BLM Elko District;
- The HC/CUEP Plan (N-66621) administered by the BLM Battle Mountain District;



- The West Pine Valley Exploration Project Plan (N-77213) administered by the BLM Elko District; and
- Use of existing infrastructure at the Cortez Mine (N-67575) administered by the BLM Battle Mountain District. No proposed boundary modifications or surface disturbance re-classification from the Cortez Mine to the Goldrush Mine Plan would occur. Under the Proposed Action, construction of the 120-kV power line with two switching stations, infiltration distribution pipeline, Lower Horse Canyon Road and contact water pipeline would occur partially within the Cortez Mine Plan boundary and the proposed Goldrush Mine Plan boundary.

The Plans listed above would be modified with the BLM following the completion of the Final EIS.

The proposed Goldrush Mine Plan boundary would modify portions of the West Pine Valley Plan boundary, and the HC/CUEP Plan boundary (**Figure 2-1**). The Horse Canyon Mine Plan and associated Reclamation Permit would be closed, and the authorized disturbance and reclamation obligations would be transferred to the Goldrush Mine Plan. Further details on the modification to the existing Plan can be found in the Supplemental Information Report for the Goldrush Mine Project (SIR) (BLM 2021a), Goldrush Mine Plan (NGM 2021), and **Appendix D. Figure 2-2** provides a summary of the proposed Plan boundary modifications which would create the proposed Goldrush Mine Plan boundary. **Table 2-1** provides the Township, Range, and Section of the National System of Public Lands survey system within the Mount Diablo Baseline & Meridian for the Proposed Action.

**Table 2-1 Legal Description of the Proposed Action**

Township and Range	Sections or Portions of Sections
<b>Proposed Goldrush Mine Plan Boundary</b>	
T25N R48½E	1
T25N R49E	6
T26N R47E	1, 12, and 13
T26N R48E	1 through 17, 20 through 29, and 32 through 36
T26N R49E	7, 14, 15, 18, 19, 22, 23, 27 through 32, and 34
T27N R48E	14, 15, 22, 23, 26 through 28, and 33 through 36
<b>120-kV Power Line (Portions within the Cortez Mine Plan Boundary)</b>	
T26N R47E	1, 12, and 13
T26N R48E	8, 17, and 18
T27N R47E	25 and 36
<b>Contact Water Pipeline (Portions within the Cortez Mine Plan Boundary)</b>	
T26N R48E	6 through 8
T27N R47E	25 and 36
T27N R48E	30 through 31
<b>Mount Tenabo Access Road (Portions within the West Pine Valley Exploration Plan Boundary)</b>	
T26N R48E	22 through 24
T26N R49E	30 through 31
<b>Infiltration Distribution Pipeline (Portions within the Cortez Mine Plan Boundary)</b>	
T25N R48½E	1
T25N R49E	6
T26N R48E	2, 3, 11 through 14, and 24
T26N R49E	14, 15, 19, 22, 23, 27 through 32, and 34
T27N R48E	34 and 35

Township and Range	Sections or Portions of Sections
<b>Lower Horse Canyon Road (Portions within the Cortez Mine Plan Boundary)</b>	
T25N R48½E	1
T25N R49E	6
T26N R48E	2, 3, 11, 13, and 14
T26N R49E	19 and 29 through 32

Source: NGM 2021

#### 2.1.1.1 Horse Canyon Mine Plan

The Horse Canyon Mine Plan area encompasses 1,929 acres (**Figure 2-1**). Mining under the Horse Canyon Mine Plan ended in 1987. The 1,855 acres of the Horse Canyon Mine Plan overlaps with the HC/CUEP Plan and NGM is proposing to transfer the 1,855 acres to the proposed Goldrush Mine Plan boundary; however, this transfer is accounted for in the HC/CUEP Plan acreage transfer calculations. Additionally, 14 acres not overlapping with the HC/CUEP Plan would be transferred to the proposed Goldrush Mine Plan boundary. The remaining 60 acres would be allocated to the HC/CUEP Plan (58 acres of which are already overlapping). This modification would result in closing the Horse Canyon Mine Plan and transferring authorized disturbance and reclamation obligations to the proposed Goldrush Mine Plan and HC/CUEP Plan.

#### 2.1.1.2 HC/CUEP Plan

The HC/CUEP Plan encompasses 22,141 acres. Approximately 17,100 acres would be transferred to the proposed Goldrush Mine Plan boundary. Additionally, 1,855 acres overlaps with the Horse Canyon Mine Plan boundary and would be transferred to the proposed Goldrush Mine Plan boundary. Approximately 60 acres would be transferred to the HC/CUEP Plan from the Horse Canyon Mine Plan, 58 acres of which are already overlapping, so an additional two acres from the Horse Canyon Mine would be added to the HC/CUEP Plan. These modifications would result in a modified HC/CUEP Plan area that would encompass approximately 3,188 acres in two separate areas (**Figure 2-1**).

#### 2.1.1.3 West Pine Valley Exploration Plan

The West Pine Valley Exploration Project Plan encompasses 33,404 acres (**Figure 2-1**). NGM is proposing to transfer 912 acres to the proposed Goldrush Mine Plan boundary. The modification would result in a modified West Pine Valley Exploration Project Plan area of 32,534 acres. Under the Proposed Action, approximately 2.8 acres of new road disturbance would be created in the West Pine Valley Exploration Plan area to construct the proposed Mount Tenabo access road. The West Pine Valley Exploration Project Plan would be amended to include the portions of the proposed Mount Tenabo access road that would be located outside of the proposed Goldrush Mine Plan boundary. The total proposed Mount Tenabo access road is included in the EIS analysis.

#### 2.1.1.4 Cortez Mine Plan

The Cortez Mine Plan boundary encompasses 62,372 acres (**Figures 2-1 and 2-2**). Under the Proposed Action, the Cortez Mine Plan would be amended to include the dual use of facilities between the Cortez Mine and Goldrush Mine operations. Additionally, the Cortez Mine Plan would be amended to incorporate the proposed disturbance from the 120-kV power line and switching stations, the infiltration distribution pipeline, and Lower Horse Canyon Road, as well as the reclassification of acres for the proposed contact water that are outside of the proposed Goldrush Mine Plan boundary. **Sections 2.1.4.4 and 2.1.4.6** provide further details on the proposed contact water pipeline and 120-kV power line and switching stations, respectively. The Horse Canyon Mine, HC/CUEP, and West Pine Valley existing disturbance that would be reclassified to the Goldrush Mine are outlined in the Project Alternatives SIR for the Goldrush Mine Project (BLM 2021a) and **Appendix D**. No changes to the Cortez Mine Plan boundary are proposed.

The following authorized facilities that are part of the Cortez Mine Plan would be utilized for the Goldrush Mine operations (**Figure 2-3**):

**Cortez Hills Complex** – Offices, warehouses, and laydown facilities at the maintenance shop; waste rock facilities (WRFs) (South WRF, Canyon WRF, and Pediment portion of the Cortez Hills Open Pit); aggregate crushing plant, screening facilities, and aggregate stockpiles; fueling facilities at the Cortez Hills maintenance shop; laydown facilities at the Cortez Hills maintenance shop; growth media stockpile south of Area 34 Heap Leach Facility; security and emergency response facilities at the Control 3 building; communications and IT infrastructure; dry facilities at the Cortez Hills Open Pit; ancillary and support facilities; and fresh water pond. Additionally, non-acid generating waste from the Cortez Hills Complex Open Pit would be crushed for use as an aggregate source for the CRF and paste backfill at the Goldrush Mine.

**Cortez Complex** – Contact water management infrastructure at F-Canyon; power lines and electrical infrastructure; TA-7 Tailings Storage Facility; ancillary and support facilities; and lined ore stockpiles at the Range Front declines.

**Pipeline Complex** – Access roads; solid waste disposal at Class-III waived landfill(s); hazardous waste storage; assay laboratory; Pipeline Area 28 Tailings Storage Facility; ancillary and support facilities; petroleum-contaminated soil (PCS) pad at the Pipeline WRF; and core shed.

**Water Management** – Pine Valley RIB

### 2.1.2 Proposed Disturbance

No disturbance from the Cortez Mine would be reclassified to the Goldrush Mine. Authorized, existing, proposed, reclassified, and total surface disturbance are summarized in **Table 2-2**. **Figure 2-4** displays the proposed disturbance under the Proposed Action. Reclassified disturbance is defined as existing/authorized disturbance that changes categories and would eliminate double counting of disturbance acreages where features overlap.

### 2.1.3 Underground Mining Operations

The Goldrush Mine operations would include an underground mine that would be accessed through the previously authorized HC/CUEP exploration declines. Underground mining would proceed to approximately 4,500 feet above mean sea level (AMSL). The anticipated average production rate would be approximately 6,000 tons per day of ore and about 3,000 tons per day of waste rock. Ore and waste rock would be transported to the surface by use of either a haul truck or conveyor. Approximately 2.1 million tons (Mt) of ore and 1.1 Mt of waste rock would be produced annually on average over the mine life. NGM anticipates mining approximately 34 Mt of ore and mining approximately 19 Mt of waste rock over the mine life.

Mining and mine development would use a combination of three different mining methods: lateral and vertical development, stoping with backfill, and cut and fill. The mining method would be determined by the character of the host and waste rock, such as strength, fracture, density, etc. The combination of mining methods is detailed further in the Goldrush Plan (NGM 2021) and the Project Alternatives SIR for the Goldrush Mine Project (BLM 2021a).

Once the declines are sufficiently deep, excavations would be established to support mining and ongoing exploration. These excavations would include raises for ventilation, power, and secondary escape routes that would connect the underground workings with the surface. Raises would be constructed from surface or underground using a drill rig or a raise boring machine. Excavations also would be developed to house facilities for underground equipment maintenance, fueling, warehousing, and backfill and shotcrete storage areas. Ground support of underground workings would consist of rock bolts, mesh, shotcrete, CRF, or other appropriate ground control methods typical of Nevada underground operations. Ground support would be installed by mechanical means including, but not limited to, mechanical rock bolters and robotic shotcrete machines.

Underground infrastructure would include offices, sanitary facilities, drill stations, access drifts, ventilation systems, stopes, load centers, laydown areas, fuel storage areas, refuge stations, connector drifts, muck bays, material storage areas, warehousing, underground materials handling systems, paste distribution, metal removal systems, IT and communications infrastructure, utility distribution systems, motor control

centers, pump stations, sumps, dewatering infrastructure, oil-water separators, contact water infrastructure, explosive storage areas, and maintenance facilities.

#### **2.1.3.1 Mine Ventilation**

Eight ventilation raises, approximately 19 to 23 feet in diameter, would be developed over time to provide and circulate fresh air to the underground workings (**Figure 2-4**). The fans are proposed to be located underground within each ventilation raise. Ventilation raises would be able to act as exhaust or intake depending on requirements for the mine ventilation system. At the surface, each ventilation raise would be enclosed within a chain-link fence and a steel exhaust/intake structure. Within the underground mine, there would also be internal ventilation raises for airflow. Internal raises are generally proposed with dimensions of 12 feet by 12 feet.

**Table 2-2 Summary of Proposed Surface Disturbance under the Proposed Action**

Component	Existing/Authorized Disturbance (acres) <sup>1</sup>			Proposed Disturbance (acres)			Reclassified Disturbance (acres)			Total (acres)		
	Public	Private	Total	Public	Private	Total	Public	Private	Total	Public	Private	Total
Exploration	528.8	50.4	579.2	200.0	10.0	210.0	-204.0	-24.2	-228.2	524.8	36.2	561.00
Communication Sites	0.5	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.5
WTP/Multi-Use Building Yards	12.4	0.0	12.4	22.5	0.0	22.5	9.4	0.0	9.4	44.3	0.0	44.3
Portal Pad and Stormwater Controls	12.0	0.0	12.0	37.7	0.0	37.7	0.6	0.0	0.6	50.3	0.0	50.3
West Pine Valley Gravel Pit	2.8	0.0	2.8	15.5	0.0	15.5	1.7	0.0	1.7	20.0	0.0	20.0
Access Roads	2.7	0.0	2.7	188.6	14.8	203.4	56.3	5.6	61.9	247.6	20.4	268.0
Dewatering and Monitoring Wells	0.0	0.0	0.0	31.3	3.2	34.5	4.0	0.4	4.4	35.3	3.6	38.9
Horse Canyon Haul Road	189.4	3.7	193.1	34.9	1.9	36.8	-3.4	0.0	-3.4	220.9	5.4	226.5
13.8-kV Power Line Corridors	0.0	0.0	0.0	61.4	11.1	72.5	10.4	3.6	14.0	71.8	14.7	86.5
120-kV Power Line Corridors	0.0	0.0	0.0	20.7	0.0	20.7	0.1	0.0	0.1	20.8	0.0	20.8
RIBs	0.0	0.0	0.0	308.6	0.0	308.6	1.1	0.0	1.1	309.7	0.0	309.7
Water Pipeline Corridors (dewatering and RIBs)	0.0	0.0	0.0	63.3	0.0	63.3	0.3	0.0	0.3	63.6	0.0	63.6
Ventilation Raises	0.0	0.0	0.0	14.8	8.0	22.8	9.1	1.0	10.1	23.9	9.0	32.9
Ancillary	0.0	0.0	0.0	580.3	29.6	609.9	128.4	13.6	142.0	708.7	43.2	751.9
Horse Canyon Mine	221.4	0.0	221.4	0.0	0.0	0.0	-2.2	0.0	-2.2	219.2	0.0	219.2
<b>Goldrush Mine Total</b>	<b>970.9</b>	<b>54.1</b>	<b>1,024.1</b>	<b>1,579.6</b>	<b>78.6</b>	<b>1,658.2</b>	<b>11.8</b>	<b>0.0</b>	<b>11.8</b>	<b>2,561.4</b>	<b>132.7</b>	<b>2,694.1</b>
<b>Proposed Disturbance under the Proposed Action Located Outside of the Proposed Goldrush Mine Plan Boundary</b>												
120-kV Power Line and Switching Station Corridors (Cortez Mine Plan Boundary)	NA	NA	NA	30.6	0.0	30.6	NA	NA	NA	30.6	0.0	30.6
Infiltration Distribution Pipeline (Cortez Mine Plan Boundary)	NA	NA	NA	1.9	0.0	1.9	NA	NA	NA	1.9	0.0	1.9

Component	Existing/Authorized Disturbance (acres) <sup>1</sup>			Proposed Disturbance (acres)			Reclassified Disturbance (acres)			Total (acres)		
	Public	Private	Total	Public	Private	Total	Public	Private	Total	Public	Private	Total
Lower Horse Canyon Road (Cortez Mine Plan Boundary)	NA	NA	NA	0.9	0.0	0.9	NA	NA	NA	0.0	0.0	0.0
Mount Tenabo Access Road (West Pine Valley Exploration Plan Boundary)	NA	NA	NA	2.8	0.0	2.8	NA	NA	NA	2.8	0.0	2.8

Source: NGM 2021

NA = Not applicable and would be determined upon Plan Amendments for the Cortez Mine and West Pine Valley.

Note: Details regarding acreage calculations are provided in the Project Alternatives SIR for the Goldrush Mine Project (BLM 2021a).

<sup>1</sup> Existing disturbance totals are as of March 31, 2020.



### 2.1.3.2 Ore and Waste Rock Handling

#### On-Site and Off-Site Ore Processing

Ore blasted would be mucked and transported to a muck bay, an ore pass, or directly to the portal pad. From the muck bay or the ore pass, ore would either be loaded into haul trucks and trucked to the surface or brought to the surface utilizing underground conveyors. Ore would be transported to lined ore stockpiles located on the portal pad (**Figure 2-4**). The portal pad extension would contain two lined ore stockpile pads, with capacities of 10,000 tons each, for ore storage prior to haulage. There would be one bin on the portal pad for waste rock with approximately 8,000 tons of storage and one bin for backfill materials for the CRF plant with 4,000 tons of storage. Ore would be dumped from underground haul trucks to the lined ore stockpile pads. Ore would then be truck-hauled from the portal pad to authorized lined ore stockpiles located at the Range Front declines in the Cortez Hills Complex or loaded into over-the-road trucks for direct transportation to a processing facility at NGM's Goldstrike or Gold Quarry facilities.

Ore produced from the Goldrush Mine would be processed off site at a rate of up to 2.1 Mt per year (Mtpy). The ore hauled under the Proposed Action would be in addition to the authorized 2.5 Mtpy of ore haulage from the Cortez Mine. For the years 2021 through 2032, NGM is proposing to increase haulage to 4.6 Mtpy. For the years 2033 through 2045, haulage would reduce from 4.6 to 2.1 Mtpy.

#### Waste Rock

Waste rock material would be hauled to muck bays or directly loaded to underground haul trucks. Waste rock would be hauled to backfill stopes in the mine or hauled to the portal pad. Non-potentially acid generating (PAG) waste rock brought to the surface would be hauled to the Canyon WRF and the Pediment portion of the Cortez Hills Complex Pit. The PAG waste rock brought to the surface would be temporarily placed on the lined waste rock pad or directly hauled to the Canyon WRF at the Cortez Mine.

The authorized Canyon WRF is currently authorized to handle up to 976,750,000 tons of waste rock but has a capacity of up to 1.4 billion tons of waste rock. The Canyon WRF holds approximately 730 Mt of waste rock as of March 2020. The Canyon WRF would only receive waste rock from the Goldrush Mine Project as the Cortez Hills open pit is no longer being mined and is no longer contributing to the Canyon WRF capacity. Additionally, the available space within the Pediment portion of the Cortez Hills Complex Open Pit is approximately 50 Mt. Mining within the Pediment portion of the Cortez Hills Complex Pit has ceased. Of the total 19 Mt of waste rock generated at the Goldrush Mine, 10 Mt of waste rock would be brought to the surface and the remaining nine Mt of waste rock would remain underground as backfill. Both the Canyon WRF and Pediment portion of the Cortez Hills Complex Open Pit have excess storage capacity to accommodate the additional 10 Mt of waste rock from the Goldrush Mine.

Under the Proposed Action, approximately 19 Mt of waste rock would be mined. **Table 2-3** provides a summary of the proposed waste rock movement from the Goldrush Mine to the Cortez Mine. Additionally, approximately 15 Mt of waste rock from the Cortez Hills Complex at the Cortez Mine and Goldrush Mine would be used for backfilling.

**Table 2-3 Summary of Waste Rock Movement**

Description	Waste Rock (Mt)	Notes
<b>Total Proposed Goldrush Mine Waste Rock</b>	<b>19</b>	Includes both non-acid generating and PAG waste rock.
<b>Waste Rock to Remain Underground</b>	<b>9</b>	Used as backfill.
<b>Total Waste Rock Brought to the Surface (see break down below)</b>	<b>10</b>	<b>See below.</b>
PAG Waste Rock Brought to the Surface	4	Sent to Canyon WRF and encapsulated.
Non-PAG Waste Rock Brought to the Surface	6	Sent to the Canyon WRF or the Pediment portions of the Cortez Hills Complex Open Pit
<b>Projected Additional Amount of Waste Rock Needed for Backfill (Cemented or Paste)<sup>1</sup></b>	<b>15</b>	<b>Combination of Goldrush and Cortez Hills Complex waste rock.</b>

Source: NGM 2021

<sup>1</sup> Replacement of mined ore with fill is not expected to be a 1:1 ratio on a tonnage basis. Fill material has a lower density than the material that it replaces.

### **2.1.3.3 Mine Backfill**

The three types of backfill proposed for use at the Goldrush Mine include CRF, aggregate paste fill, and waste rock fill. The three methods of backfill would be used to maintain a geotechnically stable area, preventing impacts to the surface. In general, the non-acid generating waste rock from the Goldrush Mine placed on the Canyon WRF along with the waste rock placed from the Cortez Hills Complex Open Pit would be crushed for use as an aggregate source for the CRF and aggregate paste fill. Material would be excavated from the Canyon WRF and would be hauled to the Cortez Hills Complex aggregate plant crushing facilities for crushing to the appropriate aggregate size before hauling either back to the portal pad or the aggregate paste plant. Further details on the three types of backfill are discussed in the Goldrush Plan (NGM 2021) and Project Alternatives SIR for the Goldrush Mine Project (BLM 2021a).

## **2.1.4 Surface Mining Operations**

### **2.1.4.1 Portal Pad Extension**

The existing portal pad would be extended to the southwest to allow for construction of lined ore and waste stockpiles, metals removal, offices, dry facility, septic system, parking areas, diesel fueling area, laydown yard, and crushed aggregate stockpile (**Figure 2-5**). The portal pad extension would be constructed from non-PAG waste rock generated by mining at the Goldrush Mine, waste rock from the Canyon WRF, decline development, and the Pediment portion of the Cortez Hills Complex Open Pit.

Ore and waste rock would be excavated and temporarily placed on the proposed lined ore stockpiles pads on the portal pad extension that satisfy the requirements of NAC 445A.438 (**Figure 2-5**). Growth media would be salvaged from the portal pad expansion footprint and stored in a berm around the toe.

Precipitation on the proposed lined ore and waste rock transfer pads located at the portal pad extension would be captured in a containment system designed to contain runoff from the 25-year, 24-hour storm event. Design criteria of the containment system would adhere to the criteria set forth in NAC 445A.438. Collected stormwater drainage would be conveyed in a pipe from the lined pads to the authorized contact water collection tanks. The pipe would be double-walled where buried.

### **2.1.4.2 Aggregate Paste Plant**

An aggregate paste plant would be constructed within an enclosed heated building for the production of aggregate paste fill. The aggregate paste plant would use a mixture of aggregate, ground rock, water, and other reagents to create paste backfill.

### **2.1.4.3 Growth Media Stockpiles**

Suitable growth media would be salvaged and stockpiled in multiple locations during the construction of the Goldrush Mine facilities. Alternately, the growth media may be transported to, and redistributed on surface disturbance areas undergoing concurrent reclamation. Growth media stockpiles would be located such that mining operations would not disturb them. Growth media stockpiles would be maintained in the RIB laydown area. Each RIB gallery would contain one growth media stockpile developed during grubbing and stripping.

Small local stockpiles would be utilized as needed at the ventilation raises and well pad locations. Growth media salvaged from exploration and access road construction would typically be stored by side-casting above or below the road.

The surfaces of the stockpiles would be shaped and sloped to no steeper than 2.5 horizontal to 1 vertical (2.5H:1V) to reduce erosion. To further minimize erosion, the growth media stockpiles would be seeded with an approved interim seed mix. Diversion channels and/or berms would be constructed around the stockpiles as needed to prevent erosion from overland runoff. Best Management Practices (BMPs) such as silt fences or staked straw bales would be used as necessary to contain sediment resulting from direct precipitation.

#### 2.1.4.4 Water Management

Most of the mineral resource would be located below the water table, and the Goldrush Mine would require dewatering to keep the underground mining operations dry; therefore, eight surface wells would be installed to dewater the mine workings (**Figure 2-6**). Underground dewatering wells would also be used to route water to the surface and into the dewatering pipe network. The average annual dewatering rate would be up to approximately 4,500 gallons per minute (gpm).

##### **Water Treatment Plant**

A WTP would be constructed to reduce natural levels of arsenic, antimony, manganese, and iron in the groundwater from the dewatering system prior to filtration, if required by NDEP. The design would be based on the annual average dewatering flow rate of 4,500 gpm and would consist of media filtration vessels, reagent storage, inclined plate settlers, and a filter press. The WTP would include a steel-enclosed building on a concrete slab foundation with water stop and concrete curbs to provide secondary containment of the facilities. The WTP building would house reagent storage, process mixing equipment, maintenance equipment storage, control room, and a small laboratory. Potable water and septic systems would also service the building.

The WTP would be located to the west of RIB Gallery 1 and southwest of RIB Gallery 2, and the dewatering water would be piped to the RIB galleries for infiltration via the proposed infiltration distribution pipeline (**Figure 2-4**).

##### **Water Supply**

The expected consumptive water use for the Goldrush Mine is 2,897 acre-feet (1,796 gpm) annually for mining and milling, which would be supplied through production wells and dewatering wells. The non-consumptive water pumping is 11,294 acre-feet (7,002 gpm) annually and would be used for dewatering the mine. The water rights supporting the Goldrush Mine were approved by the Nevada State Engineer in April 2020.

##### **Wells and Distribution Piping**

One production and eight surface dewatering wells would be installed to support the Goldrush Mine (**Figure 2-6**). The production well would be approximately 16 inches in diameter and range up to 3,500 feet below ground surface (bgs).

Test wells would be drilled for some of the eight surface dewatering wells to verify the production rate. The test wells would be approximately six inches in diameter, and depths may range between 1,500 and 3,500 feet bgs. Up to 20, six-inch average diameter wells with an average length of 1,200 feet may be drilled from underground workings and pumped to the surface dewatering infrastructure through lined boreholes.

Water pumped from dewatering wells would be collected in a conveyance piping network. The piping network would then route flow from the wells to the aggregate paste plant, WTP, and RIBs. The distribution piping network would have capacity to carry up to 6,700 gpm. Pipeline corridors would generally be up to 100 feet wide to allow for construction and maintenance.

The Deep South Expansion Project Final EIS stipulated that mitigation wells be installed within the Horse Creek area in the HC/CUEP Plan boundary to maintain baseflows in Horse Creek (BLM 2019b). A well located within Horse Creek Canyon would be used to supply a minimum of 24 gpm of water to Horse Creek via a surface high-density polyethylene (HDPE) pipe (**Figure 2-6**) (NGM 2020a). At the cessation of the proposed activities at the Goldrush Mine Project, the operating, maintenance, and reclamation costs for the system would be assured by a long-term funding mechanism. Pumping to maintain baseflows in Horse Creek is expected to continue for at least 83 years to maintain baseflow in compliance with the Deep South Expansion Project Final EIS (BLM 2019b).

##### **Rapid Infiltration Basin Galleries**

The treated water would be routed from the WTP through surface piping to two proposed RIB galleries (RIB Galleries 1 and 2). Additionally, water would be routed to the Pine Valley RIB, which is currently authorized under the Cortez Mine Deep South Expansion (**Figure 2-6**). RIB Gallery 1 would consist of seven infiltration

basins, RIB Gallery 2 would consist of six infiltration basins, and the Pine Valley RIB consists of four basins. Both proposed galleries would have associated infrastructure including pipelines, roads, monitoring wells, growth media stockpiles, construction laydown areas, and four-strand Natural Resources Conservation Service (NRCS) wildlife fencing to exclude livestock and horses.

Proposed surface disturbance for the RIBs amounts to 308.6 acres (**Table 2-2**). The RIBs would range in size up to 1,000 feet in length by 200 feet in width and would be excavated to a depth of approximately 20 feet. A portion of the excavated material would be used to construct embankments around the basins, thereby increasing the storage capacity. The remainder of the excavated material would be stockpiled and reseeded for future use as growth media. To increase the infiltration capacity of the basins, a series of rock-filled French drains would be installed along the basin bottoms similar to RIBs previously constructed under BLM authorizations and NDEP permits in the Cortez Mine area.

The flow rates of dewatering water discharged to the RIBs would be controlled through the selective use of pumps and a manifold/valve distribution system. The amount of RIB water surface area would fluctuate, depending on the infiltration rate of individual RIBs. The infiltration efficiency at individual RIBs would vary based on realized subsurface conditions.

Maintenance of RIBs would consist of the selected RIBs being taken offline and allowed to drain and dry. Then the bottom of the basin would be ripped or scarified to enhance infiltration and/or removal of finer sediments. Removed sediment would be placed on the soil stockpiles adjacent to the RIBs.

### **Contact Water Management**

Underground contact water consists of residual passive inflow of groundwater to the underground workings and water from mining activities. Contact water would be collected from sumps located underground and at the lined ore stockpile pads. This water would be reused underground for dust suppression and other mining activities including drilling. Excess water would be pumped to the contact water tanks located on the portal pad. Water would be piped to the Cortez Mine contact water management system at a rate of approximately 150 gpm.

The proposed contact water pipeline would be partially constructed within the Cortez Mine Plan boundary and partially constructed within the proposed Goldrush Mine Plan boundary (**Figure 2-4**). The total proposed contact water pipeline is included for analysis in this EIS. Details of the length, average width, and proposed acreage of the proposed contact water pipeline between the Cortez Mine Plan and the proposed Goldrush Mine Plan are provided in the Project Alternatives SIR for the Goldrush Mine Project (BLM 2021a). The contact water pipeline would be six inches in diameter and a single-walled pipe, except where buried, in which case the pipe would be double-walled. A water fill stand would be used to drain the pipeline as needed for maintenance and repair. Water trucks would be used to transport contact water until the pipeline is brought online. Contact water flow rates would be dependent on conditions encountered during mining.

## **2.1.4.5 Roads and Transportation**

### **Haul Road**

The authorized and existing Horse Canyon haul road would be utilized primarily without improvements. Of the 38,820 feet of haul road, approximately 9,550 feet is proposed to be widened to a 44-foot-wide travel lane and to provide seven turnout locations.

The Horse Canyon haul road would tie into the proposed aggregate paste plant road (**Figure 2-7**). The proposed aggregate paste plant road would include a 44-foot-wide travel way for one-way traffic for 100-ton haul trucks and have three turnout locations. The road would be at the maximum grade of 10 percent for 3,400 feet. The total road length from the portal pad to the proposed aggregate paste plant would be 52,250 feet.

### **Access and Secondary Roads**

Existing road disturbance would be used to the extent practicable. Where necessary, roads would be constructed or upgraded to access the power line corridors, ventilation raises, dewatering wells and pipeline

corridor, RIBs, aggregate paste plant, and ancillary facilities. Roads would be bermed in accordance with Mine Safety and Health Administration (MSHA) regulations and BMPs would be used where necessary to control erosion. Fugitive dust emissions from roads would be controlled using water or chemical dust suppressant application where appropriate.

Under the Proposed Action, the Mount Tenabo access road would be constructed to connect the Horse Canyon haul road to JD Ranch Road (M-111) that would access Horse Canyon and provide continued public access to Mount Tenabo (**Figure 2-7**). The proposed Mount Tenabo access road would be partially constructed within the proposed Goldrush Mine Plan boundary and partially constructed within the West Pine Valley Exploration Plan boundary. Details on the length and proposed acreage of the Mount Tenabo access road between the proposed Goldrush Mine Plan boundary and the West Pine Valley Exploration Plan boundary are provided in the Project Alternatives SIR for the Goldrush Mine Project (BLM 2021a). The total proposed Mount Tenabo access road is included for analysis in this EIS.

### **Transportation**

The ore transportation route is located in portions of Lander, Eureka, and Elko counties. Ore from previous authorizations is transported via a fleet of over-the-road truck and trailer units. Trucks are loaded with ore at the Cortez Mine and travel north on State Route (SR) 306 through Crescent Valley and Beowawe to Interstate 80 (I-80) and exit at Carlin. The trucks deliver ore to either the Gold Quarry Mine or the Goldstrike Mine via SR 766 (**Figure 2-8**). The Goldrush Mine ore transportation would follow the same transportation route.

Approximately 36 to 40 trucks hauling backfill aggregate from the Cortez Hills Complex aggregate plant (Cortez Mine Plan) to the aggregate paste plant (Goldrush Plan) are expected to use the haul roads on a daily basis. Other traffic on site would include light mine vehicles, service vehicles, inter-company deliveries, and solid and hazardous waste transport to shared Cortez Mine Class-III waived landfills and hazardous waste storage areas. Material deliveries would be via SR 278 and the JD Ranch Road (M-111) and/or SR 306 and fuel deliveries would be via SR 278.

#### **2.1.4.6 Ancillary and Support Facilities**

To minimize new surface disturbance, some surface facilities at the West Pine Valley Exploration Plan, the HC/CUEP Plan, and the Cortez Mine Plan would be used for the Goldrush Mine operations. Proposed new ancillary and support facilities are discussed in detail in the sections below (**Figures 2-4** and **2-5**).

### **Multi-Use Shop, Laydown Areas, and Fire Suppression System**

The existing, authorized exploration laydown yard, located in the West Pine Valley Exploration Plan boundary, would be expanded for the Goldrush Mine and would include the proposed multi-use shop and WTP.

The proposed multi-use shop would utilize existing infrastructure, which includes a diesel generator, a fuel delivery system, refuse bin, petroleum contaminated soils bin, fencing, and road access. The authorized lined mud sumps would continue to be utilized for excess surface exploration drill water. Parking areas would also be provided.

The multi-use shop and WTP area would require additional infrastructure for personnel including on-site electrical distribution, telecommunications, a propane tank, potable water, a fire suppression distribution system, and septic facilities. An enclosed room for the compressed air system would also be included in the multi-use shop.

A new fire suppression system would be constructed above the multi-use shop and would consist of a tank with a volume of about 300,000 gallons and underground HDPE piping that would connect with the fire sprinkler system in the multi-use shop. The proposed aggregate paste plant would have a similar fire suppression system constructed with an approximate 270,000-gallon tank.

An additional laydown yard would be constructed and operated for the proposed RIBs (**Figure 2-4**). Growth media for these yards would be salvaged and stored at the laydown area or nearest RIB location.

### **Bulk Material and Surface Diesel Storage**

The Cortez Mine facilities would be used to supply gasoline, diesel fuel, propane, antifreeze, petroleum lubricants, and solvents to the Goldrush Mine. NGM would continue to use the existing diesel and gasoline storage tanks (authorized exploration laydown yard under the HC/CUEP Plan) located at the proposed multi-use shop area. NGM would also have underground fuel and reagent storage areas. Procedures for materials transportation, storage, waste management, and spill prevention and emergency response programs are in place for the authorized NGM operations and would be modified to include the Goldrush Mine.

Up to two diesel fuel stations, one at the portal pad and one at the aggregate paste plant, would be constructed to allow for fueling of vehicles and the transfer of fuel underground via the service boreholes. These surface fuel stations would each contain storage tanks and be designed for 110 percent secondary containment.

Surface storage tanks would be located within concrete secondary containment structures designed to contain 110 percent of the capacity of the largest tank within the containment area as well as the precipitation from the 25-year, 24-hour storm event as applicable for surface storage.

### **Maintenance and Emergency Helipads**

The authorized gravel pit, located west of the multi-use shop, would be expanded by 15.5 acres and gravel from this pit would be stored and used to surface roads and for construction purposes. Additionally, Eureka County maintains several gravel pits within the proposed Goldrush Mine Plan boundary and West Pine Valley boundary and NGM would continue to purchase gravel from Eureka County per past practice and on an as-needed basis.

Refill stands would be utilized to load water trucks for dust control on access roads and provide drill water. One authorized water truck refill stand with a 12,000-gallon water storage tank would be located near water well, GRW-01, approximately 0.5 mile from the gravel pit. When water well GRW-01 is no longer useable, the dewatering pipe would be connected to the fill stand. One proposed refill stand located near the paste backfill plant would be constructed, and another proposed refill stand would be located on Upper Horse Canyon Road.

Three authorized emergency helipads would also be utilized to support access by medical and other emergency helicopters (**Figure 2-4**).

### **Potable Water and Septic Systems**

Potable water and septic systems would be installed at the multi-use shop, dry facilities, and the WTP. These systems would be installed in accordance with the applicable state and federal regulations. NGM would obtain the appropriate State of Nevada potable water system permit for the Goldrush Mine.

### **Power Supply**

Under the Proposed Action, two separate power lines would be constructed to provide power to the Goldrush Mine. This would include a 120-kV power line and a 13.8-kV power line.

**120-kV Power Line** - Electric power for underground and surface support facilities would be supplied via the proposed 120-kV power line and switching stations (**Figure 2-4**). The proposed 120-kV power line and switching stations (2) would be partially constructed within the Cortez Mine Plan boundary and partially constructed within the proposed Goldrush Mine Plan boundary. The Cortez Mine Plan would be amended to incorporate the 120-kV power line and switching station overlap within authorized disturbance and proposed new disturbance. The total proposed 120-kV power line and switching stations are included for analysis in this EIS. Details of the length, average width, and proposed disturbance acreage of the 120-kV power line and switching stations are provided in the Project Alternatives SIR for the Goldrush Mine Project (BLM 2021a). The 120-kV power line would be owned, constructed, and operated by Wells Rural Electric Company (WREC).

The proposed 120-kV power line would be tapped at the existing NV Energy 120-kV power transmission line between the existing Cortez Mine F-Canyon substation and the existing Cortez Hills Complex substation. Two switching stations are proposed with the 120-kV power line: Switching Station 1 would be located at the NV Energy transmission line tap point and would be owned, constructed, and operated by NV Energy. Switching Station 2 would be located near the existing Lander County public road and would be owned, constructed, and operated by WREC. The switching stations would average approximately 200 feet by 200 feet. Both switching stations would remain as post-mining features.

The 120-kV power line would be constructed in accordance with the Avian Power Line Interaction Committee design standards as identified in the Bird and Bat Conservation Strategy (BBCS) (APLIC 2012). The primary structure type to be used would include tubular weathering steel monopole structures with possible use of steel H-frames for select spans. Angle and dead-end structures would have guying. The average span length between structures would be approximately 450 feet with an average above ground height of 70 feet and may range between 50 feet and 100 feet.

13.8-kV Power Line - Electric power would be distributed to proposed surface facilities, dewatering wells, and underground operations from the Goldrush Mine portal substation (located on the portal pad) via a 13.8-kV power line and power cables. The 13.8-kV power cables would feed electric power to the Goldrush Mine through service boreholes, ventilation raises, and portal declines. Two main underground electrical rooms would support 13.8-kV and 4.16-kV power distribution through the underground workings. Multiple mine-load centers would distribute 1,000-voltage and 480-voltage power for underground mining and auxiliary ventilation fans. Dry-type transformers would be used underground for safety.

One emergency generator with capacity of 2,300 kilowatt would be located on the surface of the portal pad, to provide emergency electric power in the case of power supply disruption for personnel evacuation. In addition, the authorized generators at the West Pine Valley Exploration Plan laydown yard would be maintained as emergency back-up for the proposed WTP and multi-use shop.

### **Lighting**

Dedicated lighting and portable light plants would be provided as needed to maintain safe working conditions. The portal pad and portal pad extension, aggregate paste plant, and multi-use shop would have dedicated lighting. Lighting would be directed onto the work area only and away from adjacent areas not in use, with safety and proper lighting of the active work areas being the primary goal. Lighting fixtures would be hooded and shielded as appropriate. Lighting designed to reduce the impacts to night skies would be used. Portable light plants would be sited as determined necessary.

### **Monitoring Wells**

Groundwater monitoring would be conducted pursuant to the Goldrush Mine Water Pollution Control Permit (WPCP). The authorized groundwater monitoring wells and piezometers range between four to 12 inches in diameter with average depths about 2,000 feet bgs. NGM would propose new monitoring wells associated with each of the three RIB galleries. Final location and number of monitoring wells for each RIB gallery would be approved by the NDEP and included in the WPCP.

Monitoring wells subject to the Nevada Division of Water Resources (NDWR) regulations would be abandoned in accordance with applicable rules and regulations (NAC 534.420 through 534.427). They would be sealed to prevent cross-contamination between aquifers, and the required shallow seal would be placed to prevent contamination by surface access.

### **Stormwater Controls**

Stormwater diversions would be installed around Goldrush Mine facilities to divert stormwater runoff around disturbance areas, as needed. Facilities would be monitored following spring snowmelt and intense rain events to observe that drainage and sediment control measures are effective and operating properly.

Goldrush Mine facilities would be covered under the NDEP's general mining stormwater permit (NVR300000). To limit erosion and reduce sediment transport from Goldrush Mine disturbance areas, erosion control measures as outlined in the Stormwater Pollution Prevention Plan (SWPPP) and Reclamation Plan would be installed and maintained as needed.

## **Fencing**

Proposed fencing for safety and security would include rockwall fencing around the portal cut slope, BLM-approved four-strand range fencing around the RIBs (three strands of barbed wire and a smooth bottom strand per the BLM Handbook 1741-1), and chain-link fencing at the WTP and yard, multi-use shop, aggregate paste plant, ventilation raises, and substations.

## **Service Boreholes**

Up to 36 lined service boreholes, approximately eight inches in diameter, would be constructed to provide conduits for electric power lines and bulk materials handling such as diesel fuel and paste aggregate. These boreholes would be located near the ventilation raises or other facilities.

## **Communication Infrastructure**

Two modular structures would be placed at the portal pad to provide IT and communications support for the underground mine. In addition, seven existing communications sites would be incorporated into the proposed Goldrush Mine Plan including the Dry Hills site which consists of three communications facilities: the lower pad, upper pad, and ComNet microwave site (not owned by NGM); the Horse Creek ridgeline road site; the Horse Canyon haul road visitors overlook site; the Willow Creek microwave site; and the Willow Creek weather station site. A number of portable communications sites may be moved to authorized disturbance within the proposed Goldrush Mine Plan boundary and no new surface disturbance would occur.

### **2.1.5 Surface Exploration**

NGM is proposing to conduct up to 210 acres of surface disturbance associated with exploration activities within the proposed Goldrush Mine Plan boundary. Exploration drilling would be conducted by reverse circulation rigs and core rigs. Up to 20 drill rigs for the Goldrush Mine would be on site at any time. Each rig would be supported by at least two rubber-tired light vehicles. The number of drill rigs on-site would vary depending on seasonal conditions and the type of drilling conducted (reverse circulation drilling versus core rigs).

### **2.1.6 Waste Management**

Solid non-hazardous waste from the Goldrush Mine would be transported to the Cortez Mine Class III-waivered landfill. The authorized PCS Management Plan would be revised to include PCS generated from the Goldrush Mine. PCS would be placed on the Cortez Mine authorized PCS storage area or transported off site to a disposal facility licensed to handle such materials. Hazardous waste generated at the Goldrush Mine would be transported to a Cortez Mine hazardous waste storage area that is operated pursuant to Nevada Revised Statutes (NRS) 459.400 to 459.600.

### **2.1.7 Bridge Crossings**

Bridges would be used to keep traffic and structures out of drainages. Seven drainage crossings are proposed, and one existing crossing would not be further improved, for a total of eight crossings (**Figure 2-4**). These bridges would consist either of metal plate arch spans or steel-frames placed on concrete footings outside of the drainages.

In areas where there are permanent roads with a structure that requires replacement, NGM would replace like-for-like under the Clean Water Act (CWA) maintenance exemption without prior notice to the U.S. Army Corps of Engineers (USACE) or the NDEP. Permanent roads that need a culvert to be enlarged or added, change in location, or additional design would be evaluated on a case-by-case basis and may require prior notification to both the USACE under Section 404 of the CWA and NDEP for water quality certification under Section 401 of the CWA (NGM 2021).

### **2.1.8 Work Force and Schedule**

NGM estimates that the work force would be approximately 570 persons, which includes both NGM employees and contractors. The construction work force would utilize about 495 workers.



The Goldrush Mine would operate 24 hours per day, 365 days per year for 24 years. The construction phase (approximately 18 months) is estimated to start after the issuance of the ROD and the reclamation financial instrument adjudication would continue for about 18 months for the first phase. Operations are anticipated to continue for 24 years from issuance of the ROD. An anticipated ROD date in 2022 would result in operations occurring until 2046.

### **2.1.9 Reclamation**

Reclamation of disturbed areas resulting from activities outlined in the proposed Goldrush Mine Plan would be completed in accordance with the BLM and the NDEP regulations. The purpose of Title 43 CFR Subpart 3809 – Surface Management is to prevent unnecessary or undue degradation of public lands by mining operations. This subpart establishes procedures and standards to ensure that operators and mining claimants meet this responsibility and provide for the maximum possible coordination with appropriate state agencies to avoid duplication and to ensure that operators prevent unnecessary or undue degradation. In addition, the State of Nevada requires that a reclamation plan be developed and approved for new mining projects and for expansions of existing operations (NRS and NAC 519A). Detailed information on the proposed reclamation is found in the Goldrush Plan (NGM 2021) and the Project Alternatives SIR for the Goldrush Mine Project (BLM 2021a).

Concurrent reclamation would be conducted on inactive mine and exploration areas when reclamation is practical and safe, and the area is no longer needed. The time to complete reclamation and closure activities would be staged in a manner that allows completion of earthwork within approximately 36 months, depending on average precipitation rates for successful reseeding.

The Horse Canyon haul road and other roads would remain open to provide access for post-mining land uses. NGM would continue coordinating with Eureka County regarding road closures during reclamation activities. NGM would submit a letter or application to the Eureka Board of County Commissioners requesting temporary closure of the Horse Creek Road, and any other road used by the public that would be closed during mining and reclamation operations, and would ask for a temporary exclusive license. A map showing the road segments to be closed and alternate access would be provided at that time.

Existing culverts under the Horse Canyon haul road would remain in place to continue to route stormwater past the road. The aggregate paste plant road would remain as a post-mining feature for public access to Mount Tenabo. The portal pad cut slope and rockfall fencing would remain as a safety feature. The 120-kV power line and switching stations 1 and 2 would remain in place. The stormwater diversion ditch above the portal pad would be a post-mining feature and would remain in place after reclamation of other facilities is complete. Approximately 443.9 acres (430.5 on public land and 13.4 on private land) would remain unreclaimed following the end of mining operations. Additional details of features unreclaimed are provided in the Project Alternatives SIR for the Goldrush Mine Project (BLM 2021a).

### **2.1.10 Proposed Applicant Committed Environmental Protection Measures**

NGM would implement Applicant-Committed Environmental Protection Measures (ACEPMs) to ensure a safe and environmentally sound mine project. The ACEPMs proposed for the Goldrush Mine are discussed below. The ACEPMs presented in **Appendix E** are not applicable to the Goldrush Mine and only apply to the No Action Alternative.

#### **2.1.10.1 Air Quality**

- In accordance with the NDEP Bureau of Air Pollution Control (BAPC) regulations, the Goldrush Mine air quality operating permits must be authorized by the BAPC prior to construction.
- Fugitive dust controls, including water application on roads and other disturbed areas, chemical dust suppressant application (e.g., magnesium chloride), where appropriate, and application of other BMPs as approved by the BAPC would be implemented. Committed air quality practices would include dust control for mine unit operations.
- NGM would seed temporary disturbance areas (e.g., growth media stockpiles, cut and fill embankments, etc.) with a BLM-approved interim seed mix, and concurrent reclamation would be

implemented on completed portions of the WRFs when safe and practical to do so, thereby minimizing fugitive dust emissions.

- To control combustion emissions, all manufacturer installed pollution control equipment would be operated and maintained in good working order. Speed limits would be posted, and vehicle speeds reduced in areas of disturbance to minimize the potential for fugitive dust emissions, to protect wildlife and livestock, and to maintain operational safety. Vehicles would be maintained regularly to ensure they are operating in a manner to minimize vehicle emissions.
- The processing facilities at Goldstrike and Gold Quarry are designed to capture mercury emissions. Mercury emissions from thermal sources would be controlled as described in the Cortez Hills Expansion Project Final EIS (BLM 2008b).

#### **2.1.10.2 Cultural Resources**

A Programmatic Agreement (PA) was developed for NGM projects within an Area of Implementation that includes the Goldrush Mine Project (**Appendix F**). The PA applies to this Project because the Project Area is located within the PA's Area of Implementation, Project activities are consistent with the categories of activities covered by the PA, and the PA is signed by Barrick Cortez, Inc. which is the majority owner of NGM. The PA was executed in 2018 and was developed by the BLM, Mount Lewis and Tuscarora Field Offices, the Nevada State Historic Preservation Office (SHPO), and NGM. The PA guides how Section 106 consultation under the NHPA is conducted for undertakings within the defined Area of Implementation. The BLM consulted with and invited the following tribes as consulting parties to the PA: the Te-Moak Tribe of Western Shoshone Indians, the Yomba Shoshone Tribe, the Duckwater Shoshone Tribe of the Duckwater Reservation, the Ely Shoshone Tribe, and the Shoshone-Paiute Tribe of the Duck Valley Reservation (Tribes). The current version of the PA was signed in September 2018 and addresses undertakings which include existing and new mining operations and mineral exploration projects within the defined Area of Implementation.

NGM would implement the following ACEPMs, per the existing September 2018 PA:

- Facilities in the proposed Goldrush Mine Plan boundary have been located and designed to avoid and maintain access to the Mount Tenabo/White Cliffs and the Horse Canyon Property of Cultural and Religious Importance (PCRI). Access to these areas via public roads would be maintained throughout the life of the Goldrush Mine. Facilities have also been designed to avoid the historic Cortez and Shoshone Wells town sites. NGM would provide for continued access to the historic Cortez townsite and has erected a marker designed in coordination with the BLM at the town site to provide historical information for visitors.
- Cultural resources not previously identified which are discovered while conducting any approved undertakings are subject to all the terms outlined in the September 2018 PA. All ground-disturbing activities within 50 meters of the location of discovery would be halted and the BLM Agency Official would be contacted within 24 hours after the discovery. The BLM Agency Official would issue a Notice to Proceed before ground-disturbing activities can continue. If the site is eligible for inclusion in the National Register of Historic Places (NRHP), impacts would be mitigated through avoidance or an archeological data recovery program developed pursuant to the September 2018 PA.
- NGM would continue to train employees and contractors not to engage in the illegal collection of historic and prehistoric materials, cultural resources avoidance procedures, and off-road travel procedures. If the undertaking would adversely affect an historic property, directly or indirectly, then BLM in consultation with NGM, the Tribes, and SHPO, would develop and implement a mitigation plan prior to authorizing ground disturbance as outlined in Stipulation G of the PA.

#### **2.1.10.3 Erosion and Sediment Control**

- BMPs would be used to limit erosion and reduce sediment in precipitation runoff from the Goldrush facilities and disturbed areas during construction, operations, and initial stages of reclamation. These BMPs may include, but are not limited to, diversion and routing of stormwater using accepted

engineering practices, such as diversion ditches, and the placement of erosion control devices such as sediment traps and rock and gravel cover.

- Revegetation of disturbed areas would reduce the potential for wind and water erosion. Following construction activities, NGM would seed disturbed areas and growth media stockpiles as soon as practical and safe. Concurrent reclamation would be maximized to the extent practical to accelerate revegetation of disturbed areas. Sediment and erosion control measures would be inspected periodically and after storm events, and repairs would be performed as needed.
- The proposed Goldrush Mine Plan boundary would be covered under the NDEP's general stormwater permit (NVR300000). The Goldrush SWPPP would address the proposed facilities. To limit erosion and reduce sediment transport from disturbance areas, erosion control measures as outlined in the SWPPP and proposed Goldrush Mine Plan would be installed and maintained. Stormwater diversions would be installed around the Goldrush facilities, as needed, to divert stormwater runoff around disturbance areas. Facilities would be monitored following spring snowmelt and intense rain events to ensure that drainage and sediment control measures are effective and operating properly. In addition, implementation of concurrent reclamation would further reduce erosion potential.

#### **2.1.10.4 Geology and Minerals**

- Geotechnical monitoring would be conducted during active mining. In addition, operational procedures for controlling blasting and reducing ground vibrations would facilitate underground mining.
- A Waste Rock Management Plan (Itasca 2020) was developed which characterizes waste rock geochemistry, describes the mine plan and anticipated waste rock tonnages. This plan discusses the strategy for classification, underground sampling and identification, waste rock placement, and stormwater management. The management plan is protective of water resources. Waste rock from the Goldrush Mine would be sampled and analyzed per the WPCP.
- The geochemical characterization indicated that Goldrush Mine waste rock is overall acid-neutralizing. Based on the results, any PAG waste rock would be placed internal to the Canyon WRF, located at the Cortez Mine, and encapsulated or blended with acid-neutralizing waste rock prior to placement. There would be adequate capacity to buffer the anticipated PAG material from the Goldrush Mine. Maintaining circumneutral conditions within the Canyon WRF would limit potential for development of elevated solute concentrations associated with acidic effluent.
- NGM's current operations at the Cortez Mine include a Subsidence and Earth Fissure Monitoring Plan. The Plan is currently under revision and incorporates the maximum extent of the four-inch subsidence contour projected at the end of mining at the Goldrush Mine. Baseline Interferometric Synthetic Aperture Radar (InSAR) studies in Pine Valley began in 2018.
- Conventional drilling and blasting techniques would be used to facilitate the proposed underground mining. Blasting techniques would include monitoring with blasting seismographs, and using acceptable vibration standards and techniques to predict and control blast vibrations that reduce the risk of off-site damage. Blasting activities would maintain the minimum safe vibration threshold for residential structures of 0.5 inches per second within a site-to-source distance of up to 1,500 feet.
- Underground workings are expected to encounter mineralized and altered rock with poor rock quality. The underground workings would be backfilled with CRF, paste fill, or waste rock.
- WRF designs are based on industry standards for the minimum static and pseudostatic factors of safety for design of WRFs. These designs include estimations of design peak ground acceleration that would be generated by an operational basis earthquake (i.e., the earthquake for which the structure is designed to resist and remain operational).

#### **2.1.10.5 Hazardous Materials and Solid Waste**

- Petroleum products would be used on site. Petroleum products are excluded as hazardous substances under the Comprehensive Environmental Response, Compensation, and Liability Act section 101(14). If regulated materials are spilled, measures would be taken under NGM spill response guidelines to control the extent of the spill, and the appropriate agencies would be notified in accordance with the applicable federal and state regulations.
- Solid waste would be collected and transported offsite periodically for disposal at an approved solid waste facility.
- Hazardous waste generated in the proposed Goldrush Mine Plan area would be taken to the temporary hazardous waste storage area at the Cortez Mine that is operated pursuant to NRS 459.400 to 459.600.
- The hazardous substances to be used in mining activities under the Proposed Action would be transported to an approved offsite facility in accordance with U.S. Department of Transportation (USDOT) and applicable NDOT regulations. All shippers would be licensed by the USDOT, the NDOT, and other applicable agencies.
- Chemicals would be stored and handled in accordance with manufacturer's recommendations and applicable regulations. The Safety Data Sheets for materials used at the Goldrush Mine would be kept at locations that are accessible to the working personnel in accordance with the MSHA Hazard Communication Standard. The hazardous materials to be used at the Goldrush Mine would be handled as recommended on the manufacturer's Safety Data Sheets.
- An Emergency Response Plan would be maintained and implemented, as needed, throughout the life of the mine. This plan would describe the system that would be used for the prevention, response, containment, and safe cleanup of any spills or discharges of substances that potentially may degrade the environment. The procedures outlined in this plan would apply to potential leaks and spills that would remain within the mine boundary or flow off site.
- Transportation and handling of fuel, lubricants, reagents, and explosives would be conducted by licensed carriers and properly trained workers in accordance with applicable federal, state, and local regulations.
- Tanker trucks would be inspected by NDOT and USDOT and would have a Certificate of Compliance issued by the Nevada Motor Vehicle Division.
- Hazardous materials transporters are required to maintain an emergency response plan which details the appropriate response, treatment, and cleanup for a material spilled onto land or into water. Companies contracted to transport reagents and hazardous substances to the Goldrush Mine would follow all applicable State and Federal safety regulations and would have their own company-specific spill and contingency plans. Contracted carriers would notify local emergency response personnel, the National Response Center (for discharge of reportable quantities of hazardous substances), Eureka County, and the USDOT in the event of an accident involving hazardous materials.
- All shipping containers and vehicles would be USDOT-approved for the specific materials. All shipments of hazardous substances would be properly identified and placarded to comply with regulations concerning labeling. Shipping papers would be accessible and must include information describing the substance, immediate health hazards, fire and explosion risks, immediate precautions, firefighting information, procedures for handling leaks or spills, first aid measures, and emergency response telephone numbers.

- The Barrick Cortez Solid and Hazardous Waste Management Plan and the Emergency Response Plan (BCI 2018a, 2018b) would outline the procedures for the handling of solid and hazardous waste generated at the site, as well as reagent storage, transportation, and handling requirements.
- All hazardous substances would be handled in accordance with applicable MSHA or Occupational Safety and Health Administration regulations (Titles 30 and 29 of the CFR).
- A training program to inform employees of their responsibilities regarding proper waste disposal procedures would be implemented for the Goldrush Mine.
- Blasting agents would be stored in appropriate storage bins separate from the explosive magazine. Blasting initiation devices would be stored in magazines that conform with federal and state regulations. Explosives materials for the Goldrush Mine would be stored in compliance with applicable Department of Homeland Security, Bureau of Alcohol, Tobacco, Firearms and Explosives, and MSHA regulations.
- Materials not spent or consumed (e.g., petroleum oils and antifreeze) would be recycled to the extent possible or disposed of off-site in an approved depository in accordance with all applicable federal and state regulations.
- NGM would have the necessary spill containment and cleanup equipment available at the site, and personnel would be able to quickly respond. All spills, including transportation and loading/unloading spills occurring on site, would be cleaned up as soon as possible.
- NGM would continue to provide annual inventories of hazardous materials to the appropriate agencies, including the State Fire Marshal's office. All materials proposed for use at the Goldrush Mine are currently in use at the existing adjacent operations areas. NGM has previously provided information relative to hazardous materials on hand at the existing operations to the State Fire Marshal, state and local planning agencies, and local fire departments as required by the Emergency Planning and Community Right-to-Know Act.
- All hazardous materials would be shipped to and from the site in accordance with applicable USDOT hazardous materials regulations.
- The existing and proposed facilities that would be used under the proposed Goldrush Mine were designed to minimize the potential for an upset that could result in a major spill.
- The proposed Goldrush Mine Plan would provide the structures, procedures, and training to minimize the effects of a potential spill of a hazardous material to soils, vegetation, wildlife, and water resources.
- The authorized PCS Management Plan Cortez Hills, Pipeline Project, Pipeline Infiltration Project, and HC/CUEP Crescent Valley, Nevada (Broadbent 2018) would be revised to include PCS generated within the proposed Goldrush Mine Plan area.

#### **2.1.10.6 Land Use, Transportation and Access**

- With the exception of the historic Horse Canyon Mine Plan pits, concurrent reclamation would be conducted on inactive mine and exploration areas when reclamation is practical and safe, and the area is no longer needed.
- With the exception of stormwater controls, concrete sets for the portal and rockfall fencing above the portal pad, 120-kV power lines and two switching stations, culverts, and roads selected by BLM for post-mining use, all of the surface disturbance associated with the mine components would be reclaimed.

- Following closure and final reclamation, the proposed Goldrush Mine Plan area would support the multiple land uses of livestock grazing, wildlife habitat, and recreation. Post-closure land uses would be in conformance with the BLM Battle Mountain RMP, Eureka-Shoshone RMP, the BLM Final Elko Proposed RMP and Final EIS Elko Resource Area, and Lander County and Eureka County zoning ordinances.
- NGM would conduct a traffic study to determine increased traffic effects in relation to the capacity of the roadway system.
- To limit access through Horse Canyon and the proposed active operations site, NGM would complete a public access road that would connect the Horse Canyon haul road to a Eureka County road.
- The paste plant road would remain as a post-mining feature for public access to Mount Tenabo.
- Site access to the portal pad area would be restricted to employees and authorized visitors for safety and security reasons.

#### **2.1.10.7 Monitoring**

- Monitoring of meteorological conditions, surface water quality and quantity, groundwater quality and quantity, revegetation, air quality, cultural resources, noxious weeds, reclamation, slope stability, stormwater, traffic, waste rock chemistry, and wildlife would be conducted in accordance with approved monitoring plans and applicable federal, state, and local permits. Noxious weed monitoring would be undertaken in conjunction with revegetation monitoring. Migratory bird surveys would be undertaken prior to construction activities. Geotechnical monitoring, consisting of geologic structure mapping and stability analyses, would be conducted during active mining to assist in optimizing underground mine designs.

#### **2.1.10.8 Native American Traditional Values**

- NGM continues to support the BLM's consultation with the Tribes and, upon BLM and Tribal request, facilitates Tribal meetings and field visits.
- NGM also engages in ongoing outreach with the above listed tribal communities. This includes quarterly Dialogue Meetings and a Western Shoshone Cultural Advisory Group that visits NGM projects and sites, advises NGM on matters of cultural importance, and reports back to their communities on NGM's operations.
- Formally trained cultural specialists would be provided the opportunity to be present during Goldrush Mine-related construction activities (i.e., new surface disturbance) to provide information and/or recommendations to the BLM, as well as during any data recovery (i.e., archaeological excavation) within the proposed Goldrush Mine Plan boundary. NGM would select a cultural specialist from a list provided by the Western Shoshone. If the selected cultural specialist is not available upon two days' notice, a different cultural specialist may be selected. If none are available within a reasonable period, NGM would document that a reasonable attempt was made to contact the Tribes and obtain an observer.
- To limit access through Horse Canyon and the proposed active operations site, NGM would complete a public access road that would connect the Horse Canyon haul road to a Eureka County road.
- The paste plant road would remain as a post-mining feature for public access to Mount Tenabo.

#### **2.1.10.9 Noise**

- NGM has incorporated sound reduction measures in the engineering design of the Goldrush Mine. The ventilation fans would be located underground in the ventilation raises to reduce the potential for sound propagation.
- NGM would conduct routine fleet maintenance on all fleet vehicles.

#### **2.1.10.10 Paleontological Resources**

- If vertebrate fossils are discovered during construction, operation, or reclamation, construction activities would be halted in the area of discovery, and NGM would contact the BLM Agency Official and if requested, may also contact a qualified paleontologist. The BLM Agency Official and/or the qualified paleontologist would evaluate the discovery within five working days of being notified. If the discovered paleontological resource is determined significant, appropriate measures would be developed to mitigate potential adverse effects. Activities would not resume until a notice to proceed is granted by the BLM Agency Official.

#### **2.1.10.11 Public Safety, Fire Protection, and Access**

- Public safety would be maintained throughout the life of the Goldrush Mine. All equipment and other facilities would be maintained in a safe and orderly manner. Site access to the portal pad area would be restricted to employees and authorized visitors for safety and security reasons.
- The Cortez Mine's fire protection plan would be implemented for the Goldrush Mine. The procedures as outlined in the fire protection plan are in accordance with MSHA and applicable state and county fire code regulations. Adequate fire protection equipment as needed to implement the plan would be maintained on site during operation. A fire water reserve would be maintained in the facility water supply tanks.
- Goldrush Mine would operate in conformance with all MSHA safety regulations (30 CFR 1-199).

#### **2.1.10.12 Range Resources**

- NGM would protect fences, gates, stock ponds, and other range improvements within the proposed Goldrush Mine Plan area. Gates would be closed and/or locked as appropriate.
- NRCS wildlife fencing would be installed around the RIB galleries to prevent livestock from entering the infiltration basins.
- Livestock watering troughs would be installed to deter livestock and wildlife from attempting to access water in the RIB galleries and would be operated on a rotational basis in coordination with the BLM and grazing permittees. The troughs would be located within the Place of Use as authorized by the State Engineers Office. Meters would be installed to record the amount of water going to the troughs.
- Areas undergoing concurrent reclamation would be fenced as necessary to minimize livestock and wildlife access until vegetation has re-established. In addition, concurrent reclamation would be conducted on inactive mine and exploration areas when reclamation is practical and safe, and the area is no longer needed.
- NGM would monitor the water-related range improvements that potentially may be affected by mine-related groundwater drawdown. If effects to these water sources as a result of mine-related drawdown are identified, NGM would coordinate with the BLM to determine the appropriate placement and type of water-related range improvement to be developed. NGM routinely would inspect the replaced water-related range improvements to ensure that they are operating in an appropriate manner.

- The proposed disturbance area would be reclaimed in accordance with the site's reclamation plan and ACEPMs. Following closure and final reclamation, the proposed Goldrush Mine Plan area would support the multiple land uses of livestock grazing, wildlife habitat, and recreation. Post-closure land uses would be in conformance with the BLM Battle Mountain RMP, Eureka-Shoshone RMP, the BLM Final Elko Proposed RMP and Final EIS Elko Resource Area, and Lander County and Eureka County zoning ordinances.
- NGM is not proposing new fencing to restrict livestock access within the proposed Goldrush Mine plan area.

#### **2.1.10.13 Recreation**

- Following closure and final reclamation, the proposed Goldrush Mine Plan area would support the multiple land uses of livestock grazing, wildlife habitat, and recreation. Post-closure land uses would be in conformance with the BLM Battle Mountain RMP, Eureka-Shoshone RMP, the BLM Final Elko Proposed RMP and Final EIS Elko Resource Area, and Lander County and Eureka County zoning ordinances.
- A public access road would be constructed to connect the Horse Canyon haul road to a Eureka County road that accesses Horse Canyon.

#### **2.1.10.14 Social and Economic**

- The proposed Goldrush Mine overall would benefit the economic conditions of the study area, and while any new proposed industry would place some burdens on public infrastructure, NGM remains committed to supporting Nevada socioeconomic environment, with particular focus on support of local communities.

#### **2.1.10.15 Soils, Vegetation, and Invasive and Non-Native Species**

- To minimize the introduction and spread of noxious weeds, the Goldrush Mine would utilize the Noxious Weed Control Plan. The plan contains a risk assessment, management strategies, provisions for annual monitoring and treatment evaluation, and provisions for treatment. The monitoring results would be the basis for updating the plan and developing annual treatment programs.
- Wet topsoil handling would be minimized when possible during soil salvage and reclamation.
- NGM would implement a fire control plan to minimize potential fire-related impacts to vegetation and soil.
- NGM would conduct noxious weed management activities in coordination with Eureka County.
- Growth media stockpiles would be recontoured to slopes of 2.5H:1V as well as seeded with an interim seed mix to minimize wind and water erosion.
- The potential for erosion and sedimentation in precipitation runoff from the Goldrush Mine facilities and disturbed areas would be minimized during construction, operations, and initial stages of reclamation through the following BMPs:
  - Diversion and routing of stormwater using accepted engineering practices, such as diversion ditches, and the placement of erosion control devices such as sediment traps and rock and gravel cover.
  - Revegetation of disturbed areas would reduce the potential for wind and water erosion.
  - BMPs such as silt fences or staked weed-free straw bales would be used, as necessary, to control sediment transport.
  - The Goldrush Mine area is covered under the NDEP's general stormwater permit (NVR300000); erosion control measures as outlined in the SWPPP and Goldrush Mine



Plan would be installed and maintained: stormwater diversions installed, inspections following intense events conducted to ensure effectiveness; implement concurrent reclamation to reduce erosion potential.

- A reclamation plan would be implemented which addresses earthwork and recontouring, revegetation and stabilization, and monitoring operations necessary to satisfactorily reclaim the proposed disturbance.
- Prior to seeding and following the placement of growth media, disturbance areas would be recontoured, surfaces would be ripped or scarified (as needed), and growth media would be redistributed.
- Seeding would typically occur between the months of October and April to take advantage of the winter/spring moisture. The individual species and application rates have been selected to promote optimum seed germination and plant growth, and have been approved by the BLM. The seed mixes contain native species with characteristics suitable for site conditions while affording erosion protection and facilitating the post mining land uses of wildlife habitat and livestock grazing.
- Surface disturbance would be limited to that which is reasonably incidental to the development of the Goldrush Mine.
- Where suitable as a growth media, surface soils and some alluvium would be managed as a growth media resource and removed, stockpiled, and used during reclamation.
- The Goldrush Mine reclamation plan includes NDEP permit applications that would be reviewed by appropriate bureaus within the agency. The NDEP reviews and approvals also involve BLM through various memorandums of understanding, particularly with respect to reclamation and water quality. A reclamation plan would be implemented which addresses earthwork and recontouring, revegetation and stabilization, and monitoring operations necessary to satisfactorily reclaim the proposed disturbance.
- Following the placement of growth media, reclamation practices would include contouring, seedbed preparation, decompaction (if necessary).

#### **2.1.10.16 Survey Monuments**

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

#### **2.1.10.17 Sustainability Activities**

- NGM would continue to take a comprehensive approach to sustainability for the Goldrush Mine. This includes health and wellness programs for its workforce to continually improve on attraction, retention, and employee performance. Environmental stewardship is also integrated into all activities including close collaboration with: Native American communities who have traditional ties to the lands where NGM operates; environmental and sportsmen's organizations; universities conducting research; and regulators to update mining plans from development to post-closure. Through this engagement, NGM has developed and is implementing a strategy to maintain stakeholder engagement. This includes conducting social risk assessments; keeping extensive stakeholder matrices and maps; conducting ongoing engagement; making social investments focused in the areas of education, environment, cultural heritage, and community development; and maintaining a complaint management mechanism.

#### **2.1.10.18 Vegetation**

- Following closure and final reclamation, the proposed Goldrush Mine Plan area would support the multiple land uses of livestock grazing, wildlife habitat, and recreation. Post-closure land uses would be in conformance with the BLM Battle Mountain RMP, Eureka-Shoshone RMP, the BLM Final Elko Proposed RMP and Final EIS Elko Resource Area, and Lander County and Eureka County zoning ordinances.
- Reclamation measures are described in the reclamation plan that would control runoff and reduce erosion. Seed mix species and application rates have been selected to promote optimum seed germination and plant growth. The mixes are based on species effectiveness in providing erosion protection, the ability to grow within the constraints of the low annual precipitation experienced in the region, species suitability for site aspect, and the site elevation and soil type. The selected mixtures would provide forage and cover species similar to the pre-disturbance conditions, facilitating the post-mining land uses of livestock grazing and wildlife habitat.
- Post-mining monitoring of revegetation would be conducted in accordance with applicable federal, state, and local permits.
- Growth media stockpiles would be reclaimed with an interim seed mix to stabilize the growth media, reduce soil erosion, and minimize the potential for the establishment of noxious weeds or invasive species.
- Annual pre-disturbance surveys for Beatley buckwheat (*Eriogonum beatleyae*) would be conducted between May and August (when the species is known to flower) in potential habitat (dry, exposed areas and weathered knolls with sagebrush, pinyon-juniper woodlands, mountain mahogany). If Beatley buckwheat are located during the survey, NGM would coordinate with the BLM to evaluate the potential extent of impacts and determine if additional mitigation is necessary.

#### **2.1.10.19 Visual Resources**

- Impacts to visual resources would be minimized through careful location, minimal disturbance, and reclamation activities that provide for a more natural, post-mining landscape. The color of buildings would be selected to blend with adjacent landscape. Following the completion of mining operations, structures and buildings would be dismantled and removed from the site.
- To minimize effects from lighting, hooded stationary lights and light plants would be used. Lighting would be directed onto the work area only and away from adjacent areas not in use, with safety and proper lighting of the active work areas being the primary goal. Lighting fixtures would be hooded and shielded as appropriate. Lighting designed to reduce the impacts to night skies would be used.
- Final reclamation would include grading and contouring to resemble surrounding landforms and seeded with native vegetation to re-establish pre-Goldrush Mine vegetation communities.
- Berms required for haul roads would naturally block vehicle lights emanating from haul roads that may be directed toward public roads during travel. In the Goldrush Mine area, the lights would be naturally shielded by distance from main access roads.

#### **2.1.10.20 Water Resources**

- Mineral exploration and development drill holes, groundwater monitoring wells, piezometers, boreholes, ventilation raises, and production dewatering wells would be properly abandoned following completion of their functions.
- Process components would be designed, constructed, and operated in accordance with the NDEP regulations.

- Culverts would be used as necessary to route diverted surface flow underneath access roads. The culvert outlet elevation(s) would be designed at or near the existing ground elevations to minimize any hydraulic jump and reduce the potential for erosion as the stormwater flows from the culvert(s) onto natural ground.
- When drainages must be crossed with a road, BMPs would be followed to minimize the surface disturbance and erosion potential. Temporary culverts and/or straw bales would be utilized to protect drainages.
- The Goldrush Mine SWPPP would identify BMPs that would be used such that sediments, cuttings, drilling fluids, or any other material or substance would not enter flowing drainages. NGM also maintains the Goldrush Mine Spill Prevention, Control, and Countermeasures Plan that describes measures implemented to prevent oil discharges from occurring and to prepare NGM to respond in a safe, effective, and timely manner to mitigate the impacts of oil discharges. If regulated materials are spilled, measures would be taken under NGM spill response guidelines to control the extent of the spill, and the appropriate agencies would be notified in accordance with the applicable federal and state regulations. If a spill exceeds reportable quantities, it would be reported to the Nevada Division of Emergency Management, NDEP, Bureau of Mining Regulation and Reclamation, USEPA, National Response Center, BLM, Lander County Emergency Response Coordinator, Eureka County Emergency Response Coordinator, and local authorities in compliance with all agency-specific communication time limits.
- In areas where there are temporary roads with a structure that requires replacement, NGM would replace like-for-like under the CWA maintenance exemption without prior notice to the USACE or the NDEP. Permanent roads that need a culvert to be enlarged or a change in culvert location, or design would be evaluated on a case-by-case basis and may require prior notification to both the USACE under Section 404 of the CWA and NDEP for water quality certification under Section 401 of the CWA.

#### **2.1.10.21 Wetlands and Riparian Areas**

- NGM would apply a 30-meter buffer around wetlands and riparian areas, even if existing disturbance occurs within the 30-meter buffer.

#### **2.1.10.22 Wildlife**

- Fencing would be installed around lined ponds.
- In order to avoid potential impacts to breeding migratory birds, NGM would have a third-party biologist perform ground surveys each year of all areas proposed for surface disturbance for the presence of active nests. Surface disturbance clearance surveys would be conducted following BLM's Statewide Wildlife Protocols (BLM 2014) during the nesting season, defined by the BLM as March 1 through July 31. Goldrush Mine-related disturbance for a specific location would be conducted within 14 days of the survey, or another survey would be conducted. When active nests are located, or if other evidence of nesting is observed (e.g., mating pairs, territorial defense, carrying nesting material, transporting food), the biologist would notify BLM and confirm an appropriate avoidance buffer around the nest. The biologist would inform BLM and NGM when the birds have left the nest. NGM would not conduct any surface disturbing activities within the avoidance buffer until the biologist determines that the birds are no longer nesting.
- Should surface disturbance at the Goldrush Mine occur during raptor nesting season (March 1 through July 31), a ground survey would be conducted. Goldrush Mine-related disturbance for a specific location would be conducted within 14 days of the survey, or another survey would be conducted. The protocol for burrowing owl surveys would be coordinated with the BLM Battle Mountain biologist prior to ground disturbance. If active nests are located, or if other evidence of nesting (i.e., mated pairs, territorial defense, carrying nesting material, transporting food) is observed, a protective buffer would be established around the nest. No construction would occur

within the avoidance buffer until the birds are no longer actively breeding or rearing young, or until the young have fledged.

- Aerial raptor surveys would be conducted annually during the overall raptor breeding season utilizing the methods outlined in Pagel et al. (2010) for the life of the mine. The survey area would include the operations area plus a 10-mile buffer. The annual survey report would be provided to the BLM and NDOW. Additionally, NGM would implement their BBCS which addresses the Migratory Bird Treaty Act. NGM is coordinating with the USFWS and BLM on the appropriate survey buffer and the development of an Eagle Conservation Plan and Eagle Incidental Take permit associated with but not the Purpose of the Activity.
- Transmission lines would be designed and constructed in accordance with applicable regulations to minimize raptor electrocution and collision potential. To minimize the collision potential for foraging raptors and other birds, standard safe designs as outlined in Reducing Avian Collisions with Power Lines (APLIC 2012) would be incorporated, as applicable. To minimize the potential for electrocution of raptor species attempting to perch on the lines in areas of identified avian concern, standard safe designs as outlined in Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006 (APLIC 2006) and Avian Protection Plan Guidelines (APLIC and USFWS 2005) would be incorporated, as applicable.
- NGM would ensure that all appropriate personnel undergo training on the issues and protocols outlined in the BBCS. This training ensures that all appropriate personnel have a thorough understanding of the BBCS and their responsibility to bird and bat protection and regulatory compliance. As part of this training, personnel would be well versed on what actions need to be taken when nests are encountered as well as when injured or deceased bird and bat species are encountered.
- Potential impacts to GRSG habitat from the Goldrush Mine would be evaluated under the terms of the Bank Enabling Agreement (BEA) between the USFWS, BLM, and NGM or through the Nevada Conservation Credit System. NGM is committed to sage-grouse mitigations via the BEA, which is recognized in NAC 232.460(c). Compensatory mitigation would be determined in accordance with the BEA or the state system. NGM would implement approved habitat restoration, enhancement, and/or preservation actions to offset impacts with a net conservation gain for GRSG habitat.
- NGM would adhere to the ACEPMs as established by the 2015 ARMPA Management Decision regarding noise limits and seasonal restrictions (March 1 to June 15) during construction, operation, and maintenance of the RIBs to not exceed 10 decibels above ambient sound levels at least 0.25 mile from active and pending leks from two hours before to two hours after sunrise and sunset during the breeding season (March 1 to June 30, Lek: March 1 to May 15, and Nesting: April 1 to June 30). NGM would adhere to the above restrictions for early brooding between May 15 through June 15.
- Predictive modeling incorporating any engineering controls would be conducted to confirm noise is below the 10 A-weighted decibels threshold. NGM would install sound attenuation enclosures for the four skid-mounted 350-horsepower electric pumps at the Grass Valley pump station and three pumps at the Cortez Hills station or other engineering controls to reduce noise impacts as an ACEPM for the Goldrush Mine Plan.
- To reduce noise impacts to leks, NGM would use drilling setbacks distances for typical drilling operations set forth in Tables 1 through 3 of the report entitled Cumulative Noise Levels for the NGM's Goldrush Project, Eureka County, Nevada dated October 30, 2020 (Saxelby 2020c).
- NGM would install flight diverters on fencing around the RIBs as recommended by the NRCS program.
- NGM would construct berms over the dewatering conveyance pipelines leading to the RIB galleries.

- The ACEPMs would be applicable to potentially affected active and pending active leks within four miles of the proposed Goldrush Mine Plan boundary, as listed below. The ACEPMs would subject to review by a BLM biologist and NDOW and would be adjusted based on annual surveys of lek activity. Upon identifying any previously unknown GRSG lek/strutting ground, nesting or brood rearing area, NGM would notify the NDOW.
  - The Quartz Road lek, Horse Canyon lek 1, and the New Cortez Grass Valley lek are all active leks. The Horse Creek leks 2 and 3 are also active leks but are likely not distinct and are part of a multi-lek complex.
  - Three new leks were discovered in 2017: Curlow Flat 1, Curlow Flat 2, and Rocky Hills 1. The newly discovered Curlow Flat lek is likely a multi-lek complex.
  - The New Brock Canyon Lek is excluded from ACEPMs due to topographical features, which reduce or eliminate noise generated from the Proposed Action.
- NGM has incorporated sound reduction measures in the engineering design of the Goldrush Mine. The ventilation fans would be located underground in the ventilation raises to reduce the potential for sound propagation.
- Prior to conducting an extensive ground disturbance (approximately five acres or more), NGM would conduct a desktop analysis to identify all historic mine workings within 0.25 mile of the proposed disturbance areas. The desktop analysis would be submitted to the BLM, NDOW, and the Nevada Division of Minerals for assessment of sites that potentially may provide suitable bat habitat.
- Prior to conducting an extensive ground disturbance (approximately five acres or more), NGM would conduct a pygmy rabbit (*Brachylagus idahoensis*) survey in accordance with the BLM Wildlife Survey Protocols and Ulmschneider et al. (2008). Broad-based burrow surveys would be conducted in areas known to have potentially suitable habitat. Where burrows are encountered, nine- to 15-meter spaced transects would then be established to map the extent of active burrows. All past locations of burrows would be surveyed to generate an updated status in these areas. If active pygmy rabbit burrows are observed, NGM would coordinate with NDOW and BLM regarding potential mowing in the vicinity of the active burrows in advance of ground disturbance to minimize potential impacts to this species.
- NGM would obtain the necessary project permits for water quality protection, including a WPCP, Section 401 certification, and an industrial artificial pond permit. Adherence to stipulations in these permits would protect all wildlife against mortalities using the following means:
  - Minimum facility design and containment requirements are to be followed to prevent degradation of waters of the State.
  - All artificial or man-made bodies of water that contain any chemical in solution at levels lethal to wildlife must be covered or contained in a manner that shall preclude access by birds and bats. All covers or containers shall be maintained in a manner that shall continue to preclude access by wildlife for as long as the pond or container can hold water.
  - Any chemical-laden fluids that are the result of any process and that are impounded in a pond that is too large to cover or contain a non-lethal level at the point where the fluid flows from a pipe into the pond or open conveyance system. Chemical neutralization and dilution are among methods that may be used to reduce chemical concentration.
- Following closure and final reclamation, the proposed Goldrush Mine Plan area would support the multiple land uses of livestock grazing, wildlife habitat, and recreation. Post-closure land uses would be in conformance with the BLM Battle Mountain RMP, Eureka-Shoshone RMP, the BLM Final Elko Proposed RMP and Final EIS Elko Resource Area, and Lander County and Eureka County zoning ordinances.

- Remedial actions may be taken based upon the information gathered from site investigations and reported. In consultation with the USFWS, BLM, and NDOW, NGM would determine whether implementation of remedial protection measures is warranted to protect birds and bats.
- NGM would develop cuts into the haul road berms where there are mule deer migration corridors to facilitate mule deer migration and drainage of stormwater.
- NGM would relocate impacted populations of western toads (*Anaxyrus boreas*) to suitable habitat with a current population of western toads. Prior to any relocation, NGMs would develop a western toad relocation plan to be approved by the BLM and NDOW.

## 2.2 No Action Alternative (Currently Authorized Activities)

Under the No Action Alternative, the development of the Goldrush Mine would not be authorized and NGM would not construct, operate, and close a new underground mine (i.e., the Goldrush Mine). Modifications or reclassification of acres as proposed under the Proposed Action would not occur, the dual use of facilities between the Cortez Mine and Goldrush Mine operations would not occur. NGM would be permitted to continue current authorized mining and exploration activities under the approved plans, which are (Figures 2-9 and 2-10):

- The Horse Canyon Mine Plan (N-66896 and Reclamation Permit No. 0249);
- The HC/CUEP Plan (N-66621 and Reclamation Permit No. 0159);
- The West Pine Valley Exploration Project Plan (N-77213 and Reclamation Permit No. 0229); and
- The Cortez Mine Plan (N-67575 and Reclamation Permit No. 0093).

Mining under these plans has been completed, is ongoing, or would expand under current authorizations. Most of the impacts from the No Action Alternative (for example, surface disturbance or lowering of groundwater levels from dewatering) have already occurred or are occurring (for example, noise, economic impacts). The comparison of the two alternatives should be viewed as identifying the incremental additional impacts of the Proposed Action beyond those that have occurred, are occurring or would occur under the existing exploration and mine approvals that are the No Action Alternative. The four authorized exploration and mine Plans including the authorized surface disturbance are discussed below and are shown on Figure 2-9. Total authorized disturbance under the No Action Alternative is 22,433 acres as shown in Table 2-4. Details of the four mine Plans that make up the No Action Alternative is provided in the Project Alternatives SIR for the Goldrush Mine Project (BLM 2021a).

**Table 2-4 No Action Disturbance**

Exploration/Mine Plan	Disturbance (acres)		
	Private	Public	Total
Horse Canyon Mine Plan	421.5	3.2	424.7
HC/CUEP Plan	81.6	606.5	688.1 <sup>1</sup>
West Pine Valley Exploration Plan	10.2	139.8	150.0
Cortez Mine Plan	3,173.2	17,997.2	21,170.4
<b>Total</b>	<b>3,686.5</b>	<b>18,746.7</b>	<b>22,433.2</b>

Source: BLM 2021a

Note: Details regarding acreage calculations are provided in the Project Alternatives SIR for the Goldrush Mine Project

<sup>1</sup>Includes 99.1 acres of pre-1981 disturbance that would be reclaimed.

### 2.2.1 Authorized Horse Canyon Mine Plan

NGM is the operator of the Horse Canyon Mine, an authorized open pit mine (Figure 2-9). The authorized Horse Canyon Mine Plan boundary encompasses approximately 1,929 acres (NGM 2021). Previous NEPA actions associated with the Horse Canyon Mine are presented in Appendix C.

The authorized Horse Canyon Mine facilities consisted of pits, WRFs, roads, a shop, engineering and management offices, fuel storage tanks, parking areas, a warehouse, a storage yard, two water wells and a pond to collect water for dust control on the haul road. The Horse Canyon Pit was developed in 1983 along with the north and south WRF. Approximately three years later, the South Extension and South Silicified Pits were developed along with additional WRFs (NGM 2021). Mining under the Horse Canyon Mine Plan ended in 1987. Some areas have been reclaimed, some reclamation is ongoing, and some disturbed areas have been used to support exploration and would be reclaimed.

NGM uses the existing and authorized disturbance in the Horse Canyon Mine Plan for sumps and to store materials and equipment consistent with the authorized Horse Canyon Mine Plan.

### **2.2.2 Authorized Horse Canyon/Cortez Unified Exploration Project Plan**

The authorized HC/CUEP Plan boundary encompasses approximately 22,141 acres and is operated by NGM (**Figure 2-9**). Approximately 589 acres of surface disturbance are authorized under the HC/CUEP Plan (NGM 2021). Previous NEPA actions associated with HC/CUEP are presented in **Appendix C**.

The authorized HC/CUEP project facilities consist of the following components: underground twin declines, exploration drifts, and portal entrances; portal pad; power line and water supply line; underground exploration and associated infrastructure; overland access; trenching; test and monitoring wells; communication sites; and exploration drill pads, roads, and sumps.

### **2.2.3 Authorized West Pine Valley Exploration Project Plan**

The authorized West Pine Valley Exploration Plan boundary encompasses approximately 33,404 acres, approximately 478 acres being private land and 32,926 acres being public land administered by the BLM Elko District, Tuscarora Field office, and is operated by NGM (**Figure 2-9**). Approximately 150 acres of surface disturbance are authorized under the West Pine Valley Exploration Plan (NGM 2021). As authorized, exploration activities at West Pine Valley would be phased and disturbance of up to 150 acres would not occur all at once. Additionally, NGM undertakes concurrent reclamation in those areas in West Pine Valley that have been drill tested and are no longer viable geologic targets. Existing disturbance within West Pine Valley is presented on **Figure 2-9** and consists of exploration pad, roads, and ancillary support facilities. Previous NEPA actions associated with West Pine Valley are presented in **Appendix C**.

### **2.2.4 Authorized Cortez Mine**

NGM is the operator of the Cortez Mine (**Figures 2-9** and **2-10**). Previous NEPA actions associated with the Cortez Mine are presented in **Appendix C**. Details of the mine Plans associated with the Cortez Mine are provided in the Project Alternatives SIR for the Goldrush Mine Project (BLM 2021a). The authorized Cortez Mine Plan boundary encompasses approximately 62,372 acres and is operated by NGM. Approximately 21,170 acres of surface disturbance are authorized at the Cortez Mine. The Cortez Mine includes the Pipeline Complex, Gold Acres Complex, Cortez Complex, and Cortez Hills Complex. Details regarding each complex within the Cortez Mine are provided in the Project Alternatives SIR for the Goldrush Mine Project (BLM 2021a). The Cortez Mine is one of the largest mining operations in Nevada. In 2020, more than 1,300 people were employed in the operations at Cortez, and in 2020, the mine produced more than 790,000 ounces of gold.

### **2.2.5 Authorized Reclamation**

Under the No Action Alternative, reclamation of disturbance from activities outlined in the Horse Canyon Mine Plan (N-66896); HC/CUEP Plan (N-66621); the West Pine Valley Exploration Project Plan (N-77213); and Cortez Mine (N-67575) would be completed in accordance with the approved reclamation plans, current permits, and applicable federal and state site closure and reclamation requirements. Further details of the authorized reclamation procedures can be found in the following plans: Horse Canyon Mine Plan (CGM 1990), HC/CUEP Plan (Barrick 2017), West Pine Valley Exploration Project Plan (CGM 2004), and Cortez Mine Plan (BCI 2019). A summary of reclamation for each of the mine Plans associated with the No Action Alternative are provided in the Project Alternatives SIR for the Goldrush Mine Project (BLM 2021a).

**2.2.6 Authorized Applicant-Committed Environmental Protection Measures and Mitigation Measures**

Under the No Action Alternative, NGM would continue to implement approved ACEPMs and mitigation measures for the Horse Canyon Mine, HC/CUEP, West Pine Valley Exploration Project, and Cortez Mine as authorized under previous NEPA actions (NGM 2021; BLM 2019b). **Appendix E** provides a complete list of the previously authorized ACEPMs and mitigation measures associated with the Horse Canyon Mine, HC/CUEP, West Pine Valley Exploration Project, and Cortez Mine.

**2.3 Alternatives Considered but Eliminated from Detailed Analysis**

In accordance with 40 CFR 1502.14(a), agencies are required to describe the alternatives considered but eliminated from detailed study and to provide a brief rationale for eliminating the alternative. Alternatives should be explored and objectively evaluated in the EIS. For alternatives that are eliminated from detailed study, the EIS should briefly discuss the reasons for them being eliminated [40 CFR 1502.14(a)]. The CEQ defines reasonable alternatives as “those that are practical or feasible from the technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the applicant” (CEQ 1986).

The BLM NEPA Handbook (H-1790-1) indicates that the range of alternatives should explore alternative means of meeting the Purpose and Need for the action (BLM 2008). The Purpose and Need statement helps to define the range of alternatives. Within the range of alternatives evaluated, the EIS must at least consider the Proposed Action and No Action Alternative and provide a description of alternatives eliminated from further analysis (if any exist), with the rationale for elimination. The agency must analyze those alternatives that are necessary to permit a reasoned choice.

The BLM Handbook also indicates that CEQ regulations direct that an EIS “...include reasonable alternatives not within the jurisdiction of the lead agency” [40 CFR 1502.14(c)]. Potential alternatives were reviewed to determine if they were consistent with the following criteria: 1) Consistent with the Purpose and Need, 2) Technically Practical and Feasible, 3) Economically Practical and Feasible, and 4) Environmentally Reasonable. In addition to the Proposed Action, as required by regulation, the No Action Alternative is included in this document (40 CFR Part 1502.14(c)) as an alternative carried through for full analysis. There were 15 additional alternatives that were considered but dismissed from detailed analysis. These alternatives are summarized in **Table 2-5**. Additional details regarding the alternatives considered but dismissed, as well as the rationale for dismissal, is provided below and in the Project Alternatives SIR for the Goldrush Mine Project (BLM 2021a).

**Table 2-5 Alternatives Considered but Dismissed from Detailed Analysis**

<b>Alternative Category</b>	<b>Alternative Considered but Eliminated from Detailed Analysis</b>	<b>Rationale For Elimination of Alternative</b>
Road Design Alternatives	Post-Mining Road Alternative	Not Environmentally Reasonable
	Road Construction Within Jurisdictional Waters Alternative	Not Environmentally Reasonable
Design Component Alternatives	Open Pit Mine Alternative	Not Environmentally Reasonable
	Dewatering Well Design Component Alternative	Not Environmentally Reasonable
	Process Facility Design Component Alternative	Not Environmentally Reasonable
	Ventilation Raises/Fans Design Component Alternative	Not Environmentally Reasonable
	Power Line Route Design Component Alternative	Not Environmentally Reasonable
	Alternatives Water Disposal Via Injection Well Alternative	Not Economically Feasible/Not Economically Practical and Feasible/Not Environmentally Reasonable
	Alternative Underground Access Alternative	Not Environmentally Reasonable
	Rapid Infiltration Basin Alternative	Not Economically Feasible
	Consolidating or Relocation of Laydown Yards Alternative	Not Economically Feasible/Not Environmentally Reasonable



<b>Alternative Category</b>	<b>Alternative Considered but Eliminated from Detailed Analysis</b>	<b>Rationale For Elimination of Alternative</b>
Transportation Alternatives	Off-Site Ore Transportation Alternative Via Rail, Slurry Line or Dedicated Haul Road	Not Economically Feasible
	Ore Transportation by Rail from Goldrush Underground Mine to the Surface at Cortez Mine Open Pit Alternative	Not Economically Feasible/Environmentally Reasonable
	On-Site Processing Alternative	Not Economically Feasible/Environmentally Reasonable
Waste Rock Handling Alternative	Pediment Backfill Alternative	Not Technically Practical

### **2.3.1 Road Design Alternatives**

#### **2.3.1.1 Post-Mining Road Alternatives**

Under this alternative, all of the newly constructed roads proposed for Goldrush would be reclaimed after mining, except the Lower Horse Canyon Road to the connection point with the South Silicified Haul Road, the South Silicified Haul Road, and the Mount Tenabo Access Road. This alternative would only include newly constructed roads associated with the Goldrush Mine operations and pre-mining existing roads would not be reclaimed after mining and would be left open. This alternative may reduce the amount of permanent disturbance to the landscape as it would allow for more mine road area to be reclaimed post-mining. However, this alternative may increase impacts to Horse Creek, the Horse Canyon PCRI and other cultural resources, and would likely result in blind spots and one-way traffic on portions of the Lower Horse Canyon Road and the South Silicified Road which would result in potential safety concerns (NGM 2020b).

This alternative was eliminated from further analysis because, although it may decrease permanent disturbance, it would have substantially greater environmental impacts to Native American cultural concerns, Horse Creek, and safety concerns in comparison to the Proposed Action.

#### **2.3.1.2 Road Construction Within Jurisdictional Waters Alternative**

In 2014, NGM performed a survey to determine the presence or absence of jurisdictional waters within the Goldrush Mine Plan area. The USACE issued a determination in 2016 that the Pine Creek Headwaters is regulated under Section 404 of the CWA. This determination is valid through January 7, 2021. Most of the drainages are dry throughout the year and convey flows only during high precipitation events or high-water years.

Under the Road Construction Within Jurisdictional Waters Alternative, NGM considered the use of traditional dredge and fill of waters and wetlands in areas where roads were planned instead of the current proposed drainage crossings. NGM would need to apply for a CWA 404 permit to allow for dredge or fill material in jurisdictional waters or wetlands. This alternative would reduce construction time near jurisdictional waters, thereby reducing the potential for sedimentation, or other water quality or soil resource conflicts during construction; however, traditional dredge and fill alternatives would require additional permitting under the CWA. This alternative was eliminated from further study as it would have substantially greater environmental impacts to waters of the U.S., surface water, vegetation, and wildlife resources compared to the Proposed Action (NGM 2020c).

### **2.3.2 Design Component Alternatives**

#### **2.3.2.1 Open Mine Pit Alternative**

Under the Open Mine Pit Alternative, an open pit mine would be developed instead of the proposed development of an underground mine. An open pit mine would be more economically feasible compared to the current proposed Goldrush Mine due to reduced construction and operation timelines. Under the Open Mine Pit Alternative, an open pit design may result in a post-mine pit lake (NGM 2020c). Under this alternative, the mine life would be reduced; however, the overall footprint of the mine (disturbance acres), an open pit would increase the resource conflicts for air quality, cultural, wildlife, noise, soils, vegetation,

visual, and land use resources due to the additional disturbance. Therefore, this alternative was eliminated from further analysis as it would have substantially greater environmental impacts to multiple resources in comparison to the Proposed Action.

#### **2.3.2.2 Dewatering Well Design Component Alternative**

Under the Dewatering Well Design Component Alternative, the proposed dewatering wells would be located inside the footprint of the PCRI. This alternative would place the dewatering wells closer to the underground mine facilities and would reduce the amount of energy and material consumption required for dewatering. The length of the associated water pipelines would also be reduced compared to the Proposed Action, thereby reducing the amount of surface disturbance (NGM 2020c). Under this alternative, the location of dewatering wells within the PCRI would result in a substantial environmental impact to Native American cultural concerns compared to the Proposed Action and was therefore eliminated from further analysis.

#### **2.3.2.3 Process Facility Design Component Alternative**

Under the Process Facility Design Component Alternative, the Goldrush Mine would construct several new mine support facilities within the current West Pine Valley Plan boundary instead of the current proposed use of the existing Cortez Mine mining and processing facilities under the Proposed Action. Under this alternative, new mine ancillary facilities would be constructed closer to the proposed Goldrush Mine and would therefore reduce mobile equipment and material transportation thereby reducing air emissions, the potential for spills and leaks associated with hazardous and solid waste transport, reducing associated potential for soil erosion and sedimentation associated with road use, and reducing risks of wildlife collisions. Under this alternative, the existing Cortez Mine mining and processing operations in the Cortez Gold Mine Operations Area and the current off-site transport of refractory ore to the Goldstrike and Gold Quarry roasters for processing and backhaul of Arturo Mine oxide ore to the Pipeline Complex for processing would continue under the terms of current permits and approvals as authorized by the BLM and State of Nevada (BCI 2019; NGM 2020c). The construction of additional mine support facilities in the West Pine Valley Plan area (in place of utilizing the existing facilities associated with the Cortez Hills Plan) would increase visual and noise resource conflicts and would increase impacts to GRSG priority habitat management areas (PHMA) that would be removed due to ancillary facility development. This alternative was eliminated from detailed analysis due to the increased environmental impacts to visual, noise and wildlife resources compared to the Proposed Action.

#### **2.3.2.4 Vent Raises/Fans Design Component Alternative**

The Vent Raises/Fan Design Component Alternative would place vent raises above ground within the Horse Canyon PCRI area instead of the current proposed placement underground (NGM 2020c). Under this alternative, vent raises above ground would increase noise levels and would increase environmental impacts to cultural, wildlife and recreational resources due to the increased noise levels. In addition, ventilation raises constructed in the Horse Canyon PCRI would significantly increase Native American cultural resources conflict compared to the Proposed Action. This alternative was eliminated from detailed analysis because of the increased environmental impacts compared to the Proposed Action.

#### **2.3.2.5 Power Line Route Design Component Alternative**

Under the Power Line Route Design Component Alternative, the proposed 120-kV power line route included siting the line from a tap off point at the Cortez Mine instead of the currently proposed existing NV Energy 120-kV power transmission line between the existing Cortez F-Canyon substation and the existing Cortez Hills substation. Additionally, under this alternative, the 13.8-kV power line would locate the line south along the Horse Canyon haul road and over the mountain in the Horse Canyon. Under this alternative the proposed 120-kV and 13.8-kV power lines would have a more direct route between the substations and the proposed Goldrush portal substation and other surface facilities; however, would be located within the PCRI boundary (NGM 2020c). The 120-kV and 13.8-kV power line routes as proposed under the Proposed Action include longer routes. Although ground disturbance associated with this alternative would be less than for the Proposed Action, This alternative was eliminated from detailed analysis due to the significant environmental impacts to Native American cultural concerns and visual resources due to the power line construction within the PCRI boundary compared to the Proposed Action.

### 2.3.2.6 Alternative Water Disposal Via Injection Wells Alternative

Under this alternative, the use of injection wells was reviewed to reduce the cone of depression (i.e., groundwater drawdown) and to minimize impacts to culturally important springs. The injection of dewatering water into the deep aquifer carbonate units northwest of Shoshone Wells, and injection of dewatering water in the Wenban limestone upgradient of Horse Canyon were reviewed as possible alternatives.

Upon further review of the alternative, it was identified that several technical issues would occur with the potential injection of mine dewatering water into bedrock units to prevent impacts to surface water resources in the local hydrogeologic setting. First, the seeps and springs in the vicinity of the dewatering (including Shoshone Wells) and Toiyabe Range occur in areas underlain by volcanic, intrusive, and siliceous rock, rather than carbonate rock. The hydraulic properties of these volcanic, intrusive, and siliceous rock units are considerably less conducive to recharge and injection of water than the properties of carbonate rocks. In this hydrogeologic setting, this rock mass generally has very low permeability, and the movement and storage of groundwater is controlled by secondary features such as fractures and faults. The density and interconnection of these secondary features tends to vary between the rock units and within the individual rock units. Therefore, it is not technically feasible to effectively predict and manage injection of dewatering water in this complex fractured rock hydrogeologic setting to offset the effects of mine-related drawdown (BLM 2019c).

In addition, because of these variable hydraulic properties, there is a high potential that water injection into these bedrock units would result in unintended consequences, such as excessively raising local groundwater levels resulting in the emergence of new springs and streams, localized surface flooding, or the increase in baseflow of existing springs and streams above the current conditions. Also, injection of mine dewatering water likely would involve extracting water from within or near the ore body and injecting it into another rock unit that contains water with different geochemical characteristics, resulting in potential for groundwater quality impacts (BLM 2019c).

The suggested location for dewatering water injection (i.e., carbonate units northwest of Shoshone Wells) is unsuitable because it is within the projected groundwater drawdown cone. As a result, there likely would be interference between the dewatering-induced drawdown cone and the injection-induced groundwater mound. This would result in some of the injection water being recaptured by the dewatering system, resulting in the need for increased dewatering rates and an associated increase in costs (BLM 2019c).

Finally, mine dewatering and any dewatering water injection operations would cease following the completion of mining. Residual drawdown in the post-mining period could impact baseflow to perennial springs in the same way as active dewatering, but at a later point in time. Therefore, contingency mitigation measure would still be necessary to address potential mine-related drawdown impacts to perennial waters during both operations and the post-mining period (BLM 2019c).

The Wenban limestone is present at elevations above 8,000 feet AMSL compared to the regional groundwater table at approximately 7,000 feet AMSL. In addition, there are several noncarbonated geologic formations underlying the Wenban Formation that may not readily transmit recharge to the regional groundwater system. As a result, injection into the Wenban limestone upgradient of Horse Canyon may not substantially affect drawdown in the regional groundwater system and could result in the formation of new springs at higher elevations on the flanks of the Cortez Mountains (BLM 2019c).

Ultimately, this alternative was eliminated from further consideration for the following reasons (BLM 2019c):

- Not technically feasible to prevent impacts to perennial waters with dewatering water injection into bedrock units in this hydrogeologic setting;
- Potential for groundwater quality impacts;
- Recapture of injected water by the dewatering system would result in the need for increased dewatering rates and associated costs; and

- Would not address residual drawdown and potential associated impacts to perennial waters in the post-mining period.

### **2.3.2.7 Alternate Underground Access Alternative**

Under this alternative, NGM reviewed various locations for the underground access for the Goldrush Mine as part of previous permitting efforts for the twin exploration declines, which are proposed for use as access to the underground for the Goldrush Mine. NGM provided a memo detailing this alternative on September 30, 2020 (NGM 2020b).

The selection of the twin exploration declines starting in Mill Canyon was the preferred access alternative due to length, gradient and straightness of the declines relative to the other alternatives. Declines from the Cortez Hills open pit and Cortez Hills underground mine were discussed but not evaluated as it was decided that the Goldrush underground mine should be evaluated as a stand-alone operation to align with the overall permitting strategy (NGM 2020b).

During the preliminary development of the Plan of Operations for the Mill Canyon declines, several constraints were identified and included culturally sensitive areas and environmentally sensitive areas. Impacts of the constraints are below (NGM 2020b):

- The preferred location for the proposed portal location needed to be relocated to avoid culturally sensitive areas;
- The existing two-track road access to the portal site would only have minimal upgrades and maintenance work on the length and width of the road, creating logistical and safety concerns;
- Footprint of the portal pad would be constrained by culturally sensitive areas, thus limiting the amount of material that could be brought out of the declines without hauling through the canyon;
- The dry facilities would be located too far from the portal creating logistic issues and technical and economic feasibility issues;
- The canyon access road would not allow two-way traffic, creating safety issues;
- The average gradient of the declines would be at the maximum of 12 percent, creating technical feasibility issues.

Key risks of the Mill Canyon exploration decline alternative included the high probability of time delays, cost overruns, safety incidents, and environmental non-compliance during the construction of the declines due to the physical constraints and culturally sensitive avoidance areas (NGM 2020b).

Due to the risks associated with the Mill Canyon exploration decline access, this alternative was eliminated from further consideration due to increased surface disturbance, multiple environmental concerns, and overall technical and economic feasibility issues. Additionally, the authorized twin declines locations were then permitted for exploration activities. Since the twin declines already exist and the other locations already having undergone analysis for accessing the resources (as discussed above), the Proposed Action proposes to utilize the twin declines for underground access and constructing other locations has been dismissed (NGM 2020b).

### **2.3.2.8 Rapid Infiltration Basin Alternative**

Due to concerns about the proximity of mine features to the GRSG leks, an alternative to move the mine features closest to the GRSG leks was considered. This would include relocating the RIBs for the Goldrush Mine in West Pine Valley to reduce impacts to GRSG. Suggestions included moving all RIBs further away from the GRSG leks, moving the RIBs to an area closer to an existing road or existing disturbance, and moving the RIBs closer to the JD Ranch Road (M-111) or Buckhorn Road.

NGM reviewed the potential feasibility of eliminating or moving RIB Gallery 3 (the RIB Gallery closest to the GRSG lek). It was determined RIB Gallery 3 could not be eliminated without causing mounding concerns at the remaining two RIB galleries. In addition, NGM reviewed the existing data to determine if RIB Gallery 3 could be re-located further from the GRSG leks. Based on the available information, an adequate alternative site was not located (NGM 2021). Since this alternative was determined not technically feasible, it was eliminated from detailed analysis.

### **2.3.2.9 Consolidating or Relocation of Laydown Yards Alternative**

Due to concerns about impacts to GRSG habitat and leks combining or relocating the laydown yards near the RIBs was discussed. NGM was not able to identify a feasible alternative location for the laydown yard that would reduce impacts to GRSG habitat or leks (NGM 2021). Since a more environmentally preferred feasible alternative was not identified, this alternative has been eliminated from detailed analysis.

### **2.3.3 Transportation Alternatives**

#### **2.3.3.1 Off-Site Ore Transportation Alternative via Rail, Slurry Line, or Dedicated Haul Road**

The Deep South EIS considered an off-site ore transportation alternative which reviewed the alternative of transporting ore via rail or slurry pipeline (BLM 2019c). The use of rail transport would require the construction of a rail line to the Goldstrike Mine along with loading and unloading facilities at both Goldstrike and the Cortez mines. The use of a slurry pipeline for ore transport would require the construction of a new slurry pipeline between the Cortez Mine and the Goldstrike Mine, construction of pump stations, and construction of water management facilities at Goldstrike. In addition, a dedicated haul road was assessed from the Cortez Mine to Goldstrike Mine and Gold Quarry Mine (NGM 2020b). Any potential rail line or slurry pipeline route would require construction of a crossing over the Humboldt River, I-80, and the Union Pacific rail line (BLM 2019c). The use of a dedicated haul road would require the construction of a new road from Cortez to Gold Quarry and Goldstrike via Crescent Valley and Boulder Valley, and would include crossing over the Humboldt River, I-80, and the Union Pacific rail line. Any of the alternatives would result in greater environmental impacts than the Proposed Action including (NGM 2020b):

- Additional new surface disturbance which would vary greatly depending on the route;
- Potential impacts to GRSG leks and habitat;
- Potential impacts to cultural resources, including the California National Historic Trail;
- Potential air quality impacts from construction activities;
- Potential impacts to surface water, including the Humboldt River, in the event of a train derailment in proximity to surface water; and
- Potential impacts to mule deer and antelope habitat and movement.

The alternatives were eliminated from further consideration due to increased surface disturbance, multiple environmental concerns, and overall estimated capital costs.

#### **2.3.3.2 Ore Transport by Rail from Goldrush Underground Mine to the Surface at the Cortez Mine Open Pit Alternative**

Under this alternative, NGM evaluated an underground rail system to transport personnel and material from the underground Goldrush Mine facilities. A key advantage of a rail system compared to a conveyor system is the ability to transport people, fuel, cement, and other consumable materials without having to rely on rubber-tired vehicles (NGM 2020b).

In 2018, the evaluation of the rail system was reviewed by the NGM management team. The rail alternative did not meet the required investment criteria at the time from both a risk and cost perspective, so it was determined to be not economically feasible. At that time, a decision was taken to proceed with proven

transportation methods over this relatively short distance while further evaluations were conducted. The rail line would require additional disturbance and mitigation of archaeological sites and there is a potential increased safety concern for pedestrians and wildlife. The alternative to truck material over the selected route makes use of existing roads from the Goldrush portals to the point of final delivery, thus reducing the potential additional impacts from construction of a rail system (NGM 2020b).

The alternative was eliminated from further consideration due to increased surface disturbance, multiple environmental concerns, and increased economic costs.

### **2.3.3.3 On-Site Processing Alternative**

Under this alternative, NGM considered construction of a new roaster at the Cortez Mine for ore processing rather than off-site transport to the Goldstrike and Gold Quarry mills for processing. This alternative would require additional disturbance associated with the construction of new facilities which would result in additional environmental impacts. Potential additional impacts would be (NGM 2020b):

- Potential impacts to air quality;
- Increased consumptive water use;
- Additional new disturbance from a potentially required new 120-kV power line from Boulder Valley through Crescent Valley; and
- Additional new disturbance from a potentially required new natural gas pipeline from Boulder Valley through Crescent Valley.

### **2.3.3.4 Pediment Backfill Alternative**

Under the Pediment Backfill Alternative, all waste rock generated by the by the proposed Goldrush Mine would be placed in the footprint of the authorized Pediment portion of the Cortez Hills Pit located at the Cortez Mine creating a Pediment WRF. Under this alternative, all waste rock would be placed in the Pediment portion of the Cortez Hills Pit instead of the current proposed division of waste rock between the existing Canyon WRF and the existing Pediment portion of the Cortez Hills Pit. Under this alternative, no other components of the Proposed Action would change aside for the waste rock placement (NGM 2020c).

Under the Pediment Backfill Alternative, 10 Mt of waste rock would be removed from the Goldrush Mine. Of this total, about four Mt of waste rock are expected to be PAG, and the remaining six Mt is expected to be non-PAG. PAG waste rock would be brought to the surface and either placed on a temporary lined waste rock pad or hauled directly to the Pediment backfill area. The Pediment portion of the Cortez Hills Pit is currently backfilled with other non-PAG material. Waste rock would continue to be sampled and analyzed per the Goldrush Mine's WPCP (NGM 2020c).

The backfilled top elevations under this alternative would be the same as described for the proposed Goldrush Mine. Current backfill located in the Pediment portion of the Cortez Hills Pit would be relocated elsewhere in the Cortez Gold Mine Operations area of the Cortez Mine. No changes in water management would be required for this alternative. No dewatering would be required for the Pediment portion of the Cortez Hills Pit as the pit bottom elevations would be above the groundwater table (BLM 2019c). Reclamation and post-reclamation monitoring would be conducted in accordance with the proposed Project's reclamation plan as described in Section 4.0 of the Plan (NGM 2021). The post-reclamation topography under this alternative would be the same as currently authorized.

Under this alternative, there may be an increased demand for growth media for the Pediment WRF compared to the proposed Plan, and new borrow sources may need to be identified. In addition, under this alternative, waste rock from the proposed Goldrush Mine would not be placed in the Canyon WRF thus allowing for reclamation of the Canyon WRF to occur earlier than currently proposed under the Proposed Action.

This alternative would not ultimately decrease the disturbance footprint and would only consist of moving waste rock between facilities which would not provide an environmental benefit in comparison to the Proposed Action. In addition, the 2019 Deep South EIS for the Cortez Mine included the authorization for the creation of the Pediment East and Pediment South extensions. This alternative as currently presented, would conflict with the authorized extensions and as a result this alternative was eliminated for further analysis as it was determined not to be technically feasible.

#### **2.4 Comparison of Effects by Alternative**

**Table 2-6** compares the anticipated effects from the Proposed Action and No Action Alternatives on the resources analyzed in this document. Under the No Action Alternative, exploration and mining would continue under approved plans, including implementation of ACEPM's and mitigation measures required by current authorizations. The Proposed Action would expand mining into the Goldrush deposit, in general causing incremental increases in impacts related to surface disturbance, dewatering, ore transportation, and other resources. The impacts from currently authorized operations are included within the Affected Environment, described in **Chapter 3**. The anticipated effects from the Proposed Action are described in **Chapter 4**; together with additional comparison to the current baseline or No Action Alternative. Additional detail supporting the information in **Chapters 3** and **4** can be found in the resource-specific Supplemental Environmental Reports (SERs) (BLM 2021b through 2021t). The impacts described in **Table 2-6** for the Proposed Action are not in place of those described for the No Action Alternative, but likely in addition to the No Action Alternative as it is anticipated the No Action Alternative would continue and the Proposed Action would be an addition to the authorized actions. The No Action Alternative is listed first to facilitate an understanding of the acreage that would be added from the implementation of the Proposed Action or action alternatives. **Chapters 3** and **4** provide more detail, including analysis methods and rationale for the effect's conclusions.

#### **2.5 BLM-Preferred Alternative**

The BLM preferred alternative will be determined following publication and review of the Draft EIS and public comment period.

**Table 2-6 Comparison of Effects**

Potential Impact	Proposed Action	No Action Alternative
<b>Air Quality and Climate Change</b>		
Fugitive, Non-Fugitive Particulate Emissions and Gaseous Emissions	Modeling has determined that impacts from the Proposed Action would not exceed applicable NAAQS for PM <sub>10</sub> , PM <sub>2.5</sub> , CO, NO <sub>x</sub> , and SO <sub>2</sub> . Total facility-wide Hazardous Air Pollutants (HAPs) are estimated to be an additional 1.8 tons per year (tpy), with 0.5 tpy of the highest single HAP, arsenic. The facility wide HAP emissions are within USEPA thresholds.	Modeling has determined that impacts from the No Action Alternative would not exceed applicable NAAQS for PM <sub>10</sub> , PM <sub>2.5</sub> , CO, NO <sub>x</sub> , and SO <sub>2</sub> . Total facility wide HAPs are estimated to be 13.5 tpy, with 8.2 tpy of the highest single HAP, hydrogen cyanide. The facility wide HAP emissions are within USEPA thresholds.
Greenhouse Gas (GHG) Emissions	GHG emissions generated from the Proposed Action, including off-site ore transport, are estimated to be an additional 96,624 tpy.	GHG emissions generated from the No Action Alternative, including off-site ore transport, are estimated to be 397,919 tpy.
Mercury Emissions	Mercury emissions generated from the Proposed Action are estimated to be an additional 0.014 tpy.	Mercury emissions generated from the No Action Alternative are estimated to be 0.04 tpy.
<b>Cultural Resources</b>		
Direct Impacts to NRHP-eligible or Unevaluated Cultural Sites	An additional 55 NRHP-eligible or unevaluated cultural properties would be physically altered, resulting in an adverse effect to these cultural sites. Although no direct physical effects are anticipated in the PCRIs, the Project would have an effect from visual changes outside the boundaries of the PCRIs and from authorized and proposed mining traffic in the boundaries of the PCRIs.	Adverse impacts to NRHP-eligible or unevaluated cultural properties resulting from the No Action Alternative are as previously authorized and being mitigated in accordance with existing Historic Properties Treatment Plans (HPTPs).
Indirect Impacts to NRHP-eligible or Unevaluated Cultural Sites	No adverse visual impacts are anticipated to NRHP-eligible or unevaluated cultural properties. Vibrational adverse impacts anticipated to one NRHP-eligible site (Lime Kiln) and is being mitigated in accordance with the existing HPTPs under the No Action Alternative.	Adverse impacts to NRHP-eligible or unevaluated cultural properties resulting from the No Action Alternative are as previously authorized and being mitigated in accordance with existing HPTPs.
<b>Environmental Justice</b>		
Disproportionate effects on an environmental justice population	No disproportionate effects to an environmental justice population are anticipated.	No disproportionate effects to an environmental justice population are anticipated.
<b>Geology and Minerals</b>		
Future Mineral Extraction	The Proposed Action would dispose of an additional 19 Mt of waste rock which would impact potential future development of mineral resources. Additionally, the Proposed Action would result in an additional 1,694.4 acres of proposed new disturbance which would alter the natural topographic and geomorphic features.	The No Action Alternative would dispose of 442 Mt of waste rock, 59.5 Mt of spent heap leach material, and 16 Mt of tailings material which would impact potential future development of mineral resources. Additionally, the No Action Alternative would result in approximately 22,433 acres of disturbance which would alter the natural topographic and geomorphic features. The additional disturbance from the Proposed Action would not occur.
Removal of Ore	The Proposed Action would remove an additional 34 Mt of ore for off-site processing.	The No Action Alternative would remove approximately 88.5 Mt of ore.



Potential Impact	Proposed Action	No Action Alternative
Subsidence – Goldrush Underground Mine Induced	In the post-closure period, localized rock collapse would likely occur over open workings and result in the development of localized ground deformation/subsidence-type features. The declines are expected to have localized long-term collapse; however, they are unlikely to impact surface features due to the strength and thickness of the overlying rock in relation to the dimensions of the underground openings. Surface deformation/subsidence is anticipated to be local to the immediate mining area and not propagate extensively.	Not applicable. Under the No Action Alternative, the Goldrush underground mine would not be developed.
Subsidence – Dewatering Induced	At the end of mining, the model-predicted subsidence with the addition of the Proposed Action dewatering predicts a four-inch contour of land subsidence extending 14.5 percent further into the basin fill deposits on the eastern and southern sides of the Pipeline Complex pits, a 29 percent increase in subsidence area in the northern part of Grass Valley, and a 13.2 percent increase in land subsidence in the western part of Pine Valley. The four-inch contour of predicted land subsidence extends over 32,380 acres under Scenario 1, 32,221 acres under Scenario 2, and 32,134 acres under Scenario 3. This may expand the development of earth fissures.	Peak subsidence rates from large-scale dewatering at the Cortez Mine has already occurred and annual monitoring of subsidence and earth fissures through the life of the Cortez Mine is currently ongoing. At the end of mining, the model-predicted subsidence predicts a four-inch contour of land subsidence extending 14.5 percent less than the Proposed Action into the basin fill deposits on the eastern and southern sides of the Pipeline Complex pits, 29 percent less subsidence area in the northern part of Grass Valley, and a 13.2 percent less in land subsidence in the western part of Pine Valley. The four-inch contour of predicted land subsidence extends over 28,656 acres under Scenario 1, 28,559 acres under Scenario 2, and 28,339 acres under Scenario 3
<b>Bald and Golden Eagles</b>		
Habitat	The Proposed Action would result in the removal of an additional 1,067 acres of foraging habitat.	The No Action Alternative would result in the removal of 10,880 acres of foraging habitat.
Compliance with the Bald and Golden Eagle Protection Act of 1940 (BGEPA)	Eight golden eagle territories occur within one mile of Goldrush Mine Project disturbance, and NGM has committed to obtaining an USFWS incidental Eagle Take Permit, including required USFWS mitigation.	Impacts to the BGEPA would be as discussed under the West Pine Valley Exploration Plan, HC/CUEP Plan, Horse Canyon Mine Plan, and Cortez Mine Plan and as ongoing with USFWS. NGM is currently working with the USFWS for an incidental take permit associated with the Cortez Complex (part of the Cortez Plan).
Disturbance to Eagles from Activity	Increased human presence and noise may cause eagles to avoid areas adjacent to the proposed Goldrush Mine.	Same as the Proposed Action.
<b>Hazardous Materials and Solid Waste</b>		
Accidental Spills/Releases During Transportation or Storage and Solid Waste Generation	Overall, based upon the small quantities of hazardous waste that would be generated by the Proposed Action, there is anticipated to be a low probability of an accident resulting in a release of hazardous materials to the environment during transportation.	Same as the Proposed Action.
<b>Land Use and Realty</b>		
Impacts to Rights-of-Way (ROWs)	Land use authorization N-48321, owned by Sierra Pacific Power Company, crosses the portion of the proposed 120-kV power line located within the Cortez Mine boundary. NGM and/or Wells Rural Electric Company would need to coordinate with the ROW-holder to ensure no conflicts would occur during construction.	Impacts to ROWs would be as previously authorized under the West Pine Valley Plan, HC/CUEP Plan, Horse Canyon Mine Plan, and Cortez Mine Plan.

Potential Impact	Proposed Action	No Action Alternative
Loss of Public Land for Multiple Uses	The Proposed Action would result in an additional 1,615.8 acres of new surface disturbance on public lands, which would result in the loss of this area for multiple use authorizations for life of the mining and exploration operations.	The No Action Alternative would result in approximately 22,433 acres of authorized surface disturbance on public lands, which would result in the loss of this area for multiple use authorizations for the life of mining and exploration operations. The additional disturbance from the Proposed Action would not occur.
<b>Native American Traditional Values</b>		
Impacts to TCPs, Properties of Traditional Religious and Cultural Importance, or Sacred Sites	An Additional 55 NRHP-eligible or unevaluated cultural properties would be physically altered, resulting in an adverse effect to these cultural sites. Although no direct physical effects are anticipated in the PCRIs, the Proposed Action would have an effect from visual changes outside the boundaries of the PCRIs and from authorized and proposed mining traffic in the boundaries of the PCRIs. Vegetation communities important to Native American traditional values and may be impacted by the Proposed Action.	Adverse impacts to NRHP-eligible or unevaluated cultural properties resulting from the No Action Alternative are as previously authorized and being mitigated in accordance with existing HPTPs. Vegetation communities important to Native American traditional values may be impacted by the No Action Alternative.
<b>Noise</b>		
Increase in Noise Levels at Sensitive Receptors	Noise levels at GRSG leks would increase by up to 9.1 dBA over baseline conditions. Increases at the GRSG sensitive receptor sites would not exceed the 10 dBA ARMPA threshold at all locations when the specific ACEPMs are implemented.	Due to the ACEPMs that would be implemented under the Proposed Action that are not currently being implemented under the No Action Alternative, the No Action Alternative would result in increased noise levels at several lek locations when compared to the No Action Alternative.
<b>Grazing Management</b>		
Loss of Forage	The Proposed Action would result in proposed new surface disturbance of an additional 1,694.4 acres which would impact forage utilized by livestock.	Disturbance of 19,482.2 acres of forage utilized by livestock.
Impacted AUMs	An additional 121.4 AUMs would be impacted in the Carico Lake, Grass Valley, JD, and South Buckhorn allotments. The 210 acres of proposed exploration disturbance may result in an additional impact ranging from nine to 19 AUMs, depending on the allotment within which it occurs.	Approximately 907 AUMs would be disturbed in the Carico Lake, Grass Valley, JD, and South Buckhorn allotments.
Range Improvements	Impacts from proposed disturbance to rangeland improvements includes: one cattleguard, one well, and 1.9 miles of fence within the Grass Valley Allotment; one spring and 1.5 miles of fence in the South Buckhorn pasture; and 0.8 mile of fence in the JD Allotment.	Disturbance to range improvements would be as previously authorized under the West Pine Valley Plan, HC/CUEP Plan, Horse Canyon Mine Plan, and Cortez Mine Plan.
<b>Recreation</b>		
Impacts to Recreational Opportunity	Short-term impact from the loss of land for recreational opportunities for the life of the mine.	Short-term impact from the loss of land for recreational opportunities for the life of the mine.
Impacts to Access to Recreation	The Proposed Action would prohibit access in fenced areas within the proposed Goldrush Mine Plan boundary.	Potential impacts to access routes as previously authorized under the West Pine Valley Plan, HC/CUEP Plan, Horse Canyon Mine Plan, and Cortez Mine Plan.

Potential Impact	Proposed Action	No Action Alternative
Impacts to Quality of Recreation	The Proposed Action would result in an increase in noise and activity near the Goldrush Mine, as well as potential increased population using the local region for recreational activities.	Increase in activity as previously authorized under the West Pine Valley Plan, HC/CUEP Plan, Horse Canyon Mine Plan, and Cortez Mine Plan.
<b>Social and Economic Values</b>		
Employment	The Proposed Action would result in an additional 495 people employed during the construction phase and 570 people that would be directly employed during the operations. Indirect and induced employment is anticipated to be an additional 316 people during construction and 364 people during operations.	Impacts would be as previously authorized under the West Pine Valley Plan, HC/CUEP Plan, Horse Canyon Mine Plan, and Cortez Mine Plan.
Labor Income	Direct labor income generated from Goldrush Mine is estimated to be an additional \$108,320,933, and total indirect and induced labor income is estimated to be an additional \$42,695,964.	Impacts would be as previously authorized under the West Pine Valley Plan, HC/CUEP Plan, Horse Canyon Mine Plan, and Cortez Mine Plan.
Taxes and Economic Activity	An additional net proceeds taxes of \$288 million and \$48 million in business taxes would be generated over the life of the mine.	Impacts would be as previously authorized under the West Pine Valley Plan, HC/CUEP Plan, Horse Canyon Mine Plan, and Cortez Mine Plan.
Housing	The Goldrush Mine would develop the demand for both temporary and permanent housing, which may result in additional demand for housing that is not currently available.	Impacts would be as previously authorized under the West Pine Valley Plan, HC/CUEP Plan, Horse Canyon Mine Plan, and Cortez Mine Plan.
<b>Soils</b>		
Disturbance to Soils	The Proposed Action would result in an additional 1,694.4 acres of proposed new surface disturbance to native soils.	The No Action Alternative would result in surface disturbance of approximately 22,433 acres of native soils. The additional disturbance from the Proposed Action would not occur.
Biological Soil Crusts	BSCs could be impacted by removal of topsoil during salvage operations, changing the soil structure and reducing soil quality.	Same as the Proposed Action.
<b>Transportation and Access</b>		
Impacts to Level of Service (LOS)	Changes in LOS at some locations along the transportation route may occur over life of Goldrush Mine but there would be no degrading of the LOS below acceptable levels.	Same as the Proposed Action.
Increased Traffic on Transportation Routes	Increase of two additional ore hauling truck per hour, for a total of up to 20 per hour for 11 years, on the transportation route. In addition, up to an additional 89 trips each shift for employees and construction workers during construction and up to 71 trips during operations would occur along the transportation route. It is estimated that NGM would contribute 64 percent of equivalent single axle loads along SR 306 and 48 percent of the total equivalent single axle loads along SR 766.	Continuation of up to 18 ore hauling trucks per hour on public roads, as well as authorized levels of employee trips.
<b>Vegetation, Including Noxious and Invasive Non-native Species and Special Status Plants</b>		
Vegetation Removal	The Proposed Action would result in proposed new surface disturbance to an additional 1,694.4 acres of vegetation.	The No Action Alternative would disturb approximately 22,433 acres of vegetation. The additional disturbance from the Proposed Action would not occur.
Establishment of Noxious Weeds	The Proposed Action would result in the potential for establishment and spread of noxious species during construction, operation, and reclamation.	Same as the Proposed Action.

Potential Impact	Proposed Action	No Action Alternative
Special Status Species	Pre-disturbance surveys would avoid and minimize potential impacts from exploration disturbance to Beatley buckwheat individuals or populations.	Disturbance of special status vegetation species would be as previously authorized under the West Pine Valley Plan, HC/CUEP Plan, Horse Canyon Mine Plan, and Cortez Mine Plan.
<b>Visual Resources</b>		
Contrasting Visual Elements	The Proposed Action would add form, line, texture and color to existing landscape, but would not conflict with the established interim BLM VRM Class IV objectives.	Same as the Proposed Action.
Night Sky Impacts	Under the Proposed Action, nighttime lighting at the Goldrush Mine is not anticipated to be a perceptible change from current, authorized operations.	Impacts would be as previously authorized under the West Pine Valley Plan, HC/CUEP Plan, Horse Canyon Mine Plan, and Cortez Mine Plan.
<b>Water Resources and Geochemistry</b>		
Seep and Spring Flow	Potential impacts to seep and spring flow may occur from proposed dewatering operations if the source of the water is connected to the regional aquifer. Impacts would be reduced by previously authorized contingency mitigation plans.	Same as the Proposed Action.
Stream Flow	An additional one mile of perennial stream flow may be impacted if the source of water is connected to the regional aquifer.	Up to 24 miles of perennial stream flow may be impacted if the source of the water is connected to the regional aquifer.
Sedimentation and Erosion	Surface water may be impacted due to mobilization of sediment from expanded construction operations and road networks, but ACEPMs would be implemented to reduce impacts as well as implementation of the SWPPP for the Goldrush Mine and compliance with NDEP's general mining stormwater permit.	Same as the Proposed Action.
Groundwater Quantity	Predicted maximum extent of the 10-foot drawdown contour at the center of the Crossroads Pit is predicted to reach up to 7.5 miles to the north, 7.7 miles to the east and 13.4 miles to the southwest. The maximum extent of the 10-foot drawdown contour under the Proposed Action would be 14.1 miles to the southeast. The maximum extent of the 10-foot drawdown would be 149,364 acres or 233.4 square miles ( <b>Figure 3-3</b> ). Recovery to a new equilibrium would occur at approximately year 2543.	Predicted the maximum extent of the 10-foot drawdown contour at the center of the Crossroads Pit would be 7.2 miles to the north, 7.8 miles to the east and 12.8 miles to the southwest. The maximum extent of the 10-foot drawdown contour to the southeast from the Cortez Hills Pit under the authorized environment would be 13.8 miles to the southwest. The maximum extent of the 10-foot drawdown would be 125,962 acres or 196.8 square miles Recovery to a new equilibrium would occur at approximately year 2532.
Floodplains	The Proposed Action would have no impacts to FEMA-delineated floodplains but would disturb approximately 32 acres of desktop delineated floodplains.	The No Action Alternative would impact portions of FEMA-delineated floodplains.
Water Rights	For surface water rights that are dependent on groundwater discharge, a potential reduction in groundwater levels may reduce or eliminate the flow available at the point of diversion for the surface water right. However, pursuant to existing agreements, NGM would take action to make the senior water right holders whole as required under Nevada law, if impacts occur.	Same as the Proposed Action.
Groundwater Quality from Goldrush Underground Mine	Potential localized impacts from antimony and manganese at 530 years in the immediate vicinity (within 400 feet) of the underground mine.	Not Applicable. Under the No Action Alternative, the Goldrush underground mine would not be developed.

Potential Impact	Proposed Action	No Action Alternative
Groundwater Quality from RIBs	Negligible, localized, and short-term.	Same as the Proposed Action.
Surface Water Quality Impacts from Waste Rock	No impacts expected.	No Impacts expected.
<b>Wetland and Riparian Areas</b>		
Potential Loss of Flow to Wetlands and Riparian Areas	If the flow from a perennial spring or stream is controlled by discharge from the aquifer affected by proposed dewatering drawdown, a reduction of groundwater levels could reduce the groundwater discharge to perennial springs or streams with a corresponding reduction in spring flows, lengths of perennial stream reaches, and their associated riparian/wetland areas. Flow in Horse Creek is anticipated to cease as a result of proposed dewatering activities starting in Year 2024 through 2106, starting to recover in Year 2107. All impacts from potential flow reductions in perennial stream reaches attributable to dewatering would be addressed through the authorized contingency mitigation plans, including flow supplementation to Horse Creek for a period of at least 83 years.	Impacts would be as previously authorized under the West Pine Valley Plan, HC/CUEP Plan, Horse Canyon Mine Plan, and Cortez Mine Plan. Impacts would be associated with direct disturbances, changes in acres of wetlands, changes in the volume of flow to wetlands, and degradation of wetlands. The No Action Alternative would continue to implement the authorized contingency mitigation plans to address impact from potential flow reductions to perennial streams from authorized dewatering operations.
<b>Wildlife Resources, Including Migratory Birds and Special Status Wildlife Species</b>		
Habitat Change	Disturbance of an additional 1,694.4 acres of avian nesting and foraging habitat, insect species habitat, mammal species habitat, and reptile habitat.	Disturbance of approximately 22,433 acres of avian nesting and foraging habitat, insect species habitat, and mammal species habitat. The additional disturbance from the Proposed Action would not occur.
Water Sources	A potential reduction in flow to surface waters within the groundwater drawdown contour plus one-mile buffer as a result of mine dewatering would result in an overall reduction of habitat for aquatic species. All impacts from potential flow reductions in surface waters attributable to dewatering would be addressed through the authorized contingency mitigation plans. Construction of RIBs may act as an attractant for avian and mammal species, including big game, but the use of NRCS wildlife fencing around the RIBs would reduce the potential entanglement of wildlife that may be attracted to the RIBs.	Impacts would be as previously authorized under the West Pine Valley Plan, HC/CUEP Plan, Horse Canyon Mine Plan, and Cortez Mine Plan. The No Action Alternative would continue to implement the authorized contingency mitigation plans to address impact from potential flow reductions to surface water features from authorized dewatering operations.
Displacement for Human Activity and Disturbance and Collision	Human presence and noise could cause wildlife avoidance and displacement. Vehicles, vertical facilities, and lights may cause collisions.	Same as the Proposed Action.
Crushing	Small mammals and insects may be crushed during construction, operations, or reclamation.	Same as the Proposed Action.
Mule Deer Habitat Loss	The Proposed Action would disturb an additional 1,124 acres of mule deer habitat.	Disturbance of mule deer habitat would be as previously authorized under the West Pine Valley Plan, HC/CUEP Plan, Horse Canyon Mine Plan, and Cortez Mine Plan.
Pronghorn Habitat Loss	The Proposed Action would disturb an additional 616 acres of pronghorn habitat.	Disturbance of pronghorn habitat would be as previously authorized under the West Pine Valley Plan, HC/CUEP Plan, Horse Canyon Mine Plan, and Cortez Mine Plan.

Potential Impact	Proposed Action	No Action Alternative
Mountain Lion Habitat Loss	The Proposed Action may disturb an additional 434 acres of preferred pinyon-juniper and mountain mahogany habitat, and 1,050 acres of other habitat available for mountain lions. An additional 210 acres of exploration disturbance may occur anywhere within the proposed Goldrush Mine Plan boundary, which may impact mountain lion habitat.	Disturbance of mountain lion habitat would be as previously authorized under the West Pine Valley Plan, HC/CUEP Plan, Horse Canyon Mine Plan, and Cortez Mine Plan.
Movement Impediments	There is currently existing disturbance within the mule deer movement corridor and the proposed Goldrush Mine would add to the disturbance within the mule deer movement corridor.	Impacts to wildlife movement corridors would be as previously authorized under the West Pine Valley Plan, HC/CUEP Plan, Horse Canyon Mine Plan, and Cortez Mine Plan.
GRSG Habitat Loss	The Proposed Action would disturb an additional 1,125 acres of PHMA, 215 acres of General Habitat Management Area (GHMA), and 12 acres of Other Habitat Management Areas (OHMA) of 2019 ARMPA habitat. The Proposed Action would disturb an additional 771 acres of PHMA, 19 acres of GHMA, 615 acres of OHMA habitat, and 79 acres of Non-habitat of 2015 ARMPA habitat. Exploration disturbance could result in up to 210 acres of additional disturbance any of the GRSG habitat types.	Disturbance of GRSG habitat would be as previously authorized under the West Pine Valley Plan, HC/CUEP Plan, Horse Canyon Mine Plan, and Cortez Mine Plan.
Burrowing Owl Habitat Loss	The Proposed Action would disturb an additional 1,213 acres of burrowing owl habitat. Exploration disturbance could result in up to 210 acres of additional disturbance in burrowing owl habitat. Surface disturbance may result in the destruction of burrows outside of breeding season.	Disturbance of burrowing owl habitat would be as previously authorized under the West Pine Valley Plan, HC/CUEP Plan, Horse Canyon Mine Plan, and Cortez Mine Plan.
Bat Habitat Loss	The Proposed Action would disturb an additional 1,448 acres of bat habitat, including 462 acres of woodland habitat. Exploration disturbance could result in up to 210 acres of additional disturbance of bat habitat.	Disturbance of bat habitat would be as previously authorized under the West Pine Valley Plan, HC/CUEP Plan, Horse Canyon Mine Plan, and Cortez Mine Plan.
Pygmy Rabbit Habitat Loss	The Proposed Action would disturb an additional 1,051 acres of pygmy rabbit habitat. Exploration disturbance could result in up to 210 acres of additional disturbance of pygmy rabbit habitat. Surface disturbance may result in the destruction of burrows.	Disturbance of pygmy rabbit habitat would be as previously authorized under the West Pine Valley Plan, HC/CUEP Plan, Horse Canyon Mine Plan, and Cortez Mine Plan.
Dark Kangaroo Mouse Habitat Loss	The Proposed Action would result in the disturbance of an additional 1,070 acres of dark kangaroo mouse habitat. Exploration disturbance could result in up to 210 acres of additional disturbance.	Disturbance of kangaroo mouse habitat would be as previously authorized under the West Pine Valley Plan, HC/CUEP Plan, Horse Canyon Mine Plan, and Cortez Mine Plan.

### 3.0 Affected Environment

This chapter describes the existing conditions of the physical, biological, cultural, and socioeconomic resources that have the potential to be affected by activities related to the Proposed Action and the No Action Alternative described in **Chapter 2**. To comply with NEPA, the BLM is required to address specific elements of the environment that are subject to requirements specified in statutes, regulations, or by Executive Order. **Table 3-1** lists the supplemental authorities and other resources addressed in the Draft EIS. Supplemental authorities that may be affected by the Proposed Action are discussed further in **Chapters 3** and **4** and in the SERs for each resource (BLM 2021b through 2021t). Those elements listed under the supplemental authorities that are not present in the proposed Goldrush Mine Plan boundary or resource-specific study area or are present but would not be affected are not carried through in this Draft EIS.

**Table 3-1 Supplemental Authorities and Other Resources**

Supplemental Authority and Other Resources	Not Present	Present/Not Affected	Present/May be Affected	Rationale/Section Reference
Air Quality and Climate Change			X	Sections 3.1 and 4.1. Air Quality SER (BLM 2021b)
Areas of Critical Environmental Concern	X			Resource not present.
Cultural Resources			X	Sections 3.2 and 4.2. Cultural Resources SER (BLM 2021c)
Environmental Justice			X	Sections 3.3 and 4.3. Environmental Justice SER (BLM 2021d)
Farmlands (Prime or Unique)	X			Resource not present.
Floodplains			X	Sections 3.17 and 4.17 Water Resources and Geochemistry SER (BLM 2021r)
Forest and Rangelands	X			Resource not present.
Geology and Minerals			X	Sections 3.4 and 4.4 Geology and Minerals SER (BLM 2021e)
Hazardous Materials/Solid Waste			X	Sections 3.6 and 4.6 Hazardous Materials and Solid Waste SER (BLM 2021g)
Land Use and Realty Resources			X	Sections 3.7 and 4.7 Land Use and Realty SER (BLM 2021h)
Lands with Wilderness Characteristics	X			Resource not present.
Livestock and Grazing Resources			X	Sections 3.10 and 4.10 Grazing Management SER (BLM 2021k)
Migratory Birds			X	Sections 3.19 and 4.19 Wildlife Resources, Including Migratory Birds and Special Status Wildlife SER (BLM 2021t)
National Historic Trails	X			Resources not present.
Native American Concerns			X	Sections 3.8 and 4.8 Native American Traditional Values SER (BLM 2021i)
Noise			X	Sections 3.9 and 4.9 Noise SER (BLM 2021j)
Noxious Weeds/Invasive Non-native Species			X	Sections 3.15 and 4.15 Vegetation, Including Noxious and Invasive Non-native Species and Special Status Plants SER (BLM 2021p)
Paleontological Resources	X			Resource not present.

Supplemental Authority and Other Resources	Not Present	Present/Not Affected	Present/May be Affected	Rationale/Section Reference
Recreation			X	Sections 3.11 and 4.11 Recreation SER (BLM 2021l)
Social and Economic Values			X	Sections 3.12 and 4.12 Social and Economic Values SER (BLM 2021m)
Soils			X	Sections 3.13 and 4.13 Soils SER (BLM 2021n)
Special Status Species			X	Sections 3.5, 4.5, 3.15, 4.15, 3.19, and 4.19 Bald and Golden Eagles SER (BLM 2021f); Vegetation, Including Noxious and Invasive Non-native Species and Special Status Plants SER (BLM 2021p); Wildlife Resources, Including Migratory Birds and Special Status Wildlife SER (BLM 2021t);
Threatened and Endangered Species	X			Resource not present.
Transportation and Access			X	Sections 3.14 and 4.14 Transportation and Access SER (BLM 2021o)
Vegetation Resources			X	Sections 3.15 and 4.15 Vegetation, Including Noxious and Invasive Non-native Species and Special Status Plants SER (BLM 2021p)
Visual Resources			X	Sections 3.16 and 4.16 Visual Resources SER (BLM 2021q)
Water Resources and Geochemistry			X	Sections 3.17 and 4.17 Water Resources and Geochemistry SER (BLM 2021r)
Wetland and Riparian Areas			X	Sections 3.18 and 4.18 Wetland and Riparian Areas SER (BLM 2021s)
Wild and Scenic Rivers	X			Resource not present.
Wild Horses and Burros	X			Resource not present.
Wilderness	X			Resource not present.
Wildlife Resources			X	Sections 3.19 and 4.19 Wildlife Resources, Including Migratory Birds and Special Status Wildlife SER (BLM 2021t)

### 3.1 Air Quality and Climate Change

Additional details of the affected environment for air quality are provided in the Air Quality SER for the Goldrush Mine Project (BLM 2021b). The air quality area of analysis for the Proposed Action includes the three Hydrographic Areas (HAs) in which the proposed Goldrush Mine Plan boundary overlaps including Pine Valley (HA 53), Crescent Valley (HA 54), and Grass Valley (HA 138). The air quality area of analysis for the No Action Alternative includes the same three HAs as the Proposed Action in which the Horse Canyon Mine Plan boundary, the HC/CUEP Plan boundary, the West Pine Valley Exploration Plan boundary, and the Cortez Mine Plan boundary overlap (**Figure 3-1**).

The Goldrush Mine area is located on the southern flank of the Mount Tenabo Range. Winds are affected by the local terrain and topography, and generally flow from the south or north. Wind speeds are generally highest in the daylight hours and lighter throughout the night. Existing conditions in the proposed Goldrush Mine Plan boundary include a four-season environment that ranges in intensity depending on elevation. Valley locations register warmer mean temperatures than those found in higher elevations. Greater precipitation and snowfall occur in the higher elevations and less on the valley floor (WRCC 2020).



The area of analysis and immediate surrounding areas are in Attainment or unclassified for all criteria pollutants. Given that the Goldrush Mine is not a major stationary source subject to Prevention of Significant Deterioration program and that there are no Federal Class I areas within 100 kilometers of the Goldrush Mine boundary, potential impacts to Class I area air quality related values, including visibility impairment, were not analyzed further. The nearest Federal Class I area is the Jarbidge Wilderness, located approximately 180 kilometers to the northeast. Monitoring of criteria pollutants has been discontinued in the area since the late 1990s when the USEPA allowed monitoring to cease where monitoring showed less than 60 percent of the NAAQS. Ongoing monitoring in the state of Nevada is conducted primarily in urban areas where ambient air pollution concentrations are expected to be closer to the USEPA limits as compared to more remote, rural areas. These sites are not representative of the rural location of the Goldrush Mine. Background concentrations for modeled pollutants were selected using monitoring stations located in unindustrialized, rural areas similar to the Project area.

The background concentrations used in the modeling analysis are provided in the Air Quality SER for the Goldrush Mine Project (BLM 2021b). The Goldrush Mine is distant from roads that support high levels of traffic and from active industrial operations. For rural areas, the NDEP approves the use of zero background concentrations for gaseous pollutants like carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), and sulfur dioxide (SO<sub>2</sub>) and non-zero background concentrations for particulate matter 10 microns or less in diameter (PM<sub>10</sub>) and particulate matter 2.5 microns or less in diameter (PM<sub>2.5</sub>). Background concentrations for PM<sub>10</sub> use the Great Basin National Park (Lehman Caves) IMPROVE site, located in White Pine County, Nevada. PM<sub>10</sub> monitoring at this station indicates low particulate levels in a rural area similar to the Goldrush Mine area. The Jarbidge Wilderness monitoring station, located 130 miles northeast of the Goldrush Mine, measures PM<sub>2.5</sub>. This monitoring station is more rural and significantly less populated than the Elko PM<sub>2.5</sub> monitoring station which is much closer to the Goldrush Mine (ASI 2020).

However, to determine non-zero background concentrations for gaseous pollutants, a review of nearby ambient monitoring stations was conducted taking into consideration terrain, land use and proximity of sources. The Turtleback Dome monitoring station located near Yosemite National Park, California, was used for both the NO<sub>2</sub> and CO background concentrations. The period of record for the monitoring station was 2006-2007. This monitoring station is located 240 miles southwest of the Goldrush Mine Project, in a rural area with similar topographic characteristics including mountainous features. In this rural setting with no major sources of air pollution nearby, the monitoring station is in a pristine setting and was considered representative of the Goldrush Mine area. Thus, this dataset was selected for nitrogen oxide (NO<sub>x</sub>) and CO background concentrations (ASI 2020).

The White Mountain Research Center-Owens Valley Lab in California may be considered representative of a rural area of Nevada for conservative SO<sub>2</sub> background concentrations. Similar to the Turtleback Dome monitoring station, the White Mountain monitoring station is located in relatively rural settings in terms of nearby population centers and traffic activity. The period of record for the monitoring station was 2016 to 2018. Thus, this dataset was selected for SO<sub>2</sub> background concentrations (ASI 2020).

The existing sources of significant air emissions located within the area of analysis are the Cortez Mine and the Fire Creek Mine Project (ASI 2016, 2020; BLM 2016b). Potential impacts from small nearby sources, including agricultural activities and traffic, are included in the background concentrations discussed above.

### **3.1.1 Greenhouse Gases and Climate Change**

GHG emissions are comprised of many separate chemicals, but the most notable is carbon dioxide (CO<sub>2</sub>). The USEPA has formed a correlation of the various gasses with CO<sub>2</sub> so that any particular GHG can be shown as a carbon dioxide equivalent (CO<sub>2</sub>e). This methodology allows gaseous emissions to be reduced to the CO<sub>2</sub>e and compared with area wide GHG emissions on a local, state-wide, country-wide, or global level. Recent scientific evidence suggests there is a direct correlation between global warming and emissions of GHGs. Although many of these gases occur naturally in the atmosphere, man-made sources substantially have increased the emissions of GHGs over the past several decades. Other sources of increased GHG emissions include methane, which has increased as a result of human activities related to agriculture (primarily from grazing operations), natural gas distribution and landfills (IPCC 2007). The global atmospheric concentrations of both atmospheric CO<sub>2</sub> and methane far exceed pre-industrial values over the past 650,000 years; however, methane concentrations have decreased over the past two decades

(IPCC 2007). Through complex interactions on a regional and global scale, these GHG emissions and net losses of biological carbon sinks (i.e., vegetation) 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 GHG concentrations to increase dramatically and are a possible contributor to overall global climatic changes (IPCC 2007).

Potential impacts to Nevada as a result of the warming climate include decreasing snowpack, increase in water demand and decrease in water supply, decreasing agricultural productivity, increase in the severity and frequency of wildfires, increase in pests, and impacts to human health (USEPA 2016). Potential changes to the project area resulting from the effects of climate change forecasted by the Central Basin and Range Rapid Eco-Regional Assessment could include higher than normal growing season temperatures, contraction or expansion of some existing vegetation communities, the expansion of existing noxious weed populations, and the introduction of noxious weed species previously undocumented in the ecoregion and project area (Comer et al. 2013). Regarding temperature increases specifically, the Central Basin and Range Rapid Eco-Regional Assessment forecasts an average increase in average summer maximum daytime temperatures of approximately 5 degrees Fahrenheit within the Goldrush Mine project area by 2060 (Comer et al. 2013). In low elevation basins throughout the Central Basin and Range ecoregion, these increases in average growing season temperatures are anticipated to cause transitions from the existing cool semi-desert vegetation communities into very warm and sparsely-vegetated desert landscapes more typical of the Mojave Basin and Range. Additionally, there is a naturally high variability in precipitation in the Central Basin and Range ecoregion. There are currently no suggestions for a strong trend toward either wetter or drier conditions in any month within the ecoregion, with the exception of slight increases in precipitation during the summer “monsoon” season toward the south and east (Comer et al. 2013).

### 3.2 Cultural Resources

Additional details of the affected environment for cultural resources are provided in the Cultural Resources SER for the Goldrush Mine Project (BLM 2021c). The area of analysis for the Proposed Action and No Action Alternative for cultural resources is the same as the area of potential effects (APE). The Direct APE consists of the proposed and authorized disturbance plus a 30-meter (100-foot) buffer, for a total of 4,962 acres on NGM-owned private land and BLM-administered public land (**Figure 3-2**). Any changes to the auditory environment would be consistent with the current environment; therefore, no auditory effects are expected to extend beyond the Direct APE and no Auditory APE is proposed. As the Goldrush Mine is an underground mine, the potential for changes to the surrounding atmospheric environment is low; no Atmospheric APE is proposed. The Visual APE consists of the areas identified as visible through a Geographic Information System viewshed analysis of these features up to a maximum of five miles. A Vibrational APE of 200 feet (60 meters) is proposed for all new disturbance areas. The Vibrational APE consists of the proposed disturbance plus a 200-foot buffer (**Figure 3-2**).

Within the areas of analysis, several other mining and mineral exploration activities including the Cortez Mine, Horse Canyon Mine, HC/CUEP, and West Pine Valley are present. In addition, utilities, infrastructure, roads, livestock grazing, dispersed recreation, and wildland fires also occur throughout the areas of analysis. Over the last 35 years, more than 100 cultural resource investigations have been conducted in the general vicinity of the Goldrush Mine. These have included Class I, Class II, and Class III investigations to identify cultural resources and assessments of project effects, and ethnographic studies as well as the development of historic contexts, research designs, and mitigation plans, and the implementation of plans to mitigate effects to historic properties.

All areas of the Direct APE, within which the areas of proposed new ground disturbance are located, have been covered by Class III inventory to identify cultural resources and evaluate those resources for the NRHP. A total of 35 inventories have been conducted in this APE. Both prehistoric and historic sites, as well as ethnographic and multi-component sites, have been identified within the Direct APE. The results of the inventories have been documented in survey reports submitted to the BLM and SHPO for review and concurrence. The reports contain the cultural and historical overviews of the area, the archaeological field methods used to identify the resources, artifacts analyses, where applicable, and the location, type, and NRHP evaluation of eligibility for the identified resources.

Based on the results of the Class III inventories, there are 216 archaeological sites within the Direct APE. Of these sites, 54 are eligible, three are unevaluated, seven are unknown, and the remaining 152 sites have been determined not eligible to the NRHP. Both the Cortez Historic Mining District and the Cortez Townsite Historic District are eligible sites to the NRHP within the Direct APE. There are 323 sites in the Visual APE: 71 eligible, six unevaluated, and 22 unknown with 224 determined not eligible. There are 238 sites in the Vibrational APE: 66 eligible, including the Garrison Lime Kiln, two unevaluated, and 170 determined not eligible (Summit Envirosolutions 2020). The number of eligible, unevaluated, and not eligible sites are calculated as of March 2021, and these numbers are likely to change as additional sites are evaluated through the Section 106 process.

Additionally, portions of two PCRIIs or eligible Traditional Cultural Properties, the Mount Tenabo/White Cliffs and Horse Canyon PCRIIs, are within the Direct APE (Dixon and McGonagle 2004).

### **3.3 Environmental Justice**

Additional details of the affected environment for environmental justice are provided in the Environmental Justice SER for the Goldrush Mine Project (BLM 2021d). The area of analysis for the Proposed Action and the No Action Alternative includes portions of Elko, Eureka and Lander counties specifically census block groups 320079516001, 320079516002, 320110001001, 320150003001, 320150003002, 320150003003, 320150003004, and 320150003005 (**Figure 3-1**).

In addition to the Goldrush Mine, the area of analysis includes several other mining and mineral exploration activities including several major mines such as the Betze-Post Mine, Carlin Mine, Argenta Mine, Cortez Mine, Fire Creek Mine, Phoenix Mine, Greystone Mine, Mountain Spring Mine, and Slaven Canyon Mine (NBMG 2019).

#### **3.3.1 Minority Populations**

The census blocks within the area of analysis are notably less ethnically and racially diverse than the state of Nevada as a whole. All census blocks have a higher percentage of white residents and a lower percentage of black, Asian, and mixed race/other residents when compared to the state. No non-white racial or ethnic group exceeds 50 percent of the population in any census block.

Census blocks 320150003001 and 320150003004 have higher percentages of Hispanic or Latino populations compared to the state of Nevada. Hispanic or Latino populations are comparable to the state average within census blocks, 320150003002, 320150003003, and 320150003005. The remaining census blocks, 320079516001, 320079516002, and 320110001001, have a lower percentage of Hispanic or Latino residents than the state as a whole. Census blocks within Elko, Eureka, and Lander counties (320079516001, 320079516002, 320110001001, 320150003002, and 320150003003) have higher percentages of tribal populations compared to the state of Nevada. Additionally, census block 320150003005 has a higher percentage of Pacific Islander populations compared to the state of Nevada (USEPA 2020b; Headwaters Economics 2020). Therefore, environmental justice minority populations exist within portions of the area of analysis, as defined by the CEQ guidance, as there is a meaningful difference between the State average and some of the census blocks within the area of analysis (CEQ 1997).

#### **3.3.2 Low-Income Populations**

Poverty status is determined by comparing annual income to poverty thresholds, which vary by family size, number of children, and age of the householder, although not geographically. Poverty thresholds are updated annually based on changes in the Consumer Price Index. In 2019, the weighted poverty thresholds ranged from \$15,468 for a single individual under the age of 65 to \$49,426 for a household of nine or more (USCB 2020a).

The majority of the census blocks within the area of analysis have a greater percentage of low-income populations as a whole including: 320079516001, 320079516002, 320150003001, 320150003002, 320150003003, and 320150003005. Based on EJSCREEN, census blocks 320079516001 (Elko County), 320150003001, and 320150003003 (Lander County) have the highest percentage of low-income populations at approximately 46.0, 37.0, and 28.0 percent, respectively. Based on the EJSCREEN data,

portions of the area of analysis would be considered to have meaningfully greater low-income populations under Executive Order 12898 (USEPA 2020b, 2020c; Headwaters Economics 2020).

### 3.4 Geology and Minerals

Additional details of the affected environment for geology and minerals are provided in the Geology and Minerals SER for the Goldrush Mine Project (BLM 2021e). The area of analysis for evaluating the impacts to geology and minerals for the Proposed Action includes the proposed Goldrush Mine Plan boundary (**Figure 3-2**). The area of analysis for the No Action Alternative includes the Horse Canyon Mine Plan boundary, the HC/CUEP Plan boundary, the West Pine Valley Exploration Plan boundary, and the Cortez Mine Plan boundary.

Within the areas of analysis, several other mining and mineral exploration activities including the Cortez Mine, Horse Canyon Mine, HC/CUEP, and West Pine Valley are present. In addition, utilities, infrastructure, roads, livestock grazing, dispersed recreation, and wildland fires also occur throughout the areas of analysis.

The geology of the area of analysis includes a relatively complex sedimentary sequence of Paleozoic, predominantly siliceous (upper-plate) rocks that overlie predominantly carbonate (lower-plate) rocks of similar age, as a result of the Roberts Mountains Thrust fault. Additionally, intrusive and extrusive Mesozoic and Tertiary rocks emplaced at four distinct times, as well as Tertiary and Quaternary sediments, are present in the area. The generalized stratigraphic sequence in the area of analysis includes the Tertiary-Quaternary Alluvium and Tertiary Tuffs and Gravels; Volcanics; Ordovician Vinini Formation; Devonian Blue Hills Mudstone; Devonian Horse Canyon Siltstone; Devonian Wenban Limestone; Silurian Roberts Mountains Formation; Ordovician Hanson Creek Limestone/Dolomite; Ordovician Eureka Quartzite; and Cambrian Hamburg Dolomite (Itasca 2020).

Mineralization in the Goldrush Mine area is typical Carlin style, with the principal ore-bearing mineral species being arsenian pyrite. The mineral deposit is entirely concealed under varying thicknesses of gravels, volcanoclastic sediments, and tuffs to the south and upper plate lithologies to the north. Gold mineral resources for the Goldrush Mine are inferred 34,107,425 tons containing 9,353,275 ounces and indicated 11,795,143 tons containing 2,855,098 ounces (NGM 2019).

The area of analysis is located in a region that is characterized by active and potentially active faults and a relatively high level of historic seismicity. Several active and potentially active faults occur in the vicinity of the Goldrush Mine including the Crescent fault, located approximately 12 miles north of the Cortez Mine; the Cortez fault, located along the front of the Cortez Mountains; and the Simpson Park Fault, a north-south fault that traverses the western flank of the Simpson Park Mountains and the east side of the proposed Goldrush Mine (USGS 2011). The area of analysis is located in a region that has experienced considerable seismic activity in historic time. The largest recorded earthquake to affect the region was a 6.8 Richter Magnitude event located approximately 65 miles west of the area of analysis within the Nevada Seismic Belt (USGS 2020a).

The lowering of groundwater levels associated with ongoing dewatering activities at the Pipeline Complex at the Cortez Mine has resulted in ground subsidence and development of earth fissures within the Quaternary alluvial sediments in Crescent Valley in the vicinity of the pit (AMEC 2014). In response to the fissures, NGM personnel backfilled the fissure gullies. A monitoring plan was developed for ground subsidence and earth fissuring associated with mine dewatering and water management activities (BLM 2019d). Quarterly ground inspections conducted since 2012 have identified localized areas of surficial features south of the Pipeline South Area Heap Leach Facility that may be surface expressions of earth fissures at depth.

### 3.5 Bald and Golden Eagles

Additional details of the affected environment for bald and golden eagles (*Haliaeetus leucocephalus*, *Aquila chrysaetos*) are provided in the Bald and Golden Eagles SER for the Goldrush Mine Project (BLM 2021f). The area of analysis for the Proposed Action for bald and golden eagles includes a 10-mile buffer of the proposed Goldrush Mine Plan boundary (**Figure 3-2**). The area of analysis for the No Action Alternative

includes the USFWS recommended one-mile buffer of the authorized/existing disturbance at the Horse Canyon Mine, HC/CUEP, West Pine Valley, and Cortez Mine.

Within the areas of analysis, several other mining and mineral exploration activities including the Cortez Mine, Horse Canyon Mine, HC/CUEP, West Pine Valley, Toiyabe Mine, Buck Mine, Buckhorn Mine, many small exploration projects, and sand and gravel operations are present. In addition, utilities, infrastructure, roads, livestock grazing, dispersed recreation, and wildland fires also occur throughout the areas of analysis. Past and present activities within the areas of analysis have resulted in removal of vegetation including foraging habitat.

Bald eagles are known to occur in the region, especially in winter months (ERM 2018); however, they have not been observed within the area of analysis and are not analyzed further in this EIS. Golden eagles have been observed in the area of analysis foraging and nesting (Western Biological 2021) and are discussed below.

Topographic features such as mountainous areas that include ridgeline and tops of slopes oriented perpendicular to prevailing winds or near ridge crests of cliff edges are features that are conducive to slope soaring and are attractive for golden eagles. The area of analysis encompasses several mountain ranges and valleys, including Cortez Mountains, Simpson Park Mountains, Toiyabe Range, Shoshone Mountains, Crescent Valley, Carico Lake Valley, Pine Valley, and Grass Valley. Saddles or low points on ridge lines or near riparian corridors may serve as flight paths.

The potential foraging value of the various habitat types present in the region has not been quantified, but in general, the Inter-Mountain Basins Big Sagebrush Shrubland, Great Basin Xeric Mixed Sagebrush Shrubland, and Inter-Mountain Basins Montane Sagebrush Steppe are believed to provide the highest-value native foraging habitat due to higher abundance of golden eagle prey base, such as black-tailed jackrabbits (*Lepus californicus*), mountain cottontails (*Sylvilagus nuttallii*), and yellow-bellied marmots (*Marmota flaviventris*). These communities account for approximately 62 percent of the mapped habitat within the area of analysis (USGS 2005).

Wetlands and springs provide a reliable water source for eagle prey and, therefore, allow higher concentrations of eagle prey. Known water sources within the areas of analysis include 244 seeps/springs and eight perennial drainages. Ephemeral and intermittent drainages also occur throughout the area of analysis. Meadow habitats, agricultural alfalfa pivots, and pastures in Crescent Valley and Rocky Pass can support large populations of rodents and lagomorphs and serve as foraging grounds for golden eagles.

Golden eagles frequently feed on carrion, which can be found along roads, especially during winter and even when live prey is available, golden eagles consume fresh carrion during nesting season (Kochert and Steenhof 2002). Roads within the area of analysis, particularly improved roads that allow vehicles to travel at higher speeds, represent potentially high-value golden eagle scavenging habitat. A number of paved (e.g., SR 278 and SR 306) and non-paved roads are located within the area of analysis.

Within the area of analysis, various rock outcrops and mine highwalls were identified as areas with nesting golden eagles. There are multiple open pits throughout the area of analysis, and cliffs and outcrops occur in the Shoshone Mountains, Toiyabe Range, Simpson Park Mountains, and the Cortez Mountains.

Annual golden eagle aerial and ground surveys have been conducted in the Goldrush Mine area from 2013 to 2021 (NGM 2020d; Western Biological 2021; Stantec 2021). The total number of nests surveyed increased annually from 2013 to 2017 due to an increased survey effort and survey area size, as well as increased searcher efficiency. In 2021, 70 golden eagle nests were surveyed in the area of analysis, of which seven were found to be occupied. Occupied nests included all nests that held eggs or young, or were attended by adult birds, particularly birds that appeared to be incubating or brooding during the survey period. Territories were considered occupied if at least one nest in the territory was occupied by golden eagles during the survey period. This definition of occupancy likely results in an underestimation of territory and nest occupancy, as breeding attempts that occur outside of the survey period would be missed. Nests were assumed to be golden eagle nest based on the location, size and substrate of the nest material.

A summary of golden eagle nest surveys from 2013 to 2021 is presented in **Table 3-2**. Surveyed golden eagle nests within the area of analysis are presented by section on **Figure 2-3**. No occupied golden eagle nests occurred within the Goldrush Mine Plan boundary in 2021.

**Table 3-2 Summary of Nest Surveys from 2013 to 2021**

Year	Occupied Golden Eagle Nests <sup>1</sup>	Unoccupied Golden Eagle Nests <sup>2</sup>	Total Surveyed Golden Eagle Nests <sup>3</sup>
2013	4	7	11
2014	14	34	48
2015	15	39	54
2016	9	63	72
2017	17	58	75
2018	15	57	72
2019	6	65	71
2020	12	64	76
2021	7	63	70

Sources: NGM 2020d, Western Biological 2021, Stantec 2021

<sup>1</sup> Occupied Nest – A nest used for breeding in the current year by a pair.

<sup>2</sup> Unoccupied Nest – Those nests not selected by golden eagles for use in the current nesting season. This total also includes nests that were in-use by a species other than golden eagle.

<sup>3</sup> Totals do not include nests that could not be found or were not present.

Golden eagle nesting territories within the area of analysis were delineated based on the 2013 through 2021 dataset. A total of 38 distinct territories were delineated in 2021 based on proximity of nests to one another, concurrent occupancy of adjacent nests, alternating occupancy (from year to year) of adjacent nests within a cluster, and nearest available quality nesting substrate (i.e., rock outcrop, cliff, pit highwall, etc.), obtained from surveys and monitoring conducted in the area of analysis. Four territories, represented by single nests, were not able to be located by surveyors in 2021.

Of the golden eagle territories delineated within the area of analysis, four were occupied in 2013, 14 were occupied in 2014, 15 were occupied in 2015, nine were occupied in 2016, 17 were occupied in 2017, 15 were occupied in 2018, six were occupied in 2019, 12 were occupied in 2020, and seven were occupied in 2021. These delineations represent the biological opinion of wildlife biologists and are subject to modification when/if new data are found that justify re-delineation. A brief description of each territory is provided in the Bald and Golden Eagle SER for the Goldrush Mine Project (BLM 2021f).

### 3.6 Hazardous Materials and Solid Waste

Additional details of the affected environment for hazardous materials and solid waste are provided in the Hazardous Materials and Solid Waste SER for the Goldrush Mine Project (BLM 2021g). The area of analysis for the Proposed Action for impacts from hazardous materials and solid waste includes the proposed Goldrush Mine Plan boundary and the portions of the 120-kV power line and switching stations, contact water pipeline, and Mount Tenabo access road that occur outside of the proposed Goldrush Mine Plan boundary, as well as the main transportation routes and access roads from which materials would be transported including: from Goldrush Mine north on SR 306 to I-80, continuing either east on I-80 to Carlin or Elko; and from Goldrush Mine north on SR 306 to west on I-80 to Battle Mountain or Reno (**Figure 3-1**). The area of analysis for the No Action Alternative includes the Horse Canyon Mine Plan boundary, the HC/CUEP Plan boundary, the West Pine Valley Exploration Plan boundary, and the Cortez Mine Plan boundary and the main transportation routes and access roads listed above.

Within the areas of analysis, several other mining and mineral exploration activities including the Cortez Mine, Horse Canyon Mine, HC/CUEP, and West Pine Valley are present. In addition, utilities, infrastructure, roads, livestock grazing, dispersed recreation, and wildland fires also occur throughout the areas of analysis. Activities in the area of analysis utilize the road network to transport hazardous materials, including

reagents and petroleum, to nearby mining operations and other customers. Vehicles using these routes also contain petroleum fuels.

Existing operations within the area of analysis include mining and exploration activities. These activities include the permitted use of hazardous materials such as:

- Diesel fuel, gasoline, oils, and antifreeze used for equipment operation and maintenance;
- Sodium cyanide, sodium hydroxide, acid, flocculants, lime, and antiscalants used in mineral extraction processes;
- Ammonium nitrate and high explosives used for blasting in the open pits; and
- Various by-products classified as hazardous waste and chemicals used in the existing assay laboratory (BLM 2019e).

Non-hazardous, solid wastes are generated within the area of analysis and disposed of in the authorized Class III-waivered landfills within the Cortez Mine Complex (BLM 2016a, 2019e).

### **3.7 Land Use and Realty**

Additional details of the affected environment for land use and realty are provided in the Land Use and Realty SER for the Goldrush Mine Project (BLM 2021h). The area of analysis for the Proposed Action for land use and realty includes the proposed Goldrush Mine Plan boundary and the portions of the 120-kV power line and switching stations, contact water pipeline, infiltration distribution pipeline, Lower Horse Canyon Road, and Mount Tenabo access road that occur outside of the proposed Goldrush Mine Plan boundary (**Figure 3-2**). The area of analysis for the No Action Alternative includes the Horse Canyon Mine Plan boundary, the HC/CUEP Plan boundary, the West Pine Valley Exploration Plan boundary, and the Cortez Mine Plan boundary. As the area of analysis for both the Proposed Action and No Action Alternative extends into both Lander and Eureka counties, land use and realty are discussed for both counties.

Within the areas of analysis, several other mining and mineral exploration activities including the Cortez Mine, Horse Canyon Mine, HC/CUEP, and West Pine Valley are present. In addition, utilities, infrastructure, roads, livestock grazing, dispersed recreation, and wildland fires also occur throughout the areas of analysis.

The Lander County Master Plan is policy-oriented and general in nature, focusing primarily on the areas in and around the county's three major communities: Battle Mountain, Austin, and Kingston (BLM 2019a). In addition, Lander County zoning regulations also apply to the area of analysis. The proposed Goldrush Mine area is zoned as a zone A-3, Farm and Ranch District (Lander County 2019; BLM 2019a). The A-3 zone requires the proponent of mining projects to obtain a Special Use Permit from the Lander County Planning Commission. Eureka County has not adopted a zoning ordinance and existing land use patterns within the county are primarily used for mining and agriculture (Eureka County 2010). The largest land use within Eureka County is agriculture with the second largest mining.

The proposed Goldrush Mine Plan boundary would encompass approximately 19,895 acres, of which 772 acres would be on private land controlled by NGM and 19,081 acres of public lands administered by the BLM MLFO and in part by the BLM Elko District. The portions of the 120-kV power line and switching stations, contact water pipeline, infiltration distribution pipeline, Lower Horse Canyon Road, and Mount Tenabo access road that occur outside of the proposed Goldrush Mine Plan boundary would all be located on public lands within the BLM MLFO.

The primary land uses within the area of analysis include mining and mineral exploration, dispersed recreation, and wildlife habitat (BLM 2019c). Mining activities in the Cortez Mining District have occurred since the 1860s (NGM 2021). Currently, open pit and underground mining, milling, leaching and ore transport are all being conducted at the Cortez Mine. The nearest residential community is the town of Crescent Valley, Nevada, located approximate 15 miles north of the proposed Goldrush Mine. Livestock

grazing is also an established land use in the area of analysis, particularly in Crescent Valley and some foothill areas. Agricultural operations also occur around the area of analysis, including hay production in Crescent Valley and an irrigated pasture in Carico Lake Valley (BLM 2019c).

Multiple existing BLM land use authorizations or rights-of-way (ROWs) are located within the proposed Goldrush Mine Plan boundary (**Table 3-3**). In addition, a dispersed network of unimproved roads (i.e., gravel and dirt roads) are present within the area of analysis that are used by the public. Within the area of analysis, NGM or its subsidiaries controls multiple mining claims (NGM 2021). There are also numerous mining claims within the area of analysis that are not controlled by NGM, but none would overlap the Goldrush Mine disturbance footprint. Additionally, a dispersed network of unimproved roads (i.e., gravel and dirt roads) are present within the area of analysis that are used by the public (Eureka County 2005; USCB 2018), which are improved and maintained public/county gravel roads, designated through NRS 403 and NRS 405, providing public access to and through the area, including access to private property. There are also other public access roads in the area not actively maintained by the counties. Many of these are designated public roads through NRS 405.

**Table 3-3 Administrative Land Use Authorizations in the Area of Analysis**

Serial Number	Grantee	BLM Case Type/Description	Location			ROW Width (feet)
			Township	Range	Section(s)	
N-48321	Sierra Pacific Power Co.	ROW-Power Tran-FLPMA/60kV overhead power line and substation	T26N	R47E	1	40
			T26N	R48E	17, 20, 29, 32, 33	
N-71002	Nevada Gold Mines LLC	Surface Mgt-Plan Exploration/Mill Canyon	T27N	R48E	14, 15, 22, 27,28, 33	NA
N-89245	Nevada Gold Mines LLC	Surface Mgt-Notice/Cortez Summit	T27N	R48E	26, 35, 36	NA
N-91250 <sup>1</sup>	Barrick Gold Expl. Co.	Min Mat Negotiated-All/West Pine Valley Sand and Gravel	T26N	R49E	30	NA
N-93829	Commnet of Nevada LLC	ROW-Comm Site, FLPMA/Communication Site	T26N	R48E	21	NA
N-95151	BLM	ROW-Comm Site, FLPMA/Communication Site	T27N	R48E	33	50
N-95325	BLM	AML Physical Safety Reclamation/Remediation Project	T26N	R48E	5, 8	NA
			T27N	R48E	28	
N-97721	Wells Rural Electric Co.	ROW-Pwr Facilities/Electrical Substation	T26N	R48E	32	100

Sources: BLM 2020c, 2020d, and 2020e

NA = Not Applicable

<sup>1</sup> N-91250 would be incorporated in its entirety within the proposed Goldrush Mine Plan boundary and NGM is currently in the process of transferring the authorization.

### 3.8 Native American Traditional Values

Additional details of the affected environment for Native American traditional values are provided in the Native American Traditional Values SER for the Goldrush Mine Project (BLM 2021i). The area of analysis for the Proposed Action and No Action Alternative for Native American Traditional Values encompasses the proposed Goldrush Mine Plan boundary, Mount Tenabo, and a larger regional area of the Native American Traditional Values that encompasses recent hard rock mines in north-central Nevada (Carlin Trend, Crescent Valley, and Tonkin Springs areas) plus other industrial developments (e.g., large transmission lines), activities, and events (e.g., wildfires) in relative proximity to mineral development within the Western Shoshone's traditional homeland (**Figure 3-1**). This area of analysis is consistent with the regional cumulative effects study area used in the environmental analysis for the Deep South Final EIS and the Cortez Hills Expansion Project Final EIS, which was developed with Tribal coordination (BLM 2008b, 2019g).



Within the areas of analysis, several other mining and mineral exploration activities are included, these are the Cortez Mine, Horse Canyon Mine, HC/CUEP, Arturo Project, Emigrant Mine, Goldstrike mine, Lantern/Genesis/Bluestar Mine, Rossi Mine, Maggie Creek (Gold Quarry) Mine, Carlin Mine, Mule Canyon Mine, Capstone/Tara-Bootstrap Mine, Toiyabe Mine, Goldbar Mine, Leeville Underground Mine, Buckhorn Mine, Tonkin Spring Mine, Argenta Mine and Mill, Greystone Mine, Buck Mine, Rain Mine, Fire Creek Mine, Black Rock Canyon Mine and Mill, May Mine, Hollister Mine, Dee Gold Mine, Ivanhoe Mine, Beaver Peak Mine, and Lazy Old Men Mine. In addition several mineral exploration projects throughout the area of analysis include West Pine Valley, Pediment Exploration, Robertson, Argenta Project, Chevas Project, Woodruff Creek, Patty Project, Pipeline and South Pipeline, Hilltop Drilling, HD, Mike, Emigrant Springs, Bell Creek, Rodeo Creek, Tonkin Springs, Gold Bar, South Railroad, Toiyabe, CMZ, Railroad, Pleasant View, Pediment Project, Keystone, and Goldstrike Exploration. There are also several sand and gravel operations, utilities, infrastructure, roads, livestock grazing, dispersed recreation, and wildland fires also occur throughout the areas of analysis. Past and present activities within the areas of analysis have resulted in ground disturbance and potential visual impacts.

The Western Shoshone are the indigenous or aboriginal people of the area including most of northern Nevada, and specifically the area of analysis and Cortez Canyon. The following context is a summary of the ethnographic information about the Western Shoshone in general, and includes descriptions of places, resources, and practices that are not necessarily located in the area of analysis. The presented existing conditions tiers to and summarizes analyses that was set forth in prior NEPA documents including the Deep South Final EIS and the Cortez Hills Expansion Project Final EIS (BLM 2008b, 2019g).

Portions of the area of analysis have been utilized by the Western Shoshone people for at least 1,200 years (McGuire et al. 2007). Several ethnographic studies have been conducted that identify areas of importance to contemporary Western Shoshone within or near the area of analysis. These studies were conducted in conjunction with mine and transmission line development activities and are described in the Deep South Final EIS and the Cortez Hills Expansion Project Final EIS (BLM 2008b, 2019g). Through these analyses, the BLM determined that Mount Tenabo, the White Cliffs, and Horse Canyon were eligible for inclusion on the NRHP as a place of cultural and religious importance under criteria A, B, and C (Dixon and McGonagle 2004). The following ethnographic context is taken primarily from the Native American Values Enhanced Baseline Report for the Goldrush Mine Project, which references the following primary sources: Deep South Final EIS (BLM 2019f; Cedar Creek 2019a).

### **3.8.1 Bands and Territory**

By the time Euro-American fur traders entered the area (ca. 1826), Western Shoshone territory encompassed approximately one-third of what would become the state of Nevada. Historically, the Western Shoshone were organized in extended family groups identified with loosely defined home districts that were often named for a prominent food source (Cedar Creek 2019a). Other names were derived from geographic features or unique resources. These districts, often bordered by crests of mountains, contained settlement areas that were connected to a particular group of resources. Group names usually changed as the group moved on to other areas during seasonal rounds. After Euro-American contact, Western Shoshone “band” names tended to become more permanent. Today, Western Shoshone live on several small reservations and colonies located throughout California, Nevada, and Utah. The nearest Western Shoshone colony is the Battle Mountain Band Colony, located approximately 30 miles to the northeast of the area of analysis.

### **3.8.2 Governmental Organization**

Seven federally recognized tribes are located in, or have former territory in, northern Nevada. Five of these tribes regularly communicate with the BLM regarding projects in the vicinity of the area of analysis or region. These five tribes are the Te-Moak Tribe of Western Shoshone, the Yomba Shoshone Tribe, the Duckwater Shoshone Tribe, the Duck Valley Shoshone-Paiute Tribes of Idaho and Nevada, and the Ely Shoshone Tribe. Each is organized under a tribal constitution and governed by a tribal council. The Te-Moak Tribe is composed of four bands: Battle Mountain, Elko, Wells, and South Fork. Each of the bands has its own tribal council that governs the band’s reservation lands and appoints representatives to the Te-Moak tribal council.

### **3.8.3 Habitation Patterns**

Traditionally, Western Shoshone families lived a very mobile lifestyle, and individual families established temporary camps throughout their areas for hunting and gathering. They would return to established winter camps each year that were in the same general area as the temporary camps. To meet the needs of the highly mobile lifestyle of the Western Shoshone, dwellings tended to be temporary and easily constructed structures. Most of these winter houses were dome-shaped; however, some of the Battle Mountain people constructed their lodges by bending willow branches to form a peak or cone. Other structures built by the Western Shoshone included dome-shaped sweat lodges, sun shades, windbreaks, and pine nut caches (Cedar Creek 2019a).

### **3.8.4 Villages**

Winter encampments are documented on the Humboldt River near Battle Mountain and Beowawe and ceremonial, traditional food collecting, and hunting ranges were not necessarily adjacent to one another. Frequent travel for periodic gatherings and celebrations, cooperative drives, fishing, pine nut harvests, intermarriage, or visits with shamans could last several months or even years and were undertaken as a family unit or by smaller groups. The traveling patterns created an extensive social network across a broad landscape of varied topography.

### **3.8.5 Subsistence**

Traditionally, the Western Shoshone were hunter-gatherers. Women primarily were responsible for gathering plants; trapping small animals; preparing the food; and making pottery, baskets, and clothing. The men hunted large game; built the conical huts; and made flaked stone tools, digging sticks, and rabbit skin blankets. Due to the diverse environmental and ecological variability throughout their aboriginal territory, seasonal subsistence methods varied from band to band. Seasonal movement in search of favored gathering and hunting areas was conducted by small family groups from spring through fall. During the winter, several families would gather into villages in relatively warm areas near food caches (Cedar Creek 2019a). In the spring, family groups dispersed from camps located near caches of stored foods that had been exhausted over the winter, to harvest resources as they become available.

### **3.8.6 Plant Resources**

Of the many plants gathered in the summer, recent accounts emphasize camas bulbs, yampa roots, and the seeds of Indian ricegrass, stickleaf, and sunflowers. The fall pine nut harvest, which was critical for winter supplies, was second only to fishing in influencing seasonal movement.

### **3.8.7 Animal Resources**

Golden eagles and bald eagles figure prominently in Western Shoshone mythology as messengers to and from the creator. Feathers were used by shamans, usually as part of the healing ritual. Other birds, including sage grouse, mourning dove, and mockingbirds, were trapped in sagebrush country, and red-winged and yellow-headed blackbirds were trapped near wetlands (Cedar Creek 2019a). Mormon crickets, cicadas, and grasshoppers were collected when abundant. Rabbits were commonly taken in large numbers by communal drives, often associated with the fall pine nut harvest. Bighorn sheep (*Ovis canadensis*) are rare in the vicinity of the area of analysis; however, they were once the most important large game of Western Shoshone populations. Pronghorn (antelope) were probably the second-ranked large game species and were hunted communally by large numbers of participants drawn to locations where antelope shamans resided. Deer hunting among the Western Shoshone, occasional and opportunistic in the past, became more important in proportion to the reduction of other game. The Humboldt fishery was recognized as one of the most important fisheries in the Great Basin, although fishing opportunities were apparently limited (Cedar Creek 2019a).

### **3.8.8 Ceremonies and Religion**

Few ceremony types have been documented for the Western Shoshone. The only documented traditional dance is the Circle or Round Dance. The Round Dance was included in most festivals, which were held during pine nuts festivals, rabbit drives, and pronghorn hunts. One of the primary places for such festivals

was at Battle Mountain. A few other dances were held by Western Shoshones, such as the Bear Dance, South of Exhibition Dance, Sun Dance, and Ghost or Feather Dance (Cedar Creek 2019a).

Indigenous North American religions are typically based on beliefs of an interdependence of human beings with other life forms and with the earth itself. This belief system has been very important in Great Basin religions, where a delicate balance must be maintained between human subsistence and an unpredictable, sometimes harsh environment (Cedar Creek 2019a). Most Great Basin native populations participated in a variety of rituals associated with essential subsistence activities such as hunting, gathering, taking other resources, or associated with life passages such as birth and death.

The scarcity and unpredictability of water in this semi-arid region may account for the importance of water in the Great Basin religion. Western Shoshone have indicated that power is believed to be present in prominent peaks in the ranges that collect most of the precipitation that falls in the Great Basin, and they have expressed the belief that Mount Tenabo is such a peak (Cedar Creek 2019a). Rituals are commonly conducted upon entering a hunting or gathering area, particularly in the mountains.

### **3.8.9 Burials**

The concern for burials stems from the traditional practice of locating burials close to the place of death rather than in specific cemeteries. Ties to the land are maintained and derived from ancestors who are buried there. The presence of hundreds of generations of ancestors powerfully bonds individuals to the homeland and contributes to its power. Due to the variety of burial practices and the time span of Western Shoshone in the Great Basin, burials could be located in a variety of places. Some Western Shoshone believe that revered ancestors were buried in crevices in the white cliffs of Mount Tenabo before this region was affected by historic mining (Rucks 2000). Such difficult to reach or high places generally were reserved for well-regarded individuals. No pre-historic burial locations have been identified in cultural resource surveys or during exploration or mining activities in the area. NGM-operated projects within the Area of Implementation defined in the 2018 PA have had burial discovery procedures in place for many years that has not needed to be utilized.

### **3.8.10 Euro-American Contact**

The first written accounts of contact with Euro-Americans in the area of analysis date from fur trapping expeditions in the late 1820s, and these and later explorations caused land disturbance visible by 1845. By 1857, it was apparent that Euro-Americans were permanently settling into Western Shoshone territory. As a result, conflicts between Euro-Americans and Western Shoshone increased. The need to resolve the conflicts led federal agents to propose a reservation area of six square miles in Ruby Valley in 1859, which was never legally established. Meanwhile, white immigration and overland travel began encroaching into other parts of Western Shoshone territory with the establishment of the Central Route of the California Trail in 1859, also used by the Pony Express until 1861, and then by the Butterfield Overland mail company. Between 1854 and 1859, the U.S. government launched expeditions in an attempt to locate feasible wagon routes to California across Western Shoshone lands.

The Indian Reorganization Act of 1934 is the centerpiece of the New Deal policies affecting Native Americans that reversed what has been called the cultural genocide of former federal policies (Cedar Creek 2019a). The Indian Reorganization Act of 1934 granted tribes the means to consolidate allotments and buy lands, organize councils with elected officials, and pursue economic development. The Indian Reorganization Act of 1934 allowed for establishment of three new Western Shoshone tribal organizations: the Te-Moak Tribe of Western Shoshone Indians, the Yomba Shoshone Tribe of the Yomba Reservation, and the Duckwater Shoshone Tribe of the Duckwater Reservation. The creation of the Indian Claims Commission in 1946 had the purpose to settle and extinguish claims prior to termination. Only four Western Shoshone tribal organizations considered participating in submitting a claim: Duck Valley, Elko, South Fork, and Battle Mountain. Battle Mountain later withdrew its representative.

The Indian Claims Commission determined that Western Shoshone title had been extinguished. This issue and associated compensation have been the subject of numerous lawsuits. While all courts addressing the issues have rejected Western Shoshone claims to continued ownership of these lands, some Western Shoshone still maintain that title to their ancestral lands has not been extinguished. The funds held in trust

from the Indian Claims Commission proceedings were distributed according to the terms of the Western Shoshone Claims Distribution Act of 2004.

In the 1970s, the U.S. adopted a new policy for tribes that emphasizes self-determination and treats federally recognized tribes as sovereign over their internal affairs and reservations. The BLM consults with area tribes on a government-to-government basis on issues that potentially affect tribal resources.

### 3.9 Noise

Additional details of the affected environment for noise are provided in the Noise SER for the Goldrush Mine Project (BLM 2021j). The area of analysis for noise for the Proposed Action and No Action Alternative encompasses the four-mile buffer of the proposed Goldrush Mine Plan boundary (**Figure 3-2**).

Within the areas of analysis, several other mining and mineral exploration activities including the Cortez Mine, Horse Canyon Mine, HC/CUEP, and West Pine Valley are present. Noise from these other activities was included in the baseline noise data collection and modeling to document existing conditions.

In order to determine the existing environment potentially affected by noise, sensitive noise receptor sites in the area of analysis were identified at Horse Creek 01 Lek, New Horse Creek Lek 02, New Grass Valley Lek, and Quartz Lek. Baseline noise monitoring data was collected approximately 0.25 mile from each location between March and May 2020 (Saxelby 2020a). The Quartz Road Lek was chosen to represent pre-development noise levels as it is located over 10 miles from the existing Cortez Mine and is not located close to any other substantial sources of anthropogenic noise. No human sensitive receptors were identified. The results of the baseline noise level monitoring and noise modeled conditions are presented in **Table 3-4**. Review of the Goldrush Mine baseline noise data collected for all monitoring locations compared to recent literature prepared by Ambrose et al. (2020) shows that average baseline L<sub>50</sub> across all monitoring locations was below the reported average existing sound level in undeveloped sagebrush of 20 dB noted by Ambrose et al. (2020). The equipment used for baseline data collection consisted of the recently developed Larson Davis Laboratories Model 831 Type 1 sound level meters that have a noise floor of approximately 5 to 6 dBA, which is consistent with the instruments used in the Ambrose et al. (2020) study.

**Table 3-4 Baseline Noise Levels**

Time Period	4:00 AM to 9:00 AM			24-Hour Average			6:00 PM to 10:00 AM		
	Baseline Conditions, Measured (L <sub>90</sub> )	Assumed Pre-Development (L <sub>90</sub> )	Baseline Conditions, Modeled <sup>1</sup> (L <sub>50</sub> )	Baseline Conditions, Measured (L <sub>90</sub> )	Assumed Pre-Development (L <sub>90</sub> )	Baseline Conditions, Modeled <sup>1</sup> (L <sub>50</sub> )	Baseline Conditions, Measured (L <sub>90</sub> )	Assumed Pre-Development (L <sub>90</sub> )	Baseline Conditions, Modeled <sup>1</sup> (L <sub>50</sub> )
Horse Creek 01 Lek	10.6	9.6	16.1	12.7	10.5	16.1	10.0	9.0	16.1
Horse Creek 02 Lek	9.5	9.6	8.4	12.0	10.5	8.4	9.5	9.0	8.4
Horse Creek 03 Lek	9.5	9.6	16.7	12.0	10.5	16.7	9.5	9.0	16.7
New Horse Creek 02 Lek <sup>2</sup>	9.5	9.6	9.0	12.0	10.5	9.0	9.5	9.0	9.0
Cortez-Grass Valley Lek	11.3	9.6	25.7	10.6	10.5	25.7	9.4	9.0	25.7
New Cortez Grass Valley Lek	11.3	9.6	20.7	10.6	10.5	20.7	9.4	9.0	20.7
Quartz Road Lek	9.6	9.6	-2.9	10.5	10.5	-2.9	9.0	9.0	-2.9

Sources: Saxelby 2020b, 2020c

Note: All results are shown in dBA.

<sup>1</sup> Modeled baseline conditions includes noise modeling incorporating the noise sources from authorized activities not taking place at the time of baseline data collection, including two exploration drill rigs within the West Pine Valley Exploration Plan boundary and five skid-mounted 350-horsepower electric pumps located within the Cortez Mine Plan boundary with no sound attenuation enclosures or structures to reduce noise levels. This value is referred to as "Cumulative No Project Noise L50" in Saxelby 2020b.

<sup>2</sup> New Horse Creek 02 lek has previously represented as Horse Creek 04 lek; however, based on NDOW communications, Horse Creek 04 lek should be included with the New Horse Creek 02 lek (NDOW 2020a).

The expected range of ambient sound levels along the ore transportation route was estimated based on existing land uses and data found in Protective Noise Levels Condensed Version of USEPA Levels Document (USEPA 1978). Based on existing conditions along the ore transportation route, the existing ambient sound levels are expected to be between 39 dBA day-night sound level (Ldn) and 59 dBA Ldn along the majority of SR 306, and 68 dBA Ldn and 87 dBA Ldn along I-80 (Cedar Creek 2020).

### 3.10 Grazing Management

Additional details of the affected environment for grazing management are provided in the Grazing Management SER for the Goldrush Mine Project (BLM 2021k). The area of analysis for the Proposed Action and No Action Alternative includes the Carico Lake, Grass Valley, JD, and South Buckhorn allotments. Portions of the proposed Goldrush Mine Plan boundary occur within each of these allotments (**Figure 3-1**).

The Carico Lake, Grass Valley, and JD allotments are located within the BLM Battle Mountain District and are managed by the MLFO. The South Buckhorn Allotment is located in the BLM Elko District and is managed by the Tuscarora Field Office, with the exception of the South Buckhorn pasture, which is managed by the MLFO. There are 70,430 active Animal Unit Months (AUMs) permitted in the area of analysis. The Carico Lake, Grass Valley, and South Buckhorn allotments are in the Improve category, meaning that they are managed with a high priority for improving the current unsatisfactory conditions (BLM 1987b, 1988). The Carico Lake Allotment was last evaluated in 2005 while the Grass Valley and South Buckhorn allotments were last evaluated in 1987. The JD Allotment is in the Maintain category (as of the last analysis in 1988), meaning the objective is to maintain current satisfactory conditions (BLM 1988). Numerous range improvement projects have been installed in these allotments, including fences, exclosures, and watering infrastructure (e.g., pipeline and troughs). In addition to these projects, hundreds of seeps/springs and numerous perennial streams occur within the area of analysis (USGS 2020b).

Within the areas of analysis, several other mining and mineral exploration activities including the Cortez Mine, Horse Canyon Mine, HC/CUEP, and West Pine Valley are present. In addition, utilities, infrastructure, roads, livestock grazing, dispersed recreation, and wildland fires also occur throughout the areas of analysis. Past and present activities within the areas of analysis have resulted in removal of vegetation, dispersal or displacement of local wildlife, including special status species, populations, and fragmentation of certain wildlife habitats and populations. The Barrick BEA Public Land Polygons are present in portions of the area of analysis. If activities associated with the BEA take place on the authorized areas within the area of analysis the goal would be to restore and/or enhance habitat to benefit GRSG and sagebrush ecosystems and generate credits under the BEA (BLM et al. 2015; BLM 2020f).

### 3.11 Recreation

Additional details of the affected environment for recreation are provided in the Recreation SER for the Goldrush Mine Project (BLM 2021l). The area of analysis for the Proposed Action for recreation includes the land area within the proposed Goldrush Plan boundary and the immediate surrounding area, as well as the portions of the 120-kV power line and switching stations, contact water pipeline, and Mount Tenabo access road that occur outside of the proposed Goldrush Plan boundary (**Figure 3-1**). The area of analysis for the No Action Alternative includes the Horse Canyon Mine Plan boundary, the HC/CUEP Plan boundary, the West Pine Valley Exploration Plan boundary, and the Cortez Mine Plan boundary.

Within the areas of analysis, several other mining and mineral exploration activities including the Cortez Mine, Horse Canyon Mine, HC/CUEP, and West Pine Valley are present. In addition, utilities, infrastructure, roads, livestock grazing, dispersed recreation, and wildland fires also occur throughout the areas of analysis.

Developed recreational opportunities are relatively sparse within the area of analysis and immediate vicinity of the Goldrush Mine. There are no developed recreation facilities, including Special Recreation Management Areas and Extensive Recreation Management Areas, in the area of analysis or immediately surrounding the Goldrush Plan boundary. The nearest developed BLM recreation facility is the Mill Creek

Recreation Area, a small camping, fishing, and picnicking area in the Reese River Valley, located approximately 25 air miles northwest of the area of analysis (Recreation.gov 2020). In addition, Crescent Valley, Elko, Carlin, Eureka, Diamond Valley, and Battle Mountain also provide park and recreation facilities for residents.

Dispersed outdoor recreation activities are the primary recreation uses in the area of analysis. While BLM-managed public lands in the vicinity of the area of analysis generally are open for dispersed recreation use, authorized mining areas are fenced off for the protection of the public and to prevent interference with mining activities. A dispersed network of unimproved roads (i.e., gravel and dirt roads) are present within the area of analysis that are used by the public (Eureka County 2005; USCB 2018), which are improved and maintained public/county gravel roads, designated through NRS 403 and NRS 405, providing public access to and through the area, including access to private property. There are also other public access roads in the area not actively maintained by the counties. Many of these are designated public roads through NRS 405.

Dispersed recreation activities in and near the Goldrush Plan boundary include: hiking; camping; firewood collecting; rock collecting; off-highway vehicle (OHV) use; photography; sightseeing; and hunting (BLM 2019g). The historic Cortez townsite, located within the proposed Goldrush Plan boundary, also offers sightseeing opportunities of historic sites. Mule deer and pronghorn are the predominant big game species sought by hunters within the area of analysis (NDOW 2020b). Small game species including chukar (*Alectoris chukar*) and GRSG are also common species sought by hunters in the area of analysis (BLM 2019g).

There are no Wilderness Areas, Wilderness Study Areas (WSAs), or Areas of Critical Environmental Concern located within the area of analysis. The Roberts Mountain WSA is located approximately 14 miles southeast of the Goldrush Plan boundary and the Simpson Park WSA is located approximately 16 miles south of the Goldrush Plan boundary.

### **3.12 Social and Economic Values**

Additional details of the affected environment for social and economic values are provided in the Social and Economic Values SER for the Goldrush Mine Project (BLM 2021m). The area of analysis for social and economic values for the Proposed Action and No Action Alternative includes the entirety of Lander, Elko and Eureka counties including the city of Elko, Spring Creek Census-Designated Place (CDP), the city of Carlin, and Battle Mountain CDP (**Figure 3-1**).

Mining and natural resources is the prominent industry in the three-county area of analysis, directly employing thousands of workers. Some of these mines include Cortez Mine, Maggie Creek (Gold Quarry), Bald Mountain, Mount Hope, Marigold, Carlin Mine, Goldstrike, Leeville, Gold Bar, McCoy Cove, Tonkin Spring, Arturo, Emigrant, Capstone/Tara-Bootstrap, Lantern/Genesis/Bluestar, Rossi, and others. Other industries that are reflected in the past and present social and economic values are agriculture, trade transportation and utilities, professional/business services, leisure and hospitality, and government.

#### **3.12.1 Population and Demography**

Elko County is the fifth largest county in Nevada by population, with approximately 53,702 people in 2020. In contrast, Lander County and Eureka County were ranked 12 and 16 with populations of 5,734 and 1,855, respectively (USCB 2020b). Nevada has been one of the country's fastest growing states for much of the past three decades (USCB 2001, 2011). The bulk of the growth occurred in urbanized areas. The city of Elko and the Spring Creek CDP have experienced significant growth since 1980. The more rural counties and cities within the area of analysis, including the city of Carlin, Eureka County, Lander County, and the Battle Mountain CDP, experienced steady growth through the 1980 to 1990 period. Lander County and the Battle Mountain CDP have since decreased in population since 1990 to 2019, whereas steady population growth has occurred in Eureka County during this time, with Diamond Valley and the town of Eureka being expected to see population increases as a result of mineral exploration and development operations within Eureka County (Eureka County 2018). Local knowledge suggests that population growth in southern Eureka County is greater than described in or can be parsed from the U.S. Census Bureau (USCB) data (Tibbitts 2021). The USCB estimates may not reflect transient workers brought into communities from

mining operations or other job opportunities that claim residency in other locales and are not included in official population statistics or estimates. As a result, actual population levels in these areas may be greater than represented in USCB data and statistics. Workers typically choose a residence location based on some combination of job proximity, housing availability, and access to public and private services. The communities closest to the existing mining operations which are moderately sized include the city of Carlin and Battle Mountain CDP. These communities provide a reasonably broad selection of services and facilities. Most workers likely choose Elko and Spring Creek as residence locations due to the broad selection of services and housing availability despite the approximate 85 to 100 miles from operations.

All areas within the area of analysis are less diverse than Nevada as a whole, with substantially fewer black and Asian residents as a percentage of total population. With the exception of Battle Mountain, all areas also have a lower percentage of Hispanic residents than the State as a whole. The area of analysis has a higher percentage of Native Americans than the State, particularly at the county level where Elko, Eureka, and Lander counties have populations of approximately six percent, three percent, and six percent, respectively, compared with approximately two percent for the entire state (USCB 2020b).

### **3.12.2 Economy and Employment**

The area of analysis is a major contributor to Nevada's mining industry. The three counties' combined natural resources and mining sector employment comprises approximately 44 percent of the total statewide employment in that sector, a large majority of which is devoted to metal mining in the State. All counties in the area of analysis are substantially more dependent on mining than the State as a whole, although the data indicate a distinct difference between Elko County and Eureka and Lander counties. North American Industry Classification System (NAICS) sectors include Sector 21: Mining, Quarrying, and Oil and Gas Extraction in relation to top performing industries throughout various counties in Nevada. Mining alone (NAICS subsector 21) ranks third for top performing jobs in Elko County. The total industry earnings from the Mining sector in Elko County as of 2018 were \$169,861,133 (UNR 2020a). Mining ranks first for top performing jobs in Eureka County with a total industry earning for the county of \$512,938,074 in 2018 (UNR 2020b). In Lander County, Mining ranks first in the NAICS sectors with a total of \$248,236,545 industry earnings in 2018 (UNR 2020c). Elko County's economy is much more diverse, befitting its role as a trade center for northeast Nevada. Elko County has substantial numbers of workers in services, trade, and government employment, and 11.2 percent in mining. In contrast, Lander County has 67.1 percent of its jobs in the mining industry and lesser but still sizable numbers working in government and trade jobs. Eureka County is an extreme case with over 90 percent of its employment coming from mining and approximately 2.7 percent coming from government jobs (NDETR 2019, 2020a). However, differing socioeconomic conditions occur in southern and northern Eureka County, with mining activities primarily occurring in northern Eureka County, and large areas of agricultural lands and public range lands occurring in southern Eureka County, particularly in Diamond Valley. Other sectors include agriculture, government and public education, retail trade and services, and construction. The levels of economic activity and employment in sectors other than agriculture, particularly construction, have historically reflected changes in mining activity, but they also reflect non-mining related demand, including that from tourism and outdoor recreation. The "boom and bust" nature of mining activity periodically brings farming, ranching and agricultural services back to the forefront of the economy (Eureka County 2010, 2018). The employment numbers are based on place of work, not place of residence, which explains why Eureka County has more employees in the natural resources and mining sector than it has residents. Several major mines on the Carlin Trend are located in northern Eureka County, but many of those workers live in Elko County (Cedar Creek 2019b).

As of June 1, 2020, the combined labor force in the three counties is estimated at 37,233, approximately 35,713 of whom are employed. The remaining 1,520 unemployed individuals represent a 4.1 percent unemployment rate (NDETR 2020b). This level is lower than both the 15.2 percent statewide unemployment rate and the 10.2 percent national rate (Bureau of Labor Statistics 2020). High unemployment rates on the state and national levels were likely driven in large part by a decrease in the number of jobs in the leisure and hospitality and retail trade sectors due to the COVID-19 pandemic. Estimates for the individual county unemployment rates in June 2020 were estimated at 4.2 percent for Elko County, 2.9 percent for Eureka County, and 3.5 percent for Lander County (NDETR 2020b).

### 3.12.3 Income

Average mining wages and salaries are the highest for any industry in Nevada, with an average weekly wage of \$2,129, for Nevada and \$2,024 for Elko County in the first quarter of 2020. No 2020 mining wage data were available for Eureka County or Lander County, but weekly mining wages for Lander County and Eureka County were \$2,229 and \$2,327, respectively, for the fourth quarter of 2019 (NDETR 2019, 2020a). Other high weekly wage jobs in the area of analysis include trade, transportation and utilities and professional and business services, primarily in Elko County (NDETR 2019, 2020a).

Although mining wages and salaries typically are higher than average, per capita personal incomes in the area of analysis indicate the relatively high mining wages are not always sufficiently distributed to substantially raise county-wide income levels. Estimates for 2018 indicate that per capita personal incomes in the area of analysis exceed the state average of \$49,176 by 30 percent in Lander County (\$63,923), but they lag behind the state average by 18.9 percent in Eureka County (\$39,903) and by 4.1 percent in Elko County (\$46,808) (USBEA 2019). It is important to note that most mining income in Eureka County is earned by workers residing outside of Eureka County (Eureka County 2018).

Estimated median household incomes in all areas within the area of analysis were above the statewide household income level in 2020. The median household income for the state in 2020 was estimated at \$60,365, compared with \$81,232 for Elko County (34.6 percent above the state level), \$67,105 for Eureka County (11.2 percent above the state level), and \$88,030 for Lander County (45.8 percent above the state level) (USCB 2020b). According to the USCB, an estimated 11.0 percent of Elko County's population, 9.9 percent of Eureka County's population, and 10.9 percent of Lander County's population were living below the poverty threshold in 2020. In comparison, the Nevada statewide poverty rate was 12.5 percent in 2020.

### 3.12.4 Housing

The 2018 American Community Survey (ACS) estimated 25,101 housing units in the area of analysis: 21,350 units (85 percent) were in Elko County; 1,174 units (5 percent) were in Eureka County; and 2,577 units (10 percent) were in Lander County. Based on the ACS 2018 estimates, 82.8 percent of housing units in Elko County were occupied, 63.9 percent of housing units in Eureka County were occupied, and 81.0 percent of housing units in Lander County were occupied. The overall vacancy rate can be misleading, however, as some portion of the vacant units were primarily used for occasional seasonal and recreational use and not readily available for people seeking housing (USCB 2020c). ACS data are estimates and often have large margins of error. Local knowledge suggests that housing stock is more limited and that unoccupied housing is less than described in the ACS data (Tibbitts 2021).

Manufactured homes are the dominant housing type in Eureka County, accounting for 62 percent of county housing in 2017. With few traditional rental-housing units in Eureka County (multi-family and single-family attached), most renters occupy mobile homes and single-family detached housing (Eureka County 2018). Recognizing housing shortages in the Eureka area, Eureka County spent millions of dollars to subsidize the development of the Eureka Canyon Subdivision annexed into the town of Eureka. Buildable lots currently exist in the Prospect Canyon and Eureka Canyon subdivisions, and in the nearby Devil's Gate General Improvement District. There are 58 vacant lots for sale in the Eureka Canyon subdivision with an average lot priced at approximately \$24,000 per lot. Lots are served with water, wastewater, and electricity with streets, curbs, and gutters in place. The subdivision could be expanded to adjacent areas given sufficient demand, including for potential multi-family housing (rental apartments) (Tibbitts 2021). There are numerous short-term housing opportunities available in the area of analysis including two motel/lodging facilities in Carlin and several combination mobile home/recreational vehicle (RV) parks in and near town. There are approximately 35 motels in Elko with a total of over 2,300 rooms. There also are six RV parks and several campgrounds in the vicinity of Elko. Lander County is host to seven motels and two RV parks (Cedar Creek 2019b).

The town of Eureka has approximately four motel/lodging facilities with approximately 88 rooms and suites. There are also approximately 110 RV spaces. Local knowledge suggests that most of the current RV spaces are occupied. Temporary housing resources in Eureka routinely house construction and mining workers as well as tourists and recreationalists. Temporary housing resources, particularly RV parks, are also used by some mine operations workers who commute weekly. Demand for temporary housing by



tourists is typically high during the summer months. During peak summer travel periods and during the work week, hotels, motels, and RV parks in the project region routinely report full or near-full occupancy. (Tibbitts 2021).

### **3.12.5 Community Facilities and Services**

Public utilities include electricity, potable water, wastewater, and solid waste disposal. Communities within the area of analysis are served by NV Energy, WREC, or Mount Wheeler Power. The Cortez Mine Area is powered by 60-kV and 120-kV power lines operated by NV Energy (formerly Sierra Pacific Power Company) and a 120-kV power line operated by WREC (BLM 2019h). Municipal utilities provide water service to some residents in the area of analysis; most rural residents obtain water from wells or springs.

Elko's maximum daily production capacity is approximately 2,000 gpm (BLM 2019h). The city does have mandatory watering restrictions during the summer months to manage demand and treats wastewater to "reclaim" it for use in irrigating city parks and golf courses. Elko's water meets State and Federal water quality standards via standard chlorination treatment for domestic use (BLM 2019h). Spring Creek's water is provided by Great Basin Water Company. Testing conducted in 2018 indicated Spring Creek's water met or exceeded all State and Federal water quality standards for domestic use (Great Basin Water Company 2018). The City of Carlin has a plentiful supply of water and adequate storage and meets all State and Federal water quality standards for domestic use. The City of Carlin encourages conservation measures in the summer months, although distribution is not metered (Cedar Creek 2019b).

Within Eureka County, there are three municipal systems operated by Eureka County including the water systems in the town of Eureka, Devil's Gate Water District, and the town of Crescent Valley (Eureka County 2018). All systems are managed by the Eureka County Public Works Department. The town of Eureka system produces water from two wells, pumping it to three storage tanks with a total capacity of 2,350,000 gallons. A spring rehabilitation project above the town has augmented the town of Eureka's supply from numerous springs. The Devil's Gate system consists of one well, pumps, a 405,300-gallon storage tank, and distribution system. The water system has been upgraded and the department has implemented a conservation plan. In combination, the two efforts have reduced consumption and added reliability to the system (Eureka County 2019). The town of Crescent Valley system supplies water from two main wells with back-up generators. Water is pumped through an arsenic treatment plant to remove arsenic before filling the three tanks which store a total of 660,000 gallons of water to supply the gravity-fed system. Battle Mountain has an ample supply of water (BLM 2019h). Within Lander County, domestic water supply and quality are both in good condition in Crescent Valley (BLM 2019h). Austin also has county provided water and sewer services, and the community of Kingston provides its own water system.

Wastewater treatment capacity is adequate or better for each of the larger communities in the area of analysis. Elko's system is using approximately half of its permitted capacity (BLM 2019h). Carlin is operating at less than 75 percent of its permitted capacity. Battle Mountain's wastewater treatment system is operating well within its permitted capacity (BLM 2019h). The smaller communities in the area of analysis operate with individual septic systems rather than centralized wastewater treatment systems. The Eureka Wastewater Treatment Facility, managed by Eureka County's Public Works Department, treats wastewater for the town of Eureka with a multi-cell, aerated evaporative lagoon treatment system. The facility is permitted to discharge up to 100,000 gallons per day, though it typically operates at less than 50 percent of its capacity (Tibbitts 2020).

There are public landfill operations in all three counties in the area of analysis. The Battle Mountain sanitary landfill is permitted Class II landfill with a permitted disposal capacity of 1,138,000 cubic yards and the amount of municipal solid waste is not anticipated to exceed 20 tons per day during the life of the landfill. The City of Elko sanitary landfill is a Class I landfill with a permitted disposal capacity of 21,000,000 cubic yards and no capacity issues have been identified (NDEP 2020a). Eureka County Public Works operates a Class II landfill north of the town of Eureka and a landfill transfer site in Crescent Valley. Current capacity at the Eureka landfill (approximately 1,000,000 cubic yards) is expected to be sufficient until approximately 2035 under conditions, and the county is exploring additional capacity via acquisition of additional land from the BLM or vertical expansion of the landfill through a permit modification through the NDEP (NDEP 2020a).

### **3.12.6 Public Safety**

County wide law enforcement is provided by the Lander, Elko, and Eureka County sheriff departments. Local law enforcement is provided to Elko and Carlin by their respective city police. The Nevada Highway Patrol provides law enforcement protection services along the roads and highways maintained or funded by the State of Nevada. In addition, the Nevada Highway Patrol provides law enforcement protection services along primary and secondary road systems that are supported by federal aid.

Within the area of analysis, Lander County had the highest violent crime rate at an estimated 9.4 violent crimes per 1,000 persons in 2018. This trend was driven by a high number of reported aggravated assaults. Elko County had an estimated 1.0 violent crimes per 1,000 persons, and Eureka County had an estimated 2.5 violent crimes per 1,000 persons. Property crime rates were highest in Eureka County, followed by Lander County, then Elko County at 24.6, 17.5, and 3.3 property crimes per 1,000 persons (FBI 2018).

Eureka County does not have a county fire department, but it provides funding, a District Fire Chief, facilities, equipment, training, and supplies for six volunteer departments in communities throughout the county. The Eureka Volunteer Fire Service provides fire protection services in the town of Eureka and surrounding area. The Diamond Valley Volunteer Fire Department serves a primary area north of the town of Eureka (Cedar Creek 2019b). There are volunteer fire departments in Eureka County in the towns of Pine Valley, Crescent Valley, Beowawe, and Dunphy. Within Lander County, Battle Mountain and Austin Volunteer Fire Departments provide residential and commercial fire protection services (Lander County 2020). Elko County provides a combination of paid and volunteer fire services through the Elko County Fire Protection District (Elko County 2020). Local fire protection in Elko is provided by the City of Elko Fire Department. Ambulances are similarly headquartered in the major communities including Elko, with numerous substations dispersed throughout the area of analysis. Eureka County also has two volunteer ambulance services in the towns of Eureka and Crescent Valley (Eureka County 2020). Lander County has two volunteer ambulance services in the towns of Battle Mountain and Austin (Lander County 2020). There are also mutual aid agreements among the various emergency response services to provide the most effective response to any particular emergency. Additionally, the BLM and the Nevada Division of Forestry provide fire protection and suppression activities on federal land throughout Nevada (Cedar Creek 2019b).

### **3.12.7 Healthcare**

Northeastern Nevada Regional Hospital in Elko serves all of northeast Nevada. Battle Mountain General Hospital serves north-central Nevada. There are also clinics in several communities, including Elko, Carlin, and Crescent Valley. In addition, all NGM employees and dependents are eligible for healthcare services at NGM's Golden Heath facility in Elko. The Eureka County Emergency Medical Service provides emergency services in Eureka County; however, there is no hospital in Eureka County, so persons needing hospital or medical services beyond the capabilities of the diagnostic centers are transported to Elko or Ely or other regional facilities. The nearest of these is the William Bee Ririe Hospital in Ely, which is an accredited critical access hospital providing a full range of health care for the Ely and White Pine County area (Cedar Creek 2019b). In addition, the William Bee Ririe Critical Access Hospital and Rural Health Clinic has expanded their service area to include the residents of Eureka County at the Eureka County Medical Clinic (WBR 2020).

### **3.12.8 Education**

The Lander County, Elko County, and Eureka County School Districts provide public education services in the area of analysis. Student enrollment has increased in Elko and Eureka counties, with relatively stable enrollment at Lander County; however, student teacher ratios are steadily increasing for each county (Nevada Department of Education 2020a, 2020b). Education funding is a limiting factor when addressing increased enrollment. The school districts in the area of analysis have financial and facility limitations. Pursuant to NRS 388.700(5), the State Board of Education is required to submit a quarterly report on class size ratios in elementary grades and any school district requested variances for exceeding the target class size ratio. Eureka County School District's class sizes are below the target class sizes, and no variances were requested for the 2019 to 2020 school year. As a result of teacher shortages, lack of funding, and lack of classrooms, both Elko County and Lander County were unable to achieve the target class size ratio at all schools in the districts (Nevada Department of Education 2020c). In May 2021, Assembly Bill 495 was passed by the Nevada State Legislature to provide for the imposition, administration and payment of an

annual excise tax on businesses engaged in gold or silver extraction with a gross revenue in Nevada in excess of \$20,000,000 and require disbursements of certain federal money to the Department of Education and the State Public Charter School Authority for grant-making and education purposes (AB 495). Deposits of annual tax payments are currently made to the State General Fund from the taxation of net proceeds of minerals extracted in Nevada based upon actual net proceeds from the preceding calendar year; however, beginning July 1, 2023, the portion of the tax on the net proceeds of minerals will thereafter be deposited in the State Education Fund (AB 495).

### **3.12.9 Local Government**

Each county is run by their respective local government. The counties provide judicial, public safety, public works, and recreation services to their populations. The area of analysis is primarily rural. Population centers have led to the development of cities and towns. Elko County has all of the incorporated cities (i.e., Carlin, Elko, Wells, West Wendover). Each has city councils, with traditional city departments in public works, parks, police, and general governments. Other unincorporated communities include the town of Eureka, Beowawe, Crescent Valley, Battle Mountain, and Austin.

### **3.12.10 Public Finance**

Local government finance in Nevada is a mixture of locally derived and state-shared revenues. Local revenues primarily are derived from ad valorem property taxes on real and personal property (e.g., business equipment, agricultural equipment, etc.), and the net proceeds of mines in the jurisdiction. Senate Bill Number 543, signed by the Nevada Governor in June 2019, modifies the distribution of net proceeds of minerals within a county, including school districts, requiring the proceeds apportioned to each school district to be deposited to the credit of the State Education Fund. Senate Bill 543 created an 11-member Commission on School Funding to provide recommendations for the implementation of the Pupil-Centered Funding Plan. The exact method of disbursement of net proceeds of minerals is currently unknown, but the new funding formula would have implications on the current disbursement of those funds to individual school districts (Nevada Legislature 2019). Local governments also collect revenues from fines, licenses and permits, and fees for services. State-shared revenues include sales, motor vehicle, fuel, and gaming taxes.

For Fiscal Year 2018 to 2019, Elko, Eureka, and Lander County all reported more revenue than expenses. The largest share of locally derived income of all counties is from taxes and various shared intergovernmental revenues. The taxable net proceeds and assessed valuations of mines can be volatile, and the stability of tax revenues have been a particular concern in rural counties throughout Nevada as the mining industry has contracted in past years (BLM 2019h). Expenditure amounts vary among the counties, but in general, the largest expenditures are general government, public works, and public safety. These represent utilities, police, medical response, administration and other basic features of the government.

### **3.13 Soils**

Additional details of the affected environment for soils are provided in the Soils SER for the Goldrush Mine Project (BLM 2021n). The area of analysis for the Proposed Action for soil resources includes the proposed Goldrush Mine Plan boundary and the portions of the 120-kV power line and switching stations, contact water pipeline, and the Mount Tenabo access roads that lie outside of the proposed Goldrush Mine Plan boundary (**Figure 3-2**). The area of analysis for the No Action Alternative includes the Horse Canyon Mine Plan boundary, the HC/CUEP Plan boundary, the West Pine Valley Exploration Plan boundary, and the Cortez Mine Plan boundary.

Within the areas of analysis, several other mining and mineral exploration activities including the Cortez Mine, Horse Canyon Mine, HC/CUEP, and West Pine Valley are present. In addition, utilities, infrastructure, roads, livestock grazing, dispersed recreation, and wildland fires also occur throughout the areas of analysis. Past and present activities within the areas of analysis have resulted in disturbance to soils. The Barrick BEA Public Land Polygons are present in portions of the area of analysis. If activities associated with the BEA take place on the authorized areas within the area of analysis, the goal would be to restore and/or enhance habitat to benefit GRSG and sagebrush ecosystems and generate credits under the BEA (BLM et al. 2015; BLM 2020f).

The area of analysis includes 36 soil map units comprised of 48 individual soil series and vary by depth, texture, erosion potential, and other characteristics based on several soil forming factors. Soils in the area of analysis are largely derived from tuffaceous sandstone and limestone and igneous rocks, occurring as residuum and colluvium deposits that occupy moderate to steep hillslopes at higher elevations. In general, these soils are coarse and well drained; a shallow restrictive layer is common. Organic material in these soils is low (less than five percent) (NRCS 2020a). Soil associations may contain minor loess and volcanic ash deposits in addition to residuum and colluvium (BLM 2016a). Soils in the area of analysis occur on alluvial flats, fan skirts and piedmonts, inset fans, piedmont slopes, hills, foothills, and mountains. The soils on mountain and foothill side slopes typically are shallow or moderately deep, with substantial rock fragments distributed through the soil profile. Soils on the fans generally are very deep, loamy to sandy, and may have gravel within the profile. At lower elevations nearer the basin floor, the soils on floodplains, fan skirts, and alkali flats are very deep with silty clay loam to sandy loam textures and may have gravel within the profile. They typically have substantial salinity, sodicity, and alkalinity concentrations, and may be seasonally flooded in the lowest topographic positions. The soils in the area of analysis have formed in an arid environment from bedrock residuum, colluvium, widespread deposits of both younger and older alluvium, and isolated windblown deposits. Some of the soils in the area of analysis previously have been disturbed by mining and other activities and have been modified from their original state.

Most of the soil profiles have material suitable for use as topsoil during reclamation; however, the limiting characteristics include too high of a rock fragment content, which causes an unacceptably low water holding capacity, or insufficient organic matter, which creates a soil with an unacceptably low fertility level. Topsoil can be used to cover an area for the establishment of vegetation. The surface layer of most soils is preferred for topsoil due to generally higher organic matter content than subsurface layers. Soils within the proposed new disturbances of the area of analysis are limited in their ability to provide suitable topsoil according to their rating. Based on the NRCS's evaluated soil survey for the area of analysis, 6,292 acres of soil units within the area of analysis are rated as fair sources of reclamation material (NRCS 2020a).

Wind erodibility groups were used to determine susceptibility of soils to wind erosion. Wind erodibility groups are based on compositional properties of the surface horizon that are considered to affect susceptibility to wind erosion such as texture, presence of carbonates, and the degree of decomposition of organic soils. Group ratings range from one to eight, with one being the most susceptible and eight being the least susceptible to erosion. In the proposed Goldrush Mine Plan boundary, most soil map units range between wind erodibility groups five and eight. In the proposed Goldrush Mine Plan boundary, the average wind erodibility index is approximately 56 tons per acre per year (NRCS 2020a).

In the proposed Goldrush Mine Plan boundary, the average erosion factor  $K_w$  is approximately 0.2 tons per acre per year for all soils. The average erosion factor  $K_f$  for soils within the proposed Goldrush Mine Plan boundary is approximately 0.4 tons per acre per year. The average erosion factor  $T$  for the proposed Goldrush Mine Plan boundary is approximately 2.5 tons per acre per year. Therefore, based on the NRCS custom soils report, some soils within the proposed Goldrush Mine Plan boundary have a high erosion potential (NRCS 2020a). Within the proposed Goldrush Mine Plan boundary, there are eight soil map units with soils that have a hydric soil rating (NRCS 2020b).

Biological soil crusts (BSCs) are complex mosaic of cyanobacteria, green algae, lichens, mosses, microfungi, and other bacteria. BSCs were not mapped during baseline surveys in the proposed Goldrush Mine Plan boundary; however, the soils within the area of analysis were assessed for potential use as a growth medium within the HC/CUEP and West Pine Valley project areas during 2014 and 2015 soils investigations, including assessment of soil horizon parameters based on specified physical, biological and chemical soil characteristics. The findings from these reports recommended a soil health determination be completed after topsoil is replaced in the reclamation process to account for soil microbial biomass and to evaluate nitrogen and phosphorous mineralization potential, which is the core of the nutrient supply mechanism for plants (Smith 2014).

Prime, unique, and farmlands of statewide importance were analyzed for the area of analysis, and all soil units were reviewed for these characteristics. There are three soil units classified as prime farmlands in the area of analysis, only if measures are taken to overcome a hazard or limitation to the soil. There are no

soils classified as unique farmland within the area of analysis. Farmland of statewide importance may include tracts of land that have been designated for agriculture by state law (NRCS 2020c).

### 3.14 Transportation and Access

Additional details of the affected environment for transportation and access are provided in the Transportation and Access SER for the Goldrush Mine Project (BLM 2021o). The Proposed Action and No Action area of analysis for transportation and access includes the proposed Goldrush Mine Plan boundary and the primary ore transport route between the proposed Goldrush Mine and the off-site processing facilities (**Figure 3-1**). The primary ore transport route would include trucks leaving the proposed Goldrush Mine to the Cortez Mine via Cortez Canyon Road (county roads [CRs] 222 and 225) to northbound travel on SR 306 through Crescent Valley and Beowawe to I-80. The route continues east on I-80, over Emigrant Pass, to the East Carlin Exit 282. The route then crosses over I-80 and re-enters I-80 westbound to Exit 280 and then proceeds north along SR 766 to Goldstrike or Gold Quarry for ore processing. The back haul follows the same route in reverse entering I-80 westbound at Exit 280 back towards the Goldrush Mine.

Within the areas of analysis, several other mining and mineral exploration activities including the Cortez Mine, Horse Canyon Mine, HC/CUEP, and West Pine Valley are present. In addition, utilities, infrastructure, roads, livestock grazing, dispersed recreation, and wildland fires also occur throughout the areas of analysis. Activities in the area of analysis utilize the road network to transport hazardous materials, including reagents and petroleum, to nearby mining operations and other customers. Vehicles using these routes also contain petroleum fuels.

The road network in the area of analysis consists of I-80, SR 766, SR 306, and Cortez Canyon Road (CRs 222 and 225). I-80 is a four-lane divided interstate freeway that connects San Francisco and New York City and is the primary east-west traffic artery across northern Nevada. It extends from Reno-Sparks to Salt Lake City passing through Winnemucca, Battle Mountain, Carlin, Elko, and Wells. The portion of I-80 in Nevada is also designated as Dwight D. Eisenhower Highway and Purple Heart Trail. The freeway has 12-foot-wide travel lanes with access limited to on and off ramps, and the speed limit is 75 miles per hour (mph) in the area of analysis. SR 766 and SR 306 are two-lane state routes with 12-foot-wide travel lanes and two-foot-wide shoulders. Goldrush Mine access is directly from these roads. The speed limit is 70 mph on SR 306 and 45 mph on SR 766. Speed limits for county roads are 45 mph unless otherwise posted. Cortez Canyon Road (CRs 222 and 225) are gravel roads providing access to private property. In addition, a dispersed network of unimproved roads (i.e., gravel and dirt roads) are present in the region and are used by the public. Additionally, a dispersed network of unimproved roads (i.e., gravel and dirt roads) are present within the area of analysis that are used by the public (Eureka County 2005; USCB 2018), which are improved and maintained public/county gravel roads, designated through NRS 403 and NRS 405, providing public access to and through the area, including access to private property. There are also other public access roads in the area not actively maintained by the counties. Many of these are designated public roads through NRS 405.

Traffic counts collected for the Goldrush Mine Project in August 2020 showed I-80 has the greatest level of traffic with 5,510 eastbound trips and 5,534 westbound trips on weekdays at the SR 306 ramps with 40 percent being from heavy vehicles (Matrix 2020). The makeup of traffic on SR 766 and SR 306 have large percentages of heavy truck traffic at 39 percent at SR 306 north of Beowawe and 36 percent at SR 766 north of the I-80/SR 66 ramps.

NGM is hauling up to 2.5 Mt of ore per year (Mtpy) using truck and trailer units consisting of a Kenworth truck pulling a 28-ton trailer and a 10-ton auxiliary trailer. The maximum hourly trucking volumes associated with the permitted hauling scenario is estimated at 18 trucks per hour in each direction (Matrix 2020).

Roadway LOS is a measure of effectiveness that explains how a roadway or intersection operates and is measured in terms of the amount of traffic volume compared to the theoretical capacity of the roadway or intersection. LOS can also be measured in seconds of delay on average experienced by users of the roadway or intersection (Matrix 2020). LOS ranges from LOS A, which is free-flow conditions describing the highest quality when motorists are able to travel at their desired speed, to LOS F, stop and go conditions, which represents heavily congested flow with traffic demand exceeding the capacity of the road. LOS A to LOS D are considered to be acceptable, whereas LOS E and LOS F are considered unacceptable and may

necessitate improvements to get to an acceptable LOS (Matrix 2020). All road locations in the area of analysis have acceptable baseline LOS conditions. None of the intersections along the haul route are signalized and all intersections operated at an acceptable LOS under baseline conditions.

Crash data from 2014 to 2018 shows there were three fatality accidents, with two occurring on westbound I-80 and one on eastbound I-80 in the area of analysis. The majority of accidents involved property damage and the total rate was fairly constant ranging from 31 to 46 (the lower range does not include some data from 2017 and 2018). Similarly, the injury rate was also fairly constant for the years where data was available ranging from 11 to 15 injury accidents per year across the haul route roads. SR 306 and SR 766 in the area of analysis have crash rates that are below the statewide average crash rate for similar roads. The portion of I-80 in the area of analysis has a crash rate approximately 44 percent higher than the average crash rate for statewide rural interstates but approximately 27 percent less than the average for statewide major collector rural roads. There are no obvious design deficiencies along the section of I-80 within the area of analysis, but there is more horizontal and vertical curvature along this section than most rural interstate roadways in the state of Nevada (Matrix 2020).

### **3.15 Vegetation, Including Noxious and Invasive Non-native Species and Special Status Plants**

Additional details of the affected environment for vegetation are provided in the Vegetation, Including Noxious and Invasive Non-native Species and Special Status Plants SER for the Goldrush Mine Project (BLM 2021p). The area of analysis for the Proposed Action for vegetation, including noxious weeds and invasive species, as well as special status plants includes the proposed Goldrush Mine Plan boundary and the portions of the 120-kV power line and switching stations, contact water pipeline, and Mount Tenabo access road that occur outside of the proposed Goldrush Mine Plan boundary (**Figure 3-2**). The area of analysis for the No Action Alternative includes the Horse Canyon Mine Plan boundary, the HC/CUEP Plan boundary, the West Pine Valley Exploration Plan boundary, and the Cortez Mine Plan boundary.

Within the areas of analysis, several other mining and mineral exploration activities including the Cortez Mine, Horse Canyon Mine, HC/CUEP, and West Pine Valley are present. In addition, utilities, infrastructure, roads, livestock grazing, dispersed recreation, and wildland fires also occur throughout the areas of analysis. Past and present activities within the areas of analysis have resulted in removal of vegetation, dispersal or displacement of local wildlife, including special status species, populations, and fragmentation of certain wildlife habitats and populations. The Barrick BEA Public Land Polygons are present in portions of the area of analysis. If activities associated with the BEA take place on the authorized areas within the area of analysis, the goal would be to restore and/or enhance habitat to benefit GRSG and sagebrush ecosystems and generate credits under the BEA (BLM et al. 2015; BLM 2020f).

The area of analysis is located within the USEPA Central Basin and Range Level III ecoregion, and the U.S. Department of Agriculture Forest Service Northeastern Great Basin physiographic section of the Intermountain Semidesert and Desert Province (Bailey et al. 1994). Topography in this ecoregion is characterized by interior basins with heavy accumulations of alkaline and saline salts. Few streams in the ecoregion are perennial. The mountains rise steeply from the semi-arid, sagebrush-covered plains. The Intermountain Semi-desert and Desert Province vegetation is made up of four vegetation belts: sagebrush-dominated, woodland, montane, and sub-alpine (Bailey et al. 1994). The area of analysis is limited to the sagebrush and woodland vegetation belts.

Upland vegetation communities mapped in the area of analysis include 10 types of mixed sagebrush shrubland systems, six types of woodland systems, and 12 types of grassland and meadow systems. Areas of ongoing or unreclaimed disturbance, such as roads, and rock outcrops were classified separately as disturbed systems. Additional details on the of vegetation community composition within the area of analysis are provided in the Vegetation SER for the Goldrush Project (BLM 2021p).

Plant species composition, abundance, and vegetative structure have been affected by previous disturbances within the area of analysis by livestock grazing, mineral exploration, and wildfire (ERM 2018). In 1999, a fire burned over 20,330 acres throughout a portion of the area of analysis (ERM 2018).

### 3.15.1 Noxious and Invasive, Non-native Species

Noxious and invasive species were observed throughout the area of analysis between 2011 and 2017 (ERM 2018). The most common noxious and invasive species observed in the area of analysis included: hoary cress, also known as whitetop (*Cardaria draba*); Scotch thistle (*Onopordum acanthium*); and musk thistle (*Carduus nutans*). Canada thistle (*Cirsium arvense*), poison-hemlock (*Conium maculatum*), and Klamath weed or spotted St. Johnswort (*Hypericum perforatum*), are also known to occur, but have a more limited distribution. Other non-native species included cheatgrass, crested wheatgrass, and forage kochia (ERM 2018). Invasive species were primarily observed along roads and edges of seeps/springs and streams (ERM 2018).

### 3.15.2 Special Status Species

Beatley buckwheat (*Eriogonum beatleyae*) is the only special status plant species that has been observed in the area of analysis (ERM 2018). Between 2011 and 2013, four observations of this species were recorded (ERM 2018).

### 3.15.3 Ethnobotanical Plant Species

Desert parsley (*Lomatium dissectum*), also known as fernleaf biscuitroot, Indian carrot, fern leaf lovage, and giant lomatium, has been valued and harvested for its medicinal properties by Native Americans throughout the west and northwest for centuries and is one of the most widely used plant species in Native American culture (Tilley et al. 2010). Conditions in the Cortez Mountains provide optimum habitat for desert parsley, and the plant grows in abundance in numerous canyons throughout the range. Occurrences of this species were recorded throughout the area of analysis, including within woodland, sagebrush, and grassland habitats (ERM 2018).

## 3.16 Visual Resources

Additional details of the affected environment for visual resources are provided in the Visual Resources SER for the Goldrush Mine Project (BLM 2021q). The area of analysis for visual resources for the Proposed Action is the proposed Goldrush Mine Plan boundary and the portions of the 120-kV power line and switching stations, contact water pipeline, and Mount Tenabo access road that occur outside of the proposed Goldrush Mine Plan boundary and the surrounding viewshed as seen from the Key Observation Points (KOPs) identified for the Goldrush Mine (**Figure 3-2**). The area of analysis for the No Action Alternative includes the Horse Canyon Mine Plan boundary, the HC/CUEP Plan boundary, the West Pine Valley Exploration Plan boundary, and the Cortez Mine Plan boundary and the surrounding viewsheds.

Within the areas of analysis, several other mining and mineral exploration activities including the Cortez Mine, Horse Canyon Mine, HC/CUEP, and West Pine Valley are present. In addition, utilities, infrastructure, roads, livestock grazing, dispersed recreation, and wildland fires also occur throughout the areas of analysis. Past and present activities within the areas of analysis have resulted in existing changes to the viewshed.

Based on the Visual Resource Inventory (VRI) that has been completed for the BLM Battle Mountain District Office and Elko District Office, the proposed Goldrush Mine Plan boundary is located in a designated VRI Class II and IV (BLM 2004, 2016a, 2019c). After reviewing the VRI, previous NEPA, and completing an analysis of scenic quality, visual sensitivity levels, delineating distance zones, completing visual simulations, and completing visual contrast rating worksheets, it was established by BLM management that the interim Visual Resource Management (VRM) class for the proposed Goldrush Mine Plan boundary will be managed under a VRM Class IV (BLM 2021q).

Three KOPs were selected for the proposed Goldrush Mine Plan boundary. KOP 1 is located along JD Ranch Road (M-111) facing northwest towards the proposed Goldrush Mine. KOP 1 was selected as the proposed mining operations would be most readily viewed by an occasional motorist traveling along JD Ranch Road (M-111). For those driving on JD Ranch Road (M-111) towards the Goldrush Mine, their direction of focus would be on the road with the existing and proposed disturbances in their periphery. KOP 2 is located approximately 1.5 miles from the Mount Tenabo summit facing east-southeast towards the proposed Goldrush Mine. The KOP point was proposed to be located on top of the summit; however, access

to the Mount Tenabo summit was restricted during data collection for KOP photographs and was field-adjusted as appropriate. The views from the summit of Mount Tenabo represent a lightly used scenic overlook that may be viewed by users in the area. Additionally, the view represents a sensitive viewpoint and has been reported as having ceremonial importance for Native Americans. KOP 3 is located along Cortez Canyon Road (CR 225/CR 222) facing east towards the proposed Goldrush Mine. The view from KOP 3 was chosen due to its partial view of the White Cliffs, Mount Tenabo, and the portions of the proposed portal pad expansion. KOP 3 is also located near Shoshone Wells which represented a sensitive viewpoint that is also used for Native Americans ceremonial purposes (Cedar Creek 2019a, 2021).

### **3.17 Water Resources and Geochemistry**

Additional details of the affected environment for water resources and geochemistry are provided in the Water Resources and Geochemistry SER for the Goldrush Mine Project (BLM 2021r). The area of analysis for surface water, groundwater, and geochemistry encompasses the Crescent Valley, Pine Valley, Grass Valley, and Carico Lake Valley hydrographic basins, for a total area of 2,725 square miles (**Figure 3-1**). The area of analysis for floodplains is the proposed Goldrush Mine Plan boundary, as this is the area where potential impacts for this resource would be realized (**Figure 3-2**). The area of analysis for water rights is the maximum extent of the predicted 10-foot groundwater drawdown contour related to mine dewatering, plus a one-mile buffer (**Figure 3-1**). The buffer was chosen to identify areas that may be affected as a result of drawdown of less than 10 feet, as well as to account for potential uncertainty in the predicted groundwater model (SRK 2020b).

There are several authorized projects in the area of analysis that impact the existing conditions. These authorized actions include exploration activities, sand and gravel operations, roads, railroads, power line, pipelines, telephone and fiberoptic lines and geothermal infrastructure, and agriculture areas. Authorized activities in the immediate vicinity of the Goldrush Mine include the Horse Canyon Mine Plan (N-66896), the HC/CUEP Plan (N-66621), the West Pine Valley Exploration Project Plan (N-77213), the Cortez Mine Plan (N 67575), and other exploration activities. In addition, the Cortez Mine plan consists of authorized dewatering activities. The authorized dewatering activities are described in more detail under the No Action Alternative in the Project Alternatives SIR for the Goldrush Mine Project (BLM 2021a). As part of the authorized Cortez Mine Plan, the BLM has required NGM to implement two Surface Water Contingency Mitigation Plans. These plans describe monitoring spring sites within the maximum extent of the predicted 10-foot groundwater drawdown contour related to mine dewatering and its one-mile buffer, contingency mitigation for each spring site, and triggers for each spring site to determine when contingency mitigation would be implemented (Barrick and JBR 2010; BCI and Stantec 2018). All contingency and mitigation measures would comply with Nevada Water Law and would involve the Nevada Office of the State Engineer.

#### **3.17.1 Surface Water Resources**

Naturally occurring surface waters in the area of analysis include the Humboldt River, Pine Creek, and numerous smaller perennial, intermittent, and ephemeral streams, seeps, and springs in the mountain ranges (Itasca 2016). Most streams in the area of analysis originate from the mountain ranges and flow or dissipate into the fans along the valley margins or drain toward playas near the basin centers. The playas are intermittently wet from occasional runoff and from natural fluctuations of groundwater levels beneath the playas (SRK 2020b). Surface water is a small portion of the water budget of the area of analysis, with the only surface water from streamflow via Pine Creek at the north end of Pine Valley. Surface flow that arises from Carico Lake Valley at Rocky Pass is conveyed into Crescent Valley via Cooks Creek, where it rapidly infiltrates into the alluvium in southern Crescent Valley. Grass Valley is reported to be closed topographically and hydrologically, with flow direction toward the valley floor. There is a low topographic divide just south of Beowawe, as well as other watershed divides near Iron Blossom Mountain that naturally restrict surface water flow to the Humboldt River. Crescent Valley is predominantly a closed drainage system, except for a small amount of inflow at Rocky Pass in the southern part of the valley. Subsurface flow is more significant in the water balance in the area of analysis than is surface water flow. Streamflow measurements conducted by the United State Geological Survey in 1992 indicate the Humboldt River gains flow as a result of groundwater discharge between the Pine Creek confluence and Beowawe. The extent to which basins to the north of Crescent Valley contribute to the flow gain of the Humboldt River is unknown,



though groundwater discharge from Crescent Valley to the Humboldt River is estimated to be one-half of the net gain (SRK 2020b, 2020c; Itasca 2016).

Precipitation and geologic conditions in the area of analysis limit perennial stream flows to only a few isolated channels. Elsewhere, flows in the area of analysis occur as either intermittent or ephemeral discharges. Longer-duration intermittent flows originate from isolated springs or as short-term seasonal runoff from snowmelt and winter precipitation, whereas ephemeral flows result from infrequent storm events. Numerous drainages flow downward along the mountain fronts and cross alluvial fans where the flows dissipate into deeper sediments on the fans or farther downslope on the valley floors. When water does reach the fans or valley floors during larger runoff events, it is soon taken up by evapotranspiration and seepage into the valley floor sediments (SRK 2020b). There is a naturally high variability in precipitation in the area of analysis within the Central Basin and Range ecoregion, but there are currently no suggestions for a strong trend toward either wetter or drier conditions in any month within the ecoregion. There are, however, slight increases in precipitation during the summer “monsoon” season toward the south and east (Comer et al. 2013).

Isolated stream reaches are typically perennial during years of normal and above-average precipitation. Perennial flow and/or seasonally ponded areas occur over short stream reaches in the mountains and downstream of perennial springs. In the Shoshone Range, isolated perennial stream reaches occur in Carico Lake Valley along upper Cooks Creek and Elder Creek northwest of Rocky Pass, and in upper Ferris Creek and Indian Creek draining to Crescent Valley. Short perennial or intermittent stream reaches also drain to Crescent Valley from the Cortez Mountains. A perennial reach likely occurs on Mill Creek, and isolated perennial stream reaches also may occur in upper Brock Canyon, Cottonwood Creek, Hand Me Down Creek, and in other Crescent Valley side drainages to the northeast of the area of analysis (SRK 2020b).

Skull and Steiner Creeks are perennial creeks in the Grass Valley portion of the area of analysis. Skull Creek also has upstream intermittent segments. Callaghan and McClusky creeks are perennial in the upper elevations but become intermittent in the valley. Dry Canyon Wash Creek is an intermittent creek that has a short perennial segment. In the Pine Valley portion of the area of analysis, numerous headwater tributaries to Pine Creek form on the east and southeast-facing slopes of the Cortez Mountains. In Pine Valley, Willow Creek, Horse Creek, and their tributaries are steep channels fed by runoff and spring flow. Streams characterized as perennial include short, isolated segments of Horse Creek and Willow Creek located on the east flank of the Cortez Mountains along the western-most portion of Pine Valley. Horse Creek and Pine Creek are perennial immediately upstream of their confluence. Downstream, Pine Creek is generally intermittent until below Curlew Flats and generally perennial to its confluence with the Humboldt River, but has several branching intermittent reaches along wider parts of the valley floor where seepage into the valley floor sediments removes flow from the divided channels (SRK 2020b).

Where perennial stream reaches occur, most flows historically ranged from approximately five gpm to approximately 20 gpm. In some streams, such as Indian Creek in Crescent Valley, greater flows ranging from approximately 150 to 1,000 gpm occur. Recent data for Horse Creek vary but indicated a March monthly average high flow of approximately 50 gpm and a September monthly average low flow of approximately four gpm. However, there was no measurable flow from July 2015 through January 2016. In the north central part of Pine Valley, recent data for Pine Creek indicate an average monthly high flow in February of approximately 3,000 gpm (6.7 cubic feet per second [cfs]), and an average monthly low flow in October of approximately 1,660 gpm (3.7 cfs) (BLM 2019i).

Numerous springs and seeps occur in the area of analysis. Multiple seep and spring surveys and monitoring have been conducted since the early 1990s in portions of the area of analysis. Two hundred and ninety-four seeps and springs have been identified within the area of analysis (JBR 1993, 2000, 2012, 2013; HDR 2014; SRK 2020b; Stantec 2016). Many springs in the area of analysis, regardless of discharge location or surface rock type, discharge from groundwater systems that are dependent on annual groundwater recharges and the springs are greatly influenced by seasonal and climatic variations in precipitation. Monitoring of the springs, including isotopic data analysis, supports the assumption that the springs do not discharge from the deep carbonate aquifer since many springs periodically dry up with minimum to no discharge (HydroGeo Group 2017; HDR 2020; Barrick and JBR 2010; BCI and Stantec 2018).

There are several hot springs located throughout the area of analysis. Three of the spring sites in Crescent Valley are thermal springs. In Crescent Valley, a large geothermal spring system is located at Hot Springs Point north of the Goldrush Mine. These thermal springs emanate from fault zones in the siliceous bedrock at the alluvium/bedrock interface. An additional hot spring, known as the Dewey Dann spring, occurs near the base of the Cortez Mountains west of Hand Me Down Creek and is associated with the Hot Springs Point geothermal system. The source of the hot spring is believed to be within the alluvium and the Pony Trail Group volcanic intrusions (SRK 2020a).

On January 7, 2016, the USACE determined 38.45 acres of wetlands and 1,399,941.33 feet of drainages in upper Pine Creek are jurisdictional and would require a CWA 404 permit for any placement of fill material in those waters (USACE 2016). On November 25, 2020, the USACE determined that water features within the Mill Canyon area are not jurisdictional under the CWA (USACE 2020a). On December 31, 2020, the USACE determined that water features within the Cottonwood Creek and Brock Creek areas are not jurisdictional under the CWA (USACE 2020b). While the features within the Mill Canyon, Cottonwood Creek, and Brock Creek areas were deemed not jurisdictional by the USACE and exist outside of the proposed boundary of the Goldrush Mine Project, they are referenced throughout this analysis.

### **3.17.2 Groundwater Resources**

More detailed hydrogeologic baseline conditions in the area of analysis are presented in the Barrick Cortez Four-Basin (Carico Lake Valley, Crescent Valley, Grass Valley, and Pine Valley) Groundwater Flow Model Report (Itasca 2016) and updated in the Goldrush Project Groundwater Flow Modelling Report (SRK 2020b). Studies in the region have indicated a wide range of hydraulic properties of bedrock units and characterized the fault controlled and hydraulically isolated nature of the bedrock groundwater system (Geomega 2006; Itasca 2016).

The regional groundwater flow directions in the Crescent Valley and Pine Valley hydrographic basin prior to mine dewatering are generally north from these valleys towards the Humboldt River that defines the northern boundary of the basins. Groundwater flow in the area of analysis is typical of the Basin-and-Range province, where groundwater flows from mountainous areas (where annual precipitation is greatest) to the basin-fill aquifer in the valley lowland. Alluvial fans surrounding the valley floors receive recharge from surface-water runoff from the mountain block. Much of the groundwater in the basin-fill aquifers is lost through evapotranspiration as it flows toward discharge areas such as the playas in Crescent and Grass valleys or to Pine Creek or the Humboldt River. The crests of the mountain ranges create divides for surface-water flow and, in some cases, can also function as groundwater divides (Itasca 2016).

The regional flow system generally mimics the topography with steep gradients in the mountains and gentler gradients in the basins. Groundwater flow in the Carico Lake and Grass Valley hydrographic basins in the southern portion of the area of analysis is from the mountain blocks toward the central portion of the valleys (SRK 2020b, 2020c).

The groundwater elevations for December 2015 represent the existing groundwater conditions. The four basin groundwater model simulated aggregate drawdown and mounding resulting from mine dewatering and re-infiltration activities that occurred between April 1996 and December 2015. As of December 2015, drawdown associated with existing mine dewatering activities in the Pipeline Complex generally were restricted to areas in the southern Crescent Valley Hydrographic Area. Drawdown associated with existing dewatering activities in the Cortez Hills complex extends across an area in the southeast Crescent Valley Hydrographic Area, the northern part of the Grass Valley Hydrographic Area, and in the Horse Canyon area of the western Pine Valley Hydrographic Area. Re-infiltration of mine water through the existing RIBs also has resulted in rising groundwater levels (i.e., mounding) in the basin fill aquifer in three areas in southern Crescent Valley (SRK 2020b).

Existing groundwater inflow components include precipitation recharge, infiltration of excess mine water at the RIBs in West Pine Valley (previously authorized), and surface and subsurface inflow from adjacent areas outside the area of analysis. Groundwater outflow components include evapotranspiration from phreatophyte and playa areas, groundwater pumping for non-mining uses and for existing mine dewatering operations, discharge at springs and streams, and subsurface outflow to adjacent areas outside the area of analysis. A large percentage of the groundwater withdrawn for mine dewatering is re-infiltrated into the

basin fill aquifer through RIBs or irrigation. Groundwater dewatering has previously occurred and continues to occur in the area of analysis; therefore, the existing conditions of groundwater include the authorized dewatering associated with the Cortez Mine Plan through 2032. Under the Cortez Mine authorized action, the maximum drawdown in the area of analysis was predicted to be 2,655 feet in the vicinity of the Deep South underground mine. The predicted maximum extent of the 10-foot drawdown contour from the center of the Crossroads Pit would be 7.2 miles to the north, 7.8 miles to the east and 12.8 miles to the southwest. The maximum extent of the 10-foot drawdown contour to the southeast from the Cortez Hills Pit under the authorized actions would be 13.8 miles in the carbonate window in the northern end of the Simpson Park Mountains in Pine Valley. The authorized maximum extent of the 10-foot drawdown would be 125,962 acres or 196.8 square miles. The drawdown was predicted to approach a new equilibrium after 500 years of recovery in 2532 (SRK 2016).

### **3.17.3 Floodplains**

The Federal Emergency Management Agency (FEMA) has delineated flood hazard zones in the proposed Goldrush Mine Plan boundary. No FEMA designated floodplains exist within the proposed Goldrush Mine Plan boundary. A FEMA-designated floodplain (Zone A delineation for the 100-year flood hazard zones) follows Pine Creek which is outside of the proposed Goldrush Mine Plan boundary. A FEMA Zone X floodplain, indicating moderate- to low-risk areas, surrounds Pine Creek in some areas, and a Zone A floodplain follows Cooks Creek in a fairly narrow band through Rocky Pass into Crescent Valley.

A desktop delineation was conducted to determine the extent of potential floodplains associated Willow Creek, Dry Creek, and Horse Creek, which are the channels that intersect the proposed Goldrush Mine Plan boundary. The floodplain extent in the proposed Goldrush Mine Plan boundary was estimated to assess the potential for sediment transport, especially during construction. The floodplain width varies along the extents of each channel analyzed, expanding to over 3,000 feet wide where Willow Creek, Dry Creek and Horse Creek intersect. There are approximately 172 acres of desktop delineated floodplains within the proposed Goldrush Mine Plan boundary.

### **3.17.4 Water Rights**

An inventory of active water rights in the water rights area of analysis was completed using water rights records on file with the NDWR. Vested water rights that have not yet been filed with the State Engineer may not have been available in the water rights inventory, though they may be present in the area of analysis. There are 179 active water rights in the area of analysis, including 52 surface water rights and 127 groundwater rights (NDWR 2021a). The surface water rights include 12 vested rights, 50 certified rights, and 117 permit rights. The primary uses for water in the area are stock watering, irrigation, and mining and milling. Since water rights are not necessary for most domestic wells, some wells that do not have water rights associated with them may occur within the area of analysis. Review of the NDWR well log database details approximately 14 domestic wells, 646 monitoring wells, 22 irrigation wells, 110 industrial use wells, 67 mining use wells, 29 municipal use wells, six stock use wells, and four other use (e.g., infiltration) wells. The majority of these wells are controlled by NGM (NDWR 2021b). Review of Eureka County's domestic well log database indicates that the only well within the 10-foot drawdown and one-mile buffer is located on the Dean Ranch which is controlled by NGM (Eureka County 2021). No federally reserved water rights or Public Water Reserves were identified in the NDWR water rights database within the area of analysis (SRK 2020b).

### **3.17.5 Surface Water Quality**

Nevada water quality standards are summarized in the Water Resources and Geochemistry SER for the Goldrush Mine Project (BLM 2021r).

Surface water bodies within the area of analysis with designated uses and corresponding surface water quality standards (NAC 445A.11704 through 445A.2234) are the Humboldt River (which forms the northern boundary of the area of analysis), Pine Creek and its tributaries, and Coyote Creek and similar small tributaries drain to the Humboldt River in the extreme northern end of Crescent Valley. The remaining streams flow in closed basins or onto playas with no outlet to a designated stream segment.

Continuous seep, spring, and stream monitoring is conducted to evaluate water quality. Generally, the sampling results from the 2019 monitoring and sampling event showed the most common constituents of dissolved metals that were reported above NDEP Profile II reference values were dissolved aluminum, dissolved arsenic, dissolved iron, and dissolved manganese. Likewise, generally the most common constituents of total metals that were reported above the USEPA secondary standards were total aluminum, total iron, and total manganese (HDR 2020). The 2019 sampling results were similar to previous year sampling results (HDR 2019; SRK 2020b).

### **3.17.6 Groundwater Quality**

Groundwater downgradient of the Goldrush Mine has the potential to be used for drinking water, and therefore, Nevada drinking water standards would apply to mine-related activities that affect groundwater (NAC 445A.424). The NDEP Bureau of Mining Regulation and Reclamation has established reference values for use in compliance monitoring of groundwater quality downgradient of the mine facilities.

Groundwater quality is monitored on a quarterly basis in an extensive network of monitoring wells and dewatering wells in the Cortez Mine area. Twelve new monitoring wells were established in the Goldrush Mine area. These are monitored on quarterly basis including GRMW-01, 06, 08, 09, 10, 11, 12, 13, 14, 15, 16, 17, and 18. In general, water quality meets NDEP Profile I but has exceedances of arsenic, iron, manganese, antimony, and pH (Geomega 2020).

The background groundwater quality in the vicinity of the Pipeline Complex is based on sampling through 2015 at nine wells located in the pit vicinity (Geomega 2016). The average chemistry for these wells indicates that the groundwater has a circum-neutral pH with abundant alkalinity (231 milligrams per liter [mg/L]) and total dissolved solids (TDS) concentration of 595 mg/L. All constituent concentrations were below their respective NDEP Profile I reference values with the exception of arsenic and manganese, which appear to be naturally elevated in this area. The background groundwater chemistry for the Goldrush Mine was assessed between 2013 to 2017 from three wells (BRMW-01, GRW-03, and RHMW-04). These wells were the closest groundwater wells in the proposed Goldrush Mine Plan boundary that were screened within the Goldrush Mine level of inundation. The background groundwater chemistry is alkaline (Geomega 2020).

#### **3.17.6.1 Waste Rock Geochemical Characterization**

A waste rock characterization program was conducted to determine geochemical characteristics of the various rock materials encountered during underground mining operations. The overall geology of the Goldrush Mine area classifies as a low-sulfide mineralization Carlin-type deposit (Plumlee 1999), in which the overall carbonate content as acid neutralization potential (ANP) exceeds the acid generation potential (AGP). Geochemical characterization testing was completed for a total of 169 samples of rock for the Goldrush Mine. Rock samples were subjected to the standard suite of geochemical tests including acid-base accounting, Meteoric Water Mobility Procedure (MWMP), column tests, total metals, mineralogical analysis, and humidity cell testing (HCT) (Itasca 2020).

The ANP measured in the 146 waste rock samples ranged from below the detection limit (0.3 calcium carbonate ( $\text{CaCO}_3$ ) equivalent tons per thousand tons of rock (TCaCO<sub>3</sub>/kT)) to a maximum of 1,080 TCaCO<sub>3</sub>/kT, with an average of 365 TCaCO<sub>3</sub>/kT. Two samples (Devonian Horse Canyon siltstone [Dhc] and Ordovician Vinini formation [Ovi]) of the 146 tested did not report measurable ANP. Per NDEP guidance, the AGP was calculated as the sum of sulfide-sulfur and water-soluble sulfur. Of the 146 waste rock samples analyzed for acid-base accounting, 42 recorded no measurable sulfide-sulfur and 29 reported no measurable water-soluble sulfur. Total AGP ranged from less than detection to a maximum of 240 TCaCO<sub>3</sub>/kT, averaging 25 TCaCO<sub>3</sub>/kT (Itasca 2020). On average, all of the rock types tested classified as acid neutralizing based on net neutralization potential (NNP) (i.e., NNP greater than 20 TCaCO<sub>3</sub>/kT) with the rock unit Cambrian Hamburg dolomite (Ch) having the highest average value (1,013 TCaCO<sub>3</sub>/kT) and Tertiary basalt the lowest (27 TCaCO<sub>3</sub>/kT). Similarly, neutralization potential ratios is on average much greater than three (171 TCaCO<sub>3</sub>/kT) ranging from a high of 1,308 TCaCO<sub>3</sub>/kT for Ch to a low of 6.3 TCaCO<sub>3</sub>/kT for Dhc. Eighteen of the 146 waste rock samples tested categorize as uncertain (Itasca 2020).

A total of 55 rock samples were subjected to MWMP. Effluent pH ranged from a low of 2.16 standard units (s.u.) to a high of 8.63 s.u. Seven of the MWMP effluent samples had pH values less than the lower reference value (6.5 s.u.) with four reporting pH values less than the rinse solution pH (5.0 s.u.). All the Ch, Ordovician Hanson Creek limestone/dolomite (Ohc), Ordovician Eureka quartzite (Oe), and tertiary basalt (Tb) materials had pH values within the applicable reference value range. Constituents that exceeded reference values and the number of samples that exceeded the reference value (in parentheses) included: aluminum (nine); antimony (27); arsenic (31); beryllium (three); cadmium (five); chromium (two); copper (two); fluoride (five); iron (seven); lead (one); magnesium (three); manganese (nine); mercury (one); nickel (12); selenium (eight); sulfate (seven); thallium (14); TDS (five); and zinc (three). Rock associated with Ch, Oe, and Ohc produced effluent chemistry with no exceedances of any reference value. Of the MWMP effluents with pH below the reference value, six of seven also exceeded reference values for aluminum, antimony, arsenic, iron, manganese, nickel, and sulfate. Arsenic and antimony exceeded reference values in most of the 48 rock samples with circumneutral pH MWMP effluent.

Mineral identification was completed using X-ray diffraction analysis with Rietveld refinement. The focus of the mineralogical evaluation was to identify the sulfide-bearing minerals, as related to acid generation potential, and the carbonate-bearing minerals, related to ANP. Pyrite was the primary sulfide mineral prevalent throughout the lithologies that would contribute to waste rock, with the highest pyrite content measured in a sample of intrusive rocks was six percent by weight. Additionally, the sulfate-bearing minerals gypsum and barite were observed in nine total samples. Carbonate mineral phases were dominated by calcite and dolomite, though siderite and ankerite were also identified. When aluminosilicate minerals were present, quartz was typically the dominant mineral phase followed by muscovite-illite and minor amounts of feldspar and kaolinite.

A total of 47 HCT were conducted using materials that represent waste rock in the proposed Goldrush Mine Plan boundary. Three of the 47 HCTs containing waste rock materials reported acidic leachate, corresponding to samples from the Dhc, Devonian Wenban limestone (Dw), and Ovi lithologies. Effluent from the three acidic HCTs from week 30 onward exceeded reference values for: aluminum, antimony, arsenic, cadmium, iron, manganese, nickel, sulfate, thallium, and TDS. In at least one of the acidic HCTs, post-week 30 effluent samples also exceeded reference values for beryllium, copper, fluoride, lead, mercury, selenium, and zinc. In HCTs with circumneutral effluent pH, 17 of 21 post-week 30 effluent samples exceeded the reference value for antimony and arsenic. Reference values for aluminum were exceeded in seven HCT effluents in post-week 30 effluents, iron in five, manganese in one, mercury in two, sulfate in one, and thallium in one.

### 3.18 Wetlands and Riparian Areas

Additional details of the affected environment for wetland and riparian areas are provided in the Wetland and Riparian Areas SER for the Goldrush Mine Project (BLM 2021s). The area of analysis for wetland and riparian resources for the Proposed Action is the proposed Goldrush Mine Plan boundary plus the maximum extent of the predicted 10-foot groundwater drawdown contour related to mine dewatering, plus a one-mile buffer (**Figure 3-2**). The area of analysis for the No Action Alternative includes the Horse Canyon Mine Plan boundary, the HC/CUEP Plan boundary, the West Pine Valley Exploration Plan boundary, and the Cortez Mine Plan boundary, as well as the maximum extent of the predicted 10-foot groundwater drawdown contour associated with the Cortez Mine dewatering operations, plus a one-mile buffer.

Within the areas of analysis, several other mining and mineral exploration activities including the Cortez Mine, Horse Canyon Mine, HC/CUEP, Toiyabe Mine, Greystone Mine, Tonkin Spring Mine, Buckhorn Mine, Rain Mine, Buck Mine, Carico Lake Mine, Black Rock Canyon Mine, May Mine, and Fire Creek Mine are present. In addition multiple exploration projects are present in the area of analysis including West Pine Valley, Pediment, Pipeline and South Pipeline, Robertson, Hilltop Drilling, Patty Project, Emigrant Springs Project, Woodruff Creek Project, Railroad, Toiyabe, CMZ, South Railroad, Keystone, Gold Bar Project, and Tonkin Springs Project. In addition, utilities, infrastructure, roads, livestock grazing, dispersed recreation, and wildland fires also occur throughout the areas of analysis.

The area of analysis is located within the Humboldt River Basin and Central Nevada Hydrographic Region and intersects three hydrographic basins, as defined by the NDWR, including Pine Valley (#53), Grass Valley (#138), and Crescent Valley (#54) (**Figure 3-1**). Each of the basins comprising the area of analysis

are designated basins, as defined by the NDWR. Statistics for the four basins within the area of analysis are summarized in the Water Resources and Geochemistry SER for the Goldrush Mine Project (BLM 2021r).

Precipitation and geologic conditions in the area of analysis limit perennial stream flows to a few isolated channel reaches. In most other places, flows occur as either intermittent or ephemeral discharges. A summary of perennial, ephemeral, and intermittent reaches in the area is provided in Water Resources and Geochemistry (**Section 3.17**).

Seep and spring locations (including wetlands) within the proposed Goldrush Mine Plan boundary and vicinity were identified and documented in 2012 (JBR 2012, 2013). Following this effort, seep and springs reconnaissance, as well as formal delineations of additional wetland features, continued in the summer of 2013 within 10 miles of the proposed Goldrush Mine Plan boundary and within the area of analysis (HDR 2014). Monitoring at these seeps and springs has occurred annually from 2014 through 2020 (HDR 2020).

NGM conducts continued monitoring of the network of seeps, springs, and streams within the area of analysis in an effort to evaluate if changes in flow are attributable to authorized mine-induced drawdown (BLM 2019i). Any documented potential flow reductions in perennial stream reaches attributable to authorized mining-induced drawdown are addressed through the implementation of mitigation as described in the Technical Memorandum Contingency Mitigation Plans for Surface Waters Deep South Expansion Project and the Technical Memorandum Contingency Mitigation Plans for Surface Waters Cortez Hills Expansion Project (BCI and Stantec 2018; Barrick and JBR 2010). All contingency and mitigation measures would comply with Nevada Water Law and would involve the Nevada Office of the State Engineer.

### **3.18.1 Wetlands**

There are 32.4 acres of field-mapped wetlands within the area of analysis. The Wetlands and Riparian Areas SER for the Goldrush Mine (BLM 2021s) provides the site identifications within the area of analysis and related drainages.

Many of the wetlands in the area of analysis are fed by a single seep or spring and are located in a drainage or adjacent feature. The wetlands are dominated by various sedges and rushes. Other frequently observed species included Sandberg bluegrass (*Poa secunda*), seep monkeyflower (*Mimulus guttatus*), watercress (*Nasturtium officinale*), and American speedwell (*Veronica americana*). Some features have more structural complexity, and support shrubs and trees in addition to low growing wetland plants (ERM 2018).

The Dry Hills area is a section of the Grouse Creek-Pine Creek hydrologic unit within the Pine Valley hydrographic basin. The Dry Hills are located south of Horse Canyon on the east-facing slopes of the Cortez Mountain Range. Within the area of analysis, five wetlands were mapped in the Dry Hills area. Fourmile Canyon is located east of the Mill Canyon watershed within the Crescent Valley hydrographic unit. The majority of the main drainage in this canyon is ephemeral. Within the area of analysis, two wetlands were mapped in the Fourmile Canyon area.

The Horse Creek area is within the Willow Creek hydrologic unit located in the Pine Valley. The upper portion of Horse Creek is perennial and is fed by a spring in upper Horse Canyon. Below Horse Canyon meadow, the creek is ephemeral and contains water only after large precipitation events. Dense riparian scrub, wet meadow, and sage scrub were all observed along Horse Creek. Within the area of analysis, 27 wetlands were mapped in the Horse Creek area. The Mill Canyon area is located on the north side of the Cortez Mountain Range and drains into the Crescent Valley. Two wetlands were mapped in the Mill Canyon area within the area of analysis.

The Willow Creek area is located in the Pine Valley hydrographic basin. The upper reaches of Willow Creek are perennial with year-round water supported by natural springs. The middle portion is ephemeral and flows as a result of snowmelt and precipitation events. Downstream, Willow Creek is intermittent, rarely exhibiting water flow. The tributaries to Willow Creek have similar characteristics. Tributaries at higher elevations are ephemeral, having some spring sources and having flowing water during the spring snowmelt, while the lower portions of the tributaries are dry most months of the year. Dense riparian scrub and sage scrub were observed along the drainage. Willow Creek has many tributaries associated with it.

Within the area of analysis, 33 wetlands were mapped in the Willow Creek area. The Willow Springs area is located between Horse Creek and Willow Creek in the Pine Valley hydrographic basin. Seven wetlands were mapped in the Willow Springs area within the area of analysis.

### 3.18.2 Riparian Areas and Springs

Springs in the area of analysis were identified using Geographic Information System data from spring survey data. Within the area of analysis, 223 spring sites have been identified during past surveys; however, 23 of these sites lacked wetland characteristics including the presence of wetland vegetation, hydrology, or hydric soils, and are not part of the NGM monitoring program and are not discussed in detail in this document. Of the 200 spring sites within the area of analysis that are monitored, 83 sites are located within the proposed Goldrush Mine Plan boundary.

Proper functioning condition (PFC) assessments were conducted along approximately 21 miles of intermittent and perennial reaches of Willow and Horse creeks between 2015 and 2017, and along Dry and Fourmile creeks in 2017. PFC assessments were also performed at select seeps and springs in 2015 (ERM 2018). Results from PFC assessments at two spring sites (Springs 27-48-35-112 and 26-49-07-114B) were considered functional at risk due to livestock, horse, and/or wildlife-related degradation. Trampling and severe grazing in these systems have resulted in enhanced erosion and surface hummocking, which has altered hydrology patterns in the spring and resulted in reduced functionality of the system (ERM 2018).

The conditions of the assessed streams were determined either to be in PFC (40 percent), functional at risk (40 percent), or nonfunctional (20 percent). Approximately one third of the stream reaches assessed in Horse Creek and Willow Creek were determined to be in PFC, while the remainder were determined to be in either functional at risk or nonfunctional. The majority of reaches assessed in Fourmile Canyon and the entirety of reaches in Dry Creek were determined to be in PFC. The reaches exhibiting PFC characteristics exhibited abundant and diverse riparian vegetation, well defined channels, slight to moderate incision, and laterally stable banks. Sections classified as functional at risk and nonfunctioning were characterized as such due to lower density and diversity of riparian plants, anthropogenic disturbances to stream hydrology due to legacy mining activities, physical and hydrologic disturbances due to the placement of roadways and ditches adjacent to or crossing streams, and livestock, wild horses, and/or wildlife disturbances (ERM 2018).

Riparian habitat associated with perennial and intermittent reaches of streams was delineated in 2017. Approximately 287 acres of riparian habitat occurs within the area of analysis. Riparian vegetation occurs in disconnected stretches of Willow Creek, Horse Creek, Pine Creek, and Fourmile Canyon in areas where stream flow is perennial. Habitat structure is predominantly herbaceous, consisting commonly of baltic rush (*Juncus balticus*) and mixed grass species. Mixtures of herbaceous vegetation and shrub or sapling structure were also common. In very isolated areas, dense willow and other tree species stands were observed, with willows dominating the overstory.

Riparian communities include dense woody riparian, dense mesic shrub riparian, wetted herbaceous riparian, and intermittently wetted channel. Dense woody riparian communities contain predominately willow species (*Salix* spp.) and box elder (*Acer negundo*). Gooseberry (*Ribes inerme*), chokecherry (*Prunus virginiana*), desert snowberry (*Symphoricarpos longiflorus*), and serviceberry (*Amelanchier alnifolia*) are also present. Dense mesic shrub riparian communities have a similar shrub and herbaceous composition as dense woody riparian communities but lack willows and box elder (ERM 2018).

Wetted herbaceous riparian and intermittently wetted channel communities occur primarily along Willow Creek and Fourmile Canyon. These communities are dominated by sedges including Nebraska sedge (*Carex nebrascensis*), small-wing sedge (*Carex microptera*), and Baltic rush. Mesic grasses include Sandberg bluegrass, Idaho fescue (*Festuca idahoensis*), and Rocky Mountain fescue (*Festuca saximontana*). The noxious weed hoary cress (*Cardaria draba*) was frequently observed associated with the wetted herbaceous riparian community (ERM 2018).

### 3.19 Wildlife Resources, Including Migratory Birds and Special Status Wildlife

Additional details of the affected environment for wildlife resources are provided in the Wildlife Resources, Including Migratory Birds and Special Status Wildlife SER for the Goldrush Mine Project (BLM 2021t). The area of analysis for the Proposed Action for general wildlife, migratory birds, special status wildlife species, and aquatic species encompasses the proposed Goldrush Mine Plan boundary, the maximum extent of the predicted 10-foot groundwater drawdown contour related to mine dewatering, plus a one-mile buffer (**Figure 3-2**). The area of analysis for the Proposed Action for big game, including pronghorn, mule deer and mountain lion (*Puma concolor*), encompasses the four-mile buffer of the proposed Goldrush Mine Plan boundary, the maximum extent of the predicted 10-foot groundwater drawdown contour related to mine dewatering, plus a one-mile buffer (**Figure 3-2**). The area of analysis for the Proposed Action for GRSG encompasses the four-mile buffer of the proposed Goldrush Mine Plan boundary (**Figure 3-2**). Bald and golden eagles are discussed in **Section 3.5**.

The area of analysis for the No Action Alternative for wildlife resources including general wildlife and aquatic life, migratory birds, big game, special status wildlife species, and GRSG includes the Horse Canyon Mine Plan boundary, the HC/CUEP Plan boundary, the West Pine Valley Exploration Plan boundary, and the Cortez Mine Plan boundary. The Cortez Mine Plan boundary would also include the maximum extent of the predicted 10-foot groundwater drawdown contour associated with the Cortez Mine dewatering operations, plus a one-mile buffer.

Within the areas of analysis, several other mining and mineral exploration activities including the Cortez Mine, Horse Canyon Mine, HC/CUEP, and West Pine Valley are present. In addition, utilities, infrastructure, roads, livestock grazing, dispersed recreation, and wildland fires also occur. Past and present activities within the areas of analysis have resulted in removal of vegetation, dispersal or displacement of local wildlife, including special status species, populations, and fragmentation of certain wildlife habitats and populations. The Barrick BEA Public Land Polygons are present in portions of the area of analysis. If activities associated with the BEA take place on the authorized areas within the area of analysis, the goal would be to restore and/or enhance habitat to benefit GRSG and sagebrush ecosystems and generate credits under the BEA (BLM et al. 2015; BLM 2020f).

#### 3.19.1 General Wildlife

##### 3.19.1.1 Fish and Aquatic Invertebrate Species

Baseline studies for fish were completed at wetted reaches along Horse Creek and Willow Creek in 2015. Habitat characteristics in both Horse Creek and Willow Creek are not suitable for the survival of fish. Although brook trout (*Salvelinus fontinalis*) and rainbow trout (*Oncorhynchus mykiss*) were reported in the vicinity by the NDOW (NDOW 2020c), there are no waters that are anticipated to support these species in the area of analysis, therefore, they are not discussed further.

The most abundant taxa of aquatic macroinvertebrates in Horse Creek samples were scuds or “side swimmers” in the family Hyalellidae and tube worms in the family Naididae. The most abundant taxa in Willow Creek were midges in the genus *Diplocladius* and midges in the genus *Micropsectra* (ERM 2018).

Springsnail (*Pyrgulopsis*) surveys were conducted in 2000, 2005, 2007, 2014, and 2015 within the area of analysis. Springsnail and other aquatic snails collected represented five different genera, *Physella*, *Pyrgulopsis*, *Galba*, *Valvata*, and *Stagnicola* within the Pine Valley, Crescent Valley and Carico Lake Valley hydrographic basins (ERM 2018; BLM 2019j). Attempts to identify snail specimens to the species level were conducted in 2014 and 2015; none were identified as special status species (ERM 2018).

##### 3.19.1.2 Avian Species, Including Migratory Birds and Raptors

During baseline surveys, 116 avian species have been documented within the area of analysis. Of the avian species documented within the area of analysis, 105 are protected under the Migratory Bird Treaty Act.

Upland game bird species that occur within the area of analysis include GRSG, chukar, gray (Hungarian) partridge (*Perdix perdix*), and mourning dove (*Zenaida macroura*) (ERM 2018). Mourning doves are found in a wide range of habitats in close proximity to water and are most likely to occur within the area of analysis



during spring, summer, and early fall (Floyd et al. 2007; BLM 2019j). Due to the lack of suitable open water habitat, no waterfowl concentrations are found within the area of analysis. However, several species of migratory birds (i.e., Canada goose (*Branta canadensis*), long-billed curlew (*Numerius americanus*), mallard (*Anas platyrhynchos*), and willet (*Tringa semipalmata*)) were observed during field surveys (ERM 2018).

Fifteen species of raptors (non-sensitive species) potentially occur as residents or migrants within the area of analysis (ERM 2018; BLM 2019j). While not a raptor species, common ravens (*Corvus corax*) often utilize existing raptor nests during the nesting season and therefore, typically are noted during surveys. Field surveys have documented 87 raptor nests within the area of analysis (Stantec 2019).

#### **3.19.1.3 Insect Species**

A total of 21 species of butterflies and moths were identified during field surveys within the area of analysis. No special status butterfly or moth species were documented within the area of analysis (ERM 2018).

#### **3.19.1.4 Mammal Species**

During baseline surveys, 40 mammal species were documented in the area of analysis (ERM 2018; BLM 2019j). Bobcats (*Lynx rufus*), kit fox (*Vulpes macrotis*), gray fox (*Urocyon cinereoargenteus*), and several species of small mustelids are categorized as furbearer species by the NDOW and are known to occur in the area of analysis. Other game species documented within the area of analysis include mountain lion, mountain cottontail, pygmy rabbit, and white-tailed jackrabbit (*Lepus townsendii*).

#### **3.19.1.5 Big Game**

Mule deer, pronghorn, and mountain lion occur within portions of the area of analysis. There are no known occurrences of bighorn sheep or elk (*Cervus canadensis*) in the area of analysis (BLM 2019j).

#### **3.19.1.6 Reptile Species**

Thirteen reptile species have been observed in almost every habitat type in and around the area of analysis (BLM 2019j; ERM 2018; USFWS 2020).

### **3.19.2 Special Status Species**

All BLM Statewide and/or Battle Mountain District Office and Elko District Office sensitive species documented in the area of analysis were identified using the 2017 Final BLM Nevada Sensitive and Special Status Species List (BLM 2017).

#### **3.19.2.1 Fish and Aquatic Invertebrate Species**

No special status fish or aquatic invertebrate species, including springsnail species were identified during baseline surveys within the area of analysis (JBR 2009; ERM 2018). As stated above, springsnail surveys were conducted in 2000, 2005, 2007, 2014, and 2015 within the area of analysis. Two springsnails were not identified to the species level indicating that potential habitat for special status springsnails exists in the area of analysis (ERM 2018).

#### **3.19.2.2 Avian Species, Including Migratory Birds and Raptors**

Twelve special status avian species have been identified within the area of analysis and include Brewer's sparrow (*Spizella breweri*), ferruginous hawk (*Buteo regalis*), Lewis's woodpecker (*Melanerpes lewis*), loggerhead shrike (*Lanius ludovicianus*), long-billed curlew, mountain quail (*Oreortyx pictus*), northern goshawk (*Accipiter gentilis*), pinyon jay (*Gymnorhinus cyanocephalus*), sage trasher (*Oreoscoptes montanus*), Swainson's hawk (*Buteo swainsoni*), GRSG, and western burrowing owl (ERM 2018; Stantec 2019; NDOW 2020c; NNHP 2020).

### **Greater Sage-grouse**

The BLM has amended RMPs throughout the range of the GRSG to afford additional protection to this species, which previously was a candidate for listing under the ESA. GRSG within the area of analysis are

part of the Southern Great Basin Population (BLM 2015a) and Central Great Basin Biologically Significant Unit (BLM 2015b). The Central Nevada Population is among the largest in the state. This population is divided further into Population Management Units (PMUs). The area of analysis intersects the Shoshone, Three Bar, and Cortez GRSG PMUs.

Strutting grounds, or leks, are GRSG breeding sites. Based on NDOW (2020d) data, there are 11 GRSG leks present within the area of analysis. Given the presence of active leks in the area of analysis with a combined peak male count of 103 males, it is likely that GRSG occur within the area of analysis on a regular basis throughout the year.

Using the 2021 habitat mapping (BLM 2022), approximately 89,024 acres of PHMAs, approximately 26,139 acres of GHMAs, and approximately 10,689 acres of OHMAs occur within the area of analysis. The remainder of the land within the area of analysis is either non-habitat or private land. A detailed analysis of the present PMUs and GRSG leks within the area of analysis is provided in the Wildlife SER for the Goldrush Mine Project (BLM 2021t).

### **3.19.2.3 Insect Species**

No special status insect species have been document in the area of analysis (ERM 2018).

### **3.19.2.4 Mammal Species**

Sixteen special status bat species have been identified within the area of analysis (ERM 2018). Pygmy rabbit and/or burrows were observed in the area of analysis (ERM 2018). No kangaroo mice, including tracks or secondary signs, were observed during baseline surveys (ERM 2018). The overall lack of suitable vegetation and soil indicates that the presence of either the dark or pale kangaroo mouse (*Microdipodops megacephalus*; *Microdipodops pallidus*, respectively) is unlikely in the area of analysis (ERM 2018).

### **3.19.2.5 Reptile Species**

No special status species reptile surveys were conducted in the area of analysis, but four have a high likelihood of occurrence. The four with the high likelihood to occur include Great Basin collared lizard (*Crotaphytus bicinctores*), long-nosed leopard lizard (*Gambelia wislizenii*), desert horned lizard (*Phrynosoma platyrhinos*), and greater short-horned lizard (*Phrynosoma hernandesi*).

### **3.19.2.6 Amphibian Species**

One special status amphibian species, the western toad (*Anaxyrus boreas*), has been documented within the area of analysis (ERM 2018).

## 4.0 Environmental Consequences

The Proposed Action and alternatives outlined in **Chapter 2.0** may cause changes in the human environment. This document assesses and analyzes these potential changes and discloses the effects to the decision-makers and public. This process of disclosure is one of the fundamental aims of NEPA. There are many concepts and terms used when discussing impacts assessment that may not be familiar to the average reader, and these are discussed below.

Effects or impacts means changes to the human environment from the Proposed Action or alternatives that are reasonably foreseeable and have a reasonably close causal relationship to the Proposed Action or alternatives, including those effects that occur at the same time and place as the Proposed Action or alternatives and may include effects that are later in time or farther removed in distance from the Proposed Action or alternatives. Effects include ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic (such as the effects on employment), social, or health effects. Effects may also include those resulting from actions that may have both beneficial and detrimental effects, even if on balance the agency believes that the effect would be beneficial (40 CFR 1508.1).

Intensity refers to the severity or level of magnitude of impact. Public health and safety, proximity to sensitive areas, level of controversy, unique risks, or potentially precedent-setting effects are all factors to be considered in determining intensity of effect. This document primarily uses the terms major, moderate, minor, or negligible in describing the intensity of effects.

Context means that the effect(s) of an action must be analyzed within a framework, or within physical or conceptual limits. Resource disciplines; location, type, or size of area affected (e.g., local or regional); and affected interests are all elements of context that ultimately determine significance. Both long- and short-term effects are relevant. For impact definitions specific to each resource, see **Appendix G** and the resource SERs for the Goldrush Mine Project (BLM 2021b through 2021t).

The impacts described below for the Proposed Action are for the implementation of the Goldrush Mine Plan as described in **Section 2.0**. Under the Proposed Action, the activities described under the No Action Alternative would also continue as previously authorized and described in **Section 2.2** with the modification identified under the Proposed Action. Under the Proposed Action activity of the authorized 22,433 acres would continue as previously authorized. Impacts under the No Action Alternative are discussed further in the cumulative effects analysis within each resource analysis section below.

### 4.1 Air Quality and Climate Change

Additional details regarding the impacts to air resources are provided in the Air Resources SER for the Goldrush Mine Project (BLM 2021b).

#### 4.1.1 Proposed Action

Estimates of the emission rates for PM<sub>10</sub>, PM<sub>2.5</sub>, CO, SO<sub>2</sub>, NO<sub>x</sub> and volatile organic compounds (VOCs) generated from the Goldrush Mine mining and support operations were made for each identified emission unit. Emission estimates of GHGs, like CO<sub>2</sub> and methane, were also made. Particulate mercury is present naturally in soils, overburden, and ore at the mine; therefore, it would be present as small fraction of all particulate emissions produced during the various mine processes. Gaseous mercury emissions from hydrocarbon combustion were calculated for all on-site sources. Sources of HAPs include hydrocarbon combustion and constituents in fugitive dust from ore and waste rock (**Table 4-1**). The total mercury and HAP emissions from the Goldrush Mine-related activities, and emissions related to the off-site transport of ore from the Goldrush Mine to the Gold Quarry and Goldstrike mines were also estimated (**Table 4-2**).

**Table 4-1 Proposed Action Air Emissions (tons/year)**

Activity	PM <sub>10</sub>	PM <sub>2.5</sub>	CO	NO <sub>x</sub>	SO <sub>2</sub>	VOCs	HAPs	Mercury	GHG
Non-Fugitive	60.0	12.8	29.4	58.6	1.7	18.6	0.5	3.6 E-06	44,076
Fugitive	96.1	16.2	237.3	208.1	0.3	25.7	1.3	0.014	34,753
<b>Facility Total</b>	<b>156.1</b>	<b>29.0</b>	<b>266.7</b>	<b>266.7</b>	<b>2.0</b>	<b>44.3</b>	<b>1.8</b>	<b>0.014</b>	<b>78,829</b>

Source: ASI 2020

**Table 4-2 Off-site Ore Transport to Goldstrike and Gold Quarry Mines (tons/year)**

Activity <sup>1</sup>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO	NO <sub>x</sub>	SO <sub>2</sub>	VOCs	GHG
Off-site Ore Transport to Goldstrike	124.0	22.2	15.5	69.2	0.12	2.57	17,795

Source: ASI 2020

<sup>1</sup> Haulage to Goldstrike was used as it was the further travel distance and generates the most emissions.

The off-site processing of material would not exceed the permitted processing limits stipulated in the NDEP-issued Class I Air Quality Operating Permits for the Gold Quarry and Goldstrike mines (ASI 2020). Details specific to the off-site processing were previously analyzed in the Draft Supplemental EIS for the Betze Pit Expansion Project, the EIS for the South Operations Area Project Amendment at Gold Quarry, and the EIS for the Genesis Project at the North Operations Area (BLM 1991, 1993, 2010). As previously analyzed, the sum of the modeled ambient air pollutant concentrations associated with the off-site processing and the applicable background concentrations do not exceed the applicable NAAQS standards. However, the Project may extend the operating life of the permitted off-site processing facilities. This operations extension is not anticipated to result in NAAQS exceedances and no change would occur to permitted processing limits, but it could result in an increase of total GHG emissions for the life of the Project; therefore, off-site processing and the impacts on total GHG emissions and climate change effects is included in this EIS analysis.

The modeled ambient air pollutant concentrations for PM<sub>10</sub>, PM<sub>2.5</sub>, NO<sub>2</sub>, CO, and SO<sub>2</sub>, together with the applicable background concentrations, do not exceed the applicable NAAQS standards. Based on the dispersion modeling results, the Proposed Action would result in minor to moderate, short-term, regional air resource impacts. Impacts from reclamation activities, primarily in the form of fugitive dust but may also include vehicle emissions, may result in minor, long-term, regional air quality impacts until reclamation activities cease and vegetation is re-established.

Unlike other criteria pollutants, ozone (O<sub>3</sub>) is not directly emitted from industrial sources and instead is formed on a regional scale through a series of complex photochemical reactions involving VOCs, NO<sub>x</sub> and other gases in the atmosphere. Potential O<sub>3</sub> impacts were estimated using USEPA's guidance for the development of Modeled Emissions Rates for Precursors. A Tier I analysis was conducted using the Proposed Action VOC and NO<sub>x</sub> emissions as precursors for the formation of O<sub>3</sub>. The estimated O<sub>3</sub> impact of 0.371 parts per billion was below the O<sub>3</sub> Significant Impact Level of 1 parts per billion and therefore considered insignificant (ASI 2020).

The potential facility wide HAP emissions are 1.8 tpy of total HAPs and 0.5 tpy of the highest single HAP, arsenic. Lead emissions (included among total HAPs) from the Goldrush Mine are expected to be negligible (less than 0.05 tons/year), and therefore lead is not addressed further. This estimate includes emissions from only the proposed Goldrush Mine and not the close-by Cortez mine operations. The facility wide HAP emissions are less than the 10 tpy for any single HAP and the 25 tpy threshold for all HAP emissions in aggregate. Per the USEPA Greenhouse Gas Equivalence Calculator, the Proposed Action would produce approximately the same amount of GHG emissions annually (96,624 tpy of CO<sub>2</sub>e) as that produced by 10,115 households annually due to energy consumption (USEPA 2020a). The estimated GHG emissions include the Proposed Action and GHG emissions related to off-site ore transport to the Goldstrike Mine because it is the further travel distance and generates the most emissions.

ACEPMs under the Proposed Action would include fugitive dust control, including water application on roads and other disturbed areas, chemical dust suppressant application (i.e., magnesium chloride), where appropriate, and application of other BMPs, as approved by the BAPC, would be implemented. Committed

air quality practices would include dust control (i.e., dust collectors) for mine unit operations. NGM would seed temporary disturbance areas (i.e., growth media stockpiles, cut and fill embankments, etc.) with BLM-approved interim seed mix, and concurrent reclamation would be implemented on completed portions of the waste rock facilities when safe and practical to do so, thereby minimizing fugitive dust emissions. To control combustion emissions, all manufacturer installed pollution control equipment would be operated and maintained in good working order. Speed limits would be posted, and vehicle speeds reduced in areas of disturbance to minimize the potential for fugitive dust emissions, to protect wildlife and livestock, and to maintain operational safety. Vehicles would be maintained regularly to ensure they are operating in a manner to minimize vehicle emissions. The processing facilities at Goldstrike and Gold Quarry are designed to capture mercury emissions. Mercury emissions from thermal sources would be controlled via the BAPC-implemented Nevada Mercury Control Program (NMCP), which is designed to control mercury emissions from thermal units located at precious metal mines and mills throughout Nevada. The program utilizes the Nevada Maximum Achievable Control Technology (MACT) standards for each type of thermal unit for the installation of control devices to serve as the minimum requirement of the ensuing mercury permitting program under the NMCP (BLM 2008b). Additionally, mercury emissions are regulated by the Federal EPA MACT program per 43 CFR 63, subpart EEEEEEE.

Per the EPA Greenhouse Gas Equivalence Calculator, the Proposed Action would produce approximately the same amount of GHG emissions annually (96,624 tons per year of CO<sub>2</sub>e) as that produced by 10,115 households annually due to energy consumption (USEPA 2020b). The estimated GHG emissions include the Proposed Action and GHG emissions related to off-site ore transport to the Goldstrike mine because it is the further travel distance and generates the most emissions. The GHG emissions resulting from the Proposed Action would represent approximately 0.2 percent of the gross GHG emissions for the state of Nevada (43.8 million metric tons) (NDEP 2020b). As stated previously, cumulative GHG emissions have been linked with accelerated global climate change.

#### **4.1.2 No Action Alternative**

Under the No Action Alternative, the development of the Goldrush Mine would not be authorized and NGM would not construct, operate, and close a new underground mine (i.e., the Goldrush Mine). Modifications or reclassification of acres as proposed under the Proposed Action would not occur, the dual use of facilities between the Cortez Mine and Goldrush Mine operations would not occur, and NGM would be permitted to continue the current previously authorized mining and exploration activities under the existing authorizations (**Section 2.2**). Overall, the type of impacts to air quality are similar in nature to those disclosed for the Proposed Action and impacts are related to an increase in air emissions and changes in ambient air quality. These impacts are summarized below and impacts that are different in nature than those identified for the Proposed Action are identified. These impacts are summarized by authorized mine plan in the Air Quality SER for the Goldrush Mine Project (BLM 2021b).

Previously authorized ore transport of Cortez Mine ore to Gold Quarry or Goldstrike for processing, major emission sources and rates for PM<sub>10</sub>, PM<sub>2.5</sub>, CO, SO<sub>2</sub>, NO<sub>x</sub> and VOCs, as well as for HAP emissions and GHG emissions from authorized operations at the Cortez Mine would continue. Dispersion modeling was conducted for the Deep South Project for PM<sub>10</sub>, PM<sub>2.5</sub>, NO<sub>2</sub>, CO, and SO<sub>2</sub>. Processing of Cortez Mine material would not exceed the currently permitted processing limits stipulated in the NDEP-issued Class I Air Quality Operating Permits for Gold Quarry and Goldstrike (ASI 2020). Details specific to the off-site processing were previously analyzed in the Draft Supplemental EIS for the Betze Pit Expansion Project, the EIS for the South Operations Area Project Amendment at Gold Quarry, and the EIS for the Genesis Project at the North Operations Area (BLM 1991, 1993, 2010). As previously analyzed, the sum of the modeled ambient air pollutant concentrations associated with the off-site processing and the applicable background concentrations do not exceed the applicable NAAQS standards.

The modeled ambient air pollutant concentrations for PM<sub>10</sub>, PM<sub>2.5</sub>, NO<sub>2</sub>, CO, and SO<sub>2</sub>, together with the applicable background concentrations, do not exceed the applicable NAAQS standards. Based on the dispersion modeling results, the No Action Alternative would result in minor to moderate, short-term, regional air resource impacts. Impacts from reclamation activities, primarily in the form of fugitive dust but may also include vehicle emissions, may result in minor, long-term, regional air quality impacts until reclamation activities cease and vegetation is re-established.

The potential facility wide HAP emissions from the authorized Cortez Mine operations are 13.5 tpy of total HAPs and 8.2 tpy of the highest single HAP, hydrogen cyanide. Thus, facility wide HAP emissions are less than the 10 tpy for any single HAP and the 25 tpy threshold for all HAP emissions in aggregate. Per the USEPA Greenhouse Gas Equivalence Calculator, the No Action Alternative would produce approximately the same amount of GHG emissions annually (397,919 tpy of CO<sub>2</sub>e) as that produced by 45,917 households annually due to energy consumption (USEPA 2020a). The estimated GHG emissions include the No Action Alternative and GHG emissions related to off-site ore transport to the Goldstrike Mine as the worst-case scenario given the longer distance to travel.

## **4.2 Cultural Resources**

Additional details regarding the impacts to cultural resources are provided in the Cultural Resources SER for the Goldrush Mine Project (BLM 2021c).

### **4.2.1 Proposed Action**

There are 54 eligible, 10 unevaluated or unknown, and 152 not eligible sites potentially adversely affected by the proposed Goldrush Mine within the Direct APE. Of the 54 eligible sites within the Direct APE, 48 sites include an eligible prehistoric component representing task specific and/or residential locations, and 11 sites include an eligible historic component associated with charcoal production, mining, settlement, and ranching. Five sites include both prehistoric and historic components. In all cases, the historic property would be physically altered resulting in a loss of that resource's potential to provide important information on the past (NRHP Criterion D). Project impacts to historic properties are expected to be adverse, permanent, and localized.

Three hundred and twenty-three (323) sites were documented within the Visual APE and 238 sites were documented within the Vibrational APE. Although there are 71 NRHP-eligible and 28 unevaluated/unknown sites within the Visual APE, none would be impacted by the Proposed Action. Within the Vibrational APE, one NRHP-eligible historic site (the Garrison Lime Kiln) would potentially be impacted from increased mining traffic. The impacts to this site from the Cortez Hills Expansion Project are consistent with the potential impacts from the Project. Therefore, the mitigation completed for the Cortez Hills Expansion Project (including data recovery and public interpretation) also mitigates potential impacts from the Project (Summit Envirosolutions 2020). No adverse impacts would be anticipated for the Shoshone Wells townsite.

The lowering of groundwater levels associated with ongoing dewatering activities at the Pipeline Complex at the Cortez Mine has resulted in land subsidence and development of earth fissures within alluvial sediments in Crescent Valley in the vicinity of the pit (AMEC 2014). Subsidence modeling results predict that at the end of mining for the Goldrush Mine (year 2043), the four-inch contour of land subsidence would extend 5.9 and 5.4 miles into the basin fill deposits on the eastern and southern sides of the Pipeline Complex pits, the subsidence area would increase by 29 percent in the northern part of Grass Valley, and land subsidence would increase in the western part of Pine Valley as a result of continuous pumping from the Goldrush Mine dewatering wells (SRK 2020d). Although these impacts overlap with the PCRI and cultural sites in the Direct APE, the majority of areas affected would fall within the predicted four-inch contour of land subsidence. These impacts are expected to occur gradually and uniformly over a period of approximately 20 years over a large area; therefore, land subsidence is unlikely to result in long-term or localized impacts to cultural resources in the Direct, Vibrational, or Visual APE.

Facilities in the proposed Goldrush Mine Plan have been located and designed to avoid the Mount Tenabo/White Cliffs and the Horse Canyon PCRI. Small portions of both PCRI would be located within the Direct APE; however, neither PCRI overlaps with proposed surface disturbance. The Mount Tenabo/White Cliffs PCRI encompasses portions of five Sections of land, of which approximately 6.7 acres would be located within the Direct APE. Direct adverse impacts would be avoided; therefore, the Proposed Action is not expected to cause adverse effects/impacts to the Tenabo/White Cliffs PCRI. The Horse Canyon PCRI encompasses portions of six Sections of land. Approximately 389 acres of the Horse Canyon PCRI would be located within the Direct APE. NGM has committed that public access to these areas would be maintained throughout mining and reclamation. This would help prevent resource conflicts such as isolation or restriction of access, as well as change in the property's use due to mining activities. Although no direct physical effects are anticipated in the PCRI, the Project would have an effect from visual changes outside the boundaries of the PCRI and from authorized and proposed mining traffic in the boundaries of

the PCRI. Therefore, impacts to the Horse Canyon PCRI would still be considered an adverse effect, long-term to permanent, and localized impact. Mitigation is being developed in consultation with the SHPO and the Tribes, following the requirements outlined in the PA. Consultation with the Tribes for the Project began in 2020 with initial coordination letters, followed by information and meetings regarding treatment plans and determination of adverse effects as part of Section 106 consultation. Consultation with the Tribes about impacts from the Project to historic properties is on-going.

The Proposed Action is an undertaking as defined in the 2018 PA. In accordance with the PA, a HPTP was developed that addresses mitigation of adverse effects to sites eligible or unevaluated for the NRHP. The most common treatment for an adverse effect within the Direct APE is data collection prior to its loss. Data collection is accomplished through several means including but not limited to archaeological excavation, organic collection and sampling, mapping, photography, and analytical research. The BLM and SHPO require that in addition to any technical reports generated by the mitigation, the information also be shared with the general public in an educational format (NRHP Criterion A through C only).

All adverse effects under the NHPA and the NEPA to known NRHP-eligible properties identified within the different APEs would be mitigated in accordance with the PA and HPTP(s). Any previously unknown NRHP-eligible properties that may be discovered during construction activities would be mitigated in accordance with the PA.

#### **4.2.2 No Action Alternative**

Under the No Action Alternative, the development of the Goldrush Mine would not be authorized and NGM would not construct, operate, and close a new underground mine (i.e., the Goldrush Mine). Modifications or reclassification of acres as proposed under the Proposed Action would not occur, the dual use of facilities between the Cortez Mine and Goldrush Mine operations would not occur, and NGM would be permitted to continue the previously authorized mining and exploration activities under the existing authorizations (**Section 2.2**). Overall, the type of impacts to cultural resources are similar in nature to those disclosed for the Proposed Action and impacts are related to ground disturbance. Under the No Action Alternative, up to 22,433 acres were previously authorized to be disturbed with approximately 18,746.7 acres of surface disturbance on public land and 3,686.5 acres on private land. These impacts are summarized by authorized mine plan in the Cultural Resources SER for the Goldrush Mine Project (BLM 2021c). An HPTP was developed to resolve adverse effects for authorized actions. Under the exploration plans, all NRHP-eligible or unevaluated cultural resources would be avoided; therefore, no adverse effects to cultural resources for exploration plans are anticipated. Overall, impacts to cultural resources from the activities authorized under the No Action Alternative would be considered an adverse effect, long-term to permanent, and localized impact.

### **4.3 Environmental Justice**

Additional details regarding the impacts to environmental justice resources are provided in the Environmental Justice SER for the Goldrush Mine Project (BLM 2021d).

#### **4.3.1 Proposed Action**

The Proposed Action would not be expected to disproportionately affect any particular population. The area in the immediate vicinity of the Goldrush Mine is sparsely populated, with the nearest residences including a few remote ranches located a few miles from the Goldrush Mine. The nearest ranch is owned by NGM and has not been identified as minority or low income in nature (BLM 2019k). The nearest population to be potentially affected by the Proposed Action is the town of Crescent Valley (census block 320110001001), approximately 18 miles north of the Goldrush Mine. The next closest populations would be the town of Beowawe (census block 320110001001) and the town of Carlin (census blocks 320079516001 and 320079516002).

The effects of greatest concern to these populations from the Proposed Action would be to air quality, noise, water, and social and economic values. The Proposed Action would allow dewatering at the Goldrush Mine; however, the modeled greatest extent of drawdown would not directly overlap/impact the towns and communities within the area of analysis (BLM 2021r).

The most likely impact on residents of these population centers would be a modest increase in employment opportunities related to the Goldrush Mine, which would be a beneficial impact (BLM 2021m).

Effects to air quality and noise would be expected to lessen the farther away one gets from the Goldrush Mine and would be negligible by the time they reach communities within the area of analysis (BLM 2021b). Traffic effects would impact the area of analysis population equally without regard to race, ethnicity, or income level. As mine-related traffic impacts would impact an entire population, no disproportionate impacts to environmental justice populations are anticipated.

Dispersed residents within the rural areas of the area of analysis may experience a greater magnitude of impacts to resources such as air quality or traffic due to proximity to the Goldrush Mine; however, there is no evidence to suggest that these impacts would affect Native American or impoverished populations any differently than all other residents. The construction and operations of the Goldrush Mine would bring increased job opportunities to the area of analysis through direct, indirect, and induced employment. The new and continued employment opportunities would not proportionately have greater significant impacts to minority, low income, or tribal populations, as new employment opportunities would result for all populations. As discussed in the Social and Economic Values SER for the Goldrush Mine Project, 570 people would be directly employed during the operations phase of the Proposed Action. To the extent that the requisite skills are available in the local work force, the Goldrush Mine Project would employ workers from Elko, Eureka, and Lander counties. Approximately 228 operations employees are expected to be local and 342 are expected to be non-local. NGM has committed to take a comprehensive approach to sustainability for the Goldrush Mine. This includes health and wellness programs for its workforce to continually improve on attraction, retention, and employee performance. The creation of new employment opportunities under the Proposed Action is anticipated to result in a minor, short-term, localized impact to environmental justice populations.

#### **4.3.2 No Action Alternative**

Under the No Action Alternative, the development of the Goldrush Mine would not be authorized and NGM would not construct, operate, and close a new underground mine (i.e., the Goldrush Mine). Modifications or reclassification of acres as proposed under the Proposed Action would not occur, the dual use of facilities between the Cortez Mine and Goldrush Mine operations would not occur, and NGM would be permitted to continue the previously authorized mining and exploration activities under the existing authorizations (**Section 2.2**). Overall, the type of impacts to environmental justice are similar in nature to those disclosed for the Proposed Action and impacts are related to environmental, health, or socioeconomic impacts that would affect minority or low-income communities. These impacts are summarized by authorized mine plan in the Environmental Justice SER for the Goldrush Mine Project (BLM 2021d). There would be no measurable changes to environmental or socioeconomic effects as Horse Canyon Mine, HC/CUEP, West Pine Valley, and Cortez Mine would continue as authorized. Overall, impacts to environmental justice under the No Action Alternative would be anticipated to be negligible, short-term, and localized.

#### **4.4 Geology and Minerals**

Additional details regarding the impacts to geology and minerals resources are provided in the Geology and Mineral Resources SER for the Goldrush Mine Project (BLM 2021e).

##### **4.4.1 Proposed Action**

Impacts of the Proposed Action on geologic and mineral resources would include mining of proven and probable ore reserves of approximately 34 Mt and the generation and permanent disposal of approximately 19 Mt of waste rock, of which 10 Mt would be brought to the surface for disposal from the proposed underground mine and nine Mt would remain underground to be used as backfill. These impacts would be moderate, long-term, and localized for geology and mineral resources.

The Goldrush Mine would result in the temporary alteration of the landscape on an additional 1,694.4 acres of proposed new surface disturbance for the duration of the Proposed Action. Total surface disturbance would include 2,694.1 acres, of which approximately 443.9 acres would be left unreclaimed. This would result in alteration of the landscape that would be major, permanent, and localized. A total of 2,250.2 acres of proposed, existing, authorized and reclassified disturbance that would be reclaimed to pre-mining



topography would not permanently alter the natural topography or geomorphic features in the area of analysis. Impacts to the topography associated with this disturbance would be minor to moderate, short-term, and localized.

The model-predicted dewatering-induced subsidence with the addition of dewatering at the Goldrush Mine between now and closure. At the end of year 2043:

- The four-inch contour of land subsidence extends 5.9 and 5.4 miles into the basin fill deposits on the eastern and southern sides of the Pipeline Complex pits;
- The subsidence area would increase by 29 percent in the northern part of Grass Valley;
- Land subsidence would increase in the western part of Pine Valley due to continuous pumping from the Goldrush Mine dewatering wells; and
- The four-inch contour of predicted land subsidence extends over 32,380 acres under Scenario 1, 32,221 acres under Scenario 2, and 32,134 acres under Scenario 3 (SRK 2020a).

No additional facilities would fall within the four-inch subsidence contour beyond those captured in the 2032 prediction (SRK 2020a).

The predicted additional subsidence as a result of dewatering activities under the Proposed Action may expand the development of earth fissures. NGM's operations at the Cortez Mine include annual monitoring of subsidence and earth fissures throughout the life of the Cortez Mine within the areas affected by dewatering-induced ground subsidence. Additionally, NGM would revise the Subsidence and Earth Fissure Monitoring Plan currently in place at the Cortez Mine to incorporate the maximum extent of the four-inch subsidence contour projected at the end of mining at the Goldrush Mine. Baseline InSAR studies in Pine Valley have been conducted to survey and identify areas of abnormal surface movement over time for mining stability. Continued implementation of these measures would reduce impacts associated with subsidence-related earth fissure development in the vicinity of the Goldrush Mine. Therefore, impacts associated with dewatering-induced subsidence would be minor, long-term, and regional.

Mining-induced subsidence associated with the Goldrush Mine operations would be managed through the selected mining method, which all have the common approach of creating a void which is then subsequently backfilled. The process of creating a void and then the backfilling of the void would result in gradual/incremental, small-scale movement of the rock mass. Additionally, design work would establish appropriate strengths for the backfill medium to maintain stability when adjacent unmined areas are then subsequently mined. The voids would be filled with backfill, so that there would be minimal movement resulting from relaxation of the rock mass. Any surface impact due to mining-induced subsidence would be incremental and slow to occur. Impacts associated with potential mining-induced subsidence would be minor, long-term, and localized.

#### **4.4.2 No Action Alternative**

Under the No Action Alternative, the development of the Goldrush Mine would not be authorized and NGM would not construct, operate, and close a new underground mine (i.e., the Goldrush Mine). Modifications or reclassification of acres as proposed under the Proposed Action would not occur, the dual use of facilities between the Cortez Mine and Goldrush Mine operations would not occur, and NGM would be permitted to continue the previously authorized mining and exploration activities under the existing authorizations (**Section 2.2**). Overall, the type of impacts to geology and minerals are similar in nature to those disclosed for the Proposed Action and impacts are related to ground disturbance, geologic hazards created or exacerbated by mining, surface subsidence and ground deformation, and exclusion of future mineral resource availability. These impacts are summarized by authorized mine plan in the Geology and Minerals SER for the Goldrush Mine Project (BLM 2021e).

Under the No Action Alternative, up to 22,433 acres are already authorized to be disturbed. Potential impacts to geology and minerals include surface disturbance associated with mining and exploration activities, the mining-induced and dewatering-induced subsidence, as well as impacts from mineral

extraction and exclusion of future mineral development from WRFs and other mine facility development. No mining-induced subsidence has been documented within the area of analysis.

Overall, impacts to geology and minerals from the No Action Alternative would be anticipated to be minor to moderate, short-term to permanent, and localized to regional.

#### **4.5 Bald and Golden Eagles**

Additional details regarding the impacts to bald and golden eagles are provided in the Bald and Golden Eagle SER for the Goldrush Mine Project (BLM 2021f).

##### **4.5.1 Proposed Action**

Within the area of analysis, no identified golden eagle nests would be physically removed as a result of the proposed Goldrush Mine disturbance. If a previously unidentified or newly constructed nest needs to be removed, an eagle take permit from the USFWS would be required. The Proposed Action would remove approximately 1,067 acres of potential golden eagle foraging habitat within the area of analysis. The acres of eagle foraging habitat were calculated based on the overlap of project disturbance within the habitat types believed to provide the highest-value native foraging habitat based on higher abundance of golden eagle prey. The majority of the golden eagle foraging habitat would be reclaimed and available for foraging once reclamation is complete. Surface disturbance would directly impact 7.8 acres of mapped wetlands, 31.0 acres of riparian habitat, and eight seep/spring sites, resulting in a loss of eagle foraging habitat. Due to the complexity of these sites (their dependence on water) and the type of disturbance that occurs, sites that have been directly impacted may or may not recover after reclamation. Overall, impacts from the loss of foraging habitat would be minor, long-term to permanent, and localized.

Reduced flow to seeps, springs, and perennial streams within the groundwater drawdown contour as a result of mine dewatering may result in an overall reduction of golden eagle foraging habitat. The implementation of mitigation measures committed to for authorized actions included in the Technical Memorandum Contingency Mitigation Plans for Surface Waters Deep South Expansion Project and the Technical Memorandum Contingency Mitigation Plans for Surface Waters Cortez Hills Expansion Project (BCI and Stantec 2018; Barrick and JBR 2010) would reduce the impacts seeps, springs, and perennial streams as a result of dewatering; however, some reduction in habitat would still likely occur. All contingency mitigation measures would comply with Nevada Water Law and would involve the Nevada Office of the State Engineer. After the end of mining and the return of surface flow (a new equilibrium is estimated at 500 years of recovery), any lost vegetation would likely be restored. Therefore, the impacts from dewatering on available eagle forage would be negligible to minor, long-term, and localized.

The two proposed RIB galleries would each be individually fenced to keep out livestock. The proposed fencing around the RIB galleries may become an attractant to golden eagles and may be utilized opportunistically by golden eagles in the area for perching and predation. Impacts from potential increased perching and predation by eagles would be beneficial and minor, long-term, and localized.

Increased human presence and noise created by the proposed mine infrastructure and increased traffic may cause eagles to avoid areas adjacent to the proposed Goldrush Mine. The existing conditions include authorized actions that have been in operation where noise and human presence is already occurring within the vicinity of the proposed Goldrush Mine. Impacts to golden eagles from human presence and noise would be negligible, long-term, and localized.

For most ground-based anthropogenic activities, the USFWS recommends a one-mile no disturbance buffer surrounding golden eagle nesting sites (USFWS 2017). Breeding pairs of golden eagles with territories (nests) within these buffers may be subject to indirect disturbance resulting in a loss of annual productivity. That is, anthropogenic disturbance occurring in these buffers can prevent breeding golden eagles from using the nests during the breeding season, or if they are selected for use, could result in the nest being unsuccessful (i.e., no young fledged).

Fourteen golden eagle nests (FC-01, FC-08, FC-09, HC-02, HC-03, HC-08, MC-01, MC-02, MT-01, MT-02, MT-03, WC-02, WC-03, and WC-04) constituting eight individual golden eagle territories have been documented within one mile of the proposed Goldrush Mine Plan boundary and within one mile of the

Fourmile Canyon Road (NGM 2020d). Under the Proposed Action ACEPMs (**Section 2.1.10.22**), NGM has committed to applying for an eagle take permit and conducting the USFWS mitigation associated with this permit to offset the impacts of the incidental take of eight golden eagle territories. The Proposed Action disturbance could result in the loss of annual productivity (i.e., number of young reared) from the eight territories for a period of up to 24 years.

The issuance of a golden eagle take permit including implementation of the USFWS mitigation under the BGEPA would fully offset the estimated take for the Proposed Action and would provide additional net benefit to eagle populations. The Proposed Action, including the ACEPM to apply for and provide the USFWS required mitigation necessary for an eagle take permit, is consistent with the BGEPA.

#### **4.5.2 No Action Alternative**

Under the No Action Alternative, the development of the Goldrush Mine would not be authorized and NGM would not construct, operate, and close a new underground mine (i.e., the Goldrush Mine). Modifications or reclassification of acres as proposed under the Proposed Action would not occur, the dual use of facilities between the Cortez Mine and Goldrush Mine operations would not occur, and NGM would be permitted to continue the previously authorized mining and exploration activities under the existing authorizations (**Section 2.2**). Overall, the type of impacts to bald and golden eagles are similar in nature to those disclosed for the Proposed Action and impacts are related to direct surface disturbance, groundwater withdrawal associated with dewatering activities, and additional human presence and noise. These impacts are summarized by authorized mine plan in the Bald and Golden Eagle SER for the Goldrush Mine Project (BLM 2021f).

No impacts to bald eagles are anticipated under the No Action Alternative as no bald eagle nests have been identified within the No Action Alternative area of analysis. Under the No Action Alternatives potential impacts to golden eagles would be the loss of up to 10,880 previously authorized acres of foraging habitat. Four golden eagle nests have been documented within one mile of the authorized Horse Canyon Mine, constituting three golden eagle territories. Thirteen golden eagle nests have been documented within one mile of the HC/CUEP Plan boundary, constituting nine golden eagle territories. Two golden eagle nests have been documented within one mile of the West Pine Valley Exploration Plan, constituting one golden eagle territory. Seventeen golden eagle nests have been documented within one mile of Cortez Mine, constituting 11 golden eagle territories (NGM 2020d).

Increased human presence and noise created by exploration activities may cause golden eagles to avoid areas adjacent to West Pine Valley and may result in the loss of productivity at the identified territories. NGM would continue to implement previously authorized ACEPMs, including nesting season avoidance buffers of active nests, which would help reduce potential impacts to golden eagles. All other impacts to golden eagles (other than to be in compliance with BGEPA) are anticipated to be minor, long-term, and localized.

### **4.6 Hazardous Materials and Solid Waste**

Additional details regarding the impacts to hazardous materials and solid waste are provided in the Hazardous Materials and Solid Waste SER for the Goldrush Mine Project (BLM 2021g).

#### **4.6.1 Proposed Action**

Bulk process chemicals, fuels, and supplies would be transported to the Goldrush Mine by truck along the highways in the region. Hazardous materials would be transported by commercial carriers or vendors in accordance with the requirements of Title 49 of the CFR. Carriers would be licensed and inspected as required by the NDOT and USDOT. Delivery traffic and fuel shipments would continue to occur from SR 278 to JD Ranch Road (M-111). Traffic on these routes may increase under the Proposed Action. NGM and Eureka County have an existing MOU regarding road issues and maintenance of county roads and emergency response. Under the Proposed Action, these MOUs would be amended in coordination with Eureka County, as needed.

Procedures for materials transportation, storage, waste management, and spill prevention and emergency response programs are in place for the authorized NGM operations and would be modified to include the

Goldrush Mine. Solid non-hazardous waste from the Goldrush Mine would be transported to the Cortez Mine Class III-waivered landfill (BCI 2018a).

The Goldrush Mine would require the transport, handling, storage, use, and disposal of materials classified as hazardous according to definitions in the Comprehensive Environmental Response, Compensation, and Liability Act; Resource Conservation and Recovery Act; MSHA; and Occupational Safety and Health Administration Hazard Communication Standards, USDOT regulations; Superfund Amendments and Reauthorization Act; and Oil Pollution Act of 1990. The mining operations for the Proposed Action would require the use of the following materials classified as hazardous: diesel fuel, gasoline, oils, and antifreeze used for equipment operation and maintenance; ammonium nitrate and high explosives used for blasting underground; and various acids, corrosives, oxidizers, flocculants, and retardants used at the water treatment plant and/or throughout the operation.

The dual use of the Cortez Mine facilities would supply gasoline, diesel fuel, propane, antifreeze, petroleum lubricants, and solvents to the Goldrush Mine. Fuels, hydrocarbons, and reagents would be stored and used at the Goldrush Mine. NGM would continue to use the existing diesel and gasoline storage tanks at the location of the proposed multi-use shop area. NGM would also have fuel and reagent storage areas underground at the Goldrush Mine. Procedures for materials transportation, storage, waste management, and spill prevention and emergency response programs currently are in place for the authorized NGM operations and would be modified to include the Goldrush Mine (NGM 2021). Solid non-hazardous waste from the Goldrush Mine would be transported to the Cortez Mine Class III-waivered landfill.

The authorized PCS Management Plan would be revised to include PCS generated from the Goldrush Mine. PCS would be placed on the Cortez Mine approved PCS pad or transported off site to a disposal facility licensed to handle such materials (Broadbent 2018). Hazardous waste generated at the Goldrush Mine would be transported to a Cortez Mine hazardous waste storage area.

The use of hazardous materials for the proposed Goldrush Mine include the potential impacts to the environment from an accidental release of hazardous materials during transport to the Goldrush Mine or a release related to use or storage at the site. The transportation route from Elko would cross the Humboldt River, Maggie Creek (Gold Quarry), Susie Creek, Primeaux Creek, Highline Canal, and Indian Creek surface waterbodies. Some of these waterbodies would run parallel to the road for portions of the route. The transportation route from Reno would cross the Truckee River, Humboldt River, Highline Canal, and Indian Creek surface waterbodies, and some of the waterbodies would run parallel along portions of the route. Based on the quantity, number of deliveries, and potential hazard, the materials of greatest concern would be diesel fuel and sulfuric acid solution.

Based on the number of shipments per month for hazardous materials, an approximate load delivery frequency for the materials during the mine life was determined. In the event of a release during transport to the mine site, the transportation company would be responsible for response and cleanup. Each transportation company is required to have an emergency response plan to address spills and accidental releases of hazardous materials. The analysis shows that the probability of a release for each substance would be as follows:

Diesel fuel:

- 1,118.4 in 1,000 miles for the Reno I-80/SR 306 route (release probability of 1.1184); and
- 327.8 in 1,000 for the Elko I-80/SR 306 route (release probability of 0.3278).

Plasticizer:

- 38.4 in 1,000 miles for the Reno I-80/SR 306 route (release probability of 0.0384); and
- 11.3 in 1,000 for the Elko I-80/SR 306 route (release probability of 0.0113).

Sulfuric acid:

- 22 in 1,000 miles for the Reno I-80/SR 306 route (release probability of 0.0220); and
- 6.5 in 1,000 for the Elko I-80/SR 306 route (release probability of 0.0065).

These results indicate a high probability of an accidental release of diesel fuel, and a low probability of an accidental release of sulfuric acid to the environment during the estimated life of the Proposed Action.

National accident statistics for flammable and combustible materials (diesel fuel) indicate a higher incident of release per mile of travel than the other categories used in this analysis.

Based upon the small quantities of hazardous waste that would be generated by the Proposed Action, an accident resulting in a release to the environment during transportation from the Proposed Action area is not anticipated. Additionally, implementation of NGM's Solid and Hazardous Waste Management Plan, Emergency Response Plan, and ACEPMs would further minimize the risk of impacts should a spill or release occur. Potential effects associated with the transportation and use of hazardous materials are expected to be negligible to minor. The duration and context of impacts would depend on the location and the amount and type of material spilled. In the potential cases of transportation spills to water bodies, there could be long-term, regional impacts; however, there is a low probability of hazardous material transportation incidents. Should spills occur within the proposed Goldrush Mine Plan boundary, it would not be expected to affect a large area or spread off site, and therefore, impacts would be anticipated to be short-term and localized.

A spill of hazardous materials or fuels along transportation routes that does not impact a water body or stream channel would only impact soil adjacent to the highway. A spill of this type would be minor to moderate, short-term, and localized. A spill or release into a water body such as a flowing stream would be moderate to major, short-term to long term, and regional.

The probability of a potential release is low and the probability of a release in a populated area is low. Therefore, it is not anticipated that a release resulting in a significant effect to human health or safety would occur during the life of the mine. In the event of a release during transport to or from the mine site, the transportation company would be responsible for response and cleanup. Hazardous materials transporters are required to maintain an emergency response plan which details the appropriate response, treatment, and cleanup for a material spilled onto land or into water.

#### **4.6.2 No Action Alternative**

Under the No Action Alternative, the development of the Goldrush Mine would not be authorized and NGM would not construct, operate, and close a new underground mine (i.e., the Goldrush Mine). Modifications or reclassification of acres as proposed under the Proposed Action would not occur, the dual use of facilities between the Cortez Mine and Goldrush Mine operations would not occur, and NGM would be permitted to continue the previously authorized mining and exploration activities under the existing authorizations (**Section 2.2**). Overall, the type of impacts to hazardous materials and solid waste are similar in nature to those disclosed for the Proposed Action and impacts are related to hazardous materials transportation, storage, use, and disposal. These impacts are summarized by authorized mine plan in the Hazardous Materials and Solid Waste SER for the Goldrush Mine Project (BLM 2021g).

Ongoing transport, storage, and use of hazardous materials and solid wastes for existing operations would continue under current authorizations and potential impacts would include the potential spill or release of hazardous materials from mining, processing, and exploration activities. Overall, impacts to hazardous materials and solid waste from the No Action Alternative from the authorized No Action Alternative are anticipated to be the same as described for the Proposed Action.

#### **4.7 Land Use and Realty**

Additional details regarding the impacts to land use and realty are provided in the Land Use and Realty SER for the Goldrush Mine Project (BLM 2021h).

##### **4.7.1 Proposed Action**

The Goldrush Mine is consistent with BLM plans and policies that designate land use within the area of analysis for mineral exploration and development, as described in the Shoshone-Eureka and Elko RMPs (BLM 1986a, 1986b). There may be conflicts with local land use code and master plans. The Proposed Action, with the implementation of ACEPMs, is consistent with Eureka County Code and Master Plan.

Of the approximate 2,694 acres of surface disturbance from the Proposed Action (existing/authorized, proposed and reclassified), approximately 2,561 acres (95 percent) would occur on public lands. The

remainder of the proposed disturbance, approximately 133 acres (five percent), would occur on NGM-controlled private land. Proposed Action-related disturbance would result in a minor, short-term, loss of an additional 1,580 acres of new surface disturbance on public lands for multiple use authorizations for the life of the mine (24 years). Additionally, approximately 1,036 acres of authorized/existing surface disturbance would be used or reclassified under the Proposed Action that would also continue to affect multiple land authorizations for the life of the mine. The total combined acreage (proposed plus authorized/existing and reclassified) would include approximately 2,561 acres of surface disturbance that would result in a minor, short-term, loss of public land for the life of the mine.

The Proposed Action would result in fencing around the proposed RIBs, WTP and yard, multi-use shop, paste plant, ventilation raises, and substations for safety and security thus prohibiting uncontrolled public access and use of these locations during the life of the mine. Once mining and reclamation activities are complete, fencing would be removed and access to the public lands would be available for multiple use authorizations, thus minimizing the short-term impacts. The impact to land use from the Goldrush Mine fencing around specified areas would be minor, short-term, and localized.

Land use authorization N-48321, owned by Sierra Pacific Power Company, crosses the portion of the proposed 120-kV power line located within the Cortez Mine boundary. NGM and/or WREC would need to coordinate with the ROW-holder to ensure no conflicts would occur during construction and operation of the proposed 120-kV power line. Coordination with the ROW-holder would reduce impacts to a negligible level.

The proposed Goldrush Mine would include the construction of a 120-kV power line and switching stations, contact water pipeline, infiltration distribution pipeline, and Lower Horse Canyon Road that would run from the Goldrush Mine Plan boundary to the portions of the Cortez Mine. The proposed 120-kV power line and switching stations would be partially constructed within the Cortez Mine Plan boundary and partially constructed within the proposed Goldrush Mine Plan boundary. The construction of the 120-kV power line and switching stations would be a minor, permanent, localized impact to land use as WREC would obtain a ROW for ownership of the 120-kV power line and switching stations after issuance of the ROD and the power line would not be reclaimed. However, the 120-kV power line and switching stations would be consistent with existing land uses in the area of analysis. The construction of the contact water pipeline would be a minor, short-term, localized impact to land use as the pipeline would be consistent with existing land use authorizations and would be reclaimed once mining activities cease.

The proposed infiltration distribution pipeline and Lower Horse Canyon Road would be partially constructed within the Cortez Mine Plan boundary and partially constructed within the proposed Goldrush Mine Plan boundary. The construction of the infiltration distribution pipeline would be a minor, short-term, localized impact to land use as the pipeline would be consistent with existing land use authorizations and would be reclaimed once mining activities cease. The Lower Horse Canyon Road would be a permanent, minor, localized impact to land use as the road would not be reclaimed.

In addition, under the Proposed Action, the Mount Tenabo access road would be constructed partially within the proposed Goldrush Mine Plan boundary and partially within the West Pine Valley Exploration Plan boundary. The Mount Tenabo access road would not be reclaimed once mining operations cease and would remain open for public access post-mining. The construction of the Mount Tenabo access road would be consistent with existing land use authorizations in the area of analysis and would be a minor, permanent, localized impact to land use.

There are no patents located within the proposed Goldrush Mine Plan boundary that would fall within the proposed surface disturbance of the Goldrush Mine that are not either controlled by NGM or that NGM maintains a fee ground on, and therefore, the Proposed Action would have no impacts on patents in the area of analysis. There are multiple mining claims not owned or leased by NGM that would fall within the proposed Goldrush Mine Plan boundary, but there would be no mining claims that fall within the surface disturbance footprint that are not controlled by NGM or a subsidiary. NGM would be required to allow access within the proposed Goldrush Mine Plan boundary for claimants to the mining claims not controlled by NGM. The Proposed Action would have a negligible, short-term, localized impact to the mining claims not controlled by NGM in the proposed Goldrush Mine Plan boundary.

The proposed disturbance would overlap with several unimproved roads that are used by the public which may result in loss of access if not re-routed around the disturbance and would therefore, have a moderate to major, long-term, localized impact.

Approximately 444 acres of total Proposed Action disturbance would not be reclaimed under the Proposed Action. Approximately 2,286 acres of total surface disturbance (existing/authorized, proposed, and reclassified) would be reclaimed and would return post-reclamation land uses including open space, grazing, dispersed recreation, and wildlife habitat. Additional detail on the facilities to be reclaimed and those which would remain unreclaimed is provided in Table 2-18 of the Project Alternatives SIR for the Goldrush Mine Project (BLM 2021a). These post-mining land uses would be consistent with state, local, and BLM land use plans and guidelines. Impacts from the unreclaimed disturbance are anticipated to be minor, localized, and permanent.

#### **4.7.2 No Action Alternative**

Under the No Action Alternative, the development of the Goldrush Mine would not be authorized and NGM would not construct, operate, and close a new underground mine (i.e., the Goldrush Mine). Modifications or reclassification of acres as proposed under the Proposed Action would not occur, the dual use of facilities between the Cortez Mine and Goldrush Mine operations would not occur, and NGM would be permitted to continue the previously authorized mining and exploration activities under the existing authorizations (**Section 2.2**). Overall, the type of impacts to land use and realty are similar in nature to those disclosed for the Proposed Action and impacts are related to ground disturbance and impacts to existing land use authorizations. These impacts are summarized by authorized mine plan in the Land use and Realty SER for the Goldrush Mine Project (BLM 2021h).

Under the No Action Alternative, up to 22,433 acres were previously authorized to be disturbed, with approximately 18,746.7 acres of surface disturbance on public land and 3,686.5 acres on private land. Reclamation would also occur which would return post-reclamation land uses and would be consistent with BLM land use plans and guidelines. Overall, impacts to land use and realty under the No Action Alternative would be anticipated to be minor to moderate, short-term to permanent, and localized.

### **4.8 Native American Traditional Values**

Additional details regarding the impacts to Native American traditional values are provided in the Native American Traditional Values SER for the Goldrush Mine Project (BLM 2021i) and incorporated by reference to discussions in the Cortez Hills Final EIS and the Deep South Final EIS (BLM 2008b, 2019c).

#### **4.8.1 Proposed Action**

##### **4.8.1.1 Cultural Resources**

Impacts to prehistoric cultural resource sites are disclosed in the Cultural Resources SER for the Goldrush Mine Project (BLM 2021c). Consultation with the Native American tribes regarding impacts to NRHP-eligible prehistoric cultural resource sites is required under Section 106 of the NHPA and is ongoing. Initial consultation letters were sent to the Tribes in February 2019 and the Tribes were invited to the December 17, 2019, Goldrush Mine Project Kick-off Meeting. Additional coordination meetings between the BLM and Tribes we held on February 28, August 17, and October 8, 2021. Avoidance of impacts to prehistoric sites or resources of concern would be the preferred impact resolution measure. Where avoidance is not reasonably feasible, the BLM would consult with the appropriate Native American tribe(s) and individuals to obtain information about the identified concerns and what mitigation measures might be appropriate. Additionally, NGM would continue to implement the ACEPMs and comply with the existing September 2018 PA to help reduce impacts to cultural resources. Impacts to prehistoric cultural resources would be minor to moderate, long-term, and localized.

##### **4.8.1.2 Access**

BLM-managed public lands in the area of analysis are typically open for public access. For safety purposes, proposed disturbance areas would be removed from public access for the life of the Goldrush Mine; thus, access to resources such as pine nuts, wood, or other plants for harvesting would be limited. The Mount Tenabo/White Cliffs PCRI and the Horse Canyon PCRI are both important cultural sites for access to these

resources (Cedar Creek 2019a). However, there is extensive public land in the immediately surrounding area that support pinyon pine forests and would accommodate migration of these activities. Access impacts to the pinyon pine resource would be negligible, long-term, and localized. Under the Proposed Action, NGM would construct the Mount Tenabo access road which would allow continued access to the Cortez Range and to locations within Horse Canyon. This road would provide continued access to Mount Tenabo throughout the life of the Goldrush Mine and following reclamation. Public access through the Horse Canyon PCRI would be limited; however, consistent with the American Indian Religious Freedom Act, NGM would allow access through Horse Canyon Road upon request of the Tribes for cultural purposes. Impacts to access to the Mount Tenabo/White Cliffs PCRI and Horse Canyon PCRI would be negligible to minor, long-term, and localized.

#### **4.8.1.3 Visual**

Development of the proposed Goldrush Mine would incrementally add to existing impacts to the visual environment of the Mount Tenabo/White Cliffs PCRI. The proposed Goldrush Mine would modify the visual character of the lowest reaches of the eastern slope of Mount Tenabo and the adjacent canyon and valley lands. It would not modify the upper two-thirds of the mountain, including the White Cliffs. The undisturbed upper reaches of the mountain would be more visually prominent from distant viewpoints. Some of the aboveground elements of the Goldrush Mine would be visible from the viewpoint at the top of Mount Tenabo. Although no direct physical effects are anticipated in the PCRIs, the Project would have an effect from visual changes outside the boundaries of the PCRIs and from authorized and proposed mining traffic in the boundaries of the PCRIs. Surface features would be reclaimed and the landscape reclaimed and revegetated to reduce visual impacts from unnatural lines and landforms and regraded to better blend with the surrounding topography during closure and final reclamation. Implementation of the ACEPMs would minimize visual changes to the landscape to reduce impacts to the spiritual or cultural experience for Native American users of the resources from disturbance or construction of mining facilities. Visual impacts would be moderate in the short term and minor in the long term, and localized.

#### **4.8.1.4 Spring Sites**

Changes in the use of spring sites in the area of analysis due to changes in water quantity or quality would be avoided or minimized by the ACEPMs. NGM would also continue the monitoring of flows at streams and springs in the area of analysis as dewatering progresses to assess whether the active mitigation measures are adequate to prevent potential impacts through the implementation of previously authorized Technical Memorandum Contingency Mitigation Plans for Surface Waters Deep South Expansion Project and the Technical Memorandum Contingency Mitigation Plans for Surface Waters Cortez Hills Expansion Project (BCI and Stantec 2018; Barrick and JBR 2010). Impacts to spring sites on Native American Traditional Values would be negligible to minor, short-term, and localized.

#### **4.8.1.5 Spiritual and Religious Use**

Specific spiritual and religious use locations within the area of proposed disturbance have not been identified or disclosed by any tribes. If places of spiritual and religious use are present in the proposed disturbance, they would be impacted. If these places are outside the proposed disturbance, they may be impacted if physical disturbance to the landscape is within the viewshed. Impacts to spiritual and religious use sites would occur if such sites are identified within the physical disturbance footprint. Impacts would be major, long-term, and localized. No impacts to spiritual and religious use sites would occur to those that are identified outside of the physical disturbance footprint.

#### **4.8.1.6 Plants**

The majority of vegetation in the area of analysis consists of shrub-dominated types, which typically occur in basins, valley bottoms, and on mountain slopes. Woodland vegetation types typically occur at higher elevations along mountain ranges and are dominated by coniferous trees. Riparian and wetland vegetation types occur in localized areas. Edible and medicinal plants traditionally used by Native Americans are known to occur in great quantity (and quality) in specific places within the area of analysis (BLM 2019f). An additional 1,658 acres of shrubland, woodland, and grassland habitat that may support these species would be impacted by the Proposed Action (BLM 2021p). However, this would be a moderate, long-term, and localized impact as these habitats are common in the region.



#### 4.8.1.7 Pine Nut Harvesting

Impacts to pine nut harvesting are not entirely quantifiable due to the variability of pine nut production from year-to-year and the lack of information relative to specific pinyon grove usage. Pine nut collection, distribution, and consumption have played, and continue to play, a key role in Western Shoshone cultural identity and cohesion (McGuire et al. 2007). Access to historical pine nut harvesting sites near Mount Tenabo would be maintained and NGM would continue to assist with access and harvesting activities as requested by tribal members. As discussed in the Vegetation SER for the Goldrush Mine Project (BLM 2021p), approximately 145 acres of Pinyon Juniper Woodland habitat would be removed by the Proposed Action, a negligible to minor, long-term, and localized impact as pinyon habitat is common in the region.

#### 4.8.1.8 Wildlife

Based on the ethnographic studies described in the Deep South Final EIS (BLM 2019f), wildlife species that have been hunted by Native Americans within the area of analysis include big game species, small game species, squirrels, “ground hogs”, and eagles. These species have provided food and materials for making various items that were, and continue to be, used by Native Americans. Wildlife impacts are discussed in detail in the Wildlife Resources SER for the Goldrush Mine Project (BLM 2021t). Impacts to big game and small mammals would be minor, long-term, and localized.

#### 4.8.1.9 Regional Environmental Impact

Through review of past ethnographies and oral interviews with tribal members, tribal concerns regarding mining and other developments have been identified including threats to power spots or sources, access restrictions to traditional resource areas, degradation of cultural and biotic landscapes within Western Shoshone traditional territory, potential effects to cultural properties from development and data recovery, increased visibility and accessibility of cultural properties, inadvertent discovery of human remains, and impacts to eagles and sage grouse (BLM 2019f). Native American Traditional Values and the ability of tribes or tribal members to practice their traditional culture have been reduced through degradation of such resources over time; however, Western Shoshone continue such practices.

Archaeological excavation is perceived by some tribes as a destructive process that permanently removes tribal heritage from the landscape (Rucks 2004). Therefore, within the context of Native American Traditional Values, disturbance of prehistoric cultural sites as a result of mining and other developments, either through destruction of those sites without further management (i.e., those not eligible for the NRHP) or through excavation as mitigation under NHPA, is an adverse impact. Known landmarks in the region considered important to Native American tribes include the top of Mount Tenabo, the White Cliffs on the south half of Mount Tenabo's west face, Horse Canyon, the Tosawih Quarry area, and Big Butte near Tuscarora about 80 miles away.

Tribes utilize specific springs in their traditional territory to collect water for consumption (BLM 2019f), which is said to cleanse the mind, body, and spirit. Degradation of water quality or quantity impacts this value. Historic literature, ethnographic analysis, and interviews with contemporary Western Shoshone have indicated that the values placed on pinyon trees and the role they play in Western Shoshone heritage and have been impacted over time through reduction of this resource, and it is expected that these effects would continue. Wildlife important to the tribes include elk, mule deer, pronghorn, bighorn sheep, sage grouse, rabbits, squirrels, and marmots (BLM 2019f). Eagles are also of concern as the feathers of both bald and golden eagles are considered extremely powerful symbols of prayer, healing, and strength.

The lowering of groundwater levels associated with ongoing dewatering activities at the Pipeline Complex at the Cortez Mine has resulted in land subsidence and development of earth fissures within alluvial sediments in Crescent Valley in the vicinity of the pit (AMEC 2014). Subsidence modeling results are discussed under **Section 4.2.1** and additional details on dewatering-induced and mining-induced subsidence are included in the Geology and Minerals SER for the Goldrush Mine Project (BLM 2021e). Although these impacts overlap with the PCRIs and cultural sites in the area of analysis, the majority of areas affected would fall within the predicted four-inch contour of land subsidence. These impacts are expected to occur gradually and uniformly over a period of approximately 20 years over a large area; therefore, land subsidence is unlikely to result in long-term or localized impacts to Native American traditional values and religious concerns in the area of analysis.

#### **4.8.2 No Action Alternative**

Under the No Action Alternative, the development of the Goldrush Mine would not be authorized and NGM would not construct, operate, and close a new underground mine (i.e., the Goldrush Mine). Modifications or reclassification of acres as proposed under the Proposed Action would not occur, the dual use of facilities between the Cortez Mine and Goldrush Mine operations would not occur, and NGM would be permitted to continue the previously authorized mining and exploration activities under the existing authorizations (**Section 2.2**). Overall, the type of impacts to Native American Traditional Values are similar in nature to those disclosed for the Proposed Action and impacts are related to access to Mount Tenabo, visual degradation of the landscape, water quantity, and impacts to traditionally hunted and/or gathered resources. These impacts are summarized by authorized mine plan in the Native American Traditional Values SER for the Goldrush Mine Project (BLM 2021i).

Impacts under the No Action Alternative include visual degradation of the landscape from mine development and expansion, impacts to springs, impacts to the spiritual and religious use of the area, and impacts to resources traditionally hunted or gathered by the tribes. The No Action Alternative would include continued adherence to ACEPMs which would minimize potential effects to the Horse Canyon PCRI and the Mount Tenabo/White Cliffs PCRI, as well as resources traditionally utilized by the tribes. Overall, impacts to Native American Traditional Values under the No Action Alternative would be anticipated to be negligible to minor, permanent for those facilities left unreclaimed and long-term for surface disturbance that would be reclaimed, and localized.

#### **4.9 Noise**

Additional details regarding the impacts to noise resources are provided in the Noise SER for the Goldrush Mine Project (BLM 2021j).

##### **4.9.1 Proposed Action**

Noise levels associated with the Proposed Action at the closest wildlife sensitive receptor sites (GRSG leks) were modeled using file data collected for similar mining operations (Saxelby 2020a). No other wildlife sensitive receptors were identified or included in the Proposed Action analysis. General impacts to other wildlife species from noise and human presence is discussed in the Wildlife SER for the Goldrush Mine Project (BLM 2021t). No human sensitive receptors were identified or included in the Proposed Action analysis. Primary proposed noise sources associated with the Proposed Action include the following: concrete batch plant (operating continuously in the portal area), compressor (operating continuously in the portal area), new haul road to ore pad and haulage from ore pad to and from Cortez Mine (assumes one haul truck every four minutes, along with water trucks, service vehicles, and light duty trucks), ore pads (includes front end loaders and haul trucks), paste plant (includes a cone crusher, screening, front-end loaders, aggregate haul trucks, and paste plant process building), paste plant haul road (assumes one haul truck every 23 minutes), shop area (operating continuously, and includes the WTP), ventilation shafts (operating continuously with fans underground), and up to 20 drill rigs (Saxelby 2020a, 2020c).

The exact placement of drill rigs within the Plan boundary is unknown. Therefore, setback distances were calculated that would be required to not exceed an increase of 10.0 dBA at each GRSG lek. Setbacks were calculated based on topography, noise level of the drilling operation, and the number of drill rigs being used concurrently. Noise level data for exploration drilling was 82 dBA at a distance of 20 feet based upon use of an Atlas Copco CT-14 Christensen Core drill rig. Maximum setbacks for each lek location ranged from 5,255 feet to 11,275 feet for one drill rig to 8,275 feet to 17,920 feet for twenty drill rigs depending on the lek location. Additional sound attenuation may be applied to the drill rigs to decrease maximum setbacks and is discussed further in the Cumulative Noise Levels for the Nevada Gold Mines Goldrush Project (Saxelby 2020c). To reduce noise impacts to leks, NGM would adhere to these drilling setbacks as discussed in Section 2.10.22 of the Project Alternatives SIR for the Goldrush Mine Project (BLM 2021a).

Noise levels in the Goldrush Mine vicinity are expected to increase within the area of analysis from the Goldrush Mine operations. At specific times and locations within the area of analysis, this increase may be perceptible to humans not associated with mining activities (e.g., people using the area for recreation). No human sensitive receptors have been identified that would be impacted by the Proposed Action. Noise levels on the sensitive receptors identified for previous NEPA analysis (i.e., NGM-owned Wintle, Dean,

Filippini and Dann ranches) would be the same as estimated for previous NEPA analysis, including the Cortez Hills Expansion Project EIS and the Deep South Expansion Project Final EIS (BLM 2008b, 2019g; Cedar Creek 2020). The increased hauling from 18 trucks per hour to 20 trucks per hour is anticipated to increase the frequency of noise along the transportation route, but overall ambient noise levels are not expected to increase beyond already authorized conditions. Overall, potential impacts to humans from noise would be negligible to minor, short-term, and localized.

Noise increase over ambient conditions are anticipated at the lek sites assessed; however, predicted increases in noise levels over measured pre-development and measured ambient noise at each of the lek locations assessed would not exceed the 10 A-weighted decibels set forth in the 2015 ARMPA (BLM 2015a) threshold for each of the time periods measured at all locations when specific ACEPMs are implemented. **Table 4-3** provides the average predicted noise level increases over the time periods measured at all GRSG lek locations.

**Table 4-3 Predicted Noise Level Increases Under the Proposed Action**

Time Period	4:00 AM to 9:00 AM Average		24-Hour Average		6:00 PM to 10:00 AM Average	
	Noise Increase (NDOW Method 1)	Noise Increase (NDOW Method 2)	Noise Increase (NDOW Method 1)	Noise Increase (NDOW Method 2)	Noise Increase (NDOW Method 1)	Noise Increase (NDOW Method 2)
Horse Creek 01 Lek	10.0	8.4	10.0	8.0	9.9	9.0
Horse Creek 02 Lek	9.3	8.2	9.3	7.8	10.0	8.9
Horse Creek 03 Lek	9.3	8.2	9.3	7.9	10.0	8.9
New Horse Creek 02 Lek <sup>1</sup>	9.3	8.2	9.3	7.9	10.0 <sup>2</sup>	8.9
Cortez-Grass Valley Lek	10.0	7.1	10.0	6.1	8.9	7.3
New Cortez Grass Valley Lek	10.0	7.1	10.0	6.1	8.9	7.3
Quartz Road Lek	9.6	8.5	9.6	7.8	9.9	9.1

Sources: Saxelby 2020c, 2021

Note: All results are shown in dBA.

<sup>1</sup> New Horse Creek 02 lek has previously represented as Horse Creek 04 lek; however, based on NDOW communications, Horse Creek 04 lek should be included with the New Horse Creek 02 lek (NDOW 2020d).

<sup>2</sup> This value was incorrectly reported in Saxelby 2020c and was revised in Saxelby 2021.

The Noise SER for the Goldrush Mine Project provides details on the modeling results (BLM 2021j). NGM has committed to several ACEPMs as discussed under **Section 2.1.10.22** to help reduce potential noise impacts to GRSG leks within the area of analysis, including installation of sound attenuation enclosures or structures for the five, skid-mounted 350-horsepower electric pumps located within the Cortez Mine Plan boundary that are not currently constructed, to reduce noise levels to 60 dBA at 23 feet per pump. Noise impacts to all leks (sensitive receptors) would be minor, short-term, and localized.

#### 4.9.2 No Action Alternative

Under the No Action Alternative, the development of the Goldrush Mine would not be authorized and NGM would not construct, operate, and close a new underground mine (i.e., the Goldrush Mine). Modifications or reclassification of acres as proposed under the Proposed Action would not occur, the dual use of facilities between the Cortez Mine and Goldrush Mine operations would not occur, and NGM would be permitted to continue the previously authorized mining and exploration activities under the existing authorizations (**Section 2.2**). Overall, the type of impacts to noise are similar in nature to those disclosed for the Proposed Action and impacts are related to changes in background noise levels from activities associated with the No Action Alternative would be perceptible or may result in elevated noise levels at sensitive receptor sites.

These impacts are summarized by authorized mine plan in the Noise SER for the Goldrush Mine Project (BLM 2021j).

As the Horse Canyon Mine and HC/CUEP are fully constructed, noise from these facilities was assumed to be captured in the modeling for the Proposed Action. Under the No Action Alternative, these noise levels would continue as existing/authorized conditions. Potential noise sources from the Horse Canyon Mine includes traffic on haul roads. Potential noise sources from HC/CUEP includes traffic on haul roads, the shotcrete plant, ventilation fans, compressors, generators, and exploration drill pads and sumps. Information on baseline noise levels prior to the construction of the Horse Canyon Mine and HC/CUEP is not known, although interim measurements have been taken. Under the No Action Alternative, operational noise from the Horse Canyon Mine and HC/CUEP would continue to impact sensitive receptor sites and various wildlife species as previously authorized. Potential noise-related impacts from the Horse Canyon Mine, for the most part, have already previously occurred for the Horse Canyon Mine. NGM is using the existing and authorized disturbance in the Horse Canyon Mine Plan for sumps and to store materials and equipment consistent with the authorized Horse Canyon Mine Plan. Overall, noise impacts from the Horse Canyon Mine and HC/CUEP are anticipated to be negligible, short term, and localized.

Major potential noise sources from the Cortez Mine includes traffic on haul roads, the Pipeline Mill, WTP, dewatering infrastructure, and exploration drill pads and sumps. Information on baseline noise levels prior to the construction of the Cortez Mine is not known. Noise from these facilities was assumed to be captured in the values used for the Proposed Action modeling. Under the No Action Alternative, these noise levels would continue as existing/authorized conditions.

Noise sources that were authorized but not yet constructed at the time of baseline data collection include the Cortez Hills pump station and the Grass Valley pump station. Additionally, two exploration drill rigs within the West Pine Valley Exploration Plan boundary were authorized but not operational at the time of baseline data collection. Noise from these facilities was modeled and incorporated into the values presented in the Proposed Action. The Noise SER for the Goldrush Mine Project provides details on the modeling and comparisons between the Proposed Action and No Action Alternative (BLM 2021j). Under the No Action Alternative, these noise levels would continue as existing/authorized conditions. Noise impacts from the Cortez Mine and West Pine Valley Exploration are anticipated to be major, short term, and localized, as a result of the Cortez Hills and Grass Valley pump stations not being housed in a sound attenuation enclosure or structure as would occur under the Proposed Action.

#### **4.10 Grazing Management**

Additional details regarding the impacts to grazing management are provided in the Grazing Management SER for the Goldrush Mine Project (BLM 2021k).

##### **4.10.1 Proposed Action**

Impacts to AUMs are based on proposed disturbance and impacts from boundary fencing. While forage productivity varies widely across allotments, AUM impacts for BLM-administered land were estimated based on an average stocking rate. For the purposes of calculating impacts to AUMs, a value of 23 acres per AUM was used for the Carico Lake Allotment, 14 acres per AUM for the Grass Valley Allotment, 17 acres per AUM for the JD Allotment, and 11 acres per AUM for the South Buckhorn Allotment; these values were calculated using the acres administered by the BLM and the total permitted use on the permit. AUM impacts were only analyzed for disturbance or fencing to BLM-administered lands. Under the Proposed Action, a total of 1,694 acres (1,616 public acres, 78 private acres) of surface disturbance may impact forage utilized by livestock. Any actual reduction in permitted grazing would be done through a subsequent BLM decision based on livestock carrying capacity and resource conditions (see 43 CFR 4100.0-5), accounting for actual forage unavailable for grazing.

A total of 121.4 AUMs would be impacted in the Carico Lake, Grass Valley, JD, and South Buckhorn allotments by proposed new disturbance. The 210 acres of proposed exploration disturbance would occur within the proposed Goldrush Mine Plan boundary, with potential short-term impacts ranging from nine to 19 AUMs, depending on the allotment within which it occurs. However, exploration could occur throughout the life of the Goldrush Mine; meaning potential impacts would be temporally spaced.

Proposed fencing would encompass a total of 123.4 acres within the Tuscarora Field Office-administered portion of the South Buckhorn Allotment and 185.2 acres within the JD Allotment, precluding livestock access to approximately 11.2 and 10.9 AUMs, respectively. Proposed fencing is mainly associated with the RIBs, which would be individually fenced to prevent livestock access. Other fenced facilities include the portal cut slope, the WTP and yard, multi-use shop, paste plant, ventilation raises, and substations. Fencing would preclude livestock access and reduce potential impacts from interactions with these facilities.

Under the Proposed Action, a total of 2,286 acres of total surface disturbance would be reclaimed, which includes the total proposed, existing, authorized, and reclassified acres to be reclaimed. The portions of the proposed disturbance occurring outside of proposed fencing that would be reclaimed are as follows: 3161.6 acres in the Grass Valley Allotment, 112.7 acres in the JD Allotment, 529.5 acres in the South Buckhorn pasture, and 270.7 acres in the Tuscarora Field Office-administered portion of the South Buckhorn Allotment. The disturbance occurring outside of proposed fencing would impact a total of 99.3 AUMs.

The 444 acres of permanent, unreclaimed disturbance (including the portions of the Mount Tenabo access road and 120-kV power line that fall outside of the proposed Goldrush Mine Plan boundary) within the four allotments would create a permanent impact to 34.0 AUMs.

In total, the Proposed Action would have permanent impacts to 34.0 AUMs from unreclaimed disturbance and short-term impacts to as many as 22.1 AUMs from fenced acres (308.6 acres), 99.3 AUMs from unfenced proposed disturbance (1,176.6 acres) that would be reclaimed, and up to 19.1 AUMs from exploration (210 acres). Overall, impacts to AUMs would be minor, short-term to permanent, and regional; if AUMs are suspended, impacts would be considered moderate. Any reductions to permitted AUMs would conform with 43 CFR 4110.4-2 and be issued through a 43 CFR 4160 Grazing Decision.

Impacts from proposed disturbance to rangeland improvements include the following: one well, and 1.9 miles of fence within the Grass Valley Allotment; one spring and 0.6 miles of fence in the South Buckhorn pasture; 1.4 miles of fence in the JD Allotment. Additionally, other range improvements and infrastructure not officially accounted for may be impacted under the Proposed Action. NGM has committed to protecting fences, gates, stock ponds, and other range improvements within the Plan boundary; therefore, impacts to range improvements would be negligible, short-term, and regional.

If hydraulically connected to the affected aquifer, dewatering under the Proposed Action may potentially impact up to 41 seeps and springs in the Carico Lake Allotment, 18 in the Grass Valley Allotment, 89 in the South Buckhorn Allotment (Tuscarora Field Office-administered portion), 37 in the South Buckhorn pasture (MLFO-administered), and five in the South Buckhorn Allotment. In addition, water-related rangeland improvements may also be impacted by the proposed dewatering. Mine-related groundwater drawdown may impact forage and AUMs dependent on surface water flows. Within the groundwater drawdown contour plus one mile of the drawdown contour, one spring development and 13 wells occur within the Carico Lake Allotment, three spring developments and one well occur within the Grass Valley Allotment, one spring development and one well occur within the JD Allotment, 12 spring developments and two wells occur within the Tuscarora Field Office-administered portion of the South Buckhorn Allotment, and three spring developments and one well occur within the South Buckhorn pasture.

Potential flow reductions in seeps, springs, and perennial streams attributable to mine-induced drawdown would be addressed through the implementation of existing mitigation, as described in the Cortez Hills Expansion Project Final EIS (BLM 2008b) and Technical Memorandum, Contingency Mitigation Plans for Surface Waters, Deep South Expansion Project, Lander and Eureka Counties, Nevada (BCI and Stantec 2018). All contingency and mitigation measures would comply with Nevada Water Law and would involve the Nevada Office of the State Engineer. With this mitigation, overall impacts to water-related sources and rangeland improvements are anticipated to be negligible to minor, long term to permanent, and localized to regional.

Economic impacts from the potential reduction in AUMs would occur under the Proposed Action. The Nevada Grazing Statistics Report and Economic Analysis for Federal Lands in Nevada (RCI 2001) valued total economic impacts of one AUM at \$87.51 in 2020 dollars (U.S. Inflation Calculator 2021). The total economic impact from one AUM includes industry (\$66.20) and value-added (\$21.30) impacts. In total, \$10,623.71 in economic impacts would be realized annually based on the temporary loss of 121.4 AUMs

from the Proposed Action. Temporary loss of a total of 121.4 AUMs would equate to up to \$318,711.42 based on a 30-year period of combined active mining and post-mining reclamation (assumed to be six years of reclamation after cessation of the 24-year mining operations). Interim reclamation may reduce the economic impact of the temporary loss of AUMs. A total of 34 AUMs would be permanently impacted, resulting in the loss of \$2,975.34 annually. The economic impact would be minor, temporary to permanent, and regional to the ranching community and agricultural or grazing sector of Nevada's or Eureka County's economy; however, the economic impact to the affected permittees may be moderate, long-term (lasting through reclamation) to permanent, and regional.

#### **4.10.2 No Action Alternative**

Under the No Action Alternative, the development of the Goldrush Mine would not be authorized and NGM would not construct, operate, and close a new underground mine (i.e., the Goldrush Mine). Modifications or reclassification of acres as proposed under the Proposed Action would not occur, the dual use of facilities between the Cortez Mine and Goldrush Mine operations would not occur, and NGM would be permitted to continue the previously authorized mining and exploration activities under the existing authorizations (**Section 2.2**). Overall, the type of impacts to grazing management are similar in nature to those disclosed for the Proposed Action and impacts are related to ground disturbance and mine dewatering activities. These impacts are summarized by authorized mine plan in the Grazing Management SER for the Goldrush Mine Project (BLM 2021k).

Under the No Action Alternative, there are up to 22,433 acres of previously authorized disturbance (18,746.7 BLM and 3,686.5 on private land) which would impact grazing management. Of the total authorized/existing disturbance, 413.8 acres occurs on BLM-administered lands as follows: 3.8 acres in the Carico Lake Allotment, 29.5 acres in the Grass Valley Allotment and 380.4 acres in the South Buckhorn Allotment. This disturbance equates to lost productivity of 0.2 AUMs in the Carico Lake Allotment, 2.1 AUMs in the Grass Valley Allotment, and 34.6 AUMs in the South Buckhorn Allotment. The majority of disturbance would be reclaimed, allowing for grazing to resume once reclamation is deemed successful. Overall, impacts to range resources from the No Action Alternative would be minor to major, long-term to permanent, and regional.

#### **4.11 Recreation**

Additional details regarding the impacts to recreation are provided in the Recreation SER for the Goldrush Mine Project (BLM 2021I).

##### **4.11.1 Proposed Action**

The Proposed Action would not conflict with recreation management objectives in the Shoshone Eureka RMP and associated amendments, the Elko RMP, the FLPMA, or the various BLM manuals and handbooks directing recreation management, Wilderness Areas, and WSAs. There would also be no known conflicts with the Statewide Comprehensive Outdoor Recreation Plans, or any other state land use or recreation management plans and policies that are known to exist. There may be conflicts with local land use code and master plans, particularly if access to roads used by the public are closed. These conflicts would be minor to moderate, depending on if additional access is provided for any of the closed roads. The Proposed Action, with the implementation of ACEPMs, is consistent with Eureka County Code and Master Plan. No developed or designated recreation sites or facilities would be impacted by the Proposed Action as there are no developed recreation sites within or immediately adjacent to the proposed Goldrush Plan boundary.

Implementation of the Proposed Action would have a short-term effect on recreation through the loss of public lands managed for multiple uses, including dispersed recreation for the life of the Goldrush Mine, including closure and reclamation. County roads within the Project boundary may be closed or restricted for recreationists during active mining. NGM and Eureka County have an existing MOU regarding road issues and maintenance. This MOU would be amended in coordination with Eureka County, as needed. In addition, the Proposed Action would result in fencing around certain proposed mine facilities thus prohibiting recreation access and use of these locations during the life of the mine. Once mining and reclamation activities are complete, fencing would be removed and access to the public lands would be available for recreation activities, thus minimizing the long-term impacts.

The area around the Goldrush Mine does not provide unique recreation opportunities in the area, and similar recreational opportunities occur in other areas around the Goldrush Mine. As there are adequate recreation areas around the Goldrush Mine, and as recreation activities would be restricted around certain mining facilities, it is anticipated that the loss of recreation activities would result in a short-term, minor, localized impact to recreation resources.

Implementation of the Proposed Action would also exclude areas of proposed disturbance from hunting activities within the area of analysis. The proposed disturbance would constitute approximately 1,455 acres or 0.3 percent of NDOW Hunt Unit 141, approximately 29 acres or 0.005 percent of the NDOW Hunt Unit 154, and zero acres or zero percent of the NDOW Hunt Unit 155. Additionally, up to 210 acres of exploration may occur anywhere within the proposed Goldrush Plan boundary intersecting both NDOW Hunt Units 141 and 154. As a result, under the Proposed Action the NDOW Hunt Units 141, 154, and 155 would still offer adequate hunt unit areas for hunters within the area of analysis. Impacts to mule deer migration corridors are discussed in **Section 4.19.1.1**. Disturbance within the mule deer corridor may result in modifications of mule deer migration patterns which may impact hunting opportunities. Impacts to hunting activities as a result of the Proposed Action, are anticipated to be minor to moderate, short-term, and localized to regional.

Recreationists visiting the historic Cortez townsite may notice an increase in activity in the area from proposed mining operations under the Proposed Action. As mining operations are currently occurring within the area of analysis, it is not anticipated that recreationists would notice a change from current authorizations. Under the Proposed Action, it is anticipated that there would be negligible, short-term, localized impacts to recreational sightseeing the historic Cortez townsite.

Under the Proposed Action, minor to moderate, short-term, regional, impacts may occur as the Goldrush Mine would result from the increased population in the local region, which may increase the demand for recreation opportunities in and near the area of analysis. The impacts would occur during mining operations which is anticipated to occur for 24 years, at which point recreation activities would return to pre-mining levels. There is adequate public land available for recreation opportunities in and near the area of analysis to accommodate the needs of the population increase. Potential increased recreation use in and near the area of analysis is not anticipated to degrade or reduce the quantity or quality of the area for existing or future recreational opportunities, though the level of recreationists using the area of analysis may increase.

There would be no measurable impacts from the Goldrush Mine to the Roberts Creek WSA or Simpson Park WSA. The Proposed Action would conform to the Wilderness Act of 1964 and the BLM Manual 6330 – Management of WSAs (BLM 2012).

#### **4.11.2 No Action Alternative**

Under the No Action Alternative, the development of the Goldrush Mine would not be authorized and NGM would not construct, operate, and close a new underground mine (i.e., the Goldrush Mine). Modifications or reclassification of acres as proposed under the Proposed Action would not occur, the dual use of facilities between the Cortez Mine and Goldrush Mine operations would not occur, and NGM would be permitted to continue the previously authorized mining and exploration activities under the existing authorizations (**Section 2.2**). Overall, the type of impacts to recreation are similar in nature to those disclosed for the Proposed Action and impacts are related to ground disturbance and loss of public lands for dispersed recreation opportunities due to the surface disturbance. These impacts are summarized by authorized mine plan in the Recreation SER for the Goldrush Mine Project (BLM 2021).

Under the No Action Alternative, up to 22,433 acres were previously authorized to be disturbed. Potential impacts to recreation would include some loss of dispersed recreation potential. Reclamation would occur for the majority of the disturbance associated with the No Action Alternative which would support the multiple land uses of livestock grazing, wildlife habitat, and recreation. Post-closure land uses would be in conformance with local and BLM land use plans and guidelines and zoning ordinances. Overall, impacts to recreation from the No Action Alternative would be anticipated to be negligible to minor, short-term to permanent, and localized.

## **4.12 Social and Economic Values**

Additional details regarding the impacts to social and economic values are provided in the Social and Economic Values SER for the Goldrush Mine Project (BLM 2021m).

### **4.12.1 Proposed Action**

For social and economic values, direct, indirect, and induced effects from the Goldrush Mine were analyzed using an IMPLAN Group, LLC (IMPLAN) software based on the increase in employment from the Goldrush Mine. IMPLAN defines impacts as (IMPLAN 2020): Direct effects are one or more production changes or expenditures made by producers/consumers as a result of an activity or policy; Indirect effects are those economic effects stemming from business-to-business purchases in the supply chain.; or Induced effects are those economic effects stemming from household spending of labor income, after the removal of taxes, savings, and commuter income.

#### **4.12.1.1 Population and Demography**

Potential population increases resulting from construction of the proposed Goldrush Mine would include a projected total of 377 new, non-local households, with a projected total new construction, non-local related population of 861 (including adults and children) (IMPLAN 2021). Because of the nature of construction activities, it is likely that the construction-related projections would include mostly temporary status workers, most of whom would reside in temporary quarters, such as motels or RV parks, during the work week and return to permanent residences elsewhere when not actively working. Demographics of the area are not anticipated to change dramatically from existing conditions. Consequently, the impacts of the estimated construction population on the local communities may be less than the raw numbers would suggest. The impacts of the population increase from construction to the area of analysis would be moderate, temporary, and localized.

Potential population increases resulting from operations of the proposed Goldrush Mine would include a projected total of 433 new, non-local households, with a projected total new operations-related, non-local population of 987 (including adults and children) (IMPLAN 2021). An expectation of a 24-year-long job commitment would be more likely to entice a family to move to the area than a 1.5-year construction job. The new population would likely be distributed throughout the area of analysis in a pattern similar to the existing population distribution, with the largest number likely locating in Elko County. There is always a level of uncertainty with where contractors and employees would choose to live. If contractors and employees choose to live within communities that have fewer services and infrastructure available to accommodate this population increase, such as Battle Mountain or areas within Eureka County, this would be a greater impact than if they choose to locate in an area with more available services and infrastructure, such as the city of Elko. It is not anticipated that demographics would change dramatically from existing conditions. The impacts of the population increase to the area of analysis would be moderate, long-term, and localized.

#### **4.12.1.2 Economy and Employment**

There would be 495 people employed during the construction phase of the Proposed Action, of which approximately 198 are expected to be locals and 297 are expected to be non-locals. Considering the relatively short time period of construction and that a substantial majority of the workers would be contractors moving in and out of the area as their particular skills were needed, it is likely that the indirect and induced employment generated by the construction activity would be moderate for the period of construction, but negligible after construction ceases. Although there were approximately 1,520 unemployed individuals in the area of analysis, it is unknown whether local unemployed individuals would have the requisite skills to qualify for the available jobs. Consequently, it is assumed that many of the needed construction workers would come from outside of the area of analysis.

It is anticipated that approximately 14 indirect or induced jobs would be generated within Eureka County, approximately two indirect or induced jobs would be created in Lander County, and approximately 300 indirect or induced jobs would be created in Elko County as a result of construction. Approximately 237 are expected to be locals and 79 are expected to be non-locals. The short duration of construction suggests that most of the indirect and induced job opportunities generated by the proposed Goldrush Mine construction would be filled by individuals already residing in the area of analysis. The indirect jobs that are



expected as a result of the construction of the Proposed Action includes jobs that provide direct services to the mine, mine infrastructure, and NGM. Industries that are expected to see the most indirect jobs created include metal mining services, services to buildings, and insurance agencies, brokerages, and related activities sectors. Induced jobs, which are created as a result of direct and indirect employees spending money in the community, are expected to be created in industries such as restaurants and retail (IMPLAN 2021). The anticipated employment impact during construction of direct, indirect, and induced jobs (i.e., 811 total employment) would represent approximately 1.3 percent of total employment in Elko, Eureka, and Lander counties (60,339 people). Overall, the effect of the construction of the Proposed Action on employment in the area of analysis would be beneficial, and impacts are expected to be moderate, temporary, and regional.

There would be 570 people that would be directly employed during the operations phase of the Proposed Action. To the extent that the requisite skills are available in the local work force, the proposed Goldrush Mine would employ workers from Elko, Eureka, and Lander counties. Approximately 228 operations employees are expected to be locals and 342 are expected to be non-locals. Approximately 16 indirect and induced jobs are expected to be created in Eureka County, approximately three indirect and induced jobs are expected to be created in Lander County, and approximately 345 indirect and induced jobs are expected to be created in Elko County as a result of the operations of the Proposed Action, of which approximately 273 are expected to be locals and 91 are expected to be non-locals. It is expected that most of the mine operations workers would come from outside the local area, whereas a higher percentage of indirect and induced jobs would be filled by local individuals. Industries that are expected to see the most indirect and induced jobs created during the operations phase are the same as those in the construction phase. The anticipated employment impact during operations of direct, indirect, and induced jobs (i.e., 934 total employment) would represent approximately 1.5 percent of total employment in Elko, Eureka, and Lander counties (60,339). Overall, the effect of the operations of the Proposed Action on employment in the area of analysis would be beneficial, and impacts are expected to be minor to moderate, short-term, and regional.

#### **4.12.1.3 Income**

Total direct labor income generated from Goldrush Mine is estimated to be \$108,320,993, and total indirect and induced labor income is estimated to be \$42,695,964. \$70,190,874 of the total labor income would come from construction and \$80,826,083 would come from operations. Total Goldrush Mine output is expected to be \$643,601,503, with approximately \$299,138,385 of the total coming from construction and \$344,463,118 of the total coming from operations. Labor income and output would be distributed across the three counties proportionally to anticipated employment (IMPLAN 2021). The increase in labor income during construction would be a moderate to major, temporary, and regional economic benefit accruing to the three-county area of analysis. The increase in labor income during operations would be a moderate to major, short-term, and regional economic benefit in the area of analysis.

#### **4.12.1.4 Housing**

It is assumed that the local labor force needed from Goldrush Mine construction and operations would not need additional housing, as they are already established in the area of analysis. As a result, the non-local labor needed for the Goldrush Mine would be the primary driver for housing. Goldrush Mine construction would generate demand for an estimated maximum of 377 housing units from the non-local labor and Goldrush Mine operations would generate demand for 433 housing units from non-local labor.

Assuming most construction workers would be non-local, they would not affect the permanent housing market to any substantial degree, as they would likely move out of the area of analysis when their services were no longer needed. However, they would place a demand on local, temporary housing resources in the area of analysis including motel rooms, RV sites, and campgrounds. Elko alone has over 2,300 motel rooms, and RV parks, campgrounds, and additional motel rooms are distributed throughout the area of analysis. Depending on the current economic conditions occurring within the area of analysis at the time housing is needed, there is the potential for housing shortages to accommodate construction activities if there are multiple projects occurring within the area of analysis at the same time as the Proposed Action. In addition, on the ground conditions for housing stock and availability may be more limited than described in the ACS data. This is likely the case in several communities within the area of analysis. As a result, any level of increase in demand may generate strain on the current housing availability within the area of

analysis. Impacts during the construction phase of the Proposed Action would be minor to moderate, temporary, and regional.

Based on estimates for 2018, there were over 4,500 vacant housing units in the Elko, Eureka, and Lander which, if it is reasonably accurate, would indicate there would be more than enough housing available to accommodate the Goldrush Mine-related operations demand. However, on the ground conditions for housing stock and availability may be more limited than described in the ACS data. Furthermore, the vacancies are not uniform across the housing stock. There were moderate to high vacancy rates in the rental housing stock, which should be sufficient to accommodate the expected Goldrush Mine-related demand. It is likely, however, that the availability of suitable housing in Eureka and Lander counties is constrained by the small size of those markets and the fact that there are already strains on housing availability in these areas. It is assumed most of the new Goldrush Mine-related households would be likely to locate in Elko County communities, primarily the city of Elko due to its access to greater public utilities and infrastructure. However, there is always a level of uncertainty on where contractors and employees would choose to live and depending on economic conditions and other projects occurring in the area of analysis at the time housing is needed, there is the potential that housing shortages may be more prevalent than detailed in the ACS data. In addition, if employees decide to locate in areas with more limited housing availability than the city of Elko, such as Lander County or Eureka County, this would add additional demand for housing that may not currently exist. Demand for housing from the Proposed Action may also increase housing prices and rent within the area of analysis, which may impact the ability of those living within the area of analysis of finding affordable housing. Impacts during the operation phase of the Proposed Action would be moderate to major, short-term, and regional.

#### **4.12.1.5 Community Facilities and Services**

The construction and operations of the Proposed Action would generate increased demand for electricity. Electricity for the Proposed Action would be supplied via a proposed 120-kV power line and switching stations. Electricity would be distributed to surface facilities, dewatering wells, and underground operations from the Goldrush portal substation via 13.8-kV power lines and power cables. The 13.8-kV power cables would feed electric power to the mine through service boreholes, ventilation raises, and portal declines. One emergency generator would also be located at the portal pad to supply electricity for evacuating personnel in the event of a power interruption. No supply issues due to the construction or operations of the Proposed Action have been identified; therefore, impacts would be minor, short-term, and localized. It is anticipated that the Goldrush Mine-generated employment would locate in areas with existing infrastructure and would not result in the need for improvements or modifications to any of the area of analysis power infrastructure to accommodate the additional employment generated from the Goldrush Mine.

Consumptive water use for the Proposed Action is estimated at 2,897 acre-feet (1,796 gpm) annually for mining and milling and would be supplied through production wells and dewatering wells. The operations phase would require the use of dewatering wells in order to mine in a dry environment. Non-consumptive water use, used for dewatering the mine, is estimated at 11,294 acre-feet (7,002 gpm). These water rights were approved by the Nevada State Engineer in April 2020 (NGM 2021). Construction and operations at the Goldrush Mine would not affect municipal water supplies for the area of analysis; therefore, there would be no impacts. Individual rural wells or springs may experience reduced flow as a result of dewatering, and impacts would be negligible to minor, short-term to long-term, and localized. It is anticipated that the Goldrush Mine-generated employment would locate in areas with existing infrastructure and would not result in the need for improvements or modifications to any of the area of analysis water infrastructure to accommodate the additional employment generated from the Goldrush Mine.

NGM would dispose of sanitary waste via septic systems in the Goldrush Plan boundary (NGM 2021). There would be no impacts to municipal wastewater treatment capacities. It is anticipated that the Goldrush Mine-generated employment would locate in areas with existing infrastructure and would not result in the need for improvements or modifications to any of the area of analysis wastewater infrastructure to accommodate the additional employment generated from the Goldrush Mine. Solid waste generated during constructions and operations of the Proposed Action would be placed in the Class III landfill located at the Cortez Mine. Up to 100 cubic yards of miscellaneous solid waste would be removed offsite (NGM 2021). Impacts to landfills in the area of analysis would be negligible, short-term, and regional.

#### **4.12.1.6 Public Safety**

The construction phase is anticipated to bring temporary workers to the area of analysis. The increased workforce may result in additional requirements for law enforcement, fire protection and emergency medical services. The transient nature of these workers would likely not significantly contribute to tax revenues, thus placing the burden on municipalities. This is anticipated to be a minor, temporary, regional impact. The operations phase would generate additional tax revenue in the area of analysis as well as net proceeds of minerals tax as most non-local workers would likely relocate to the area of analysis. This may allow law enforcement, fire protection, and emergency medical services to increase staffing if suitable candidates were found. The operations phase is expected to have a minor, short-term, regional impact.

#### **4.12.1.7 Healthcare**

The construction and operations of the Proposed Action would likely increase the demand for healthcare services within the area of analysis. Employees and their families would be eligible to use NGM's Golden Health facility in Elko, which would reduce the burden on local healthcare facilities. However, contract workers would not be eligible for this service which would increase the demand on the healthcare facilities in the area of analysis. Access to healthcare facilities is somewhat limited in the area of analysis, so any increase in demand on healthcare services would be a potential strain on the existing facilities. Recruitment of qualified practitioners and service providers has historically been a challenge in the area of analysis, as individuals employed in these fields often choose to practice in larger communities. Impacts to healthcare would be minor to major, short-term, and regional.

#### **4.12.1.8 Education**

Because most of the workers needed during construction would not be anticipated to permanently relocate with their families to the area of analysis, school enrollment during the construction phase would likely not increase substantially; therefore, impacts to education would be negligible, temporary, and localized. School enrollment may increase by an estimated 189 students under the operations population growth scenario for the Proposed Action, most of whom would likely be located in Elko County. This would increase the local school enrollment by 1.8 percent. The school districts in the area of analysis appear to have sufficient capacity to accept the number of potential new students generated from Goldrush Mine operations. However, education services are dependent on having adequate funding available to accommodate potential enrollment increases, so any increase in enrollment without appropriate funding to accommodate that increase may result in impacts to the affected school district. While AB 495 was passed in May 2021 to provide additional funding for Nevada education through the State Education Fund via the deposit of the portion of taxes on the net proceeds of minerals for businesses involved in gold or silver extraction activities (AB 495), the funding from the State General Fund to the State Education Fund would not occur until 2023; thus, it is currently unknown how the tax and resultant funding formulas will impact the surrounding counties. As the overall increase in potential school enrollment throughout the area of analysis impacts to education would be minor, short-term, and localized, primarily occurring in Elko County.

#### **4.12.1.9 Public Finance**

The proposed Goldrush Mine would generate public revenues from sales and use taxes, net proceeds of mines taxes, ad valorem property taxes, and from business taxes. The estimates presented in this analysis are based on an IMPLAN analysis, as well as information provided by NGM prior to proposed Goldrush Mine development. As such, they are subject to change as the proposed Goldrush Mine proceeds and commodity prices fluctuate. The estimates are believed to be a reasonable assessment of the tax revenues that would flow from the proposed Goldrush Mine.

NGM estimates proposed Goldrush Mine generated sales taxes would be approximately \$210 million for purchases of fuels and materials during construction and operations, as well as additional property sales tax for the increased workforce (Cedar Creek 2019b). Sales taxes would be collected in the jurisdiction where purchases were made and would be distributed among the state, the school districts, the county, and the statewide counties' revenue sharing pool. School districts are significant beneficiaries of sales and use taxes, receiving over 30 percent of the proceeds. The local county's share of sales taxes is relatively modest at approximately seven percent of the revenue.

Net proceeds of mines are categorized and taxed similar to real property. In general terms, net proceeds taxes are assessed on the value of production minus the costs of production. NGM estimates that the Goldrush Mine would generate a net proceeds taxes of \$288 million over the life of the mine, although the payments may vary widely from year to year, and assuming gold prices are at \$1,200 per ounce. Senate Bill Number 543 modified the distribution of net proceeds of minerals within a county, including school districts. The exact method of disbursement of net proceeds of minerals is currently unknown, but the new funding formula would have implications on the current disbursement of those funds to individual school districts (Nevada Legislature 2019). Additionally, NGM anticipates \$48 million in business taxes would be generated over the life of the Goldrush Mine. NGM anticipates the increased public revenues from these sources would total approximately \$22,750,000 annually, primarily impacting Eureka and Lander counties (Cedar Creek 2019b).

Elko County, as the largest commercial center in northeast Nevada, would benefit more broadly from the commerce generated by the proposed Goldrush Mine and its employees throughout the life of the Goldrush Mine. An IMPLAN analysis was run to determine the potential economic impact from the additional employment from construction and operations. This analysis shows a direct impact of approximately \$50,977,240, and indirect and induced impacts of approximately \$23,749,450 in county, state, and federal tax revenue (IMPLAN 2021). Overall, the effect of increased revenue due to taxes and economic activity would be beneficial, and impacts would be major, short-term, and regional.

#### **4.12.2 No Action Alternative**

Under the No Action Alternative, the development of the Goldrush Mine would not be authorized and NGM would not construct, operate, and close a new underground mine (i.e., the Goldrush Mine). Modifications or reclassification of acres as proposed under the Proposed Action would not occur, the dual use of facilities between the Cortez Mine and Goldrush Mine operations would not occur, and NGM would be permitted to continue the previously authorized mining and exploration activities under the existing authorizations (**Section 2.2**). Overall, the type of impacts to social and economic values are similar in nature to those disclosed for the Proposed Action and impacts are related to effects on local populations, employment, housing, public services, infrastructure, and fiscal conditions. These impacts are summarized by authorized mine plan in the Social and Economic Values SER for the Goldrush Mine Project (BLM 2021m).

No additional impacts beyond current authorizations would occur to population, employment, housing, public services, and fiscal conditions under the No Action Alternative. As conditions are not anticipated to change from current conditions, overall, impacts to social and economic values under the No Action Alternative would be anticipated to be negligible, short-term, and localized.

#### **4.13 Soils**

Additional details regarding the impacts to soil resources are provided in the Soil Resources SER for the Goldrush Mine Project (BLM 2021n).

##### **4.13.1 Proposed Action**

Impacts from the Proposed Action would include an additional 1,658 acres of new surface disturbance. Of the 1,658 acres of new surface disturbance, approximately 210 acres would include exploration disturbance, which could occur anywhere within the proposed Goldrush Mine Plan boundary. Twenty-six of the 36 soil units present in the area of analysis would be impacted by the Proposed Action with the Allker gravelly sandy loam, two to eight percent slopes and the Bregar variant-Hymas-Quarz being the most impacted, at 257 and 182 acres, respectively. Four of the soil associations impacted are listed as prime farmland, only if irrigated and/or reclaimed of excess salts and sodium. As the four soil types have limitations that would preclude the classification of a prime or unique farmland, the Proposed Action would not impact prime or unique farmlands. Approximately 2,286 acres of total surface disturbance (existing, authorized, proposed, and reclassified) would be reclaimed. To minimize effects to soils, reclamation would be conducted as soon as practical, with concurrent reclamation implemented to the maximum extent possible. The impacts to soil resources from surface disturbance would be minor, long-term, and localized.

BSCs may be impacted by removal of topsoil during salvage operations as damage to any existing crusts would occur. Damage to BSCs would change the soil structure and reduce soil quality; however, natural

processes such as wind and water transport of soil particles from surrounding areas would also incidentally serve to reintroduce microorganisms to the soil. This would result in mixing of fine-grained soils with the more prevalent coarse-grained soils and would result in a finer overall texture of soils in the disturbed area. This finer texture may increase the quality of the soils in the proposed Goldrush Mine Plan boundary. As such, the impact to BSCs would be moderate, long-term, and localized, if impacted.

Impacts would include dispersion and mobilization of soils via wind and water erosion. Soil associations with moderate to severe erosion potential would be impacted the greatest. The increase in erosion potential would be moderate in the short-term and minor in the long-term once reclamation is completed and established. ACEPMs would also minimize erosion-related impacts. Stockpiled soils would be susceptible to an increase in water erosion during meteoric runoff, and an increase in wind erosion would occur as a result of salvage and reclamation operations, due to an increase in susceptibility from the removal of stabilizing vegetation in the top layer of soil, exposing the more fine-grained sediments. The susceptibility to wind erosion would last until stabilizing vegetation was reestablished. Erosion-related impacts would be localized to regional.

Groundwater drawdown effects associated with underground mining dewatering activities may have impacts to soil resources within the area of analysis. Dewatering activities may cause seeps and springs within the area of analysis to dry up; thus, increasing soil erosion. Potential flow reductions in seeps, springs, and perennial streams attributable to mine-induced drawdown would be addressed through the implementation of existing mitigation, as described in the Cortez Hills Expansion Project Final EIS (BLM 2008b) and Technical Memorandum, Contingency Mitigation Plans for Surface Waters, Deep South Expansion Project, Lander and Eureka counties, Nevada (BCI and Stantec 2018). All contingency and mitigation measures would comply with Nevada Water Law and would involve the Nevada Office of the State Engineer. Impacts to soils due to dewatering would be minor, long-term, and localized.

#### **4.13.2 No Action Alternative**

Under the No Action Alternative, the development of the Goldrush Mine would not be authorized and NGM would not construct, operate, and close a new underground mine (i.e., the Goldrush Mine). Modifications or reclassification of acres as proposed under the Proposed Action would not occur, the dual use of facilities between the Cortez Mine and Goldrush Mine operations would not occur, and NGM would be permitted to continue the previously authorized mining and exploration activities under the existing authorizations (**Section 2.2**). Overall, the type of impacts to soils are similar in nature to those disclosed for the Proposed Action and impacts are related to soil removal, profile mixing, compaction, erosion, and restoration. These impacts are summarized by authorized mine plan in the Soils SER for the Goldrush Mine Project (BLM 2021n).

Under the No Action Alternative, up to 22,433 acres were previously authorized to be disturbed. Impacts consist of disturbance of up to 82 soils map units. Reclamation would occur on most facilities; however, some mine facilities may be left unreclaimed and may remain as post-mining features. Overall, impacts to soils under the No Action Alternative are anticipated to be minor; short-term for exploration, long-term for areas to be reclaimed, and permanent for those areas unreclaimed; and localized.

#### **4.14 Transportation and Access**

Additional details regarding the impacts to transportation and access are provided in the Transportation and Access SER for the Goldrush Mine Project (BLM 2021o).

##### **4.14.1 Proposed Action**

Under the Proposed Action, annual tons of ore shipped would increase from 2.5 Mtpy in 2020 to 4.6 Mtpy from 2021 to 2032. From 2033 until mining is completed in 2043, the annual tons of ore mined and transported would be 2.1 Mtpy. This would cause the hourly truck trips each direction to increase from approximately 18 trucks per hour (authorized) to approximately 20 trucks per hour for 11 years and then drop down to approximately 15 trucks per hour for another 10 years (Matrix 2020).

The total number of new employees would be approximately 570; however, only 135 employees would be on site at the same time. It is expected there would be approximately 500 construction workers at peak of

operations. It is assumed that the construction workers would park away from the Goldrush Mine area and would be brought to the site via 10-passenger vans. Total employee and construction worker trip generation at peak operations is anticipated to be 89 AM peak hour and 84 PM peak hour trips. After construction is completed, trips are expected to reduce to 71 AM peak hour trips and 69 PM peak hour trips (Matrix 2020). Traffic generated from new employees and construction workers would add additional traffic on the area of analysis transportation route; however, it is not anticipated to degrade the LOS to an unacceptable level and the use of passenger vehicles would reduce the level of traffic generation from the Goldrush Mine. Impacts to LOS are anticipated to be minor, short-term, and localized to the area of analysis.

Delivery traffic and fuel shipments would continue to occur from SR 278 to JD Ranch Road (M-111). Traffic on these routes may increase under the Proposed Action. NGM and Eureka County have an existing MOU regarding road issues and maintenance of county roads. Under the Proposed Action, this MOU would be amended in coordination with Eureka County, as needed.

The traffic study considered future traffic operation scenarios on the haul route with the Goldrush Mine traffic for the years 2023, 2032, and 2043. All locations are estimated to operate at an acceptable LOS for the AM peak hour. During the PM peak hour, the estimated LOS across all locations would not change, except for the following: I-80 eastbound on ramp at Exit 261 and Exit 280 westbound on ramp which change from a LOS A to LOS B in 2032 and SR 306 south of I-80 is estimated to change from a LOS A to a LOS B in 2043. I-80 Exit 280 westbound on ramp is anticipated to return to a LOS A in 2043. Similar to the AM peak hour, all locations are predicted to operate at an acceptable LOS. While there would be measurable changes in traffic due to increased car and heavy truck traffic most road segments would continue to operate at their existing LOS and the impacts at these locations to LOS would be minor, short-term, and localized to the area of analysis.

The levels of service at intersections were also estimated for the years 2023, 2032, and 2043. It was predicted that there would be no change to the intersections LOS over the selected three years except for the westbound ramps at SR 766 which are anticipated to go from a LOS C to a LOS D in year 2043 (Matrix 2020). All intersections are anticipated to operate at acceptable LOS. Impacts to intersection LOS are anticipated to be minor, short-term, and localized to the area of analysis.

It is estimated that NGM would contribute 64 percent of equivalent single axle loads along SR 306 and 48 percent of the total equivalent single axle loads along SR 766 during the 24-year mine life (Matrix 2020). The Proposed Action will create an additional 216,675 equivalent single axle loads each year from what is currently permitted. The addition of equivalent single axle loads on SR 306 and SR 766 may result in lowered design life of these roads. This is anticipated to be moderate, long-term, and localized to the area of analysis.

The on ramps at the I-80 interchange at Exit 261 are relatively short and uphill, which causes heavy vehicles to merge onto the interstate below the speed limit. Based on analysis from data from the Highway Safety Manual, it is anticipated that accidents at the eastbound on ramp at Exit 261 would be reduced by increasing the acceleration distance which would allow haul trucks to accelerate to highway speed before merging into traffic. Impacts from traffic accidents are anticipated to be moderate to major, long-term, and localized to the area of analysis.

Construction and mine workers would use SR 306 off I-80 to access the Goldrush Project. Ten-passenger vans would be used to reduce traffic on the roadways. There are existing access roads from the SRs to the Goldrush Mine. In addition, a dispersed network of unimproved roads (i.e., gravel and dirt roads) are present in the region and are used by the public. The proposed disturbance would overlap with several unimproved roads that are used by the public which may result in loss of access if not re-routed around the disturbance and would have a moderate, long-term, localized impact. In addition, traffic associated with the Proposed Action may result in additional traffic generation on other paved and unpaved roads within the region not associated with the proposed hauling route. NGM would coordinate with Eureka County via the existing MOU to address public access concerns on county roads that may arise from the Proposed Action.

#### **4.14.2 No Action Alternative**

Under the No Action Alternative, the development of the Goldrush Mine would not be authorized and NGM would not construct, operate, and close a new underground mine (i.e., the Goldrush Mine). Modifications or reclassification of acres as proposed under the Proposed Action would not occur, the dual use of facilities between the Cortez Mine and Goldrush Mine operations would not occur, and NGM would be permitted to continue the previously authorized mining and exploration activities under the existing authorizations (**Section 2.2**). Overall, the type of impacts to transportation and access are similar in nature to those disclosed for the Proposed Action and impacts are related to increased traffic. These impacts are summarized by authorized mine plan in the Transportation and Access SER for the Goldrush Mine Project (BLM 2021o).

The LOS for roadways and intersections at 2032 (peak hauling operations for the No Action Alternative) are similar to the Proposed Action and are all estimated to be within acceptable levels. Impacts along the transportation routes on LOS are anticipated to be minor, short-term, and localized to the area of analysis under the No Action Alternative.

The issue regarding the relatively short and uphill condition at the on ramps at the I-80 interchange at Exit 261 would continue to cause heavy vehicles to merge onto the interstate below the speed limit under the No Action Alternative, potentially resulting in traffic accidents. Whereas there would be reduced hauling under the No Action Alternative, the issue would continue under the No Action Alternative. As under the Proposed Action, it is anticipated that accidents at the eastbound on ramp at Exit 261 would be reduced by increasing the acceleration distance which would allow haul trucks to accelerate to highway speed before merging into traffic. Impacts from traffic accidents are anticipated to be moderate, long-term, and localized to the area of analysis.

#### **4.15 Vegetation, Including Noxious and Invasive Non-native Species and Special Status Plants**

Additional details regarding the impacts to vegetation, including noxious and invasive non-native species and special status plants are provided in the Vegetation SER for the Goldrush Mine Project (BLM 2021p).

##### **4.15.1 Proposed Action**

Implementation of the Proposed Action would result in the removal or disturbance of an additional 1,694 acres of vegetation.

With the ACEPM outlined in **Section 2.1.10** no direct disturbance to wetland or riparian vegetation would result from the Proposed Action. The removal of these unique plant communities by mine-related activities would be considered a moderate, long-term, and localized impact. The surface disturbance and vegetation removal associated with the Proposed Action would result in the conversion of tree- and shrub-dominated vegetation cover types to grass/forb-dominated vegetation cover types in the short term. The loss of shrub-dominated vegetation would represent a minor, long-term, and localized impact as it could take up to 25 years or more following reclamation for mature shrublands to establish and 75 years or more for pinyon and juniper trees to establish and reach maturity.

Under the Proposed Action, approximately 444 acres of permanent vegetation removal would result from unreclaimed facilities. Reclamation and revegetation would minimize the impacts to vegetation communities within the proposed Goldrush Mine Plan boundary. With the implementation of ACEPMs, impacts to vegetation as a result of permanent disturbance would be minor, permanent, and localized. Mining activities and vehicle traffic would impact vegetation by increasing the amount of dust onto vegetation surfaces resulting in lowered primary production in plants due to reduced photosynthesis and decreased water-use efficiency. NGM has committed to fugitive dust controls on roads and other disturbed areas, which would help reduce dust related impacts to vegetation. This would represent a negligible to minor, short-term, localized impact.

##### **4.15.1.1 Noxious and Invasive, Non-native Species**

Impacts to vegetation would occur from the increased potential for establishment and spread of noxious and non-native, invasive species during construction, operation, or reclamation. Weed species readily

invade disturbed areas because vegetation is lacking and, therefore, no resource competition is occurring. Invasive species may outcompete desirable vegetation for resources (e.g., water and nutrients), making re-establishment of desired species difficult. However, implementation of the Goldrush Mine Project Noxious Weed Control Plan would substantially reduce the spread and establishment of invasive, non-native species and noxious weeds through continued treatment of the known weed occurrences (SRK 2019). Overall, impacts from the Proposed Action from the spread and establishment of noxious and non-native invasive weeds would be minor, long-term, and localized.

#### **4.15.1.2 Special Status Species**

Disturbance from the Proposed Action does not overlap with known occurrences of Beatley buckwheat; however, exploration may occur anywhere within the proposed Goldrush Mine Plan boundary. Impacts could occur from the removal of special status plants within the area of analysis, as four locations of Beatley buckwheat have been documented within the proposed Goldrush Mine Plan boundary. As Beatley buckwheat appears to do well in disturbed areas, this species may reestablish during reclamation. Under the Proposed Action as described in an ACEPM in **Section 2.1.10**, NGM has committed to a pre-disturbance survey for Beatley buckwheat and would coordinate with the BLM to avoid and minimize potential impacts. Therefore, impacts to special status vegetation species would be minor, long-term to permanent, and localized.

Impacts to other special status plant species could occur from removal of soil and growth media during construction as the area of analysis contains suitable habitat and a moderate to high likelihood of occurrence for several special status plant species (ERM 2018). However, NGM would employ ACEPMs to avoid impacts to special status plants to the extent practicable.

#### **4.15.1.3 Ethnobotanical Plant Species**

While desert parsley is known to occur within the proposed Goldrush Mine Plan boundary, specific populations of desert parsley have not been field mapped within the area of analysis; therefore, it is unknown if the Proposed Action would impact populations. If impacts to desert parsley did occur from surface disturbance, they would be expected to be minor, long-term, and localized impact.

#### **4.15.1.4 Water Management Activities**

It is anticipated that mine-related groundwater drawdown would not result in impacts to upland vegetation within the projected 10-foot drawdown contour. Herbaceous upland plant species have shallow root systems and predominantly rely on soil moisture from precipitation. Pinyon and juniper trees have moderately deep root systems, typically extending down approximately three feet. However, these species occur at elevations within the area of analysis that are well above the potentially affected aquifer. Sagebrush and other shrubs have both deep taproots that can extend three to seven feet vertically and shallow, lateral roots that collect surface precipitation (Innes 2017). Phreatophytes, which are groundwater dependent, such as greasewood (*Sarcobatus vermiculatus*), rubber rabbitbrush (*Ericameria nauseosa*), and saltgrass (*Distichlis spicata*) occur within the area of analysis and have the potential to be impacted by groundwater drawdown (ERM 2018). Other non-phreatophytic species which rely on soils wetted at the top of the groundwater capillary fringe may also occur within the area of analysis. If groundwater drawdown impacts occurred to upland vegetation communities, potential impacts include reductions in forage availability or production, changes in community composition, changes in types of species duration (e.g., more annual species versus perennial species), changes in diversity of growth habit (e.g., more shrub species versus herbaceous species), decreased resilience, and increased susceptibility to invasion by noxious and invasive, non-native species. If impacts to upland vegetation communities occur due to groundwater drawdown, they would be negligible for those with shallow root systems relying on soil moisture but may be major for those species with a deeper root system, long-term and regional.

Mine-related groundwater drawdown may affect seeps, springs, and stream segments that have a hydraulic connection to the affected aquifer. Potential impacts could occur to wetland and riparian vegetation within these areas, including changes in diversity or composition of vegetation communities, reduced production and vigor, and a reduction in the proportion of obligate or facultative wetland species within the community. Authorized mitigation and proposed ACEPMs would reduce the effects of these impacts but not eliminate them entirely. If impacts to riparian vegetation resources occur, they would be minor to moderate as



previous authorized mitigation would be implemented to reduce impacts to wetland habitat from Goldrush Mine-related water drawdown, long-term and regional.

Potential mine-related groundwater drawdown impacts to noxious and invasive, non-native species and special status species in upland habitat would be similar to impacts for general vegetation communities and the potential for drier conditions from mine-related water drawdown may result in the spread of weed populations. Impacts would be minor, long-term, and localized as implementation of the Goldrush Mine Project Noxious Weed Control Plan (SRK 2019) would reduce potential impacts. Potential mine-related groundwater drawdown impacts to ethnobotanical species in upland and riparian habitat would be similar to impacts for general vegetation communities.

#### **4.15.2 No Action Alternative**

Under the No Action Alternative, the development of the Goldrush Mine would not be authorized and NGM would not construct, operate, and close a new underground mine (i.e., the Goldrush Mine). Modifications or reclassification of acres as proposed under the Proposed Action would not occur, the dual use of facilities between the Cortez Mine and Goldrush Mine operations would not occur, and NGM would be permitted to continue the previously authorized mining and exploration activities under the existing authorizations (**Section 2.2**). Overall, the type of impacts to vegetation are similar in nature to those disclosed for the Proposed Action and impacts are related to reduction or loss of vegetation, introduction and spread of noxious and non-native invasive weeds, changes to vegetation composition, irrespective of reclamation success, and permanent alteration or removal of vegetation. These impacts are summarized by authorized mine plan in the Vegetation Resources SER for the Goldrush Mine Project (BLM 2021p).

Under the No Action Alternative, up to 22,433 acres were previously authorized to be disturbed. Disturbance of vegetation resources would occur for up to 23 vegetation communities. Reclamation would also occur on most mine facilities; however, some mine facilities may be left unreclaimed. Potential impacts to vegetation, for the most part, have already occurred. The mine-related drawdown contour of the Proposed Action includes the mine-related drawdown for the Cortez Mine and therefore, the impacts to vegetation would be similar to those described for the Proposed Action. Overall, impacts to vegetation from the authorized actions under the No Action Alternative are anticipated to be minor to major (from potential mine-related drawdown impacts to wetland vegetation), short-term for exploration activities; long-term for those areas that would be reclaimed; and permanent for those areas unreclaimed and, and both localized and regional.

#### **4.16 Visual Resources**

Additional details regarding the impacts to visual resources are provided in the Visual Resources SER for the Goldrush Mine Project (BLM 2021q).

##### **4.16.1 Proposed Action**

Exploration activities could occur anywhere within the proposed Goldrush Mine Plan boundary, drill rigs and associated disturbance may be visible at any time from all KOPs. All surface exploration activities would be reclaimed when no longer needed. Impacts for exploration activities are anticipated to be negligible, short-term, and localized as they would not create a perceptible change to the existing landscape.

Overall, the proposed mine facilities would add form, line, texture, and color to the middleground to background of all KOPs, which has been designated as an interim BLM VRM Class IV. The BLM VRM Class IV objectives allow a high-level change to the characteristic landscape where the activities may dominate the view and be the major focus of viewer attention. The proposed mine facilities would have a minor level of change to the existing landscape and NGM would commit to design the buildings to blend in with the landscape. As a result, the Proposed Action would not conflict with the established interim BLM VRM Class IV objectives. A summary of impacts from each KOP are described below.

##### **4.16.1.1 KOP 1**

Based on the visual simulation prepared for KOP 1, the multi-use shop, WTP, laydown yard, and two RIB galleries and associated water line would be visible in the middleground to background from this KOP. There would be no changes to the foreground. The multi-use shop and WTP would appear as low, block

forms, with hues of light tan along the mountainside in the background. The proposed structures would appear small and would have barely discernible texture and lines. The laydown yard and RIB galleries would be slightly visible in the middleground as low, weak, uniform, light tan forms where vegetation would be removed. Due to the distance from the KOP, the RIBs would be barely perceptible with no discernible texture. The water line associated with the RIB galleries would appear as a faint, thin, gray, horizontal line in the middleground of the landscape.

The new forms would have a minor degree of contrast within the viewshed of KOP 1 and would not dominate the view of the user due to their relatively small size. Additionally, viewers at this KOP would typically be driving towards the Goldrush Mine and the new mine components would only be momentarily visible in the middleground to background. NGM has also committed to select colors of new buildings to blend in with the adjacent landscape, which would help reduce impacts from KOP 1. As the proposed mining facilities would have only slight visibility from KOP 1, impacts to the viewshed during mining operations from KOP 1 would be minor, localized, and short-term.

The proposed multi-use shop, WTP, laydown yard, and two RIB galleries and associated water line would be reclaimed and the disturbed areas would be revegetated. Reclamation of the new mine components would reduce the degree of contrast against the existing landscape over time and impacts to the viewshed from KOP 1 would be negligible, short-term, and localized.

#### **4.16.1.2 KOP 2**

Based on the visual simulations prepared for KOP 2, the paste plant and associated facilities, expansions of the Horse Canyon haul road, the proposed paste plant access road (which will consist of expansions of existing exploration roads), and portions of the 13.8-kV power line would be located in the foreground to background from this KOP.

The proposed expansion to the Horse Canyon haul road would be barely visible in the foreground to middleground from KOP 2. The existing Horse Canyon haul road is visible from the view of KOP 2. The areas of proposed road expansions would be barely perceptible as the current haul road is already visible and the expansion areas would not increase by more than 44 feet wide. Additional small areas of vegetation would be removed for the expansion which would slightly alter the current form, line, texture, and color of the existing Horse Canyon haul road. This minor level of change within the existing landscape would be barely perceptible to the viewer and would not dominate the view of the casual observer. The Horse Canyon haul road would not be reclaimed once mining ceases and would remain as a permanent feature to the landscape. Impacts to the viewshed during mining operations would be minor, permanent and localized. As the Horse Canyon haul road is already existing and slight improvements to portions of the haul road would be made, the proposed haul road expansion after mining operations cease would result in minor, permanent, and localized impacts to the viewshed.

The proposed paste plant access road would be visible in the middleground. The proposed paste plant access road will consist of expansions of existing exploration roads to accommodate a 44-foot-wide travel way for one-way traffic for 100-ton haul trucks. The road expansion would include additional small areas of vegetation removal that would slightly alter the current form, line, texture, and color of the existing roads. Existing exploration roads are already visible on the current landscape. This minor level of change would be barely perceptible to the viewer from KOP 2 and would not dominate the view of the casual observer and impacts during operations are anticipated to be minor, permanent, and localized. The paste plant access road would not be reclaimed once mining ceases and would remain as a permanent feature to the landscape. As the paste plant access road would include slight improvements to the existing exploration roads that would be barely perceptible to the casual viewers, impacts after reclamation would be negligible, permanent, and localized to the viewshed from KOP 2.

The proposed paste plant and associated facilities would be located in the middleground. The proposed buildings would appear as multiple short, rectangular, and square forms. Additional geometric lines with uniform texture would be added to the landscape. The buildings would be light tan to light gray to blend in with the adjacent landscape. The addition of the paste plant and associated facilities would introduce additional form, line, texture, and color to the existing landscape; however, given the distance and the viewing angle from KOP 2, the new mine facilities would appear small and would not dominate the view of

the user. The proposed paste plant and associated facilities would be slightly visible and are anticipated to have minor impacts to the viewshed during operations. The proposed paste plant and associated facilities would be reclaimed, and the disturbed areas would be revegetated. Reclamation of the new mine components would reduce the degree of contrast against the existing landscape over time and impacts to the viewshed from KOP 2 would be negligible, short-term, and localized after reclamation.

The proposed 13.8-kV power line would be slightly visible in the middleground, and would add short, light gray, simple, ordered lines running down the canyon from the paste plant facilities. The power poles would be spaced evenly apart and would add ordered lines to the view. The 13.8-kV power line would not be visible in the background as the rolling hills would begin to obstruct the view of the power line. The addition of the power line would introduce new form, line, texture, and color to the existing landscape; however, given the distance and the viewing angle from KOP 2, the new power line would appear small and faint and would not dominate the view of the user. The proposed 13.8-kV power line would be reclaimed once mining ceases. Impacts from the 13.8-kV power line during operations would be short-term, minor, and localized.

#### **4.16.1.3 KOP 3**

Based on the visual simulations prepared for KOP 3, the 120-kV power line and the portal pad expansion would be visible in the foreground to background from KOP 3. The proposed 120-kV power line would run parallel to the existing power line in the foreground to background. The proposed power line would consist of additional power poles and power lines, spaced at regular intervals across the landscape. The power poles would add dark brown, bold, vertical, directional lines to the landscape and the power lines would add weak, light gray, uniform, horizontal lines from the foreground to background. The proposed 120-kV power line would introduce additional form, line, texture, and color to the existing landscape; however, the additions would not be readily noticeable as the new power line and poles would be located directly adjacent to an existing power line and poles on the landscape, and the casual user would likely not notice the additional lines. The proposed 120-kV power line would have a minor level of change to the landscape during operations and impacts are anticipated to be minor and localized. The proposed 120-kV power line would not be reclaimed and would remain as a permanent feature to the landscape once reclamation is complete. As the proposed 120-kV power line would not be readily noticeable to the casual viewers, impacts after reclamation is complete from the 120-kV power line would be minor, permanent, and localized to the viewshed from KOP 3.

The existing portal pad would be expanded and would appear as a larger, irregular form with weak lines and a smooth texture in the background. Areas where vegetation would be removed would be visible and shades of dark green would be replaced by hues of light brown to light tan. The expansion of the portal pad would introduce additional form, line, texture, and color to the view from KOP 3; however, it would be consistent with current disturbance visible on the landscape. It would not change the current scenic quality of the existing landscape due to the presence of existing disturbance and exploration activities. Impacts from the portal pad expansion to the viewshed during operations would be minor, short-term, and localized. During reclamation, the majority of the portal pad expansion would be reclaimed with the portal pad cut slope and rockwall fencing remaining post reclamation. Overall, reclamation would reduce the impacts of the portal pad expansion over time; however, components of the portal pad would remain as a permanent feature to the landscape from KOP 3. Following reclamation, impacts from the portal pad expansion are anticipated to be minor, permanent, and localized.

#### **4.16.1.4 Dark Sky Resources**

The operation of mining facilities during nighttime hours would have a different type of impact on visual resources than operations during the day. Most of the form, line, texture, and color elements of the Goldrush Mine and the existing landscape features would not be visible from the KOPs or elsewhere during the night. However, lights used on mining equipment and vehicles during nighttime operations and use of stationary lights positioned at various locations within the proposed Goldrush Mine Plan boundary would be visible. Nighttime lighting at the Goldrush Mine is not anticipated to be a perceptible change from current, authorized operations. Additionally, NGM has committed to ACEPMs including hooded stationary lights and light plants to reduce impacts to the night sky from the Goldrush Mine. Lighting would also be directed onto the work area only and away from adjacent areas not in use, with safety and proper lighting of the active work areas being the primary goal. Lighting fixtures would be hooded and shielded as appropriate. As a result, impacts to dark sky resources are anticipated to be minor, short-term, and localized.

#### **4.16.2 No Action Alternative**

Under the No Action Alternative, the development of the Goldrush Mine would not be authorized and NGM would not construct, operate, and close a new underground mine (i.e., the Goldrush Mine). Modifications or reclassification of acres as proposed under the Proposed Action would not occur, the dual use of facilities between the Cortez Mine and Goldrush Mine operations would not occur, and NGM would be permitted to continue the previously authorized mining and exploration activities under the existing authorizations (**Section 2.2**). Overall, the type of impacts to visual resources are similar in nature to those disclosed for the Proposed Action and impacts are related to ground disturbance and the addition of contrasting visual elements to the landscape. These impacts are summarized by authorized mine plan in the Visual Resources SER for the Goldrush Mine Project (BLM 2021q).

Disturbance under the No Action Alternative would add contrasting visual elements to the landscape. Reclamation would reduce the degree of contrast between the existing landscape and the authorized mine facilities. The No Action Alternative would not conflict with the established interim BLM Class IV objectives. Dark sky impacts are anticipated to be the same as the Proposed Action.

#### **4.17 Water Resources and Geochemistry**

Additional details regarding the impacts to water resources and geochemistry are provided in the Water Resources and Geochemistry SER for the Goldrush Mine Project (BLM 2021r).

##### **4.17.1 Proposed Action**

###### **4.17.1.1 Surface Water Quantity**

The pre-mining flow rate to Horse Creek was estimated at 18 acre-feet per year (SRK 2020b). Under the current authorizations, there is a predicted increase in the flow rate to Horse Creek from pre-mining conditions to approximately 40 acre-feet per year due to the authorized RIB operations in Pine Valley. However, with the addition of the Goldrush Mine dewatering (included in the cumulative analysis for the authorized environment), groundwater discharge is predicted to decrease to approximately zero acre-feet per year in 2024 through 2106. Flow recovery is predicted to begin in 2107, reaching a flow rate of 16-acre feet per year at approximately 2543 (SRK 2016, 2020c). The existing and predicted groundwater budgets for the area of analysis are detailed in the Water Resources and Geochemistry SER for the Goldrush Mine Project (BLM 2021r), the Groundwater Flow Model Report for the Deep South Expansion Project (SRK 2016), and the Groundwater Flow Modeling Report for the Goldrush Project (SRK 2020b). Under the authorization for the Deep South Project, BLM required that NGM supplement the flow in Horse Creek to maintain the flow and reduce potential impacts predicted from the combined dewatering analysis of Deep South and the proposed Goldrush Mine Project. NGM will implement the Horse Creek flow mitigation in 2021. The simulations also indicated that the net groundwater influx to the Humboldt River would not change from pre-mining conditions and small increases to groundwater inflow to Pine Creek would occur due to infiltration from RIBs. The model did not predict significant changes in groundwater discharge to modeled reference springs relative to the pre-mining conditions (SRK 2020b).

Mitigation measures are included as part of previous authorizations to reduce the impacts of existing projects on surface water. These include potential impacts to Indian and Ferris creeks, located on the east slope of the Shoshone Mountains, Horse Creek, and Mill Creek, located in the Cortez Mountains. Under the current authorizations, approximately 24 miles of perennial streams would occur within the maximum extent of predicted 10-foot drawdown contour plus one-mile buffer. Under the Proposed Action, the length of perennial streams within the predicted 10-foot drawdown contour plus one-mile buffer would increase for a total of 25 miles of perennial streams (SRK 2020b).

Within the maximum extent of the predicted 10-foot groundwater drawdown contour related to mine dewatering, plus a one-mile buffer, 223 surface water sites have been identified, of which, four are considered stream sites. Of the 223 sites within the maximum 10-foot drawdown contour plus a one-mile buffer, 199 of the sites have wetland indicators and are currently included in the contingency mitigation plan for the Cortez Hills and Deep South Expansion Projects (Barrick and JBR 2010; BCI and Stantec 2018). The remaining 24 sites were determined to lack wetland indicators during monitoring (HDR 2014, 2015a, 2015b, 2017, 2018a, 2018b). The potential impacts to the 199 sites within the maximum extent of predicted 10-foot drawdown contour plus one-mile buffer that exhibit wetland indicators would depend on the source

of groundwater that sustains the perennial flow (perched or hydraulically isolated aquifer versus regional groundwater system) and the actual extent of mine induced drawdown that would occur in the area (SRK 2020c). All 199 sites within the Goldrush 10-foot drawdown contour plus one-mile buffer have mitigation commitments from previously authorized projects. The Proposed Action, with the existing authorizations (including the contingency mitigation plans), impacts to surface water quantity in the area of analysis are not anticipated to change significantly from what is authorized. Overall, impacts from existing authorizations and the Proposed Action are anticipated to be moderate, long-term to permanent, and regional.

#### 4.17.1.2 Groundwater Quantity

Dewatering of the Goldrush Mine would occur at the same time as dewatering for other mining projects associated with the Cortez Mine Plan. Simulations include the following authorized actions: the Pipeline Complex (Pipeline, South Pipeline, Gap, and Crossroads open pits); the Cortez Mine Complex (Cortez, the Crossroads expansion; and the Cortez Pit expansion); and the Cortez Hill Complex (Cortez Hills and Pediment open pits and Deep South underground mining operations) (SRK 2017, 2020c). Impacts to groundwater levels were evaluated using the results of the numerical modeling of the Goldrush Mine under three different scenarios of closure for the Pipeline and Cortez open pits, which are detailed in the Water Resources and Geochemistry SER for the Goldrush Mine Project (BLM 2021r). The selected scenario would ultimately depend on economic factors present at the time of the Cortez Mine closure.

Goldrush Mine specific dewatering modeling assumptions include: The HC/CUEP exploration declines and drifts would be developed between January 2018 and second quarter 2021, following which, test stope development would begin; underground mining production at the Goldrush Mine was assumed through December 2043 in the groundwater model but actual dates would be based on a 24-year mine life from the date of the ROD, reaching a final working depth of 4,700 feet AMSL; the Goldrush Mine would be dewatered by approximately eight surface wells (with bottom elevations from 5,415 to 4,500 feet AMSL) starting in September 2022 to achieve an annual-average dewatering rate of up to 4,150 gpm, with a small amount of residual passive inflow to the underground workings; the Goldrush Mine workings would be backfilled in a manner similar to the Deep South Project; and passive-inflow conditions were simulated from potential future dewatering at the Four Mile project with the assumption that mine developments would be at elevations of from 4,931 to 4,800 feet AMSL; and passive inflow would occur from year 2025 through year 2043 (SRK 2020c).

The model utilized a maximum total combined dewatering rate of approximately 35,615 gpm during years 2019 through 2024; 11,897 gpm during years 2025 through 2032; and 1,622 gpm during years 2033 through 2043. A maximum monthly-average dewatering rate for the Goldrush Mine of approximately 4,311 gpm (6,941 acre-feet/year) is predicted in the year 2022 (SRK 2020c). The impacts due to all dewatering activities within the area of analysis were evaluated using the maximum extent of the predicted 10-foot drawdown contour plus a one-mile buffer. **Figure 3-3** details the maximum extent of the predicted 10-foot drawdown contour plus a one-mile buffer for both the Proposed Action and the No Action Alternative.

Under the Proposed Action, excess water not used in the Goldrush Mine operations would be conveyed to the proposed RIBs galleries and a previously authorized RIB in West Pine Valley. Comparison of the simulated pumping and infiltration rates through 2043 under the Proposed Action indicates that the dewatering wells would pump approximately 475,771 acre-feet, with a total return flow to the groundwater system through the RIBs and as part of the irrigation at Dean Ranch (under the Authorized Actions) being approximately 80.9 percent of the pumped water. The net amount that would be removed from groundwater storage under the Proposed Action is 19.1 percent of the total pumped water (SRK 2020c). By comparison, dewatering from current mining authorizations are predicted to pump approximately 506,504 acre-feet through 2032, with a total return flow to the groundwater system through the RIBs and as part of the irrigation at Dean Ranch (under the Authorized Actions) being 89.4 percent of that total amount removed. It is predicted the net amount of water removed from storage under the No Action Alternative would be approximately 23.4 percent of the amount pumped (SRK 2016).

Operation of the RIBs would be conducted per an operating plan incorporated explicitly into NDEP's WPCP for the RIBs. This operations plan would include requirements for quarterly inspections of the RIB area and monitoring of associated discharge points, piezometers, and monitoring wells. Monitoring data would be used to observe groundwater mounding in response to RIB infiltration and potential changes in receiving

groundwater chemistry. Infiltration rates would be adjusted in response to observed monitoring conditions to keep groundwater mounding and leaching from affecting water resources. Under the operating plan, fines and sediments may accumulate at the base of the RIBs would be removed with a dozer equipped with a ripper on an approximate annual basis. Removed fines would be placed in surface piles with the material excavated from the RIBs where they would be temporarily revegetated to inhibit wind erosion. For wildlife and human safety, RIB excavations would have slopes angles in native materials that are walkable. Pondered water depths in RIBs would be limited to a few feet both for safety and to promote movement of water into the subsurface with minimal exposure to evaporation. The RIB locations would also be signed and fenced to prevent accidental incursion into the pond areas.

The effects of infiltration at the northern (Highway) and southern (Rocky Pass and Windmill) RIB sites, and from the proposed Rocky Pass Reservoir, limit drawdown in the basin-fill alluvium to the northeast and southwest of the Gold Acres window (SRK 2020c). Drawdown in the bedrock aquifer, although potentially large within the Gold Acres and Cortez carbonate-rock windows, are expected to be substantially less in non-carbonate bedrock and non-carbonate bedrock underlying portions of the basin-fill aquifer (SRK 2020c).

The authorized environment predicted the simulated groundwater system approaching a new equilibrium after 500 years of recovery in 2532, whereas with the addition of the Proposed Action (Goldrush Mine), a new equilibrium is predicted after 500 years of recovery at 2543, an additional 11 years. The maximum extent of the 10-foot drawdown would be 149,364 acres or 233.4 square miles. A residual 10-foot drawdown would persist to the north and west of the Pipeline Complex and to the east, south, and west of the Cortez Hills Complex as shown on **Figures 3-2b, 3-3b, and 3-4b** of the Water Resources and Geochemistry SER for the Goldrush Mine Project (BLM 2021r). Impacts to groundwater quantity within the area of analysis are anticipated to be major, long-term to permanent, and regional.

#### **4.17.1.3 Floodplains**

The Goldrush Mine disturbance would not impact any FEMA designated flood zone. The desktop study delineated floodplains along Willow Creek, Dry Creek, and Horse Creek, and approximately 30 acres of these floodplains may be impacted from Goldrush Mine disturbance. Engineered bridge crossings would be designed to keep traffic and structures out of drainages, with eight drainage crossings proposed and one existing crossing being used but not requiring further improvements. The bridges would be sufficiently designed to not impede flood waters and the Goldrush Mine is not anticipated to increase downstream flooding resulting from impacts to floodplains. Impacts to floodplains are anticipated to be negligible, long-term to permanent, and localized.

#### **4.17.1.4 Water Rights**

There are 179 active water rights in the area of analysis, most of which are controlled by NGM. Since water rights are not necessary for most domestic wells, some wells that do not have water rights associated with them may occur within the water rights area of analysis and may be impacted by the Goldrush Mine proposed dewatering. The majority of wells within the area of analysis are controlled by NGM (NDWR 2021b).

NGM and Eureka County have submitted stipulations and agreements to the Nevada State Engineer which resulted in State of Nevada Engineer Ruling 6482. That Ruling approves NGM's water rights application, but states that if pumping under the application reduces the volume of water allocated to a senior water rights holder, NGM would take action to make the senior water rights holder whole as required under Nevada law. The Ruling also requires that NGM and Eureka County develop and submit a monitoring, management, and mitigation plan to identify and address any unpredicted potential impacts to senior water rights. For surface water rights that are dependent on groundwater discharge, a potential reduction in groundwater levels may reduce or eliminate the flow available at the point of diversion for the surface water right (SRK 2020b). Impacts to groundwater resources in the vicinity of wells may include a reduction in yield, increased pumping cost, or, if the water level were lowered below the pump setting or the bottom of the well, make the well unusable. Specific reductions in water availability would depend on the site-specific hydrogeologic conditions, well completion details, and timing of the drawdown (SRK 2020b).

Pursuant to the State of Nevada Engineer Ruling 6482, NGM and Eureka County submitted a Stipulation and Agreement stating that if pumping under water right application 82616 reduces volume of water allocated to a senior water rights holder, NGM would take action to make the senior water rights holder whole as required under Nevada law. Furthermore, pursuant to State of Nevada Engineer Ruling 6482, NGM and Eureka County submitted a Water Rights Agreement concerning water right application 88315 stipulating that a monitoring, management, and mitigation plan be developed to identify and address any unpredicted potential impacts to senior water rights, and that if any conflicts to senior water rights are determined during the monitoring, NGM would make these water right holders whole as required by Nevada Law. Infiltration of dewatering water through the use of RIBs would be non-consumptive and would return the water to the basin of origin (Pine Valley Hydrographic Basin) and would assist with recharging excess mine water. Effects of the Project on evaporation and evapotranspiration were also included in the water resource assessment based on observed evapotranspiration of effects from current operations (DRI 2016). Impacts from Goldrush Mine dewatering on water availability for water rights and wells in the area of analysis would be negligible to moderate, depending on if the water rights and wells are sustained by discharge from the regional groundwater system, long-term, and regional.

#### **4.17.1.5 Surface Water Quality**

In order to prevent resource conflicts to jurisdictional waters and wetlands, NGM has engineered bridge crossings designed to keep traffic and structures out of the drainages. Impacts to non-jurisdictional waters and associated riparian areas are evaluated (i.e., impacts to seeps and springs) and addressed via their associated mitigation plans as discussed further in **Section 4.21.1.1**. Surface water may be impacted due to mobilization of sediment from expanded construction operations and road networks. With the ACEPMs, impacts from mobilization of sediment are anticipated to be minor, short-term, and localized. Stormwater run-on controls for the waste rock facility and portal pad areas have been constructed under existing authorizations. The run-on controls for new surface facilities under the Plan would consist of conventional diversion ditches and berms constructed from native materials, utilizing sediment traps and gravel or rock covers to control erosion per best management practices and accepted engineering practices. PCS would be managed per the previously authorized PCS Management Plan (Broadbent 2018) which calls for excavation of petroleum contamination for removal and off-site disposal at a permitted disposal facility and would be revised to include PCS generated from the Goldrush Mine. Additional details on potential contamination from spills or leaks are discussed in the Hazardous Materials and Solid Waste SER for the Goldrush Mine Project (BLM 2021g).

Monitoring of mined materials is conducted and reported quarterly per the requirements of the Integrated Monitoring Plan and the NDEP WPCP. This monitoring consists of sampling and testing of mined materials for geochemical leachability as well as the examination of environmental design features (i.e., liners, stormwater controls) and associated groundwater monitoring locations. Mined materials such as those placed in waste rock facilities would be reclaimed and closed as described in the Plan and in accordance with the NDEP Reclamation Permit by physically and chemically stabilizing the facility at the end of operations. This reclamation and closure working includes grading the facility to its final, stable slope configuration and placing a six-inch growth media cover consisting of local native alluvium over the facility to facilitate revegetation and evapotranspiration of meteoric waters.

#### **4.17.1.6 Groundwater Quality**

Under the Proposed Action in the underground mine, groundwater would flow into backfilled stopes, interact with the backfill material, mobilize available chemical mass, undergo geochemical reactions (e.g., mineral precipitation), exit the downgradient wall of the underground workings, and enter the ambient groundwater. Baseline geochemical test results were used to develop chemical release functions for the lithologies exposed in the underground workings as well as for waste rock placed as backfill, and a description is provided in the Water Resources and Geochemistry SER for the Goldrush Project (Geomega 2020; BLM 2021r). The calculation was completed for: (1) groundwater; (2) rock on the floor of the access tunnels and stopes; (3) reactive mass of rock on stope walls; (4) shotcrete/concrete associated with access tunnels, CRF, and paste backfill; and (5) unconsolidated waste rock backfill. Constituent release is handled as a first-flush process, consistent with limited continued sulfide oxidation in saturated conditions (Geomega 2020).

Predicted underground mine pore water chemistry was calculated at different times during filling underground. The total concentrations determined were input into the geochemical modeling code PHREEQC (Parkhurst and Appelo 2013) to determine the equilibrium water chemistry of pore water in the underground. Predictions of pore water chemistry in the underground were completed at years five, 25, 103, and 529 after dewatering is terminated. The final chemically equilibrated underground pore water chemistry constitutes the chemistry of groundwater down gradient of the underground workings.

Predicted concentrations of constituents in underground water following interaction of ambient groundwater with the closed underground facilities show iron and arsenic are both predicted to occur in concentrations greater than the NDEP Profile I reference value prior to equilibrium geochemical reactions. That is, iron would be expected to precipitate as ferrihydrite, and arsenic would then adsorb to the precipitated ferrihydrite with the result that the predicted dissolved concentrations of iron and arsenic are less than the reference values. Antimony and manganese are predicted to remain at concentrations greater than the reference values meaning that the groundwater down gradient of the underground workings would be impacted. Thallium is predicted to occur at or slightly above the reference concentration (Geomega 2020).

Antimony and manganese are most likely to have impacts to groundwater downgradient of the underground and further analysis was completed to evaluate the extent of effect. Manganese is expected to attenuate close to the underground workings (less than 400 feet) due to a relatively high distribution coefficient (60.7 liters/kilogram) (Geomega 2020). With a lower predicted distribution coefficient for antimony (3.7 liters/kilogram), the groundwater model was used to evaluate the extent to which antimony would transport in groundwater downgradient of the underground. The groundwater model was used to determine the downgradient flow path that would result in the farthest transport distance over the approximately 530-year simulation period. Using the distribution coefficient for antimony and the identified groundwater flow path, the groundwater model was used to estimate the extent of the zone in groundwater predicted to have a concentration of antimony greater than the reference value (0.006 mg/L). Based on the contaminant transport modeling of antimony the localized effects would be restricted to the immediate vicinity (less than 400 feet) down gradient of the closed Goldrush underground would have a concentration of antimony equal to or greater than the reference value after 530 years of transport (Geomega 2020). Since the results indicated potential effects would be no further than 400 feet from the closed underground mine, predicted impacts to downgradient groundwater would be negligible to minor, long-term to permanent, and localized.

Site investigations have been conducted to characterize the conditions at the RIB sites in West Pine Valley including drilling 12 boreholes in basin-fill alluvial material. Screening tests and column tests of near-surface (less than 40 feet bgs) materials collected at the three West Pine Valley sites indicate that the sediment-leaching characteristics are similar to those observed at other operational RIB sites in Crescent Valley. Only two of the three RIB sites evaluated would be permitted, and the authorized RIB gallery under the Deep South Expansion Project would be permitted to accept dewatering water from the Goldrush Mine. In addition, a re-evaluation of the existing, authorized Pine Valley RIBs (authorized under the Deep South Project) to increase the amount of dewatering discharge they receive was completed (Geomega 2021). As a result, although some analytes may initially exceed the NDEP Profile I reference values, exceedances are likely to be temporary and to dissipate after the passage of a few pore volumes, as has been observed at the RIB sites operated by NGM in Crescent Valley (SRK 2020c; Geomega 2021).

Monitoring of the operating RIBs indicates that the rising groundwater has caused dissolution of naturally occurring salts present in the previously unsaturated alluvial materials. The salinity in the groundwater mounds is initially elevated as a result of dissolution of these soluble salts. However, the higher salinity is generally a transient event and the soluble salts are dissolved in the first few pore volumes of infiltrating water; additional inputs of water do not cause dissolution of substantial additional amounts of soluble salts (SRK 2018; Geomega 2021). Construction of the proposed RIBs would take into account site characteristics, including potential water quality considerations, and would be subject to review and approval through an NDEP permitting process. Monitoring would be conducted in accordance with the WPCP. Impacts from the RIBs on water quality is expected to be negligible, localized, and short-term.

Waste rock from the Canyon WRF would be used to make the balance of backfill material (15 Mt) needed to support full development of the Goldrush Mine. Waste rock would return as backfill in three forms: (1) CRF; (2) paste fill; and (3) un-amended fill. Under (1) and (2), cement would be added to the processed waste rock prior to placement as backfill in the underground mine. The geochemical properties of each form



of backfill would contribute to the geochemical reactivity of the underground workings and the potential impact of backfilled underground workings on groundwater quality.

Geochemical characterization of waste rock produced by the Goldrush Mine is mostly acid neutralizing due to the preponderance of carbonate lithologies. However, PAG waste rock comprises approximately 21 percent of the total waste rock production. PAG waste rock is not associated with a particular lithology and is spatially distributed. As a result, waste rock management planning would require selective handling including pre-blast geochemical characterization and removal from the underground (Itasca 2020). Waste rock that classifies as PAG would be removed from the underground and shipped to the Canyon WRF where the PAG would be encapsulated or blended in other waste rock having excess neutralizing potential (Itasca 2020). Because the Goldrush Mine non-PAG waste rock placed in the Canyon WRF would constitute a very small fraction of the total waste rock in the Canyon WRF, the geochemistry of waste rock from the Canyon WRF used as backfill in the Goldrush Mine is expected to be the same as the geochemistry of the Cortez Hills rock. Baseline geochemical characterization of waste rock from the Cortez Hills Mine was shown to contain excess neutralization capacity (Geomega 2006) and the addition of cement would only enhance the naturally occurring neutralization capacity of the waste rock. When mining ends, groundwater pumps used to keep the Goldrush Mine dewatered would be turned off and groundwater would begin filling the underground workings. The shotcrete/concrete zone of reactive rock from the floor of the tunnel, and the unconsolidated waste rock, would contribute some chemical mass loading as a result of inflowing groundwater.

The majority of the waste rock generated at the Goldrush Mine would be from the Dw lithology, which is a limestone with excess acid neutralizing capacity. The other waste rock lithologies have either greater acid generating and metal leaching potential (Dhc and Ovi) or lower acid generating and metal leaching potential (Ohc, Oe, and Ch) (Itasca 2020). Potential water quality impacts from the placement of waste rock are not anticipated.

#### **4.17.2 No Action Alternative**

Under the No Action Alternative, the development of the Goldrush Mine would not be authorized and NGM would not construct, operate, and close a new underground mine (i.e., the Goldrush Mine). Modifications or reclassification of disturbance as proposed under the Proposed Action would not occur, the dual use of facilities between the Cortez Mine and Goldrush Mine operations would not occur, and NGM would be permitted to continue the previously authorized mining and exploration activities under the existing authorizations (**Section 2.2**). Overall, the type of impacts to water resources and geochemistry are similar in nature to those disclosed for the Proposed Action and impacts are related to ground disturbance and dewatering. These impacts are summarized by authorized mine plan in the Water Resources and Geochemistry SER for the Goldrush Mine Project (BLM 2021r).

Under the No Action Alternative, up to 22,433 acres were previously authorized for disturbance. This may result in surface water impacts due to erosion and mobilization of sediment from disturbance although these would be reduced through committed ACEPMs (**Appendix E**). Impacts to surface water from the No Action Alternative from erosion and sedimentation are anticipated to be the same as the Proposed Action.

Dewatering associated with existing authorizations (Cortez Mine Plan) would continue until approximately 2032. The predicted changes in groundwater levels attributed to the No Action Alternative at the end of dewatering and infiltration activities (Year 2032) are shown on **Figure 3-5**. The predicted changes in groundwater levels attributable to the No Action Alternative at the end of dewatering and infiltration activities (Year 2032) simulated maximum total drawdown is predicted to be approximately 1,640 feet near the center of the Crossroads Pit in Year 2024. The maximum extent of the 10-foot drawdown would be 125,962 acres or 196.8 square miles. The effects of infiltration at the northern (Highway) and southern (Rocky Pass and Windmill) RIB sites and from the proposed Rocky Pass Reservoir limit drawdown in the basin-fill aquifer to the northeast and southwest of the Gold Acres window. Since the Proposed Action is additive to the No Action Alternative in terms of dewatering impacts, a comparison between the impacts from the No Action Alternative (authorized environment) and the Proposed Action are provided in the discussion of the Proposed Action, where applicable.

Potential impacts to flow of individual seeps, springs, or stream reaches under the No Action Alternative may occur from authorized dewatering operations if the source of the water is connected to the regional aquifer. The Contingency Mitigation Plans approved by previous authorizations (Barrick and JBR 2010; BCI and Stantec 2018) would continue to be implemented for the No Action Alternative, thus reducing impacts to surface waters and seeps and springs from dewatering. All contingency and mitigation measures would comply with Nevada Water Law and would involve the Nevada Office of the State Engineer. A portion of the Cortez WRF would extend into a portion of the FEMA-delineated floodplain in Crescent Valley. The Cortez WRF expansion area is surrounded by existing facilities that currently occupy a portion of the floodplain. As a result, impacts to the floodplain in Crescent Valley under the No Action Alternative would be considered negligible, long-term and localized. Construction of the Rocky Pass Reservoir and its embankment would be a major, long-term and localized to regional impact to the existing delineated floodplain in Carico Lake Valley, which would be mitigated by Nevada dam safety requirements and the permitting process involving the Nevada State Engineer (BLM 2019i). The potential resource conflicts from the No Action Alternative to water rights and wells would be the same as the Proposed Action.

Geochemical and water quality impacts would be the same as assessed under previous authorizations for the Cortez Mine Plan. Geochemical testing indicated that with implementation of the Waste Rock Management Plan, impacts to surface or groundwater quality are not anticipated. Flow from the base of the WRFs is anticipated over the long term but is anticipated to have negligible impacts to downgradient surface and groundwater quality (BLM 2019i). Potential geochemical impacts from the No Action Alternative are anticipated to be the same as the Proposed Action.

#### **4.18 Wetlands and Riparian Areas**

Additional details regarding the impacts to wetlands and riparian areas are provided in the Wetlands and Riparian Areas SER for the Goldrush Mine Project (BLM 2021s).

##### **4.18.1 Proposed Action**

###### **4.18.1.1 Wetlands**

There are approximately 7.8 acres of isolated field-mapped wetlands in the proposed Goldrush Mine Plan boundary that overlap the proposed surface disturbance. These field-mapped wetlands are located in Horse and Willow creeks. However, under the Proposed Action as described in an ACEPM listed in **Section 2.1.10.21**, NGM has committed to apply a 30-meter avoidance buffer around wetlands and riparian areas, even if existing disturbance occurs within the 30-meter buffer. To avoid impacts to wetlands, NGM would either eliminate or re-locate the proposed disturbance that overlaps the mapped wetlands to existing disturbance; therefore, no direct impacts to wetlands from the Proposed Action would occur.

Previous authorized dewatering operations at the Cortez Mine have resulted in mine-induced groundwater drawdown, and water modeling for the Goldrush Mine has predicted a reduction in groundwater levels both during active dewatering and for an extended period after dewatering ceases. If the flow from a perennial spring or stream is controlled by discharge from the aquifer affected by mine-induced drawdown, a reduction of groundwater levels could reduce the groundwater discharge to perennial springs or streams with a corresponding reduction in spring flows, lengths of perennial stream reaches, and their associated riparian/wetland areas (SRK 2020c). Specifically, the groundwater model prepared for the Goldrush Mine predicts impacts to one perennial creek in the area of analysis, Horse Creek. The model predicts that flow in Horse Creek, with a pre-mining flow rate of 18 acre-feet per year, would cease during dewatering before Year 2024 and start recovery in Year 2107, reaching a flow rate of 16 acre-feet per year during the long-term post-mining conditions around 2543 (SRK 2020b).

If the perennial flow in the specific stream reaches identified above are controlled by discharge from the regional aquifer system that is projected to be affected by mine-induced drawdown, changes to flows would likely occur. It is possible that wetlands along Horse Creek would experience a reduction from baseline. A reduction in flow could reduce the length of, or dry out, the perennial stream reaches. However, the interconnection or lack of interconnection between the perennial surface waters and deeper groundwater sources is controlled in large part by the specific hydrogeologic conditions that occur at each site. Considering the complexity of the hydrogeologic conditions in the region and the inherent uncertainty in numerical modeling predictions relative to the exact areal extent and magnitude of the predicted drawdown

area, it is not possible to conclusively identify specific perennial stream reaches or springs that would or would not be affected by future mine-induced groundwater drawdown (SRK 2020c). In 2021, NGM began to implement previously authorized mitigation that requires pumping to maintain baseflows in Horse Creek for at least 83 years. Under the Proposed Action, all other potential flow reductions in seeps and streams attributable to mine-induced drawdown would continue to be addressed through the implementation of mitigation in the Technical Memorandum Contingency Mitigation Plans for Surface Waters Deep South Expansion Project and the Technical Memorandum Contingency Mitigation Plans for Surface Waters Cortez Hills Expansion Project (BCI and Stantec 2018; Barrick and JBR 2010). These previously authorized mitigation and the applicability to the Goldrush Project are discussed in **Section 4.21.1.1**. All contingency and mitigation measures would comply with Nevada Water Law and would involve the Nevada Office of the State Engineer. Potential impacts to wetlands would be off-set and minimized with these previously authorized mitigation measures. Therefore, impacts to wetlands as a result of dewatering are expected to be minor, long-term to permanent, and regional.

#### **4.18.1.2 Riparian Areas and Springs**

Although approximately 31 acres of riparian habitat are shown to occur within the proposed Goldrush Mine Plan boundary in areas of proposed surface disturbance, NGM has committed to an ACEPM, as included in **Section 2.1.10.21**, that would avoid impacts to wetlands and riparian areas by a 30-meter buffer. NGM would either eliminate the proposed disturbance that overlaps the riparian areas and the buffer or re-located the proposed disturbance to areas where there is existing disturbance. Therefore, no direct impacts to riparian areas from the Proposed Action would occur.

Within the area of analysis, eight spring sites with wetland characteristics would be located within the proposed surface disturbance footprint within the proposed Goldrush Mine Plan boundary. NGM has committed to an avoidance buffer of 30 meters around wetlands and riparian areas; therefore, direct impacts to the spring sites from surface disturbance would not occur.

The Proposed Action could also result in impacts from dewatering to spring sites in the area of analysis. Previously authorized mitigation for these spring sites was previously addressed in the Technical Memorandum Contingency Mitigation Plans for Surface Waters Deep South Expansion Project and the Technical Memorandum Contingency Mitigation Plans for Surface Waters Cortez Hills Expansion Project (BCI and Stantec 2018; Barrick and JBR 2010). These previously authorized mitigation and the applicability to the Goldrush Project are discussed in **Section 4.21**. All contingency and mitigation measures would comply with Nevada Water Law and would involve the Nevada Office of the State Engineer. Under the Proposed Action, NGM would continue to implement the previously authorized mitigation for the spring sites and impacts would be minor, long term to permanent and regional.

Impacts to riparian areas associated with perennial segments of Horse Creek could occur as result of drawdown, similar to those described above for wetlands. Impacts would most likely occur to those habitat types dependent on the perennial presence of water, which is limited to Wetted Herbaceous Riparian habitat along Horse Creek encompassing 0.61 acre. The Water Resources and Geochemistry SER for the Goldrush Mine Project provides further details on dewatering impacts to Horse Creek. Impacts to riparian habitat would be minor, long-term to permanent, and regional.

#### **4.18.2 No Action Alternative**

Under the No Action Alternative, the development of the Goldrush Mine would not be authorized and NGM would not construct, operate, and close a new underground mine (i.e., the Goldrush Mine). Modifications or reclassification of acres as proposed under the Proposed Action would not occur, the dual use of facilities between the Cortez Mine and Goldrush Mine operations would not occur, and NGM would be permitted to continue the previously authorized mining and exploration activities under the existing authorizations (**Section 2.2**). These impacts are discussed by authorized mine plan in the Wetland and Riparian Area SER for the Goldrush Mine Project (BLM 2021s). Impacts are associated with direct disturbances, changes in acres of wetlands, changes in the volume of flow to wetlands, and degradation of wetlands. This direct disturbance could lead to erosion and mobilization of sediments, although this would be minimized through the authorized ACEPMs, reclamation, and compliance with the Stormwater Permits and SWPPPs. Water pumping activities from supply wells and dewatering activities can impact groundwater. The predicted changes in groundwater levels attributable to the No Action Alternative at the end of dewatering and

infiltration activities (Year 2032) are shown on **Figure 3-6**. The simulated maximum total drawdown is predicted to be approximately 1,640 feet near the center of the Crossroads Pit in Year 2024. The effects of infiltration at the northern (Highway) and southern (Rocky Pass and Windmill) RIB sites and from the proposed Rocky Pass Reservoir limit drawdown in the basin-fill aquifer to the northeast and southwest of the Gold Acres window, respectively.

Under the No Action Alternative, up to 22,433 acres were previously authorized to be disturbed. Disturbance of wetlands and riparian areas would occur as previously authorized. The additional disturbance from the Proposed Action would not occur. Reclamation under the No Action Alternative would also occur on most mine facilities; however, some would remain as post-mining features. Authorized mining at the Cortez Mine includes dewatering and groundwater drawdown effects associated with dewatering activities that may have impacts to wetland and riparian communities. The mine-related drawdown contour of the Proposed Action includes the mine-related drawdown for the Cortez Mine and therefore the impacts to wetlands and riparian areas would be similar to those described for the Proposed Action. Overall, impacts to wetlands and riparian areas from the authorized actions under the No Action Alternative are anticipated to be negligible to major, short-term to permanent, and both localized and regional.

#### **4.19 Wildlife Resources, Including Migratory Birds and Special Status Wildlife**

Additional details regarding the impacts to wildlife resources, including migratory birds and special status wildlife are provided in the Wildlife SER for the Goldrush Mine Project (BLM 2021t).

##### **4.19.1 Proposed Action**

The Proposed Action would result in new surface disturbance to approximately 1,022 acres of sagebrush and grassland habitat and 462 acres of woodland habitat. Additionally, approximately 210 acres of exploration may occur anywhere within the proposed Goldrush Mine Plan boundary and would remove additional wildlife habitat. Overall, approximately 2,286 acres of surface disturbance (existing/authorized, proposed, and reclassified) would be reclaimed and revegetated which would minimize impacts to vegetation and wildlife communities. Approximately 444 acres of total Proposed Action disturbance would not be reclaimed and would represent a permanent loss of wildlife habitat under the Proposed Action. Interim and concurrent reclamation would be maximized to the extent possible to help accelerate revegetation of disturbed areas and would help re-establish wildlife habitat in the short term.

##### **4.19.1.1 General Wildlife**

###### **Fish and Aquatic Invertebrate Species**

NGM has committed to an avoidance buffer of 30 meters around wetlands and riparian areas; therefore, direct impacts to the spring sites and fish and aquatic invertebrate species from surface disturbance would not occur. There is no evidence that fish occur within surface water sites that overlap surface disturbance; therefore, there would be no impacts to fish from surface disturbance. The Proposed Action would not disturb any springs where populations of springsnails are known to occur; therefore, there would be no impacts to springsnails from surface disturbance.

The drawdown due to mine-related dewatering may affect up to 199 springs sites with wetland characteristics within the area of analysis. Reduced flow to seeps, springs, and perennial streams within the maximum extent of the groundwater drawdown contour resulting from mine dewatering plus one-mile buffer would result in an overall reduction of habitat for aquatic species and may potentially harm local populations. Potential flow reductions in seeps, springs, and perennial streams attributable to mine-induced drawdown would be addressed through the implementation of previously authorized mitigation in the Technical Memorandum Contingency Mitigation Plans for Surface Waters Deep South Expansion Project and the Technical Memorandum Contingency Mitigation Plans for Surface Waters Cortez Hills Expansion Project (BCI and Stantec 2018; Barrick and JBR 2010). The implementation of previously authorized mitigation would help reduce impacts to surface waters from mine-related dewatering. A more detailed descriptions of previously authorized mitigation measures for mine-related drawdown can be found in **Appendix E**. Reduction in flow to surface waters may potentially reduce or eliminate populations that occur within the drawdown contour or may cause local populations to relocate. After the end of mining and the return of surface flow (a new equilibrium is estimated at 500 years of recovery), extirpated populations would be unlikely to reestablish. However, since previously authorized mitigation would be implemented for

impacts to surface waters from mine-related drawdown, impacts are anticipated to be minor to moderate, long-term to permanent, and localized.

Springsnails would be unlikely to reestablish after the end of dewatering and return of surface flows due to their lack of mobility and impacts from mine dewatering that results in a loss of habitat may potentially harm local populations of springsnails. However, since previously authorized mitigation would be implemented for impacts to surface waters from mine-related drawdown, impacts are anticipated to be minor to moderate, long-term to permanent, and localized.

### **Avian Species, Including Migratory Birds and Raptors**

Under the Proposed Action, an additional 1,448 acres of wildlife habitat is proposed to be removed which would result in the removal of habitat available for avian nesting and foraging. Some of this habitat may become available through interim reclamation, but a majority of this habitat would be unavailable for avian use until the successful completion of reclamation. The Proposed Action disturbance would be reclaimed upon the closure of the Goldrush Mine, except for approximately 444 acres of surface disturbance that would not be reclaimed at the end of mining and would be a permanent loss of avian nesting and foraging habitat. Impacts from the loss of nesting and foraging habitat would be minor, long-term to permanent, and localized. The Proposed Action would add to the vegetation removal that has already occurred within the area of analysis from other past and present activities including mineral development and exploration activities and may result in increased predation and nesting success.

No raptor nests occur within the proposed Goldrush Mine disturbance footprint; however, eleven raptor nests are located within 0.5 mile of proposed disturbance, and one nest that was being used by a packrat (*Neotoma*) in 2019 overlaps the proposed disturbance footprint. The packrat occupied nest would be removed prior to construction. Of the 11 nests, five nests (FC-01, HC-02, HC-03, MT-01, and HC-08) are classified as golden eagle nests and are discussed further in the Bald and Golden Eagle SER for the Goldrush Mine Project (BLM 2021f). As described above, NGM has committed to conduct pre-construction raptor surveys within the nesting season and would establish a protective buffer around the nest if evidence of raptor nesting is observed until birds are no longer actively breeding or rearing young, or until the young have fledged. With the implementation of ACEPMs, impacts to non-special status raptors at these nests would be negligible to minor, short-term, and localized.

Reduced flow to seeps, springs, and perennial streams within the drawdown contour as a result of mine dewatering would result in an overall reduction of avian habitat used for foraging, nesting, and migratory stopovers within the area of analysis. A more detailed descriptions of previously authorized mitigation measures for mine-related drawdown can be found in **Appendix E**. As discussed above, the implementation of previously authorized mitigation would help reduce impacts to surface waters as a result of dewatering activities. After the end of mining and the return of surface flow (a new equilibrium is estimated at 500 years of recovery), any lost vegetation would likely be restored. Therefore, the impacts from dewatering operations would be minor to moderate, long-term to permanent, and localized.

The proposed 120-kV and 13.8-kV power lines would be constructed to accommodate the proposed Goldrush Mine. Within the area of analysis, existing power lines exist from past and present projects which may result in increased electrocution and collision hazards to avian species. The addition of power transmission lines under the Proposed Action may pose an increased electrocution hazard for migratory bird and raptor species attempting to perch on structures and may pose an incremental increase in collisions for migrating species. NGM has committed to design and construct transmission lines in accordance with the Avian Power Line Interaction Committee (APLIC 2012) guidelines to minimize raptor electrocution and collision potential. The 13.8-kV power line would be reclaimed following the end of mining; the 120-kV power line would remain in place. Therefore, impacts to migratory bird and raptor species from the proposed power lines within the area of analysis would be minor, long-term to permanent, and localized.

Increased human presence and noise created by mine infrastructure and increased traffic may cause avian species to avoid areas adjacent to the Goldrush Mine. As previously authorized actions have been in operation, as well as human presence from recreational use of the area, noise and human presence has been occurring within the area of analysis for many years. NGM has incorporated sound reduction measures in the engineering design of the Goldrush Mine, including locating ventilation fans underground

in the ventilation raises to reduce the potential for sound propagation, impacts to avian species from human presence and noise would be anticipated to be minor, long-term, and localized.

### **Insect Species**

Disturbance associated with the Proposed Action may impact insect species. Individual insects may be injured or crushed during the construction, maintenance, and reclamation of the Proposed Action. This impact may harm individuals but would not be anticipated to impact entire populations; therefore, impacts would be minor, temporary to long-term, and localized.

### **Mammal Species**

The Proposed Action would remove an additional 1,448 acres of mammal habitat. Some of this habitat may become available through interim reclamation, but a majority of this habitat would be unavailable for use until the successful completion of reclamation. The Proposed Action disturbance would be reclaimed upon the Goldrush Mine closure, except for approximately 444 acres of total disturbance that would not be reclaimed at the end of mining and would be a permanent loss of mammal habitat.

Potential impacts to phreatophytes and other plant species that rely on soils wetted at the top of the capillary fringe from the groundwater drawdown are described further in the Vegetation SER for the Goldrush Mine Project (BLM 2021p). If groundwater drawdown impacts occurred to upland vegetation communities, potential impacts could include reductions in forage availability or production, changes in vegetation community composition of wildlife habitat, and could ultimately impact migration patterns for species that utilize these species as habitat. Impacts to upland vegetation communities that serve as wildlife habitat due to groundwater drawdown would be long-term and regional. The intensity of potential impacts, they were to occur, would be negligible for wildlife habitat comprised of vegetation species with shallow root systems but may be moderate for wildlife habitat comprised of vegetation species with deeper root systems.

Within the area of analysis, past and present activities have already resulted in displacement and habitat fragmentation for mammal species. Under the Proposed Action, additional habitat fragmentation and displacement would occur and may decrease survival rates of affected individuals to some degree and increased competition. Small and medium-sized mammals would not be able to relocate as easily as large mammals, and may become injured, crushed, and/or killed by equipment during the construction, maintenance, operation, and reclamation of the Proposed Action. Larger mammals would likely redistribute to adjacent habitat easier than small and medium-sized mammals; however, impacts may still occur as efforts to relocate may not be successful due to lack of suitable habitat or already occupied habitats. Additionally, vehicular collisions with mammals may occur from the traffic to and from the Goldrush Mine. NGM has committed to an ACEPM that restricts vehicle speed to help protect wildlife species. The implementation of ACEPMs would lessen the likelihood of mammals being injured, crushed, and/or killed by the implementation of the Proposed Action. The Proposed Action may result in the injury or death of individual mammals but would not be anticipated to remove populations. Impacts to small and medium-sized mammals from the Proposed Action would be minor, long-term, and localized.

The Proposed Action would include construction of two RIB galleries and a 1.1-million-gallon double-lined event pond associated with the Water Treatment Plant in the proposed Goldrush Mine Plan boundary. The two RIB galleries and event pond would become an attractant to mammal species and would be an increase in water sources for mammal species. As committed to in **Section 2.1.10.12** four-strand range NRCS wildlife fencing would be installed around each RIB gallery and the event pond to deter livestock. The proposed fencing around the RIBs could cause entanglement and possible death when mammals attempt to cross the fencing thus causing impacts to individuals but not populations. The use of NRCS wildlife fencing would reduce the potential entanglement of wildlife. NGM would adhere to stipulations in the WPCP for the event pond to protect wildlife from direct impacts. The construction and operation of the RIBs and event pond would have a minor, long-term to permanent, localized impact to mammals.

Impacts from reduced flow to seeps, springs, and perennial streams within the drawdown contour as a result of mine dewatering would be similar to the impacts described for avian species.

## **Big Game**

The Proposed Action would disturb 1,124 acres of mule deer habitat, including 616 acres of crucial winter habitat and 508 acres of year-round habitat. The Proposed Action would disturb 538 acres of pronghorn habitat, including 446 acres of winter range and 92 acres of year-round habitat. In addition, 210 acres of exploration disturbance may occur anywhere within the proposed Goldrush Mine Plan boundary, which may affect mule deer or pronghorn habitat. The majority of surface disturbance related to the Proposed Action would occur outside of designated pronghorn habitat in the southern Cortez Mountains; however, collar data suggests that pronghorn do utilize these areas and may be affected by the removal of habitat. The Proposed Action would add to the vegetation removal that has already occurred within the area of analysis from other past and present activities including mineral development and exploration activities and would result in displacement and habitat fragmentation. Under the Proposed Action, additional habitat fragmentation and displacement would occur and may decrease survival rates of affected individuals to some degree and increased competition. NGM has entered into an agreement with NDOW to provide funding for the loss of critical mule deer habitat. Overall, impacts to mule deer and pronghorn due to surface disturbance would be minor to moderate, long-term, and localized.

The Proposed Action would construct new mine facilities within a designated mule deer movement corridor, which links designated crucial winter habitat in the northern Toiyabe and southern Cortez Mountains across the Pine and Grass valleys to summer habitat in the Simpson Park Mountains. However, existing conditions within the mule deer movement corridor include existing mine and exploration disturbance from the Cortez Mine, Horse Canyon Mine, HC/CUEP, and West Pine Valley. The proposed Goldrush Mine would incrementally add new disturbance to the mule deer movement corridor which is utilized for travel between crucial winter habitat and year-round habitat and includes stopover sites for areas of foraging during migration. Under the Proposed Action, mule deer attempting to migrate using this corridor may avoid the mine facilities to the south as they move across Grass Valley and to the north as they move across Pine Valley. The Project would result in a reduction of forage and habitat quality in the corridor, and could impact when individuals utilize the corridors. To facilitate mule deer migration and stormwater drainage, NGM has committed to an ACEPM under the Proposed Action to develop cuts into the haul road berms in mule deer migration corridors. In combination with existing disturbance within the mule deer movement corridor, the proposed linear features of the Goldrush Mine (including the haul road and pipelines to the RIBs) would add an incremental change, resulting in displacement of individuals along the corridor for the duration of the Project, this would be a moderate to major, long-term, localized impact.

The Proposed Action would add additional noise sources in mule deer and pronghorn habitat created by mine infrastructure and traffic. Within the area of analysis, past and present projects have added additional noise sources which may have resulted in increased stress and avoidance of areas of increased noise. Although there are no established thresholds for noise impacts to these species, under the Proposed Action adverse effects would likely increase and continue to occur within the area of analysis. Increased anthropogenic noise within the designated movement corridor may cause mule deer to avoid the southern Cortez Mountains altogether during migration; however, past and present anthropogenic activities may already be contributing to impacts on mule deer movement patterns. NGM has incorporated sound-reduction measures in the engineering design of the Goldrush Mine, including locating ventilation fans underground in the ventilation raises and sound attenuation enclosures or structures. Impacts to big game habitat as a result of additional noise would be moderate to major, long-term, and localized.

Impacts from increased traffic in the vicinity of the Proposed Action would be similar to those described for mammal species.

Additionally, fencing of the RIBs and associated disturbance would cause habitat fragmentation to big game species. NGM has committed to a Proposed Action ACEPM where livestock watering troughs installed to deter livestock and wildlife from attempting to access water in the RIBs galleries would be operated on a rotational basis, therefore limiting the ability to act as an attractant to any one location. The construction and operation of the RIBs would have a minor, long-term to permanent, localized impact to mule deer and pronghorn. Additionally, NGM has committed to an ACEPM where crossing ramps would be installed at locations recommended by NDOW to facilitate mule deer and pronghorn crossing of the water pipelines. Impacts from the water pipeline to mule deer and pronghorn populations would be minor, long-term, and localized.

The Proposed Action would disturb approximately 434 acres of preferred pinyon-juniper and mountain mahogany habitat and 1,050 acres of other habitat available for mountain lions within the proposed Goldrush Mine Plan boundary. An additional 210 acres of exploration disturbance may occur anywhere within the proposed Goldrush Mine Plan boundary, which may impact mountain lion habitat. Loss of mule deer populations within the area of analysis may result in a reduction of primary prey species for mountain lions; however small mammals (i.e., mice, ground squirrels, and rabbits) also make up a large part of the mountain lion diet (NDOW 2020e). Additionally, anthropogenic noise from mine activities may cause individuals to avoid the area. Overall, impacts to mountain lions would be minor to moderate, long-term, and localized.

**Reptile Species**

Impacts to reptile species from the Proposed Action would be similar to those described for general mammal species above. No additional impacts beyond those described for mammal species are anticipated.

**4.19.1.2 Special Status Species**

**Avian Species, Including Migratory Birds**

The Proposed Action would result in new surface disturbance to approximately 1,022 acres of sagebrush and grassland and 462 acres of woodland that serve as avian species habitat within the proposed Goldrush Mine Plan boundary. Approximately 210 acres of exploration could occur anywhere within the proposed Goldrush Mine Plan boundary and would also remove additional special status avian species habitat. In addition, approximately 7.8 acres of riparian habitat within the area of analysis would be disturbed under the Proposed Action. Impacts would be the same as described for general wildlife avian species.

*Greater Sage-grouse*

The Proposed Action would remove a total of 1,352 acres of the 125,852 acres of mapped GRSG habitat, including approximately 1,125 acres of PHMA, 215 acres of GHMA, and 12 acres of Other Habitat Management Area (OHMA) (BLM 2022). The remainder of the land (96 acres) is either non-habitat or private land. In addition, approximately 210 acres of exploration may occur in any GRSG habitat category within the proposed Goldrush Mine Plan boundary.

The Proposed Action would add to the vegetation removal and construction of mine infrastructure that has already occurred within the area of analysis from other past and present activities including mineral development and exploration activities and would result in habitat fragmentation. The Proposed Action would likely result in increased predation and decreased nesting success. Human presence and noise also occurs within the area of analysis which would further stress GRSG. The construction, maintenance, and operation of mine infrastructure would add additional human presence and disturbance around the leks during the life of the mine and reclamation activities, which would likely cause GRSG to avoid the leks and negatively impact nesting activities with leks located near the proposed mine features. Distances from the leks to the ancillary facility features that may provide additional perching opportunities for predators are provided in **Table 4-4**. The closest proposed disturbance to the leks are as follows: the Horse Creek 01 lek is located approximately 0.33 mile south of the waterline leading to RIB Gallery 1; Horse Creek 02 and Horse Creek 03 leks located approximately 0.66 miles and 1.69 miles northeast of the waterline leading to the treatment plant and ancillary disturbance, respectively; and the Quartz Road lek is located approximately 2.24 miles northeast of the road to RIB Gallery 2. Impacts would occur, as GRSG have high site fidelity and would likely be displaced to less-suitable habitat. Impacts from the construction, maintenance, and reclamation of new, mine infrastructure within the area of analysis would be moderate to major, long-term, and localized. Noise impacts to GRSG from the Proposed Action are further discussed in the Noise SER for the Goldrush Mine Project (BLM 2021j).

**Table 4-4 Ancillary Features Providing Predator Perching Opportunities and Distance to Leks**

Lek	RIB Gallery 1 (miles)	RIB Gallery 2 (miles)	Closest Proposed Power Line (miles)	Closest RIB Pipeline (miles)	Closest RIB Access Road (miles)
Cortez-Grass Valley	7.81	8.73	3.14 (120 KV)	4.63	4.75
Fye Canyon	8.13	9.85	6.99 (13KV)	5.07	5.33



Horse Creek 1	0.99	2.34	1.27 (13KV)	0.33	0.33
Horse Creek 2	4.43	4.02	0.76 (13KV)	3.00	3.00
Horse Creek 3	4.05	3.28	1.77 (13KV)	3.12	3.12
New Brock Canyon	8.34	6.76	4.96 (13KV)	7.14	6.80
New Cortez-Grass Valley	8.97	9.82	2.99 (120 KV)	5.81	5.93
Quartz Road	4.53	2.47	5.83 (13KV)	3.23	2.24
Rocky Hills	3.93	6.15	5.58 (13KV)	4.6	4.6
Red Hills 3	2.69	3.78	5.16 (13KV)	3.10	3.10
Red Hills 4	3.80	4.46	6.29 (13KV)	4.17	4.17

Fencing would be constructed around each RIB gallery, which would add additional perching opportunities for predatory avian species and predation to GRSG. The addition of water sources and perching for predatory avian species would have impacts on GRSG, as nest success, chick survival, and population growth would decrease (Gibson et al. 2018). ACEPMs would lessen this impact; however, perching may still occur. Impacts from fencing around the RIBs would be moderate to major, long-term, and localized.

Under the Proposed Action, two power lines would be constructed, which may also add additional perching opportunities for predatory avian species and predation to GRSG. The additional perching opportunities for predatory avian species would have significant impacts on GRSG, as nest success and chick survival would decrease. Impacts from the proposed power lines and increased perching would be moderate, long-term, and localized to regional.

Impacts from reduced flow to seeps, springs, and perennial streams within the drawdown contour as a result of mine dewatering would be similar to the impacts described for avian species.

Impacts from the Proposed Action would be offset by either the BEA or the Conservation Credit System (CCS). Potential impacts to GRSG habitat would be calculated in accordance with the terms of the BEA between the USFWS, BLM, and NGM (BLM et al. 2015). The BEA and the CCS and the terms of such programs are in compliance with the State laws requiring net conservation gain of GRSG habitat through compensatory mitigation for new anthropogenic disturbances impacting habitat that is considered unavoidable (Sagebrush Ecosystem Program and State of Nevada 2018). The use of the CCS is required to fulfill mitigation requirements for disturbances to GRSG habitat on public lands. The Proposed Action was analyzed using the CCS Habitat Quantification Tool, and if the CCS were to be utilized, the direct and indirect impacts from the project would result in 2,224 Term Debits and 1,004 Permanent Debits (SEP 2021a, 2021b). Implementation of this ACEPM would mitigate impacts to GRSG habitat through net conservation gain. As a result, potential impacts to GRSG as a result of surface disturbance would be considered moderate to major, long-term, and localized to regional.

### *Burrowing Owl*

Approximately 186,444 acres of potential burrowing habitat occurs within the area of analysis, of which, the Proposed Action would remove 1,213 acres. Additionally, approximately 210 acres of exploration may occur anywhere within the proposed Goldrush Mine Plan boundary and would remove additional potential burrowing owl habitat. The Proposed Action would add to the removal potential burrowing owl habitat that has already occurred within the area of analysis from other past and present activities including mineral development and exploration activities and may result in increased predation and nesting success.

Approximately 24 field-surveyed burrowing owl burrowing locations would be located within the footprint of proposed disturbance (ERM 2018). Additionally, within the area of analysis, areas of high burrowing owl activity were observed. NGM has committed to ACEPMs that would reduce impacts to burrowing owls by conducting pre-construction clearance surveys prior to the construction of mine infrastructure during burrowing owl nesting season (April 1 through July 31) and avoidance buffers would be implemented if breeding owls are discovered. However, surface disturbance may result in the destruction of burrows outside of breeding season, in which case owls would likely relocate to the surrounding suitable habitat; however, impacts may still occur as efforts to relocate may not be successful due to lack of suitable habitat

or competition. Impacts to burrowing owls would be minor to moderate, long-term to permanent, and localized to regional.

Impacts from reduced flow to seeps, springs, and perennial streams within the drawdown contour as a result of mine dewatering would be similar to the impacts described for avian species.

### **Mammal Species**

The Proposed Action would remove an additional 1,448 acres of bat foraging habitat, including 462 acres of woodland habitat. Removal of woodland habitat may also result in a loss of roosting habitat for bat species that roost in trees. The Proposed Action would add to the vegetation removal that has already occurred within the area of analysis from other past and present activities including mineral development and exploration activities and may result in increased habitat removal and fragmentation. Impacts to bat species from disturbance would be minor to moderate, long-term to permanent, and localized to regional.

Of the approximate 21 cave and mine features mapped during baseline surveys, none would overlap with proposed disturbance. The Proposed Action would not remove any known mapped mines, buildings, caves, or bridges as a result of new, proposed surface disturbance which serves as roosting locations for many bat species. Additionally, prior to conducting an extensive ground disturbance (approximately five acres or more), NGM has committed to an ACEPM where NGM would conduct a desktop analysis to identify any historic mine workings within 0.25-mile of the proposed disturbance areas. The desktop analysis would be submitted to the BLM and NDOW for assessment of sites that potentially may provide suitable bat habitat. If any mines, buildings, caves, or bridges are disturbed, the loss of potential roosting habitat would be a minor, long-term to permanent, and localized impact.

The construction of the RIBs would create additional forage for bats that forage above open water, which would be a minor, long-term, and localized beneficial impact. Lighting from the Proposed Action would attract insects, which would attract foraging bats. NGM has committed to an ACEPM where lighting measures would be implemented to minimize effects from new light sources. Impacts from additional lighting would affect individuals but not populations and impacts would be minor, long-term, and localized.

Bats foraging in close proximity to the Proposed Action facilities may also collide with associated infrastructure. NGM's BBSC would be implemented as part of the Proposed Action and outlines both preventative and reactive approaches to take if bat fatalities are observed from collisions with the proposed facilities (Stantec 2019). Impacts potential collisions with infrastructure would affect individuals but not populations and would be minor, long-term, and localized.

Impacts from reduced flow to seeps, springs, and perennial streams from the Goldrush Mine dewatering would be the same as discussed for general wildlife.

Disturbance associated with the Proposed Action would remove approximately 1,051 acres of potential pygmy rabbit habitat. An additional 210 acres of exploration disturbance may occur anywhere within the proposed Goldrush Mine Plan boundary, which may affect pygmy rabbit habitat. The Proposed Action would add to the removal of potential pygmy rabbit habitat that has already occurred within the area of analysis from other past and present activities including mineral development and exploration activities and may result in increased habitat fragmentation. Field surveyed pygmy rabbit and/or burrow locations have been found within the footprint of proposed disturbance and would likely result in the removal of occupied pygmy rabbit habitat and/or burrows. NGM has committed to an ACEPM to reduce impacts to pygmy rabbits by conducting a pygmy rabbit survey prior to ground disturbance of five acres or more. If active pygmy rabbit burrows are observed, NGM would coordinate with NDOW and BLM on the appropriate course of action. If active burrows are destroyed during construction, pygmy rabbits may or may not relocate to nearby suitable habitat. As a result, impacts to pygmy rabbits as a result of surface disturbance would be minor to moderate, long-term to permanent, and localized to regional.

Impacts from reduced flow to seeps, springs, and perennial streams within the drawdown contour as a result of mine dewatering would be similar to the impacts described for avian species.

Disturbance associated with the Proposed Action would remove approximately 1,070 acres of potential dark kangaroo mouse habitat. An additional 210 acres of exploration disturbance could occur anywhere

within the proposed Goldrush Mine Plan boundary, which may affect dark kangaroo mouse habitat. The overall lack of suitable vegetation and soils in the area of analysis indicates that the presence of dark kangaroo mice is unlikely; therefore, no impacts to kangaroo mice are anticipated as a result of the Proposed Action.

### **Reptile Species**

Impacts to special status reptile species for the Proposed Action would be the same as those described for General Wildlife Reptile Species.

### **Amphibian Species**

Under the Proposed Action, no individual western toad observed locations would overlap with proposed, new surface disturbance. The closest individual western toad observed location is in Horse Creek, approximately 0.08 mile west of proposed disturbance. Under the Proposed Action, the proposed disturbance areas would overlap with approximately 0.55 mile of Horse Creek, which may alter or remove potential habitat for western toads. Individuals would likely not be able to relocate and may become injured, crushed, and/or killed by equipment during the construction, maintenance, operation, and reclamation of the Proposed Action. To minimize direct impacts to western toads, NGM has committed to an ACEPM under the Proposed Action to relocated impacted western toad populations to suitable habitat with a current population of western toads. Impacts from surface disturbance to amphibian species would be minor to moderate, long-term to permanent, and localized to regional.

#### **4.19.2 No Action Alternative**

Under the No Action Alternative, the development of the Goldrush Mine would not be authorized and NGM would not construct, operate, and close a new underground mine (i.e., the Goldrush Mine). Modifications or reclassification of acres as proposed under the Proposed Action would not occur, the dual use of facilities between the Cortez Mine and Goldrush Mine operations would not occur, and NGM would be permitted to continue the previously authorized mining and exploration activities under the existing authorizations (**Section 2.2**). Overall, the type of impacts to wildlife resources are similar in nature to those disclosed for the Proposed Action and impacts are related to the loss or alteration of native habitats, increased habitat fragmentation, animal displacement, loss of individuals/populations, increased noise and additional human presence, and the effects associated with water management. These impacts are summarized by authorized mine plan in the Wildlife Resources SER for the Goldrush Mine Project (BLM 2021t).

Under the No Action Alternative, up to 22,433 acres were previously authorized for disturbance which may have been used by insects, mammals, reptiles, and a variety of avian species, including migratory birds. Impacts to wildlife species would occur as previously authorized. Authorized mining at the Cortez Mine includes dewatering and groundwater drawdown effects associated with dewatering activities that may have impacts to wildlife species. The mine-related drawdown contour of the Proposed Action includes the mine-related drawdown for the Cortez Mine and the impacts to wildlife would be similar to those described for the Proposed Action. Reclamation would occur on most mine facilities; however, some facilities and roads would not be reclaimed. Reclamation would help reestablish some wildlife habitat to species. Overall, impacts to wildlife resources under the No Action Alternative would be minor to major, long-term for those areas that would be reclaimed to permanent for those areas unreclaimed or impacted by dewatering, and localized to regional.

#### **4.20 Cumulative Effects Analysis**

This document analyzes potential impacts from past, present, and reasonably foreseeable future actions (RFFAs) combined with the Proposed Action within the Cumulative Effects Study Area (CESA) specific to the resources for which impacts may be anticipated. This analysis focuses on cumulative impacts of the Proposed Action and other actions within the CESA. Major past and present land uses and disturbances within the resource CESAs that are projected to continue into the future include mineral development and exploration, utilities, infrastructure and public purpose projects, roads, wildland fires, livestock grazing, agriculture, and mining. Dispersed recreation (including hunting, fishing, and OHV use) and residential development also occur and are expected to continue in portions of the CESA. Past and present actions are included in the affected environment descriptions as they are part of the existing environment.

The boundaries of the CESAs vary by resource. Cumulative effects should be evaluated in terms of the specific resource, ecosystem, and human community being impacted. To determine the size of the CESAs, each environmental resource was analyzed to determine the extent to which the environmental effect from the project could be reasonably detected and the geographic area impacted was defined.

The geographical areas considered for the analysis of cumulative effects are illustrated on the CESA figures for each resource. The CESA boundaries vary in size and shape to reflect each evaluated resource. **Table 4-5** outlines the CESAs and their sizes.

**Table 4-5 Reasonably Foreseeable Affected Area by Resource**

Resource	Cumulative Effects Study Area	Size of Area (acres)	Figure
Air Quality and Climate Change	Three HAs: Pine Valley (HA #053), Crescent Valley (HA #054), and Grass Valley (HA #138).	1,500,637	4-1
Cultural Resources	Includes the area encompassed by the Indirect Visual APE (5-mile viewshed radius) which includes the Direct APE and Vibrational APE.	192,021	4-1
Environmental Justice	Includes portions of Elko, Eureka, and Lander counties specifically census block groups 320079516001, 320079516002, 320110001001, 320150003001, 320150003002, 320150003003, 320150003004, and 320150003005.	5,687,444	4-2
Geology and Minerals	Includes a 50-mile radius around the Plan boundary.	6,058,518	4-1
Bald and Golden Eagles	Includes a 10-mile radius around the Plan boundary.	440,316	4-1
Hazardous Materials and Solid Waste	Includes the Plan boundary and the portions of the 120- kV power line and switching stations, contact water pipeline, and Mount Tenabo access road that occur outside of the Goldrush Plan boundary, as well as the main haulage route.	1,446	4-2
Land Use and Realty	Includes nearby land use authorizations and realty decisions between SR 305 to SR 278 and north of I-80 towards Goldstrike Mine and Gold Quarry Mine.	2,850,318	4-1
Native American Traditional Values	Includes the proposed Goldrush Plan boundary, Mount Tenabo, and a larger regional area of the Native American Traditional Values that encompasses recent hard rock mines in north-central Nevada (Carlin Trend, Crescent Valley, and Tonkin Springs areas) plus other industrial developments (e.g., large transmission lines), activities, and events (e.g., wildfires) within the Western Shoshone's traditional homeland in relative proximity to the Goldrush Plan boundary.	2,667,619	4-1
Noise	Includes the Goldrush boundary, Cortez Mine boundary, and West Pine Valley boundary.	114,758	4-2
Grazing Management	Includes the Carico Lake, Grass Valley, JD, and South Buckhorn allotments.	1,328,982	4-1
Recreation	Includes recreation areas between SR 305 to SR 278 and north of I-80 towards Goldstrike and Arturo Mine.	2,850,318	4-1
Social and Economic Values	Includes Elko, Eureka, and Lander counties in Nevada.	17,210,114	4-1
Soils	Includes the Carico Lake, Grass Valley, JD, and South Buckhorn allotments.	1,328,982	4-1
Transportation and Access	Includes the proposed Plan boundary and the primary access roads between the project and off-site processing. Additionally, it includes the primary access roads from Goldrush to Elko/Spring Creek and Battle Mountain for employee transport.	4,950	4-2

Resource	Cumulative Effects Study Area	Size of Area (acres)	Figure
Vegetation Including Noxious Weeds and Special Status Plan Species	Includes the Carico Lake, Grass Valley, JD, and South Buckhorn allotments.	1,328,982	4-1
Visual Resources	Includes the viewshed within approximately 20 miles of the proposed project from which the proposed project would be visible.	524,135	4-2
Water Resources and Geochemistry	Includes four hydrographic basins: Crescent Valley, Pine Valley, Grass Valley, and Carico Lake Valley.	1,742,423	4-1
Wetland and Riparian Areas	Includes the Hydrologic Study Area (HSA) domain boundary which would be the area of the proposed Goldrush Plan boundary and predicted 10-foot drawdown contour for dewatering operations.	1,742,423	4-1
Wildlife including Special Status Plan Species	Includes the proposed Goldrush Plan boundary plus the predicted 10-foot groundwater drawdown contour related to mine dewatering.	296,187	4-2
Greater Sage Grouse	Includes the proposed Project boundary plus a 4-mile buffer of the boundary.	153,772	4-2
Big Game Species	Includes the proposed Project boundary and Hunt units 154, 155, 141 and 143.	2,039,140	4-2

Past, present, and RFFAs were identified within each CESA as projects that could potentially interact or have a close causal relationship with the Proposed Action. These actions were identified using BLM's LR2000 records and aerial imagery. Present actions that are considered include those that have existing and/or ongoing disturbance. RFFAs are those actions where a permit application has been submitted but an action has not yet been authorized.

Projects within each CESA have been grouped as past, present, and RFFAs and identified by resource group in the sections below. Surface disturbance characteristics were selected to describe the projects for most resources because it allows the combined surface disturbance impacts of all projects to be totaled. Acres of disturbance are not applicable to Native American Traditional Values, social and economic values, environmental justice, and transportation; thus, impacts to those resources are discussed qualitatively. Air, noise, and groundwater reasonably foreseeable impacts were all discussed in the modeling efforts for those resources; therefore, the information from the modeling efforts were utilized in the cumulative analysis and not disturbance acres.

#### 4.20.1 Air Quality and Climate Change

##### 4.20.1.1 CESA Boundary Description

There are no Class I areas within 100 kilometers (62.5 miles) of the Goldrush Mine project site. The CESA for air quality includes three air basins (**Figure 4-1**). The air quality CESA was based on the anticipated extent of air impacts from the Goldrush Mine project activities. The total area of the CESA encompasses 1,500,637 acres.

##### 4.20.1.2 Past, Present, and Reasonably Foreseeable Future Actions

Existing air quality within the CESA is currently in attainment or unclassified for all criteria pollutants. Effects to air quality in the CESA from past, present, and RFFAs are largely from airborne dust released by mining, utility construction, vehicle travel on unpaved roads, and smoke from wildland fires. Mine development and exploration operations can also affect air quality through emissions from vehicles and process equipment. Grazing and timber harvesting can produce fugitive dust, but the quantities are minimal and are expected to remain approximately equal to present conditions. Travel on unpaved roads in the CESA can affect air quality from vehicle emissions and fugitive dust, but this type of use has not affected air quality measurably in the past and is not considered a concern.

Development in the CESA has included the following: mining and mineral exploration activity; utility and infrastructure construction; range improvements; road construction; and limited urban development. Those projects have accounted for short-term to medium-term surface disturbance and gaseous emissions. Smoke generated during wildland fires has intermittent impacts on local air quality.

Current mining and exploration operations within the CESA includes the Cortez Mine, Fire Creek Mine, and Toiyabe Mine Exploration Project. There are also several past and present sand and gravel operations within the CESA. The only urban development is the Beowawe and Crescent Valley areas, which would produce negligible impacts to air quality.

RFFAs in the CESA would be similar to those that are presently occurring. Most activities, with the exception of sand and gravel operations, would occur at elevations above the valleys where sensitive receptors (human residences) are located. Past, present, and reasonably foreseeable gravel production generates dust that could lead to moderate impacts in the immediate vicinity.

#### 4.20.1.3 Cumulative Effects

##### Proposed Action

The cumulative effects assessment evaluates whether the combined effects of the Proposed Action and other significant permitted air pollutant emissions from adjacent sources, plus background levels of applicable air pollutants, have the potential to create any exceedances of the NAAQS.

The cumulative effects assessment conservatively modeled the Proposed Action emissions, together with significant permitted emission sources for projects located within the CESA. The Cortez Mine and Fire Creek Mine were included in this analysis. The Air Quality SER for the Goldrush Mine Project (Table 2-5) shows the emissions for these two sources that were included in the analysis (BLM 2021b). **Table 4-6** shows the modeled concentrations for the cumulative effects assessment.

**Table 4-6 Model-Predicted Maximum Impacts of the CESA**

Pollutant	Averaging Period	Modeled Impact ( $\mu\text{g}/\text{m}^3$ )	Background ( $\mu\text{g}/\text{m}^3$ )	Total Impact ( $\mu\text{g}/\text{m}^3$ )	NAAQS ( $\mu\text{g}/\text{m}^3$ )	Compliance
PM <sub>10</sub>	24-hour	95.0	10.2	105.2	150	Yes
PM <sub>2.5</sub>	Annual	5.2	2.3	7.5	12	Yes
	24-hour	9.9	8.0	17.9	35	Yes
CO	1-hour	193	801	995.0	10,000	Yes
	8-hour	969	1,030	1,997.7	40,000	Yes
NO <sub>2</sub>	Annual	27.9	1.9	29.8	100	Yes
	1-hour	92.3	9.2	101.5	188	Yes
SO <sub>2</sub>	3-hour	11.0	1.3	12.3	1,300	Yes
	1-hour	15.2	1.1	16.3	196	Yes

Source: ASI 2020

$\mu\text{g}/\text{m}^3$  = micrograms per cubic meter

PM<sub>10</sub> = particulate matter 10 microns in diameter or less

PM<sub>2.5</sub> = particulate matter 2.5 microns in diameter or less

CO = carbon monoxide

NO<sub>2</sub> = nitrogen dioxide

SO<sub>2</sub> = sulfur dioxide

As demonstrated in **Table 4-6**, the sum of the modeled ambient air pollutant concentrations and the applicable background concentrations do not exceed the applicable NAAQS standards. Thus, the cumulative effects assessment shows possible long-term, minor to moderate, regional air resource impacts.

The potential reasonably foreseeable HAP emissions are 4.8 tons per year of total HAPs, which are less than 25 tons per year threshold for all HAP emissions in aggregate. Per the USEPA Greenhouse Gas Equivalencies Calculator, the Proposed Action along with the Cortez Mine and Fire Creek Mine would

produce approximately the same amount of GHG emissions annually as that produced by 25,210 households annually due to energy consumption (USEPA 2020a).

In combination with past, present, and RFFAs, impacts to region-wide air quality are expected to remain minor. However, isolated pockets of moderate impacts are possible near vehicle access routes, and active mining and exploration projects, or expansion of existing mining or exploration projects. The analysis shows that a short-term, minor to moderate, regional impact to air resources would occur.

**No Action Alternative**

The cumulative effects assessment for the No Action Alternative estimated the modeling concentrations as a result of the significant permitted emission sources located within the CESA. Modeled concentrations shown in the Air Quality SER for the Goldrush Mine Project (Table 3-4) include the Cortez Mine and Fire Creek Mine emissions (the only significant permitted emission sources in the CESA) (BLM 2021b). **Table 4-7** shows the estimated modeling concentrations for the No Action Alternative cumulative effects assessment.

**Table 4-7 CESA Estimated Modeling Concentrations for the No Action Alternative**

Pollutant	Averaging Period	Modeled Impact (µg/m <sup>3</sup> ) <sup>a</sup>	Background (µg/m <sup>3</sup> )	Total Impact (µg/m <sup>3</sup> )	NAAQS (µg/m <sup>3</sup> )	Compliance
PM <sub>10</sub>	24-hour	24.4	10.2	34.6	150	Yes
PM <sub>2.5</sub>	Annual	1.1	2.3	3.4	12	Yes
	24-hour	4.1	8	12.1	35	Yes
CO	1-hour	607.8	801 <sup>b</sup>	1,408.8	10,000	Yes
	8-hour	180.3	1,030 <sup>b</sup>	1,210.3	40,000	Yes
NO <sub>2</sub>	Annual	10.2	1.9 <sup>b</sup>	12.1	100	Yes
	1-hour	115.6	9.2 <sup>b</sup>	124.8	188	Yes
SO <sub>2</sub>	3-hour	0.4	1.3 <sup>b</sup>	1.7	1,300	Yes
	1-hour	0.2	1.1 <sup>b</sup>	1.3	196	Yes

<sup>a</sup> Modeled impacts were scaled down to exclude the Goldrush Mine emissions (ASI 2016).

<sup>b</sup> Non-zero background concentrations approved by NDEP for gaseous pollutants were used.

As demonstrated in **Table 4-7**, the modeled ambient air pollutant concentrations for PM<sub>10</sub>, PM<sub>2.5</sub>, NO<sub>2</sub>, CO and SO<sub>2</sub>, together with the applicable background concentrations, do not exceed the applicable NAAQS standards. The cumulative HAP and GHG emissions would be similar to those described in the Proposed Action.

The cumulative effects assessment shows possible long-term, minor to moderate air resource impacts. These impacts would be limited to the immediate area surrounding the Plan boundary.

**4.20.2 Cultural Resources**

**4.20.2.1 CESA Boundary Description**

The CESA for cultural resources includes the area encompassed by the Indirect Visual APE (5-mile viewshed radius) which includes the Direct APE and Vibrational APE (**Figure 4-1**). The CESA was chosen because this includes the geographic area where impacts to cultural resources from the Proposed Action would most likely occur. The total area of the CESA encompasses 192,021 acres.

**4.20.2.2 Past, Present, and Reasonably Foreseeable Future Actions**

Within this CESA, past and present disturbance, as detailed in **Table 4-8**, has resulted from the following activities: mineral development and exploration projects (26,580 acres); utilities, infrastructure, and public purpose activities (630 acres); roads (1,100 acres); dispersed recreation; and livestock grazing. Additionally, approximately 53,588 acres within the CESA have been affected by recent and past wildland fires.

**Table 4-8 Past, Present, and RFFAs in the Native American Traditional Values CESA**

<b>Past, Present, and RFFAs, Disturbances and Projects</b>	<b>CESA</b>
<b>CESA Acres</b>	<b>192,021</b>
<b>Past Actions</b>	
<b>Mineral Development and Exploration Past Actions</b>	
Sand and Gravel Operations, Materials Sites and Community Sand and Gravel Pits	237
Notices	736
Mining and Exploration Projects	2,899
<b>Past Actions Total Disturbance Acres</b>	<b>3,872</b>
<b>Present Actions</b>	
<b>Mineral Development and Exploration Present Actions</b>	
Sand and Gravel Operations, Materials Sites and Community Sand and Gravel Pits	31
Notices	3
<b>Mining Projects<sup>1</sup></b>	
HC/CUEP <sup>2</sup>	106
Cortez Mine	21,170
Other Mining Projects <sup>3</sup>	775
<b>Exploration Projects</b>	
West Pine Valley Exploration Project <sup>4</sup>	122
Pediment Project Exploration	250
Other Exploration Projects <sup>5</sup>	251
<b>Utilities, Infrastructure, and Public Purpose Present Actions</b>	
Power Lines	514
Communication Facilities	1
Telephone and Fiber Optic Lines	102
Water Pipelines and Water Infrastructure	13
<b>Development and Infrastructure Present Actions Total Disturbance Acres</b>	<b>23,337</b>
<b>Roads and Railroads Present Actions</b>	
Local Roads	265
Other Roads	835
<b>Roads and Railroads Present Actions Total Disturbance Acres</b>	<b>1,100</b>
<b>RFFAs</b>	
<b>Mineral Development and Exploration RFFA Actions</b>	
Notices	3
<b>Mining and Exploration RFFAs</b>	
Shasta Project	210
<b>RFFAs Total Disturbance Acres</b>	<b>213</b>
<b>Past, Present, and RFFAs Total Disturbance Acres</b>	<b>28,522</b>
<b>Percent of CESA</b>	<b>15</b>
<b>Fires</b>	<b>53,588</b>

Source: BLM 2021c

<sup>1</sup> All existing disturbance acres associated with Horse Canyon Mine would be transferred to the Goldrush Mine Plan and HC/CUEP Plan and the Horse Canyon Mine Plan would be closed.

<sup>2</sup> Surface disturbance total included equals the total authorized disturbance of 688.1 less the existing disturbance of 582.6 acres to be transferred to the proposed Goldrush Plan boundary.

<sup>3</sup> Other Mining Projects includes: Buckhorn Mine, Buck Mine, and Avocado Mine.

<sup>4</sup> Surface disturbance total included equals the total authorized disturbance of 150 less the existing disturbance of 27.9 acres to be transferred to the proposed Goldrush Plan boundary.

<sup>5</sup> Other Exploration Projects includes: Patty Project, Pipeline and South Pipeline, and CMZ Exploration Projects.



RFFAs in the CESA would include mineral development and exploration projects (213 acres) (**Table 4-8**). Wildland fires in this CESA may occur in the future, as would restoration projects, livestock grazing, and dispersed recreation. Any of these projects with a federal nexus would require compliance with Section 106 of the NHPA to determine if they have effects to historic properties. As part of Section 106, federal agencies are required to consider the views of consulting parties, including SHPO, Native American Tribes, and others.

Past and present actions may have resulted, or may result, in illegal collecting and/or inadvertent damage to cultural resources. Cultural resources that may have been, or may be, discovered during environmental analysis of past or present projects, or during construction of these projects, would be dealt with through the Programmatic Agreement (PA) between NGM, the BLM Mount Lewis and Tuscarora Field Offices, the SHPO, the Te-Moak Tribe of Western Shoshone Indians, the Yomba Shoshone Tribe, the Duckwater Shoshone Tribe of the Duckwater Reservation, the Ely Shoshone Tribe, and the Shoshone-Paiute Tribe of the Duck Valley Reservation. Activities identified as RFFAs would lead to similar impacts as those identified for past and present actions and would be addressed through resolution of adverse effects or consultation as appropriate.

#### **4.20.2.3 Cumulative Effects**

Of the 192,021 acres covered by the CESA, 28,522 acres of disturbance are associated with past, present, and RFFA disturbances, which is a disturbance of approximately 15 percent of the CESA.

#### **Proposed Action**

Impacts to cultural resources, including those not eligible for the NRHP and NRHP-eligible sites mitigated through data recovery, impact the cultural landscape. The development of the Proposed Action would contribute to these cumulative effects. Minimization of cumulative effects from the Proposed Action would be addressed through avoidance of identified eligible and unevaluated sites. If avoidance is not possible, eligible and unevaluated sites would be mitigated as agreed upon by the BLM and SHPO in the PA and a historic properties treatment plan. Approval of the Goldrush Mine would increase disturbance within the CESA by 1,658 acres in addition to disturbance associated with past, present, and RFFAs (28,522 acres) for a total disturbance of 30,180 acres, which is approximately 16 percent of the CESA. The intensity and duration of the cumulative effects would vary depending on the cultural resource and sensitive areas impacted and the mitigation plans in places; however, these impacts would occur over the long term. Cultural resources inventories and government-to-government consultation/coordination would be completed for any future proposed development within the CESA with a federal nexus, and potential adverse impacts to any Native American Traditional Values would be avoided or mitigated, as appropriate.

Illegal collecting of artifacts and inadvertent damage to archaeological sites, and sites of tribal concern, has occurred and most likely would continue to occur in the CESA through increased access, development, and increased human presence as a result of past, present, and RFFAs. Cumulative impacts would occur over the long term and could be adverse.

#### **No Action Alternative**

Under the No Action Alternative, the proposed Goldrush Mine would not be developed and the associated impacts to Cultural Resources would not occur. Overall, cumulative effects to this CESA from the No Action Alternative would be less than the Proposed Action since additional surface disturbance from that alternative would not occur and therefore would not impact additional cultural resources, but would still be anticipated to be minor, long-term, and localized.

### **4.20.3 Environmental Justice**

#### **4.20.3.1 CESA Boundary Description**

The CESA for environmental justice populations, includes portions of Elko, Eureka and Lander counties specifically Census Block Groups 320079516001, 320079516002, 320110001001, 320150003001, 320150003002, 320150003003, 320150003004, and 320150003005 (**Figure 4-2**). The CESA was chosen because the geographic areas are most likely to experience social or economic effects from the Proposed Action and No Action. The total area of the CESA encompasses 5,687,444 acres.

#### 4.20.3.2 Past, Present, and Reasonably Foreseeable Future Actions

Past and present actions within the CESA have resulted in projects that may result in disproportionate effects on environmental justice populations. Activities such as mineral exploration and development, oil and gas development, and utilities and infrastructure development may cumulatively impact environmental justice populations through a variety of means, including through increased traffic, air pollution, light pollution, and noise pollution, as well as increased job opportunities.

Mining is a major existing disturbance within the CESA. Present mining/exploration activity within the CESA includes Betze-Post Mine, Carlin Mine, Argenta Mine, Cortez Mine, Fire Creek Mine, Phoenix Mine, Greystone Mine, Mountain Spring Mine, and Slaven Canyon Mine.

RFFAs within the CESA include mineral exploration and new and continuing mining operations and utility construction.

#### 4.20.3.3 Cumulative Effects

##### Proposed Action

Impacts from the Proposed Action would not be expected to negatively disproportionately affect any environmental justice populations. There is no indication that minority populations would be affected from past, present, and responsibly foreseeable futures activities any differently than other area residents; therefore, negative impacts on environmental justice populations within the CESA from the past, present, and RFFAs, including the Proposed Action, would be considered negligible.

The Proposed Action would contribute to cumulative effects on environmental justice populations within the CESA by providing the continued employment opportunities, though the effects would be the same as previously authorized and analyzed. The Proposed Action would also contribute to overall traffic, air pollution, light pollution, and noise pollution for environmental justice populations; however, the effects would not disproportionately affect minority or low-income populations. The cumulative effects on environmental justice populations within the CESA from the past, present, and RFFAs, including the Proposed Action, would be long-term, localized, and minor.

##### No Action Alternative

Under the No Action Alternative, the proposed Goldrush Mine would not be developed and the associated impacts to environmental justice populations would not occur. There is no indication that minority populations would be affected from past, present, and responsibly foreseeable futures activities any differently than other area residents; therefore, negative impacts on environmental justice populations within the CESA from the past, present, and RFFAs are not anticipated.

#### 4.20.4 Geology and Minerals

##### 4.20.4.1 CESA Boundary Description

The CESA for geology and minerals encompasses the proposed Goldrush Mine Plan boundary plus a 50-mile radius (**Figure 4-1**). The CESA was defined to include the maximum geographic extent of effects from the Project disturbance. The total area of the CESA encompasses 6,058,518 acres.

##### 4.20.4.2 Past, Present, and Reasonably Foreseeable Future Actions

Within this CESA, past and present disturbance, as detailed in **Table 4-9**, has resulted from the following activities: mineral development and exploration projects (128,223 acres); utilities, infrastructure, and public purpose activities (11,495 acres); oil, gas, and geothermal infrastructure and facilities (2,589 acres); roads (32,003 acres); railroads (11,775 acres); agricultural areas (55,475 acres); dispersed recreation; and livestock grazing. Additionally, approximately 1,448,447 acres within the CESA have been affected by recent and past wildland fires.

**Table 4-9 Past, Present, and RFFAs in the Geology and Minerals CESA**

Past, Present, and RFFAs, Disturbances and Projects	CESA
CESA Acres	6,058,518

<b>Past, Present, and RFFAs, Disturbances and Projects</b>	<b>CESA</b>
<b>Past Actions</b>	
<b>Mineral Development and Exploration Past Actions</b>	
Sand and Gravel Operations, Materials Sites and Community Sand and Gravel Pits	14,813
Notices	3,630
Mining and Exploration Projects	11,546
Public Purpose	1,713
<b>Past Actions Total Disturbance Acres</b>	<b>31,702</b>
<b>Present Actions</b>	
<b>Mineral Development and Exploration Present Actions</b>	
Sand and Gravel Operations, Materials Sites and Community Sand and Gravel Pits	6,567
Notices	167
<b>Mining Projects<sup>1</sup></b>	
HC/CUEP <sup>2</sup>	106
Rain Mine	952
Ruby Hill Mine	274
Cortez Toiyabe JV Mine	802
Copper Basin Complex Mine	1,122
Mule Canyon Mine	1,400
Trenton Canyon Mine	1,633
Emigrant Mine	1,711
Phoenix Mine	1,909
Carlin Mine	2,984
Lantern/Genesis/Bluestar Mine	4,204
McCoy Cove Mine	4,256
Gold Bar Mine	5,071
Marigold Mine	5,659
Mount Hope Mine	8,307
Bald Mountain North Operations Area	8,899
Maggie Creek (Gold Quarry) Mine	9,710
Cortez Mine	21,170
Other Mining Projects <sup>3</sup>	2,884
<b>Exploration Projects</b>	
West Pine Valley Exploration Project <sup>4</sup>	150
South Railroad Exploration	500
Pediment Exploration Project	250
NGM Robertson Exploration	294
McCoy Cove Exploration Project	299
Trenton Canyon Exploration	1,920
NGM 5 Exploration Areas	6,343
Other Exploration Projects <sup>5</sup>	2,189
<b>Utilities, Infrastructure, and Public Purpose Present Actions</b>	
Power Lines	8,288
Communication Facilities	334
Telephone and Fiber Optic Lines	2,181
Water Pipelines and Water Infrastructure	692
Oil and Gas Pipelines	592
Oil and Gas and Geothermal Infrastructure	1,998
Public Purpose	675

<b>Past, Present, and RFFAs, Disturbances and Projects</b>	<b>CESA</b>
Other	1,147
Agricultural Areas	55,475
<b>Development and Infrastructure Present Actions Total Disturbance Acres</b>	<b>173,113</b>
<b>Roads and Railroads Present Actions</b>	
State Routes	2,177
County Route	153
Local Roads	8,683
Interstate	5,013
US Highway	892
Other Roads	15,085
Railroads	11,755
<b>Roads and Railroads Present Actions Total Disturbance Acres</b>	<b>43,758</b>
<b>RFFAs</b>	
<b>Mineral Development and Exploration RFFAs</b>	
Sand and Gravel Operations, Materials Sites and Community Sand and Gravel Pits	127
Notices	29
<b>Mining and Exploration RFFAs</b>	
Norse Windfall	11
Windfall	150
Prospect Mountain	25
Gunman Project	7
Shasta Project	210
South Railroad Mine	1,771
Robertson Mine	5,990
Golden Lake Exploration	939
<b>Utilities, Infrastructure, and Public Purpose RFFAs</b>	
Power Lines	4,643
Communication Facilities	0
Telephone and Fiber Optic Lines	26
Water Pipelines and Water Infrastructure	8
Oil and Gas Pipelines	4
Oil and Gas and Geothermal Infrastructure	638
Public Purpose	95
Other	9
<b>RFFAs Total Disturbance Acres</b>	<b>13,737</b>
<b>Past, Present, and RFFAs Total Disturbance Acres</b>	<b>262,311</b>
<b>Percent of CESA</b>	<b>4</b>
<b>Fires</b>	<b>1,448,447</b>

Source: BLM 2021c

<sup>1</sup> All existing disturbance acres associated with Horse Canyon Mine would be transferred to the Goldrush Mine Plan and HC/CUEP Plan and the Horse Canyon Mine Plan would be closed.

<sup>2</sup> Surface disturbance total included equals the total authorized disturbance of 688.1 less the existing disturbance of 582.6 acres to be transferred to the proposed Goldrush Plan boundary.

<sup>3</sup> Other Mining Projects includes: Buckhorn Mine, Tonkin Spring Mine, Cove-Helen Mine, Argenta Mine and Mill, Greystone Mine, Buck Mine, Rain Mine, Buffalo Valley Mine, Fire Creek Mine, Black Rock Canyon Mine and Mill, Mountain Springs Mine, Carico Lake Mine, May Mine, Avocado Mine, Mountain Springs Mine, and Lazy Old Men Mine.

<sup>4</sup> Surface disturbance total included equals the total authorized disturbance of 150 less the existing disturbance of 27.9 acres to be transferred to the proposed Goldrush Plan boundary.

<sup>5</sup> Other Exploration Projects includes: Poker Flats, Keystone, CMZ, Railroad, Robertson, HD, Argenta, South Railroad, Toiyabe, Copper Basin, Hilltop Drilling, Buffalo Valley, Woodruff, Emigrant Springs, Mike, Pleasant View, Patty, Gold Bar, Pipeline and South Pipeline, Tonkin Springs, and Converse Exploration Projects.

Mineral development and exploration activities typically have the largest impacts on geology and mineral resources because they contribute to removal of mineral resources from availability for development, topographic changes, and affect geotechnical stability. Other past and present actions may impact potential access to mining claims, or access to areas for mineral exploration and development. Other actions with potential effects include utility lines and roads. While these activities also disturb surface acreage, they typically conform closely to the local topography and have negligible, if any, impacts on geology and mineral resources.

RFFAs in the CESA would include mineral development and exploration projects (9,259 acres); oil, gas, and geothermal facilities and infrastructure (642 acres); and utilities, infrastructure, and public purpose activities (4,776 acres) (**Table 4-9**). Wildland fires in this CESA may occur in the future, as would restoration projects, livestock grazing, and dispersed recreation. These activities would lead to similar disturbances and impacts as stated in past and present actions.

#### **4.20.4.3 Cumulative Effects**

Of the 6,058,518 acres covered by the CESA, 262,311 acres of disturbance are associated with past, present, and RFFA disturbances, which is a disturbance of approximately four percent of the CESA.

#### **Proposed Action**

Surface mining activity affects geology and mineral resources by excavating, modifying, or covering natural topographic and geomorphic features, and by removing mineral deposits. Relatively little disturbance has occurred in the CESA from past, present, and RFFAs, and mining disturbance has included exploration (drilling, trenching, sampling, and road construction). In addition to mining, other development in the region includes utilities.

Past, present, and RFFAs combined with the Proposed Action within the CESA for geology and minerals would result in approximately 263,969 acres of disturbance which would likely result in a permanent alteration of the natural topography. This disturbance represents approximately five percent of the total acreage in the CESA. Therefore, cumulative impacts to this CESA from the past, present, and RFFAs, including the Proposed Action to geology and mineral resources would be minor to moderate, permanent, and localized.

#### **No Action Alternative**

Under the No Action Alternative, the proposed Goldrush Mine would not be developed and the associated impacts to geology and mineral resources would not occur. Cumulative impacts to geology and mineral resources under the No Action Alternative would be less than those under the Proposed Action. Cumulative impacts to this CESA from the past, present, and RFFAs, including the No Action Alternative are anticipated to be minor, long-term, and localized.

### **4.20.5 Bald and Golden Eagles**

#### **4.20.5.1 CESA Boundary Description**

The CESA boundary for golden eagles encompasses the proposed Goldrush Mine Plan boundary plus a 10-mile radius (**Figure 4-1**). The spatial extent of the CESA was defined to include the maximum geographic extent of effects to golden eagles from surface disturbances and water management activities associated with the proposed Project and RFFAs. The total area of the CESA encompasses 440,316 acres.

#### **4.20.5.2 Past, Present, and Reasonably Foreseeable Future Actions**

Within this CESA, past and present disturbance, as detailed in **Table 4-10**, has resulted from the following activities: mineral development and exploration projects (26,367 acres); utilities, infrastructure, and public purpose activities (814 acres); roads (2,359 acres); agricultural areas (1,886 acres); dispersed recreation; and livestock grazing. Additionally, approximately 95,210 acres within the CESA have been affected by recent and past wildland fires, resulting in various stages of alteration to golden eagle habitat and prey forage.

**Table 4-10 Past, Present, and RFFAs in the Bald and Golden Eagle CESA**

<b>Past, Present, and RFFAs, Disturbances and Projects</b>	<b>CESA</b>
<b>CESA Acres</b>	<b>440,316</b>
<b>Past Actions</b>	
<b>Mineral Development and Exploration Past Actions</b>	
Sand and Gravel Operations, Materials Sites and Community Sand and Gravel Pits	347
Notices	574
Mining and Exploration Projects	2,608
<b>Past Actions Total Disturbance Acres</b>	<b>3,529</b>
<b>Present Actions</b>	
<b>Mineral Development and Exploration Present Actions</b>	
Sand and Gravel Operations, Materials Sites and Community Sand and Gravel Pits	209
Notices	16
<b>Mining Projects<sup>1</sup></b>	
HC/CUEP <sup>2</sup>	106
Cortez Toiyabe JV Mine	802
Cortez Mine	19,245
Other Mining Projects <sup>3</sup>	1,223
<b>Exploration Projects</b>	
West Pine Valley Exploration Project <sup>4</sup>	122
Robertson Exploration	294
Pediment Project Exploration	250
Other Exploration Projects <sup>5</sup>	572
<b>Utilities, Infrastructure, and Public Purpose Present Actions</b>	
Power Lines	592
Communication Facilities	1
Telephone and Fiber Optic Lines	111
Water Pipelines and Water Infrastructure	56
Other	54
Agricultural Areas	1,886
<b>Development and Infrastructure Present Actions Total Disturbance Acres</b>	<b>25,538</b>
<b>Roads and Railroads Present Actions</b>	
State Routes	58
Local Roads	761
Other Roads	1,540
<b>Roads and Railroads Present Actions Total Disturbance Acres</b>	<b>2,359</b>
<b>RFFAs</b>	
<b>Mineral Development and Exploration RFFAs</b>	
Notices	8
<b>Mining and Exploration RFFAs</b>	
Shasta Project	210
Robertson Mine	5,990
<b>Utilities, Infrastructure, and Public Purpose RFFAs</b>	
Power Lines	161
Water Pipelines and Water Infrastructure	2
<b>RFFAs Total Disturbance Acres</b>	<b>6,371</b>
<b>Past, Present, and RFFAs Total Disturbance Acres</b>	<b>37,797</b>
<b>Percent of CESA</b>	<b>9</b>
<b>Fires</b>	<b>95,210</b>

Source: BLM 2021c

<sup>1</sup> All existing disturbance acres associated with Horse Canyon Mine would be transferred to the Goldrush Mine Plan and HC/CUEP Plan and the Horse Canyon Mine Plan would be closed.

<sup>2</sup> Surface disturbance total included equals the total authorized disturbance of 688.1 less the existing disturbance of 582.6 acres to be transferred to the proposed Goldrush Plan boundary.

<sup>3</sup> Other Mining Projects includes: Buck Mine and Buckhorn Mine.

<sup>4</sup> Surface disturbance total included equals the total authorized disturbance of 150 less the existing disturbance of 27.9 acres to be transferred to the proposed Goldrush Plan boundary

<sup>5</sup> Other Exploration Projects includes: CMZ, Toiyabe, Pipeline and South Pipeline, Robertson Project, Tonkin Springs, Keystone, and Patty Project Exploration.

Past and present projects have disturbed golden eagles by removing habitat through construction of pads and support roads, utilities, and similar infrastructure. Structures can create artificial nesting or roosting habitat, which (depending on type) could be beneficial or harmful to species. These impacts change the predator and prey relationships for the CESA. Increased human presence and noise deter golden eagles from areas of activity, further fragmenting CESA habitat.

Wildland fires change the habitat available to golden eagles and their prey. Fires convert sagebrush or other shrub habitat into grasslands. These can create fragmented habitat and barriers to wildlife movement, particularly where large swaths of the landscape have been changed to habitat dominated by non-native species. Wildland fires are a natural part of the ecosystem, but also can have increased risk of anthropogenic causes near industrial activity and roadways.

Livestock and rangeland management also can impact golden eagles directly and indirectly. The intensity of grazing can change vegetation composition in the CESA. Nests can be trampled. Important habitat features, such as water sources, can be altered from grazing causing potential for increased erosion or changes in water runoff, causing a reduced vegetative cover.

RFFAs in the CESA would include mineral development and exploration projects (6,208 acres); and utilities, infrastructure, and public purpose activities (163 acres) (**Table 4-10**). Wildland fires in this CESA may occur in the future, as would restoration projects, livestock grazing, and dispersed recreation. These activities would lead to similar disturbances and impacts as stated in past and present actions.

#### **4.20.5.3 Cumulative Effects**

Of the 440,316 acres covered by the CESA, 37,797 acres of disturbance are associated with past, present, and RFFA disturbances, which is a disturbance of approximately nine percent of the CESA.

#### **Proposed Action**

The cumulative effect analysis focused on golden eagle resources and how they may be susceptible to the actions identified for this proposed Project. The analysis assumed that: 1) human use of the CESA would increase with the implementation of the proposed Project; 2) wildlife habitats currently are at their respective carrying capacities in and adjacent to the proposed Project; and 3) the overall region has been previously affected by past and current mining activities.

Increased human presence and noise created by the proposed mine infrastructure and increased traffic may cause eagles to avoid areas adjacent to the proposed Goldrush Mine. The existing conditions include authorized actions that have been in operation where noise and human presence has already been occurring within the vicinity of the proposed Goldrush Mine. Cumulative effects from past, present and RFFAs including the Proposed Action to golden eagles from human presence and noise would be negligible, long-term, and localized.

Potential reduced flow to seeps, springs, and perennial streams within the groundwater drawdown contour as a result of mine dewatering may result in an overall reduction of golden eagle foraging habitat, although mitigated for potential impacts has been committed to through the Surface Water Contingency mitigation plans. Potentially positive impacts on golden eagles in the CESA area is the introduction of artificial nesting or perching habitat (e.g., utility poles).

The proposed Project would incrementally increase disturbance to wildlife habitat by an additional 1,658 acres (less than 1 percent of the CESA) resulting in a total cumulative disturbance of approximately 39,455 acres (approximately 9 percent of the CESA). Cumulative impacts from past, present, and RFFAs, including the Proposed Action, to eagles are anticipated to be negligible to minor, long-term, and localized.

### **No Action Alternative**

Under the No Action Alternative, the proposed Goldrush Mine would not be developed and the associated impacts to eagles would not occur. Overall, effects in the CESA would be less than the Proposed Action since no new surface disturbance would occur from the Project. Therefore, cumulative impacts to golden eagles from past, present, and RFFAs including the No Action Alternative are expected to be negligible, long-term, and localized.

## **4.20.6 Hazardous Materials and Solid Waste**

### **4.20.6.1 CESA Boundary Description**

The CESA boundary for hazardous materials and solid waste includes the Plan boundary and the portions of the 120-kV power line and switching stations, contact water pipeline, and Mount Tenabo access road that occur outside of the proposed Goldrush Plan boundary, as well as the main haulage route. The transportation routes from the Goldrush Mine include north on SR 306 to I-80, continuing either east on I-80 to Carlin or Elko; and north on SR 306 to west on I-80 to Battle Mountain or Reno (**Figure 4-2**). The CESA was defined to include the areas of potential spills due to an unlikely accident from the Project and past, present, and RFFAs. The total area of the CESA encompasses 1,446 acres.

### **4.20.6.2 Past, Present, and Reasonably Foreseeable Future Actions**

Within the vicinity of the CESA, past and present disturbance has resulted from mineral development and exploration projects; utilities, infrastructure, and public purpose activities; oil, gas, and geothermal development; roads and railroads; dispersed recreation; and livestock grazing. The CESA is occupied and has been disturbed by past and present mining and exploration; roads including U.S. highways, state routes, local roads, and other roads.

The transportation routes within the CESA have been used in the past, and currently are being used to transport hazardous materials, including reagents and petroleum, to nearby mining operations and other customers. Vehicles using these routes also contain petroleum fuels. Increased traffic on these routes also would increase the potential for vehicle collision with other vehicles transporting hazardous materials. There are numerous major mines throughout Nevada that utilize one or more of the transportation routes making up the CESA to transport hazardous materials. Utilities such as power lines and telephone lines primarily would use petroleum-based products during construction and operation.

Infrastructure development and public purpose sites (e.g., wastewater treatment facilities) surrounding the CESA may require transportation of chemicals and hazardous material, including petroleum products. All existing projects would need to comply with all federal, state, and local regulations relevant to the transport, handling, and disposal of all wastes.

RFFAs within the vicinity of the CESA would include mineral development and exploration projects and utilities, infrastructure, and public purpose activities. Wildland fires in and surrounding this CESA may occur in the future, as would restoration projects, livestock grazing, and dispersed recreation. These actions would have similar impacts as stated for past and present actions.

### **4.20.6.3 Cumulative Effects**

The hazardous materials and solid waste CESA encompasses 1,446 acres. Due to the nature of the CESA with much of it including roadways, the vast majority of the area already has been disturbed by past and present actions.

### **Proposed Action**

The Proposed Action and other past, present, and RFFAs in the CESA would transport and utilize hazardous materials throughout the CESA. With best management practices and management plans in



place for these projects, a release to the environment during transportation and use is not anticipated. Potential effects associated with the transportation and use of hazardous materials from past, present, and RFFAs including the Proposed Action are expected to be long-term, negligible to minor and localized to the CESA.

**No Action Alternative**

Under the No Action Alternative, the proposed Goldrush Mine would not be developed and the associated impacts to hazardous materials and solid waste would not occur. Overall, the type of impacts to hazardous materials and solid waste from the No Action Alternative are similar in nature to those described for the Proposed Action. Potential effects associated with the transportation and use of hazardous materials from past, present, and RFFAs including the No Action Alternative are expected to be long-term, negligible to minor, and localized to the CESA.

**4.20.7 Land Use and Realty**

**4.20.7.1 CESA Boundary Description**

The CESA boundary for land use and realty includes nearby land use authorizations and realty decisions between SR 305 to SR 278 and north of I-80 towards Goldstrike Mine and Gold Quarry Mine (**Figure 4-1**). The CESA is based on the potential extent of cumulative impacts on lands and realty . The total area of the CESA encompasses 2,850,318 acres.

**4.20.7.2 Past, Present, and Reasonably Foreseeable Future Actions**

Within this CESA, past and present disturbance, as detailed in **Table 4-11**, has resulted from the following activities: mineral development, mining, and exploration projects (89,501 acres); utilities, infrastructure, and public purpose activities (9,315 acres); oil, gas, and geothermal infrastructure and facilities (1,313 acres); roads (13,804 acres); railroads (4,986 acres); agricultural areas (4,602 acres); dispersed recreation; and livestock grazing. Additionally, approximately 654,505 acres within the CESA have been affected by recent and past wildland fires.

**Table 4-11 Past, Present, and RFFAs for the Land Use and Realty CESA**

<b>Past, Present, and RFFAs, Disturbances and Projects</b>	<b>CESA</b>
<b>CESA Acres</b>	<b>2,850,318</b>
<b>Past Actions</b>	
<b>Mineral Development and Exploration Past Actions</b>	
Sand and Gravel Operations, Materials Sites and Community Sand and Gravel Pits	2,533
Notices	2,241
Mining and Exploration Projects	5,774
Public Purpose	828
<b>Past Actions Total Disturbance Acres</b>	<b>11,376</b>
<b>Present Actions</b>	
<b>Mineral Development and Exploration Present Actions</b>	
Sand and Gravel Operations, Materials Sites and Community Sand and Gravel Pits	4,623
Notices	105
<b>Mining Projects<sup>1</sup></b>	
HC/CUEP <sup>2</sup>	106
Cortez Toiyabe JV Mine	802
Gold Bar Mine	5,071
Mount Hope Mine	8,307
Rain Mine	952
Maggie Creek (Gold Quarry) Mine	9,710
Genesis Mine	4,204
Carlin Mine	2,984

<b>Past, Present, and RFFAs, Disturbances and Projects</b>	<b>CESA</b>
Goldstrike Mine	9,080
Lantern/Genesis/Bluestar Mine	4,204
Mule Canyon Mine	1,400
Cortez Mine	21,170
Other Mining Projects <sup>3</sup>	3,948
<b>Exploration Projects</b>	
West Pine Valley Exploration Project <sup>4</sup>	122
NGM Robertson Exploration Project	294
Pediment Exploration Project	250
Other Exploration Projects <sup>5</sup>	1,623
<b>Utilities, Infrastructure, and Public Purpose Present Actions</b>	
Power Lines	5,661
Communication Facilities	233
Telephone and Fiber Optic Lines	1,387
Water Pipelines and Water Infrastructure	302
Oil and Gas Pipelines	497
Oil and Gas and Geothermal Infrastructure	816
Public Purpose	26
Other	904
Agricultural Areas	4,602
<b>Development and Infrastructure Present Actions Total Disturbance Acres</b>	<b>93,382</b>
<b>Roads and Railroads Present Actions</b>	
State Routes	1,004
Local Roads	4,207
Interstate	2,402
US Highway	408
Other Roads	5,783
Railroads	4,986
<b>Roads and Railroads Present Actions Total Disturbance Acres</b>	<b>18,790</b>
<b>RFFAs</b>	
<b>Mineral Development and Exploration RFFAs</b>	
Sand and Gravel Operations, Materials Sites and Community Sand and Gravel Pits	126
Notices	21
<b>Mining and Exploration RFFAs</b>	
Shasta Project	210
Robertson Mine	5,990
<b>Utilities, Infrastructure, and Public Purpose RFFAs</b>	
Power Lines	1,917
Communication Facilities	2
Telephone and Fiber Optic Lines	26
Water Pipelines and Water Infrastructure	2
Oil and Gas Pipelines	28
Oil and Gas and Geothermal Infrastructure	638
Other	1
<b>RFFAs Total Disturbance Acres</b>	<b>8,961</b>
<b>Past, Present, and RFFAs Total Disturbance Acres</b>	<b>132,509</b>
<b>Percent of CESA</b>	<b>5</b>
<b>Fires</b>	<b>654,505</b>

Source: BLM 2021c

<sup>1</sup> All existing disturbance acres associated with Horse Canyon Mine would be transferred to the Goldrush Mine Plan and HC/CUEP Plan and the Horse Canyon Mine Plan would be closed

<sup>2</sup> Surface disturbance total included equals the total authorized disturbance of 688.1 less the existing disturbance of 582.6 acres to be transferred to the proposed Goldrush Plan boundary

<sup>3</sup> Other Mining Projects includes: Greystone Mine, Mountain Springs Mine, Argenta Mine and Mill, Tonkin Spring Mine, Buckhorn Mine, Buck Mine, Dee Gold Mine, Leeville Mine, Carico Lake Mine, Black Rock Canyon Mine and Mill, May Mine, Fire Creek Mine, and Lazy Old Men Mine.

<sup>4</sup> Surface disturbance total included equals the total authorized disturbance of 150 less the existing disturbance of 27.9 acres to be transferred to the proposed Goldrush Plan boundary.

<sup>5</sup> Other Exploration Projects includes: Chevas, Patty, Argenta, Robertson, Hilltop Drilling, HD, Mike, Bell Creek, Goldstrike, Tonkin Springs, Pipeline and South Pipeline, Gold Bar, Toiyabe, CMZ, Pleasant View, Keystone, and Woodruff Creek Exploration Project.

Mineral and gravel mining represents one of the major land disturbing activities present within the CESA. This use precludes other land uses, such as grazing, recreation, or development of other resources. These impacts typically are concentrated in local disturbances over long time spans. Rehabilitation plans focus on returning these land uses to the area after mine closure.

Public infrastructure, such as utilities and roads, often have long-term impacts to lands but facilitate other land uses. These can increase access for all other types of disturbances, while easements can limit the types of land use in the immediate area. Some types of infrastructure can prevent other land uses, such as for rangeland or recreation.

Rangeland and recreational land uses are other important land categories that can occur throughout the CESA. Other types of land uses may be compatible and even facilitate these activities (e.g., rural roads).

RFFAs in the CESA would include mineral development and exploration projects (6,347 acres) and utilities, infrastructure, and public purpose activities (1,948 acres); and oil, gas, and geothermal infrastructure and facilities (666 acres) (**Table 4-11**). Wildland fires in this CESA may occur in the future, as would restoration projects, livestock grazing, and dispersed recreation. These activities would have similar impacts as stated for past and present actions.

#### **4.20.7.3 Cumulative Effects**

Of the 2,850,318 acres covered by the CESA, 132,509 acres of disturbance are associated with past, present, and RFFA disturbances, which is a disturbance of approximately five percent of the CESA.

#### **Proposed Action**

Approval of the Goldrush Mine would increase disturbance within the CESA by 1,658 acres in addition to disturbance associated with past, present, and RFFAs (132,509 acres) for a total disturbance of 134,167 acres, which is approximately five percent of the CESA. This represents a small increment of the vast acreage of public lands in the Goldrush Mine vicinity and would have minimal effect on land uses displaced by past, present, and RFFAs in the CESA. The cumulative un-reclaimed disturbance area that would remain after completion of the past, present, and RFFAs, including the Proposed Action, would be a small percentage of the total land area in the CESA, and would have a localized, negligible, long-term effects on land uses.

#### **No Action Alternative**

Under the No Action Alternative, the proposed Goldrush Mine would not be developed and the associated impacts to land use and realty resources would not occur. Cumulative impacts to lands and realty from the past, present, and RFFAs under the No Action Alternative are anticipated to be localized, negligible and long-term.

### **4.20.8 Native American Traditional Values**

#### **4.20.8.1 CESA Boundary Description**

The CESA boundary for Native American Traditional Values encompasses the proposed Goldrush Plan boundary, Mount Tenabo, and a larger regional area that encompasses recent hard rock mines in north-central Nevada (Carlin Trend, Crescent Valley, and Tonkin Springs areas) plus other industrial

developments (e.g., large transmission lines), activities, and events (e.g., wildfires) within Western Shoshone traditional homeland in relative proximity to the Goldrush Plan boundary (**Figure 4-1**). This CESA is consistent with the regional study area used in the environmental analysis for the Deep South Final EIS and the Cortez Hills Expansion Project Final EIS (BLM 2008b, 2019b) as well as the area of analysis utilized in the EIS and Native American Traditional Values SER. As a result of the ongoing tribal coordination and consultation over exploration and mining in the area since the 1990s, including consultation documented in prior NEPA documents and in response to issues raised by the Western Shoshone bands and tribes, the BLM has determined to maintain the CESA for the Goldrush Mine. The total area of the CESA encompasses 2,667,619 acres.

#### 4.20.8.2 Past, Present, and Reasonably Foreseeable Future Actions

Within this CESA, past and present disturbance, as detailed in **Table 4-12**, has resulted from the following activities: mineral development and exploration projects (79,210 acres); utilities, infrastructure, and public purpose activities (3,920 acres); oil, gas, and geothermal infrastructure and facilities (1,876 acres); roads (13,815 acres); railroads (8,116 acres); agricultural areas (7,196 acres); dispersed recreation; and livestock grazing. Additionally, approximately 1,050,745 acres within the CESA have been affected by recent and past wildland fires.

**Table 4-12 Past, Present, and RFFAs in the Native American Traditional Values CESA**

<b>Past, Present, and RFFAs, Disturbances and Projects</b>	<b>CESA</b>
<b>CESA Acres</b>	<b>2,667,619</b>
<b>Past Actions</b>	
<b>Mineral Development and Exploration Past Actions</b>	
Sand and Gravel Operations, Materials Sites and Community Sand and Gravel Pits	721
Notices	2,391
Mining and Exploration Projects	6,622
Public Purpose	135
<b>Past Actions Total Disturbance Acres</b>	<b>9,868</b>
<b>Present Actions</b>	
<b>Mineral Development and Exploration Present Actions</b>	
Sand and Gravel Operations, Materials Sites and Community Sand and Gravel Pits	1,794
Notices	111
<b>Mining Projects<sup>1</sup></b>	
HC/CUEP <sup>2</sup>	106
Rain Mine	952
Arturo Project	2,774
Emigrant Mine	1,711
Goldstrike Mine	9,080
Lantern/Genesis/Bluestar Mine	4,204
Rossi Mine	908
Maggie Creek (Gold Quarry) Mine	9,710
Carlin Mine	2,984
Mule Canyon Mine	1,400
Cortez Mine	21,170
Cortez Toiyabe JV Mine	802
Gold Bar Mine	5,071
Other Mining Projects <sup>3</sup>	3,358
<b>Exploration Projects</b>	
West Pine Valley Exploration Project <sup>4</sup>	122
South Railroad Exploration	500
Pediment Project Exploration	250

<b>Past, Present, and RFFAs, Disturbances and Projects</b>	<b>CESA</b>
NGM Robertson Exploration	294
Other Exploration Projects <sup>5</sup>	2,177
<b>Utilities, Infrastructure, and Public Purpose Present Actions</b>	
Power Lines	2,430
Communication Facilities	222
Telephone and Fiber Optic Lines	902
Water Pipelines and Water Infrastructure	189
Oil and Gas Pipelines	518
Oil and Gas and Geothermal Infrastructure	1,358
Other	41
Agricultural Areas	7,196
<b>Development and Infrastructure Present Actions Total Disturbance Acres</b>	<b>82,334</b>
<b>Roads and Railroads Present Actions</b>	
State Routes	908
Local Roads	3,702
Interstate	3,326
Other Roads	5,880
Railroads	8,116
<b>Roads and Railroads Present Actions Total Disturbance Acres</b>	<b>21,931</b>
<b>RFFAs</b>	
<b>Mineral Development and Exploration RFFAs</b>	
Sand and Gravel Operations, Materials Sites and Community Sand and Gravel Pits	85
Notices	20
<b>Mining and Exploration RFFAs</b>	
Shasta Project	210
South Railroad Mine	1,771
Robertson Mine	5,990
<b>Utilities, Infrastructure, and Public Purpose RFFAs</b>	
Power Lines	161
Water Pipelines and Water Infrastructure	2
Oil and Gas Pipelines	25
Oil and Gas and Geothermal Infrastructure	638
Other	1
<b>RFFAs Total Disturbance Acres</b>	<b>8,903</b>
<b>Past, Present, and RFFAs Total Disturbance Acres</b>	<b>123,036</b>
<b>Percent of CESA</b>	<b>5</b>
<b>Fires</b>	<b>1,050,745</b>

Source: BLM 2021c

<sup>1</sup>All existing disturbance acres associated with Horse Canyon Mine would be transferred to the Goldrush Mine Plan and HC/CUEP Plan and the Horse Canyon Mine Plan would be closed.

<sup>2</sup>Surface disturbance total included equals the total authorized disturbance of 688.1 less the existing disturbance of 582.6 acres to be transferred to the proposed Goldrush Plan boundary.

<sup>3</sup>Other Mining Projects includes: Leeville Underground Mine, Buckhorn Mine, Tonkin Spring Mine, Argenta Mine and Mill, Greystone Mine, Buck Mine, Rain Mine, Fire Creek Mine, Black Rock Canyon Mine and Mill, May Mine, Hollister Mine, Dee Gold Mine, Ivanhoe Mine, Beaver Peak Mine, and Lazy Old Men Mine.

<sup>4</sup>Surface disturbance total included equals the total authorized disturbance of 150 less the existing disturbance of 27.9 acres to be transferred to the proposed Goldrush Plan boundary.

<sup>5</sup> Other Exploration Projects includes: Robertson, Argenta Project, Chevas Project, Woodruff Creek, Patty Project, Pipeline and South Pipeline, Hilltop Drilling, HD, Mike, Emigrant Springs, Bell Creek, Rodeo Creek, Tonkin Springs, Gold Bar, South Railroad, Toiyabe, CMZ, Railroad, Pleasant View, Pediment Project, Keystone, and Goldstrike Exploration.

RFFAs in the CESA would include mineral development and exploration projects (8,076 acres); oil, gas, and geothermal facilities and infrastructure (663 acres); and utilities, infrastructure, roads and railroads (221,931 acres) and public purpose activities (2,752 acres) (**Table 4-12**). Wildland fires in this CESA may occur in the future, as would restoration projects, livestock grazing, and dispersed recreation. Any of these with a federal nexus would require consultation with affiliated tribes.

Federal statutes, regulations, and Executive Orders require consultation with Native Americans when a federal action is taken. Past and present projects on public land would need to have gone through a Native American consultation to determine potential impacts to areas of Native American concern. If funerary objects, or items of cultural patrimony on BLM-administered land are encountered during construction, activities would need to cease within the vicinity of the discovery, and the BLM Authorized Officer and a Tribal Representative would be contacted.

Past and present actions may have resulted, or may result, in illegal collecting and/or inadvertent damage to sites of tribal concern. Items or areas of tribal concern that may have been, or may be, discovered during environmental analysis of past or present projects, or during construction of these projects, would be dealt with through guidelines set up under an agreement between the proponent, the BLM, and the SHPO. Activities identified as RFFAs would lead to similar impacts as those identified for past and present actions and would be addressed through consultation as appropriate.

#### **4.20.8.3 Cumulative Effects**

Of the 2,667,619 acres covered by the CESA, 123,036 acres of disturbance are associated with past, present, and RFFA disturbances, which is a disturbance of approximately five percent of the CESA.

#### **Proposed Action**

Cumulative impacts from past, present, and RFFAs including the Proposed Action to Native American Traditional Values could impact the following resources identified as concerns during consultation: visual resources, Plants with Tribal significance, pine nut harvesting, access, cultural sites, spiritual and religious use areas, and burials and items of cultural patrimony, water resources, and wildlife. Approval of the Goldrush Mine would increase disturbance within the CESA by 1,658 acres in addition to disturbance associated with past, present, and RFFAs (123,036 acres) for a total disturbance of 124,694 acres, which is approximately five percent of the CESA. Cultural resources inventories and government-to-government consultation/coordination would be completed for any ongoing and future proposed development within the CESA with a federal nexus, and potential adverse impacts to any Native American Traditional Values would be avoided or mitigated, as determined appropriate. Impacts to areas of concern are discussed below, and overall regional impacts outlined in Section 3.2.9 of the Native American Traditional Values SER for the Goldrush Mine Project (BLM 2021g). Much of this section builds on the analysis completed previously for the Deep South EIS and SER (BLM 2019b, 2019f).

**Access** – Access to places of Native American traditional importance throughout the CESA may have been temporally impacted from past, present, and CESA projects. These projects may increase access from other general public to these areas. Overall, the addition of the Proposed Action to the other past, present, and RFFAs is not expected to have any further impacts on access.

**Visual Resources** – As discussed in Section 3.2.3 of the Goldrush Native American Traditional Values SER development of the proposed Goldrush Mine would incrementally add to existing impacts to the visual environment of the Mount Tenabo area and the Horse Canyon PCRI. Some Native Americans consider the entirety of Mount Tenabo and its surroundings to be an “ethnographic landscape.” The White Cliffs and the top of Mount Tenabo have been combined into one PCRI, the Mount Tenabo/White Cliffs PCRI, which is considered eligible for inclusion in the NRHP (Dixon and McGonagle 2004). This in addition to the other past, present, and RFFAs throughout the CESA could alter the spiritual or cultural experience for Native American users. The reclamation of projects throughout the CESA would reduce visual impacts from unnatural lines and landforms and regraded to better blend with the surrounding topography during closure and final reclamation. Visual impacts throughout other portions of the CESA are not anticipated to differ from that described in the previous Final Deep South Expansion Project SER – Native American Traditional Values (BLM 2019f). Visual impacts to Native American Traditional Values from past, present, and RFFAs are anticipated to be moderate in the short term and minor in the long term, and regional.

**Water Resources** – Native American Traditional Values concerns regarding water resources in the CESA are as described in the Deep South Native American Traditional Values SER (BLM 2019f). This analysis included the Goldrush project as a RFFA with no other significant RFFAs for water pumping identified this analysis would not change. A detailed discussion of these impacts are provided in Section 3.3.2.7 of the Deep South Native American Traditional Values SER (BLM 2019f) and are summarized below.

Cumulative effects to water sources from past, present, and RFFAs is anticipated to occur in the CESA. The degree to which impacts to perennial waters in the regional CESA have affected, or would affect, Native American Traditional Values is not quantifiable. It is assumed that Western Shoshone traditional lifeways as they relate to perennial waters have been, and would continue to be, cumulatively affected (BLM 2019f).

**Spiritual and Religious Use** – Spiritual and religious use locations are present throughout the CESA, but all of these locations within the CESA have not been identified or disclosed. If places of spiritual and religious use are present near past, present, or RFFAs including the Proposed Action, they may be impacted by these activities. Cumulative effects to places of spiritual and religious use from past, present, and RFFAs are anticipated, but the extent of these impacts is unknown.

**Plants with Tribal Significance** – Plants with tribal significance that occur through the CESA are outlined in detail in Section 3.3.2.2 of the Deep South Native American Traditional Values SER (BLM 2019f). Impacts to some of these species is anticipated within the CESA from the past, present, and RFFAs including the Proposed Action, but the extent of the impacts cannot be quantified as the extent and locations of these species has not been documented throughout the RFFA.

**Pine Nut Harvesting** – As discussed in the Vegetation SER for the Goldrush Mine Project (BLM 2021h), approximately 145 acres of Pinyon Juniper Woodland habitat would be removed by the Proposed Action. This in addition to the other past, present, and RFFAs in the CESA are anticipated to have negligible to minor, long-term, and localized impact as pinyon habitat is common throughout the CESA.

**Wildlife** – Based on the ethnographic studies described in the Deep South Final EIS (BLM 2019b), wildlife species that have been hunted by Native Americans within the area of analysis include four big game species (i.e., elk, mule deer, pronghorn [antelope], and bighorn sheep), two small game species (i.e., sage-grouse and rabbits), squirrels, “ground hogs” (i.e., yellow-bellied marmots), and eagles. These species have provided food and materials for making various items (e.g., tools, clothes, shelters) that were, and continue to be, used by Native Americans. The cumulative impacts to these species is discussed further in **Section 4.20**. Cumulative impacts to big game and small mammals utilized by Native Americans from the past, present, and RFFAs are anticipated to be minor, long-term, and regional.

### **No Action Alternative**

Under the No Action Alternative, the proposed Goldrush Mine would not be developed and the associated impacts to Native American Traditional Values would not occur. Overall, cumulative effects to this CESA from the past present, and RFFAs including the No Action Alternative would be as described in the Deep South EIS and Final Deep South Expansion Project SER – Native American Traditional Values and would be minor, long-term, and regional and localized (BLM 2019b, 2019f).

## **4.20.9 Noise**

### **4.20.9.1 CESA Boundary Description**

The proposed CESA boundary for noise would include the Goldrush boundary, Cortez Mine boundary, and West Pine Valley boundary (**Figure 4-2**). The proposed CESA would include the noise model that would quantitatively assess noise at human receptors based on the noise report and discussion with NGM. The total area of the CESA encompasses 114,758 acres.

### **4.20.9.2 Past, Present, and Reasonably Foreseeable Future Actions**

Within the CESA, present disturbance results from activities including operation of electric pumps at the Cortez Mine and operation of exploration drill rigs in the West Pine Valley Plan boundary, traffic along SR 306 and I-80. These existing conditions were captured in the data collected in the Noise SER for the Goldrush Mine Project (BLM 2021d).

RFFAs within the vicinity of CESA would include mineral development and exploration projects and utilities, infrastructure, and public purpose activities. These actions would have similar impacts from noise as stated for past and present actions. Wildland fires in and surrounding this CESA may occur in the future, as would restoration projects, livestock grazing, and dispersed recreation, but would have minimal noise impacts.

#### 4.20.9.3 Cumulative Effects

The noise CESA encompasses 1,446 acres. Due to the nature of the CESA, existing and on-going impacts to noise were captured in the baseline conditions.

#### Proposed Action

Noise levels in the Goldrush Mine vicinity are expected to increase within the CESA from the Proposed Action. Primary noise sources from the Proposed Action include mining, exploration, processing, and hauling activities. Although the Proposed Action would increase the frequency of the noise associated with hauling, overall ambient noise levels are not expected to increase beyond already authorized conditions. A modeled noise increase is expected over ambient conditions at the sensitive receptors (lek sites). This modeled noise would include baseline conditions of past and present projects and would not exceed thresholds identified in the 2015 ARMPA (BLM 2015a) when the specific ACEPMs are implemented including sound attenuation enclosures or structures. Impacts to sensitive receptors (leks) from past present, and RFFAs including the Proposed Action would be minor, short-term, and localized. No cumulative future projects for noise sources were identified.

#### No Action Alternative

Under the No Action Alternative, the proposed Goldrush Mine would not be developed and the associated impacts from noise to the sensitive receptors (leks) would not occur. Overall, the type of impacts from noise to leks are similar in nature to those described for the Proposed Action and since the Proposed Action was considered an RFFA in past analysis, the cumulative impacts including past, present and RFFAs are the same as for the Proposed Action.

### 4.20.10 Grazing Management

#### 4.20.10.1 CESA Boundary Description

The CESA for grazing management includes the Carico Lake, Grass Valley, JD, and South Buckhorn allotments. Portions of the proposed Plan boundary occur within each of these allotments (**Figure 4-1**). The CESA was defined to include the maximum geographic extent of effects to range resources from surface disturbances and water management activities associated with the Proposed Action. The total area of the CESA encompasses 1,328,982 acres.

#### 4.20.10.2 Past, Present, and Reasonably Foreseeable Future Actions

Within this CESA, past and present disturbance, as detailed in **Table 4-13**, has resulted from the following activities: mineral development and exploration projects (37,839 acres); utilities, infrastructure, and public purpose activities (1,966 acres); oil, gas, and geothermal infrastructure and facilities (800 acres); roads (5,172 acres); agricultural areas (13,075 acres); dispersed recreation; and livestock grazing. Additionally, approximately 261,210 acres within the CESA have been affected by recent and past wildland fires.

**Table 4-13 Past, Present, and RFFAs in the Grazing Management CESA**

Past, Present, and RFFAs, Disturbances and Projects	CESA
CESA Acres	1,328,982
<b>Past Actions</b>	
<b>Mineral Development and Exploration Past Actions</b>	
Sand and Gravel Operations, Materials Sites and Community Sand and Gravel Pits	1,010
Notices	1,125
Mining and Exploration Projects	4,773
Public Purpose	20
<b>Past Actions Total Disturbance Acres</b>	<b>6,928</b>



<b>Past, Present, and RFFAs, Disturbances and Projects</b>	<b>CESA</b>
<b>Present Actions</b>	
<b>Mineral Development and Exploration Present Actions</b>	
Sand and Gravel Operations, Materials Sites and Community Sand and Gravel Pits	959
Notices	48
<b>Mining Projects<sup>1</sup></b>	
HC/CUEP <sup>2</sup>	106
Cortez Mine	21,170
McCoy Cove Mine	4,256
Cortez Toiyabe JV Mine	802
Other Mining Projects <sup>3</sup>	1,981
<b>Exploration Projects</b>	
West Pine Valley Exploration Project <sup>4</sup>	150
Pediment Project Exploration	250
NGM Robertson Exploration	294
McCoy Cove Exploration Project	299
Other Exploration Projects <sup>5</sup>	597
<b>Utilities, Infrastructure, and Public Purpose Present Actions</b>	
Power Lines	1,446
Communication Facilities	21
Telephone and Fiber Optic Lines	411
Water Pipelines and Water Infrastructure	87
Oil and Gas and Geothermal Infrastructure	800
Other	98
Agricultural Areas	13,075
<b>Development and Infrastructure Present Actions Total Disturbance Acres</b>	<b>46,850</b>
<b>Roads and Railroads Present Actions</b>	
State Routes	324
Local Roads	1,537
Other Roads	3,311
<b>Roads and Railroads Present Actions Total Disturbance Acres</b>	<b>5,172</b>
<b>RFFAs</b>	
<b>Mineral Development and Exploration RFFAs</b>	
Sand and Gravel Operations, Materials Sites and Community Sand and Gravel Pits	5
Notices	14
<b>Mining and Exploration RFFAs</b>	
Shasta Project	210
Robertson Mine	5,990
<b>Utilities, Infrastructure, and Public Purpose RFFAs</b>	
Power Lines	161
Telephone and Fiber Optic Lines	2
Water Pipelines and Water Infrastructure	2
Oil and Gas Pipelines	2
<b>RFFAs Total Disturbance Acres</b>	<b>6,386</b>
<b>Past, Present, and RFFAs Total Disturbance Acres</b>	<b>65,336</b>
<b>Percent of CESA</b>	<b>5</b>
<b>Fires</b>	<b>261,210</b>

Source: BLM 2021c

<sup>1</sup>All existing disturbance acres associated with Horse Canyon Mine would be transferred to the Goldrush Mine Plan and HC/CUEP Plan and the Horse Canyon Mine Plan would be closed.

<sup>2</sup>Surface disturbance total included equals the total authorized disturbance of 688.1 less the existing disturbance of 582.6 acres to be transferred to the proposed Goldrush Plan boundary.

<sup>3</sup>Other Mining Projects includes: Greystone Mine, Mountain Springs Mine, Tonkin Spring Mine, Buckhorn Mine, Buck Mine, Carico Lake Mine, Cove-Helen Mine, and Lazy Old Men Mine.

<sup>4</sup>Surface disturbance total included equals the total authorized disturbance of 150 less the existing disturbance of 27.9 acres to be transferred to the proposed Goldrush Plan boundary.

<sup>5</sup>Other Exploration Projects includes: CMZ, Robertson, Toiyabe, Gold Bar, Pipeline and South Pipeline, Patty Project, Pediment Project, Keystone, and Tonkin Springs Exploration.

Mineral development and exploration activities, utilities, infrastructure, and public purpose sites that occur within the CESA can impact range conditions through surface disturbance, road construction, and vegetation clearing. These activities can negatively impact range quality directly through the removal of forage and indirectly through the spread of noxious and invasive, non-native plant species, which could further reduce forage availability and quality. Mines and utilities such as pipelines, telephone lines, and power transmission lines have limited long-term footprints, and reclamation activities typically follow the installation of these features which can minimize long-term impacts and assist in reducing the spread of noxious and invasive, non-native plant species. If reclamation activities are not conducted following these activities, areas of productive forage could be lost; however, reclamation is required for disturbance on public lands.

Road disturbance is often difficult to reclaim because of the soil compaction that occurs on or adjacent to the roadway. This environment has the potential to introduce or spread noxious and invasive, non-native plant species throughout the CESA. Vehicles traveling on roadways also have the potential to collect and disperse seeds throughout and beyond the extents of the CESA. The spread of noxious and invasive, non-native plant species could reduce the quality of the forage available within each allotment. Vehicle traffic on roads could also lead to direct impacts to livestock from collisions.

Other grazing impacts not quantifiable include competing public land uses (recreation, mining, subdividing private lands, etc.), market forces, and other issues that could impact the viability of livestock operations.

Impacts from wildland fires alter vegetation communities, which creates opportunities for noxious and invasive, non-native plant species to invade, become established, and spread. Wildland fires can also remove the shrub and tree components from vegetation communities and allow grasses and forbs to dominate for a period of time, improving forage availability.

RFFAs in the CESA would include mineral development and exploration projects (6,219 acres); oil, gas, and geothermal facilities and infrastructure (2 acres); and utilities, infrastructure, and public purpose activities (165 acres) (**Table 4-13**). Wildland fires in this CESA may occur in the future, as would restoration projects, and dispersed recreation. These activities would lead to similar disturbances and impacts as stated in past and present actions.

#### **4.20.10.3 Cumulative Effects**

Of the 1,328,982 acres covered by the CESA, 65,336 acres of disturbance are associated with past, present, and RFFA disturbances, which is a disturbance of approximately five percent of the CESA.

##### **Proposed Action**

Approval of the Goldrush Mine would increase disturbance within the CESA by 1,658 acres in addition to disturbance associated with past, present, and RFFAs (65,336 acres) for a total disturbance of 66,994 acres, which is approximately five percent of the CESA. Much of the past, present, and reasonably foreseeable surface disturbance would be reclaimed following the actions, therefore decreasing the potential impacts to range resources. The cumulative un-reclaimed disturbance area that would remain after completion of the past, present, and RFFAs including the Proposed Action, would have a negligible, short-term localized effect on range resources.

##### **No Action Alternative**

Under the No Action Alternative, the proposed Goldrush Mine would not be developed and the associated impacts to range resources would not occur. Cumulative impacts from past, present, and RFFAs, including

the No Action Alternative, to range resources would be less than under the Proposed Action are anticipated to be negligible and short-term.

#### 4.20.11 Recreation

##### 4.20.11.1 CESA Boundary Description

The CESA boundary for recreation includes recreation areas between SR 305 to SR 278 and north of I-80 towards Goldstrike and Arturo Mine (**Figure 4-1**). The CESA is based on the potential cumulative impacts of the Project on recreation opportunities and the spatial intersection of recreation and other land uses, including wildlife and land use and realty, among others. The total area of the CESA encompasses 2,850,318 acres.

##### 4.20.11.2 Past, Present, and Reasonably Foreseeable Future Actions

Within this CESA, past and present disturbance, as detailed in **Table 4-14**, has resulted from the following activities: mineral development, mining, and exploration projects (89,501 acres); utilities, infrastructure, and public purpose activities (9,315 acres); oil, gas, and geothermal infrastructure and facilities (1,313 acres); roads (13,804 acres); railroads (4,986 acres); agricultural areas (4,602 acres); dispersed recreation; and livestock grazing. Additionally, approximately 654,505 acres within the CESA have been affected by recent and past wildland fires.

**Table 4-14 Past, Present, and RFFAs in the Recreation CESA**

Past, Present, and RFFAs, Disturbances and Projects	CESA
CESA Acres	2,850,318
<b>Past Actions</b>	
<b>Mineral Development and Exploration Past Actions</b>	
Sand and Gravel Operations, Materials Sites and Community Sand and Gravel Pits	2,533
Notices	2,241
Mining and Exploration Projects	5,774
Public Purpose	828
<b>Past Actions Total Disturbance Acres</b>	<b>11,376</b>
<b>Present Actions</b>	
<b>Mineral Development and Exploration Present Actions</b>	
Sand and Gravel Operations, Materials Sites and Community Sand and Gravel Pits	4,632
Notices	105
<b>Mining Projects<sup>1</sup></b>	
HC/CUEP <sup>2</sup>	106
Cortez Toiyabe JV Mine	802
Gold Bar Mine	5,071
Mount Hope Mine	8,307
Rain Mine	952
Maggie Creek (Gold Quarry) Mine	9,710
Genesis Mine	4,204
Carlin Mine	2,984
Goldstrike Mine	9,080
Lantern/Genesis/Bluestar Mine	4,204
Mule Canyon Mine	1,400
Cortez Mine	21,170
Other Mining Projects <sup>3</sup>	3,948
<b>Exploration Projects</b>	
West Pine Valley Exploration Project <sup>4</sup>	122
NGM Robertson Exploration Project	294

<b>Past, Present, and RFFAs, Disturbances and Projects</b>	<b>CESA</b>
Pediment Exploration Project	250
Other Exploration Projects <sup>5</sup>	1,623
<b>Utilities, Infrastructure, and Public Purpose Present Actions</b>	
Power Lines	5,661
Communication Facilities	233
Telephone and Fiber Optic Lines	1,387
Water Pipelines and Water Infrastructure	302
Oil and Gas Pipelines	497
Oil and Gas and Geothermal Infrastructure	816
Public Purpose	26
Other	904
Agricultural Areas	4,602
<b>Development and Infrastructure Present Actions Total Disturbance Acres</b>	<b>93,382</b>
<b>Roads and Railroads Present Actions</b>	
State Routes	1,004
Local Roads	4,207
Interstate	2,402
US Highway	408
Other Roads	5,783
Railroads	4,986
<b>Roads and Railroads Present Actions Total Disturbance Acres</b>	<b>18,790</b>
<b>RFFAs</b>	
<b>Mineral Development and Exploration RFFAs</b>	
Sand and Gravel Operations, Materials Sites and Community Sand and Gravel Pits	126
Notices	21
<b>Mining and Exploration RFFAs</b>	
Shasta Project	210
Robertson Mine	5,990
<b>Utilities, Infrastructure, and Public Purpose RFFAs</b>	
Power Lines	1,917
Communication Facilities	2
Telephone and Fiber Optic Lines	26
Water Pipelines and Water Infrastructure	2
Oil and Gas Pipelines	28
Oil and Gas and Geothermal Infrastructure	638
Other	1
<b>RFFAs Total Disturbance Acres</b>	<b>8,961</b>
<b>Past, Present, and RFFAs Total Disturbance Acres</b>	<b>132,509</b>
<b>Percent of CESA</b>	<b>5</b>
<b>Fires</b>	<b>654,505</b>

Source: BLM 2021c

<sup>1</sup> All existing disturbance acres associated with Horse Canyon Mine would be transferred to the Goldrush Mine Plan and HC/CUEP Plan and the Horse Canyon Mine Plan would be closed.

<sup>2</sup> Surface disturbance total included equals the total authorized disturbance of 688.1 less the existing disturbance of 582.6 acres to be transferred to the proposed Goldrush Plan boundary.

<sup>3</sup> Other Mining Projects includes: Greystone Mine, Mountain Springs Mine, Argenta Mine and Mill, Tonkin Spring Mine, Buckhorn Mine, Buck Mine, Dee Gold Mine, Leeville Mine, Carico Lake Mine, Black Rock Canyon Mine and Mill, May Mine, Fire Creek Mine, and Lazy Old Men Mine.

<sup>4</sup> Surface disturbance total included equals the total authorized disturbance of 150 less the existing disturbance of 27.9 acres to be transferred to the proposed Goldrush Plan boundary.

<sup>5</sup> Other Exploration Projects includes: Chevas, Patty, Argenta, Robertson, Hilltop Drilling, HD, Mike, Bell Creek, Goldstrike, Tonkin Springs, Pipeline and South Pipeline, Gold Bar, Toiyabe, CMZ, Pleasant View, Keystone, and Woodruff Creek Exploration Project.

Mineral development and exploration operations in the CESA often limit public access to areas previously used for dispersed recreation. In addition, they may reduce the recreational value and modify the recreational setting when vegetation and/or wildlife are affected and may result in visual and noise impacts for those recreation users seeking experiences of isolation and solitude. These actions also may displace recreationists to surrounding areas. Impacts to recreation resources from mining and exploration operations may be long term if left un-reclaimed (such as open pits); however, impacts are typically short term until reclamation is completed and access and use of the area is restored to pre-Project conditions. In addition, mining activities may increase the population of an area by bringing in mine employees and workers to the areas, which may increase the use of recreation areas within the CESA.

Past and present disturbance associated with utilities, infrastructure, and public purpose projects in the CESA include transmission lines, telephone and fiber optic lines, and water and sewer infrastructure. Lands occupied by utilities and infrastructure generally are still available for dispersed recreation activities, but the recreation setting may have changed due to the presence of man-made features (e.g., power lines and telephone poles). These facilities often include maintenance roads that may increase OHV use in the area and allow vehicular access to areas that previously had little, if any, OHV traffic. Public purpose sites have resulted in these areas no longer being available for dispersed recreation.

Road disturbance within the CESA provides access to recreation areas and can also become a form of recreation. For those seeking solitude and a primitive outdoor experience, development of roads can impact the recreation experience by modifying the recreation setting with the visual appearance and noise of road traffic, as well as the increased vehicular traffic.

Wildland fires may affect recreation resources as they would temporarily affect the area available for dispersed recreation and would impact the recreation setting until revegetation and/or reclamation occurs on the burned area. However, wildland fires do not typically restrict access for recreation activities. Livestock grazing is not consistent with dispersed recreation, and impacts are largely from restricted access to potential recreation areas that may occur from range fencing.

RFFAs in the CESA would include mineral development and exploration projects (6,347 acres) and utilities, infrastructure, and public purpose activities (1,948 acres); and oil, gas, and geothermal infrastructure and facilities (666 acres) (**Table 4-14**). Wildland fires in this CESA may occur in the future, as would restoration projects, livestock grazing, and dispersed recreation. These activities would have similar impacts as stated for past and present actions.

#### **4.20.11.3 Cumulative Effects**

Of the 2,850,318 acres covered by the CESA, 132,509 acres of disturbance are associated with past, present, and RFFA disturbances, which is a disturbance of approximately five percent of the CESA.

#### **Proposed Action**

Approval of the Goldrush Mine would increase disturbance within the CESA by 1,658 acres in addition to disturbance associated with past, present, and RFFAs (132,509 acres) for a total disturbance of 134,167 acres, which is approximately five percent of the CESA. Much of the past, present, and reasonably foreseeable surface disturbance would be reclaimed following the actions, therefore decreasing the potential impacts to recreation. The cumulative un-reclaimed disturbance area that would remain after completion of the interrelated actions, including the Project, would be a small percentage of the total land area in the CESA, and would have a negligible, long-term cumulative effect on recreation.

#### **No Action Alternative**

Under the No Action Alternative, the proposed Goldrush Mine would not be developed and the associated impacts to recreation resources would not occur. Cumulative impacts to recreation resources under the No Action Alternative would be less than those under the Proposed Action but would still be anticipated to be negligible and long-term.

## **4.20.12 Social and Economic Values**

### **4.20.12.1 CESA Boundary Description**

The CESA for social and economic values includes Elko, Eureka, and Lander counties in Nevada (**Figure 4-1**). The social and economic condition outside of this area is unlikely to result in cumulative effects from the proposed Project.

### **4.20.12.2 Past, Present, and Reasonably Foreseeable Future Actions**

The social and economic structure of the CESA is the same as discussed in the Social and Economic Values SER for the Goldrush Mine Project (BLM 2021i), all data on socioeconomic conditions, fiscal conditions, public services, and utilities apply to the CESA analysis as the CESA is the same as the area of analysis. The three counties' combined natural resources and mining sector employment comprises approximately than 44 percent of the total statewide employment in that sector, a large majority of which is devoted to metal mining in the state. All of the counties in the area of analysis are substantially more dependent on mining than the state as a whole, although the data indicate a distinct difference between Elko County and Eureka and Lander counties. The RFFAs are expected to be a continuation of the existing exploration and mining activities and growth associated with the indirect impacts from these activities.

### **4.20.12.3 Cumulative Effects**

The past and present land uses in the CESA have had a direct effect on social and economic values through changes to employment (both type and number of jobs), changes in housing availability, and changes to the overall population.

#### **Proposed Action**

The Proposed Action would contribute to the cumulative effects for the social and economic values in the CESA. This would include providing employment, and increasing demand for housing, income, community facilities, and local government. Increased tax revenues would provide financing to meet some of these demands, although there would likely be a significant time lag between demand and supply for long lead items (e.g., school or utility capacity). The past, present, and RFFAs including the Proposed Action would have a significant positive impact on Eureka and Lander counties in terms of employment and tax revenue but may present problems such as inadequate housing and increased demand for sewage treatment, water, and other county services which may need additional capacity. Due to potential inadequate housing opportunities in Eureka and Lander counties, more workers would be likely to reside in and commute from larger communities in Elko County. The cumulative effects on social and economic values from the past, present, and RFFAs would be long-term, regional, and major.

#### **No Action Alternative**

Under the No Action Alternative, the proposed Goldrush Mine would not be developed and the associated impacts to social and economic values would not occur. Cumulative impacts to social and economic values under the No Action Alternative would be less than those under the Proposed Action but is anticipated to be major, long-term, and regional.

## **4.20.13 Soils**

### **4.20.13.1 CESA Boundary Description**

The CESA boundary for soil resources includes the four grazing allotments the Plan boundary intersects: South Buckhorn, Grass Valley, Carico Lake, and JD (**Figure 4-1**). The CESA was defined to include the maximum geographic extent of effects from surface disturbances and water management activities associated with the proposed Project. The total area of the CESA encompasses 1,328,982 acres.

### **4.20.13.2 Past, Present, and Reasonably Foreseeable Future Actions**

Within this CESA, past and present disturbance, as detailed in **Table 4-15**, has resulted from the following activities: mineral development and exploration projects (37,839 acres); utilities, infrastructure, and public purpose activities (1,966 acres); oil, gas, and geothermal infrastructure and facilities (800 acres); roads (5,172 acres); agricultural areas (13,075 acres); dispersed recreation; and livestock grazing. Additionally, approximately 261,210 acres within the CESA have been affected by recent and past wildland fires.

**Table 4-15 Past, Present, and RFFAs in the Soils CESA**

<b>Past, Present, and RFFAs, Disturbances and Projects</b>	<b>CESA</b>
<b>CESA Acres</b>	<b>1,328,982</b>
<b>Past Actions</b>	
<b>Mineral Development and Exploration Past Actions</b>	
Sand and Gravel Operations, Materials Sites and Community Sand and Gravel Pits	1,010
Notices	1,125
Mining and Exploration Projects	4,773
Public Purpose	20
<b>Past Actions Total Disturbance Acres</b>	<b>6,928</b>
<b>Present Actions</b>	
<b>Mineral Development and Exploration Present Actions</b>	
Sand and Gravel Operations, Materials Sites and Community Sand and Gravel Pits	959
Notices	48
<b>Mining Projects<sup>1</sup></b>	
HC/CUEP <sup>2</sup>	106
Cortez Mine	21,170
McCoy Cove Mine	4,256
Cortez Toiyabe JV Mine	802
Other Mining Projects <sup>3</sup>	1,981
<b>Exploration Projects</b>	
West Pine Valley Exploration Project <sup>4</sup>	150
Pediment Project Exploration	250
NGM Robertson Exploration	294
McCoy Cove Exploration Project	299
Other Exploration Projects <sup>5</sup>	597
<b>Utilities, Infrastructure, and Public Purpose Present Actions</b>	
Power Lines	1,446
Communication Facilities	21
Telephone and Fiber Optic Lines	411
Water Pipelines and Water Infrastructure	87
Oil and Gas and Geothermal Infrastructure	800
Other	98
Agricultural Areas	13,075
<b>Development and Infrastructure Present Actions Total Disturbance Acres</b>	<b>46,850</b>
<b>Roads and Railroads Present Actions</b>	
State Routes	324
Local Roads	1,537
Other Roads	3,311
<b>Roads and Railroads Present Actions Total Disturbance Acres</b>	<b>5,172</b>
<b>RFFAs</b>	
<b>Mineral Development and Exploration RFFAs</b>	
Sand and Gravel Operations, Materials Sites and Community Sand and Gravel Pits	5
Notices	14
<b>Mining and Exploration RFFAs</b>	
Shasta Project	210
Robertson Mine	5,990
<b>Utilities, Infrastructure, and Public Purpose RFFAs</b>	
Power Lines	161

<b>Past, Present, and RFFAs, Disturbances and Projects</b>	<b>CESA</b>
Telephone and Fiber Optic Lines	2
Water Pipelines and Water Infrastructure	2
Oil and Gas Pipelines	2
<b>RFFAs Total Disturbance Acres</b>	<b>6,386</b>
<b>Past, Present, and RFFAs Total Disturbance Acres</b>	<b>65,336</b>
<b>Percent of CESA</b>	<b>5</b>
<b>Fires</b>	<b>261,210</b>

Source: BLM 2021c

<sup>1</sup> All existing disturbance acres associated with Horse Canyon Mine would be transferred to the Goldrush Mine Plan and HC/CUEP Plan and the Horse Canyon Mine Plan would be closed

<sup>2</sup> Surface disturbance total included equals the total authorized disturbance of 688.1 less the existing disturbance of 582.6 acres to be transferred to the proposed Goldrush Plan boundary.

<sup>3</sup> Other Mining Projects includes: Greystone Mine, Mountain Springs Mine, Tonkin Spring Mine, Buckhorn Mine, Buck Mine, Carico Lake Mine, Cove-Helen Mine, and Lazy Old Men Mine.

<sup>4</sup> Surface disturbance total included equals the total authorized disturbance of 150 less the existing disturbance of 27.9 acres to be transferred to the proposed Goldrush Plan boundary.

<sup>5</sup> Other Exploration Projects includes: CMZ, Robertson, Toiyabe, Gold Bar, Pipeline and South Pipeline, Patty Project, Pediment Project, Keystone, and Tonkin Springs Exploration.

Each past and present disturbance in the CESA may have impacted soil resources in a variety of ways. Heavy equipment could have resulted in soil compaction, increasing the density to the point where vegetation cannot grow and support the ecosystem. Disturbance of soil can make it vulnerable to wind and water erosion. Heavy precipitation events can then remove soil, and transport sediment downstream. Roads reduce the infiltration of water into the soil and concentrate erosive forces down embankments. Fine particulates can easily contaminate the water or air and are difficult to recapture once they are disturbed from the environment. Natural soil profiles also are lost during ground disturbance. Contamination can occur by exposing naturally occurring geochemical processes or through inadvertent releases.

Recreation and livestock grazing may also have resulted in impacts to the soil. These uses can increase erosion, particularly along waterways where activities are concentrated. Trails can serve as new sources of erosion, combining disturbance of the vegetation with breaking apart the soil surface, which can channel precipitation into new areas.

Wildland fire can alter soil infiltration (e.g., create hydrophobicity) and remove or change the vegetation, which prevents erosion. Particularly hot fires also can sterilize the soil, eliminating the seed bank, and preventing vegetative regrowth. Regular occurrences of fire also are a natural component of the landscape, returning nutrients to the soil and triggering succession of different communities in the CESA.

RFFAs in the CESA would include mineral development and exploration projects (6,219 acres); oil, gas, and geothermal facilities and infrastructure (2 acres); and utilities, infrastructure, and public purpose activities (165 acres) (**Table 4-15**). Wildland fires in this CESA may occur in the future, as would restoration projects, and dispersed recreation. These activities would lead to similar disturbances and impacts as stated in past and present actions.

#### **4.20.13.3 Cumulative Effects**

Of the 1,328,982 acres covered by the CESA, 65,336 acres of disturbance are associated with past, present, and RFFA disturbances, which is a disturbance of approximately five percent of the CESA.

#### **Proposed Action**

Approval of the Goldrush Mine would increase disturbance within the CESA by 1,658 acres in addition to disturbance associated with past, present, and RFFAs (65,336 acres) for a total disturbance of 66,994 acres, or approximately five percent of the CESA. Most projects in the CESA would reclaim most of the disturbance; therefore, the majority of disturbance is not permanent in nature. Cumulative impacts of the past, present, and RFFAs including the Proposed Action would be moderate prior to successful reclamation, and minor after successful reclamation.



### **No Action Alternative**

Under the No Action Alternative, the proposed Goldrush Mine would not be developed and the associated impacts to soil resources would not occur. Cumulative impacts to soil resources under the No Action Alternative would be less than those under the Proposed Action but would still be anticipated to be a minor, short-term, and localized.

#### **4.20.14 Transportation and Access**

##### **4.20.14.1 CESA Boundary Description**

The proposed CESA boundary would include the proposed Plan boundary and the primary access roads between the project and off-site processing (**Figure 4-2**). Additionally, it includes the primary access roads from Goldrush to Elko/Spring Creek and Battle Mountain for employee transportation and consists of I-80, SR 766, SR 306, and Cortez Canyon Road (County Roads 222 and 225). This would be the same as the area of analysis for transportation and access and encompasses an area of 4,950 acres.

##### **4.20.14.2 Past, Present, and Reasonably Foreseeable Future Actions**

Within the vicinity of the CESA, past and present activities include the following: mineral development and exploration projects utilities, infrastructure, and public purpose activities; oil, gas, and geothermal development; roads and railroads; dispersed recreation; and livestock grazing. It is assumed that the traffic generated from the present activities in the CESA is captured in the existing conditions of the traffic study.

Given the nature of the CESA, the majority of the land within the CESA has been disturbed by past and present mining and exploration; and road projects, including U.S. highways, state routes, local roads, and other roads.

These activities have resulted in increased traffic on the surrounding road network. Traffic generation depends on the size and intensity of operations of the facilities. Infrastructure development and public purpose sites (e.g., wastewater treatment facilities) surrounding the CESA may generate traffic during construction and following construction as part of routine maintenance.

RFFAs within the vicinity of CESA would include mineral development and exploration projects and utilities and infrastructure. The traffic analysis assumes a background growth rate in the CESA of three percent, the RFFAs are that are not large-scale projects are included in this background growth rate. At this time no large-scale RFFAs have been identified that would contribute to traffic in the CESA. Wildland fires in and surrounding this CESA may occur in the future, as would restoration projects, livestock grazing, and dispersed recreation. These actions would have similar impacts as stated for past and present actions.

##### **4.20.14.3 Cumulative Effects**

The transportation and access CESA encompasses 4,950 acres. Due to the nature of the CESA occurring along transportation routes, the vast majority of the area already has been disturbed by past and present actions.

### **Proposed Action**

Although the Proposed Action would generate traffic from new employees and construction workers in the CESA, impacts from the Proposed Action with the additional three percent projected growth rate would be the same as described for the Proposed Action in the Transportation and Access SER for the Goldrush Mine Project (BLM 2021e). The Proposed Action would not degrade the level of service to an unacceptable level and impacts to the Loss of Service in the CESA are anticipated to be short-term, minor, and localized; the effects of the Proposed Action and RFFAs on SR 306 and SR 766 may result in lowered design life of these roads resulting in moderate, long-term, and localized impacts to the CESA; and the Proposed Action and RFFAs could result in impacts to unimproved roads in the CESA, and impacts would be moderate, long-term, and localized.

### **No Action Alternative**

Under the No Action Alternative, the proposed Goldrush Mine would not be developed and the associated impacts to soil resources would not occur. Cumulative impacts to transportation and access from past,

present, and RFFAs including the No Action Alternative would be less than those under the Proposed Action but would still be anticipated to be a minor, short-term, and localized.

#### 4.20.15 Vegetation, Including Noxious and Invasive Non-native Species and Special Status Plants

##### 4.20.15.1 CESA Boundary Description

The CESA boundary for vegetation, including noxious weeds, invasive species, and special status species includes the land area within the Goldrush Mine Plan boundary and the portions of the 120-kV power line and switching stations, contact water pipeline, and Mount Tenabo access road that occur outside of the proposed Goldrush Mine Plan boundary (**Figure 4-1**). The CESA was defined to include the maximum geographic extent of effects to vegetation resources from surface disturbances and water management activities associated with the Proposed Action. The total area of the CESA encompasses 1,328,982 acres.

##### 4.20.15.2 Past, Present, and Reasonably Foreseeable Future Actions

Within this CESA, past and present disturbance, as detailed in **Table 4-16**, has resulted from the following activities: mineral development and exploration projects (37,839 acres); utilities, infrastructure, and public purpose activities (1,966 acres); oil, gas, and geothermal infrastructure and facilities (800 acres); roads (5,172 acres); agricultural areas (13,075 acres); dispersed recreation; and livestock grazing.

**Table 4-16 Past, Present, and RFFAs in the Vegetation, Including Noxious and Invasive Species CESA**

Past, Present, and RFFAs, Disturbances and Projects	CESA
CESA Acres	1,328,982
<b>Past Actions</b>	
<b>Mineral Development and Exploration Past Actions</b>	
Sand and Gravel Operations, Materials Sites and Community Sand and Gravel Pits	1,010
Notices	1,125
Mining and Exploration Projects	4,773
Public Purpose	20
<b>Past Actions Total Disturbance Acres</b>	<b>6,928</b>
<b>Present Actions</b>	
<b>Mineral Development and Exploration Present Actions</b>	
Sand and Gravel Operations, Materials Sites and Community Sand and Gravel Pits	959
Notices	48
<b>Mining Projects<sup>1</sup></b>	
HC/CUEP <sup>2</sup>	106
Cortez Mine	21,170
McCoy Cove Mine	4,256
Cortez Toiyabe JV Mine	802
Other Mining Projects <sup>3</sup>	1,981
<b>Exploration Projects</b>	
West Pine Valley Exploration Project <sup>4</sup>	150
Pediment Project Exploration	250
NGM Robertson Exploration	294
McCoy Cove Exploration Project	299
Other Exploration Projects <sup>5</sup>	597
<b>Utilities, Infrastructure, and Public Purpose Present Actions</b>	
Power Lines	1,446
Communication Facilities	21

<b>Past, Present, and RFFAs, Disturbances and Projects</b>	<b>CESA</b>
Telephone and Fiber Optic Lines	411
Water Pipelines and Water Infrastructure	87
Oil and Gas and Geothermal Infrastructure	800
Other	98
Agricultural Areas	13,075
<b>Development and Infrastructure Present Actions Total Disturbance Acres</b>	<b>46,850</b>
<b>Roads and Railroads Present Actions</b>	
State Routes	324
Local Roads	1,537
Other Roads	3,311
<b>Roads and Railroads Present Actions Total Disturbance Acres</b>	<b>5,172</b>
<b>RFFAs</b>	
<b>Mineral Development and Exploration RFFAs</b>	
Sand and Gravel Operations, Materials Sites and Community Sand and Gravel Pits	5
Notices	14
<b>Mining and Exploration RFFAs</b>	
Shasta Project	210
Robertson Mine	5,990
<b>Utilities, Infrastructure, and Public Purpose RFFAs</b>	
Power Lines	161
Telephone and Fiber Optic Lines	2
Water Pipelines and Water Infrastructure	2
Oil and Gas Pipelines	2
<b>RFFAs Total Disturbance Acres</b>	<b>6,386</b>
<b>Past, Present, and RFFAs Total Disturbance Acres</b>	<b>65,336</b>
<b>Percent of CESA</b>	<b>5</b>
<b>Fires</b>	<b>261,210</b>

Source: BLM 2021c

<sup>1</sup> All existing disturbance acres associated with Horse Canyon Mine would be transferred to the Goldrush Mine Plan and HC/CUEP Plan and the Horse Canyon Mine Plan would be closed.

<sup>2</sup> Surface disturbance total included equals the total authorized disturbance of 688.1 less the existing disturbance of 582.6 acres to be transferred to the proposed Goldrush Plan boundary.

<sup>3</sup> Other Mining Projects includes: Greystone Mine, Mountain Springs Mine, Tonkin Spring Mine, Buckhorn Mine, Buck Mine, Carico Lake Mine, Cove-Helen Mine, and Lazy Old Men Mine.

<sup>4</sup> Surface disturbance total included equals the total authorized disturbance of 150 less the existing disturbance of 27.9 acres to be transferred to the proposed Goldrush Plan boundary.

<sup>5</sup> Other Exploration Projects includes: CMZ, Robertson, Toiyabe, Gold Bar, Pipeline and South Pipeline, Patty Project, Pediment Project, Keystone, and Tonkin Springs Exploration.

Actions that directly remove vegetation, including special status species, during ground-disturbing development have the potential to introduce or spread noxious weeds and non-native invasive plant species. These actions include the construction of mines, roads, utilities, and associated infrastructure. Noxious weeds and non-native invasive plant species are often the first species to establish, especially along road corridors and where vehicles travel off-road. Vehicles that travel off-road can spread seeds of noxious weeds and non-native invasive plant species, and roads create access into areas that might not otherwise have been accessible. Reclamation and revegetation required for projects on public land would minimize long-term impacts to vegetation. Noxious weeds and non-native invasive plant species are more likely to establish in disturbed areas; therefore, successful reclamation limits the spread of these species. Indirect impacts from past and present disturbances include impacts from fugitive dust, which can cover leaves, thereby reducing photosynthesis. Surface disturbance from off-road recreation and livestock trampling remove vegetative layer and can result in increased erosion. Livestock grazing can impact vegetation communities through the intensity of grazing which removes herbaceous undergrowth, and through the introduction and spread of noxious weeds and non-native invasive plant species.

Approximately 261,210 acres within the CESA have been affected by recent and past wildland fires. Wildland fires can dramatically change vegetation communities, often from shrublands to grasslands, with impacts throughout the CESA's ecosystem.

RFFAs in the CESA would include mineral development and exploration projects (6,219 acres); oil, gas, and geothermal facilities and infrastructure (2 acres); and utilities, infrastructure, and public purpose activities (165 acres) (**Table 4-16**). Wildland fires in this CESA may occur in the future, as would restoration projects, and dispersed recreation. These activities would lead to similar disturbances and impacts as stated in past and present actions.

#### 4.20.15.3 Cumulative Effects

Of the 1,328,982 acres covered by the CESA, 65,336 acres of disturbance are associated with past, present, and RFFA disturbances, which is a disturbance of approximately five percent of the CESA.

#### Proposed Action

The Proposed Action would increase disturbance within the CESA by 1,658 acres in addition to disturbance associated with past, present, and RFFAs (65,336 acres) for a total disturbance of 66,994 acres, which is approximately five percent of the CESA. Most projects in the CESA would go through reclamation of most of the disturbance; therefore most of the past, present, and RFFA disturbance is not permanent in nature. The cumulative un-reclaimed disturbance area that would remain after completion of the interrelated actions, including the Project, would be a small percentage of the total land area in the CESA. Both reclaimed and un-reclaimed disturbance from past, present, and RFFAs including the Proposed Action would have a negligible, short-term localized effect on vegetation resources.

#### No Action Alternative

Under the No Action Alternative, the proposed Goldrush Mine would not be developed and the associated impacts to vegetation resources would not occur. Cumulative impacts to vegetation resources, including noxious and invasive vegetation and special status vegetation species, from past, present, and RFFAs including the No Action Alternative would be less than those under the Proposed Action but is anticipated to be negligible, short-term, and localized.

#### 4.20.16 Visual Resources

##### 4.20.16.1 CESA Boundary Description

The CESA boundary for visual resources encompasses the viewshed within approximately 20 miles of the proposed Project from which the proposed Project would be visible (**Figure 4-2**). A viewshed analysis, as seen from the KOPs, was conducted to document which proposed Project facilities would be visible from locations within the CESA boundary. The total area of the CESA encompasses 524,135 acres.

#### 4.20.17 Past, Present, and Reasonably Foreseeable Future Actions

Within this CESA, past and present disturbance, as detailed in **Table 4-17**, has resulted from the following activities: mineral development and exploration projects (24,544 acres); utilities, infrastructure, and public purpose activities (1,476 acres); oil, gas, and geothermal facilities and infrastructure (480 acres); roads (3,226 acres); agricultural areas (1,133 acres); dispersed recreation; and livestock grazing. Additionally, approximately 112,113 acres within the CESA have been affected by recent and past wildland fires, resulting in various stages of disturbance and vegetation recovery.

**Table 4-17 Past, Present, and RFFAs in the Visual Resources CESA**

Past, Present, and RFFAs, Disturbances and Projects	CESA
CESA Acres	526,785
<b>Past Actions</b>	
<b>Mineral Development and Exploration Past Actions</b>	
Sand and Gravel Operations, Materials Sites and Community Sand and Gravel Pits	722
Notices	609

<b>Past, Present, and RFFAs, Disturbances and Projects</b>	<b>CESA</b>
Mining and Exploration Projects	2,605
Public Purpose	55
<b>Past Actions Total Disturbance Acres</b>	<b>3,991</b>
<b>Present Actions</b>	
<b>Mineral Development and Exploration Present Actions</b>	
Sand and Gravel Operations, Materials Sites and Community Sand and Gravel Pits	716
Notices	19
<b>Mining Projects<sup>1</sup></b>	
HC/CUEP <sup>2</sup>	106
Cortez Mine	17,821
Other Mining Projects <sup>3</sup>	775
<b>Exploration Projects</b>	
West Pine Valley Exploration Project <sup>4</sup>	122
NGM Robertson Exploration Project	294
Pediment Exploration Project	250
Other Exploration Projects <sup>5</sup>	451
<b>Utilities, Infrastructure, and Public Purpose Present Actions</b>	
Power Lines	1,066
Communication Facilities	1
Telephone and Fiber Optic Lines	341
Water Pipelines and Water Infrastructure	63
Oil and Gas and Geothermal Infrastructure	480
Other	364
Agricultural Areas	1,133
<b>Development and Infrastructure Present Actions Total Disturbance Acres</b>	<b>23,643</b>
<b>Roads and Railroads Present Actions</b>	
State Routes	363
Local Roads	1,095
Other Roads	1,768
<b>Roads and Railroads Present Actions Total Disturbance Acres</b>	<b>3,226</b>
<b>RFFAs</b>	
<b>Mineral Development and Exploration RFFAs</b>	
Notices	13
<b>Mining and Exploration RFFAs</b>	
Shasta Project	210
Robertson Mine	5,990
<b>Utilities, Infrastructure, and Public Purpose RFFAs</b>	
Power Lines	161
<b>RFFAs Total Disturbance Acres</b>	<b>6,373</b>
<b>Past, Present, and RFFAs Total Disturbance Acres</b>	<b>37,234</b>
<b>Percent of CESA</b>	<b>7</b>
<b>Fires</b>	<b>112,113</b>

Source: BLM 2021c

<sup>1</sup> All existing disturbance acres associated with Horse Canyon Mine would be transferred to the Goldrush Mine Plan and HC/CUEP Plan and the Horse Canyon Mine Plan would be closed.

<sup>2</sup> Surface disturbance total included equals the total authorized disturbance of 688.1 less the existing disturbance of 582.6 acres to be transferred to the proposed Goldrush Plan boundary.

<sup>3</sup> Other Mining Projects includes: Buckhorn Mine, Buck Mine, Rain Mine, Buffalo Valley Mine, Fire Creek Mine, Black Rock Canyon Mine and Mill, Mountain Springs Mine, Carico Lake Mine, May Mine, and Lazy Old Men Mine.

<sup>4</sup> Surface disturbance total included equals the total authorized disturbance of 150 less the existing disturbance of 27.9 acres to be transferred to the proposed Goldrush Plan boundary.

<sup>5</sup> Other Exploration Projects includes: Poker Flats, Keystone, CMZ, Railroad, Robertson, HD, Argenta, South Railroad, Toiyabe, Copper Basin, Hilltop Drilling, Buffalo Valley, Woodruff, Emigrant Springs, Mike, Pleasant View, Patty, Gold Bar, Pipeline and South Pipeline, Tonkin Springs, and Converse Exploration Projects.

Mining for minerals and sand and gravel have concentrated impacts on visual resources. These often include large-scale topographic changes with associated change in vegetation and alternations in linear features (e.g., drainage patterns, skylines). Effects are often long-term, with permanent changes in topography and un-reclaimed features such as pits, ponds, and cliff faces. Rehabilitation can contour topography to blend into the surrounding landscape and promote re-establishment of vegetation communities.

Utilities and roads disrupt the visual landscape with form and line elements. These can be aboveground (e.g., power lines and roads) with visible infrastructure interrupting the landscape. Underground utilities also can cause disturbances with linear changes in vegetation caused by ground disturbance or support infrastructure (e.g., access roads). Reclamation can re-establish vegetation, which can be in different successional stages than the surrounding habitat.

Nighttime operations on mining facilities can have an impact on dark sky resources. Features that may not be readily visible during the day could be illuminated at night due to facility and equipment lighting. Directed and hooded lighting fixtures, as well as other mitigation measures, can reduce the cumulative effect of artificial lighting on dark sky resources.

Recreation can have impacts to visual resources, often through the introduction of linear features. Trails can be visible from great distances and are easily formed from disturbance of the soil with relatively low levels of activity. Trails take long time periods to restore, and often attract use from their visual signature. Concentrated recreational areas, such as campgrounds and interpretive sites, also disrupt the visual landscape.

Wildland fire can impact visual resources primarily through changes in texture and color elements. Covering vegetation is often eliminated, shrubs are converted to grasslands, and the landscape is darkened with carbon. Fire also is patchy, altering the visual landscape in apparently random paths. This can be recognized in the long term, with different neighboring successional stages of vegetation communities visible throughout the CESA.

RFFAs in the CESA would include material and mineral mining, development, and exploration projects (6,213 acres); and utilities and infrastructure (161 acres) (**Table 4-17**). Wildland fires in this CESA may occur in the future, as would restoration projects, livestock grazing, and dispersed recreation. These activities would have similar impacts as stated for past and present actions.

#### **4.20.17.1 Cumulative Effects**

Of the 526,785 acres covered by the CESA, 37,234 acres of disturbance are associated with past, present, and RFFA disturbances, which is a disturbance of approximately seven percent of the CESA.

#### **Proposed Action**

Approval of the Goldrush Mine would increase disturbance within the CESA by 1,658 acres in addition to disturbance associated with past, present, and RFFAs (37,234 acres) for a total disturbance of 38,892 acres, which is approximately seven percent of the CESA. Cumulative effects to visual resources in the CESA from the proposed Project in combination with past, present, and RFFAs would include changes in line, form, color, and texture elements that would contrast with the existing landscape. The Proposed Action would increase the direct effects of contrast (i.e., minor color contrast and minor line and form contrast) with the existing landscape by increasing visual impacts in the CESA. The impacts from past, present and RFFAs including the Proposed Action would blend with the existing disturbance and have a minor, localized additional impact to visual resources. Reclamation activities would further reduce the visual impacts of the proposed Project.

**No Action Alternative**

Under the No Action Alternative, the proposed Goldrush Mine would not be developed and the associated impacts to visual resources and geochemistry would not occur. Cumulative impacts to visual resources under the No Action Alternative would be less than those under the Proposed Action but would be anticipated to be minor, long-term, and localized.

**4.20.18 Water Resources and Geochemistry**

**4.20.18.1 CESA Boundary Description**

The CESA boundary for water resources and geochemistry encompasses four hydrographic basins: Crescent Valley, Pine Valley, Grass Valley, and Carico Lake Valley (**Figure 4-1**). The total area of the CESA encompasses 1,742,423 acres. The CESA was defined to include the maximum geographic extent of effects from surface disturbances and water management activities associated with the Proposed Action and past, present, and RFFAs.

**4.20.18.2 Past, Present, and Reasonably Foreseeable Future Actions**

Within this CESA, past and present disturbance, as detailed in **Table 4-18**, has resulted from the following activities: mineral development and exploration projects (34,254 acres); utilities, infrastructure, and public purpose activities (5,453 acres); oil, gas, and geothermal facilities and infrastructure (1,358 acres); roads (6,926 acres); agricultural areas (2,131 acres); railroads (916 acres); dispersed recreation; and livestock grazing. Additionally, approximately 483,477 acres within the CESA have been affected by recent and past wildland fires, resulting in various stages of disturbance and vegetation recovery.

**Table 4-18 Past, Present, and RFFAs in the Water Resources and Geochemistry CESA**

<b>Past, Present, and RFFAs, Disturbances and Projects</b>	<b>CESA</b>
<b>CESA Acres</b>	<b>1,742,423</b>
<b>Past Actions</b>	
<b>Mineral Development and Exploration Past Actions</b>	
Sand and Gravel Operations, Materials Sites and Community Sand and Gravel Pits	991
Notices	1,540
Mining and Exploration Projects	5,119
Public Purpose	65
<b>Past Actions Total Disturbance Acres</b>	<b>7,714</b>
<b>Present Actions</b>	
<b>Mineral Development and Exploration Present Actions</b>	
Sand and Gravel Operations, Materials Sites and Community Sand and Gravel Pits	1,021
Notices	70
<b>Mining Projects<sup>1</sup></b>	
HC/CUEP <sup>2</sup>	106
Cortez Mine	21,170
Cortez Toiyabe JV Mine	802
Other Mining Projects <sup>3</sup>	1,946
<b>Exploration Projects</b>	
West Pine Valley Exploration Project <sup>4</sup>	122
Pediment Exploration Project	250
Other Exploration Projects <sup>5</sup>	1,118
<b>Utilities, Infrastructure, and Public Purpose Present Actions</b>	
Power Lines	1,238
Communication Facilities	125
Telephone and Fiber Optic Lines	341
Water Pipelines and Water Infrastructure	100

<b>Past, Present, and RFFAs, Disturbances and Projects</b>	<b>CESA</b>
Oil and Gas and Geothermal Infrastructure	1,358
Other	95
Agricultural Areas	2,131
<b>Development and Infrastructure Present Actions Total Disturbance Acres</b>	<b>31,992</b>
<b>Roads and Railroads Present Actions</b>	
State Routes	646
Local Roads	2,505
Other Roads	3,775
Railroads	916
<b>Roads and Railroads Present Actions Total Disturbance Acres</b>	<b>7,842</b>
<b>RFFAs</b>	
<b>Mineral Development and Exploration RFFAs</b>	
Sand and Gravel Operations, Materials Sites and Community Sand and Gravel Pits	5
Notices	30
<b>Mining and Exploration RFFAs</b>	
Shasta Project	210
South Railroad Mine	1,771
Robertson Mine	5,990
<b>Utilities, Infrastructure, and Public Purpose RFFAs</b>	
Power Lines	161
Water Pipelines and Water Infrastructure	2
Oil and Gas and Geothermal Infrastructure	638
Other	
<b>RFFAs Total Disturbance Acres</b>	<b>8,797</b>
<b>Past, Present, and RFFAs Total Disturbance Acres</b>	<b>56,345</b>
<b>Percent of CESA</b>	<b>3</b>
<b>Fires</b>	<b>483,477</b>

Source: BLM 2021c

<sup>1</sup> All existing disturbance acres associated with Horse Canyon Mine would be transferred to the Goldrush Mine Plan and HC/CUEP Plan and the Horse Canyon Mine Plan would be closed.

<sup>2</sup> Surface disturbance total included equals the total authorized disturbance of 688.1 less the existing disturbance of 582.6 acres to be transferred to the proposed Goldrush Plan boundary.

<sup>3</sup> Other Mining Projects includes: Greystone Mine, Tonkin Spring Mine, Buckhorn Mine, Rain Mine, Buck Mine, Carico Lake Mine, Black Rock Canyon Mine and Mill, May Mine, and Fire Creek Mine.

<sup>4</sup> Surface disturbance total included equals the total authorized disturbance of 150 less the existing disturbance of 27.9 acres to be transferred to the proposed Goldrush Plan boundary.

<sup>5</sup> Other Exploration Projects includes: Pipeline and South Pipeline, Robertson, Hilltop Drilling, Patty Project, Emigrant Springs Project, Woodruff Creek Project, Railroad, Toiyabe, CMZ, South Railroad, Keystone, Gold Bar Project, and Tonkin Springs Project.

Wildland fires are a major disturbance to water resources. These can impact surface water quality by removing the vegetation layer and increasing erosion and downstream turbidity. Storms can cause mass losses of sediment along eroded embankments, altering the course of hydrological systems. Wildland fires also can change the ecosystem, replacing shrub habitat with grasslands. Shrubs are more resistant to erosion, but grasslands are more adaptable to changing environmental conditions.

Mining also has the potential for cumulative impacts to water quality and quantity. Individually insignificant dewatering of numerous mine pits or underground facilities can cause CESA-wide changes in both groundwater and surface water quantity. Exposure of naturally occurring geochemical conditions can cause harmful constituents to enter the watershed through inadvertent release. Waste rock poses a threat for erosion and sedimentation to the watershed. Individual mine impacts may be minor to negligible, while cumulative mining activity can pose potential for significant impacts to water quality in the CESA.



Previous construction associated with utilities, infrastructure projects, and roads may have used water during construction, and the largest potential post-construction effect likely is related to erosion and sedimentation associated with access roads or reclaimed disturbances. All roads can present water quality impacts due to inadvertent spills or releases during vehicular accidents. Unpaved roads, such as those crossing public lands and those within recreation sites in the CESA, also can be a source of increased erosion and sedimentation. Paved roads may cause water quality issues resulting from increased stormwater run-off.

Rangeland management also is an important disturbance to, and utilizer of, water resources in the CESA. Rangeland management relies on predictable subsurface and surface water quantity and quality to sustain activities. This source can contribute to changes in water quality through the additions of nitrogen and other constituents. Livestock also can trample vegetation around water sources, degrading surface water quality through the subsequent erosion.

RFFAs in the CESA would include material and mineral mining, development, and exploration projects (8,006 acres); utilities and infrastructure (163 acres); and oil, gas, and geothermal infrastructure and facilities (638 acres) (**Table 4-18**). Wildland fires in this CESA may occur in the future, as would restoration projects, livestock grazing, and dispersed recreation. These activities would have similar impacts as stated for past and present actions.

The groundwater model includes other pumping activities from past and present actions. The numerical groundwater flow model and impact assessment collected per the Cortez Mine's Integrated Monitoring Plan, required by the BLM since the 1996 approval of the Pipeline Complex, examines the combined effects of prior, current, and proposed dewatering operations in the four-basin area. The model was calibrated using data through the year 2015 to provide predictions for the Deep South Expansion Project (SRK 2016) and effects of dewatering of Deep South and Goldrush Mine underground mines (SRK 2017). The model was recalibrated again using measured data between 2016 and 2018 to support dewatering simulations for the Goldrush Mine (SRK 2020), which included projected dewatering impacts from the potential future Four Mile Project. Predictive simulations include the authorized actions for the Pipeline Complex, the Cortez Mine Complex, and the Cortez Hills Complex (SRK 2017, 2020). The areas predicted to experience a drawdown of groundwater levels resulting from the Goldrush Mine in combination with the other authorized actions in the CESA are further discussed and visualized (Figures 3-2a through 3-4b) in the Water Resources and Geochemistry SER for the Goldrush Mine Project (BLM 2021f).

#### **4.20.18.3 Cumulative Effects**

Of the 1,742,423 acres covered by the CESA, 56,345 acres of disturbance are associated with past, present, and RFFA disturbances, which is a disturbance of approximately three percent of the CESA.

#### **Proposed Action**

Approval of the Goldrush Mine would increase disturbance within the CESA by 1,658 acres in addition to disturbance associated with past, present, and other RFFAs (56,345 acres) for a total disturbance of 58,003 acres, which is approximately three percent of the CESA. Although the cumulative surface disturbance would be greater than the proposed new disturbance from the Goldrush Mine, it still would be a small increment of the vast acreage of public lands in the Goldrush Mine vicinity and would have minor effect on water resources displaced by past and present actions in the CESA. Past and present actions are accounted for in the numerical groundwater flow model for prior, current, and proposed dewatering operations as discussed above in **Section 3.17.2**. There are no additional RFFAs from proposed dewatering within the CESA; thus, there are no RFFAs identified. Therefore, the cumulative effects to groundwater are the same as identified for the Proposed Action in the Water Resources and Geochemistry SER for the Goldrush Mine Project (BLM 2021f). The cumulative un-reclaimed disturbance area that would remain after completion of the interrelated actions, including the Project, would be a small percentage of the total land area in the CESA, and would have a minor to moderate, long-term regional effect on water resources and geochemistry.

#### **No Action Alternative**

Under the No Action Alternative, the proposed Goldrush Mine would not be developed and the associated impacts to water resources and geochemistry would not occur. Cumulative impacts to water resources from

past, present, and RFFAs including the No Action Alternative would be less than those under the Proposed Action but would be anticipated to be minor to moderate, long-term, and regional.

#### 4.20.19 Wetlands and Riparian Areas

##### 4.20.19.1 CESA Boundary Description

The CESA boundary for wetlands and riparian areas is the HSA domain boundary, which would be area of the proposed Goldrush Plan boundary and predicted 10-foot drawdown contour for dewatering operations (**Figure 4-1**). The total area of the CESA encompasses 1,742,423 acres. The CESA was defined to include the maximum geographic extent of effects from surface disturbances and water management activities associated with the Proposed Action and past, present, and RFFAs.

##### 4.20.19.2 Past, Present, and Reasonably Foreseeable Future Actions

Within this CESA, past and present disturbance, as detailed in **Table 4-19**, has resulted from the following activities: mineral development and exploration projects (34,254 acres); utilities, infrastructure, and public purpose activities (5,453 acres); oil, gas, and geothermal facilities and infrastructure (1,358 acres); roads (6,926 acres); agricultural areas (2,131 acres); railroads (916 acres); dispersed recreation; and livestock grazing. Additionally, approximately 483,477 acres within the CESA have been affected by recent and past wildland fires, resulting in various stages of disturbance and vegetation recovery.

**Table 4-19 Past, Present, and RFFAs in the Wetland and Riparian CESA**

Past, Present, and RFFAs, Disturbances and Projects	CESA
CESA Acres	1,742,423
<b>Past Actions</b>	
<b>Mineral Development and Exploration Past Actions</b>	
Sand and Gravel Operations, Materials Sites and Community Sand and Gravel Pits	991
Notices	1,540
Mining and Exploration Projects	5,119
Public Purpose	65
<b>Past Actions Total Disturbance Acres</b>	<b>7,714</b>
<b>Present Actions</b>	
<b>Mineral Development and Exploration Present Actions</b>	
Sand and Gravel Operations, Materials Sites and Community Sand and Gravel Pits	1,021
Notices	70
<b>Mining Projects<sup>1</sup></b>	
HC/CUEP <sup>2</sup>	106
Cortez Mine	21,170
Cortez Toiyabe JV Mine	802
Other Mining Projects <sup>3</sup>	1,946
<b>Exploration Projects</b>	
West Pine Valley Exploration Project <sup>4</sup>	122
Pediment Exploration Project	250
Other Exploration Projects <sup>5</sup>	1,118
<b>Utilities, Infrastructure, and Public Purpose Present Actions</b>	
Power Lines	1,238
Communication Facilities	125
Telephone and Fiber Optic Lines	341
Water Pipelines and Water Infrastructure	100
Oil and Gas and Geothermal Infrastructure	1,358
Other	95
Agricultural Areas	2,131

<b>Past, Present, and RFFAs, Disturbances and Projects</b>	<b>CESA</b>
<b>Development and Infrastructure Present Actions Total Disturbance Acres</b>	<b>31,992</b>
<b>Roads and Railroads Present Actions</b>	
State Routes	646
Local Roads	2,505
Other Roads	3,775
Railroads	916
<b>Roads and Railroads Present Actions Total Disturbance Acres</b>	<b>7,842</b>
<b>RFFAs</b>	
<b>Mineral Development and Exploration RFFAs</b>	
Sand and Gravel Operations, Materials Sites and Community Sand and Gravel Pits	5
Notices	30
<b>Mining and Exploration RFFAs</b>	
Shasta Project	210
South Railroad Mine	1,771
Robertson Mine	5,990
<b>Utilities, Infrastructure, and Public Purpose RFFAs</b>	
Power Lines	161
Water Pipelines and Water Infrastructure	2
Oil and Gas and Geothermal Infrastructure	638
Other	
<b>RFFAs Total Disturbance Acres</b>	<b>8,797</b>
<b>Past, Present, and RFFAs Total Disturbance Acres</b>	<b>56,345</b>
<b>Percent of CESA</b>	<b>3</b>
<b>Fires</b>	<b>483,477</b>

Source: BLM 2021c

<sup>1</sup> All existing disturbance acres associated with Horse Canyon Mine would be transferred to the Goldrush Mine Plan and HC/CUEP Plan and the Horse Canyon Mine Plan would be closed.

<sup>2</sup> Surface disturbance total included equals the total authorized disturbance of 688.1 less the existing disturbance of 582.6 acres to be transferred to the proposed Goldrush Plan boundary.

<sup>3</sup> Other Mining Projects includes: Greystone Mine, Tonkin Spring Mine, Buckhorn Mine, Rain Mine, Buck Mine, Carico Lake Mine, Black Rock Canyon Mine and Mill, May Mine, and Fire Creek Mine.

<sup>4</sup> Surface disturbance total included equals the total authorized disturbance of 150 less the existing disturbance of 27.9 acres to be transferred to the proposed Goldrush Plan boundary.

<sup>5</sup> Other Exploration Projects includes: Pipeline and South Pipeline, Robertson, Hilltop Drilling, Patty Project, Emigrant Springs Project, Woodruff Creek Project, Railroad, Toiyabe, CMZ, South Railroad, Keystone, Gold Bar Project, and Tonkin Springs Project.

Mineral and gravel mining represent one of the major land disturbing activities present within the wetlands and riparian areas CESA. This use precludes other land uses, such as grazing, recreation, or development of other resources. These impacts typically are concentrated in local disturbances over long time spans. Rehabilitation plans focus on returning these land uses to the area after mine closure.

Surface disturbance can result in direct loss of wetlands and riparian areas, as well as indirect impacts from increased runoff which can degrade wetlands and riparian function. These projects also may use water pumped from groundwater wells, which can indirectly impact hydrogeology that supports nearby wetlands. Livestock and wildlife grazing can impact wetland and riparian areas through trampling and shearing of streambanks, compaction of wetland soils, trampling of plants, and overuse of riparian plant species. Wetland and riparian areas that have been overgrazed are susceptible to invasion by noxious weeds and invasive plant species, which can displace riparian and wetland species over time. Wildland fire could alter the surrounding landscape, resulting in a loss of vegetation species stabilizing banks. This can cause an increased amount of precipitation runoff and erosion which could drain to wetlands, resulting in indirect impacts to wetland and riparian areas.

Past and present projects within the CESA may have directly or indirectly impacted mapped wetlands and riparian areas. Unless considered jurisdictional by, and disturbance coordinated with, the USACE, mitigation has likely not occurred for the loss of wetland disturbance within the CESA.

RFFAs in the CESA would include material and mineral mining, development, and exploration projects (8,006 acres); utilities and infrastructure (163 acres); and oil, gas, and geothermal infrastructure and facilities (638 acres) (**Table 4-19**). Wildland fires in this CESA may occur in the future, as would restoration projects, livestock grazing, and dispersed recreation. These activities would have similar impacts as stated for past and present actions.

#### **4.20.19.3 Cumulative Effects**

Of the 1,742,423 acres covered by the CESA, 56,345 acres of disturbance are associated with past, present, and RFFA disturbances, which is a disturbance of approximately three percent of the CESA. Depending on where this disturbance has occurred, the wetlands and streams in the CESA may have been directly or indirectly impacted.

#### **Proposed Action**

Approval of the Goldrush Mine would increase disturbance within the CESA by 1,658 acres in addition to disturbance associated with past, present, and other RFFAs (56,345 acres) for a total disturbance of 58,003 acres, which is approximately three percent of the CESA. The total disturbance from the Proposed Action amounts to less than one percent disturbance within the CESA.

Past, present, and RFFAs including the Proposed Action could have resulted in direct removing or disturbing wetland and riparian areas, potentially altering flow within wetlands and riparian areas, reducing quantity and quality of water received through groundwater drawdown, or degrading wetlands and riparian areas. The cumulative impacts from the past, present, and RFFAs including the Proposed Action would contribute a minor, long-term regional effect on wetlands and riparian areas.

#### **No Action Alternative**

Under the No Action Alternative, the proposed Goldrush Mine would not be developed and the associated impacts to wetland and riparian resources would not occur. Cumulative impacts to wetland and riparian resources from past, present, and RFFAs including the No Action Alternative would be less than those under the Proposed Action but are anticipated to be negligible and long-term.

### **4.20.20 Wildlife Resources, Including Migratory Birds and Special Status Wildlife, Big Game, and Greater Sage-Grouse**

#### **4.20.20.1 Wildlife Resources, Including Migratory Birds and Special Status Wildlife**

#### **CESA Boundary Description**

The CESA boundary for wildlife resources, including migratory birds, special status wildlife species (except GRSG and big game species which are discussed under separate subheadings below), and aquatic species, encompasses the proposed Goldrush Plan boundary plus the predicted 10-foot groundwater drawdown contour related to mine dewatering (**Figure 4-2**). The CESA boundary is defined to include the maximum geographic extent of effects to wildlife resources from surface disturbances and water management activities associated with the proposed Project and RFFAs. The total area of the CESA encompasses 296,187 acres.

#### **Past, Present, and Reasonably Foreseeable Future Actions**

Within this CESA, past and present disturbance, as detailed in **Table 4-20**, has resulted from the following activities: mineral development and exploration projects (28,019 acres); utilities, infrastructure, and public purpose activities (728 acres); roads (1,526 acres); dispersed recreation; and livestock grazing. Additionally, approximately 50,314 acres within the CESA have been affected by recent and past wildland fires, resulting in various stages of alteration to wildlife habitat and forage.

**Table 4-20 Past, Present, and RFFAs within the Wildlife Resources Including Migratory Birds and Special Status Species CESA**

<b>Past, Present, and RFFAs, Disturbances and Projects</b>	<b>CESA</b>
<b>CESA Acres</b>	<b>255,679</b>
<b>Past Actions</b>	
<b>Mineral Development and Exploration Past Actions</b>	
Sand and Gravel Operations, Materials Sites and Community Sand and Gravel Pits	306
Notices	584
Mining and Exploration Projects	2,661
<b>Past Actions Total Disturbance Acres</b>	<b>3,551</b>
<b>Present Actions</b>	
<b>Mineral Development and Exploration Present Actions</b>	
Sand and Gravel Operations, Materials Sites and Community Sand and Gravel Pits	201
Notices	30
<b>Mining Projects<sup>1</sup></b>	
HC/CUEP <sup>2</sup>	106
Cortex Toiyabe JV Mine	802
Cortez Mine	21,170
Other Mining Projects <sup>3</sup>	1,121
<b>Exploration Projects</b>	
West Pine Valley Exploration Project <sup>4</sup>	122
NGM Robertson Exploration	294
Pediment Exploration Project	250
Other Exploration Projects <sup>5</sup>	373
<b>Utilities, Infrastructure, and Public Purpose Present Actions</b>	
Power Lines	497
Communication Facilities	1
Telephone and Fiber Optic Lines	102
Water Pipelines and Water Infrastructure	54
Other	74
<b>Development and Infrastructure Present Actions Total Disturbance Acres</b>	<b>25,196</b>
<b>Roads and Railroads Present Actions</b>	
State Routes	51
Local Roads	310
Other Roads	1,165
<b>Roads and Railroads Present Actions Total Disturbance Acres</b>	<b>1,526</b>
<b>RFFAs</b>	
<b>Mineral Development and Exploration RFFAs</b>	
Notices	8
<b>Mining and Exploration Projects</b>	
Robertson Mine	5,990
<b>RFFAs Total Disturbance Acres</b>	<b>5,998</b>
<b>Past, Present, and RFFAs Total Disturbance Acres</b>	<b>36,272</b>
<b>Percent of CESA</b>	<b>14</b>
<b>Fires</b>	<b>50,314</b>

Source: BLM 2021c

<sup>1</sup> All existing disturbance acres associated with Horse Canyon Mine would be transferred to the Goldrush Mine Plan and HC/CUEP Plan and the Horse Canyon Mine Plan would be closed.

<sup>2</sup> Surface disturbance total included equals the total authorized disturbance of 688.1 less the existing disturbance of 582.6 acres to be transferred to the proposed Goldrush Plan boundary.

<sup>3</sup> Other Mining Projects includes: Buckhorn Mine, Greystone Mine, Buck Mine.

<sup>4</sup> Surface disturbance total included equals the total authorized disturbance of 150 less the existing disturbance of 27.9 acres to be transferred to the proposed Goldrush Plan boundary

<sup>5</sup> Other Exploration Projects includes: CMZ, Robertson, Patty, and Pipeline and South Pipeline Projects.

Activities such as mineral exploration and development and oil and gas development impact wildlife through a variety of means, including habitat loss, habitat fragmentation, disruption of migration, introduction of invasive species, disturbance, and direct impacts (e.g., road kill). Developments require land use, which serves as a direct loss to wildlife habitat. They also require a transportation and infrastructure network, which segments habitat and serves as a vector for the introduction of invasive species. Roads, utilities, and fences can be physical barriers to wildlife movement. Operations and maintenance activities that cause movement and noise also can lead to behavioral changes in wildlife.

Mitigation measures can decrease these impacts to wildlife. Roads can be planned to be consolidated and routed around high quality habitat. Speed limits can limit the risk for direct take, in addition to reducing the behavioral avoidance from noise. Fencing can be limited to the minimum required, enclosing discrete parcels rather than range-wide divisions. Reclamation can restore habitat after activity is complete. Project design also can incorporate elements to minimize the impacts to wildlife, such as preventing wildlife access to waste or artificial ponds.

Wildland fires can directly take wildlife, but also have long-term impacts from changing vegetation. Fires also can dramatically shift available habitat, removing shrub species that some wildlife rely on. However, under certain circumstances in fire-adapted communities, wildland fires also can positively benefit individual bird species by transitioning habitat from shrublands to grassland communities. Alternatively, fires also increase habitat heterogeneity, and provide important diversity in static climax ecosystems. Prolonged drought and increased average temperatures can also impact wildlife by decreasing water availability throughout the region.

Past and present recreation activities can impact wildlife through disturbance and direct takes of habitat. Activity can cause wildlife to avoid high quality habitat, and can have direct takes on habitat, such as burrows. Dispersed recreation also can serve as a vector for invasive species. Some types of activity can degrade riparian corridors, through eroding waterway banks and establishing erosion prone trails. Both recreation and livestock grazing activities can disturb nesting birds, degrade potential nesting and foraging habitat, and crush ground nests.

Past and present livestock grazing within the CESA can change vegetation abundance and influence dominant cover types. Particularly around areas of high-density use, such as water sources, livestock can degrade habitat and promote erosion. This can remove important habitat for wildlife, particularly in the desert environment.

RFFAs in the CESA would include mineral development and exploration projects (5,998 acres) (**Table 4-20**). Wildland fires in this CESA may occur in the future, as would restoration projects, livestock grazing, and dispersed recreation. These activities would lead to similar disturbances and impacts as stated in past and present actions.

### **Cumulative Effects**

Of the 255,679 acres covered by the CESA, 36,272 acres of disturbance are associated with past, present, and RFFA disturbances, which is a disturbance of approximately 14 percent of the CESA.

#### *Proposed Action*

Cumulative effects to wildlife resources would be primarily related directly to habitat loss, habitat degradation, habitat fragmentation including impacts to general wildlife migration corridors (impacts to big game migration corridors are discussed below), and animal displacement. Many of the local wildlife populations that occur in the CESA would continue to occupy their respective ranges; however, as a result of present and RFFAs, wildlife population numbers may decrease relative to habitat loss and disturbance from incremental development. In addition, local bird species would be displaced into neighboring territories, thereby increasing local competition, which can lead to increases in predation, mortality, or lost nesting opportunities. Competition among the remaining resources can limit population health.

Under the Proposed Action, additional habitat fragmentation and displacement (including impacts to migration corridors) would occur and may decrease the survival rates of affected individuals, increase competition, and impact migration patterns and corridors. Fencing around the rapid infiltration basin galleries could directly impact individual wildlife that get tangled in the fencing, or indirectly from habitat fragmentation or increased predation (from perching avian predators).

The Project would incrementally increase disturbance to wildlife habitat by an additional 1,658 acres (less than one percent of the CESA) for a total disturbance in the CESA from past, present, and RFFAs of 37,930 acres, or 15 percent of the CESA. Since the Project would add additional noise sources in wildlife habitat from construction and operation of mine infrastructure as well as from traffic, NGM has incorporated sound-reduction measures in the engineering design of the Project. Implementation of ACEPMs for the Proposed Action in combination with reclamation would decrease some of the impacts of these past, present, and RFFAs including the Proposed Action throughout the CESA. However, since the collective impacts result in habitat degradation, habitat fragmentation, and displacement from past, present, and RFFAs, impacts to wildlife would be moderate, regional, and long-term to permanent.

*No Action Alternative*

Under the No Action Alternative, the proposed Goldrush Mine would not be developed and the associated impacts to wildlife, migratory birds, and special status species resources would not occur. Cumulative impacts to wildlife resources from the past, present, and RFFAs including the No Action Alternative would be less than those under the Proposed Action but are anticipated to be moderate to major, regional, and long-term.

**4.20.20.2 Big Game Species**

**CESA Boundary Description**

The CESA boundary for big game encompasses NDOW Hunt Units 154, 155, 141, and 143 (**Figure 4-2**). The CESA boundary is defined to include the maximum geographic extent of effects to big game species associated with the proposed Project and RFFAs. The total area of the CESA encompasses 2,039,140 acres.

**Past, Present, and Reasonably Foreseeable Future Actions**

Within this CESA, past and present disturbance, as detailed in **Table 4-21**, has resulted from the following activities: mineral development and exploration projects (40,205 acres); utilities, infrastructure, and public purpose activities (6,754 acres); roads (8,185 acres); dispersed recreation; and livestock grazing. Additionally, approximately 385,440 acres within the CESA have been affected by recent and past wildland fires, resulting in various stages of alteration to big game species habitat and forage.

**Table 4-21 Past, Present, and RFFAs within the Big Game Species CESA**

<b>Past, Present, and RFFAs, Disturbances and Projects</b>	<b>CESA</b>
<b>CESA Acres</b>	<b>2,039,140</b>
<b>Past Actions</b>	
<b>Mineral Development and Exploration Past Actions</b>	
Sand and Gravel Operations, Materials Sites and Community Sand and Gravel Pits	1,594
Notices	1,372
Mining and Exploration Projects	5,748
Public Purpose	495
<b>Past Actions Total Disturbance Acres</b>	<b>9,208</b>
<b>Present Actions</b>	
<b>Mineral Development and Exploration Present Actions</b>	
Sand and Gravel Operations, Materials Sites and Community Sand and Gravel Pits	3,087
Notices	72
<b>Mining Projects<sup>1</sup></b>	
HC/CUEP <sup>2</sup>	105
Mount Hope Mine	8,307

<b>Past, Present, and RFFAs, Disturbances and Projects</b>	<b>CESA</b>
Gold Bar Mine	5,071
Cortez Mine	11,317
Cortex Toiyabe JV Mine	802
Other Mining Projects <sup>3</sup>	1,468
<b>Exploration Projects</b>	
West Pine Valley Exploration Project <sup>4</sup>	122
NGM Robertson Exploration	294
Pediment Exploration Project	250
Other Exploration Projects <sup>5</sup>	373
<b>Utilities, Infrastructure, and Public Purpose Present Actions</b>	
Power Lines	3,918
Communication Facilities	54
Telephone and Fiber Optic Lines	753
Water Pipelines and Water Infrastructure	229
Oil and Gas Pipelines	0
Oil and Gas Geothermal Infrastructure	816
Public Purpose	7
Other	482
Agricultural Areas	3,540
<b>Development and Infrastructure Present Actions Total Disturbance Acres</b>	<b>41,291</b>
<b>Roads and Railroads Present Actions</b>	
State Routes	497
Local Roads	2,978
US Highway	307
Other Roads	4,404
Railroads	1,368
<b>Roads and Railroads Present Actions Total Disturbance Acres</b>	<b>9,554</b>
<b>RFFAs</b>	
<b>Mineral Development and Exploration RFFAs</b>	
Sand and Gravel Operations, Material Sites and Community Sand and Gravel Pits	46
Notices	15
Mining and Exploration Projects	7,011
<b>Utilities, Infrastructure, and Public Purpose RFFAs</b>	
Power Lines	1,917
Water Pipelines and Water Infrastructure	2
Oil and Gas Pipelines	2
<b>RFFAs Total Disturbance Acres</b>	<b>8,993</b>
<b>Past, Present, and RFFAs Total Disturbance Acres</b>	<b>69,046</b>
<b>Percent of CESA</b>	<b>3</b>
<b>Fires</b>	<b>385,440</b>

Source: BLM 2021c

<sup>1</sup> All existing disturbance acres associated with Horse Canyon Mine would be transferred to the Goldrush Mine Plan and HC/CUEP Plan and the Horse Canyon Mine Plan would be closed.

<sup>2</sup> Surface disturbance total included equals the total authorized disturbance of 688.1 less the existing disturbance of 582.6 acres to be transferred to the proposed Goldrush Plan boundary.

<sup>3</sup> Other Mining Projects includes: Buckhorn Mine, Tonkin Spring Mine, Buck Mine, Greystone Mine, Rain Mine, and Lazy Old Men Mine.

<sup>4</sup> Surface disturbance total included equals the total authorized disturbance of 150 less the existing disturbance of 27.9 acres to be transferred to the proposed Goldrush Plan boundary

<sup>5</sup> Other Exploration Projects includes: Tonkin Springs, Pipeline and South Pipeline, Robertson, Patty, Toiyabe, CMZ, Keystone, and Gold Bar Exploration Project.



Impacts to big game species occur from activities such as mineral exploration and development, oil and gas development, installation of utilities and infrastructure, and roads. Indirect effects from these activities include habitat loss, removal of vegetation, fragmentation of migration corridors, increased use and noise, and introduction of invasive species, and direct effects include displacement of individuals and collision with vehicles. Roads, utilities, and fences can be physical barriers to big game movement from summer and winter ranges, and along migration corridors. Operations and maintenance activities that cause movement and noise also can lead to behavioral changes in big game populations.

Mitigation measures can reduce some of these impacts to big game populations and individuals. Roads can be routed around high quality habitat and reduced speed limits can limit direct take. Fencing used to minimize impacts to wildlife, can fragment big game species habitat. Sound-reduction technologies can minimize impacts from noise to big game habitat. Reclamation can restore big game habitat after activities are complete.

Past and present dispersed recreation activities can impact big game species through habitat disturbance and removal, similar to those described for wildlife.

Similar to those described for wildlife, past and present livestock grazing within the CESA can alter vegetation abundance and influence dominant cover types especially around water resources.

RFFAs in the CESA would include mineral development and exploration projects (7,072 acres) (**Table 4-21**). Wildland fires in this CESA may occur in the future, as would restoration projects, livestock grazing, and dispersed recreation. These activities would lead to similar disturbances and impacts to big game as stated in past and present actions.

### **Cumulative Effects**

Of the 2,039,140 acres covered by the CESA, 69,046 acres of disturbance are associated with past, present, and RFFA disturbances, which is a disturbance of approximately three percent of the CESA.

#### *Proposed Action*

Similar to wildlife, cumulative effects to big game would be primarily related directly to habitat loss, habitat degradation, habitat fragmentation, and animal displacement. Mule deer and pronghorn populations that occur in the CESA would continue to occupy their respective ranges; however, as a result of present and RFFAs, big game populations may decrease in size, modify their migration movements, and timing. Past and present anthropogenic activities may already be contributing to impacts on mule deer movement patterns as well as habitat fragmentation.

Under the Proposed Action, additional habitat fragmentation and displacement would occur and may decrease the survival rates of affected individuals, increase competition, and impact mule deer migration patterns.

The Project would incrementally increase disturbance to big game habitat by an additional 1,658 acres (less than one percent of the CESA) for a total disturbance in the CESA from past, present, and RFFAs of 69,046 acres, or three percent of the CESA. NGM has incorporated sound-reduction measures in the engineering design of the Project to reduce noise impacts, committed to installing cross ramps to facilitate mule deer and pronghorn cross of the water pipelines, committed to develop cuts into the haul road berms in mule deer migration corridors to facilitate mule deer migration. Implementation of ACEPMs for the Proposed Action in combination with reclamation would decrease some of the impacts of these past, present, and RFFAs including the Proposed Action throughout the CESA. However, since the collective impacts result in habitat degradation, habitat fragmentation, and displacement from past, present, and RFFAs, impacts to big game would be moderate, regional, and long-term to permanent.

#### *No Action Alternative*

Under the No Action Alternative, the proposed Goldrush Mine would not be developed and the associated impacts to big game species would not occur. Cumulative impacts to big game species and their habitat from the past, present, and RFFAs including the No Action Alternative would be less than those under the Proposed Action but are still anticipated to be moderate to major, regional, and long-term.

### 4.20.20.3 Greater Sage-Grouse

#### **CESA Boundary Description**

The CESA boundary for GRSG encompasses the Project area and a four-mile buffer (**Figure 4-2**). The CESA boundary is defined to include the maximum geographic extent of effects to GRSG from the proposed Project and RFFAs. The total area of the CESA encompasses 153,772 acres.

#### **Past, Present, and Reasonably Foreseeable Future Actions**

Within this CESA, past and present disturbance, as detailed in **Table 4-22**, has resulted from the following activities: mineral development and exploration projects (2,418 acres); utilities, infrastructure, and public purpose activities (437 acres); roads (939 acres); dispersed recreation; and livestock grazing. Additionally, approximately 43,863 acres within the CESA have been affected by recent and past wildland fires, resulting in various stages of alteration to GRSG habitat and forage.

**Table 4-22 Past, Present, and RFFAs within the Greater Sage-Grouse CESA**

<b>Past, Present, and RFFAs, Disturbances and Projects</b>	<b>CESA</b>
<b>CESA Acres</b>	<b>153,772</b>
<b>Past Actions</b>	
<b>Mineral Development and Exploration Past Actions</b>	
Sand and Gravel Operations, Materials Sites and Community Sand and Gravel Pits	234
Notices	302
Mining and Exploration Projects	1,881
<b>Past Actions Total Disturbance Acres</b>	<b>2,418</b>
<b>Present Actions</b>	
<b>Mineral Development and Exploration Present Actions</b>	
Sand and Gravel Operations, Materials Sites and Community Sand and Gravel Pits	31
Notices	3
<b>Mining Projects<sup>1</sup></b>	
HC/CUEP <sup>2</sup>	106
Other Mining Projects <sup>3</sup>	775
<b>Exploration Projects</b>	
West Pine Valley Exploration Project <sup>4</sup>	122
Pediment Exploration Project	250
Other Exploration Projects <sup>5</sup>	322
<b>Utilities, Infrastructure, and Public Purpose Present Actions</b>	
Power Lines	342
Communication Facilities	1
Telephone and Fiber Optic Lines	95
<b>Development and Infrastructure Present Actions Total Disturbance Acres</b>	<b>2,045</b>
<b>Roads and Railroads Present Actions</b>	
Local Roads	242
Other Roads	697
<b>Roads and Railroads Present Actions Total Disturbance Acres</b>	<b>939</b>
<b>RFFAs</b>	
<b>Mineral Development and Exploration RFFAs</b>	
Notices	3
<b>RFFAs Total Disturbance Acres</b>	<b>3</b>
<b>Past, Present, and RFFAs Total Disturbance Acres</b>	<b>5,404</b>

Past, Present, and RFFAs, Disturbances and Projects	CESA
Percent of CESA	4
Fires	43,863

Source: BLM 2021c

<sup>1</sup> All existing disturbance acres associated with Horse Canyon Mine would be transferred to the Goldrush Mine Plan and HC/CUEP Plan and the Horse Canyon Mine Plan would be closed.

<sup>2</sup> Surface disturbance total included equals the total authorized disturbance of 688.1 less the existing disturbance of 582.6 acres to be transferred to the proposed Goldrush Plan boundary.

<sup>3</sup> Other Mining Projects includes: Buckhorn Mine and Buck Mine.

<sup>4</sup> Surface disturbance total included equals the total authorized disturbance of 150 less the existing disturbance of 27.9 acres to be transferred to the proposed Goldrush Plan boundary

<sup>5</sup> Other Exploration Projects includes: CMZ Exploration Project.

Impacts to GRSG and their habitat occur from activities such as mineral exploration and development, oil and gas development, installation of utilizes and infrastructure, and roads. Indirect effects from these activities include habitat fragmentation, increased use and noise, introduction of invasive species, increased predation, and decreased nesting success. Operations and maintenance activities that cause movement and noise also can lead to displacement of individuals to less-suitable habitat.

Mitigation measures can reduce some of these impacts to GRSG. Linear features include pipelines can be routed around occupied habitat and reduced speed limits can limit direct take. Anti-perch structures of fencing and utility poles can reduce impacts from raptor predation. Sound-reduction technologies can minimize impacts from noise to GRSG habitat. Reclamation can help restore GRSG habitat after activities are complete.

Past and present dispersed recreation activities have impacted GRSG habitat from direct disturbance and vegetation removal, as well as impacts from noise, similar to those described for wildlife.

Similar to those described for wildlife, past and present livestock grazing within the CESA can alter vegetation abundance and influence dominant cover types especially around water resources.

RFFAs in the CESA would include mineral development and exploration projects (3 acres) (**Table 4-22**). Wildland fires in this CESA may occur in the future, as would restoration projects, livestock grazing, and dispersed recreation. These activities would lead to similar disturbances and impacts to GRSG as stated in past and present actions.

### **Cumulative Effects**

Of the 153,772 acres covered by the CESA, 5,404 acres of disturbance are associated with past, present, and RFFA disturbances, which is a disturbance of approximately four percent of the CESA.

#### *Proposed Action*

Cumulative effects to GRSG would be primarily related directly to habitat loss, habitat degradation, increased predation habitat fragmentation, and animal displacement (from increased noise). While many of the GRSG in the leks within the CESA would continue to occupy their respective ranges, individual GRSG numbers may decrease as a result of habitat loss and disturbance from incremental development. Past and present anthropogenic activities are likely contributing to habitat fragmentation, increased predation, and reduction in nesting success for GRSG.

Under the Proposed Action, additional habitat fragmentation and displacement would occur and may decrease the survival rates of affected individual GRSG and increase competition. Fencing around the rapid infiltration basin galleries could indirectly effect GRSG from increased predation (from perching avian predators). Similar to RFFAs, the Proposed Action would result in impacts to mapped GRSG habitat including additional habitat fragmentation, increased predation, and nesting success. The Proposed Action would mitigate these impacts to GRSG through an ACEPM for net conservation gain.

The Project would incrementally increase disturbance to GRSG habitat by an additional 1,658 acres (less than one percent of the CESA) for a total disturbance in the CESA from past, present, and RFFAs of 17,422 acres, or 11 percent of the CESA. Since the Project would add additional noise sources in GRSG habitat

from construction and operation of mine infrastructure as well as from traffic, NGM has incorporated sound-reduction measures in the engineering design of the Project. Additionally, the Project would reduce flow to seeps, springs, and perennial streams from drawdown. Implementation of ACEPMs for the Proposed Action as well as mitigation in combination with reclamation would decrease some of the impacts of these past, present, and RFFAs including the Proposed Action throughout the CESA. However, since the collective impacts result in habitat degradation, habitat fragmentation, and displacement from past, present, and RFFAs, impacts to GRSG would be moderate, regional, and long-term to permanent.

#### *No Action Alternative*

Under the No Action Alternative, the proposed Goldrush Mine would not be developed and the associated impacts to GRSG would not occur. Cumulative impacts to GRSG and their habitat from the past, present, and RFFAs including the No Action Alternative would be less than those under the Proposed Action but are anticipated to be moderate to major, regional, and long-term.

### **4.21 Mitigation and Monitoring**

#### **4.21.1 Proposed Action Alternative**

##### **4.21.1.1 Mitigation**

Mitigation measures, as determined applicable, are identified in this section by resource. All of the mitigation measures described below would be fully supported and covered financially by NGM. For the Project, water resources if the only resource with identified mitigation.

#### **Water Resources**

##### *Mitigation*

Potential impacts on surface water resources from the drawdown of the groundwater table have been identified and mitigated under the Contingency Mitigation Plans for Surface Waters for the Deep South Expansion Project located in Lander and Eureka counties, Nevada (BCI and Stantec 2018) under the adjacent previously authorized Deep South Project (BLM 2019i). The spacial extent of potential impacts to surface water resources from groundwater drawdown from the Proposed Action is the same as that identified under Deep South. Therefore, the existing Contingency Mitigation Plans are already mitigating the same surface water sources. The temporal extent of the impacts for the Proposed Action would extend beyond those identified and mitigated for under Deep South to include the life of the Project. The proposed mitigation for the Project would be the continuation of the Contingency Mitigation Plans for Surface Waters for the Deep South Expansion Project in Lander and Eureka Counties until the BLM closes the Project Casefile. This will be accomplished through incorporating the Goldrush Plan (and extended Project timeline) into the Existing Integrated Monitoring Plan.

##### *Effectiveness of Mitigation*

This measure would provide for identification of potential flow-related impacts to perennial surface water as a result of mine-related groundwater drawdown and trigger implementation of appropriate mitigation measures as specified in the currently authorized and proposed Contingency Mitigation Plans for Surface Water Resources. As stated in the Cortez Hills Expansion Project Final EIS (BLM 2008b; page 3.4-25), implementation of this mitigation would effectively off-set any potential loss of riparian/wetland vegetation.

##### *Impacts of Mitigation*

No impacts other than those previously authorized and identified in the Deep South Final EIS (BLM 2019b) are anticipated from the implementation of this mitigation.

#### **GRSG Wildlife**

##### *Mitigation*

Impacts from the Proposed Action would be offset by either the use of the BEA or the CCS. NGM would use the BEA or CCS program to ensure net conservation gain of GRSG. Potential impacts to GRSG habitat would be calculated in accordance with the terms of the BEA between the USFWS, BLM, and NGM (BLM et al. 2015). The use of the CCS is required to fulfill mitigation requirements for disturbances to GRSG habitat on public lands. As stipulated by NAC 232.400-232.480, the Proposed Action was analyzed using the CCS Habitat Quantification Tool to calculate a debit obligation based on the proposed Goldrush disturbance following habitat field verification. If the CCS were to be utilized, the direct and indirect impacts

from the project would result in 2,224 Term Debits and 1,004 Permanent Debits (SEP 2021a, 2021b). Mitigation has been committed to by NGM as an ACEPM to mitigate impacts to GRSG habitat through net conservation gain.

#### *Effectiveness of Mitigation*

The BEA and the CCS and the terms of such programs are in compliance with the State laws requiring net conservation gain of GRSG habitat through compensatory mitigation for new anthropogenic disturbances impacting habitat that is considered unavoidable (Sagebrush Ecosystem Program and State of Nevada 2018).

#### *Impacts of Mitigation*

There are no anticipated impacts from the implementation of this mitigation.

##### **4.21.1.2 Monitoring**

NGM's current operations at the Cortez Mine include a Subsidence and Earth Fissure Monitoring Plan. The Plan is currently under revision and incorporates the maximum extent of the four-inch subsidence contour projected at the end of mining at Goldrush. Baseline InSAR studies in Pine Valley began in 2018.

##### **4.21.1.3 Residual Impacts**

Residual adverse impacts to surface water are not anticipated with the successful implementation of the Contingency Mitigation Plans in accordance with the site-specific mitigation triggers and contingency mitigation measures described therein. The potential for residual adverse impacts to occur would be further reduced by the provision in WR-1b (Section 3.2.4 of the Cortez Hills Expansion Project Final EIS [BLM 2008a]) that indicates that the BLM has the ability to require the implementation of additional mitigation measures if the initial implementation was unsuccessful.

##### **4.21.2 No Action Alternative**

Mitigation and monitoring authorized under previous authorization that would continue under the No Action Alternative are provided in **Appendix E**. Impacts from mitigation and residual impacts have been included in previous analysis.

## 5.0 Consultation, Coordination, and Public Involvement

### 5.1 Consultation and Coordination with Agencies and Tribal Governments

This section describes the specific actions taken by the BLM to consult and coordinate with Native American tribes, cooperating agencies, and other government agencies. Various federal laws require the BLM to consult with Native American tribes, SHPO, USFWS, and USEPA, and cooperating agencies during the NEPA decision-making process. In addition to formal scoping, the BLM implemented collaborative outreach and a public involvement process that included inviting agencies to be cooperative partners for the EIS NEPA process.

### 5.2 Government-to-Government Consultation with Native American Tribes

The BLM contacted the following tribal governments during the EIS process:

- Te-Moak Tribe of Western Shoshone;
- Battle Mountain Band of the Te-Moak Tribe of Western Shoshone;
- Duckwater Shoshone Tribe;
- Yomba Shoshone Tribe;
- Ely Shoshone Tribe; and
- The Shoshone-Paiute Tribe of Duck Valley.

Initial consultation letters were sent to the Tribes in February 2019. In addition, the Tribes were invited to the December 17, 2019, Goldrush Mine Project Kick-off meeting. Additional coordination meetings between the BLM and Tribes following Project Initiation were held in 2021 on February 17 with the Te-Moak, South Fork, Ely Shoshone, and Duckwater Tribes, February 23 with the South Fork, Ely Shoshone, Te-Moak, and Duckwater Tribes, April 14 with the Duckwater Tribe, August 17 with the Duckwater Tribe, and October 8 with the Te-Moak Tribe. To date, the tribes have not raised specific concerns regarding the Proposed Action during the consultation for this Project that has taken were not previously been covered under the September 2018 PA. Tribal consultation is ongoing, and as part of that process, the BLM will provide the Tribes with this EIS for review and comment.

### 5.3 Cooperating Agencies

This section lists agencies/counties that were invited to be cooperating agencies and note which ones accepted the role. In addition, agencies participating as cooperating agencies under existing MOUs are outlined below. A cooperative agency is any federal, state, or local government agency or Native American tribe that enters into formal agreement with the lead federal agency to help develop an environmental analysis.

To prepare this EIS, the following entities were coordinated with:

- U.S. Fish and Wildlife Service – Participating under IM2018-065
- U.S. Environmental Protection Agency – Participating as a cooperating agency under existing MOU, BLM-MOU-NV920-3809-2018-005
- Nevada Department of Conservation and Natural Resources – Participating as a cooperating agency under existing MOU among the BLM’s Nevada and California State Offices and the State of Nevada’s Department of Conservation and Natural Resources and Depart of Wildlife from August 2019
- Nevada Division of Environmental Protection – Participating as a cooperating agency under an existing MOU, BLM-MOU-NV921-3809-2019-014

- Nevada Department of Wildlife – Accepted request to participate as a Cooperating Agency
- Eureka County Board of Commissioners – Accepted request to participate as a Cooperating Agency
- Nevada Department of Transportation – Accepted request to participate as a Cooperating Agency

Agencies invited to participate as a cooperating agency but who did not respond to the request are listed below.

- Lander County

## **5.4 Public Involvement**

Public participation in the EIS process occurs at four specific points: scoping period, review of Draft EIS, review of Final EIS, and receipt of the ROD.

### **5.4.1 Scoping**

The public was provided a 30-day scoping period to disclose potential issues and concerns associated with the Proposed Action. Information obtained by the agencies during public scoping was combined with issues identified by the agencies and this formed the scope of the EIS. The issues identified during scoping are outlined in **Section 1.6**. The NOI to prepare an EIS was published on August 10, 2021 in the Federal Register, Volume 86, No. 151, Pages 43674 to 43677. The publication of the NOI initiated a 30-day public scoping period, which ended September 9, 2021. In addition, a press release was issued by the BLM Nevada State Office to the BLM Nevada media outlets.

An BLM National NEPA Register website was launched concurrently with publication of the NOI in the Federal Register and will remain active throughout the NEPA process (<https://eplanning.blm.gov/eplanning-ui/project/2012544/510>). A scoping overview document was also published to the site to provide introductory Project information to the public in advance of the public scoping meetings.

The BLM held two virtual public scoping meetings for the Project on August 25 from 2:00 to 3:00 P.M and August 26 from 5:00 to 6:00 P.M. A short slideshow presentation was given at the beginning of each virtual meeting and was thereafter published on the Project BLM National NEPA Register website for public availability. These presentations outlined key items of the Proposed Action. The remaining portion of the virtual meetings was held in a question-and-answer format. A document describing the proposed Project and instructions on ways to comment were available on the BLM National NEPA Register website. Members of the public and public interest groups other than people directly affiliated with the Project attended the two virtual meetings. By the close of the scoping process, 16 comment documents had been received. The BLM reviewed the scoping comments and the Draft EIS was prepared.

### **5.4.2 Draft EIS Comment Period**

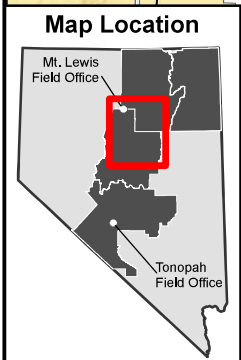
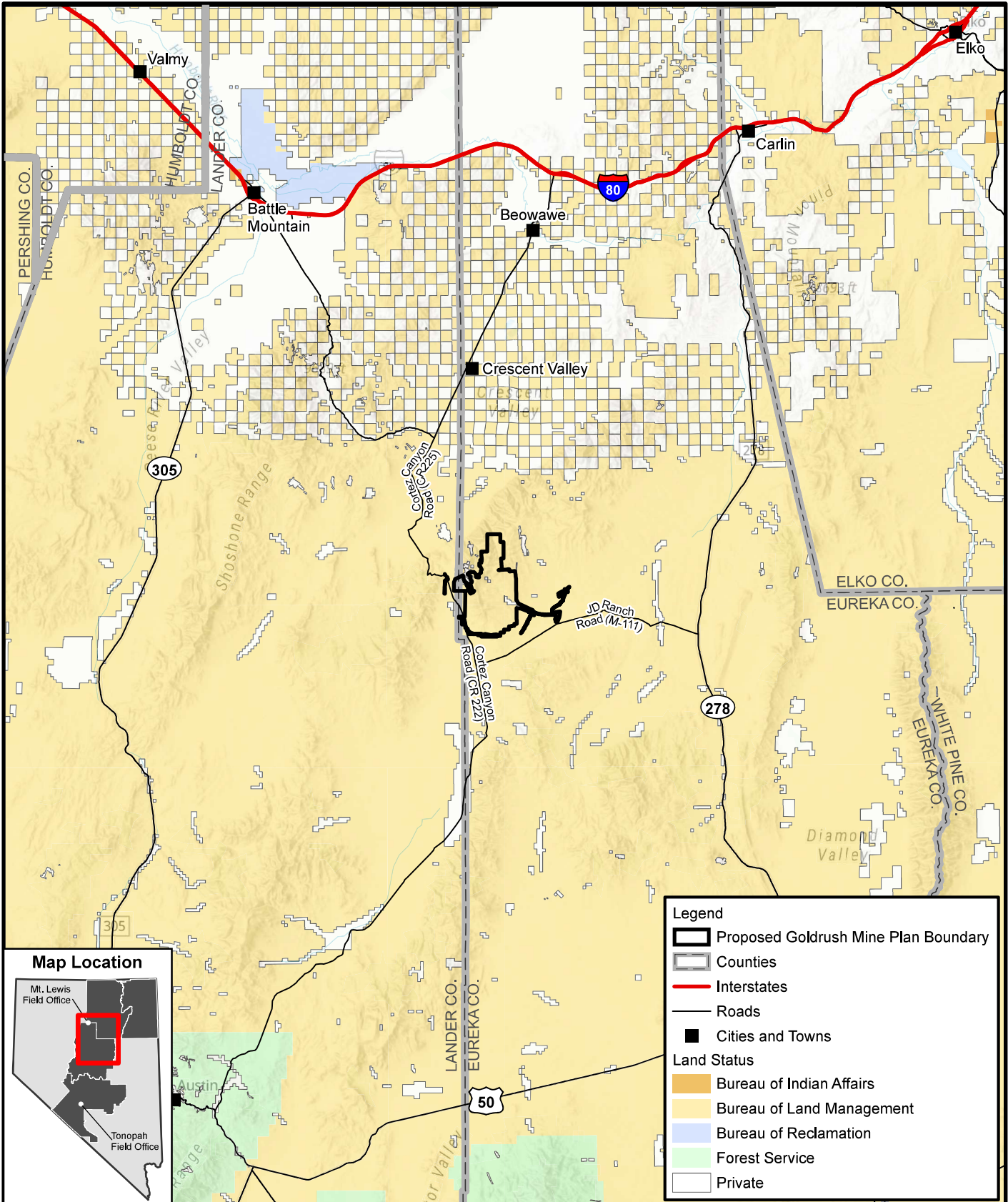
A 45-day Draft EIS comment period is initiated by publication of a Notice of Availability of the Draft EIS in the Federal Register. Public meetings are held to inform the public of the Project, answer questions, and inform the public of how to comment. Public comments received during the public comment period on the Draft EIS will be reviewed and responded to. Responses to these comments will be appended to the Final EIS.


### **5.4.3 Final EIS Availability Period**

A 30-day Final EIS availability period will be initiated by publication of a Notice of Availability for the Final EIS in the Federal Register. BLM will review all comments received on the Final EIS during the availability period. If the BLM determines the comments have merit, such as identifying significant new circumstances relevant to environmental concerns from the Proposed Action, the BLM will determine whether to supplement the EIS or if minor changes can be made to the existing EIS. The BLM will address all comments received on the Final EIS in the ROD. At the end of the 30-day availability period and review of comments, a ROD will be prepared and issued. The Final EIS/ROD will cite the conclusions regarding the environmental effects and appropriate mitigation measures for the selected alternative.

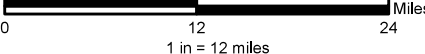
## Appendix A: Figures







  
 Battle Mountain  
 BLM District  
 Mount Lewis Field Office

**NEVADA GOLD MINES LLC  
 GOLDRUSH MINE PROJECT**


  
 0 12 24 Miles  
 1 in = 12 miles

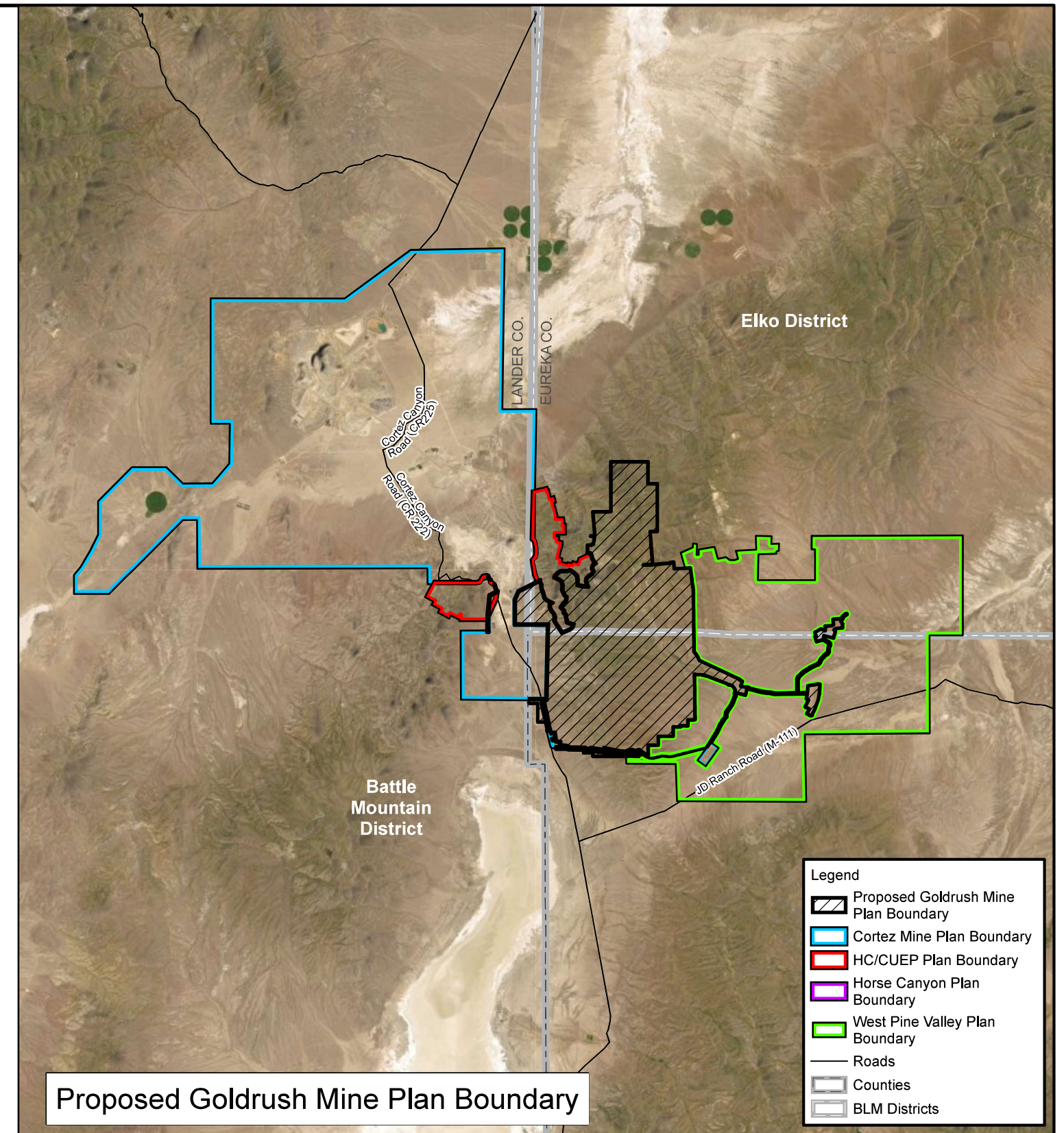
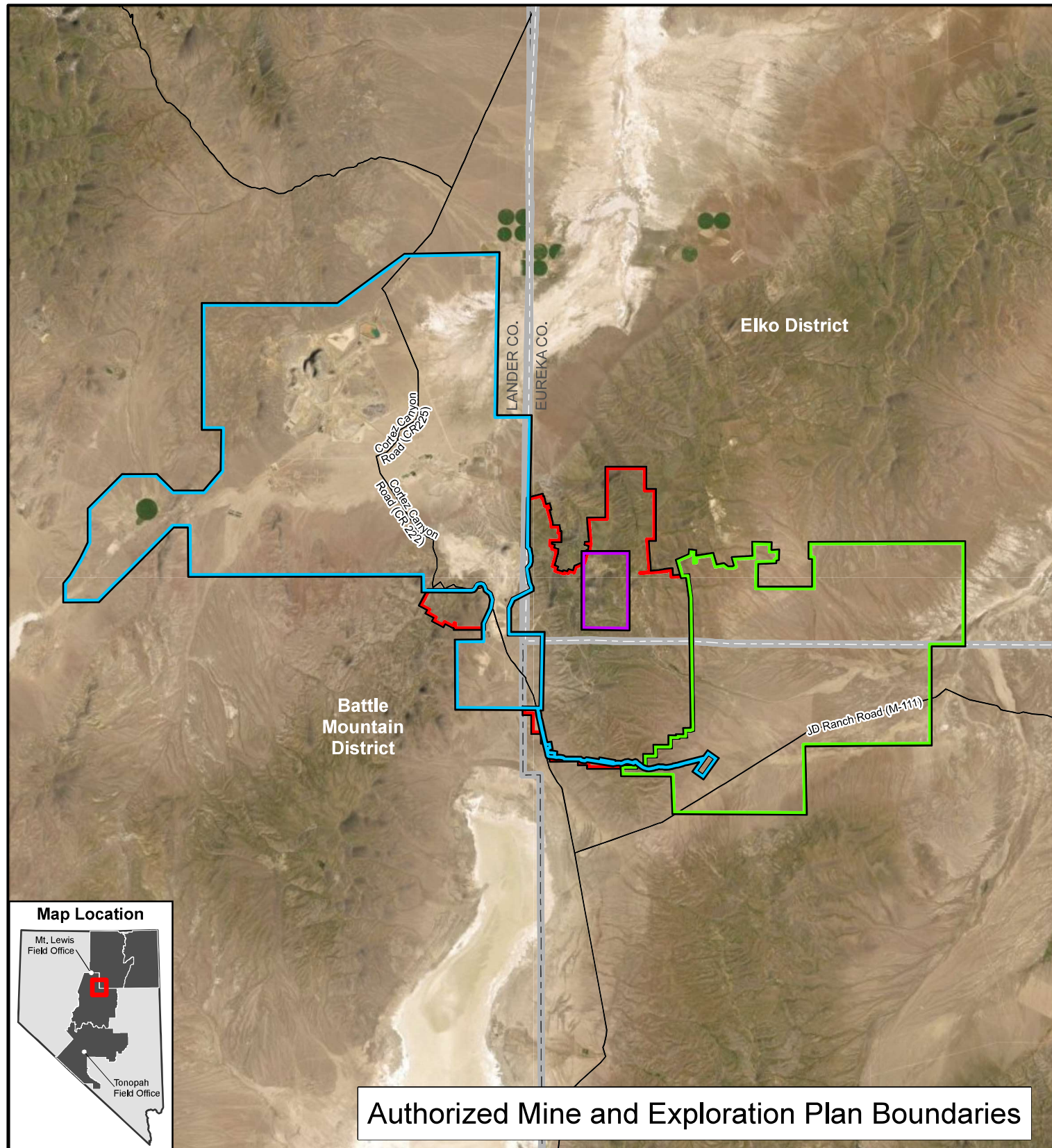


**PROJECT VICINITY**

<b>FIGURE 1-1</b>	REVISION
<b>2021-08-23</b>	<b>A</b>

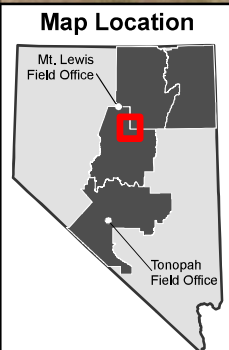
No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.






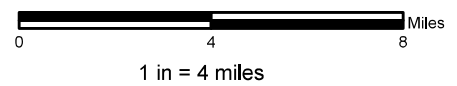
**Legend**

- Proposed Goldrush Mine Plan Boundary
- Cortez Mine Plan Boundary
- HC/CUEP Plan Boundary
- Horse Canyon Plan Boundary
- West Pine Valley Plan Boundary
- Roads
- Counties
- BLM Districts



 Battle Mountain  
BLM District  
Mount Lewis Field Office

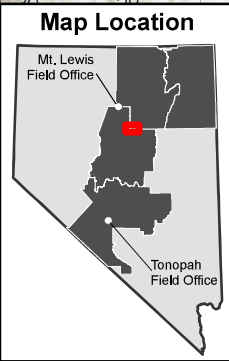
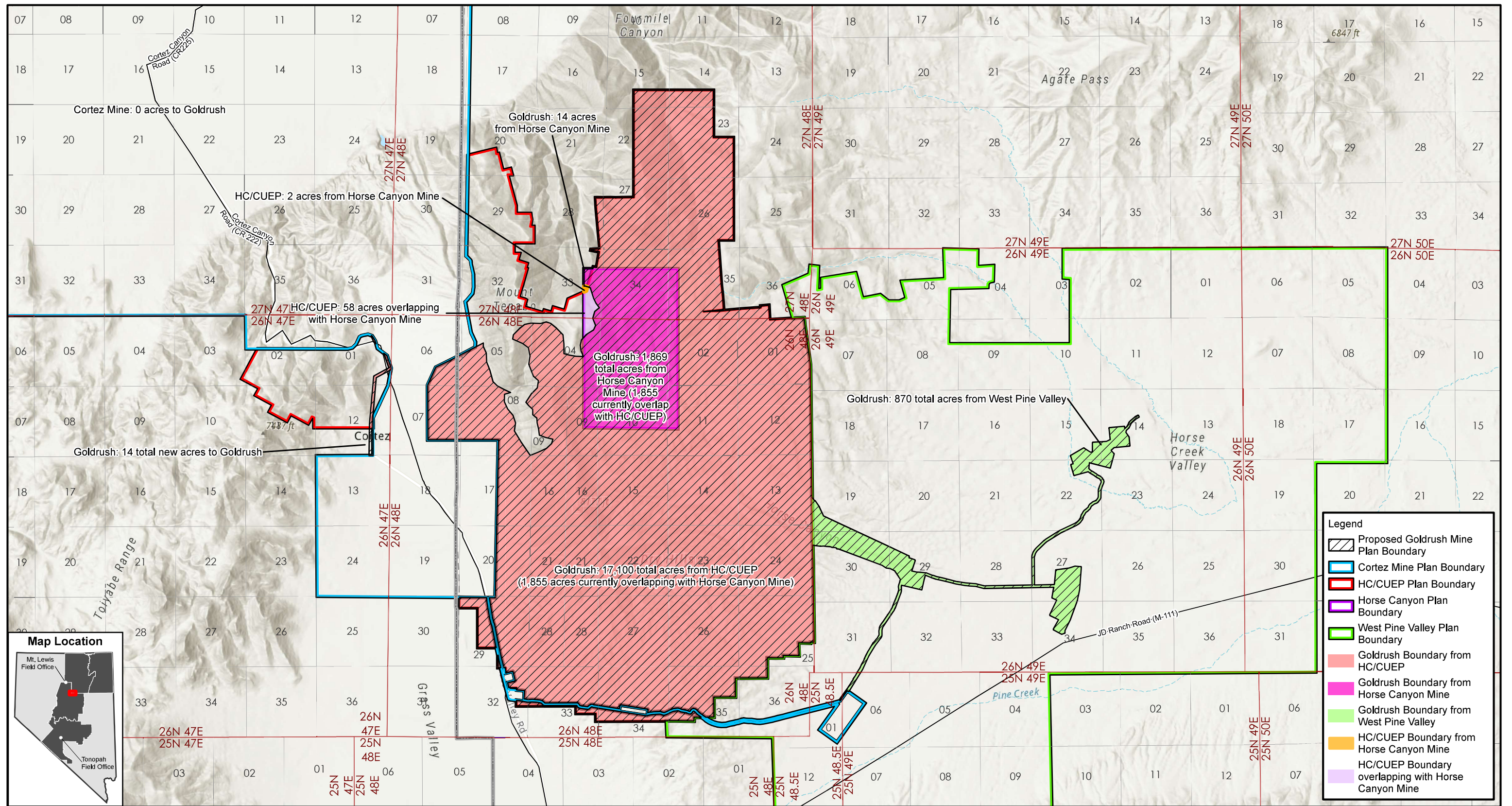
**NEVADA GOLD MINES LLC  
GOLDRUSH MINE PROJECT**



<b>AUTHORIZED MINE AND EXPLORATION PLAN BOUNDARIES AND PROPOSED GOLDRUSH MINE PLAN BOUNDARY</b>	
<b>FIGURE 2-1</b>	REVISION
DATE: <b>2021-08-23</b>	<b>A</b>

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.





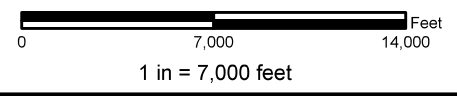
**Legend**

- Proposed Goldrush Mine Plan Boundary
- Cortez Mine Plan Boundary
- HC/CUEP Plan Boundary
- Horse Canyon Plan Boundary
- West Pine Valley Plan Boundary
- Goldrush Boundary from HC/CUEP
- Goldrush Boundary from Horse Canyon Mine
- Goldrush Boundary from West Pine Valley
- HC/CUEP Boundary from Horse Canyon Mine
- HC/CUEP Boundary overlapping with Horse Canyon Mine



Battle Mountain  
BLM District  
Mount Lewis Field Office

**NEVADA GOLD MINES LLC  
GOLDRUSH MINE PROJECT**

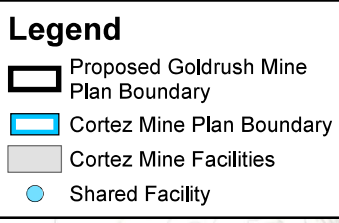
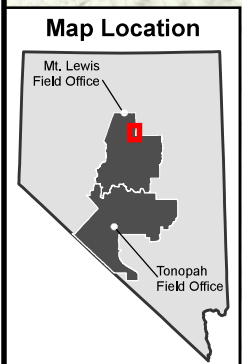
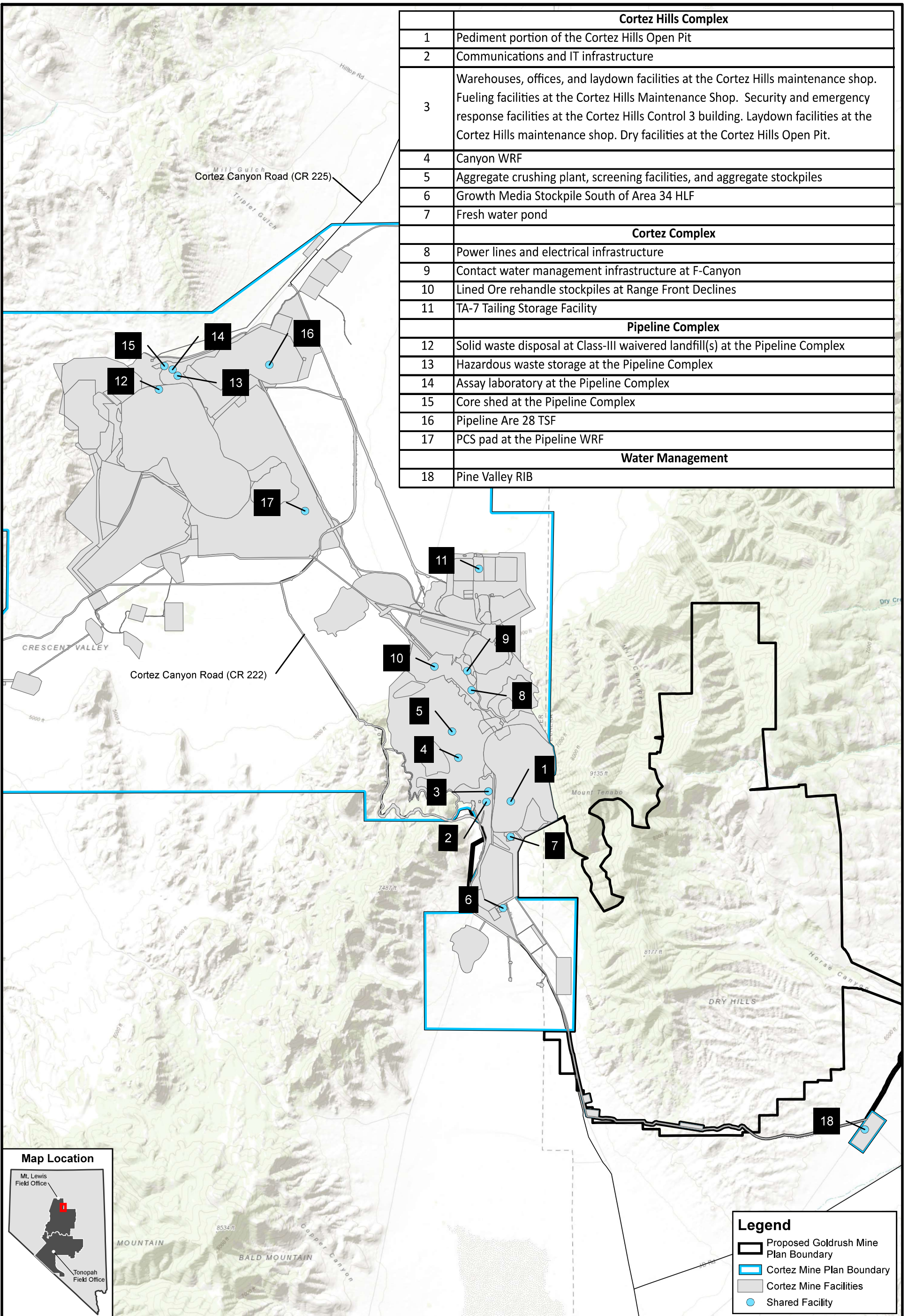



**PROPOSED CHANGES TO AUTHORIZED  
MINE AND EXPLORATION PLAN BOUNDARIES**

<b>FIGURE 2-2</b>	REVISION
DATE: <b>2021-12-14</b>	<b>A</b>

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.







  
 Battle Mountain  
 BLM District  
 Mount Lewis Field Office

**NEVADA GOLD MINES LLC  
 GOLDRUSH MINE PROJECT**

0 8,000 16,000 Feet  
 1 in = 8,000 Miles



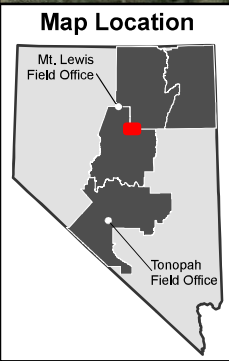
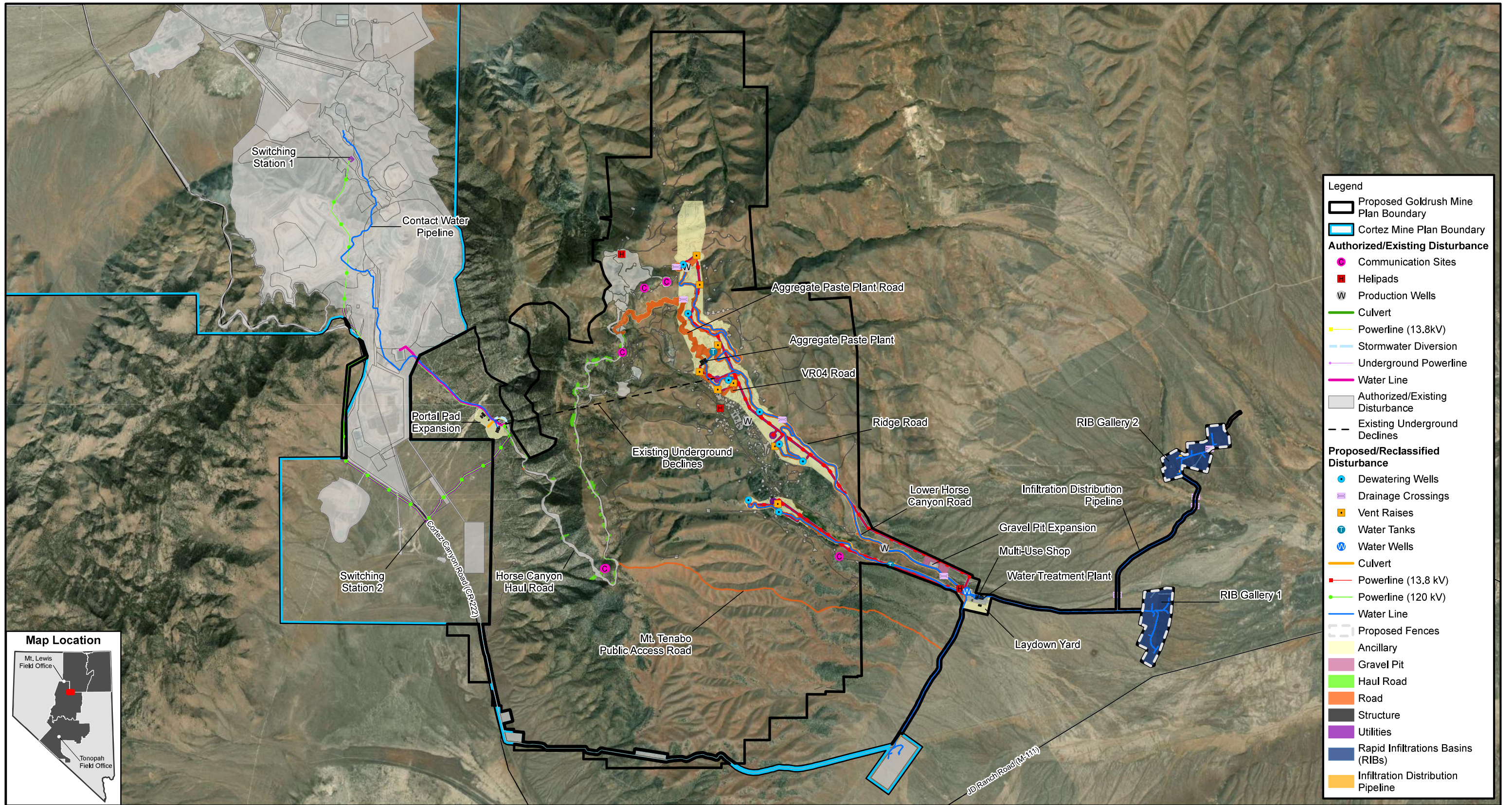
**PROPOSED CORTEZ MINE SHARED FACILITIES**

**FIGURE 2-3**  
 2021-11-23

REVISION  
**A**

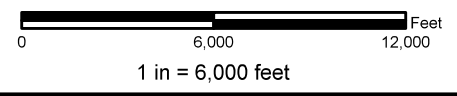
No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.






 Battle Mountain  
 BLM District  
 Mount Lewis Field Office

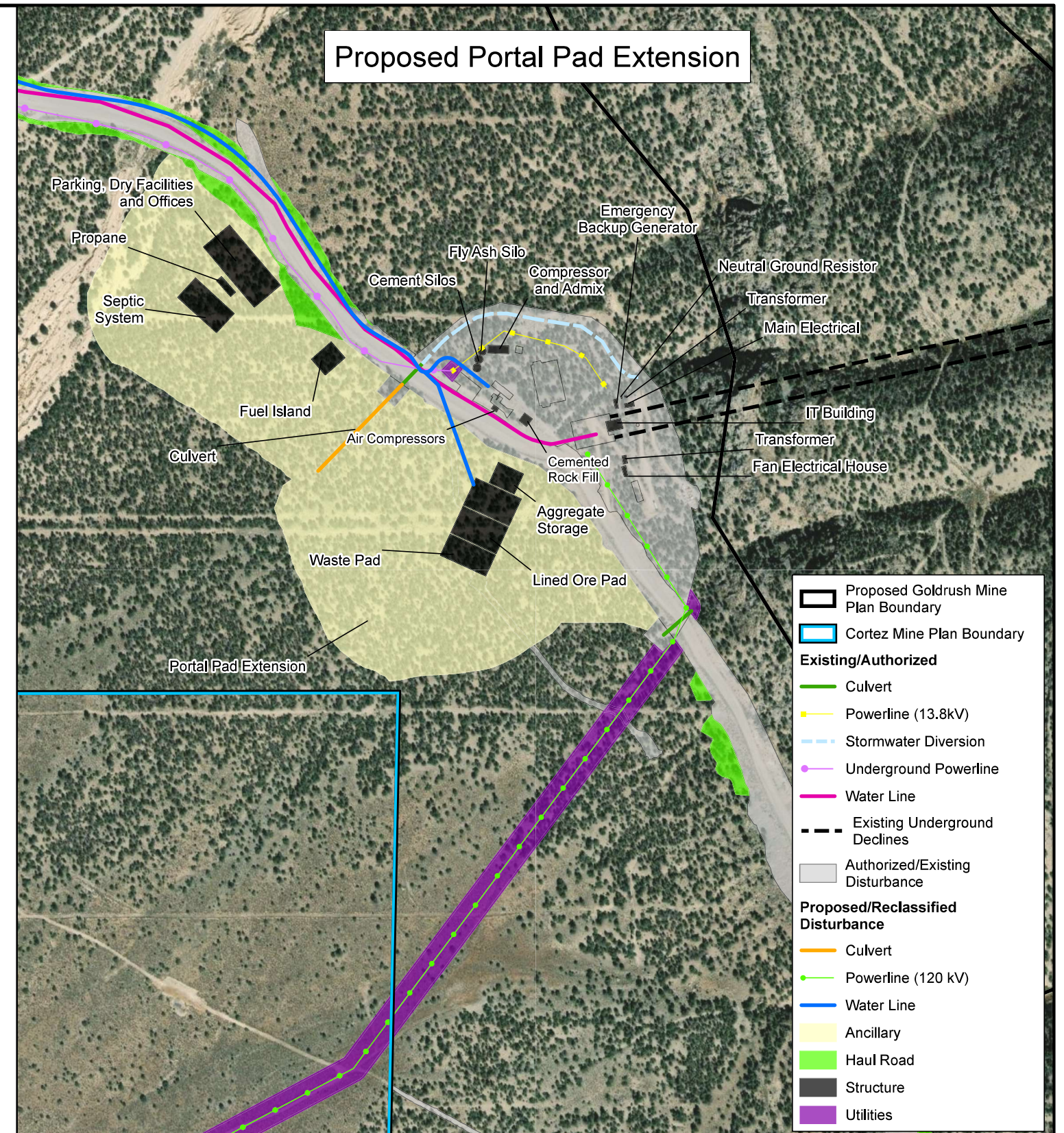
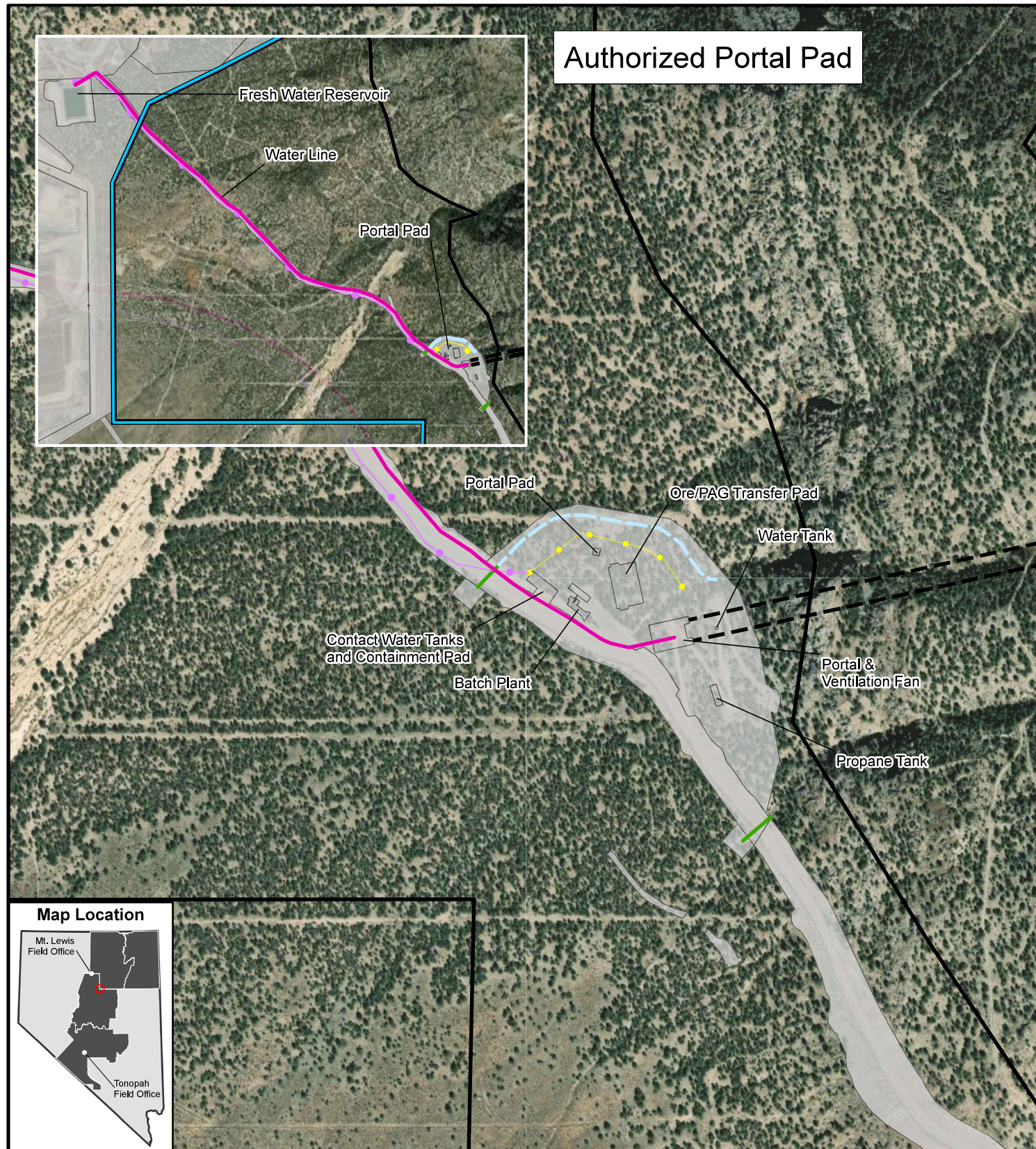
**NEVADA GOLD MINES LLC  
GOLDRUSH MINE PROJECT**



PROPOSED PROJECT FACILITIES	
<b>FIGURE 2-4</b>	REVISION
DATE: <b>2021-12-14</b>	<b>A</b>

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.



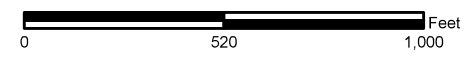


- Proposed Goldrush Mine Plan Boundary
- Cortez Mine Plan Boundary
- Existing/Authorized**
- Culvert
- Powerline (13.8kV)
- Stormwater Diversion
- Underground Powerline
- Water Line
- Existing Underground Declines
- Authorized/Existing Disturbance
- Proposed/Reclassified Disturbance**
- Culvert
- Powerline (120 kV)
- Water Line
- Ancillary
- Haul Road
- Structure
- Utilities



 Battle Mountain  
BLM District  
Mount Lewis Field Office

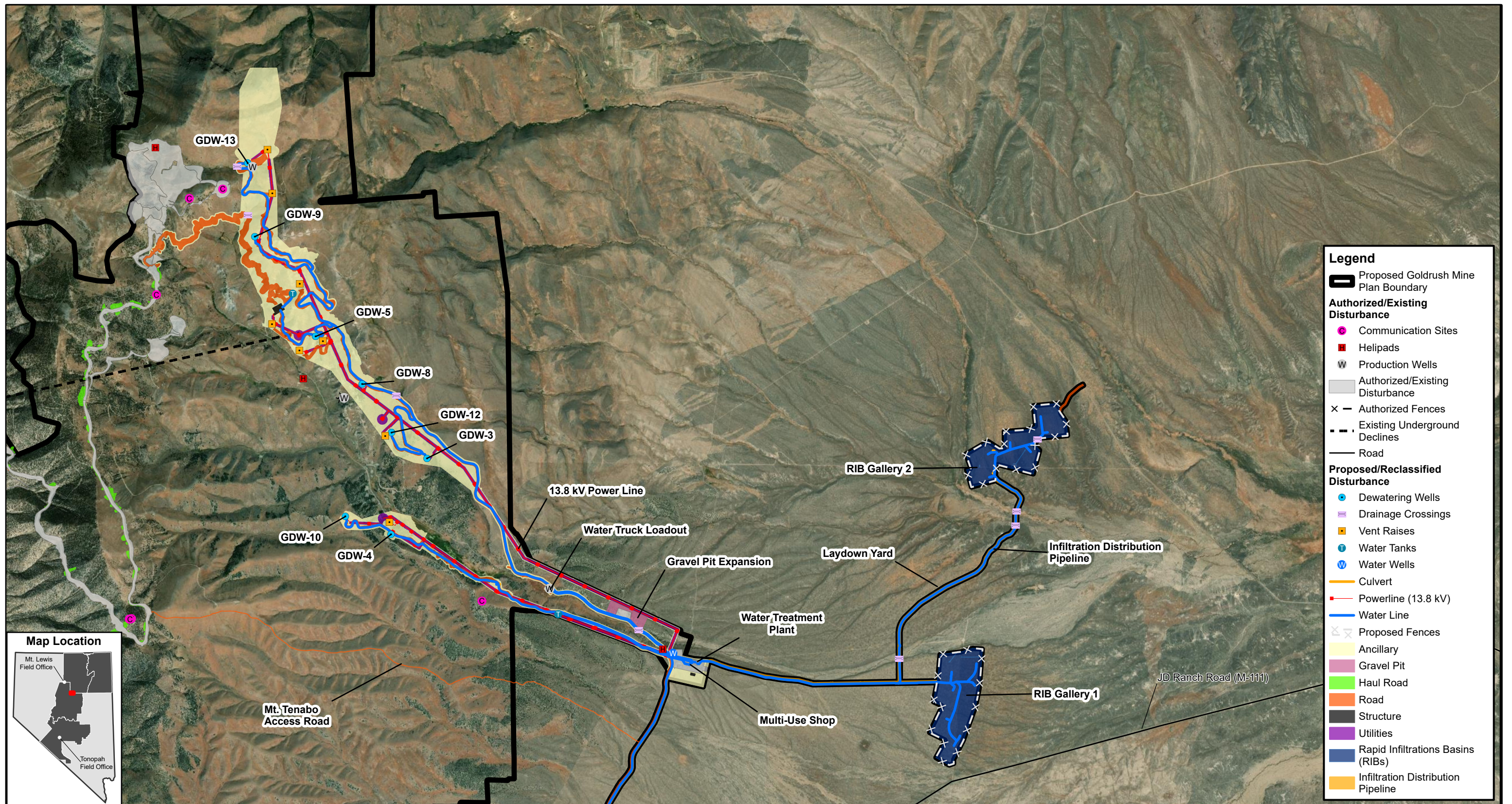
**NEVADA GOLD MINES LLC  
GOLDRUSH MINE PROJECT**



<b>AUTHORIZED AND PROPOSED PORTAL PAD EXTENSION</b>	
<b>FIGURE 2-5</b>	REVISION
DATE:	<b>A</b>
	<b>2021-08-23</b>

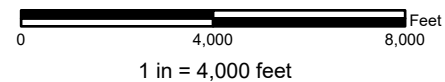
No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.





Battle Mountain  
BLM District  
Mount Lewis Field Office

**NEVADA GOLD MINES LLC  
GOLDRUSH MINE PROJECT**

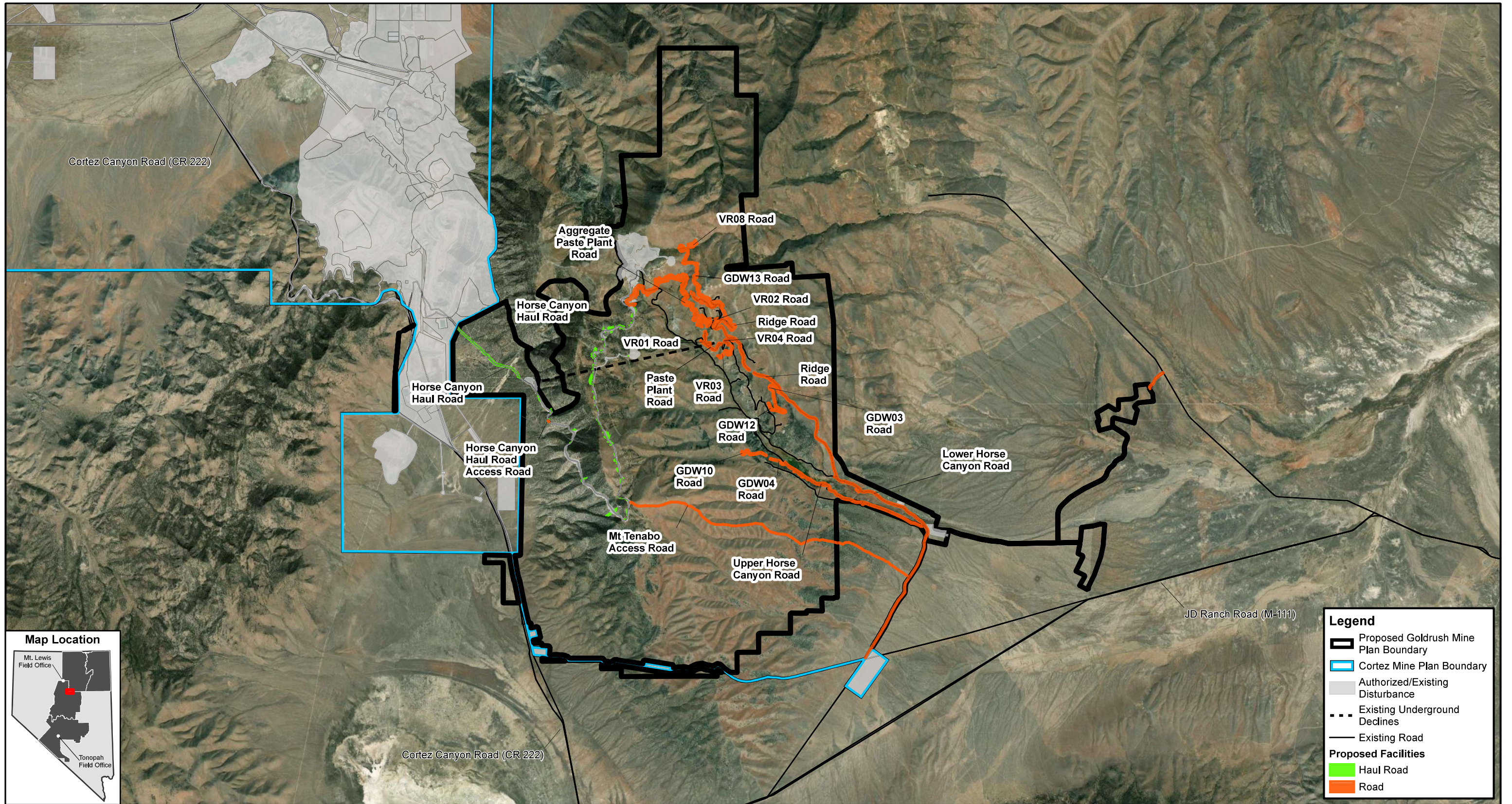


**PROPOSED WATER MANAGEMENT SYSTEM**

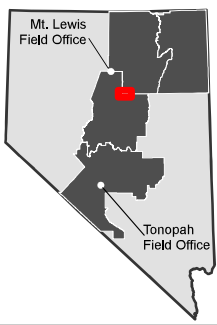
**FIGURE 2-6**

DATE: **2021-12-14**





**Map Location**



**Legend**

- Proposed Goldrush Mine Plan Boundary
- Cortez Mine Plan Boundary
- Authorized/Existing Disturbance
- Existing Underground Declines
- Existing Road

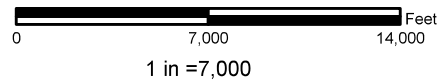
**Proposed Facilities**

- Haul Road
- Road



Battle Mountain  
BLM District  
Mount Lewis Field Office

**NEVADA GOLD MINES LLC  
GOLDRUSH MINE PROJECT**

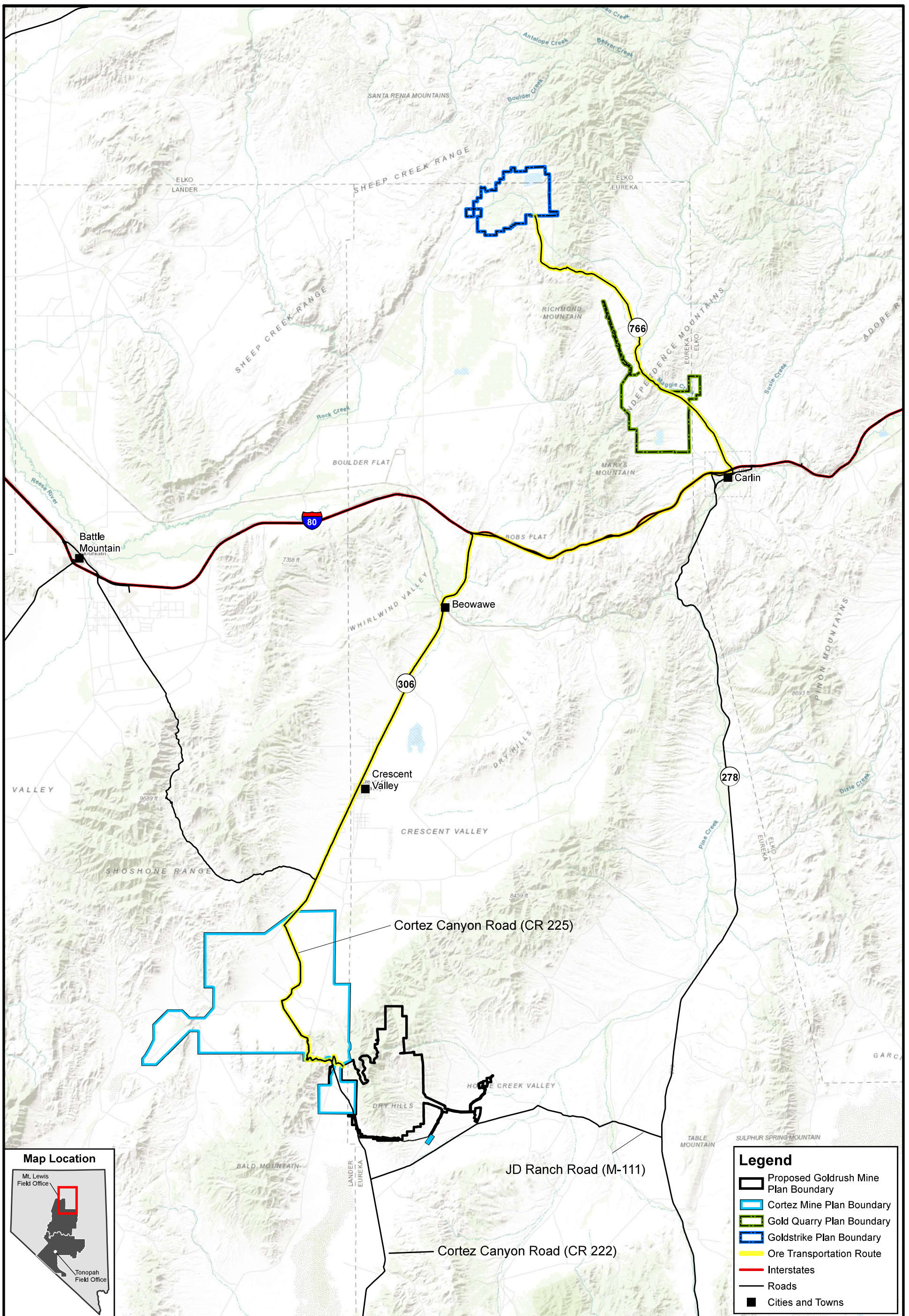



**PROPOSED ROADS**

<b>FIGURE 2-7</b>		REVISION
DATE:	<b>2021-08-23</b>	<b>A</b>

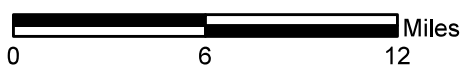
No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.







 Battle Mountain  
 BLM District  
 Mount Lewis Field Office

**NEVADA GOLD MINES LLC  
 GOLDRUSH MINE PROJECT**

  
 0 6 12 Miles  
 1 in = 6 miles

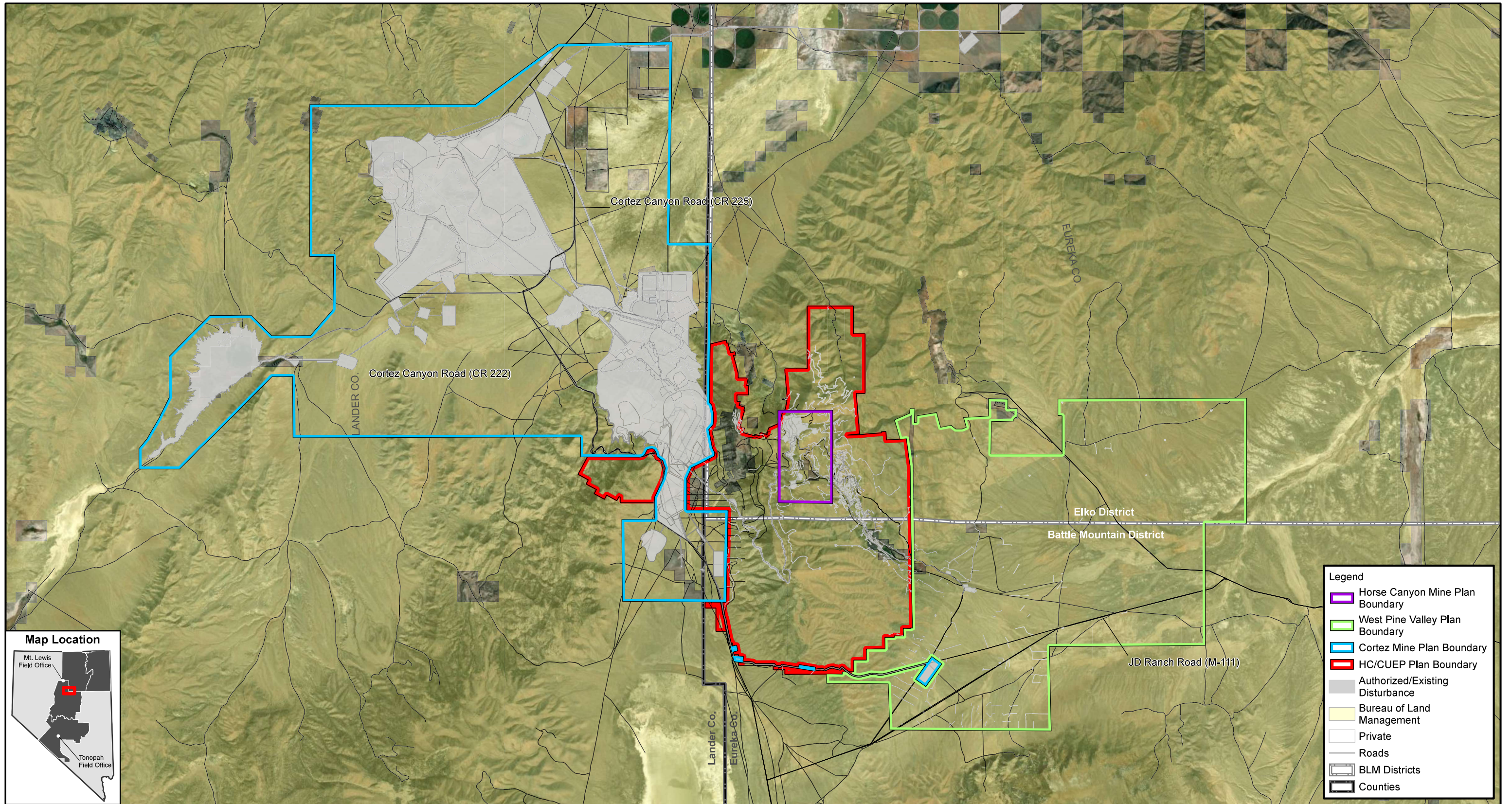


**ORE TRANSPORTATION ROUTE**

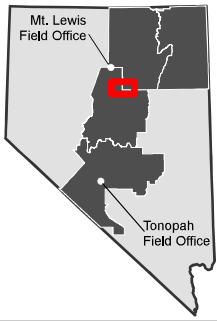
<b>FIGURE 2-8</b>	REVISION
<b>2021-08-23</b>	<b>A</b>

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.



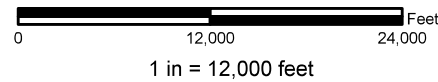


**Map Location**



Battle Mountain  
BLM District  
Mount Lewis Field Office

**NEVADA GOLD MINES LLC  
GOLDRUSH MINE PROJECT**



**NO ACTION OPTION**

**FIGURE 2-9**

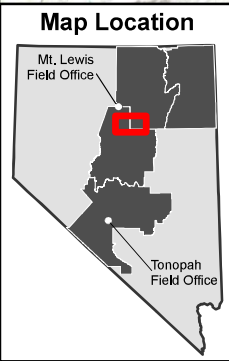
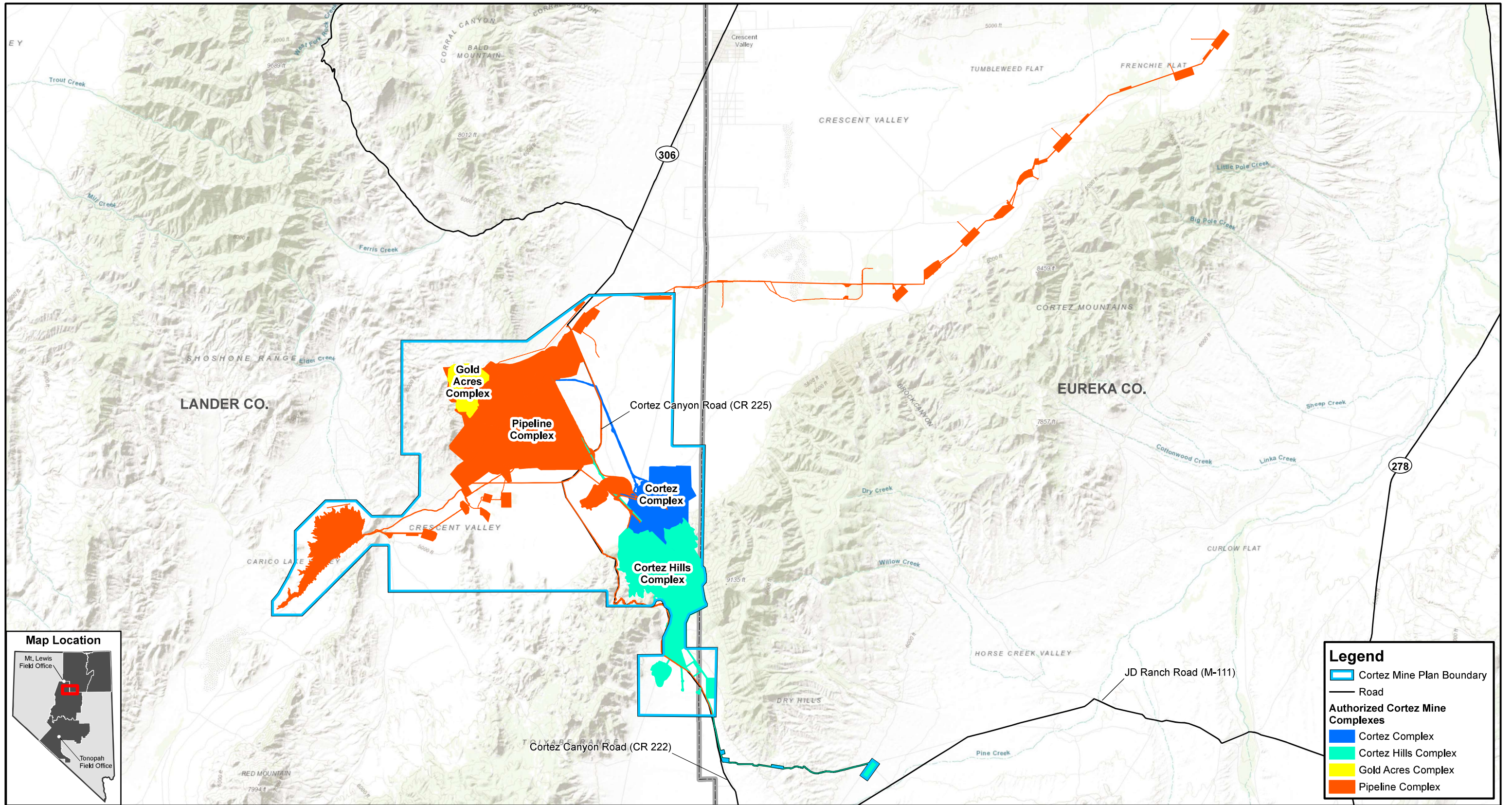
REVISION

DATE:

**2021-08-23**

**A**





**Legend**

- Cortez Mine Plan Boundary
- Road

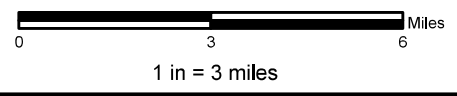
**Authorized Cortez Mine Complexes**

- Cortez Complex
- Cortez Hills Complex
- Gold Acres Complex
- Pipeline Complex



Battle Mountain  
BLM District  
Mount Lewis Field Office

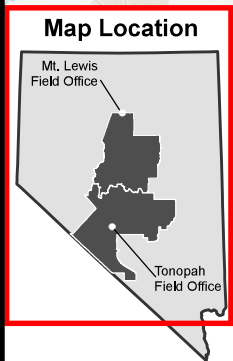
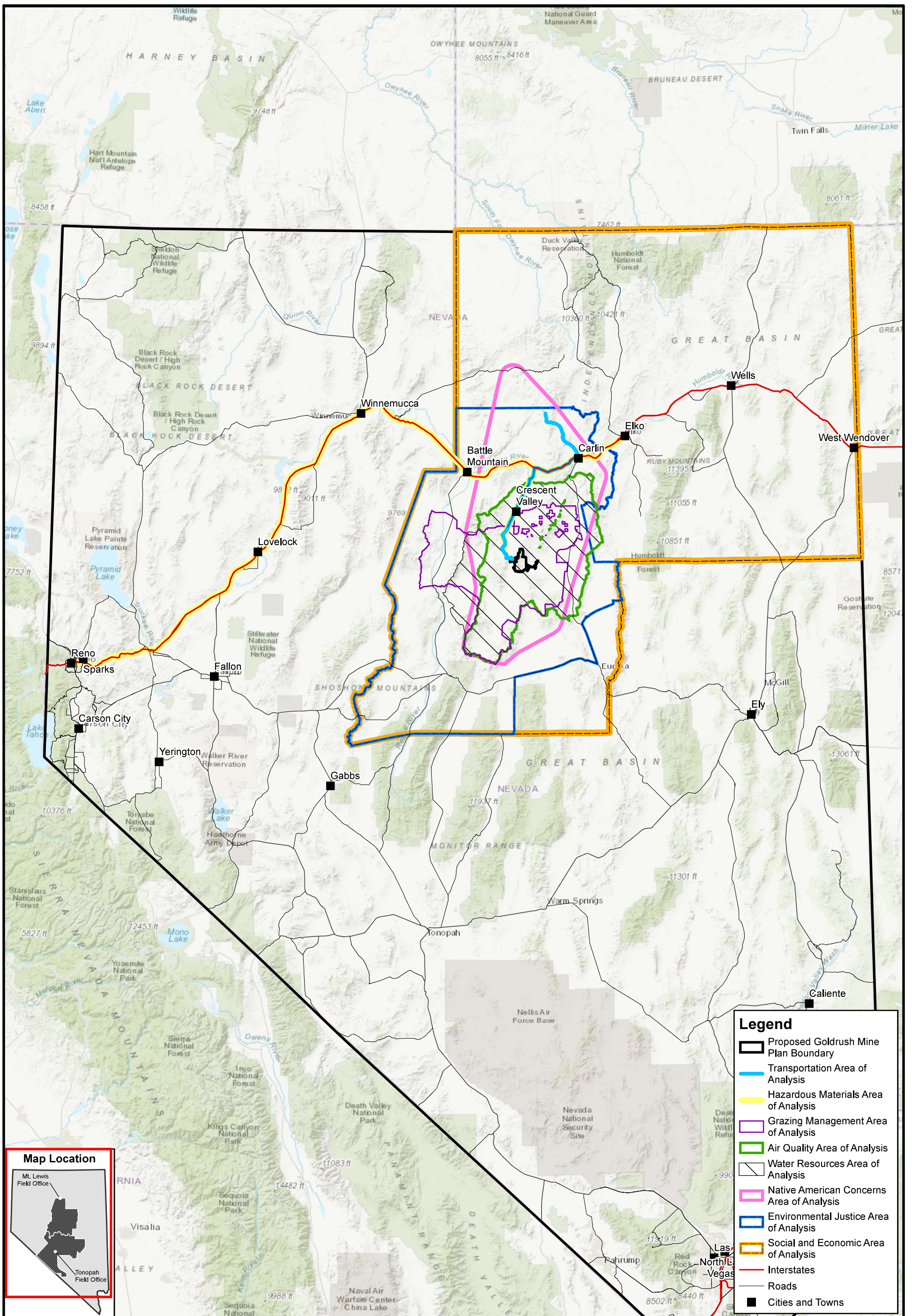
**NEVADA GOLD MINES LLC  
GOLDRUSH MINE PROJECT**



<b>AUTHORIZED CORTEZ MINE COMPLEXES</b>	
<b>FIGURE 2-10</b>	REVISION
DATE: <b>2021-08-23</b>	<b>A</b>

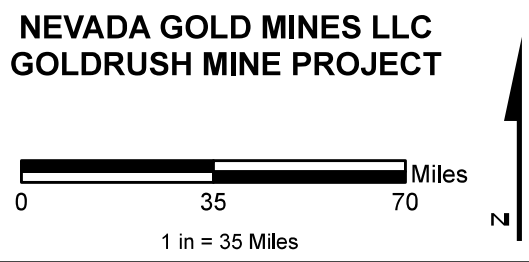
No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.





**NEVADA GOLD MINES LLC  
GOLDRUSH MINE PROJECT**

Battle Mountain  
BLM District  
Mount Lewis Field Office



**AREAS OF ANALYSIS**

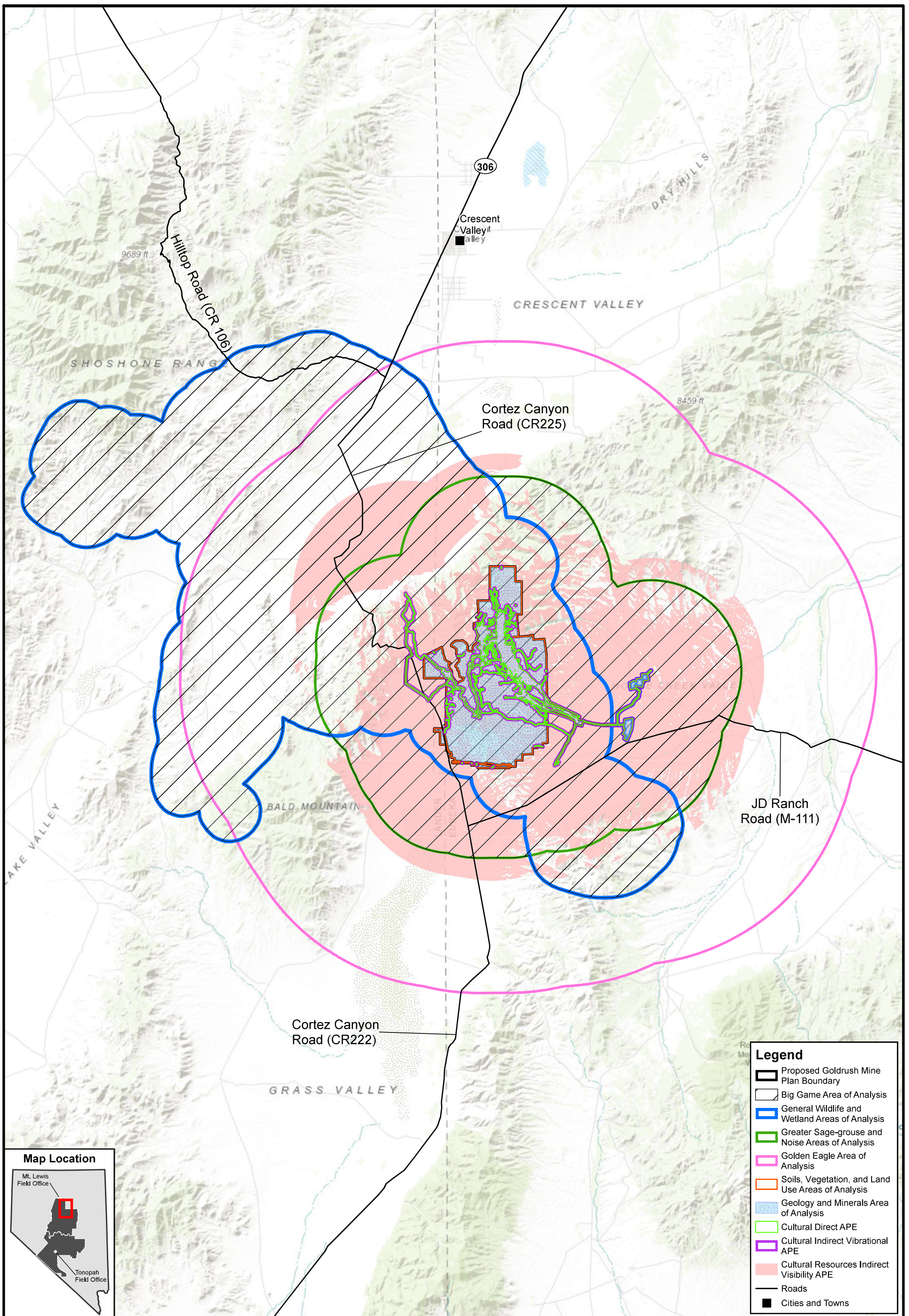
**FIGURE 3-1**

2021-08-23

REVISION  
**A**

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.





**Map Location**

Mt. Lewis Field Office  
Tonopah Field Office

Battle Mountain  
BLM District  
Mount Lewis Field Office

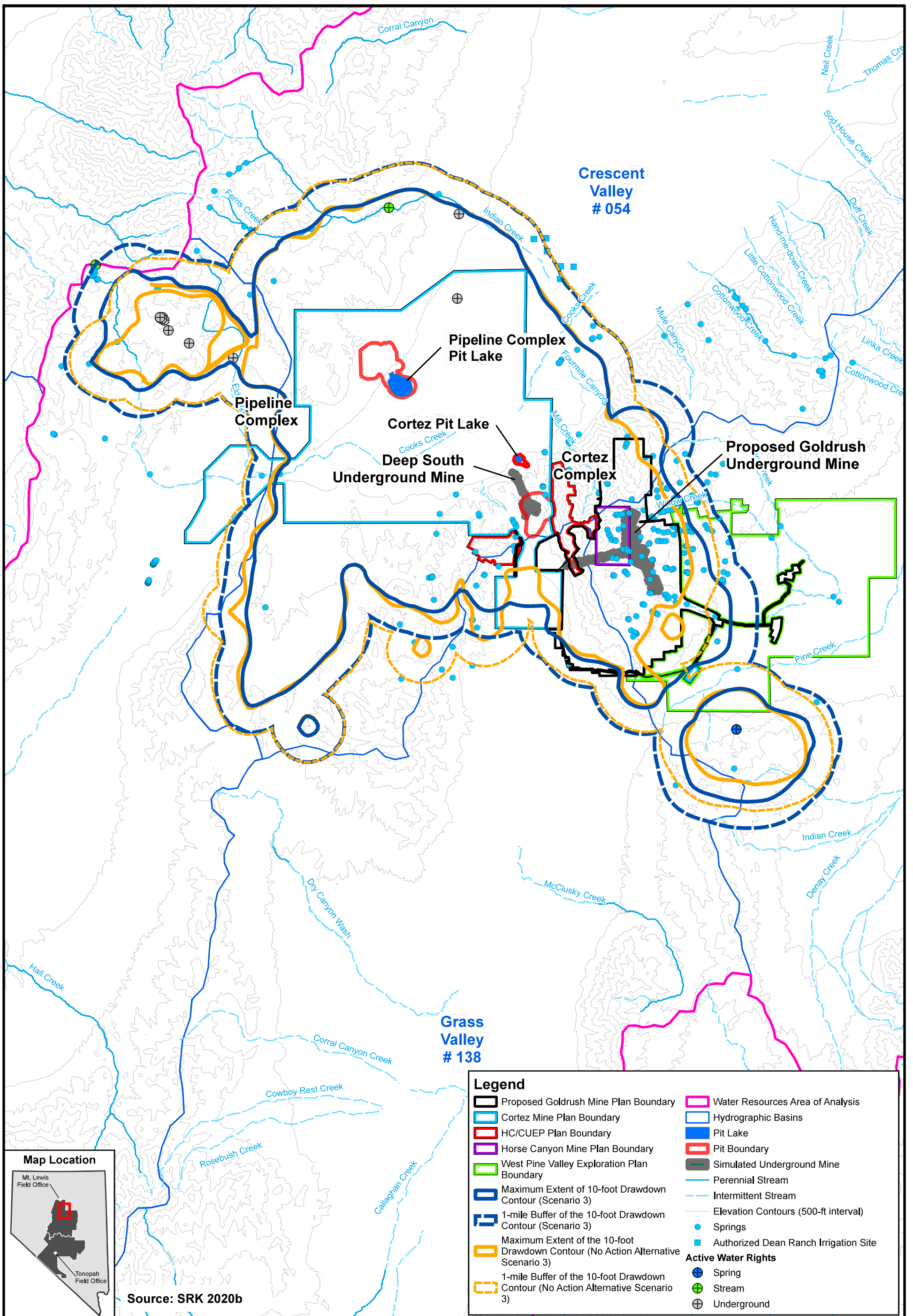
**NEVADA GOLD MINES LLC  
GOLDRUSH MINE PROJECT**

0 4 8 Miles  
1 in = 4 Miles

**AREAS OF ANALYSIS**

<b>FIGURE 3-2</b>	REVISION
<b>2021-08-24</b>	<b>A</b>





**Battle Mountain BLM District**  
Mount Lewis Field Office

**NEVADA GOLD MINES LLC**  
**GOLDRUSH MINE PROJECT**

0 18,000 36,000 Feet

1 in = 18,000 Feet

N

**MAXIMUM EXTENT OF 10-FOOT DRAWDOWN CONTOUR FOR THE PROPOSED ACTION AND NO ACTION ALTERNATIVE**

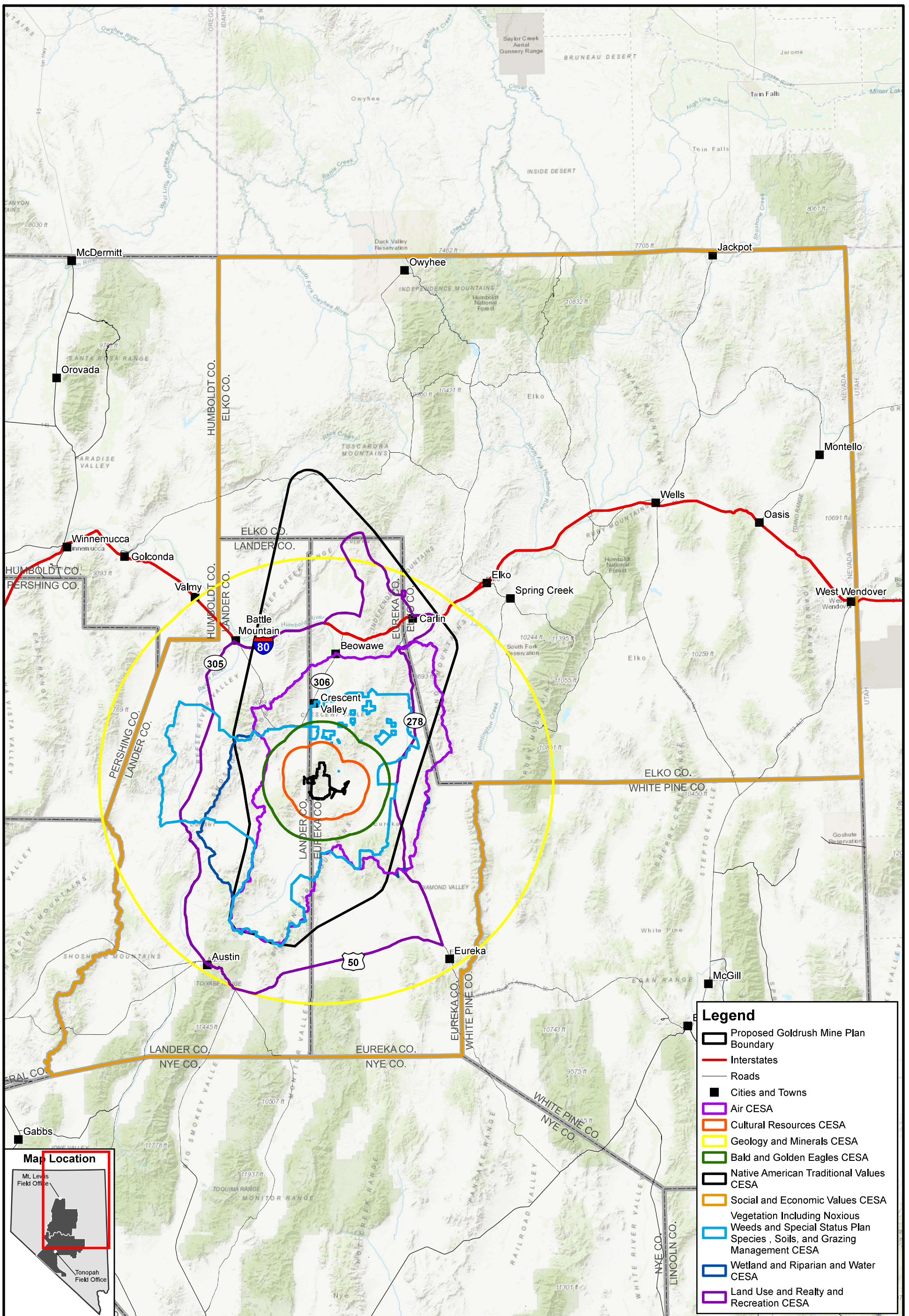

**FIGURE 3-3**

2021-12-14

REVISION  
**A**

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.



**Battle Mountain  
BLM District  
Mount Lewis Field Office**

**NEVADA GOLD MINES LLC  
GOLDRUSH MINE EIS**

0      22      44 Miles

1 in = 22 Miles

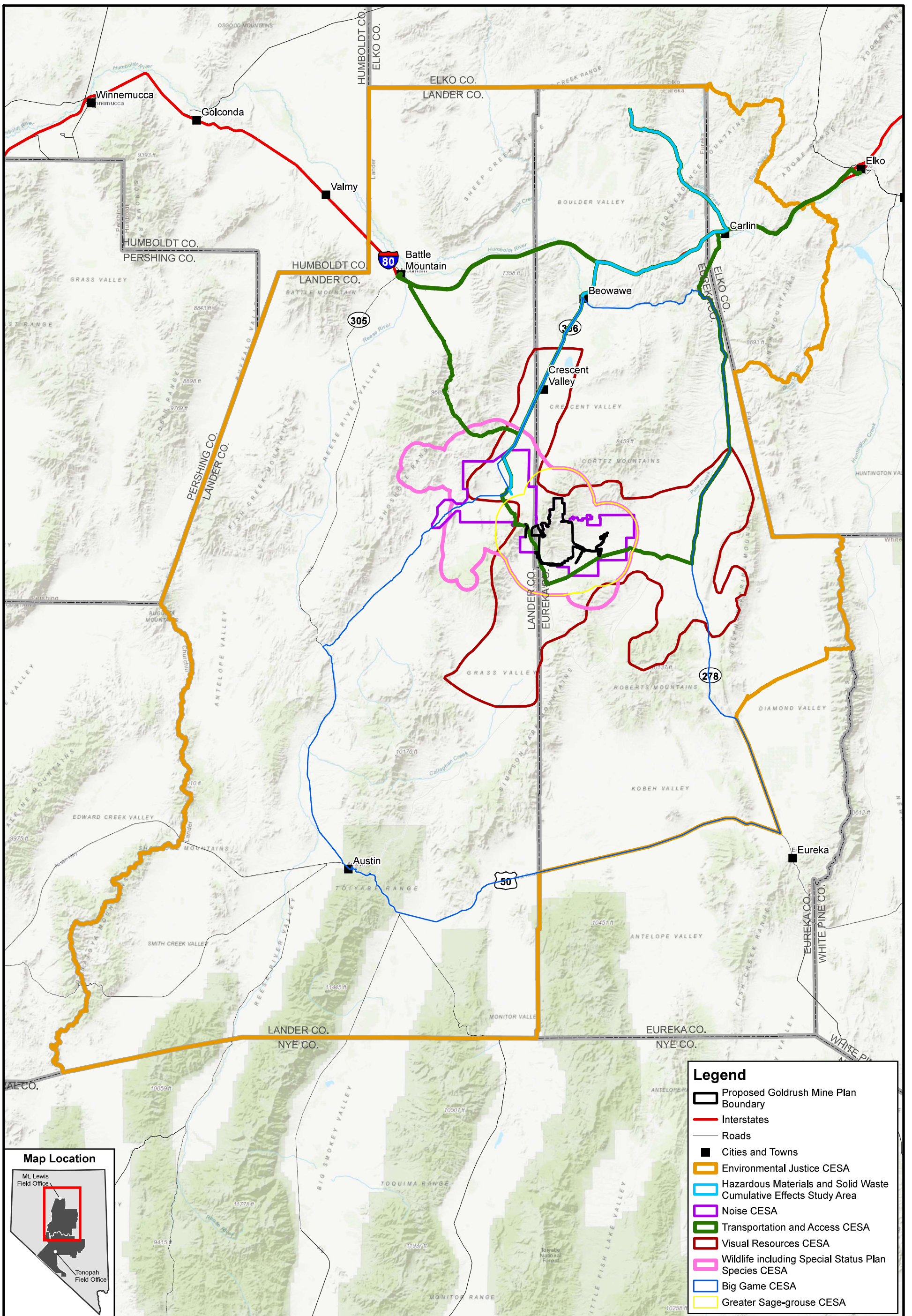
N

**CUMULATIVE EFFECTS STUDY AREAS, PART 1**

<b>FIGURE 4-1</b>	REVISION
<b>2021-12-10</b>	<b>A</b>

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.





**Map Location**

Mt. Lewis Field Office

Tonopah Field Office

Battle Mountain  
BLM District  
Mount Lewis Field Office

**NEVADA GOLD MINES LLC  
GOLDRUSH MINE EIS**

0 12 24 Miles

1 in = 12 Miles

**CUMULATIVE EFFECTS STUDY AREAS, PART 2**

<b>FIGURE 4-2</b>	REVISION
<b>2021-12-10</b>	<b>A</b>

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.



## Appendix B: Major Permits and Approvals

Permit/Approval	Issuing Authority
Air Quality Operating Permit	NDEP (Bureau of Air Pollution Control)
Eagle Take Permit	USFWS
Explosives Permit	U.S. Bureau of Alcohol, Tobacco, Firearms, and Explosives
General Stormwater Discharge Permit	NDEP (Bureau of Water Pollution Control)
Hazardous Materials Storage Permit	Nevada Department of Public Safety, State Fire Marshall, and State Emergency Response Commission
Industrial Artificial Pond Permit	NDOW (Habitat Division)
Jurisdictional Delineation Report Concurrence	U.S. Army Corps of Engineers
Liquefied Petroleum Gas License	NV Board of the Regulation of Liquefied Petroleum Gas
Mercury Operating Permit to Construct	NDEP (Bureau of Air Pollution Control)
Notification of Commencement of Operations	MSHA
Permit to Appropriate Water	NDWR
Permit to Operate	Division of Minerals
Plan of Operations/Record of Decision	BLM
Potable Water System Permit	NV Bureau of Safe Drinking Water
Radioactive Materials License	Nevada Division of Public and Behavioral Health
Reclamation Permit and Reclamation Cost Determination	NDEP (Bureau of Mining Regulation and Reclamation)
Section 401 Certification	NDEP (Bureau of Water Pollution Control)
Septic Treatment Permit, Holding Tank Permit, Sewage Disposal System Permit	NDEP (Bureau of Water Pollution Control)
Water Pollution Control Permit	NDEP (Bureau of Mining Regulation and Reclamation)

Source: NGM 2021

## **Appendix C: Previous NEPA Actions**

**Appendix C**  
**Previous NEPA Actions for Horse Canyon Mine, Horse Canyon/Cortez Unified Exploration Project, West Pine Valley, and Cortez Mine**

Mine Plan	Date	Document	File Number	Proposed Action
Horse Canyon Mine	Approved prior to August 1981	Not Available	Not Available	Approval of the Horse Canyon Project.
	Approved August 1981	NV-060-EA1-47	NV-060-P01-1	Approval of Horse Canyon Haul Road.
	Approved September 1983	Decision, Mining Plan of Operations	NV-010-1P-81	Stipulations to the Plan of Operations.
	Approved October 1986	Decision Mining Plan of Operations	NV-010-1P-81	Alternative location for the South Extension waste pile.
	Approved October 1987	Not Available	N-66896	Not Available
	Approved February 1990	Not Available	N-66896	Not Available
	Approved August 1994	Not Available	N-66896	Not Available
Horse Canyon/Cortez Unified Exploration Project (HC/CUEP)	Approved August 2001	HC/CUEP Environmental Assessment (EA) and Decision Record (DR)/Finding of No Significant Impact (FONSI) (NV063-EA00-35); Plan of Operations (Plan) No. N64-87-010P (97-1A)	N-66621	Amendment 1 combined two previously approved exploration areas. Approval created HC/CUEP and allowed exploration on up to 50 acres.
	Approved September 2004; October 2004	HC/CUEP II EA; DR/FONSI (NV063- EA04-61)	N-66621	Exploration on up to 250 acres within HC/CUEP Plan boundary.
	Approved April 2005	HC/CUEP Decision	N-66621	Amendment 2 Decision affirmed up to 250 acres allowed as modified with revised stipulations.
	Approved November 2008	Cortez Hills Expansion Project Record of Decision (ROD) and Plan of Operations Amendment Approval	N-67575	The ROD modified the HC/CUEP Plan boundary to consolidate and remove overlapping mine plan and exploration plan boundaries.
	Approved March 2009	HC/CUEP Decision	N-66621	Authorized proposed disturbance within authorized disturbance in HC/CUEP Plan.
	Approved November 2010; May 2011	Addendum to the HC/CUEP II EA (NV063-EA04-61); DR/FONSI	N-66621; EA Addendum	Replaced/superseded the 2004 EA, as modified by 2005 DR; supplemented the analysis of cumulative effects; 250 acres of surface disturbance.
	Approved August 2012	HC/CUEP Decision	N-66621 (11-1A)	Addendum to EA removed 50-acre disturbance limit on up to 250 acres
	Approved January 2013	HC/CUEP Decision	N-66621	Authorized HC/CUEP Plan boundary change (reduction of 35 acres).
	Approved March 2015	HC/CUEP Addendum to Plan Modification EA	N-66621 (13-1A, 14-1A)	Authorization of an additional 159 acres of surface disturbance, for a total of 409 acres.

Mine Plan	Date	Document	File Number	Proposed Action
Horse Canyon/Cortez Unified Exploration Project (HC/CUEP) (continued)	Approved June 2015	HC/CUEP Plan Amendment EA	N-66621 (13-1A, 14-1A, 14-2A)	Authorization of additional 140 acres of surface disturbance, for a total of 549 acres.
	Approved September 2016	Barrick Gold Exploration, Inc. Amendment to the Horse Canyon/Cortez Unified Exploration Project Plan of Operations (NVN-066621 [16-1A]) and Reclamation Permit No. 0159 Twin Declines for Underground Exploration	N-66621; DOI-BLM-B010-2016-0026EA	Authorization for the construction of twin declines, exploration drifts, and associated infrastructure to support underground exploration activities.
West Pine Valley	Approved June 2004	West Pine Valley Exploration Project EA	N-77213	Authorization of 150 acres of surface disturbance for phased exploration drilling, seismic, a gravel pit, and laydown yard.
Cortez Mine	July 1993	Final Environmental Impact Statement (EIS), Cortez Gold Mine Expansion Project	N64-87-010P	Authorization of expanding the existing open pit mine, expanding existing waste rock dumps, construction of new heap leach and tailings facilities, exploration, and expansion of existing processing facilities.
	January 1996	Final EIS, Cortez Pipeline Gold Deposit Project, Volumes I and II	N64-93-001P	Authorization of a new open-pit mine with associated dewatering system and waste dumps, a combined heap leach/tailing impoundment facility, a 5,000 ore-processing facility, and continued exploration drilling.
	September 1998	Pipeline Infiltration Project EA	Not Available	Authorization of the expansion of the existing CGM Pipeline Project to create additional infiltration sites within the Project Area. The Project also included an expansion of the Pipeline Project Area to the southeast to accommodate potential infiltration sites.
	February 2000	South Pipeline Project Final EIS	NV64-93-001P (96-2A); NV063-EIS98-014	Authorization of an expansion of the existing open pit and waste rock disposal sites, and the development of heap leach and ancillary facilities.
	December 2004	Pipeline/South Pipeline Pit Expansion Project Final Supplemental EIS	N-67575(01-1A); NV063-EIS01-70	Authorized the expansion of open pit in stages, the expansion of existing waste rock disposal sites, the increase in height of the heap leach pads and waste rock dumps, as well as sequential backfilling of a majority of the open put and development of a new waste rock dump.
	2006	Cortez Mine Underground Exploration Project EA	NV-063-EA05-088	Not Available.

Mine Plan	Date	Document	File Number	Proposed Action
Cortez Mine (continued)	July 2008	Cortez Hills Expansion Project Final EIS	N-67575; NV063-EIS06-011	The Proposed Action included development of new mining facilities in a new area, the Cortez Hills Complex, including development of a new open pit, underground mining, three new waste rock facilities, new heap leach pad, and related roads and ancillary facilities. The Proposed Action also included continued use of existing facilities in the Pipeline Complex, Cortez Complex, and Gold Acres Complex and expansion of existing facilities (pits and waste rock facilities) in the Pipeline Complex and Cortez Complex. The Proposed Action included new surface disturbance of approximately 6,792 acres.
	January 2011	Cortez Hills Expansion Project Final Supplemental EIS	N-67575; DOI-BLM-NV-2010-0132-SEIS	This Supplemental EIS analyzed the air quality impacts of the off-site transportation to and processing of Cortez refractory ore at the existing Goldstrike Mine.
	December 2013	Amendment to Plan of Operations and Reclamation Permit Application Proposed North Waste Rock Facility Realignment/Rangeland Fence Addition/Stockpile Relocation/Ancillary Addition EA	DOI-BLM-NV-B010-2013-0071-EA	Modifications to the Cortez Hills Complex and the Pipeline Complex.
	June 2015	Fiber Optic Cable Project EA	DOI-BLM-NV-B010-2015-0049-EA	A 21.8-mile-long fiber optic cable installation between Barrick Cortez Inc.'s (BCI's) Lodge at Pine Valley and the southeastern boundary of BCI's Cortez Gold Mines (CGM) Operations Area, where it would connect to a fiber optic cable segment and associated equipment on privately owned lands within the CGM Operations Area.
	July 2015	Amendment 3 to Plan of Operations and Reclamation Permit Application EA	DOI-BLM-NV-B010-2015-055-EA	Modifications would result in a total of 581 acres of new surface disturbance and the reallocation of use of currently authorized disturbance at the Pipeline and Cortez Hills complexes.
	April 25, 2018	Cortez Refractory Ore Amendment to the Plan of Operations EA	DOI-BLM-NV-B010-2018-0028-EA	Allow the shipment of an additional 1.2 million tons of refractory ore from the Cortez Hills Open Pit to Goldstrike for processing in an 18-month period.

Mine Plan	Date	Document	File Number	Proposed Action
Cortez Mine <b>(continued)</b>	2019	Deep South Expansion Project EIS	N-67575 (16- 1A); DOI-BLM- NV-B010- 2016-0052 EIS	The Proposed Action included new surface disturbance of approximately 4,380 acres, the life of the mine extended by approximately 12 years, followed by approximately three years for ongoing ore processing, site closure, and final reclamation.

Source: NGM 2020

## References

Nevada Gold Mines LLC (NGM). 2020. Goldrush Mine Plan of Operations and Reclamation Permit Application. September 2019. Updated May 2020. Updated August 2020.



## Appendix D: Details on Authorized Plan Modifications Under the Proposed Action

**Table D-1 Summary of Proposed Goldrush Mine Plan Reclassification Acres**

Authorized Plan	Authorized Plan (acres)	Summary of Acres Removed from Authorized Plan to Other Plans	Acres Added Authorized Plan	Total Acres Transferred to the Goldrush Mine Plan	Total Acres Remaining in Authorized Plan
Horse Canyon Mine <sup>1</sup>	1,929	14 acres (to Goldrush)	0	1,869	0
		1,855 acres (to Goldrush currently overlapping with HC/CUEP)			
		2 acres (to HC/CUEP)			
		58 acres (to HC/CUEP and is currently overlapping)			
HC/CUEP	22,141	17,100 acres (to Goldrush)	2 acres (from Horse Canyon Mine)	18,955	3,188
		1,855 acres (to Goldrush and is currently overlapping with Horse Canyon Mine)	58 acres (from Horse Canyon Mine and is currently overlapping)		
West Pine Valley	33,404	912 (to Goldrush)	0	912	32,492
Cortez Mine	62,372	0	0	0	62,372

Source: NGM 2021

<sup>1</sup> Under the Proposed Action, the Horse Canyon Mine Plan would be closed, and all reclamation obligations would be transferred to the Goldrush Mine.

**Table D-2 Existing Mine Components to Proposed Reclassified Goldrush Mine Components**

Existing Mine Components	Existing Disturbance (acres)	Reclassified Goldrush Mine Component	Reclassified Disturbance (acres)
<b>Horse Canyon Mine</b>		<b>Goldrush Mine</b>	
Horse Canyon Haul Road	3.4	Dewatering and Monitoring Wells and Access Roads	3.4
Horse Canyon Mine	2.2	Dewatering and Monitoring Wells and Access Roads	2.2
<b>Subtotal Horse Canyon Mine</b>	<b>5.6</b>	<b>Subtotal Goldrush Mine</b>	<b>5.6</b>
<b>HC/CUEP</b>		<b>Goldrush Mine</b>	
Exploration	218.1	Ancillary	141.2
		Dewatering and Monitoring Wells and Access Roads	52.5
		Horse Canyon Haul Road	0.03
		Portal Pad and Stormwater Controls	0.6
		Power Line corridors (120-kV)	0.1
		Power Line corridors (13.8-kV)	13.6
		Ventilation Raises	10.1
<b>Subtotal HC/CUEP</b>	<b>218.1</b>	<b>Subtotal Goldrush Mine</b>	<b>218.1</b>

Existing Mine Components	Existing Disturbance (acres)	Reclassified Goldrush Mine Component	Reclassified Disturbance (acres)
<b>West Pine Valley</b>		<b>Goldrush Mine</b>	
Exploration	11.1	Ancillary	0.8
		Dewatering and Monitoring Wells and Access Roads	7.5
		Power Line corridors (13.8-kV)	0.4
		RIBs	2.2
		Water Pipeline Corridors (Dewatering and RIBs)	0.2
Gravel Pit	0.5	Dewatering and Monitoring Wells and Access Roads	0.5
WTP/Multi-Use Building Yards	0.2	Dewatering and Monitoring Wells and Access Roads	0.2
<b>Subtotal West Pine Valley</b>	<b>11.8</b>	<b>Subtotal Goldrush Mine</b>	<b>11.8</b>
<b>Total</b>	<b>235.6</b>	<b>Total<sup>1</sup></b>	<b>235.6</b>

<sup>1</sup> Approximately 235.6 acres of authorized disturbance would be reclassified under the Proposed Action. Total reclassified disturbance would be equal to the negative numbers listed in **Table D-4**, plus the additional 0.5 and 0.2 reclassified acres from the authorized Drill Supply Laydown Yard and the authorized West Pine Valley Gravel Pit. The total reclassified 235.6 acres does not include the 11.8 authorized acres to be reclassified in **Table 2-2** of the EIS.

**Table D-3 Summary of Proposed Goldrush Mine Plan Boundary Acres**

Plan of Operations	Acres
Authorized Horse Canyon Mine <sup>1</sup>	14
Authorized HC/CUEP (currently overlapping with Horse Canyon Mine)	1,855
Authorized HC/CUEP	17,100
Authorized West Pine Valley	912
<b>Total Acres Transferred to Goldrush from Other Plans</b>	<b>19,881</b>
Proposed Goldrush Mine Plan New Acres	14
<b>Proposed Goldrush Mine Plan Boundary Total</b>	<b>19,895</b>

<sup>1</sup> As detailed in **Table D-1**, 1,855 acres would be transferred from the Horse Canyon Mine to the proposed Goldrush Mine Plan boundary and is currently overlapping with HC/CUEP. However, the 1,855 acres of overlap is already accounted for in the HC/CUEP transfer acreage to the Goldrush Mine; thus, it is not shown as an acreage transfer for the Horse Canyon Mine Plan to avoid double counting.

**Table D-4 Existing Disturbance within Horse Canyon Mine, HC/CUEP, and West Pine Valley Mine Plans Located within the Proposed Goldrush Mine Plan Boundary**

Component	Authorized Disturbance (acres)			Existing Disturbance within the Proposed Goldrush Mine Plan Boundary (acres) <sup>1</sup>		
	Public	Private	Total	Public	Private	Total
<b>Horse Canyon Mine</b>						
Horse Canyon Haul Road	186.3	3.2	189.5	189.4	3.7	193.1
Horse Canyon Mine	235.2	0.0	235.2	221.4	0.0	221.4
<b>Horse Canyon Mine Plan Total</b>	<b>421.5</b>	<b>3.2</b>	<b>424.7</b>	<b>410.8</b>	<b>3.7</b>	<b>414.5</b>
<b>HC/CUEP</b>						
Drill Roads Less Than 30 Percent Underlying Slope	79.4	15.0	94.4	77.2	9.9	87.1
Drill Roads Greater Than 30 Percent Underlying Slope	65.3	3.0	68.3	62.3	0.8	63.1
Drill Pads and Sumps Less Than 30 Percent Underlying Slope	71.4	15.0	86.4	69.5	8.7	78.2

Component	Authorized Disturbance (acres)			Existing Disturbance within the Proposed Goldrush Mine Plan Boundary (acres) <sup>1</sup>		
	Public	Private	Total	Public	Private	Total
Drill Pads and Sumps Greater Than 30 Percent Underlying Slope	66.0	1.0	67.0	44.5	0.1	44.6
Trenches Less Than 30 Percent Underlying Slope	1.0	0.0	1.0	0.2	0.0	0.2
Trenches Greater Than 30 Percent Underlying Slope	1.0	0.0	1.0	0.0	0.0	0.0
Communications Sites Less Than 30 Percent Underlying Slope	0.8	0.1	0.9	0.5	0.0	0.5
Sediment/Erosion Control Less Than 30 Percent Underlying Slope	7.0	0.0	7.0	2.0	0.0	2.0
Geophysical Activities Less Than 30 Percent Underlying Slope	1.0	0.0	1.0	0.0	0.0	0.0
Geophysical Activities Than 30 Percent Underlying Slope	2.0	0.0	2.0	0.0	0.0	0.0
Ancillary	10.0	0.0	10.0	10.0	0.0	10.0
Surface Disturbance Recontoured/Seeded Less Than 30 Percent Underlying Slope	141.8	18.6	160.4	133.6	17.7	151.3
Surface Disturbance Recontoured/Seeded Greater Than 30 Percent Underlying Slope	71.3	17.8	89.1	62.6	6.2	68.8
<b>HC/CUEP Total<sup>2</sup></b>	<b>518.0</b>	<b>71.0</b>	<b>589.0</b>	<b>462.4</b>	<b>43.4</b>	<b>505.8</b>
<b>HC/CUEP Pre-81 Improved</b>						
Pre-81 Improved Less Than 30 Percent Underlying Slope	51.3	8.6	59.9	41.9	5.8	47.7
Pre-81 Improved Greater Than 30 Percent Underlying Slope	37.2	2.0	39.2	29.0	0.1	29.1
<b>HC/CUEP Total Pre-81 Improved</b>	<b>88.5</b>	<b>10.6</b>	<b>99.1</b>	<b>70.9</b>	<b>5.9</b>	<b>76.8</b>
<b>HC/CUEP Total (including Pre-81 Improved)</b>	<b>606.5</b>	<b>81.6</b>	<b>688.1</b>	<b>533.3</b>	<b>49.3</b>	<b>582.6</b>
<b>West Pine Valley</b>						
Cut/Fill Drill Roads, Pads and Sumps	57.8	10.0	67.8	12.1 <sup>3</sup>	0.8	12.9
Overland Drill roads, Pads and Sumps	60.0	0.2	60.2	2.3	0.3	2.6
Drill Supply Laydown Yard Area	22.0	0.0	22.0	12.4	0.0	12.4
<b>West Pine Valley Total</b>	<b>139.8</b>	<b>10.2</b>	<b>150.0</b>	<b>26.8</b>	<b>1.1</b>	<b>27.9</b>
<b>Total</b>	<b>1,167.8</b>	<b>95.0</b>	<b>1,262.8</b>	<b>970.9</b>	<b>54.1</b>	<b>1,025.0</b>

Source: NGM 2021

<sup>1</sup> Total existing acres as of March 31, 2020.

<sup>2</sup> HC/CUEP authorized total acres are rounded to the nearest whole acre.

<sup>3</sup> Of the 12.1 acres of public land, 2.8 acres include the West Pine Valley gravel pit.

**Appendix E: ACEPMs and Mitigation Required under  
Currently Authorized Actions (No Action Alternative)**

## **Appendix E**

# **Previously Authorized Applicant-Committed Environmental Protection Measures and Mitigation Measures**

### **1.0 Introduction**

Nevada Gold Mines LLC (NGM) would continue to implement approved applicant-committed environmental protection measures (ACEPMs) and mitigation measures for the Horse Canyon Mine, Horse Canyon/Cortez Unified Exploration Project (HC/CUEP), West Pine Valley Exploration Project, and Cortez Mine as authorized in previous National Environmental Policy Act (NEPA) actions, outlined in Appendix A (NGM 2020). The ACEPMs presented below are not applicable to the proposed Goldrush Mine and only apply to the No Action Option.

In addition, the Cortez Mine would also continue to implement previously authorized ACEPMs as described in the following documents and already in place under existing approved Plans of Operation (Plans) (BCI 2019):

- Amendment to the Pipeline/South Pipeline Plan of Operations for the Cortez Hills Expansion Project (N-67575), July 2008;
- Cortez Gold Mines 2010 Amendment to Plan of Operations and Reclamation Permit (Cortez, December 2010, revised June 2011) (N-67575);
- A Determination of NEPA Adequacy was issued for the Cortez Gold Mines (N-67575) (12-1A) Amendment to Plan of Operations and Reclamation Permit Application;
- Barrick Cortez Inc. 2011 Amendment to the Plan of Operations and Reclamation Permit Application – Proposed North Waste Rock Facility Realignment/Rangeland Fence Addition/Stockpile Relocation/Ancillary Addition (N-67575 [11-3A]);
- Barrick Cortez Inc. (N-67575 [14-1A]) Amendment 3 to Plan of Operations and Reclamation Permit Application; and
- Barrick Cortez Inc. (N-67575 [18-1A]) Amendment 3 to Plan of Operations and Reclamation Permit Application for Temporary Refractory Ore Haulage.

Previous ACEPMs and mitigation measures at Horse Canyon Mine, HC/CUEP, West Pine Valley Exploration Project, and Cortez Mine were authorized under Barrick Gold Corporation; however, on July 1, 2019, Nevada Gold Mines LLC (NGM) was established as a joint venture between Barrick Gold Corporation and Newmont Goldcorp Corporation, which took control of Barrick Cortez Inc. NGM, as operator of Horse Canyon Mine, HC/CUEP, West Pine Valley Exploration Project, and Cortez Mine, has committed to all previously authorized ACEPMs and mitigation measures and all ACEPMs and mitigation measure are herein referenced with the new operator, NGM. The wording of the ACEPMs and mitigation measures are as provided in the previous documents and therefore reference the specific projects they are applicable to. In addition, some ACEPMs or mitigation measures may be completed or superseded by other more protective ACEPMs or mitigation measures but are still listed as they are part of the authorizations. In addition, clarifying text to the specific data sources has been added to authorized ACEPMs and mitigation measures to provide further explanation to assist with readability and citations.

## **2.0 Environmental Protection Measures**

### **2.1 Horse Canyon Mine, Horse Canyon/Cortez Unified Exploration Project, West Pine Valley Exploration Project**

#### **2.1.1 Air Quality**

- NGM, in compliance with the Nevada Division of Environmental Protection (NDEP) - Bureau of Air Pollution Control (BAPC) Surface Disturbance Permit, will protect air quality by undertaking road maintenance activities to reduce fugitive dust emissions. Roads will continue to be watered using freshwater or drill-produced groundwater consistent with NDEP approvals, graveled, or chemically treated to reduce fugitive dust emissions, based upon weather and road conditions. Application of water and/or a dust suppression chemical such as magnesium chloride by water trucks will be done, as needed, in areas of close-spaced drilling and related activity. NGM will use wet drilling methods to reduce the potential for fugitive dust emissions.
- Speed limits are posted and vehicle speeds reduced in areas of disturbance and on the Horse Canyon Haul Road to minimize the potential for fugitive dust emissions, to protect wildlife and livestock, and to maintain operational safety. Speed limits will continue to be enforced.
- Horse Canyon Mine, HC/CUEP, and West Pine Valley Exploration Project vehicles will continue to be maintained regularly to ensure they are operating in a manner to minimize vehicle emissions.
- NGM will implement the HC/CUEP fugitive dust control plan to minimize dust emissions. The Horse Canyon Haul Road and the portal pad will be watered, graveled, or chemically treated to reduce fugitive dust emissions, based upon weather and road conditions.

#### **2.1.2 Cultural and Paleontological Resources**

- NGM will continue to conduct exploration activities in accordance with all applicable state and federal regulations and the 2018 Programmatic Agreement among the Bureau of Land Management (BLM), State Historic Preservation Office (SHPO), and the Cortez Joint Venture. Before conducting any surface disturbing activities, NGM will submit to the BLM a 1:24,000 scale map showing the location of proposed activity. For areas that previously have been surveyed at the Class III level, the BLM will then determine which cultural sites need to be monitored and establish an exclusion zone around each site eligible for the National Register of Historic Places (NRHP).
- For areas that have not been surveyed at a Class III level, the BLM will determine the Area of Potential Effect and whether a Class III survey is necessary. If a Class III survey is required, NGM will retain a BLM-qualified archaeologist to undertake the inventory. NGM will select a Native American observer from a list of previously used observers to accompany the archaeologist during the inventory to provide information and/or recommendations to the BLM. If selected Native American observer is not available upon 5 days' notice, a different observer may be selected. If none is available within a reasonable period, NGM will document that a reasonable attempt was made to contact the Tribes and obtain an observer. A revised Programmatic Agreement between NGM, BLM, SHPO, and Tribal entities is currently under development, which may result in an updated Native American observer process.
- The archaeologist will submit a report that adheres to the BLM's Cultural Resource Inventory Guidelines documenting the results of the inventory. All documented sites will be protected from surface disturbing activities by an exclusion zone determined by a BLM archaeologist until the BLM assesses whether the site is eligible for listing on the NRHP. If the BLM determines, in consultation with SHPO, that such site is or may be eligible for the NRHP, NGM will not conduct any surface disturbing activities within the exclusion zone without further authorization from the BLM, which may require further environmental and/or cultural analyses. If the site is determined not to be eligible, or the BLM determines that existing cultural surveys are sufficient to conclude that no eligible sites exist, NGM may conduct surface disturbing activities upon notification by the BLM.



- If NGM discovers previously unknown cultural resources while undertaking exploration activities, NGM will immediately cease any surface disturbing activity within 100 meters/330 feet of the discovery and notify the BLM. If the BLM determines, in consultation with SHPO, that the site is or may be eligible for the NRHP, a BLM archaeologist will determine an exclusion zone adequate to protect the resource. NGM will not conduct any surface disturbing activities within this exclusion zone without further authorization from the BLM, which may require further environmental and/or cultural analyses. If the site is determined not to be eligible, NGM may resume surface disturbing activities upon notification by the BLM.
- NGM's employees and contractors will receive training on the potential for cultural resources and the procedures required by NGM to avoid disturbing, altering, or destroying any remains or any historical or archaeological site, structure, building or object on federal land. If exploration activities uncover human remains, NGM will immediately cease all earth disturbing activities within 100 meters/330 feet of the discovery and notify the BLM and county law enforcement so that the BLM and/or law enforcement can ensure compliance with all applicable laws regarding such discovery.
- If NGM discovers a vertebrate fossil deposit during surface disturbing activities, NGM will immediately cease further activities that may affect the deposit and notify the BLM so that the BLM may evaluate the discovery and establish an exclusion zone. NGM will not undertake any further surface disturbance within the exclusion zone.

### **2.1.3 Fire Prevention and Control**

- NGM will comply with all applicable federal and state fire laws and regulations, and will take all reasonable measures to prevent and suppress fires in the area of operations. NGM and contractors are required to carry fire extinguishers, hand tools, and/or backpack-type water pumps in their vehicles to suppress small fires.

### **2.1.4 Hazardous Materials and Solid Waste**

- The Horse Canyon Mine, HC/CUEP, and West Pine Valley Exploration Project will not generate, use or dispose of any hazardous waste. Petroleum products will be used on-site. Petroleum products are excluded as hazardous substances under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) section 101(14). Diesel, oil, and lubricants will be transported to the site in portable containers (e.g., tanks in the pickup trucks for diesel fuel) but will not be stored on-site. If regulated materials (petroleum products) are spilled, measures will be taken under NGM spill response guidelines to control the extent of the spill, and the appropriate agencies will be notified in accordance with the applicable federal and state regulations.
- Solid waste will be collected at each drill pad and the portal pad and transported offsite periodically for disposal at an approved solid waste facility.

### **2.1.5 Invasive and Non-Native Species**

- NGM will be responsible for controlling all noxious weeds in newly disturbed areas until the reclamation activities have been determined to be successful and released by the BLM Authorized Officer.
- A noxious weed management plan has been prepared for HC/CUEP (SRK 2016) and is included in Attachment 2 of Appendix A of 2016 Final Environmental Assessment for the Barrick Gold Exploration, Inc. Amendment to the Horse Canyon/Cortez Unified Exploration Project Plan of Operations (NVN-066621 [16-1A]) and Reclamation Permit No. 0159, Twin Declines for Underground Exploration (BLM 2016). The purpose of the plan is to prevent, mitigate, and control the spread of noxious weeds during and following exploration. The plan prescribes a control protocol using disturbance categories and best applicable control methods for effectiveness. Disturbance categories are applied to areas of HC/CUEP based on frequency of disturbance. The

plan also includes a list of five weed control alternative methods, including manual, chemical, and seeding of desirable species methods, which are applied to each disturbance category.

- NGM will follow the noxious weed management plan (SRK 2016) presented in Attachment 2 of Appendix A of the 2016 Final Environmental Assessment for the Barrick Gold Exploration, Inc. Amendment to the Horse Canyon/Cortez Unified Exploration Project Plan of Operations (NVN-066621 [16-1A]) and Reclamation Permit No. 0159, Twin Declines for Underground Exploration (BLM 2016). As part of weed control measures, NGM will require that the undercarriage of all contractor vehicles be cleaned prior to entering the HC/CUEP area if the vehicle is coming from an area outside of northeastern Nevada. A list of State of Nevada weeds can be found at the State of Nevada Department of Agriculture website: [http://agri.nv.gov/Plant/Noxious\\_Weeds/Noxious\\_Weed\\_List](http://agri.nv.gov/Plant/Noxious_Weeds/Noxious_Weed_List).
- Only chemicals approved for use on public land will be used for invasive, non-native weed treatment. NGM will conduct weed eradication programs annually in areas of their activities. Areas of known noxious weeds, invasive and non-native species will be avoided during periods when weeds could be spread by vehicles (i.e., periods of potential seed dispersal).
- Re-establishment of vegetation in disturbance areas will be conducted as soon as practical to reduce the potential for wind and water erosion, minimize impacts to soils and vegetation, and help prevent the spread of noxious weeds, invasive and non-native species.
- Reclaimed areas will be seeded with BLM-approved recommendations for seed mix, application rates, and seeding methods. The Best Management Practices (BMPs) of actively treating noxious weeds, invasive and non-native species upon discovery will also prevent these weed species from spreading and dominating the site. Compliance with the noxious weed management plan (SRK 2016) in Attachment 2 of Appendix A of the 2016 Final Environmental Assessment for the Barrick Gold Exploration, Inc. Amendment to the Horse Canyon/Cortez Unified Exploration Project Plan of Operations (NVN-066621 [16-1A]) and Reclamation Permit No. 0159, Twin Declines for Underground Exploration (BLM 2016) will insure exploration activities follow proper BLM protocol regarding noxious weeds, invasive and non-native species.

#### **2.1.6 Native American Concerns**

- After more than 10 years of ethnographic work and consultation in the Crescent Valley/Cortez/Grass Valley/Pine Valley areas, which included interviews with knowledgeable individuals and groups, compilations of ethnographic research, field tours, and formal government-to-government consultations with federally recognized Native American tribes in the area, the BLM determined that Mount Tenabo/White Cliffs and portions of Horse Canyon are eligible for listing on the NRHP as Properties of Cultural and Religious Importance (PCRI) (BLM 2004a).
- Before conducting any activity in the PCRI areas, NGM will notify the BLM of the proposed activity, so that the BLM may establish exclusion zones as necessary to protect the features identified as contributing elements in the April 19, 2004 eligibility determinations for the PCRI areas. NGM will not conduct any activity within such exclusion zones without further authorization from the BLM, which may require further environmental and/or cultural analyses. For any activity conducted inside the PCRI areas, but outside of the exclusion zones, NGM will arrange for a BLM permitted archaeologist and a Native American observer (as provided above) to be on site during new surface-disturbing activity to ensure that contributing elements are not adversely affected by the operations.

#### **2.1.7 Public Safety and Access**

- Public safety will be maintained throughout the life of the Horse Canyon Mine, HC/CUEP, West Pine Valley Exploration Projects. All equipment and other facilities will be maintained in a safe and orderly manner.

- Speed limits of not more than 35 miles per hour will be posted on the Horse Canyon Haul Road to maintain operational safety. Speed limits will continue to be enforced.
- Drill sites, sumps, and excavations will be reclaimed as soon as practicable after completion of sampling and logging.
- Final reclamation of overland travel routes, sumps, and drill sites will consist of, if required, fully recontouring disturbances to their original grade, and reseeding in the fall season immediately following completion of exploration activities. In the event that any existing roads are damaged as a result of NGM activities, NGM will return them to their original condition.
- Road construction and drainage operations are governed by the provisions of the Horse Canyon Mine, HC/CUEP, West Pine Valley Exploration Project Plan and the State of Nevada General Stormwater Permit NVR 300000 (MSW-798 approved March 2013). Roads will be designed to the minimum standards needed to accommodate intended safe use and to maintain surface resource protection. Where feasible, exploration roads will be constructed along existing contours. Exploration road construction will be conducted in such a manner as to minimize cuts and fills, including limiting road construction on steep slopes, where possible.

#### **2.1.8 Range Resources**

- NGM will protect fences, gates, stock ponds, and other range improvements within the Horse Canyon Mine, HC/CUEP, West Pine Valley Exploration Project. Gates will be closed and/or locked as appropriate. Any range monitoring key areas in the Horse Canyon Mine, HC/CUEP, West Pine Valley Exploration Project area will be avoided.

#### **2.1.9 Soils and Erosion Prevention and Control**

- NGM will conduct exploration operations to minimize soil erosion. Erosion and runoff control measures, such as waterbars, ditching, and other water control structures will be implemented in areas of surface disturbance. After the exploration program is completed in an area, the surface disturbance will be graded, recontoured, and available topsoil/growth medium replaced, and the area will be seeded with an appropriate and BLM-approved seed mixture in order to establish a ground cover and minimize erosion. Revegetation activities will continue to be commenced at the earliest feasible time following reclamation activities. BMPs will be utilized to control erosion and sedimentation. BMPs utilized to control erosion and sedimentation are detailed in Attachment 1 of Appendix A of the 2016 Final Environmental Assessment for the Barrick Gold Exploration, Inc. Amendment to the Horse Canyon/Cortez Unified Exploration Project Plan of Operations (NVN-066621 [16-1A]) and Reclamation Permit No. 0159, Twin Declines for Underground Exploration (BLM 2016).
- NGM has begun a program of hand-planting Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) and bitterbrush (*Purshia* spp.) seedlings in reclaimed areas. Similar programs for hand-planting seedlings may occur in the future as deemed necessary to achieve the reclamation objectives.
- After underground exploration is completed, the portal pad at the HC/CUEP will be recontoured, growth medium will be placed, and the area reseeded with a BLM-approved seed mixture to establish ground cover and minimize erosion.

#### **2.1.10 Spill Contingency Plan**

- Materials and equipment necessary for spill cleanup will be kept at each drill rig. Equipment and materials will include, but not be limited to, shovels, gloves, safety glasses, sorbent materials, sand, sawdust, and plastic/metal trash containers specifically for this purpose.

- Well-maintained equipment will be used to perform the work required at the Horse Canyon Mine, HC/CUEP, West Pine Valley Exploration Project. When practicable, equipment maintenance will be performed off-site. In the event of oil, fuel, lubricating grease or other equipment leaks, cleanup will be conducted as soon as possible. If the leak is on compacted soil, an oil-absorbing product, such as Absorb®, may be applied. Once the cleanup product has absorbed the spill material, the product will be removed and placed in the petroleum contaminated soil bin located in the laydown yard, and the material disposed of according to state and federal regulations. Any contaminated soil will be removed, managed, and disposed of at an off-site facility in compliance with state and federal regulations. In the event of oil, fuel, or hydraulic fluid leaks, cleanup will be conducted as soon as possible. In the event of a major spill, the following actions will be taken in addition to any federal, state, and local health and safety regulations:
  - Contain the spread or migration of the spill using the on-hand supply of erosion control structures and/or by creating dirt berms, as feasible and necessary.
  - Regulated wastes will be removed from the Horse Canyon Mine, HC/CUEP, West Pine Valley Exploration Project area and disposed of in a state, federal, or local designated area.
  - If a spill of a petroleum constituent is considered to meet the reportable quantity per the NDEP's guidelines (greater than 25 gallons or greater than three cubic yards of impacted material) or a reportable quantity for hazardous waste is released based on the U.S Environmental Protection Agency guidelines established under Title III List of Lists (40 Code of Federal Regulations [CFR] Part 302), the BLM and NDEP will be notified within 24 hours and the appropriate remedial actions and confirmation sampling will be conducted under direction of the NDEP.

#### **2.1.11 Survey Monuments**

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

#### **2.1.12 Vegetation, Forestry, and Woodland Resources**

- Reseeding will be consistent with all BLM recommendations for seed mix constituents, application rate, and seeding methods.
- NGM will minimize where possible any injury or removal of pinyon pine, juniper, aspen, limber pine, or mountain mahogany during activities associated with drill pad and road construction. However, pinyon pine and juniper that has been removed due to exploration or mitigation activities will be made available to the public.

#### **2.1.13 Water and Riparian Resources**

- In general, natural drainage patterns will not be altered; however, a diversion will be placed above the portal pad to route the surface flow around the portal pad. Stormwater from this channel will be routed under the Horse Canyon haul road via culverts and directed into an unnamed drainage.
- Culverts will be used as necessary to route diverted surface flow underneath the Horse Canyon haul road. The culvert outlet elevation(s) will be designed at or near the existing ground elevations to minimize the hydraulic jump and reduce the potential for erosion as the stormwater flows from the culvert(s) onto natural ground.
- Drill site construction within drainages will be avoided unless prior approval from the BLM and NDEP is obtained. When drainages must be crossed with a road, BMPs, shown in Attachment 1 of

Appendix A of the 2016 Final Environmental Assessment for the Barrick Gold Exploration, Inc. Amendment to the Horse Canyon/Cortez Unified Exploration Project Plan of Operations (NVN-066621 [16-1A]) and Reclamation Permit No. 0159, Twin Declines for Underground Exploration (BLM 2016), will be followed to minimize the surface disturbance and erosion potential. Temporary culverts and/or straw bales will be utilized to protect drainages. Smaller drainage patterns that could be affected by trench or pad construction will be restored, and all culverts and pipes will be removed upon completion of the exploration program. The following construction and maintenance practices from the BLM Gold Book, *Surface Operating Standards and Guidelines, Fourth Edition, Revised 2007* (BLM 2007), will be implemented:

- All culverts should be laid on natural ground or at the original elevation of any drainage crossed. All future culverts should have a minimum diameter of 18 inches. The outlet of all culverts should extend at least one foot beyond the toe of any slope.
- Ditch grades should be no less than 0.5 percent to provide positive drainage and to avoid siltation.
- For “dry bed” or low flow road crossings, which do not require a culvert, the drainage will not be filled so that water can flow across the crossings without being impounded.
- NGM will not conduct new surface-disturbing activities within riparian or wetland areas without authorization from the BLM as outlined below. If NGM determines that new surface disturbance activities within riparian areas are required, NGM will submit to the BLM the locations of the proposed drill pads and access roads in an acceptable format (i.e., electronic spatial files). NGM will not conduct the proposed operations unless authorized by the BLM, which may require further environmental analysis, or operating restrictions, or site-specific environmental protection measures. If it is the only practicable alternative, the BLM may authorize surface disturbance within riparian areas if it is determined that the action, as proposed or conditioned, will not impair the long term function or utility of riparian habitat.
- If NGM determines that new surface disturbance is required within wetland areas, NGM will not conduct the proposed operations unless authorized by the BLM. Any disturbance authorized within wetland areas will be in accordance with Executive Order 11990. Specifically:

Sec. 2. (a) In furtherance of Section 101 (b)(3) of the National Environmental Policy Act of 1969 (42 U.S.C. 4331 (b)(3)) to improve and coordinate federal plans, functions, programs and resources to the end that the Nation may attain the widest range of beneficial uses of the environment without degradation risk to health or safety, each agency, to the extent permitted by law, shall avoid undertaking or providing assistance for new construction located in wetlands unless the head of the agency finds (1) that there is practicable alternative to such construction, and (2) that the proposed action includes all practicable measures to minimize harm to wetlands which may result from such use.

Sec. 5. In carrying out the activities described in Section 1 of this Order, each agency shall consider factors relevant to a proposal's effect on the survival and quality of the wetlands. Among these factors are:(a) public health, safety, and welfare, including water supply, quality, recharge and discharge; pollution; flood and storm hazards, and sediment and erosion;(b) maintenance of natural systems, including conservation and long term productivity of existing flora and fauna species and habitat diversity and stability, hydrologic utility, fish, wildlife, timber, and food and fiber resources; and (c) other uses of wetlands in the public interest, including recreational, scientific, and cultural uses.

- Existing exploration and reclamation activities within riparian areas will be allowed to continue provided the BLM conduct on-going evaluations of operations to make any riparian mitigation recommendations.

- All exploration activities will continue to be conducted using BMPs such that sediments, cuttings, drilling fluids, or any other material or substance will not enter flowing drainages.
- Sumps will be excavated and managed to prevent overtopping and saturating the safety berms. NGM will monitor sumps regularly for seeps or other evidence of erosion and will direct drill crews to cease activity and notify supervisors if seepage is observed. NGM will ensure that sump evacuation proceeds for as long as drilling or other water-producing activities continue; if evacuation is not possible, NGM will cease drilling as soon as water levels approach the sump capacity. No trash will be placed in the sumps.
- All drill holes will be plugged in accordance with Nevada Revised Statutes (NRS) 534, Nevada Administrative Code (NAC) 534.4369, and NAC 534.4371, with the exception of drill holes collared with a mud rotary or reverse circulation drill rig and completed with a core rig, which will be plugged prior to the core rig moving from the drill site. NGM may maintain up to 60 open holes which include both holes which are currently being drilled and other drill holes which have been left open for further exploration work. NGM must include in the annual summary report which drill holes were left open and the reason for this action.
- If any drill hole produces artesian flow, the drill hole will be contained pursuant to NRS 534.060 and NAC 534.378 and will be sealed by the method described in NAC 534.4371. If casings are set in a drill hole, either the drill hole must be completed as a well and plugged pursuant to NAC 534.420, or the casings will be completely removed from the drill hole and then plugged in accordance with NAC 534.4369 and NAC 534.4371.
- NGM will continue to plug all drill holes in accordance with NAC 534.4371 as administered by the Nevada Division of Water Resources (NDWR), State Engineer's Office. NGM will comply with the drill hole abandonment procedures set forth in NAC 534.420 through 534.437 to prevent cross-contamination of aquifers or contamination of ground and surface waters.
- Stormwater BMPs (NDEP et al. 1994 and 2008) will be used at construction sites to minimize stormwater erosion.
- Drill cuttings will be contained on site, and fluids managed utilizing appropriate control measures. Sediment traps will be used as necessary and filled at the end of the drill program. NGM will follow the spill contingency plan.
- Only nontoxic fluids, such as but not limited to BARAFLOC<sup>®</sup>, will be used in the drilling process.
- NGM will adhere to the HC/CUEP Stormwater Pollution Prevention Plan (SWPPP).

#### **2.1.14 Wildland Fire Protection**

- All applicable state and federal fire laws and regulations will be complied with and all reasonable measures will be taken to prevent and suppress fires in the Horse Canyon Mine, HC/CUEP, West Pine Valley Exploration Project area.
- In the event the Horse Canyon Mine, HC/CUEP, West Pine Valley Exploration Project activities start or cause a wildfire, NGM will be responsible for all the costs associated with the suppression.
- NGM will comply with all applicable state and federal fire laws and regulations and all reasonable measures (i.e., vehicle hand tools, extinguisher, contact the BLM concerning fire controls on welding) will be taken to prevent and suppress fires in the Horse Canyon Mine, HC/CUEP, West Pine Valley Exploration Project area.
- All Horse Canyon Mine, HC/CUEP, West Pine Valley Exploration Project vehicles will carry fire extinguishers and a minimum of 10 gallons of water during the months of May through September.



- Adequate fire-fighting equipment, i.e., shovel, Pulaski, extinguisher(s), and a minimum 10 gallons of water will be kept at the drill site(s).
- Vehicle catalytic converters will be inspected often and cleaned of all brush and grass debris.
- Welding operations will be conducted in an area free from or mostly free from vegetation. A minimum of 10 gallons of water and a shovel will be on hand to extinguish any fires created from the sparks. Extra personnel will be at the welding site to watch for fires created by welding sparks.
- Welding aprons will be used when conditions warrant (i.e., during red flag warnings).
- Wildland fires will immediately be reported to the BLM Central Nevada Interagency Dispatch Center at (775) 623-3444. Information reported will include the location (latitude and longitude if possible), fuels involved, time started, who or what is near the fire, and the direction of fire spread.
- When conducting operations during the months of May through September, the BLM Battle Mountain District Office, Division of Fire and Aviation will be contacted at (775) 635-4000 to determine if any fire restrictions are in place for the Horse Canyon Mine, HC/CUEP, West Pine Valley Exploration Project and to provide approximate beginning and ending dates for Horse Canyon Mine, HC/CUEP, West Pine Valley Exploration Project activities.

#### **2.1.15 Wildlife**

- Speed limits are posted and vehicle speeds reduced in areas of disturbance to minimize the potential for fugitive dust emissions, to protect wildlife and livestock, and to maintain operational safety. Speed limits will continue to be enforced.
- All trenches, sumps, and other small excavations that pose a hazard or nuisance to the public, wildlife, or livestock will be adequately fenced to preclude access or constructed with a sloped end for easy egress.
- In order to avoid potential impacts to breeding migratory birds, NGM will have a BLM-approved biologist survey in early spring of each year all areas proposed for drilling or surface disturbance for the presence of active nests. NGM has committed to conducting pre-disturbance migratory bird nest surveys in the spring and establishing exclusion zones around active nests as part of the ACEPMs. Additionally, surface disturbance clearance surveys will be conducted following BLM Wildlife Protocols (BLM 2014) when a proposed activity involves ground disturbance during the nesting season, defined by the BLM as March 1 through July 31. When active nests are located, or if other evidence of nesting is observed (e.g., mating pairs, territorial defense, carrying nesting material, transporting food), NGM's biologist will recommend to the BLM an avoidance buffer around the nest which the BLM, in coordination with the Nevada Department of Wildlife (NDOW) and the United States Fish and Wildlife Service (USFWS), will review and approve prior to surface disturbance. NGM's biologist will inform NGM when the birds have left the nest. NGM will not conduct any drilling or surface disturbing activities within the exclusion zone until the biologist determines that the birds are no longer nesting.
- Each year during the nesting season (March 1 to July 31), NGM will not conduct drilling or surface disturbing activities within a 0.5-mile radius of any active raptor nests. Upon identifying an active raptor nest, NGM will immediately notify the BLM.
- NGM will adhere to the environmental protection measures as established by the BLM for greater sage-grouse (*Centrocercus urophasianus*) lek/strutting grounds and for known nesting and brood rearing areas. Noise generated by exploration activities will not increase ambient levels by 10 A-weighted decibels (dBA) at active leks based upon the BLM stipulations (BLM 2014). The ACEPMs are applicable to potentially affected active leks within four miles of HC/CUEP, which currently include the Horse Creek 01 Lek and the New Cortez-Grass Valley Lek. The New Brock

Canyon Lek is excluded from ACEPMs due to topographical features, which reduce or eliminate noise generated from HC/CUEP. The ACEPMs are subject to review by a BLM biologist and may be adjusted based on annual surveys of lek activity. Upon identifying any previously unknown greater sage-grouse lek/strutting ground, nesting or brood rearing area, NGM will immediately notify the BLM.

- To prevent effects at leks from potential increases in noise, NGM will implement sound reduction measures, which may include sound modelling as per BLM protocol (BLM 2014), placement of a sound barrier at drill rigs, or restriction of drilling operations during seasonal and daily timing periods. If the sound modeling shows no projected increase in noise levels above 10 dBA, no additional measures are needed. If the sound modeling shows an increase in noise levels above 10 dBA or if no modeling is conducted, NGM will install sound barriers (likely hay bales or similar material) at the drill rig or will adhere to seasonal and time operational restrictions. The restrictions will be in place from March 1 through May 15 from 4:00 a.m. to 10:00 a.m. (BLM 2014).
- NGM will provide a Work Plan for future surface disturbance locations to the BLM. The BLM may conduct field verification of greater sage-grouse habitat in areas of proposed surface disturbance to further define habitat impacts.
- In order to reduce impacts due to disturbance within greater sage-grouse habitat, NGM will provide one or more of the following ACEPMs in coordination with the BLM:
  - Pinyon-juniper removal;
  - Install greater sage-grouse flight deterrents;
  - Enclosures surrounding springs, meadows, and riparian areas; and
  - Payment for greater sage-grouse mitigation (as outlined below).
- NGM will implement the ACEPMs within two years of the decision for the 2015 Plan; an extension of the timeframe for implementing the ACEPMs may be authorized by the BLM. Greater sage-grouse ACEPMs completed will be reported in the annual disturbance summary report, which is provided to the BLM and the NDEP by April 15.
- Use of hand-thinning methods (i.e., chainsaw, lop and scatter slash, etc.) to remove pinyon and juniper trees in areas that are determined to be actively encroaching into greater sage-grouse habitat will be implemented. Pinyon-juniper will be removed from three acres of encroachment areas for every one acre of HC/CUEP disturbance. Pinyon-juniper treatment will be prioritized to occur within the HC/CUEP boundary, and focus on Phase I and Phase II pinyon-juniper conditions. Treatment activities will not occur within a four-mile buffer from active leks from March 1 through June 30 to minimize the potential for impacts to breeding and nesting greater sage-grouse. Surveys for migratory birds will be required between March 1 and July 31.
- To minimize potential impacts to cultural resources as a result of the greater sage-grouse ACEPMs, several additional actions will be undertaken. As specific treatment sites are identified, a BLM staff archaeologist or BLM permitted archaeologist will evaluate the potential of the area for cultural resources, and will undertake avoidance measures as needed. To reduce the risk of unauthorized collection, field crews will be instructed by an agency archaeologist or BLM permitted archaeologist regarding the importance of cultural resources and the possible penalties under the Archaeological Resources Protection Act for the destruction of archaeological resources. In order to decrease the risk of inadvertent damage to fragile remains, crews will also be instructed to recognize wood and brush cultural resources.
- Greater sage-grouse flight deterrents (fence markers) will be attached to fences within greater sage-grouse habitat at a BLM-determined ratio of number of deterrents for every acre of disturbance. Preferred locations of flight deterrents include fencing near leks and associated buffer areas.

- Exclosures will be constructed surrounding springs, meadows, and riparian areas identified by the BLM as important greater sage-grouse habitat.
- As outlined in the Memorandum of Understanding (MOU) Regarding the Establishment of a Partnership for the Conservation and Protection of the Greater Sage-Grouse and Greater Sage Grouse Habitat (BLM 2013), payment may be made into a greater sage-grouse mitigation bank account or other program in an amount equal to the cost of satisfying the target mitigation ratios. Costs for making such improvements on private lands will be based on the Nevada Standardized Reclamation Cost Estimator (SRCE) model. The Nevada SRCE will also provide the basis for negotiating costs for public lands including cost of NEPA compliance (BLM 2013).
- Where reclaimed areas are found to adequately address some or all of the impacts to greater sage-grouse habitat the required habitat improvement acreage may be reduced or credited on a one acre to one acre ratio as determined by the BLM (BLM 2013).
- In September 2015, the BLM Washington, D.C. published the Record of Decision and Approved Resource Management Plan Amendments (ARMPAs) for the Great Basin Region, including the Greater Sage-Grouse Sub-Regions of Idaho and Southwestern Montana, Nevada and Northeastern California Oregon, and Utah. The ARMPAs include greater sage-grouse habitat management direction that avoids and minimizes additional disturbance in greater sage-grouse habitat management areas. The ARMPA for the Nevada and Northeastern California Sub-Region includes Management Decision (Mineral Resources) 18: which notes “ Subject to valid existing rights and applicable law, authorize locatable mineral development activity, by approving plans of operation and apply mitigation and BMPs that minimize the loss of Priority Habitat Management Areas and General Habitat Management Areas or that enhance greater sage-grouse habitat by applying the “avoid, minimize and compensatory mitigation” process through an applicable mitigation system, such as the Nevada Conservation Credit System and exemplified in the Barrick Nevada Sage-Grouse Bank Enabling Agreement (BEA) (March 2015).”
- The 12 acres proposed for reallocation from surface exploration to underground exploration are within the area covered by the BEA. The BEA notes that, to the extent practicable, NGM will propose measures to avoid or minimize impacts to greater sage-grouse (Barrick 2015). NGM has complied with the BEA by designing the portal pad to be within non-habitat for the greater sage-grouse. Furthermore, the portal pad is located more than four miles from the nearest lek.
- NGM will not conduct surface-disturbing activities within 50 feet of existing adits, shaft openings, or caves to prevent any impacts to bat species potentially residing in or near these structures. If a BLM-qualified biologist surveys the site and determines that bats are not residing in or near the structure, the aforementioned exclusion zone will not apply. Bat surveys are carried out in accordance with the BLM’s Statewide Wildlife Protocols (BLM 2014) and in accordance with the BLM-approved wildlife work plan (ARCADIS 2014a).
- NGM will not conduct surface disturbing activity within habitat identified as suitable to support pygmy rabbit (*Brachylagus idahoensis*) until a pre-disturbance survey has been conducted. Surveys are carried out in accordance with the BLM’s Statewide Wildlife Protocols (BLM 2014), the site pygmy rabbit survey work plan (ARCADIS 2014b), and the Interagency Pygmy Rabbit Working Group recommendations (IPRWG 2008). If active burrows are identified, NGM will notify the BLM to evaluate the potential impact and coordinate with NGM to devise and implement measures to minimize impacts to the pygmy rabbit and its habitat. These measures may include avoidance.
- If dark kangaroo mice (*Microdipodops megacephalus*) and pale kangaroo mice (*Microdipodops pallidus*) habitat have the potential to occur in disturbance areas, habitat surveys will occur prior to ground-disturbing activities, and a report will be submitted to the BLM. Both species were eliminated from further analysis in the 2015 HC/CUEP Wildlife Report. The HC/CUEP area is outside of the pale kangaroo mice known range which occurs in the southwestern portion of Nevada. The dark kangaroo mouse was discussed further, but still eliminated from further analysis based on BLM opinion on habitat. The majority of the dark kangaroo mouse’s geographic range is in Nevada, but

it is also found in small areas of Oregon, Idaho, Utah, and California (O'Farrell and Blaustein 1974). It is a nocturnal species that is found in sandy or fine, gravelly soils, such as dunes, sandy valley bottoms, or alluvial fans, in areas dominated by sagebrush, rabbitbrush (*Chrysothamnus* spp.), and horsebrush (*Tetradymia* spp.). It is active from March through October. When inactive and during winter hibernation, this mouse is found underground in burrows (NNHP 2014). This species forages primarily on seeds, but also insects (HC/CUEP review by BLM in 2015 determined suitable habitat for this species was not present in the HC/CUEP area.

- In the event that other special status plant or wildlife species are identified within the HC/CUEP, NGM will not conduct surface-disturbing activities within the species' habitat until the BLM can evaluate the potential impact and coordinate with NGM to devise and implement a plan to avoid the habitat.

## **2.2 Cortez Mine**

### **2.2.1 Air Quality**

- NGM currently holds a Class 1 air quality operating permit and Mercury Operating Permit to Construct with the NDEP-BAPC. These permits will be modified as necessary for new point sources. Appropriate changes to the air quality permits will be obtained for the Cortez Mine facilities and land disturbance. In accordance with BAPC regulations, the Cortez Mine air quality operating permit must be authorized by the BAPC prior to Cortez Mine construction. Barrick contracted with Air Sciences, Inc. to prepare Barrick Cortez – Deep South Expansion Project NEPA Air Quality Analysis Report, (Air Sciences 2016) which provides an analysis of the potential air impacts related to the Cortez Mine.
- Fugitive dust controls, including water application on haul roads and other disturbed areas, chemical dust suppressant application (e.g., magnesium chloride), where appropriate, and application of other BMPs as approved by the BAPC, currently are, and will continue to be, implemented. (Current operating permits include: Class I (Title V) Air Quality Operating Permit (Permit No. AP1041-2141) and Mercury Operating Permit to Construct: Phase 2 (Permit No. AP1041-2220). Committed air quality practices will include dust control for mine unit operations as described by the BAPC-required Surface Area Disturbance Fugitive Dust Control Plan which is included as Appendix 3 of the Deep South Expansion Project Amendment to Plan of Operations and Reclamation Permit Application #0093 (BCI 2019).
- NGM will seed temporary disturbance areas (e.g. growth media stockpiles, cut and fill embankments, etc.) with a BLM-approved interim seed mix, and concurrent reclamation will be implemented on completed portions of the waste rock facilities when safe and practical to do so, thereby minimizing fugitive dust emissions. To reduce the generation of fugitive dust from the overland conveyor, the conveyor has been partially covered on the south side, which is the predominant wind direction in the Plan Area. If needed, a water line and water sprays will be installed on the conveyor to further reduce fugitive dust generation.
- To control combustion emissions, all manufacturer installed pollution control equipment will be operated and maintained in good working order.

### **2.2.2 Cultural Resources**

- Facilities in the Cortez Hills Complex, including the Cortez Hills Pit, have been located and designed to avoid the Mount Tenabo/White Cliffs property of cultural and religious importance. Access to these areas via public roads will be maintained throughout the life of the Cortez Mine.
- Facilities in the Cortez and Cortez Hills complexes have been located and designed to avoid the historic Cortez and Shoshone Wells town sites. Road construction/maintenance has occurred in the northernmost area of the Shoshone Wells town site, the affected portion of which has been

mitigated through an approved data recovery plan, as prescribed in the Historic Properties Treatment Plan.

- If previously undocumented cultural resource sites are discovered during construction of the mine facilities, all ground-disturbing activities will be halted in the area of discovery, and the BLM Authorized Officer will be contacted. If the site is eligible for inclusion in the NRHP, impacts will be mitigated through avoidance or an appropriate data recovery program developed pursuant to the Programmatic Agreement (effective October 20, 2005) among the BLM, Nevada SHPO, and NGM. NGM will continue to train employees and contractors to avoid disturbances to cultural resources and off-road travel. Cultural clearance is required in the area of proposed disturbance through utilization of an approved cultural resources contractor in collaboration with the BLM cultural resources specialist. Mitigation of eligible archaeological and historic sites is addressed in the Historic Properties Treatment Plan, which has been prepared by a BLM-approved archaeological contractor. Once the plan is approved by the BLM and in concurrence with the Nevada SHPO, the plan will be implemented prior to surface disturbance affecting any property listed in the plan.
- NGM will provide for continued access to the historic Cortez townsite and has erected a marker designed in coordination with the BLM at the town site to provide historical information for visitors.

### **2.2.3 Erosion and Sediment Control**

- BMPs will be used to limit erosion and reduce sediment in precipitation runoff from Cortez Mine facilities and disturbed areas during construction, operations, and initial stages of reclamation. BMPs may include, but are not limited to, diversion and routing of stormwater using accepted engineering practices, such as diversion ditches, and the placement of erosion control devices such as sediment traps and rock and gravel cover.
- Revegetation of disturbed areas will reduce the potential for wind and water erosion. Following construction activities, NGM will seed areas such as cut and fill embankments and growth media stockpiles as soon as practical and safe. Concurrent reclamation will be maximized to the extent practical to accelerate revegetation of disturbed areas. Sediment and erosion control measures will be inspected periodically, and repairs performed as needed.
- The Cortez Mine is covered under the NDEP's general stormwater permit (NVR300000). The Cortez SWPPP, included as Appendix 4 of the Deep South Expansion Project Amendment to Plan of Operations and Reclamation Permit Application #0093 (BCI 2019), will be amended as necessary to include the proposed Cortez Mine facilities. To limit erosion and reduce sediment transport from Cortez Mine disturbance areas, erosion control measures as outlined in the SWPPP and Reclamation Plan will be installed, as needed, and maintained. Stormwater diversions will be installed around Cortez Mine facilities, as needed, to divert stormwater runoff around disturbance areas. Facilities will be monitored following spring snowmelt and intense rain events to ensure that drainage and sediment control measures are effective and operating properly. In addition, implementation of concurrent reclamation will further reduce erosion potential.

### **2.2.4 General Measures**

- For security and safety purposes, the existing perimeter fence will be extended to encompass proposed Cortez Mine facilities where safe and practical to do so. A BLM-approved four-strand range fencing (three strands barbed wire and a smooth bottom strand per the BLM Handbook 1741-1) will be used. Leach pads, ponds, and process areas will be fenced for wildlife exclusion.

### **2.2.5 Geology and Minerals**

- Geotechnical monitoring, consisting of geologic structure mapping, groundwater monitoring, and slope stability analyses, will be conducted during active mining to assist in optimizing final pit designs. Slope movement monitoring may also be initiated to evaluate the safety of the open pit highwalls. In addition, operational procedures for controlling blasting and bench scaling will facilitate

mining with stable pit walls. Waste rock characterization will continue to be performed in accordance with the site's BLM waste rock characterization requirements and NDEP-Bureau of Mining Regulation and Reclamation water pollution control permit requirements.

- NGM has implemented management, monitoring, and mitigation measures to address possible future fissuring in the Plan Area. These measures are described in the Pipeline/South Pipeline Pit Expansion Project Final Supplemental Environmental Impact Statement (BLM 2004b). These protective measures, which will continue as part of the Cortez Mine, include integration of the following components:
  - Stormwater diversion ditch to intercept and route surface water runoff away from the fissure area;
  - Dewatering pipeline instrumentation and pressure monitoring;
  - Intercept trench east of the existing Pipeline/South Pipeline Heap Leach Facility and west of the main fissure complex;
  - Backfilling of existing open fissure gullies;
  - Protective berms and surface grades to exclude water from the fissure field;
  - Alluvial waste rock dikes to provide containment and channelization in the event of a dewatering line break;
  - Monitoring of subsidence rates and horizontal strain; and
  - The step back area will be fenced with four-strand range fence at mine closure.

#### **2.2.6 Hazardous Materials and Solid Waste**

- The Barrick Cortez Mines Emergency Response Plan, included as Appendix 5 of the Deep South Expansion Project Amendment to Plan of Operations and Reclamation Permit Application #0093 (BCI 2019), describes the prevention, containment, and cleanup procedures to minimize the potential for related impacts to soils, vegetation, wildlife, and water resources.
- Implementation of the management procedures for the handling of solid and hazardous waste generated at the site, reagent storage, transportation, and handling requirements, will minimize the potential for related impacts to soils, vegetation, wildlife, and water resources.
- A training program has been implemented to inform employees of their responsibilities regarding proper waste disposal procedures.

#### **2.2.7 Interim Closure Management**

- The standard operating schedules at the Cortez Mine will be up to 24 hours a day, 365 days a year for the mining activities and processing operations. No temporary or interim closures of the facility are planned. However, it is possible that, due to weather conditions, mechanical or technical difficulties, unfavorable economic conditions, litigation, severe seismic events, or other unforeseen events, mining and processing facilities may have to be temporarily closed. In the event of an unplanned temporary closure, the following plan will be activated:
  - Pursuant to NAC 445.445(1)(a), NGM will notify the NDEP and the BLM within 30 days of the temporary closure of the pits, the waste rock facilities, and the process facilities. This notification will include a description of the procedures and controls that have been or will be initiated to maintain the process components during the temporary closure period;



- NGM will supply the BLM and the NDEP with a list of supervisory personnel who will oversee the mine facility during the temporary closure period. This list also will include the number of support staff required in each department to maintain the facility during the closure period. Standard security procedures will remain in place for the duration of the temporary closure period. Access to the site will be allowed for appropriate regulatory agency personnel; and
- Pursuant to NAC 445.445(1)(b)(1), if the interim closure period exceeds 90 days, NGM will begin to evaluate procedures required to carry out a permanent closure of the process components. These procedures will be reviewed and approved by the NDEP and the BLM. As stipulated by NAC 445.445(1)(b)(2), NGM may petition the NDEP for an extension that will delay permanent closure. These actions will be coordinated between NGM and the NDEP.
- Pursuant to NAC 445A.399, a seasonal closure plan is required for facilities located where the mean diurnal temperature does not exceed freezing (32 degrees Fahrenheit [°F]) for 30 days or more each year. Based on a review of available meteorological data from NGM, it is possible that the mean diurnal temperature at the Cortez Mine site will remain below 32°F for more than 30 days each year. Current plans do not include closure during the winter months; however, if closure is necessary due to extremely severe weather conditions, the process facilities will be temporarily closed in accordance with the following plan:
  - In the event of severe winter weather conditions causing a closure, the NDEP will be notified within 30 days of a seasonal closure. The notification will include a description of the procedures and controls that have been or will be carried out to maintain the process components during the closure period;
  - Heap leaching and solution processing operations will be discontinued. The addition of makeup water to the leaching circuit will stop, but the heaps will continue to be irrigated as long as possible. During severe winter weather conditions, some of the process solution may freeze on the top of the heaps; however, the solution near the bottom of the heaps and in the solution collection pipes will likely continue to flow;
  - Irrigation of the heaps will continue until process solution has been converted to ice or the weather warms enough to melt the ice on the heaps. With the cessation of milling, pumping of tailings to the impoundment will stop. The size of the liquid pool in the impoundment will be controlled, as necessary, by decanting water to the reclaim pond and subsequently into the heap leaching circuit; and
  - Seasonal closure will continue until the weather warms enough to begin melting the ice on the heaps. At this time, process solution will be circulated between the heaps and the solution ponds. Based on operational experience, ice in the heaps will melt slowly so that rundown can be easily controlled. Once the temperature of the leaching solution increases enough so that gold recovery is favorable, the process plant will be brought back on-line. Addition of makeup water to the circuit will resume as appropriate to maintain the normal working inventory of solution. The milling circuit also will be restarted at this time. Following a seasonal closure period, but prior to startup, elements of the fluid management system will be inspected for signs of damage or deterioration.
- No additional measures will be necessary to stabilize excavations and workings during an unplanned temporary closure. Interim reclamation procedures will be implemented as necessary to stabilize disturbed sites during the temporary closure period. These procedures will be coordinated with the BLM and the NDEP.
- NGM will follow the waste rock management procedures to isolate waste rock as necessary during unplanned temporary closure.

- In the event of a temporary unplanned closure, the following activities will be undertaken for the storage or removal of equipment, supplies, and structures:
  - Explosives will continue to be stored and handled according to federal and state regulations;
  - Hazardous materials will continue to be stored, handled, and disposed of according to federal and state regulations;
  - Equipment and machinery will be stored in a safe and clean condition;
  - Mine equipment remaining in operation during the temporary closure, including haul trucks, loaders, drills, and personal vehicles will continue to be maintained according to standard company procedure; and
  - Following the temporary closure period, mine equipment will be inspected for compliance with appropriate federal and state mining regulations before mining activities recommence. A thorough inspection of pipelines, drainage channels, ponds, pumping equipment, and processing equipment will be made prior to start-up. Remaining solution in the solution ponds will be processed through the metals recovery circuit or applied to the heap, and the leaching circuit will be re-established. The mine dewatering system will be visually inspected and repaired as necessary.
- Supervisory personnel will ensure that regulatory requirements continue to be met during the temporary closure period. This will include monitoring, notifications, and report submittals.
- Maintenance and inspection of processing facilities will take place regularly to ensure the maintenance of adequate storm storage capacity in the process and reclaim ponds and to ensure that the integrity of pipelines, trenches, diversion structures, berms, and embankments are maintained. Monitoring of the heap leach facilities, solution ditch leak detection system, pond leak detection system, groundwater, and other permitted solution monitoring will continue as outlined in the water pollution control permits and the NGM Integrated Monitoring Plan (IMP) during the duration of the temporary closure.

### **2.2.8 Land Use and Access and Socioeconomics**

- Post-mining safety barriers (e.g., berms, fencing, or other appropriate barriers) will be installed peripherally to the ultimate perimeters of the pits after mining has been completed, where safe and practical to do so. Development of post-mining land use plans may include future utilization of mine infrastructure for long term economic benefits for the region.
- Public access will be maintained during construction of the reroute segments on County Road 225.

### **2.2.9 Monitoring**

- Monitoring of surface water quality, surface water quantity, groundwater quality, groundwater quantity, revegetation, and stability is discussed in the Amendment to the Pipeline/South Pipeline Plan of Operations for the Cortez Hills Expansion Project (CGM 2008). Monitoring for air quality, cultural resources, groundwater, heap leach effluent chemistry, noxious weeds, reclamation, slope stability, stormwater, traffic, waste rock chemistry, and wildlife has been and will continue to be conducted in accordance with applicable federal, state, and local permits. NGM's Integrated Monitoring Plan is included in Appendix 6 of the Deep South Expansion Project Amendment to Plan of Operations and Reclamation Permit Application #0093 (BCI 2019).
- Geotechnical monitoring, consisting of geologic structure mapping, groundwater monitoring, and slope stability analyses, will be conducted during active mining to assist in optimizing final pit designs. Slope movement monitoring may also be initiated to evaluate the safety of the open pit

highwalls. In addition, operational procedures for controlling blasting and bench scaling will facilitate mining with stable pit walls.

#### **2.2.10 Native American Concerns**

- Formally trained Western Shoshone observers will be provided the opportunity to be present during Cortez Mine related construction activities (i.e., new surface disturbance) to provide information and/or recommendations to the BLM, as well as during any data recovery (i.e., archaeological excavation) within the Cortez Mine boundary. NGM will select a Native American observer from a list of previously used observers. If the selected Native American observer is not available upon two days' notice, a different observer may be selected. If none are available within a reasonable period, NGM will document that a reasonable attempt was made to contact the Tribes and obtain an observer.
- NGM will hire a contractor to harvest affected wood products in proposed disturbance areas for firewood and posts and distribute the wood products to local Western Shoshone communities. Each Western Shoshone community will coordinate with NGM relative to the number of cords of firewood and posts needed. NGM will haul the wood to tribal distribution locations, and the tribes will be responsible for distributing the wood to their members. These harvested will products will not be available for resale to the public.

#### **2.2.11 Paleontological Resources**

- If vertebrate fossils are discovered during construction, operation, or reclamation, construction activities will be halted in the area of discovery, and NGM will contact the BLM Authorized Officer and if requested, may also contact a qualified paleontologist. The BLM Authorized Officer and/or the qualified paleontologist will evaluate the discovery within five working days of being notified. If the discovered paleontological resource is determined significant, appropriate measures will be developed to mitigate potential adverse effects. Activities will not resume until a notice to proceed is granted by the BLM Authorized Officer.

#### **2.2.12 Protection of Survey Monuments**

- To the extent practicable, NGM will protect all survey monuments, witness corners, reference monuments, bearing trees, and line trees against unnecessary or undue destruction, obliteration, or damage. Public land survey system monuments will be protected and preserved in accordance with Nevada BLM Instructional Memorandum No. NV-2007-003. If, in the course of operations, monuments, corners, or accessories are destroyed, NGM will immediately report the matter to the BLM Authorized Officer. NGM will replace the damaged monuments precisely, with the approval of the Authorized Officer.

#### **2.2.13 Range Resources**

- NGM will work with the BLM and local permittees to develop livestock fencing that will preserve grazing to the extent possible, while providing protection for both reclaimed mine facilities and livestock. Livestock watering troughs previously installed to deter livestock from attempting to access water in the infiltration basins will continue to be operated on a rotational basis in coordination with the BLM and grazing permittees. Fencing between the Pipeline and Cortez complexes may be constructed to exclude cattle from the mine area during select times of the year. While the conveyor corridor will be fenced along its route, the wildlife overpasses will remain open, and, therefore, the conveyor corridor will not serve in the capacity of livestock fencing without additional components.

#### **2.2.14 Recreation**

- NGM will continue to provide access to the historic Cortez town site by maintaining directional signage and a marker at the town site to provide historical information for visitors.

### **2.2.15 Rock Characterization and Handling**

- Management and monitoring of waste rock and the waste rock facilities during operations will be implemented as stated in the Waste Rock Management Plan shown in Appendix 2 of the Deep South Expansion Project Amendment to Plan of Operations and Reclamation Permit Application #0093 (BCI 2019) to reduce the potential for acid rock drainage that does not meet applicable Nevada water quality standards.
- NGM has and will continue to conduct rock characterization in accordance with applicable water pollution control permit requirements. Appendix 2 of the Deep South Expansion Project Amendment to Plan of Operations and Reclamation Permit Application #0093 (BCI 2019) provides waste rock characterization data for the waste rock from the Cortez Mine.

### **2.2.16 Safety and Fire Protection**

- The existing facilities and the proposed Cortez Mine will continue to operate in conformance with all Mine Safety Health Administration (MSHA) safety regulations (30 CFR 1-199).
- NGM's existing fire protection plan will be implemented for the proposed Cortez Mine. A copy of the plan previously was provided to the State Fire Marshal. The procedures as outlined in the fire protection plan are in accordance with MSHA and applicable state and county fire code regulations. Adequate fire protection equipment as needed to implement the plan will be maintained on site during operation. A fire water reserve will be maintained in the facility water supply tanks. Site access will be restricted to employees and authorized visitors for safety and security reasons.

### **2.2.17 Soils, Vegetation, and Invasive and Non-Native Species**

- Growth media, surface preparation, grading, revegetation (including seed mixture), and associated BMPs, are described in the Reclamation Plan in Section 3 of the Deep South Expansion Project Amendment to Plan of Operations and Reclamation Permit Application #0093 (BCI 2019). To minimize impacts to soils and to provide for reestablishment of vegetation, suitable growth media will be salvaged and stockpiled during the development of the mine open pits and during construction of the waste rock facilities and heap leach pads for subsequent use in reclamation. Alternately, the growth media may be transported to, and redistributed on, mine related surface disturbance areas undergoing concurrent reclamation (e.g., waste rock facilities).
- Following stripping, growth media will be stockpiled within the proposed disturbance areas. Growth media stockpiles will be located such that mining operations will not disturb them. The surfaces of the stockpiles will be shaped after construction with slopes no steeper than 2.5H:1V to reduce erosion. To further minimize wind and water erosion, the growth media stockpiles will be interim seeded after shaping. Diversion channels and/or berms will be constructed around the stockpiles as needed to prevent erosion from overland runoff. BMPs such as silt fences or staked straw bales will be used as necessary to contain sediment liberated from direct precipitation.
- NGM will avoid the use of the native silty Relley-Broyles soil association in reclaiming the Pipeline Waste Rock Facility expansion area due to its high erodibility.
- Prior to the initiation of ground-disturbing activities in any unsurveyed areas, NGM will obtain information from the Nevada Natural Heritage Program (NNHP) regarding any known occurrences of special status plant species that occur within this area. If known populations occur within the proposed disturbance area, an additional field survey will be conducted for the appropriate species prior to mine development in order to determine the extent of these populations. A survey report, which will include survey methods, results, summary, a map illustrating the areas surveyed, and any populations observed during the survey, will be submitted to the BLM. After BLM's review of the report, NGM will coordinate with the BLM to develop appropriate mitigation measures.

- Revegetation of disturbance areas will be conducted as soon as practical to reduce the potential for wind and water erosion, minimize impacts to soils and vegetation, help prevent the spread of invasive and nonnative species in disturbance areas, and facilitate post-mining land uses. Following construction activities, areas such as cut and fill embankments and growth media stockpiles will be seeded. Concurrent reclamation will be conducted to the extent practical to accelerate revegetation of disturbance areas. Areas undergoing concurrent reclamation will be fenced as necessary to minimize livestock and wildlife access until vegetation has been re-established. Sediment and erosion control measures and revegetated areas will be inspected periodically to ensure long-term erosion control and successful reclamation. Certified weed-free seed mixes will be used for reclamation. Implementation of the Cortez Mine's fire control plan will minimize potential fire-related impacts to vegetation.
- Pinyon-juniper will be cleared in advance of mine construction/development in a manner that will allow utilization of the resource to the extent possible. Funding for the value of the removed firewood will be provided as a contribution to an off-site BLM or NDOW revegetation project.
- To minimize the introduction and spread of noxious weeds in Cortez Mine -related disturbance areas, NGM's Noxious Weed Control Plan (SRK 2016) will continue to be utilized. The plan, provided as Appendix 7 Deep South Expansion Project Amendment to Plan of Operations and Reclamation Permit Application #0093 (BCI 2019), contains a risk assessment, management strategies, provisions for annual monitoring and treatment evaluation, and provisions for treatment. The results from annual monitoring will be the basis for updating the plan and developing annual treatment programs.

#### **2.2.18 Spill Prevention and Emergency Response**

- There are several regulatory frameworks relative to spill prevention and releases of hazardous substances and petroleum. The CERCLA creates a framework for planning and response to hazardous substance releases. The part of CERCLA that governs emergency planning is the Emergency Planning and Community Right-to-Know Act (EPCRA), which was part of the Superfund Amendments and Reauthorization Act (SARA). The basis of emergency planning begins with requirements set forth in the Occupational Safety and Health Administration (OSHA) Hazard Communication Standard (HCS) and MSHA hazard communications program (HazCom). Under EPCRA, facilities that are required by OSHA or MSHA to have safety data sheets (SDS) on hand for hazardous chemicals are also subject to certain reporting and planning requirements, dependent on threshold amounts of those chemicals or threshold planning quantities (TPQs). The TPQ for EPCRA hazardous chemicals is 10,000 pounds. The TPQs for materials designated as extremely hazardous substances (EHS) is 500 pounds or less, depending on the hazard posed by the particular EHS. Under the reporting requirements set forth in Sections 311 and 312 of SARA Title III, the Cortez Mine will be subject to certain reporting and emergency planning requirements because the amounts of certain hazardous chemicals on-site will exceed 10,000 pounds. Some of those materials include lime, diesel fuel, and gasoline. Cyanide, a listed EHS, is present in amounts greater than the TPQ (sodium cyanide, TPQ = 100 pounds).
- Reporting and emergency planning under EPCRA includes the following requirements:
  - The facility must notify state and emergency planning committees that the facility is subject to emergency planning requirements;
  - The facility must submit to state and local emergency planning committees and local fire departments copies of SDS or a list of those materials defined as hazardous under the OSHA HCS that are present in excess of 10,000 pounds or in amounts greater than the TPQ for EHS;
  - The facility must submit an annual inventory of such materials stating the maximum amounts of those materials at any given time throughout the calendar year, and estimate

of average daily amounts of those materials, and the location of those materials at the facility;

- The annual inventories must be submitted by March 1 for materials at the facility; and
- Reporting, notification, and other plans supplied to the local, state, or federal authorities under EPCRA are available to the public.
- NGM previously provided information relative to hazardous materials on hand at the existing operations to the State Fire Marshal. The types of materials required to support the proposed Cortez Mine will be the same as those currently utilized. NGM will continue to provide annual inventories to the appropriate agencies, including the State Fire Marshal's office.
- CERCLA also established reportable quantities (RQs) for releases of hazardous substances. If a hazardous substance is released in an amount greater than the RQ, then a facility is required to report the release to the National Response Center and to state and local authorities. Examples of RQs for certain chemicals that may be used at the Cortez Mine include sodium cyanide (10 pounds) and sodium hydroxide (1,000 pounds).
- The United States Department of Transportation (USDOT) has developed a list of materials that are classified as hazardous for transportation purposes (49 CFR 172.101) and prescribes packaging and labeling requirements for each designated hazardous material. The USDOT hazardous materials list includes the hazardous substances regulated under CERCLA, and other types of chemicals. The hazardous substances to be used in mining activities at the Cortez Mine will be transported to the site in accordance with USDOT and applicable Nevada Department of Transportation regulations.
- NGM's Emergency Response Plan, included in Appendix 5 of the Deep South Expansion Project Amendment to Plan of Operations and Reclamation Permit Application #0093 (BCI 2019), will be maintained and implemented, as needed, throughout the life of the Cortez Mine. This plan describes the system that will be used for the prevention, response, containment, and safe cleanup of any spills or discharges of substances that potentially may degrade the environment. The procedures outlined in this plan apply to potential leaks and spills that will remain within the mine boundary or flow off-site.
- Petroleum products are excluded from regulation as hazardous substances under CERCLA. Standards for the storage and spill prevention of petroleum products are established by regulations issued under the Clean Water Act. These regulations are contained in 40 CFR Part 112. In compliance with Part 112, NGM's Emergency Response Plan describes the systems and procedures to prevent and contain spills of petroleum fuels, lubrication oil, coolant, and used oil. The plan also identifies the spill discovery, notification, and general cleanup procedures.
- Chemicals will be stored and handled in accordance with manufacturer's recommendations and applicable regulations. The SDS for chemicals used on the Cortez Mine site will be kept at locations that are accessible to the working personnel in accordance with the OSHA and MSHA HCS.
- Procedures for reagent transportation, storage, waste management, and spill prevention and emergency response programs currently are in place and implemented for the existing operations.

#### **2.2.19 Sustainability Activities**

- NGM currently incorporates, and will continue to incorporate, sustainability activities into day-to-day operations to minimize impacts to the human environment. The sustainability activities are discussed in the Pipeline/South Pipeline Pit Expansion Final SEIS (BLM 2004b). In summary, the activities include creating a positive work environment for employees; working proactively with federal, state, and county agencies and stakeholders; incorporating environmentally sound practices into operations; addressing legacy issues associated with older mining operations in the



Cortez Mine boundary; working with other mining companies and affected communities on an overall plan to minimize post-closure impacts to communities, including identification of post-mining land uses of the mine site that may provide long-term economic stability to the local area; maintaining an active donations and scholarship program; and encouraging employees to be active in their local communities.

#### **2.2.20 Visual Resources and Noise**

- Impacts to visual resources will be minimized through careful location, minimal disturbance, and reclamation activities that provide for a more natural, post-mining landscape. Following the completion of mining operations, structures and buildings will be dismantled and removed from the site. With successful reclamation and revegetation of the exploration roads, drill sites, and mine facilities, long-term visual impacts will be minimized, and the Class IV and Class III objectives will be met.
- Prior to initiation of mining, NGM conducted an inventory of the condition of the headstones in the Cortez cemetery. During the life of the Cortez Mine, the headstones periodically will be monitored to identify any damage so that preventative measures or repairs can be quickly and appropriately accomplished.
- During operations, the margins of the waste rock facilities will be constructed to provide for variable topography during final regrading, thereby providing a more natural post-mining landscape.
- Concurrent reclamation will be implemented to the extent possible.
- To minimize effects from lighting, hooded stationary lights and light plants will be used. Lighting will be directed onto the work area only and away from adjacent areas not in use, with safety and proper lighting of the active work areas being the primary goal. Lighting fixtures will be hooded and shielded as appropriate. Lighting designed to reduce the impacts to night skies will be used.

#### **2.2.21 Water Resources**

- All heap leach, mill, and tailings facilities are designed and operated as zero discharge facilities, with a composite liner system in accordance with the BLM and NDEP criteria. Groundwater monitoring will be conducted under the water pollution control permit and Integrated Monitoring Plan in Appendix 6 of the Deep South Expansion Project Amendment to Plan of Operations and Reclamation Permit Application #0093 (BCI 2019) to provide for early identification of potential impacts. If any monitoring wells go dry due to dewatering activities, the monitoring program will be re-evaluated in coordination with the NDEP. Drawings 104, 104a, and 104b show the locations of the existing wells. The NGM Mine's Integrated Monitoring Plan will be reviewed and updated annually to include additional surface water and groundwater resources monitoring locations in the Cortez Mine vicinity.
- Mineral exploration and development drill holes, monitoring and observation wells, and production dewatering wells will be properly abandoned following completion of their functions, to prevent migration of potential contaminants to groundwater.
- To minimize potential mine-related effects to perennial surface waters, the site-specific contingency mitigation measures developed for identified perennial waters within the currently authorized operations' modeled groundwater drawdown area will be implemented if monitoring data indicate that an observed reduction in flow is attributable to mine-induced groundwater drawdown. If needed, one or more of the identified mitigation methods will be implemented per the site-specific mitigation plans presented in Table 3.2-1 of the Cortez Hills Expansion Project Final SEIS (BLM 2011). Site-specific contingency mitigation measures identified in NGM's proposed Contingency Mitigation Plans for Surface Waters (BCI and Stantec 2018) will be implemented to minimize potential mine related effects to perennial waters within, and within one mile of, the modeled

maximum extent of the Cortez Mine groundwater drawdown area not covered by the 2011 mitigation plan.

- Process components will be designed, constructed, and operated in accordance with the NDEP regulations and the International Cyanide Code.

#### **2.2.22 Wildlife**

- Implementation of the proposed Reclamation Plan will minimize habitat impacts for wildlife species and will also minimize impacts to range resources through the re-establishment of forage and habitat.
- Eight-foot-high chain link fencing will be installed around the heap leach ponds, and netting, pond covers, or floating “bird balls”, as appropriate, will be installed over ditches and ponds that will contain leach solutions, to minimize potential impacts to avian and terrestrial wildlife species. In addition, the heaps will be scarified to minimize ponding and pooling of process solutions.
- To minimize potential impacts to wildlife species, weak acid dissociable cyanide concentrations in the tailings impoundments will be maintained at non-lethal levels. As added protection, the existing cyanide detoxification system (which uses in-line addition of ferrous sulfate to the tailings solution) will be used if it should become necessary to lower the cyanide levels in the tailings discharge to the tailings facility.
- To minimize potential impacts to wildlife species, the top of leach pads will be monitored daily for any substantial pooling of cyanide solutions, and wildlife mortalities will be reported in accordance with the NDOW Industrial Artificial Pond Permit.
- Crossing ramps will be installed in locations recommended by the NDOW to facilitate mule deer and antelope crossing of the water pipelines to the Crescent Valley, Grass Valley, and Pine Valley rapid infiltration basins.
- In the event that initiation of the proposed Cortez Mine should occur during the raptor nesting season (March 1 through July 31, and April 1 through July 31 for the burrowing owl), a raptor survey will be conducted. Cortez Mine-related disturbance for a specific location will be conducted within 14 days of the survey, or another survey will be conducted. If active nests are located, or if other evidence of nesting (i.e., mated pairs, territorial defense, carrying nesting material, transporting food) is observed, a protective buffer (the size depending on the habitat requirements of the species and location of the nest) will be established around the nests following consultation with the BLM resource specialist. No construction will occur within the avoidance buffer until the birds are no longer actively breeding or rearing young, or until the young have fledged.
- Raptor surveys will be conducted annually during the raptor breeding season in the spring, utilizing the methods outlined in Pagel et al. (2010). These include a survey area including the Plan of Operations area and 10-mile buffer, two rotor wing (helicopter) aerial surveys, and subsequent ground surveys of occupied nests. The annual survey report will be provided to the BLM. To protect nesting birds, removal of migratory bird habitat on currently undisturbed lands in the Plan Area will be avoided to the extent possible between March 1 and July 31. Should removal of habitat be required during this period, NGM will coordinate with the BLM and the NDOW to conduct migratory bird nesting surveys and implement appropriate mitigation, such as buffer zones around occupied nests, as needed. Cortez Mine-related disturbance for a specific location will be conducted within 14 days of the survey, or another survey will be conducted.
- Transmission lines will be designed and constructed in accordance with applicable regulations to minimize raptor electrocution and collision potential. To minimize the collision potential for foraging raptors and other birds, standard safe designs as outlined in Reducing Avian Collisions with Power Lines (APLIC 2012) will be incorporated as applicable. To minimize the potential for electrocution of raptor species attempting to perch on the lines in areas of identified avian concern, standard

safe designs as outlined in Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006 (APLIC 2006) and Avian Protection Plan Guidelines (APLIC et al. 2005) will be incorporated as applicable.

- An Eagle Conservation Plan to support future removal of an existing golden eagle nest at the Gold Acres Complex under USFWS regulations will be developed prior to disturbance.
- In order to reduce impacts from disturbance within Greater Sage-Grouse preliminary general habitat (PGH), habitat restoration/enhancement will be implemented. Restoration and enhancement acreage for greater sage-grouse habitat will be calculated at 2:1 (two acres of restoration/enhancement for every one acre of disturbance) for disturbance in PGH. Since pinion-juniper thinning within the Cortez Mine area is not a viable option, off-site pinion-juniper thinning to benefit greater sage-grouse habitat will be considered. A BLM biologist, in coordination with the Nevada Sagebrush Ecosystem Technical Team and a NDOW biologist, will choose a pinion-juniper thinning area analyzed in any of the following Environmental Assessments (EAs) for potential off-site mitigation: Bald Mountain Wildlife Habitat Enhancement Project (NV062-EA08-083-EA), Eagle Butte Wildlife Habitat Enhancement Project (DOI-BLM-NV-BO10-2011-0021-EA), and Toiyabe West Wildlife Enhancement Project (001-BLM-NV-BO 10-2013-0020-EA). These EAs identified and assessed crucial Greater Sage-Grouse habitat where pinion-juniper thinning projects will be beneficial due to pinyon-juniper encroachment into sagebrush communities. The BLM, the Nevada Sagebrush Ecosystem Technical Team, and NDOW will choose pinion-juniper thinning projects located within the Greater Sage-Grouse Population Management Unit nearest to the Cortez Mine area and analyzed in one of the EAs. Any off-site mitigation plan will be provided to the BLM for approval. NGM will implement restoration/enhancement measures within two years of the proposed disturbance-related activities. Completed measures will be reported in the annual disturbance report that is provided to the BLM and NDEP by April 15 each year. Impacts associated with the off-site mitigation areas were addressed in the corresponding EAs; therefore, no additional NEPA analysis will be required for this mitigation option.
- As outlined in the 2013 Memorandum of Understanding Regarding the Establishment of a Partnership for the Conservation and Protection of the Greater Sage-Grouse and Greater Sage-Grouse Habitat, payment may be made into a Greater Sage-Grouse mitigation bank account. The Nevada SRCE model will provide the basis for negotiating costs for public lands.
- Potential impacts to greater sage-grouse habitat from the Cortez Mine will be evaluated under the terms of the BEA between the USFWS, BLM, and NGM and mitigation determined in accordance with that agreement.
- NGM will avoid construction activity with heavy equipment at the Pine Valley rapid infiltration basins site during the greater sage-grouse lekking period (March 1 to May 15) to minimize noise-related impacts to breeding greater sage-grouse at the lek site in the vicinity.
- NGM will conduct a desktop analysis to identify all historic mine workings within 0.25 mile of the proposed disturbance areas for submittal to the BLM and NDOW for assessment of sites that potentially may provide suitable bat habitat.
- If active pygmy rabbit burrows are observed, NGM will coordinate with the NDOW regarding potential mowing in the vicinity of the active burrows in advance of ground disturbance to minimize potential impacts to this species.
- If dark kangaroo mice and pale kangaroo mice habitat has the potential to occur in disturbance areas, habitat surveys will occur prior to ground disturbance activities, and a report submitted to the BLM.

## **3.0 Mitigation Measures**

### **3.1 Horse Canyon/Cortez Unified Exploration Project (HC/CUEP)**

#### **3.1.1 HC/CUEP EA and Decision Record (DR)/Finding of No Significant Impact (FONSI) (NV063-EA00-35); Plan of Operations No. N64-87-010P (97-1A) (BLM 2001)**

- Specifically, NGM would not conduct exploration activities within a 2.0 mile radius of any known sage grouse leks/strutting grounds during the avian breeding season, for the time period of daybreak to 9:00 AM, from the period of March 1 to May 15 of each year.

#### **3.1.2 HC/CUEP Decision (BLM 2012)**

- In an effort to control invasive, non-native weeds, the cleaning of the undercarriage of contractor vehicles entering from northeast Nevada will be required prior to entering the HC/CUEP Project Area.
- NGM will work with a BLM specialist to avoid or evaluate possible impacts and devise an alternative plan if a special status plant or wildlife species is identified in the HC/CUEP Project Area.
- In accordance with the Shoshone-Eureka Resource Management Plan and the Elko Resource Management Plan, the post-exploration land use of the affected area would be multiple use, domestic livestock grazing, wild horse habitat, wildlife habitat, woodlands and dispersed recreation.
- No alteration of natural drainage patterns is anticipated. Access across drainages would be avoided where possible. If required, culverts and/or straw bales would be utilized to protect drainages. Drilling activity will be kept to a minimum distance of 100 feet from any drainages that are flowing. Smaller drainage patterns that could be affected by trenches or pad construction would be restored and all culverts and pipes removed.
- Concurrent reclamation will take place where practicable. Drill pads and roads would be reclaimed and final reclamation would begin once drilling has been completed. The following schedule of activities is anticipated:
  - 2nd quarter 2012 - drilling begins.
  - 2nd quarter 2021 - drilling will end.
  - 4th quarter 2021 - concurrent reclamation will conclude.
- Drill holes will not remain open and will be sealed to prevent cross contamination between aquifers and the required shallow seal will be placed to prevent contamination by surface access. Twelve holes are assumed to remain open at any one time. Open sumps and potential physical hazards to people and wildlife will be reclaimed prior to extended periods of non-operation.
- Throughout this HC/CUEP Project BMPs will be utilized to prevent unnecessary and undue degradation. These BMPs are in addition to, or a repeat of, the existing stipulations and BMP's. To protect air quality during the proposed HC/CUEP Project road maintenance activities including watering, blading, and graveling will be undertaken to prevent fugitive dust emissions. Roadway erosion controls, including water bars, ditches, and certified weed free hay bales will be installed to protect existing water quality.
- NGM will contract with a qualified wildlife biologist to survey access routes and drill sites for nests or breeding birds during the breeding season prior to any surface-disturbing activity. If nests or breeding territories are identified, then the access or drill site will either be constructed after the breeding season or be relocated to avoid the breeding territory. If identified within the surface-disturbing activities within this exclusion zone without further authorization from BLM, which may require further environmental and/or cultural analyses. NGM employees and contractors will be

informed of the potential for cultural resources and will be required to avoid disturbing, altering, or destroying any remains or any historical or archaeological site, structure, building or object on federal land, unless expressly authorized by BLM. If exploration activities uncover human remains, NGM will immediately cease all earth disturbing activities within 100 meters/330 feet of the discovery and notify BLM and county law enforcement so that BLM and/or law enforcement can ensure compliance with all applicable laws regarding such discovery.

- If NGM discovers a vertebrate fossil deposit during surface-disturbing activities, NGM will immediately cease further activities that may affect the deposit and notify BLM so that BLM may evaluate the discovery and establish an exclusion zone.
- BLM must provide tribes opportunities to actively participate in the decision making process. After more than 10 years of ethnographic work and consultation in the Crescent Valley/Cortez/Grass Valley areas, which included interviews with knowledgeable individuals and groups, compilations of ethnographic research, field tours, and formal government-to-government consultations with federally recognized Native American tribes in the area, BLM determined that Mount Tenabo/White Cliffs and Horse Canyon are eligible for listing on the National Register of Historic Places as Properties of Cultural and Religious Importance ("PCRI areas"). NGM adheres to all regulatory restrictions when operating within the PCRI areas. In addition, before conducting any activity in the PCRI areas, NGM notifies BLM of the proposed activity so that BLM may establish exclusion zones as necessary to protect the features identified as contributing elements in the April 19, 2004 eligibility determinations for the PCRI areas. For any activity conducted outside of the exclusion zones, NGM arranges for a BLM qualified archaeologist and a Native American observer to be on site during new surface disturbing activity to ensure that contributing elements are not adversely affected by the operations.
- NGM will not conduct new surface disturbing activities within at least 100 feet of any drainage seep, or spring that is actively flowing. From June 1 through August 15, NGM will not conduct new surface disturbing activities within 0.5 miles of any drainage, seep, or spring that is actively flowing to minimize impact to wildlife. All exploration activities will be conducted using BMPs such that sediments, cuttings, drilling fluids, or any other material or substance will not enter flowing drainages. NGM complies with Nevada state drill hole abandonment procedures to prevent cross-contamination of aquifers or contamination of groundwater and surface waters.

## **3.2 Cortez Mine**

### **3.2.1 Final Environmental Impact Statement, Cortez Gold Mine Expansion Project (BLM 1993)**

This Decision expressly incorporates each of the following mitigation measures and monitoring requirements (the "Stipulations") (BLM 1993).

- 1) **Monitoring:** The BLM requires the minimum quarterly (once every three months) monitoring of all cyanide facilities located on Public Lands ; and of those cyanide facilities located on private lands for which the BLM is responsible, as designated by the MOU between the NDEP and the Nevada BLM.

The Shoshone-Eureka Resource Area Minerals Staff include as part of these quarterly cyanide inspections the monitoring of the mitigation measures and resulting stipulations of all major plans of operation approvals. As part of this Decision, the Shoshone Eureka Minerals Staff, along with certain members of its environmental staff, while completing their quarterly cyanide inspections, will include the monitoring of the environmental analysis of the Draft EIS and Final EIS as well as the mitigation measures presented here. Successful implementation of the analysis and mitigation will be recorded and kept in the appropriate case file. Unsuccessful analysis or mitigation will be brought to the immediate attention of NGM and the District Manager, Battle Mountain District Office. The BLM will ensure the immediate correction of or reduction of any environmental harm that may result from the unsatisfactory mitigation.

- 2) NGM has agreed to supply the Shoshone-Eureka Area Resource Area, Battle Mountain District office BLM with copies of all past and future correspondence, permit applications, permit approvals, computer modeling efforts, and any related documentation related to the current groundwater contamination and remediation efforts associated with that groundwater contamination. Within ninety (90) days of the issuing of this Decision, NGM has agreed to enter into a Memorandum of Understanding with the NDEP and the BLM (Battle Mountain District Office). (Applicant volunteered action).
- 3) Erosion and sedimentation impacts from soils not successfully reclaimed will require the following:
  - a) reclamation efforts will be monitored longer than the three years proposed as part of standard reclamation procedures outlined in Section 2.0 of the Cortez Gold Mine Expansion Project Draft EIS, b) if reclamation efforts are not successful during the extended monitoring period, additional seedbed preparation and reseeding would be implemented. (From the Draft Cortez Gold Mine Expansion Project EIS, page 4-14, Chapter 4.3.4).
- 4) During construction, clearing of land for stockpiles and other Cortez Mine project facilities should create curvilinear boundaries instead of straight lines (Within safety, geotechnical, and appropriate engineering parameters) to minimize disturbance of the landscape. Grading should be done in a manner that will minimize erosion and conform to natural topography. To the extent practicable, all foliage adjacent to the site should remain undisturbed to provide maximum available screening of the installation relative to the landscape character type. Where the opportunity exists, strategic location techniques should be used to minimize the visibility of mining activities. (From page 4-32, 4.8.3 of the Draft Cortez Gold Mine Expansion Project EIS).
- 5) NGM shall establish, during the first 18 months following this Decision, test reclamation plots to study the effectiveness of alternative seed mixtures and fertilizer combinations and the ability of tailings and heap leach facilities to support revegetation. The Authorized Officer, in cooperation with NGM, may determine that the initial plots may be supplemented with additional plots at a later date, based upon the results of these efforts. The efforts shall be documented in a biannual report documenting the success/failure results of these efforts. Information developed from these test plots shall be utilized by the Authorized Officer in the selection of appropriate reclamation and revegetation measures or treatments to be implemented during reclamation. (Applicant Volunteered action).
- 6) During operations all disturbed but unreclaimed areas associated with this approval (i.e., the 428 acres described in the Cortez Mine Plan amendment) shall be monitored periodically by NGM in a manner acceptable to the BLM to identify whether noxious plants species (as identified by state and Federal regulations) have invaded the Cortez Mine project area. During operations, an annual report of the results of such monitoring shall be provided to the BLM. Reasonable measures to eliminate such species within the Cortez Mine project area may be imposed as a further condition of this Decision by the Authorized Officer. All use of and proper waste disposal of pesticides/herbicides are the responsibility of NGM. Herbicide loading sites will be documented and all spills reported and cleaned-up immediately. (From the Final Cortez Gold Mine Expansion Project EIS, "Revegetation Standards For Nevada's Surface Management Program;" also Bureau Authorities under: Federal Land Management Policy Act; Public Rangelands Improvement Act of 1978; Federal Noxious Weed Act of 1974; Departmental Manual Parts 609 and 517; Carlson - Foley Act of 1968 Public Law 90-583; Executive Order 11987, Exotic Organisms).
- 7) Following the completion of mining operations, NGM shall exclude access and mitigate safety hazards posed by the Gold Acres London Extension pit walls by reclaiming or berming all access roads and fencing the perimeter of the pit as directed by the Authorized Officer, taking into account post mining land uses for the area. Signs shall be posted by NGM on access roads in the vicinity of pits, as well as along the fences, warning visitors and the general public of the potential for unstable conditions or hazards. (From the Draft Cortez Gold Mine Expansion Project EIS, applicant committed practices).



- 8) NGM has volunteered to implement two informal programs for its employees to increase their awareness of the value of wildlife resources and the historical cultural properties in the mine area. All existing employees and all new employees shall be advised in writing of the responsibility of employees to avoid inadvertent harm to wildlife resources and important cultural properties. All employees shall be advised of the fragility of such resources. (Applicant Volunteered action).
- 9) NGM shall inspect all cyanide solution containment facilities at least weekly for wildlife mortalities. Any wildlife mortalities shall be reported to the NDOW and the BLM within 24 hours of discovery. The quarterly wildlife mortality reports sent to the NDOW will be courtesy copied to the Authorized Officer. (NDOW Artificial Industrial Artificial Pond Permit).
- 10) A monitoring schedule will be developed jointly by the BLM and NGM within 90 days from the Effective Date of this Decision. This schedule shall reflect a systematic, prioritized, and detailed description of all monitoring actions required by this Decision. This monitoring plan shall be reviewed annually by the BLM to determine necessary changes. (Required by CEQ Regulations).
- 11) NGM shall initiate revegetation efforts for waste rock disposal areas and decommissioned heap leach pads (those approved by this Decision) as soon as practical and such revegetation shall not be deferred until the conclusion of all mining operations in the Cortez Mine project area. (Applicant committed practice).
- 12) Any significant modification of the Cortez Mine Plan affecting Public Lands or resources must be reviewed and approved by the Authorized Officer prior to its implementation. BLM reserves the right to request NGM to modify its Cortez Mine Plan in accordance with 43 CFR 3809 in the event that the BLM determines that NGM's operations would cause or are causing unnecessary or undue degradation of Public Lands or resources. (From 43 CFR 3809).
- 13) NGM must comply with applicable Federal and State laws dealing with the storage and disposal of chemicals, petroleum, petroleum products, Resource Conservation and Recovery Act (RCRA) Subtitle c hazardous wastes, and RCRA Subtitle D solid wastes. Under no circumstances can chemicals, petroleum, petroleum products, or RCRA Subtitle c hazardous wastes be disposed in solid waste disposal areas on the mine or mill site without the written approval of the NDEP. The operator must identify what waste products will be produced, whether the waste streams are hazardous or solid, and the disposal method and location. If hazardous wastes are generated, the operator must obtain an Environmental Protection Agency (EPA) generator identification number from the State DEP and must manifest all shipments off site. Copies of the manifests must be available for the Authorized Officer's inspection. (BLM's Cyanide Management Policy).
- 14) The Federal EPA noted that the 12" of growth medium proposed for the covering of any capped tailings ponds (see Response I 22, 26 of the Cortez Gold Mine Expansion Project Final EIS) would not maintain adequate water - holding capacity to support plant life during dry periods and prevent cracking of the proposed tailings cap.

The BLM concurs with this position. The Cortez Gold Mine Expansion Project Final EIS notes the need to add an additional 6" of growth medium (total of 18") on the proposed cap (if an impermeable cap is needed).

This action creates an additional shortage of available growth medium for final reclamation.

Based on experience both at NGM and other mine properties, NGM has agreed to study the use of waste rock " fines ", including the use of amendments (fertilizers, mulches, etc.). The use of these " fines " on certain waste rock dumps should reduce the noted growth medium shortage. (Applicant Committed Practice).

### 3.2.2 Final Environmental Impact Statement, Cortez Pipeline Gold Deposit Project (BLM 1996)

- Erosion and sedimentation impacts from soils not successfully reclaimed would require mitigation measures beyond the standard reclamation measures proposed in Section 2.0 of the Cortez Pipeline Gold Deposit Project Final EIS. Proposed mitigation is discussed below.
  - Reclamation efforts would be monitored longer than the three years proposed as part of standard reclamation procedures in Section 2.0 of the Cortez Pipeline Gold Deposit Project Final EIS.
  - If reclamation efforts were not successful during the extended monitoring period, additional seedbed preparation and reseeded would be implemented.
- **Mitigation Measure 4.4.5-1:** Monitoring of creek flows and the 68 springs in the Cortez Mine project study area would be performed as dewatering progresses to assess whether the proposed reinfiltration area is adequate to prevent potential impacts. Monitoring locations and monitoring frequency are summarized in Appendix D of the Cortez Pipeline Gold Deposit Project Final EIS. Model simulations have indicated the ability to limit the extent of drawdown in the Crescent Valley alluvial aquifer through spatial variation of infiltration sites. Over time, the actual effectiveness of infiltration for recharging the alluvial aquifer as simulated will depend, in part, on the local hydraulic characteristics of the intervening soil sequences between the individual infiltration site and the aquifer area targeted for recharge. Should seepage faces begin to form at the ground surface downgradient from an individual infiltration site, or should local flows from springs or streams diminish, the proposed infiltration sites would be enhanced or relocated. Enhancement may consist of installing trenches or vertical drains below the bottom elevation of the constructed infiltration ponds into more permeable soils, which would increase the hydraulic loading rate by which the aquifer is recharged. Relocated sites would be within the infiltration band shown on Figure 3.4-7 of the Cortez Pipeline Gold Deposit Project Final EIS. If monitoring shows that significant impacts are not mitigated by management of infiltration, then additional mitigation measures, including supplementing affected flows with mine water, installation of wells at spring locations, or replacement of affected water rights, would be implemented as described in the Integrated Monitoring Plan (WMC 1995).
- **Mitigation Measure 4.4.5-2:** If regional monitoring shows impacts on water users other than the applicant, impacts should be mitigated by optimizing dewatering well pumping rates and relocation or addition of reinfiltration ponds. The area that would be considered for relocation or addition of ponds is shown on Figure 3.4-7 of the Cortez Pipeline Gold Deposit Project Final EIS. In the unlikely event that drawdown effects on water rights users other than the applicant cannot be mitigated based on compliance with applicable Nevada water laws and regulations, the applicant would supplement these users' needs with water from the dewatering system before reinfiltration. With proposed monitoring, implementation of the above mitigation measures would reduce potential impacts to less than significant levels.
- **Mitigation Measure 4.4.5-3:** If groundwater monitoring detects concentrations of chemical compounds in excess of drinking water Maximum Contaminant Levels, then a plan for remediating groundwater would be implemented. Cleanup goals established by the NDEP are the primary and secondary drinking water standards and/or existing background groundwater quality. Remediation could include a groundwater pumpback system similar to the currently operating system at the existing Cortez facility. Wells installed for the pit dewatering system could be used to remove and prevent migration of contaminated groundwater. During mine operation, poor quality pumped water could then be segregated from good-quality water and used as makeup water for mining process operations, with good-quality water used for reinfiltration. Depending upon the source of the leak and time needed to effect a cleanup, it may also be necessary to physically repair the source and operate treatment equipment beyond the period of active mine operation. These activities would be coordinated with the NDEP under the terms of the Water Pollution Control Permit. Implementation of applicant-committed monitoring and the above mitigation measures will reduce potential impacts to less than significant levels.

- **Mitigation Measure 4.4.5-4:** It is proposed that soil contaminated by leaked or spilled fuel would be disposed of by burning in the Cortez roaster, for which a permit application has been initiated. If such disposal is not permitted, it is proposed that contaminated soil be treated on site using the biopile remediation method. The biopile would be operated under a new or amended NDEP permit. A biopile is a soil pile that relies on microorganisms to degrade contaminants into carbon dioxide and water. A liner would be placed underneath and around the biopile to avoid exposure to air and completely contain contamination within the biopile. Spills of chemicals that cannot be treated as above will be disposed of at an appropriate off-site disposal facility. Implementation of mitigation measures will reduce potential impacts to less than significant levels.
- **Mitigation Measure 4.4.5-5:** Laboratory kinetic testing of representative pit wall material is in progress and is designed specifically to develop the most suitable data for numerical modeling of pit lake water chemistry. On completion of the kinetic testing program, the resulting data will be used in a refined modeling process to verify the status of long-term pit water quality.
- **Mitigation Measure 4.4.5-6:** As mining proceeds, the actual geologic materials exposed within the pit walls will be fully characterized along with the surrounding hydrogeologic system. More advanced testing and modeling will be applied through the course of mining operations to allow the best understanding and estimation of future pit lake conditions to be made at closure (in accordance with NDEP closure regulations). Details of an assessment to estimate future risk to wildlife from exposure to pit lake water are presented in Section 4.6 of the Cortez Pipeline Gold Deposit Project Final EIS. One of the scenarios evaluated included the risks associated with allowing the development of a shallow, vegetated shoreline and its associated wildlife community around the lake. The final configuration of the open pit will be determined at closure so that, if then found necessary, the formation of wildlife habitat zones associated with the future lake surface would be avoided. Refer to Section 2.2.2 of the Cortez Pipeline Gold Deposit Project Final EIS (subheading Open Pit Configuration) for details regarding pit design configuration.
- **Mitigation Measure 4.4.5-7:** In addition to Mitigation Measure 4.4.5-5 and Applicant-Committed Measure 4.4.5-6, the applicant has committed to financial surety (in addition to that required by NDEP/BLM reclamation bonding regulation) to guarantee the irrevocable availability of corrective action funds should unexpected pit lake conditions develop as the result of operator abandonment before the proposed Cortez Mine Plan is completed. A long-term, monetary contingency fund will be established. This fund will be used at the BLM's discretion. This fund will be used for long-term monitoring and will also be sufficient to provide for a program of corrective action, using the best available technology, should long-term monitoring indicate the need to take such action. Please refer to Section 2.2.8 of the Cortez Pipeline Gold Deposit Project Final EIS (Applicant-Committed Practices) for a complete description of the fund.
- **Mitigation Measure 4.4.5-8:** It is reasonable to assume that reinfiltrated water may exceed the Nevada drinking water standards for selected constituents as a result of the Cortez Pipeline Gold Deposit Project. In the event monitoring shows that reinfiltration water is of sufficiently poor quality to degrade groundwater beneath the infiltration ponds (e.g., raise Total Dissolved Solids [TDS] levels to greater than applicable standards for existing or potential beneficial uses), then mitigation measures would include chemical pretreatment such as flocculation basins to reduce TDS in water flowing into infiltration areas. In addition, if groundwater quality was degraded by infiltration through saline soils in the vadose zone, then the following mitigation measures would be undertaken:
  - The bottom surface of individual basins within the source infiltration area would be modified by installation of trenches or borings intended to provide access to deeper coarse-grained alluvial sequences underlying the site. The trenches and borings would be backfilled with clean gravel to provide wall stability and promote vertical drainage. This would result in a more direct flow path to the body of receiving water and would decrease contact time with the upper, fine-grained minerals, the source of mobilized salts.

- Vertical borings (as described above) would also be installed in the zone of percolation if necessary to enhance vertical drainage over a broader area. The borings would be constructed with gravel backfill and fitted with a surface seal.
- The monitoring well system would be modified to effectively monitor the improvements described above.
- Alternative reinfiltration sites would be used.

Implementation of these mitigation measures should reduce potential impacts to less than significant levels.

- Refer to Section 4.4.5 of the Cortez Pipeline Gold Deposit Project Final EIS for a discussion of the infiltration design and how the system would be adjusted if springflow is impacted. Flow will be monitored at springs within the entire study area. If infiltration or readjusted infiltration does not provide for the continuance of existing flows, additional mitigation may be necessary. A summary of these measures is provided here. Detailed mitigation and monitoring plans are contained in the Integrated Monitoring Plan (WMC 1995).

Seep and spring flow replacement would be accomplished by an adjustment of the infiltration system or by on-site solar powered well/pipeline systems. The solar well-pipeline system would require a water rights application for diversion to new locations. Guzzlers are indicated for certain sites and could be incorporated into any system. Guzzlers would provide drinking water for upland wildlife species when the loss of wetlands and wildlife habitats is mitigated by means that do not provide free water.

Guzzlers would provide a drinking water source for upland species but would not compensate for the small losses of jurisdictional wetlands and associated riparian communities at these sites. Mitigation of lost flows at seeps and springs by flow replacement would be done in such a manner that the primary function of unimpaired seeps or springs would be maintained. Where impacted seeps or springs support riparian areas or provide flow to adjacent creeks these flows would be maintained via groundwater wells. In areas where seeps and springs are in close proximity to one another, a single well may be utilized to mitigate several sites.

Mitigation measures would be implemented within 60 days after the BLM and NDEP have determined that mitigation is necessary. Cooperation with private landowners and BLM leases may be required for certain seeps and springs. Where guzzlers are utilized, NGM would maintain or replace the guzzlers as required.

The specific mitigation plan for each spring group or seeps and springs within a group are explained in the Integrated Monitoring Plan (WMC 1995). NGM will use its existing groundwater rights, or obtain additional well permits, to implement these mitigation measures. NGM will transfer 50 percent of any water rights used to mitigate seeps and springs located on public lands to the BLM.

- If standard revegetation efforts are unsuccessful, additional measures, such as supplemental irrigation, additional seedbed preparation, and reseeding will be required. Monitoring the results of standard methods will determine if additional measures are necessary.
- If burrowing owls are attracted to the Cortez Mine project construction site, burrowing owl nest boxes would be placed in the ground as artificial burrowing owl nest sites. These structures are adopted by burrowing owls fairly readily and represent an effective mitigation for disturbance to burrowing owl nesting colonies, should such measures be required (Herron 1995).
- Feasible mitigation would include applicant-sponsored periodic environmental education/training for off-road vehicle use, firearms safety, hunting regulations, developed recreation site use, and dispersed recreation ethics. In addition, NGM would provide support in developing or improving recreational opportunities in the area.

- For reducing visual contrast, minimization of disturbance is the most effective mitigation technique. Where disturbance is proposed, repetition of the basic landscape elements (form, line, color, and texture) would minimize visual change. Additionally, the use of surrounding landscape colors and native plant materials are appropriate means of reducing visual contrast. Described below are feasible measures that would effectively reduce visual change.
  - During construction, clearing of land for waste rock dumps and facility construction would create curvilinear boundaries instead of straight lines to minimize disturbance of the landscape. Grading should proceed in a manner that would minimize erosion and conform to the natural topography.
  - Vegetation adjacent to the site would be retained to minimize visual change to the landscape.
  - Buildings and structures would be painted to match or blend harmoniously with the surrounding soil and vegetation types.
  - The visibility of mining activities would be minimized by consolidation of disturbance.
- Ninety-eight Animal Unit Months would be lost in the Carico Lake Grazing Allotment due to the Proposed Action. The permittees for this area would be sent a notice that their permits would be evaluated in two years, and at that time the permits would be adjusted to reflect this loss. However, after the area is reclaimed, the permits are expected to be adjusted back up to current levels (Floyd Thompson, Battle Mountain BLM).

### **3.2.3 Pipeline Infiltration Project Environmental Assessment (BLM 1998)**

- To eliminate the potential for unknown impacts to the groundwater flow of the basin, additional testing and modeling, similar to that completed by Geomega (1998), shall be completed, submitted to, and reviewed by, the BLM, prior to NGM commencing the development of infiltration basin beyond the three specifically identified in the Proposed Action. In some instances, proposed basins may be in close proximity to existing operating basins, and sufficient information may exist that new sampling, testing, and modeling would not be required.
- The Cortez Mine Project Applicant shall develop and implement a program for weed prevention and control satisfactory to the BLM. The program will be in effect throughout the life of the Cortez Mine Project. If noxious weeds are determined to be a continuing problem after the completion of reclamation, a portion of the reclamation bond in an amount determined appropriate by the BLM shall be retained to fund an eradication program to eliminate factor(s) conducive to noxious weed infestation within the Cortez Mine Project Area. The bond will be released when the site is returned to vegetative conditions matching the surrounding area.

### **3.2.4 South Pipeline Project Final Environmental Impact Statement (BLM 2000)**

- **Mitigation Measure 4.4.3.3.1-2a:** Monitoring of flows at streams and the 68 springs in the Cortez Mine project study area would be performed as dewatering progresses to assess whether the active infiltration areas are adequate to prevent potential impacts. Monitoring locations and monitoring frequency are summarized in the Cortez Pipeline Gold Deposit Project Final EIS Appendix D (BLM 1996). Model simulations have indicated the ability to limit the extent of drawdown in the Crescent Valley alluvial aquifer through spatial variation of infiltration site locations and recharge volumes. Over time the actual effectiveness for recharging the alluvial aquifer as simulated will depend, in part, on the local hydraulic characteristics of the intervening soil sequences between the individual infiltration site and the aquifer area targeted for recharge. Should seepage faces begin to form at the ground surface downgradient from an individual infiltration site, or should local flows from springs or streams diminish, the proposed infiltration sites would be enhanced or relocated. Enhancement may consist of installing trenches or vertical drains below the bottom

elevation of the constructed infiltration ponds into more permeable soil, which would increase the hydraulic loading rate by which the aquifer is recharged. If monitoring shows that significant impacts are not mitigated by management of infiltration, then additional mitigation measures, including supplementing affected flows with mine water, installation of wells at spring locations, or replacement of affected water rights would be implemented as described in the Integrated Monitoring Plan (WMC 1995).

- **Mitigation Measure 4.4.3.3.1-2b:** The impacts to springs is not predicted to occur until after the end of mining, when the operational measures described above may not be available. For the post-mining delayed impact of drawdown, the groundwater flow model would be updated during the final year of dewatering using actual field data for pumping rates, infiltration rates and locations, consumptive use, and observed drawdown to reevaluate drawdown predictions that would occur after the end of mining. Streams and springs that are indicated to be significantly affected would be mitigated by one or more of the following measures, subject to approval of BLM and NDWR:
  - Replacement or purchase of the affected water right by the applicant.
  - Installation of a well and pump at affected spring locations to restore the historical yield of the spring.
  - Posting of an additional bond to provide for potentially affected water supplies in the future.
- **Mitigation Measure 4.4.3.3.1-4a:** If regional monitoring shows impacts on water users other than the applicant, impacts should be mitigated by optimizing dewatering well pumping rate and relocation or addition of infiltration ponds. In the event that drawdown effects on water rights users other than the applicant cannot be mitigated based on compliance with applicable Nevada water law and regulations, the applicant would supplement these users' needs with the appropriate permits from the State for use of water for other than mining.
- **Mitigation Measure 4.4.3.3.1-4b:** For the significant impacts to wells that are not predicted to occur until after the end of mining, the operational measures described above may not be available. For the post-mining delayed impacts of drawdown, the groundwater flow model would be updated during the final year of dewatering using actual field data for pumping rates, infiltration rates and locations, consumptive use, and observed drawdown to re-evaluate drawdown predictions that would occur after the end of mining. Wells with active water rights that are indicated to be significantly affected would then be mitigated by one or more of the following measures, subject to approval of BLM and NDWR:
  - Replacement or purchase of the affected water right by the applicant.
  - Installation of a deeper well and pump at affected locations to restore the historical yield of the well.
  - Posting of an additional bond to provide for potential future impacts to potentially affected water supplies.
- **Mitigation Measure 4.4.3.3.1-9a:** In the event monitoring shows that reinfiltration water is of sufficiently poor quality to degrade groundwater beneath the infiltration ponds (e.g., raise TDS levels to greater than applicable standards for existing or potential beneficial uses), then mitigation measures would include chemical pretreatment such as flocculation basins to reduce TDS in water flowing into infiltration areas.
- **Mitigation Measure 4.4.3.3.1-9b:** If groundwater quality is degraded by infiltration through saline soils in the vadose zone, then the following mitigation measures would be undertaken:
  - The bottom surface of individual basins within the source infiltration area would be modified by installation of trenches or borings intended to provide access to deeper coarse-grained



alluvial sequences underlying the site. The trenches and borings would be backfilled with clean gravel to provide wall stability and promote vertical drainage, resulting in a more direct flow path to the body of receiving water and would decrease contact time with the upper, fine-grained minerals, the source of mobilized salts.

- Alternative reinfiltration sites would be used.
- Implementation of the Injection Well Option (described in Section 3.3.2.3 of the South Pipeline Project Final EIS) may also be used to avoid impacts associated with infiltration through saline soils.
- **Mitigation Measure 4.7.3.3.1-1:** The control measure targeted at minimizing the establishment of whitetop on the soil stockpile and other disturbed sites as stated within the noxious weed monitoring and control plan would be applied. Reclaimed areas would be monitored annually until the reclamation bond was released.
- **Mitigation Measure 4.7.3.3.1-2:** The control measures targeted at controlling the establishment of saltcedar as stated within the noxious weed monitoring and control plan would be applied. A monitoring program would be conducted for at least five years.
- **Mitigation Measure 4.7.3.3.1-3:** The monitoring measures as stated in the noxious weed monitoring and control plan would be applied. The presence of all weed species shall be recorded, and new infestations managed appropriately.
- **Mitigation Measure 4.9.3.3.1-1:** Land clearing shall be conducted outside the avian breeding season. If this is not possible, then a qualified biologist shall survey the area to be cleared prior to clearing. If active nests are identified or if other evidence of nesting (mated pairs, territorial defense, carrying nesting material, transporting food) is observed as a result of this survey, then a protective buffer (the size of which will depend on the requirements of the species) shall be delineated and the delineated protective buffer avoided to prevent destruction or disturbance to nests until the nests are no longer active or nesting activities are no longer observed.
- **Mitigation Measure 4.9.3.3.1-4:** The Partial Backfill Option portion of the Proposed Action may not be implemented by NGM until an Ecological Risk Assessment is completed for the Partial Backfill Option, which addresses the specifics of the backfill design and concludes that an increased risk is less than the threshold for toxic effects.
- **Mitigation Measure 4.9.3.4.1-2:** Due to the uncertainty inherent in Ecological Risk Assessment's, studies shall be conducted after the pit lake forms to quantify the amount of wildlife use of the pit lake and to determine the magnitude of the impact.
- **Mitigation Measure 4.10.3.3.1-1:** A Class III Cultural Resources Inventory shall be completed in the unsurveyed areas prior to surface disturbing activities. If a significant cultural resource is identified as a result of the survey, the cultural resource shall be avoided.
- **Mitigation Measure 4.12.3.3.1-1:** For reducing visual contrast, minimization of disturbance is the most effective mitigation technique. Where disturbance is proposed, repetition of the basic landscape elements (form, line, color, and texture) would minimize visual change. Clearing of land for waste rock dumps and facility construction would create curvilinear boundaries instead of straight lines to minimize disturbance of the landscape. Grading would proceed in a manner that would minimize erosion and conform to the natural topography.
- **Mitigation Measure 4.13.3.3.1-2:** Blasting shall occur on average once per day and be no longer than 15 seconds in duration per blast. The impact would remain significant after implementation of the mitigation measure.

- **Mitigation Measure 4.14.3.3.1-2:** The Cortez Mine Project Applicant shall amend the existing Spill Prevention, Control, and Countermeasure Plan and Hazardous Material and Emergency Response Plan to incorporate the new Cortez Mine Project facilities and operations.
- **Mitigation Measure 4.18.3.3.1-1:** Any future paleontological discoveries shall be routinely reported to the BLM Authorized Officer for evaluation and possible mitigation.

### 3.2.5 Pipeline/South Pipeline Pit Expansion Project Final Supplemental Environmental Impact Statement (BLM 2004b)

- **Mitigation Measure 4.3.3.3.1-2a:** Monitoring of flows at streams and the 68 springs in the southern portion of Crescent Valley would be performed as dewatering progresses to assess whether the active infiltration areas are adequate to prevent potential impacts. Monitoring locations and monitoring frequency are summarized in the Cortez Pipeline Gold Deposit Project Final EIS, Appendix D (BLM 1996). Model simulations have indicated the ability to limit the extent of drawdown in the Crescent Valley alluvial aquifer through spatial variation of infiltration site locations and recharge volumes. Over time, the actual effectiveness of infiltration for recharging the alluvial aquifer as simulated will depend, in part, on the local hydraulic characteristics of the intervening soil sequences between the individual infiltration site and the aquifer area targeted for recharge. If monitoring shows that significant impacts are not mitigated by management of infiltration, then additional mitigation measures, including supplementing affected flows with mine water or installing wells at spring locations, or replacing affected water rights, would be implemented as described in the Integrated Monitoring Plan (WMC 1995).
- **Mitigation Measure 4.3.3.3.1-2b:** It is possible that some impacts to springs may only occur after the end of mining, when the operational measures described above may not be available. For the post-mining delayed impacts of drawdown, the groundwater flow model would be updated during the final year of dewatering using actual field data for pumping rates, infiltration rates and locations, consumptive use, and observed drawdown to re-evaluate drawdown predictions that would occur after the end of mining. Streams and springs that are indicated to be significantly affected would be mitigated by one or more of the following measures, subject to approval of the BLM and NDWR:
  - Installation of a well and pump at affected spring locations to restore the historical yield of the spring.
  - Posting of an additional bond to provide for potentially affected water supplies in the future.
- **Mitigation Measure 4.3.3.3.1-4a:** As part of the comprehensive monitoring program, NGM would be responsible for monitoring groundwater levels between the mine and water supply wells, groundwater rights, and surface water rights. Adverse impacts to groundwater rights and surface water rights would be mitigated as required by the NDWR. Mitigation of impacts to groundwater rights could include lowering the pump, deepening an existing well, drilling a new well for water supply wells, or providing a replacement water supply of equivalent yield and general water quality. For surface water rights, mitigation could require providing a replacement water supply of equivalent yield and general water quality.
- **Mitigation Measure 4.3.3.3.1-4b:** For any significant impacts to wells that are not predicted to occur until after the end of mining, the operational measures described above may not be available. For the post-mining delayed impacts of drawdown, the groundwater flow model would be updated during the final year of dewatering using actual field data for pumping rates, infiltration rates and locations, consumptive use, and observed drawdown to reevaluate drawdown predictions that would occur after the end of mining. Active water rights not controlled by NGM that are indicated to be significantly affected would then be mitigated by one or more of the following measures, subject to approval of BLM and NDWR:
  - Replacement or purchase of the affected water right by the applicant.

- Installation of a deeper well and pump at affected locations to restore the historical yield of the well.
  - Posting of an additional bond to provide for potential future impacts to potentially affected water supplies.
- **Mitigation Measure 4.3.3.3.1-7a:** A monitoring program, as described in Section 2.3.2.2.9 of the Pipeline/South Pipeline Pit Expansion Project Final Supplemental EIS (CGM 2004), shall be implemented to specifically watch for fissure development. If fissure gullies form, they shall be filled in with clean, coarse-grained alluvium in accordance with the fissure monitoring plan. The intent of using coarse-grained (permeable) backfill is to provide a rapid means of dissipation for any surface water entering the fissure, thereby reducing the propagation of the fissure through erosion.
  - **Mitigation Measure 4.3.3.3.1-7b:** The BLM, under 43 CFR 3809, has the authority to use the existing long-term trust fund or establish a new long-term trust fund for long-term mitigation of post-closure fissure development, if necessary.
  - **Mitigation Measure 4.3.3.3.2-2a:** No mitigation is expected to be required. However, monitoring of flows at streams and the 68 springs in the southern portion of Crescent Valley would be performed as dewatering progresses, and, if necessary, mitigation would be performed as described under Mitigation Measure 4.3.3.3.1-2a detailed in Section 3.2.5.
  - **Mitigation Measure 4.3.3.3.2-2b:** No mitigation is expected to be required because no impact is predicted under Stage 8 of the Proposed Action. However, it is possible that some impacts to springs may only occur after the end of mining, when the operational measures described under Mitigation Measure 4.3.3.3.1-2a detailed in Section 3.2.5 may not be available. If this were to occur, mitigation would be performed as described under Mitigation Measure 4.3.3.3.1-2b detailed in Section 3.2.5.
  - **Mitigation Measure 4.3.3.3.2-4a:** As part of the comprehensive monitoring program, NGM would be responsible for monitoring groundwater levels between the mine and water supply wells, groundwater rights, and surface water rights. Adverse impacts to groundwater rights and surface water rights would be mitigated as required by the NDWR. Mitigation of impacts to groundwater rights could include lowering the pump, deepening an existing well, drilling a new well for water supply wells, or providing a replacement water supply of equivalent yield and general water quality. For surface water rights, mitigation could require providing a replacement water supply of equivalent yield and general water quality.
  - **Mitigation Measure 4.3.3.3.2-4b:** For any significant impacts to wells that do not occur until after the end of mining, the operational measures described above may not be available. For the post-mining delayed impacts of drawdown, the groundwater flow model would be updated during the final year of dewatering using actual field data for pumping rates, infiltration rates and locations, consumptive use, and observed drawdown to re-evaluate drawdown predictions that would occur after the end of mining. Active water rights not owned by the applicant that are indicated to be significantly affected would then be mitigated by one or more of the following measures, subject to approval of the BLM and NDWR:
    - Replacement or purchase of the affected water right by the applicant.
    - Installation of a deeper well and pump at affected locations to restore the historical yield of the well.
    - Posting of an additional bond to provide for potential future impacts to potentially affected water supplies.
  - **Mitigation Measure 4.3.3.3.2-7a:** A monitoring program, as described in 2.3.2.2.9 of the Pipeline/South Pipeline Pit Expansion Project Final Supplemental EIS (CGM 2004), shall be implemented to specifically watch for fissure gully development. If fissure gullies form, they shall be filled in with clean, coarse-grained alluvium in accordance with the fissure monitoring plan. The

intent of using coarse-grained (permeable) backfill is to provide a rapid means of dissipation for any surface water entering the fissure.

- **Mitigation Measure 4.3.3.3-4a:** As part of the comprehensive monitoring program, NGM shall be responsible for monitoring groundwater levels between the mine and water supply wells, groundwater rights, and surface water rights. Adverse impacts to groundwater rights and surface water rights shall be mitigated as required by the NDWR. Mitigation of impacts to groundwater rights could include lowering the pump, deepening an existing well, drilling a new well for water supply wells, or providing a replacement water supply of equivalent yield and general water quality. For surface water rights, mitigation could require providing a replacement water supply of equivalent yield and general water quality.
- **Mitigation Measure 4.3.3.3-4b:** For any significant impacts to wells that do not occur until after the end of mining, the operational measures described above may not be available. For the post-mining delayed impacts of drawdown, the groundwater flow model shall be updated during the final year of dewatering using actual field data for pumping rates, infiltration rates and locations, consumptive use, and observed drawdown to reevaluate drawdown predictions that would occur after the end of mining. Active water rights not owned by the applicant that are indicated to be significantly affected shall then be mitigated by one or more of the following measures, subject to approval of BLM and NDWR:
  - Replacement or purchase of the affected water right by the applicant.
  - Installation of a deeper well and pump at affected locations to restore the historical yield of the well.
  - Posting of an additional bond to provide for potential future impacts to potentially affected water supplies.
- **Mitigation Measure 4.6.3.3-1-1:** For reducing visual contrast, minimization of disturbance is the most effective mitigation technique. Where disturbance is proposed, repetition of the basic landscape elements (form line, color, and texture) would minimize visual change. Clearing of land for waste rock dumps and facility construction would create curvilinear boundaries instead of straight lines to minimize disturbance of the landscape. Grading would proceed in a manner that would minimize erosion and conform to the natural topography.
- **Mitigation Measure 4.7.3.3-1-2:** Blasting shall occur on average once per day and be no longer than 15 seconds in duration per blast.

### 3.2.6 Cortez Hills Expansion Project Final Environmental Impact Statement (BLM 2008)

- **Mitigation Measure GM1:** Facility Design: Waste rock facilities, heap leach pads, and tailings facilities will be designed, constructed, monitored, and maintained in a stable manner during both the operation and post-mining periods. Stability analyses will be performed for the Cortez and Pipeline waste rock facility expansions, Cortez Heap Leach Facility, and Cortez Tailings Facility to ensure that all these facilities will remain functional after the passage of an Operational Basis Earthquake, and will not fail catastrophically or release tailings or fluids during a Maximum Credible Earthquake. The minimum factors of safety for all slope designs will be determined as part of the permits, inspections, and approvals granted by the NDEP, NDWR-Dam Safety Division, and the BLM.
- **Mitigation Measure GM2:** The potential for failure of the east wall of the Cortez Hills Pit in the post-closure period will be reduced by: 1) pit slope monitoring; 2) development of “trigger points for mitigation” if significant slope movement is detected; 3) geotechnical pit mapping; and 4) routine review of the monitoring results and geotechnical data to develop corrective actions or optimize the final pit slope configuration as necessary to minimize the potential for failure during mine operations (CGM 2007a,b). The results of the pit slope monitoring, geotechnical data collection, modifications to pit design, and development of corrective actions will be provided in an annual report to the BLM for the life of the Cortez Mine Project. In addition, the final pit slope will be designed to conform to

a minimum factor of safety of 1.0 under seismic loading for potential failure surfaces that could extend to the quartzite outcrop on the western flank of Mount Tenabo known as the White Cliffs, which is located east of the Cortez Hills Pit crest. Seismic loading will be evaluated in terms of pseudostatic analyses applied to limit equilibrium methods, with a coefficient equal to 50 percent of the peak free-field horizontal ground acceleration associated with an earthquake event expected to occur on the average of once every 1,000 years. Other measures to address long-term stability of the east wall of the Cortez Hills Pit (such as slope buttressing) will be evaluated as mining progresses and provided in the final closure plan based on the results of pit slope monitoring, geotechnical data collection, and stability analysis.

- **Mitigation Measure GM3:** Subsidence and Earth Fissures: The current Monitoring Plan for Ground Subsidence and Related Earth Fissure Development near the Pipeline Mine (CGM 2005) includes subsidence and fissure monitoring and mitigation throughout the life of the Cortez Mine Project within the area affected by dewatering-induced ground subsidence or as approved by the BLM and NDEP.
- **Mitigation Measure WR1a:** The Cortez Integrated Monitoring Plan has been revised and expanded as necessary to identify and monitor potential impacts to perennial surface water resources and groundwater resources within the mine-related drawdown area. NGM's amendments to the Cortez Integrated Monitoring Plan are included in the Plan of Operations for the Cortez Mine Project (Appendix 7 of the Cortez Mine Plan of Operations, CGM and SRK 2008). Revisions to the Cortez Integrated Monitoring Plan have been reviewed and approved by both the BLM and NDWR prior to implementation of any new dewatering activities associated with the Cortez Mine Project.

NGM will be responsible for continued monitoring and reporting of changes in groundwater levels and surface water flows prior to, and during, operation and for at least 3 years in the post-reclamation period. The plan includes the following:

1. Investigate sources of recharge to determine if mine-induced dewatering will affect flows.
2. Seasonal monitoring of flow at two locations along perennial reaches of Mill Creek.
3. Installation of monitoring wells in the vicinity of Mill Creek to monitor changes in groundwater elevations over time in the vicinity of this surface water resource.
4. Monitoring of these new surface water stations, and of spring and seep sites currently monitored for NGM's existing operations, will include annual flow measurements during the low-flow season (late September through mid-October). The depth of groundwater also will be monitored on a quarterly basis.

NGM will provide the results of water level monitoring, describe any deviations from the original predictions, evaluate if changes in flow are attributable to mine-induced drawdown, and propose modifications to the monitoring plan, as necessary, in an annual report to the NDWR and the BLM. If the monitoring results identify changes in flow to perennial waters that are attributable to mine-induced drawdown, the network of monitored seeps, springs, and streams will be expanded to include all perennial surface water features located within 2 miles of the affected area. The combined surface and groundwater monitoring results will be used to trigger the implementation of Mitigation Measure WR1b to mitigate impacts to water resources, if applicable. Monitoring and reporting will continue until impacts to water resources have been mitigated.

- **Mitigation Measure WR1b:** If monitoring (Mitigation Measure WR1a described in Section 3.2.6) indicates that flow reductions in perennial surface waters are occurring and that these reductions are likely the result of mine-induced drawdown, the following measures will be implemented:
  1. The NDWR and the BLM will evaluate the available information and determine if mitigation is required.
  2. If mitigation is required, NGM will be responsible for preparing a detailed, site-specific plan to enhance or replace the impacted perennial water resources. The mitigation plan will be

submitted to the NDWR and BLM identifying drawdown impacts to surface water resources. Mitigation will depend on the actual impacts and site-specific conditions and could include a variety of measures (flow augmentation, on-site or off-site improvements). Methods for providing a new water source or improving an existing water source may include, but are not limited to:

- Installation of a water supply pump in an existing well (e.g., monitoring well);
- Installation of a new water production well;
- Piping from a new or existing source;
- Installation of a guzzler;
- Enhanced development of an existing seep to promote additional flow; and/or
- Fencing or other protection measures for an existing seep to maintain flow.

An approved site-specific mitigation plan will be implemented followed by monitoring and reporting to measure the effectiveness of the implemented measures. If initial implementation is unsuccessful, the NDWR or BLM may require implementation of additional measures.

- **Mitigation Measure WR2:** NGM will be responsible for monitoring groundwater levels between the mine and water supply wells, groundwater rights, and surface water rights within the projected mine-related drawdown area as part of the water resources monitoring program (Mitigation Measure WR1a described in Section 3.2.6). Adverse impacts to water wells and water rights will be mitigated, as required by the NDWR.

Mitigation for impacts to water rights will depend on the actual impact and site-specific conditions and could include a variety of measures. Methods for addressing impacts to water rights may include but will not be limited to the following. For wells, mitigation could include lowering the pump, deepening an existing well, drilling a new well, and/or providing a replacement water supply of equivalent yield and general water quality. For surface water rights, mitigation could require providing a replacement water supply of equivalent yield and general water quality.

- **Mitigation Measure WR3:** NGM will work with state and county FEMA representatives and with other state or federal agencies, as appropriate, to design the Pipeline Waste Rock Facility expansion area and CR 225 reroute to safely convey the 100-year, 24-hour flood event through or around the Cortez Mine Project boundary with minimal or no hazard to human life, property, or Project components. A shorter duration flood event (e.g., 6 hours) or an appropriate rain-on-snow event may be selected as the Cortez Mine Project design flood if a larger peak discharge and/or a longer flood hydrograph duration will result. Flow conveyance structures and Cortez Mine Project component configurations will be such that stream and floodplain stability will be maintained or enhanced, and erosion and sedimentation will be avoided or minimized.
- **Mitigation Measure WR4:** Prior to final reclamation, NGM will work with federal and state agency representatives to design and construct a stormwater diversion system along the east side of the Cortez Hills Pit that will route runoff away from the pit wall over the long term with little or no maintenance, and adequately control flow velocities so as to prevent outlet failure and resulting accelerated erosion. Such design and construction safely will accommodate flow from a reasonable runoff event selected in cooperation with state and federal agencies. Methods to minimize seepage and infiltration (e.g., a compacted clay layer protected by adequately-sized durable riprap) will be incorporated into the design and implemented during construction of the diversion. No embankments will remain as outlet structures; all outlet features will be designed and constructed to minimize erosion and provide energy dissipation (e.g., installation of shallow excavated basins with outlets on grade with the existing land surface in combination with rock riprap).
- **Mitigation Measure V1:** NGM will coordinate with the BLM to develop new riparian/wetland areas and/or enhance existing riparian/wetland areas at off-site locations to compensate for the loss of riparian/wetland vegetation. The loss of riparian/wetland vegetation will be compensated at a 2:1 ratio (i.e., for every acre of riparian/wetland vegetation removed or disturbed by mine development or groundwater drawdown, 2 acres of riparian/wetland vegetation will be created and/or enhanced).



Where appropriate, replacement of wetland/riparian vegetation will be developed in conjunction with Mitigation Measure WR-1b. This measure identifies potential methods for development of new water sources or improvement to existing local water sources to off-set mine-related groundwater drawdown effects on perennial waters (see Section 3.2, Water Resources and Geochemistry of the Cortez Hills Expansion Project Final EIS). NGM, in coordination with a BLM botanist, will identify appropriate wetland/riparian species to be seeded or transplanted in these locations. Alternately, local existing areas of wetland/riparian vegetation unaffected by mine-related groundwater drawdown will be identified in coordination with the BLM for enhancement. Enhancement methods can include, but will not be limited to, the use of BLM-approved fencing to minimize livestock impacts, implementation of weed controls, and/or supplemental planting or seeding, as appropriate.

NGM will be responsible for monitoring these sites on an annual basis for approximately 3 years after creation or enhancement to ensure that these mitigation measures were effective and that the riparian/wetland sites are self-sustaining and provide similar functions as existing riparian/wetland areas. NGM will be responsible for developing an annual riparian/wetland vegetation monitoring report, which will be provided to the BLM for review and approval.

- **Mitigation Measure V2:** Prior to the initiation of ground-disturbing activities in any unsurveyed areas, NGM will obtain information from the NNHP regarding any known occurrences of special status plant species that occur within this area. If known populations occur within this proposed disturbance area, an additional field survey will be conducted for the appropriate species prior to mine development in order to determine the extent of these populations. A survey report, which will include survey methods, results, summary, a map illustrating the areas surveyed, and any populations observed during the survey, will be submitted to the BLM. After BLM's review of the report, NGM will coordinate with the BLM to develop appropriate mitigation measures.
- **Mitigation Measure WL1:** NGM will coordinate with the BLM to develop new surface water sources (e.g., seeps and springs) and riparian/wetland habitat to offset the loss of available surface water and riparian/wetland habitat for wildlife, including special status species. The loss of available surface water and riparian/wetland habitat will be mitigated at a 2:1 ratio or greater. This measure will be developed in conjunction with Mitigation Measure V1, where appropriate. The location and design of new surface water sources (e.g., wells, pipelines, or ponds) and riparian/wetland habitat will be developed in coordination with the BLM and NDOW. NGM will be responsible for monitoring these sites on an annual basis for the life of the Cortez Mine Project to ensure that this mitigation measure is effective. NGM will be responsible for developing an annual surface water and riparian/wetland vegetation monitoring report, which will be provided to the BLM and NDOW for review and approval. Surface water and riparian/wetland mitigation will continue until natural water sources return to pre-dewatering conditions.
- **Mitigation Measure WL2:** NGM will continue its mandatory employee education program for all personnel to minimize wildlife/vehicle-related impacts during the Cortez Mine Project operation.
- **Mitigation Measure WL3:** Prior to construction of the CR 222 reroute, a qualified biologist will determine if the adit that was identified in the vicinity of the reroute during baseline biological surveys will be directly impacted by the road construction. If the adit will be directly impacted, NGM will coordinate with the BLM on applicable mitigation measures, as needed.
- **Mitigation Measure WL4:** NGM will install a NDOW-approved bat gate at the existing mine working that is located in the immediate vicinity of the CR 222 reroute.
- **Mitigation Measure WL5:** Prior to construction of mine facilities, a qualified biologist will conduct surveys in the areas containing Wyoming big sagebrush and basin big sagebrush habitats for the presence or sign (e.g., burrows, fecal pellets) of pygmy rabbits. If pygmy rabbits are identified, NGM will coordinate with the BLM to determine whether additional mitigation will be required, based on the quality of habitat conditions.

- **Mitigation Measure WL6:** Prior to initiation of pit dewatering, a springsnail survey was conducted in previously unsurveyed perennial seeps and springs located within the projected cumulative mine-related 10-foot groundwater drawdown contour to determine if springsnails are present. If springsnails are identified in the future, a monitoring program will be developed in coordination with the BLM to determine if the species is affected by cumulative mine-related groundwater drawdown. For those springs with known springsnail populations, water levels will be monitored in a selected number of springs. If water levels are reduced in any of these springs, mitigation will be implemented. Mitigation options will include flow augmentation, habitat enhancement, and/or relocation of springsnails. The relocation option will be feasible if the population size is relatively small and a spring with suitable habitat is identified.
- **Mitigation Measure LS1:** NGM will monitor three water-related range improvements that are projected to be affected by mine-related groundwater drawdown. If effects occur to these water sources, NGM will coordinate with the BLM to determine the appropriate placement and type of water-related range improvement to be developed. NGM routinely will inspect these water-related range improvements to ensure that they are operating in an appropriate manner.
- **Mitigation Measure P1:** If vertebrate fossils are discovered during construction, operation, or reclamation of the Cortez Mine Project, construction activities will be halted in the area of the discovery and NGM will contact the BLM Authorized Officer. The BLM Authorized Officer will evaluate the discovery within 5 working days of being notified. If the discovered paleontological resource is determined significant, appropriate measures will be developed to mitigate potential adverse effects. Construction activities will not resume until a notice to proceed is granted by the BLM Authorized Officer.
- **Mitigation Measure NA1:** NGM has hired a contractor to harvest affected wood products for firewood and posts and distribute the wood products to local Western Shoshone communities. Each Western Shoshone community will coordinate with NGM relative to the number of cords of firewood and posts needed. NGM will haul the wood to tribal distribution locations, and the tribes will be responsible for distributing the wood to their members. These harvested wood products will not be available for resale to the public. Due to the lack of harvestable pine nuts (i.e., mature piñon trees) in the Cortez Mine project area, no mitigation is required for pine nut gathering.
- **Mitigation Measure NA2:** The HC/CUEP Native American observer program will be expanded to include the Cortez Mine Project. As part of the program, Western Shoshone observers will be provided the opportunity to be present during Cortez Mine Project-related construction activities (i.e., new surface disturbance) and during any data recovery (i.e., archaeological excavation) within the Cortez Mine Project boundary.
- **Mitigation Measure NA3:** In addition to implementation of Mitigation Measure NA2 described in Section 3.2.6, NGM will coordinate with the BLM in implementing appropriate mitigation to further minimize potential impacts to Western Shoshone artifacts and heritage. Mitigation will be based on the ongoing discussions between the BLM and the Cortez Hills Working Group (Te-Moak Tribe of Western Shoshone and Western Shoshone Committee of Duck Valley). Mitigation includes the establishment of formal training for Western Shoshone monitors/observers in cultural resource management and artifact identification via Great Basin College's ARTIFACT Program, which started in the 2007-2008 academic year.
- **Mitigation Measure NA4:** NGM will coordinate with the BLM in incorporating Tribal recommendations, as appropriate, into the project's reclamation and closure plans. Recommendations will be based on discussions between the BLM and Cortez Hills Working Group (Te-Moak Tribe of Western Shoshone and Western Shoshone Committee of Duck Valley) that will be initiated prior to finalization of the reclamation plan and during development of the closure plan for the Cortez Hills Expansion Project.

- **Mitigation Measure A1:** NGM will monitor traffic conflicts at the intersections of the cross-valley haul road with CR 222 and CR 225 to ensure traffic controls at the intersections will be sufficient to protect public and Cortez Mine Project worker safety.
- **Mitigation Measure VR1:** To the degree possible, consistent with mine safety, night lighting for the Cortez Mine Project will be directed downward and shielded to minimize spillover of light beyond the Cortez Mine Project boundaries.

### 3.2.7 Cortez Hills Expansion Project Final Supplemental Environmental Impact Statement (BLM 2011)

- **Contingent Mitigation Measures.** This following discussion from the Cortez Hills Expansion Project Final Supplemental EIS (BLM 2011) supplements the information regarding the six methods that was provided in Mitigation Measure WR1b in the Cortez Hills Expansion Project Final EIS (BLM 2008).
  1. **Installation of a Water Supply Pump in an Existing Well.** This mitigation measure consists of supplying water to the original surface water source area by pumping and piping water from an existing well. The amount of water conveyed to the affected spring would be based on the quantity of water required to sustain the identified use(s). As no new wells would need to be constructed, new surface impacts would be minimized. In addition, use of an existing well would minimize the timeframe required to implement the mitigation measure.
  2. **Installation of a New Production Well.** This mitigation measure consists of constructing a new water well to restore water flow from one or more springs or seeps. Installing a new well would include drilling to obtain sufficient water, installing appropriate casing, installing a pump with a power supply (windmill or electric), installing a tank to supply consistent flow, and installing piping to the affected spring or seep area.
  3. **Piping Water from a New or Existing Source.** This mitigation measure consists of piping water from a new or existing water source to a spring or seep that has experienced a reduction in flow. This mitigation would include identifying a nearby, upgradient source that discharges sufficient water, or creating a new source such as a small reservoir, and installing a piping system to convey water to the affected surface water source to maintain flow and sustain the identified use(s). This measure was not included in any of the site-specific contingent mitigation plans.
  4. **Installation of a Guzzler.** This mitigation measure consists of installing a guzzler. Guzzlers are systems used to collect precipitation and runoff and store the water in a surface or buried container. The container then feeds an open trough for use by livestock and/or wildlife. Installation of a guzzler would be completed at seeps and springs where the primary use of the water is for wildlife consumption. Guzzlers are used throughout Nevada, Utah, and other arid areas of the west to supply water for wildlife, especially during the dry summer months. The size of the system can vary depending on the species targeted for the system. Larger guzzlers are needed for big game, while smaller systems can be used for small game and birds.
  5. **Enhanced Development of an Existing Seep to Promote Additional Flow.** This mitigation measure consists of enhancing flow by developing the existing seep or spring. The development typically would include the installation of a spring box and piping to direct water to a specific discharge point. This mitigation likely would be used in circumstances where there has been a decrease in flow but not a complete loss of flow at the source. These types of spring and seep enhancements (or improvements) are not expected to be effective at mitigating seeps or springs that have experienced a complete loss of flow due to mine-induced groundwater drawdown.
  6. **Fencing or Other Protection Measures for an Existing Seep to Maintain Flow.** This mitigation measure consists of fencing or other protection measures for existing seeps. Many seeps and

springs are substantially impacted by livestock and wild horses. These effects can result in reduced flow as a result of overgrazing of vegetation, thus increasing surface evaporation and damage to the seep or spring source.

Site-specific contingent mitigation triggers for each of the surface water features identified in the area of concern are listed in Table 3.2-1 of the Cortez Hills Expansion Project Final Supplemental EIS (BLM 2011). The mitigation triggers include reductions in baseflow or reductions in hydrophilic vegetation below an established threshold coincident with a reduction in groundwater levels in the area as determined by monitoring.

### **3.2.8 Fiber Optic Cable Project Environmental Assessment (BLM 2015)**

- No additional monitoring or mitigation measures are recommended for cultural resources beyond the use of qualified cultural resource monitors during construction as identified in Section 2.2.4 of the Fiber Optic Cable Project EA.
- To further minimize potential impacts in the event of a spill, it is recommended that all fueling and maintenance of vehicles and equipment be conducted at least 100 feet from drainages with flowing water.

### **3.2.9 Deep South Expansion Project Environmental Impact Statement (BLM 2019a)**

- **Mitigation Measure GM1:** The current Monitoring Plan for Ground Subsidence and Related Earth Fissure Development near the Pipeline Mine (CGM 2005) would be revised to expand the area of subsidence and earth fissure monitoring to include the area within the maximum extent of the 4-inch subsidence contour projected at the end of mining under the Proposed Action as defined in the subsidence prediction report (SRK 2017), and to extend the period of monitoring through the life of the project (approximately 2032) or as approved by the BLM and NDEP. The focus of the monitoring would be to provide an assessment of cumulative ground surface settlement and identify and map any observed earth fissure development in the vicinity of the mine facilities, with emphasis on lined facilities that contain process solutions (e.g., leach pads, process ponds, and tailings facilities), as well as stormwater control features and RIB facilities. NGM would continue to provide the monitoring results in annual reports and would work with the BLM and NDEP, as necessary, to develop and implement appropriate site-specific measures to minimize the risk of damage to critical mine facilities.
- **Monitoring Measure WR1:** NGM would expand the monitoring included in the Integrated Monitoring Plan, as necessary, to include all of the identified surface water sites and associated mitigation listed in Table A-3, Attachment A of the Deep South Expansion Project Supplemental Environmental Report for Water Resources and Geochemistry (BLM 2019b). A draft of the comprehensive water resources monitoring plan would be provided to both the BLM and NDWR for review and approval prior to implementation of any new dewatering activities associated with the project. A copy of the monitoring plan would be provided to Eureka County. NGM would be responsible for continued monitoring and reporting of changes in groundwater levels and surface water flows prior to, and during, operation and for a period of time in the post-reclamation period. NGM would provide the results of water level monitoring, describe any deviations from the original predictions, evaluate if changes in flow are attributable to mine-induced drawdown, and propose modifications to the monitoring plan, as necessary, in an annual report to the NDWR and the BLM. If the monitoring results identify changes in flow to perennial waters that are attributable to mine-induced drawdown, the network of monitored seeps, springs, and streams would be expanded to include all perennial surface water features located within 2 miles of the affected area. Monitoring and reporting would continue until impacts to water resources have been mitigated.
- **Mitigation Measure WR2:** NGM would be responsible for monitoring groundwater levels between the mine and water supply wells, groundwater rights, and surface water rights within the projected mine-related groundwater drawdown area as part of the water resources monitoring program (Mitigation Measure WR1 described in Section 3.2.9). Adverse impacts to water wells and water

rights would be mitigated, as required by the NDWR. Mitigation for impacts to water rights would depend on the actual impact and site-specific conditions and could include a variety of measures. Methods for addressing impacts to water rights may include, but would not be limited to, the following: for wells, mitigation could include lowering the pump, deepening an existing well, drilling a new well, or providing a replacement water supply of equivalent yield and general water quality; for surface water rights, mitigation could require providing a replacement water supply of equivalent yield and general water quality.

- **Mitigation Measure V1:** NGM would voluntarily coordinate with the BLM to develop new wetland/riparian areas and/or enhance existing wetland/riparian areas at off-site locations to address the direct loss of 0.2 acre of wetland/riparian vegetation. The loss of wetland/riparian vegetation would be replaced at a 2:1 ratio (i.e., for every acre of wetland/riparian vegetation removed or disturbed by mine development or groundwater drawdown, 2 acres of wetland/riparian vegetation would be created and/or enhanced). Where appropriate, replacement of wetland/riparian vegetation would be developed in conjunction with the mitigation measures identified in Deep South Expansion Project Supplemental Environmental Report for Water Resources and Geochemistry (BLM 2019b), for potentially affected perennial waters. NGM in coordination with a BLM botanist would identify appropriate wetland/riparian species to be seeded or transplanted in these locations. Alternately, local existing areas of wetland/riparian vegetation unaffected by mine-related groundwater drawdown would be identified in coordination with the BLM for enhancement. Enhancement methods could include, but would not be limited to, the use of BLM-approved fencing to minimize livestock impacts, implementation of weed controls, and/or supplemental planting or seeding, as appropriate. NGM would be responsible for monitoring these sites on an annual basis for approximately 3 years after creation or enhancement to ensure that these mitigation measures were effective and that the wetland/riparian sites were self-sustaining and provided similar functions as existing wetland/riparian areas. NGM would be responsible for developing an annual wetland/riparian vegetation monitoring report, which would be provided to the BLM for review and approval.
- **Mitigation Measure WL1:** Prior to construction of facilities at the Gold Acres Complex, a qualified biologist would conduct surveys (in coordination with NDOW) to determine if bats are using the adits located in the vicinity of the proposed disturbance areas as roost, maternity, or hibernation sites. If any actively used adits would be directly or indirectly impacted, NGM would coordinate with the BLM on applicable mitigation measures (e.g., installation of NDOW-approved bat gates) that would be implemented, as needed, prior to surface-disturbing activities at the Gold Acres Complex.
- **Mitigation Measure RR1:** NGM would monitor the 14 water-related range improvements that potentially may be affected by mine-related groundwater drawdown. If effects to these water sources as a result of mine-related drawdown are identified, NGM would coordinate with the BLM to determine the appropriate placement and type of water-related range improvement to be developed. NGM routinely would inspect the replaced water-related range improvements to ensure that they are operating in an appropriate manner.

### 3.3 References

- Air Sciences, Inc. 2016. Barrick Cortez – Deep South Expansion Project NEPA Air Quality Analysis Report, January 8, 2016.
- ARCADIS. 2014a. HC/CUEP – Bat and Burrowing Owl Survey Work Plan.
- ARCADIS. 2014b. HC/CUEP – Pygmy Rabbit Survey Work Plan. March 2014.
- Avian Power Line Interaction Committee (APLIC) and United States Fish and Wildlife Service (USFWS). 2005. Avian Protection Plan Guidelines, April 2005.
- Avian Power Line Interaction Committee (APLIC). 2006. Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006, 2006.
- Avian Power Line Interaction Committee (APLIC) and United States Fish and Wildlife Service (USFWS). 2012. Reducing Avian Collisions with Power Lines. December 2012.
- Barrick Cortez Inc. (BCI). 2015. Barrick Cortez Inc. (NVN-067575 [14-1A]) Amendment 3 to Plan of Operations and Reclamation Permit Application, February 2015.
- Barrick Cortez Inc. (BCI). 2019. Deep South Expansion Project Amendment to Plan of Operations and Reclamation Permit Application #0093. July 2019.
- Barrick Cortez Inc. (BCI) and Stantec Consulting Services, Inc. (Stantec). 2018. Contingency Mitigation Plans for Surface Waters, 2018.
- Barrick Gold of North America. 2015. Barrick Nevada Sage-Grouse Bank Enabling Agreement. Department of the Interior, Bureau of Land Management, United States Fish and Wildlife Service and Barrick Gold of North America. March 25, 2015.
- Bureau of Land Management (BLM). 1993. Cortez Gold Mines Expansion Project Final Environmental Impact Statement and Record of Decision. N64-87-010P, N64-EIS2-36. U.S. Department of the Interior, Bureau of Land Management, Battle Mountain District Office. August 1993. Access September 2020 online at: <https://play.google.com/books/reader?id=0fgxAQAAMAAJ&hl=en&pg=GBS.PP5>.
- Bureau of Land Management (BLM). 1996. Final Environmental Impact Statement. Cortez Pipeline Gold Deposit. Volumes I and II. U.S. Department of the Interior, Bureau of Land Management, Battle Mountain District. January 1996.
- Bureau of Land Management (BLM). 1998. Environmental Assessment for the Pipeline Infiltration Project. U.S. Department of the Interior, Bureau of Land Management, Battle Mountain District. September 1998.
- Bureau of Land Management (BLM). 2000. Final Environmental Impact Statement. South Pipeline Project. NV64-93-001P(96-2A). NV063-EIS98-014. U.S. Department of the Interior, Bureau of Land Management, Battle Mountain District. February 2000.
- Bureau of Land Management (BLM). 2001. Environmental Assessment for the Horse Canyon/Cortez Unified Exploration Project. NV063-EA00-35. U.S. Department of the Interior, Bureau of Land Management, Battle Mountain Field Office. August 2001.
- Bureau of Land Management (BLM). 2004a. Mount Tenabo Properties of Cultural and Religious Importance Determinations of Eligibility to the National Register of Historic Places, April 19, 2004.



- Bureau of Land Management (BLM). 2004b. Pipeline/South Pipeline Pit Expansion Project Final Supplemental Environmental Impact Statement. U.S. Department of the Interior, Bureau of Land Management, Battle Mountain Field Office. December 2004.
- Bureau of Land Management (BLM). 2007. Gold Book. Surface Operating Standards and Guidelines, Fourth Edition. Revised 2007.
- Bureau of Land Management (BLM). 2008. Cortez Hills Expansion Project Final Environmental Impact Statement. NVN-067575. NV063-EIS06-011. U.S. Department of the Interior, Bureau of Land Management, Battle Mountain Field Office. September 2008.
- Bureau of Land Management (BLM). 2011. Cortez Hills Expansion Project Final Supplemental Environmental Impact Statement. NVN-067575. DOI-BLM-NV-2010-0132-SEIS. . U.S. Department of the Interior, Bureau of Land Management, Battle Mountain Field Office. January 2011.
- Bureau of Land Management (BLM). 2012. Decision for the Amendment to the Plan of Operations Approval Determination of Required Financial Guarantee. U.S. Department of the Interior, Bureau of Land Management, Battle Mountain Field Office. August 2012.
- Bureau of Land Management (BLM). 2013. Memorandum of Understanding Among USDI BLM, Nevada State Office, USDA USFS, Humboldt-Toiyabe National Forest, Nevada Department of Conservation and Natural Resources and Barrick Gold of North America, Newmont Mining Corporation, and Other Companies Regarding the Establishment of a Partnership for the Conservation and Protection of the Greater Sage-Grouse and Greater Sage-Grouse Habitat. July 2013.
- Bureau of Land Management (BLM). 2014. Statewide Wildlife Protocols (DRAFT), U.S. Department of the Interior. Bureau of Land Management. Nevada State Office. 2014.
- Bureau of Land Management (BLM). 2015. Environmental Assessment Fiber Optic Cable Project. DOI-BLM-NV-B010-2015-0049-EA. U.S. Department of the Interior, Bureau of Land Management, Battle Mountain District Office. June 2015.
- Bureau of Land Management (BLM). 2016. Final Environmental Assessment for the Barrick Gold Exploration, Inc. Amendment to the Horse Canyon/Cortez Unified Exploration Project Plan of Operations (NVN-066621 [16-1A]) and Reclamation Permit No. 0159. Twin Declines for Underground Exploration. U.S. Department of the Interior. Bureau of Land Management. Battle Mountain District. Battle Mountain, Nevada. September 8, 2016.
- Bureau of Land Management (BLM). 2019a. Final Environmental Impact Statement. Deep South Expansion Project. DOI-BLM-NV-B010-2016-0052 EIS. U.S. Department of the Interior, Bureau of Land Management, Battle Mountain District Office. 2019.
- Bureau of Land Management (BLM). 2019b. Final Deep South Expansion Project Resource Report – Water Resources and Geochemistry. Prepared in support of: DOI-BLM-NV-B010-2016-0052. Battle Mountain District Office, Mount Lewis Field Office, Battle Mountain, Nevada.
- Cortez Gold Mines (CGM). 2004. Monitoring Plan for Ground Subsidence and Related Earth Fissure Development Near the Pipeline Mine. Cortez Gold Mines.
- Cortez Gold Mines (CGM). 2005. Monitoring Plan for Ground Subsidence and Related Earth Fissure Development Near the Pipeline Mine. Unpublished report submitted to BLM. July 7, 2005.
- Cortez Gold Mines (CGM). 2007a. Letter from G. Fennemore, CGM, to V. Randall and D. Koontz, ENSR, regarding responses to questions from February 28, 2007. March 6, 2007.

- Cortez Gold Mines (CGM). 2007b. Memorandum providing a review of the stability of the east wall of the Cortez Hills Pit, to V. Randall (ENSR) from G. Fennemore (CGM). March 27, 2007.
- Cortez Gold Mines (CGM). 2008. Amendment to the Pipeline/South Pipeline Plan of Operations for the Cortez Hills Expansion Project (NVN-067575) and Modification to the Reclamation Permit Application (No. 0093). July 2008. As cited in Barrick Cortez Inc. (BCI). 2019. Deep South Expansion Project Amendment to Plan of Operations and Reclamation Permit Application #0093. July 2019.
- Cortez Gold Mines (CGM) and SRK Consulting (US), Inc. (SRK). 2008. Amendment to the Pipeline/South Pipeline Plan of Operations for the Cortez Hills Expansion Project and Modification to Reclamation Permit Application. Submitted to the Bureau of Land Management, Battle Mountain Field Office. July 2008.
- Geomega. 1998. Ground water Flow Modeling Report for the South Pipeline Project. Prepared for Cortez Gold Mines. June 4, 1998.
- Herron, G.B. 1995. Nongame biologist, Nevada Department of Wildlife. Personal communication with JBR Consultants.
- Interagency Pygmy Rabbit Working Group (IPRWG). 2008. Surveying for Pygmy Rabbits (*Brachylagus idahoensis*). Interagency Pygmy Rabbit Working Group. February 2008.
- Nevada Division of Environmental Protection (NDEP) and Nevada Division of Conservation. 1994. Best Management Practices Handbook.
- Nevada Division of Environmental Protection (NDEP), Truckee Meadows Stormwater Coordinating Committee, Washoe Regional Planning Commission, and Clark County Regional Flood Control District. 2008. Nevada Contractors Field Guide for Construction Site Best Management Practices (BMPs).
- Nevada Gold Mines LLC (NGM). 2020. Goldrush Mine Plan of Operations and Reclamation Permit Application. September 2019. Updated May 2020. Updated August 2020.
- Nevada Natural Heritage Program (NNHP). 2014. Species information (web database). Available: [http://heritage.nv.gov/species\\_info](http://heritage.nv.gov/species_info)
- O'Farrell, M.J. and A.R. Blaustein. 1974. *Microdipodops megacephalus*. Mammalian Species 46:1-3.
- Pagel, J.E., D.M. Whittington, and G.T. Allen. 2010. Interim golden eagle technical guidance: Inventory and monitoring protocols; and other recommendations in support of golden eagle management and permit issuance, Division of Migratory Bird Management. United States Fish and Wildlife Service.
- SRK Consulting (U.S.), Inc. 2016. Horse Canyon/Cortez Unified Exploration Project Noxious Weed Management Plan. June 2016.
- SRK Consulting (U.S.), Inc. 2017. Deep South Expansion Project – Cumulative Effects, Subsidence Report. Prepared for Barrick Cortez Inc. March 2017.
- Water Management Consultants Inc. (WMC). 1995. Pipeline Gold Project: Integrated Monitoring Plan. October 1995.

## **Appendix F: 2018 Programmatic Agreement**

**PROGRAMMATIC AGREEMENT**  
**AMONG THE BUREAU OF LAND MANAGEMENT, MOUNT LEWIS AND TUSCARORA**  
**FIELD OFFICES, THE NEVADA STATE HISTORIC PRESERVATION OFFICER, THE**  
**ADVISORY COUNCIL ON HISTORIC PRESERVATION, AND BARRICK CORTEZ INC.**  
**REGARDING**  
**MINERAL EXPLORATION AND DEVELOPMENT FOR BARRICK CORTEZ'S PROPERTIES**  
**IN THE CORTEZ AREA, EUREKA AND LANDER COUNTIES, NEVADA**

WHEREAS, Barrick Cortez, Inc. (Proponent) is the operator of Mining and Exploration Projects in the Area of Implementation (AOI) defined in Stipulation B and will seek additional approvals from the Bureau of Land Management (BLM) for modifications to existing mining operations or approved exploration, or propose new mining operations, exploration, or support facilities all within the AOI; and

WHEREAS, the BLM has determined that mineral exploration and development projects proposed by the Proponent may be Undertakings pursuant to Section 106 of the National Historic Preservation Act (NHPA), 54 U.S.C. § 3006108; and

WHEREAS, the Proponent's proposals may include, but not be limited to, three general categories of activities: (a) open pit and underground mining and associated infrastructure (hereafter a "Mining Project"); (b) surface exploration and associated infrastructure (hereafter an "Exploration Project"); and (c) support facilities for multiple activities such as access roads, transmission lines, pipelines, water management facilities, surface-disturbing baseline studies and other support facilities and activities (hereafter a "Support Project"). Mining Projects, Exploration Projects, and Support Projects will be individually referred to herein as an "Undertaking" and collectively as "Undertakings". These activities are further described in Appendix F. Each Undertaking within the AOI will have designated Areas of Potential Effect (APEs); and

WHEREAS, the BLM has determined that Undertakings may have Direct, Indirect, and Cumulative Effects on Cultural Resources included in or Eligible for inclusion in the National Register of Historic Places (NRHP), hereinafter called Historic Properties; and

WHEREAS, this Programmatic Agreement (PA) specifies the process by which the BLM will implement and complete Section 106 compliance regarding the effects of Undertakings within the AOI to Historic Properties; and

WHEREAS, the BLM has consulted with the Nevada State Historic Preservation Officer (SHPO), pursuant to Section 106 of the NHPA and 36 CFR § 800.14(b)(2), who is a Signatory to this PA; and

WHEREAS, the BLM has notified the Advisory Council on Historic Preservation (ACHP) per 36 CFR § 800.6(a)(1)(C) of the development of this PA and the ACHP has elected to participate per 36 CFR § 800, Appendix A(c)(3) and is a Signatory; and

WHEREAS, the BLM has invited the Proponent to participate in the development of this PA as an Invited Signatory under 36 CFR § 800.6(c)(2)(iii) as it bears certain financial and other obligations under this PA, and it has accepted and is an Invited Signatory; and

WHEREAS, for purposes of this PA, a reference to “Proponent” includes a reference to any of its successors in interest regarding these Undertakings; and

WHEREAS, federally recognized Indian Tribes who attach religious and cultural significance to the Historic Properties that may be affected by Undertakings within the AOI, including the Te-Moak Tribe of Western Shoshone Indians, the Yomba Shoshone Tribe, the Duckwater Shoshone Tribe of the Duckwater Reservation, the Ely Shoshone Tribe, and the Shoshone-Paiute Tribe of the Duck Valley Reservation (Tribes), have been consulted regarding this PA, have been invited to consult on and concur with this PA, and will be consulted in the future as detailed in this PA; and

WHEREAS, reference to “Parties” shall be taken to include Signatories, the Invited Signatory, and the Tribes. The Tribes shall be afforded the opportunity to participate as outlined in the PA; it is understood that their participation does not necessarily imply an endorsement of any Undertaking in part or as a whole; and

NOW, THEREFORE, the Signatories and Invited Signatory to this PA agree that Undertakings shall be implemented in accordance with the following stipulations to take into account the effect of Undertakings on Historic Properties in compliance with Section 106 of the NHPA.

#### DEFINITIONS

Specific terms used herein and not defined herein have the meanings given them in 36 CFR § 800.16 or in the definitions set forth in Appendix B, attached hereto.

BLM shall ensure that the following stipulations are followed:

##### A. PURPOSE AND INTENT

The purpose of this PA is to establish an agreement among the BLM, the SHPO, the ACHP, and the Proponent on how the consultation process under Section 106 will be implemented regarding Undertakings within the AOI, and the manner in which the Parties shall be afforded an opportunity to participate in that Section 106 consultation process. This PA defines general and specific measures that will be undertaken by all Parties to ensure that the BLM’s responsibilities under Section 106 will be fulfilled. It is the intent of this PA that the Parties shall work to avoid, minimize, or mitigate Adverse Effects to Historic Properties identified within an APE, regardless of surface ownership.

##### B. AOI FOR THE PA; DIRECT, INDIRECT, AND CUMULATIVE APES FOR UNDERTAKING(S)

1. The AOI for this PA consists of lands administered by the BLM in Lander and Eureka Counties, Nevada, and private lands as described and depicted in Appendix A.
2. The AOI contains the NRHP Eligible Cortez Historic Mining District (CHMD). During inventories or evaluation of an Undertaking affecting the CHMD, all historic sites and isolated features pertaining to the theme of historic mining will be additionally evaluated to assess whether they are contributing or non-contributing elements to the CHMD, per guidance set forth in NRHP Bulletin 36.
3. The APE for Direct Effects for an Undertaking will be those locations undergoing any exploration and development from such Undertaking within the AOI that are subject to surface disturbance.

4. The APE for Indirect Effects for an Undertaking will be those locations within the AOI deemed potentially affected by visual, vibrational, auditory, and atmospheric effects of such Undertaking.

5. Cumulative Effects are the effects on the environment which result from the incremental effect of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes the actions. For the purposes of this PA, the APE for Cumulative Effects is the same as that for Direct and Indirect Effects.

6. BLM will establish the, the Direct and Indirect Effects APEs for each Undertaking in writing through the submission of a Cultural Resource Information Form (CRIF), as described in this PA. The CRIF is equivalent to the Cultural Resources Inventory Needs Assessment Form (CRINA) as established in Section I.B.1(a-c) and Section 1.B.3-4 of the Protocol, dated December 22, 2014.

### C. ROLES AND RESPONSIBILITIES

#### 1. BLM

a. BLM is responsible for administering this PA and will ensure that all of the PA's stipulations are carried out. This includes but is not limited to ensuring that the Signatories and Proponent carry out their respective responsibilities as stipulated during the implementation of this PA. The Mount Lewis Field Office Manager is the BLM Agency Official for this PA. The BLM Agency Official, or their designee, is the PA point of contact for BLM.

b. BLM is responsible for consultation with Tribes, as outlined in this PA. Any consultation will comply with the NHPA and be guided by the latest edition of BLM Manual 1780 and associated Handbook 1780-1, as it may be amended, and other BLM Information Memoranda and Information Bulletins relaying guidance on tribal consultation from the Washington Office or BLM Nevada State Office, or by consultation procedures agreed to by BLM and a Tribe through a signed Memorandum of Understanding.

c. BLM will be responsible for all submissions to the SHPO, the ACHP, the Tribes, and the Proponent during the implementation of this PA for each Undertaking. Any submission not from BLM will be considered as informational only and will not trigger any compliance timelines or other actions.

d. BLM shall ensure that historic, architectural and archaeological work conducted pursuant to this PA is carried out by or under the direct supervision of persons meeting qualifications set forth in the current Secretary of the Interior's Professional Qualification Standards. Ethnographic work required by BLM under this PA will meet appropriate requirements and ethnographers working on any Undertaking under this PA shall be supervised by a qualified professional or otherwise be approved by BLM. The BLM Nevada State Office will permit inventories, recordation, and mitigation work on historic and prehistoric resources. Architectural resources must be inventoried by consultants who meet the *Secretary of Interior's Historic Preservation Professional Qualification Standards* (36 CFR § 61, Appendix A [1983]) appropriate for the resource being evaluated, and they will use the standards and forms in the latest edition of *Guidelines for Recording and Reporting Architectural Resources in Nevada*, issued by the BLM Nevada State Office.

e. The BLM will ensure that adequate identification, recordation, and treatment efforts are completed without regard to the ownership status of the lands involved. If a private landowner refuses to allow the aforementioned activities on its land, BLM will provide an assessment concerning the



likelihood of the presence of Historic Properties on the private lands based on a search of existing records surrounding the property and consultation with the Signatories, the Proponent, and the Tribes.

i. If this probability is low then BLM may make a determination that no cultural work is required on those private lands for this reason and seek SHPO concurrence, concluding review under this PA of those private lands.

ii. If the BLM assessment indicates that Historic Properties are likely to exist on those private lands, and the BLM is able to reasonably determine that the Undertaking proposed to be authorized by a BLM permit or other BLM approval may result in Adverse Effects to them, then BLM will work with the Proponent to implement reasonable measures to avoid Adverse Effects. BLM, in consultation with the SHPO, may approve a Treatment Plan for similar resources located on nearby public lands.

## 2. Proponent

a. The Proponent, in cooperation with BLM, the SHPO, and interested Tribes, shall develop an in-house training program. The Proponent shall maintain a record of having provided the in-house training program to all of its personnel and all the personnel of its contractors and subcontractors engaged in an Undertaking under this PA. Such personnel will also be directed not to engage in the illegal collection of historic and prehistoric materials. The Proponent shall ensure that subsequent hires will receive similar training. Training can be in association with the Proponent's safety and/or related job training and Proponent's orientation for a specific Undertaking. The Proponent will cooperate with BLM to ensure compliance with the Archaeological Resources Protection Act of 1979 (16 U.S.C. § 470) (ARPA) on Federal lands and with Nevada Revised Statutes (NRS) 383 for private lands.

b. The Proponent's designee will be the Proponent's point of contact for this PA and provide BLM with all information in the Proponent's possession necessary to implement this PA.

c. The Proponent shall bear the reasonable expense of identification, evaluation, and treatment of all Historic Properties directly or indirectly affected by an Undertaking under this PA. Such costs shall include, but not be limited to, pre-field planning, fieldwork, post-fieldwork analysis, research and report preparation, interim and summary report preparation, monitoring of audible, visual, and vibrational effects of an Undertaking, all mitigation, including publications for the general public, and the cost of curating project documentation and artifact collections. The BLM may require the Proponent to bear the reasonable cost for data gathering to assist the BLM in identifying, evaluating, and treating TCPs and PCRIs. If the Proponent withdraws any Undertaking application, then the Proponent shall incur no further expense except for completing fieldwork and post-fieldwork activities (production of final inventory, evaluation, and data recovery reports covering the description and analysis of data, and the curation of materials) that has been initiated prior to the date of withdrawal of that application.

## D. TYPES OF UNDERTAKINGS

Because the degree and nature of potential Undertakings that the Proponent may propose within the AOI may vary widely, this PA is intended to be flexible, requiring more extensive consultation when more Historic Properties or more extensive Adverse Effects are anticipated, and streamlining consultation for less intensive activities. In general, the following types of processes will apply to the three types of Undertakings under this PA:

1. Mining Projects generally have extensive surface disturbance and have a greater potential for Direct, Indirect, and Cumulative Effects to Historic Properties. Effects from Mining Projects tend to

be longer term, with reclamation occurring later in the mine life. Identification, evaluation, consultation and data recovery, along with other forms of mitigation, will be extensive for Mining Projects proposed under this PA, and these steps as outlined under this PA are anticipated to be conducted concurrently with the review and public processes under the National Environmental Policy Act (NEPA).

2. Exploration Projects involve multi-year exploration field seasons including initial wide-spaced exploration and later close-spaced exploration as detailed in an Exploration Plan. Treatment and data recovery are not favored mitigation for exploration, and unless otherwise approved by the BLM after consultation with the SHPO and the Tribes as outlined in this PA, strict use of Avoidance Buffer Zones under the procedure set forth in Appendix E will be required for Exploration Projects. When use of Avoidance Buffer Zones is practiced, adverse effects to Historic Properties from exploration activities are prevented. BLM will evaluate Exploration Plans, including details of the exploration processes. Once BLM approves an Exploration Plan, the Proponent submits annual workplans detailing the locations of exploration drilling for that year's field season, including the plans to use Avoidance Buffer Zones and any other stipulations in the approved Exploration Plan. Annual workplans are subject to the Notice to Proceed (NTP) process in Stipulation H, and the Avoidance Procedures in Appendix E.

3. Support Projects are either minor standalone projects not associated with a Mine Plan or Exploration Plan, or require a separate BLM approval. Support Projects shall be evaluated under this PA at an appropriate level based on the nature of the Support Project, the approvals needed and the level of surface disturbance or other potential effects to Historic Properties. This evaluation will include the CRIF process, as set forth in this PA, and may also include more intensive forms of mitigation, depending on specific Support Project designs and requirements.

4. Certain categories of Undertakings are exempted from inventory requirements and further review under this PA. These exemptions are listed in Appendix G to this PA. At the end of each fiscal year, BLM will summarize for the SHPO the use of exemptions under this PA during the year.

## **E. CRIF PROCESS**

1. At the earliest feasible planning stage, BLM in conjunction with the Proponent and/or the CRM Contractor, will develop a CRIF for any Undertaking covered under this PA.

a. The intent of the CRIF is to establish the Direct and Indirect effect APEs, provide a summary of known resources present within the APEs, evaluate inventory needs, describe the methods (other than standard inventory) that will be used to analyze effects (e.g., visual and auditory simulation modeling), and list the Tribes and members of the public who will be consulted for individual Undertakings. The CRIF will also describe whether specialty resource knowledge such as an architectural historian is necessary and will outline any other appropriate recommendations for the Undertaking.

b. In the CRIF, BLM will determine and describe the information needed to identify and evaluate Historic Properties within the APEs. BLM will base such determinations on a file search of the BLM/SHPO Cultural Resource records, aerial photographs, Government Land Office (GLO) records, BLM land records, resource management plans, project-specific NEPA documents of the proposed project area, available Cultural Resource planning models, and on information sought and obtained from the SHPO. As needed, BLM in conjunction with the Proponent and/or the CRM Contractor, will gather the necessary information through appropriate levels of inventory or interviews with members of the public, professionals, and the Tribes. Resources of religious and cultural significance to the Tribes must be included in determining inventory needs based on appropriate notification and consultation.

c. BLM may provide the Tribes with an opportunity to consult on the CRIF. If the

BLM provides an opportunity to consult on the CRIF, the agency must describe those procedures and any input that was received, in the CRIF itself.

2. Level of Field Inventory: Class III Inventory will be the standard level of field inventory required to identify archaeological and architectural resources. However, there are cases where Class II surveys (sample designed, reconnaissance, etc.) are adequate or no survey is required. The level of survey proposed by BLM will be based on the Undertaking as a whole; thus, a Class III Inventory requires 30-meters or less spacings across the entire APE, while a Class II inventory proposes some degree of inventory but more than 30-meter spacings across all or part of an APE. The CRIF will include justifications for the level of inventory required, as well as the methods BLM will use to determine the potential Undertaking's Direct and Indirect Effects on Historic Properties.

a. The BLM may determine that specific Undertakings will not require further identification efforts, as listed below. Any such determination will be documented in the CRIF.

i. Disturbed Areas: If the BLM determines that previous ground disturbance has modified the surface of an APE so that the probability of finding intact Cultural Resources within the APE is negligible, then the disturbed portion of the APE should be excluded from further inventory.

ii. Previous Adequate Inventory: If the BLM determines that all Direct and Indirect APEs have been adequately inventoried and were previously reviewed and concurred on by the SHPO.

iii. Age of Inventory: The BLM will evaluate inventories more than 20 years old to determine their adequacy for contemporary identification purposes in locating and evaluating Historic Properties in relation to the type of proposed Undertaking. This will include an assessment of the need for further consultation with the Tribes.

3. Once the BLM completes the CRIF, the BLM will send one copy to the designated SHPO email.

4. The SHPO will have five (5) working days from receipt of the CRIF to respond to the BLM by email.

a. The SHPO may indicate that it has no questions or issues with the information contained in the CRIF or it may recommend additional parties that the BLM may consult, provide additional inventory recommendations, comment on the adequacy of the designated APEs, and/or comment on the adequacy of the methods designed to assess effects. BLM will consider these comments when finalizing project plans.

b. If the SHPO has not responded by the close of business on the fifth working day after a CRIF submission, BLM will proceed with the process described in the CRIF and outlined in this PA.

## **F. IDENTIFICATION OF ELIGIBLE HISTORIC PROPERTIES**

As outlined in this PA, the CRIF will describe BLM's determination of the Cultural Resource inventory requirements for the Direct and Indirect APE(s) for any Undertaking under this PA. BLM shall ensure the required inventory is completed prior to the initiation of any ground-disturbing activities. This inventory and the reporting of inventory results will follow the procedures of this PA, as outlined below.

1. BLM must consult with the Tribes regarding the identification of potential Traditional

Cultural Properties (TCPs) and Properties of Cultural and Religious Importance (PCRIs).

2. Unless authorized in advance by the BLM Nevada State Office through issuance of a separate ARPA permit, no artifacts will be collected during the inventory phase of the fieldwork.

3. The CRM Contractor shall perform the inventory for Cultural Resources in accordance with the CRIF and will provide the BLM with a draft inventory report.

4. Upon receipt of the draft inventory report from the CRM Contractor, BLM shall have thirty (30) calendar days for review. The BLM will either accept the draft inventory report as complete, or will provide comments and/or direction to the CRM Contractor regarding edits and/or additional work needed before it can be accepted as complete.

5. Using the inventory report and any information gathered through consultation with the Tribes, BLM shall evaluate all newly identified Cultural Resources, including TCPs and PCRIs, for NRHP Eligibility as Historic Properties. BLM will utilize the Criteria found in 36 CFR § 60.4 prior to initiation of any activities that may affect those Historic Properties. In order to determine the effect of an Undertaking on Historic Properties, BLM must document which aspects are important in defining the integrity of the property in the eligibility evaluation for each property.

a. In the circumstance that information gathered by the inventory process proves inadequate for determining site Eligibility, the BLM, in consultation with the SHPO via formal letter, may authorize an Evaluation Plan, which would include the issuance of an ARPA permit for the purpose of subsurface testing.

b. In developing an Evaluation Plan, the BLM shall ensure that any testing is limited to defining the nature, density and distribution of materials within the boundaries of the unevaluated property in question. Such testing is intended to provide the minimum data necessary to make final evaluations of NRHP Eligibility and to enable the development of appropriate treatment options.

6. BLM shall provide the Tribes and the Proponent with the agency's initial determination of NRHP Eligibility for those newly identified Cultural Resources. The Tribes and the Proponent will have thirty (30) calendar days to provide the BLM with comments or to request further consultation. The BLM acknowledges that the Tribes possess special expertise in assessing the Eligibility of Cultural Resources that may possess cultural and religious significance to them. The BLM may modify its initial Eligibility determinations based on such consultation with the Tribes or the Proponent.

7. After consultation with the Tribes and Proponent, the BLM will transmit its determination of NRHP Eligibility for the newly identified Cultural Resources to the SHPO for consultation.

a. The BLM's transmittal must include details about consultation with the Tribes and the Proponent, including any comments that BLM received.

b. The SHPO shall have thirty (30) calendar days from receipt to either concur with the BLM's Eligibility determinations (in whole or in part) or provide the BLM with its comments. BLM will address comments from the SHPO, as appropriate. If the SHPO fails to respond within thirty (30) calendar days of receipt, BLM will consider the determination final.

c. Once the SHPO concurs or fails to respond to BLM's transmittal

concerning BLM's Eligibility determinations, the determinations will be considered final.

8. BLM will be responsible for informing the Tribes and Proponent of the final Eligibility determinations within five (5) working days of SHPO concurrence.

#### **G. EVALUATION OF EFFECTS ON HISTORIC PROPERTIES**

In determining if an Undertaking has an effect on Historic Properties, BLM will follow the procedure outlined in this PA.

1. Effect means alteration to the characteristics of a Historic Property qualifying it for inclusion in or Eligible for the NRHP.

a. An Adverse Effect is found when an Undertaking may alter, directly or indirectly, any of the characteristics of a Historic Property that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association.

b. BLM will consider all qualifying characteristics of a Historic Property, including those that may have been identified subsequent to the original evaluation of the property's Eligibility for the NRHP.

c. Adverse Effects may include reasonably foreseeable effects caused by the Undertaking that may occur later in time, be farther removed in distance or be cumulative.

2. BLM and Proponent shall seek to avoid Historic Properties through use of Avoidance Buffer Zones, modifications to the design of Undertaking activities, the relocation of Undertaking activities, or by other means, as practicable, recognizing valid existing rights.

a. Avoidance Buffer Zone is defined in Appendix B and the process to be used to accomplish avoidance for all Undertakings under this PA is described in Appendix E to this PA.

b. If BLM and Proponent can ensure avoidance of all Historic Properties for an Exploration Project, then the BLM will notify the SHPO and the Tribes either via formal letter or CRIF, and the Undertaking can proceed.

3. If BLM, informed by discussion with Proponent, determines that avoidance is not feasible or prudent, BLM shall evaluate the effects of the Undertaking on Historic Properties.

a. BLM will prepare a determination of effects on Historic Properties within the APEs. BLM will explain whether it has determined there will be No Effect, No Adverse Effect, or an Adverse Effect resulting from the Undertaking. If BLM initially determines that the Undertaking will have an Adverse Effect on a Historic Property, BLM will also prepare a Treatment Plan. BLM may also require the Proponent to acquire the services of a CRM Contractor to prepare effects recommendations and Treatment Plans at the BLM's discretion.

i. When archaeological data recovery is the preferred treatment option for a Historic Property or Properties under Criterion (D) because of the data it contains, BLM shall ensure that the Proponent's CRM Contractor develops a Treatment Plan based on an appropriate research design prior to the commencement of any data recovery. Data recovery plans shall be consistent with the

Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation (48 FR 44716-37) and shall conform to the stipulations outlined in the BLM Manual 8140.26 and following the guidance provided in the ACHP's website online at <http://www.achp.gov/archguide/>.

ii. For Historic Properties Eligible under Criteria (A) through (C), other forms of mitigation may be considered in the Treatment Plan in lieu of or in addition to data recovery, including interpretation, public education, collection of oral histories, or other mitigation (e.g., oral history, historic markers, exhibits, interpretive brochures, publications, informational websites, etc.). All public media will adhere to BLM Media Design Standards. In some cases, off-site mitigation may be appropriate to take into account identified Adverse Effects.

b. BLM will provide its initial determinations of effect and initial mitigation plans to the Tribes and the Proponent, which will have thirty (30) calendar days from receipt to provide comments or request further consultation.

i. The BLM acknowledges that an Undertaking's potential effects to Historic Properties, especially those that are TCPs and PCRIs, and reasonable treatments for those effects can only be determined in consultation with those Tribes who value the property.

ii. The BLM may modify its initial determinations of effect and initial mitigation plans based on such consultation with the Tribes and the Proponent.

4. After consultation with the Tribes and the Proponent, the BLM will transmit its determinations of effect and mitigation plans for Historic Properties within the APEs to the SHPO for consultation.

a. The BLM's transmittal must include details about consultation with the Tribes and the Proponent, including any comments that BLM received.

b. The SHPO shall have thirty (30) calendar days to either concur with the BLM's determinations of effect and mitigation plans (in whole or in part) or provide the BLM with its comments. BLM will address comments from the SHPO, as appropriate. If the SHPO fails to respond to the BLM within thirty (30) calendar days of receipt of a submission, the BLM shall proceed accordingly.

c. Once the SHPO concurs or fails to respond, to the BLM's determinations of effect and mitigation plans, they shall be considered final.

5. BLM will be responsible for informing the Tribes and Proponent of the final determinations of effect and mitigation plans within five (5) working days of SHPO concurrence.

## H. NOTICES TO PROCEED

Notices to Proceed (NTPs) typically are used to confirm that requirements of an existing BLM authorization have been met and are not new BLM decisions. For example, an approved Mine Plan, Exploration Plan, or other BLM authorization may contemplate a NTP process to confirm BLM decision requirements for Historic Property concerns have been met. For such purposes under this PA, NTPs may be issued by BLM to the Proponent under any of the following conditions:

1. The APE of an Undertaking has been adequately inventoried and evaluated and BLM, in consultation with the SHPO through the CRIF process as detailed in this PA, has determined that there

are no Historic Properties within the specific Undertaking APE; or

2. The BLM, in consultation with the SHPO, the Proponent and Tribes as outlined in this PA, has determined that there are no Historic Properties adversely affected by an Undertaking; or

3. The BLM, in consultation with the SHPO, the Proponent and Tribes as outlined in this PA, has approved a Treatment Plan for all Historic Properties adversely affected by the Undertaking and that Treatment Plan does not require additional fieldwork within the Undertaking APE; or

4. The BLM, in consultation with the SHPO, the Proponent and Tribes as outlined in this PA, has determined that the Proponent has implemented an adequate Treatment Plan for the Undertaking that would affect Historic Properties, and:

- a. The fieldwork phase of the treatment has been completed; and
- b. BLM has accepted a summary description of fieldwork performed for the Undertaking; and
- c. BLM has provided an electronic copy of the summary to the SHPO; and
- d. The SHPO has reviewed the summary and either concurred or provided further comments within two (2) working days of receipt. BLM will address comments from the SHPO, as appropriate. If the SHPO fails to respond to the BLM within two (2) working days, BLM may issue the NTP.

5. Once an Undertaking has gone through the relevant review process set forth in the stipulations above and the Undertaking has been approved by BLM, the BLM shall consider the Section 106 review complete for that Undertaking. Stipulation I of this PA provides the process for considering discoveries and unanticipated effects to Historic Properties after an Undertaking has been approved. New information received after the issuance of an NTP will be considered in consultation on subsequent Undertakings proposed under this PA.

## **I. DISCOVERY OR UNANTICIPATED EFFECT SITUATIONS**

1. Discoveries of previously unidentified Cultural Resources are not anticipated, however if there is a post-review discovery of Cultural Resources during the conduct of the Proponent's activities, the BLM will ensure that the following stipulations are met. These provisions will be included in all construction, operations, and maintenance plans, Historic Properties Treatment Plans, and project managers will brief field personnel.

2. The Parties believe that the stipulations in this PA will generally prevent unanticipated effects to previously identified Historic Properties. However, the Parties also adopt the stipulations below that set forth the procedures to be followed to address effects to Historic Properties that were not known, anticipated, or addressed at the time of review under this PA for a prior Undertaking.

3. Prior to the initiation of any new Undertaking, the Proponent will provide the Parties to this PA with a list of employees with the authority to halt activities in a discovery or unanticipated effects situation, and who will be responsible for notifying BLM of any discoveries or unanticipated effects. At least one of these authorized persons will be available via telephone during all ground-disturbing Undertaking activities. The currently authorized personnel are listed in Appendix C.



4. Discovery/Unanticipated Physical Effect:

a. Cultural resources not previously identified which are discovered while conducting any approved Undertaking are subject to the terms outlined in this PA. If, at any point, such resources are discovered, or an unanticipated physical effect (including newly identified physical effects resulting from vibration from an Undertaking) to an Historic Property occurs, all ground-disturbing activities within fifty (50) meters of the initial location of discovery or unanticipated physical effect will cease immediately and the Proponent shall take adequate steps to ensure the protection of the discovered resource and notify the BLM Agency Official within 24 hours after the discovery. Activity within 50 meters of the initial location of the discovery or unanticipated physical effect will remain halted until the BLM Agency Official issues an NTP following the procedure outlined in this PA.

b. BLM shall notify the SHPO and any Tribe that ascribes significance to the affected property, through email, or phone call, within 48 hours of Proponent's notice of the discovery or unanticipated physical effect. This initial notification shall describe the nature of the discovery or unanticipated physical effect, describe the plan to protect the discovery or unanticipated physical effect in order to reduce or minimize effects to the extent practicable, and provide a timeline for carrying out the rest of the provisions in this stipulation. Some instances of unanticipated physical effects may not be detectable by the Proponent and may be brought to the attention of the BLM through its own observations or by a third party. In such instances, the Proponent will follow the procedures in I.4.a above regarding cessation of activity immediately upon notice of the unanticipated physical effect from the BLM.

c. Upon notification of a discovery (with the exception of human remains, which will be handled pursuant to Stipulation I.7 below) or unanticipated physical effect, the BLM will ensure that adequate documentation is acquired from the Proponent or the Proponent's CRM Contractor, to facilitate a determination of Eligibility, finding of effects, and appropriate measures for the treatment of the discovery or unanticipated physical effect.

d. BLM shall ensure that all discoveries and unanticipated physical effects are documented in accordance with the current archaeological and architectural BLM Guidelines. BLM shall submit reports to the SHPO, the ACHP, the Proponent and any affected Tribe in accordance with Stipulation K.

e. BLM shall make an initial determination of Eligibility for the NRHP for all discoveries. BLM shall also make an initial finding of effect for discoveries and an initial determination of what actions must be taken to avoid, minimize, or mitigate any identified physical Adverse Effects.

f. BLM shall provide the SHPO, the Proponent, the ACHP, and any affected Tribe with its initial Eligibility determination and effects finding and any proposed actions to resolve Adverse Effects to Historic Properties. BLM shall afford the SHPO, the Proponent, the ACHP, and affected Tribe five (5) working days to respond with recommendations. Following the 5-day consultation period, BLM shall take any comments and suggestions provided by the SHPO, the Proponent, the ACHP, and affected Tribe into account before making a final decision and proceeding. If the BLM receives no response prior to the established deadline, BLM may proceed with implementation.

g. If a Treatment Plan or other measures are adopted, Undertaking activities in the fifty (50) meter buffer, or other appropriate distance determined by BLM, will remain suspended until the BLM Agency Official notifies the Proponent via an NTP issued in accordance with this PA that activities may resume.

5. Unanticipated Auditory, Visual, or Atmospheric Effects.

h. If, at any point, an unanticipated auditory, visual, or atmospheric effect to a Historic Property occurs, BLM shall notify the SHPO, the Proponent, the ACHP, and any Tribe that ascribes significance to the affected property, through email, or telephone call, within 48 hours of the identification of an unanticipated auditory, visual, or atmospheric effect. This initial notification shall describe the nature of the unanticipated effect and any measures to immediately reduce or minimize effects to the extent practicable and provide a timeline for carrying out the rest of the provisions in this Stipulation I.5. The Proponent is generally not required to cease activity during consultation to address the newly identified auditory, visual, or atmospheric effect, but the BLM may require it in certain circumstances, consistent with its regulatory authorities. The BLM will endeavor to limit any required cessation of activity to such areas or activities reasonably necessary to protect the Historic Property affected by the activity.

i. The BLM will ensure that adequate documentation is acquired from the Proponent or the Proponent's CRM Contractor (if any relevant information is available to them), to facilitate consideration and findings regarding auditory, visual, or atmospheric effects and appropriate measures for the avoidance, minimization, or mitigation of Adverse Effects.

j. BLM shall ensure that all unanticipated auditory, visual, or atmospheric effects are documented in accordance with the current archaeological and architectural BLM Guidelines. BLM shall submit reports to the SHPO, the Proponent, the ACHP, and any affected Tribe in accordance with Stipulation K.

k. BLM shall provide the SHPO, the Proponent, the ACHP, and any affected Tribe, with its initial effects finding and any proposed actions to resolve Adverse Effects to Historic Properties. BLM shall afford the SHPO, the Proponent, the ACHP, and affected Tribe five (5) working days to respond with recommendations. Following the 5-day consultation period, BLM shall take any comments and suggestions provided by the SHPO, the Proponent, the ACHP, and affected Tribe into account before making a final decision and proceeding with implementation of any proposed actions. If the BLM receives no response prior to the established deadline, BLM may proceed with implementation.

6. Newly Identified TCPs.

a. During the term of this PA, it is possible that the location or existence of a previously unidentified Traditional Cultural Property (TCP, as defined in Appendix B) may be revealed to the BLM. If such identification occurs after the conclusion of review for any Undertaking under this PA, the BLM shall follow the procedures below. The BLM will evaluate all of the effects of the Undertaking on the new TCP, including physical, auditory, visual, or atmospheric effects.

b. BLM shall notify the SHPO, the Proponent, and any appropriate Tribe that a new TCP has been identified within two (2) working days of such identification. Unless the BLM has determined that continuing operations in the vicinity of the new TCP would cause immediate physical Adverse Effects, the approved Undertaking may proceed during such period and during BLM, SHPO, and Tribal review of the new TCP.

c. Within five (5) working days after the initial identification of a new TCP to the BLM, the BLM shall notify the Tribe that ascribes significance to such resource of the need for the following information: 1) information regarding the property's boundary, its Eligibility and qualifying characteristics, and effects from the Undertaking, 2) input on ways to avoid, minimize, or mitigate any

Adverse Effects to the TCP, and 3) information as to why this resource was not identified during earlier identification and consultation efforts to inform the review process moving forward. The BLM shall afford such Tribe thirty (30) calendar days to provide such information to the BLM, unless the BLM required the Undertaking to cease work due to immediate physical Adverse Effects, in which case the Tribe must provide the requested information within five (5) calendar days.

d. Upon receipt of information regarding the TCP set forth in the Stipulation I.6.c above, in consultation with SHPO and any Tribe that may attach significance to the TCP, BLM shall make an initial determination of Eligibility for the NRHP and initial assessment of effect. The BLM Agency Official will make an initial determination of what actions must be taken to avoid, minimize, or mitigate any identified Adverse Effects. If the Tribe that identified the new TCP fails to provide the required information within the afforded time, the Undertaking may proceed without further review.

e. If physical effects to the new TCP are identified, the BLM, the SHPO, the Proponent, and affected Tribe shall follow the procedures outlined in Stipulation I.4 above. If the effects of the Undertaking are believed to be limited to auditory, visual, or atmospheric effects, the BLM, the SHPO, the Proponent, and affected Tribe shall follow the procedures outlined in Stipulation I.5 above.

f. Human remains and associated funerary objects may be discovered during development or during controlled archaeological excavations. BLM, the Proponent and its contractors will follow the requirements of 43 CFR § 10.4 (Inadvertent Discoveries) of the regulations implementing the Native American Graves Protection and Repatriation Act (NAGPRA) for human remains discovered on public land, and NRS 383.150 to 383.190 for human remains discovered on state and private land.

g. In all cases of a discovery of human remains and associated funerary objects, the Proponent's representative will immediately notify the BLM Agency Official and the relevant county coroner or sheriff if the discovery is located on public lands, and the BLM Agency Official, relevant county coroner or sheriff, and the SHPO if the discovery is located on private or state lands. Contact will be by telephone or in person, followed by written notification, of any discoveries of human remains, associated and unassociated funerary objects, sacred objects or objects of cultural patrimony. If requested by the BLM or law enforcement in accordance with applicable law, the Proponent's CRM Contractor will assess age, affiliation, and circumstances of burial and will notify the BLM Agency Official and the BLM will consult with the Tribes. Direction for treatment of human remains will be addressed in compliance with 43 CFR § 10.4 or NRS 383.150 to 383.190 concerning human remains.

h. Immediately upon discovery of human remains, all activity will stop and no further activity will take place within a fifty (50) meter perimeter of the discovery. The Proponent's authorized representative will respectfully ensure the protection and security of the location. It may be necessary for the Proponent to provide 24-hour onsite security for NAGPRA associated discoveries or other discoveries as directed by BLM up to a maximum of 48 hours, at which time BLM or law enforcement shall take over site security or take custody of the remains or artifacts. This protection will remain in effect until such time as the BLM Agency Official has approved the appropriate disposition of the remains in accordance with applicable local, state, and federal statutes.

7. The SHPO has determined that this PA meets the terms found in NRS 383.121 as amended (Chapter 523, Statutes of Nevada 2017, page 3544) for an "existing agreement with a federal agency that was executed pursuant to federal law and that relates to the discovery of prehistoric native Indian human remains or a funerary object." The SHPO has determined that execution of this PA means that the provisions for notification found in NRS 383.121, as amended, do not apply. Standard notification

requirements found in NRS 383.150 to NRS 383.190, amended, do apply.

## **J. CONFIDENTIALITY**

1. Information considered proprietary by the Tribes and provided to the BLM will be held confidential by BLM to the extent provided for under federal law.

2. The Signatories, the Proponent, and any Tribe that signs this PA, each agree to maintain the confidentiality of Protected Information to the extent permissible under applicable law. During the implementation of this PA, Protected Information will continue to be generated, submitted, and/or included in documentation to be generated by and/or submitted to the Signatories, Tribes, and Proponent under this PA. For Protected Information and any documentation containing Protected Information generated by the BLM, to the extent permitted by applicable law, the permission of the BLM is required before any dissemination of such information by any Signatory, the Proponent, or Tribe.

3. For Protected Information and documentation containing Protected Information held by the BLM, should a conflict over dissemination of information arise between any Signatory, Tribe, or Proponent, the BLM will contact the BLM Nevada State Director to implement the provisions set forth in Section 304 of the NHPA (54 U.S.C. § 307103), 36 CFR § 800.11(c), and Section 9 of ARPA (16 U.S.C. § 470aa-mm). Pending implementation of the Section 304 provisions, the confidentiality of the information must be preserved.

4. The Proponent agrees to maintain the confidentiality of any Protected Information, and to design procedures (in consultation with the BLM) to ensure that such information only is provided to the Proponent's personnel with a need to know this information in order to design Undertaking facilities or conduct operations in a manner to avoid, minimize, or mitigate effects to Historic Properties. The Proponent shall keep such information in a secure location with access limited to necessary personnel and Proponent representatives. The Protected Information obtained by the Proponent under this PA will not be used for any purpose other than consultation with the BLM, the Tribes, and the SHPO, the performance of Proponent operations in compliance with this PA and applicable laws, or participation in any administrative or legal process related to an Undertaking reviewed under this PA. Should the Proponent cease operations in the AOI, the Proponent agrees to destroy or return this information to the BLM.

## **K. REPORTS AND CURATION**

1. All reporting of inventory results, Treatment Plans, or other mitigation efforts, will be executed in a professional manner, through utilization of currently acceptable scientific practices and in conformance with guidelines set forth in the latest edition of BLM Nevada's Guidelines and Standards for Archaeological Inventory, and Guidelines for Recording and Reporting Architectural Resources in Nevada, and BLM Manual series 8110. All final reports submitted to the BLM will include copies of all relevant GIS data generated during activities conducted under this PA, as specified in the latest edition of BLM Nevada's Guidelines and Standards for Archaeological Inventory.

### **2. Draft and Final Reports:**

a. Unless otherwise approved by BLM, the Proponent will ensure that draft reports of all identification, evaluation, treatment or other mitigation activities are submitted to BLM no more than sixty (60) calendar days after the completion of fieldwork by the Proponent's CRM Contractor. Reports on large and/or complicated identification and treatment projects will understandably require

more time and agreed timelines should be negotiated in advance.

b. BLM will have a minimum of thirty (30) calendar days in which to review reports and inform the Proponent's CRM Contractor if the BLM accepts the report as-is, accepts it with editorial modifications, rejects the report pending substantive changes, or that the BLM needs further review time. The Proponent will ensure that any corrections required by the BLM will be incorporated into an acceptable report that will be due to BLM thirty (30) calendar days after receipt of BLM's comments unless otherwise negotiated.

c. BLM will submit all BLM accepted reports of identification, evaluation, treatment, or other mitigation activities to the SHPO for a thirty (30) day consultation period. In the letter from BLM transmitting inventory and evaluation reports to the SHPO, BLM will clearly identify its determinations of Eligibility and effect, and state clearly BLM's intent to obtain the SHPO's concurrence. If the SHPO does not respond within thirty (30) calendar days of receipt, BLM will finalize the documents contained in the submission. If the SHPO responds with comments, BLM will address them, as appropriate.

3. BLM shall ensure that reports on mitigation efforts are prepared in accordance with contemporary professional standards and conform to the Department of the Interior's Formal Standards for Final Reports of Data Recovery Programs (42 FR 5377-5579).

4. BLM shall ensure that all final mitigation reports resulting from actions pursuant to this PA will be provided to the SHPO and made available to other interested parties, subject to the limitations concerning data accountability listed below:

a. Precise site location data will be redacted to the extent authorized by law, if it appears that release of such data could jeopardize Historic Properties.

b. It is within the BLM Agency Official's purview to withhold the release of any and all reports resulting from activities pursuant to this PA if BLM determines, after completing compliance with 54 U.S.C. §307103 and the process in 36 C.F.R. § 800.11(c)(1), that the release of those reports may jeopardize Historic Properties.

c. Subject to Stipulation J, Stipulation K.4.c, and Appendix E, BLM shall provide, or authorize the CRM Contractor to provide the Proponent a copy of locational and other information for Cultural Resources, Historic Properties, TCPs and PCRIs (collectively, the "Protected Information") within the AOI, and updates of this information.

5. Curation of Archaeological Materials: All records, photographs, maps, field notes, artifacts and other materials collected or developed for any identification, evaluation, or treatment activities will be curated at the Nevada State Museum in Carson City, Nevada (NSM), unless otherwise approved by the BLM's Deputy Preservation Officer. All materials collected by a CRM Contractor will be maintained in accordance with 36 CFR § 79 until the final treatment reports are complete and collections are curated. If materials are collected on private lands, all such material will be returned to their owners after analysis is complete, unless the owners agree to donate the materials to the NSM. As to materials collected on Proponent-owned lands, the Proponent agrees to work with the Tribes to transfer ownership of materials of importance to the Tribes.

6. Discoveries or Unanticipated Effects Situations: These Treatment Plans and reports are subject to the timelines outlined in Stipulation I.

## **L. MONITORING AND OBSERVING**

1. BLM may require monitoring during any Undertaking involving initial surface-disturbance, or during any Undertaking activity within an APE that involves areas previously identified through consultation with the SHPO and/or the Tribes to contain Historic Properties, unevaluated Cultural Resource(s), or other areas considered sensitive by BLM. Monitoring will be conducted by a CRM Contractor and may include a representative of the Tribes. BLM may require Tribal monitoring in any Eligible TCP or PCRI. The BLM will consult with the Tribes regarding desired monitoring in other areas within an Undertaking's APE. Tribal monitoring, if required, shall be conducted in accordance with Appendix D. Tribal Monitors will be invited to be present during Class III inventories, during Undertaking-related construction activities (i.e., new surface disturbance) and during any data recovery (i.e., archaeological excavation) within an Undertaking's APE.

2. All Treatment Plans drafted for an Undertaking within the AOI will include provisions for monitoring in accordance with this PA and its appendices.

3. The Parties may, at their own expense, observe any actions carried out to comply with this PA at any time. To the extent practicable, every effort will be made to minimize the number of observers involved. Depending on the activity or area being observed, the observers may be required to attend mandatory safety training prior to entering an active mine or exploration area.

## **M. DISPUTE RESOLUTION**

1. If any Signatory, the Proponent, or Tribe signing this PA disagrees regarding Eligibility, the BLM shall notify all Signatories of the dispute and consult with the SHPO. If the dispute cannot be resolved, the BLM shall seek a formal determination of Eligibility from the Keeper of the National Register under 36 CFR §63.4. The Keeper's determination will be final in accordance with 36 CFR § 63.4.

2. Should any of the Signatories or the Proponent to this PA object at any time to any actions proposed or the manner in which the terms of this PA are implemented, BLM shall consult with such Party to resolve the objection. If BLM determines that such objection cannot be resolved, BLM will:

a. Forward all documentation relevant to the dispute, including the BLM's proposed resolution, to the ACHP. The ACHP shall provide BLM with its advice on the resolution of the objection within thirty (30) calendar days of receiving adequate documentation. Prior to reaching a final decision on the dispute, BLM shall prepare a written response that takes into account any timely advice or comments regarding the dispute from the ACHP, the Signatories, and the Proponent, and provide them with a copy of this written response. BLM will then proceed according to its final decision.

b. If the ACHP does not provide its advice regarding the dispute within the thirty (30) calendar day time period, BLM may make a final decision on the dispute and proceed accordingly. Prior to reaching such a final decision, BLM shall prepare a written response that takes into account any timely comments regarding the dispute from the Signatories, the Proponent, and the SHPO, and provide them and the ACHP with a copy of such written response.

3. At any time during implementation of the terms of this PA, should an objection pertaining to the PA be raised by a Tribe or a member of the interested public, the BLM shall immediately notify all Parties, consult with the objector and the Signatories, the Proponent, the Tribes, and the SHPO about the objection, and take the objection into account. The other Tribe may comment on the objection to the BLM. The BLM shall consult with the objecting Tribe or person for no more than thirty (30)

calendar days. Within fourteen (14) calendar days following closure of consultation, the BLM will render a final decision regarding the objection and proceed accordingly after notifying all the objecting Tribe or person and the Parties of its decision in writing. In reaching its final decision, the BLM will take into account comments from the objecting Tribe or person and the Parties regarding the objection.

4. BLM's responsibility to carry out all other actions subject to the terms of this PA that are not the subject of the dispute remains unchanged.

#### **N. AMENDMENT**

1. This PA may be amended only upon written agreement of the Signatories and the Invited Signatory.

2. Upon receipt of a request to amend this PA from any Signatory or Invited Signatory, the BLM will immediately notify the Parties and Tribes, then initiate a thirty (30) calendar day period to consult on the proposed amendment, whereupon all Parties shall consult to consider such amendments.

3. An amendment to this PA shall take effect on the date that they are fully executed by the Signatories and the Invited Signatory.

#### **O. TERMINATION**

1. If any Signatory or Invited Signatory to this PA determines that its terms will not or cannot be carried out, that party shall immediately consult with the other Parties to attempt to develop an amendment per Stipulation N, above. If, within sixty (60) calendar days or another time period as agreed upon by the Signatories, an amendment cannot be reached the following termination procedures apply:

a. Any Signatory or Invited Signatory may terminate the PA upon written notification to the other Signatories and Invited Signatory.

If the PA is terminated prior to work completion on any Undertaking subject to the terms of this PA, the BLM shall either (a) execute another PA pursuant to 36 CFR § 800.14(b), or (b) comply with the process set forth in 36 CFR § 800 for each individual Undertaking. The BLM may implement relevant portions of the Protocol in the Section 106 review for Undertakings that culminate in No Effect or No Adverse Effect determinations. In those cases, the Protocol shall govern BLM-SHPO interactions, but BLM shall ensure the consultation requirements of 36 CFR § 800.4-800.5 are met for other Parties.

#### **P. DURATION**

The PA shall become effective on the date of the last Signatories' signature below (Effective Date), and shall remain in effect for thirty (30) years from the Effective Date. The BLM shall propose a meeting of the Parties every five (5) years to review the PA.

#### **Q. SURETY BONDS**

1. The Proponent will post a surety bond with the BLM in an amount sufficient to cover reasonable curation and post-fieldwork costs associated with implementing an Undertaking-specific Treatment Plan, or other mitigation activity.

2. The bond posted shall be subject to forfeiture if post-fieldwork tasks are not completed



within time periods established by the Treatment Plan, provided, however, that BLM and the Proponent may agree at any time to extend any such time periods, and provided that failure to complete tasks is not due to delay caused by Parties other than the Proponent. The BLM shall consider a request by the Proponent for a reasonable extension of such time periods. The BLM shall notify the Proponent that the bond is subject to forfeiture and shall allow the Proponent forty five (45) calendar days to take corrective action before the BLM acts to forfeit the bond.

3. The bond shall be released in whole or part as specified curation and post-fieldwork tasks are completed and accepted by the BLM.

**R. NATURE OF OPERATOR CONTRACTUAL OBLIGATIONS.**

The contractual obligations of the Proponent created by this PA are enforceable only by the BLM against the Proponent. This PA creates no contractual right or obligation between the Proponent and any other person or entity, including any other Signatory (other than the BLM against Proponent), any Tribe, or member of the public. Nothing herein shall limit any person's or entity's rights under the NHPA or the Administrative Procedure Act.

**S. THE PROPONENT'S RESERVATION OF RIGHTS; NO WAIVER**

Nothing in this PA shall waive or otherwise limit any administrative or judicial remedy or right of review available to the Proponent under applicable law or regulation. By agreeing to this PA, the Proponent does not waive any right to challenge any BLM decision under relevant law.

**T. TERMINATION OF EXISTING AND PRIOR PROGRAMMATIC AGREEMENT**

1. Upon execution of this PA by all of the Signatories and the Proponent, the existing Programmatic Agreement entitled, "Programmatic Agreement Among the Bureau of Land Management, Battle Mountain and Elko Field Offices, The Nevada State Historic Preservation Office and Cortez Joint Venture dba Cortez Gold Mines Regarding the Treatment of Historic properties During Cortez Gold Mines Mineral Exploration and Development in Eureka and Lander Counties, Nevada" (2005), as amended, shall terminate and have no further force or effect.

2. The execution of this PA constitutes completion of the thirty (30) calendar days' notice and consultation necessary to satisfy the termination requirements of the existing Programmatic Agreement entitled, "Programmatic Agreement Among the Bureau of Land Management, Battle Mountain and Elko Field Offices, The Nevada State Historic Preservation Office and Cortez Joint Venture dba Cortez Gold Mines Regarding the Treatment of Historic properties During Cortez Gold Mines Mineral Exploration and Development in Eureka and Lander Counties, Nevada" (2005), as amended.

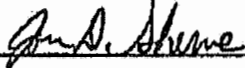
**U. EXECUTION OF THIS PA**

Execution of this PA by the BLM and Signatories and implementation of its terms shall evidence that the BLM has taken into account the effects of this Undertaking on Historic Properties and afforded the ACHP an opportunity to comment.

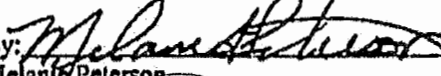
IN WITNESS WHEREOF, the Parties have executed this PA on the dates set forth below, to be effective as of the Effective Date.

SIGNATORIES:

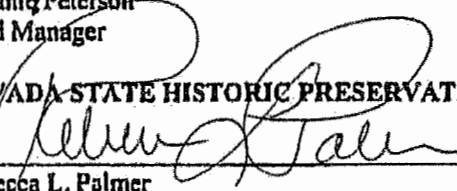
BUREAU OF LAND MANAGEMENT, MOUNT LEWIS FIELD OFFICE

By:  Date: 09/06/2018  
Jon Stierve  
Field Manager

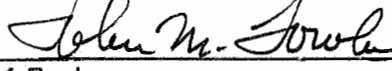
BUREAU OF LAND MANAGEMENT, TUSCARORA FIELD OFFICE

By:  Date: 9/19/18  
Melanie Peterson  
Field Manager

NEVADA STATE HISTORIC PRESERVATION OFFICER


By:  Date: 9/21/18  
Rebecca L. Palmer  
State Historic Preservation Officer

ADVISORY COUNCIL ON HISTORIC PRESERVATION

By:  Date: 8/28/18  
John M. Fowler  
Executive Director

INVITED SIGNATORY:

BARRICK CORTEZ, INC

By:  Date: 09/19/18  
William MacNevin  
President and Chief Executive Officer

INDIAN TRIBES:

TE-MOAK TRIBE OF THE WESTERN SHOSHONE

By: \_\_\_\_\_ Date: \_\_\_\_\_  
Lydia Johnson  
Tribal Chair

YOMBA SHOSHONE TRIBE

By: \_\_\_\_\_ Date: \_\_\_\_\_  
James Birchim Sr.  
Tribal Chair

DUCKWATER SHOSHONE TRIBE

By: Rodney Mike Date: 10/29/2018  
Rodney Mike  
Tribal Chair

ELY SHOSHONE TRIBE

By: \_\_\_\_\_ Date: \_\_\_\_\_  
Victor MacQueen  
Tribal Chair

SHOSHONE-PAIUTE TRIBES OF DUCK VALLEY

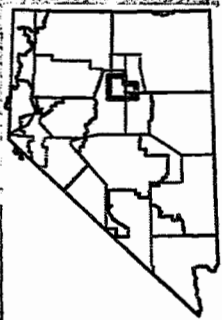
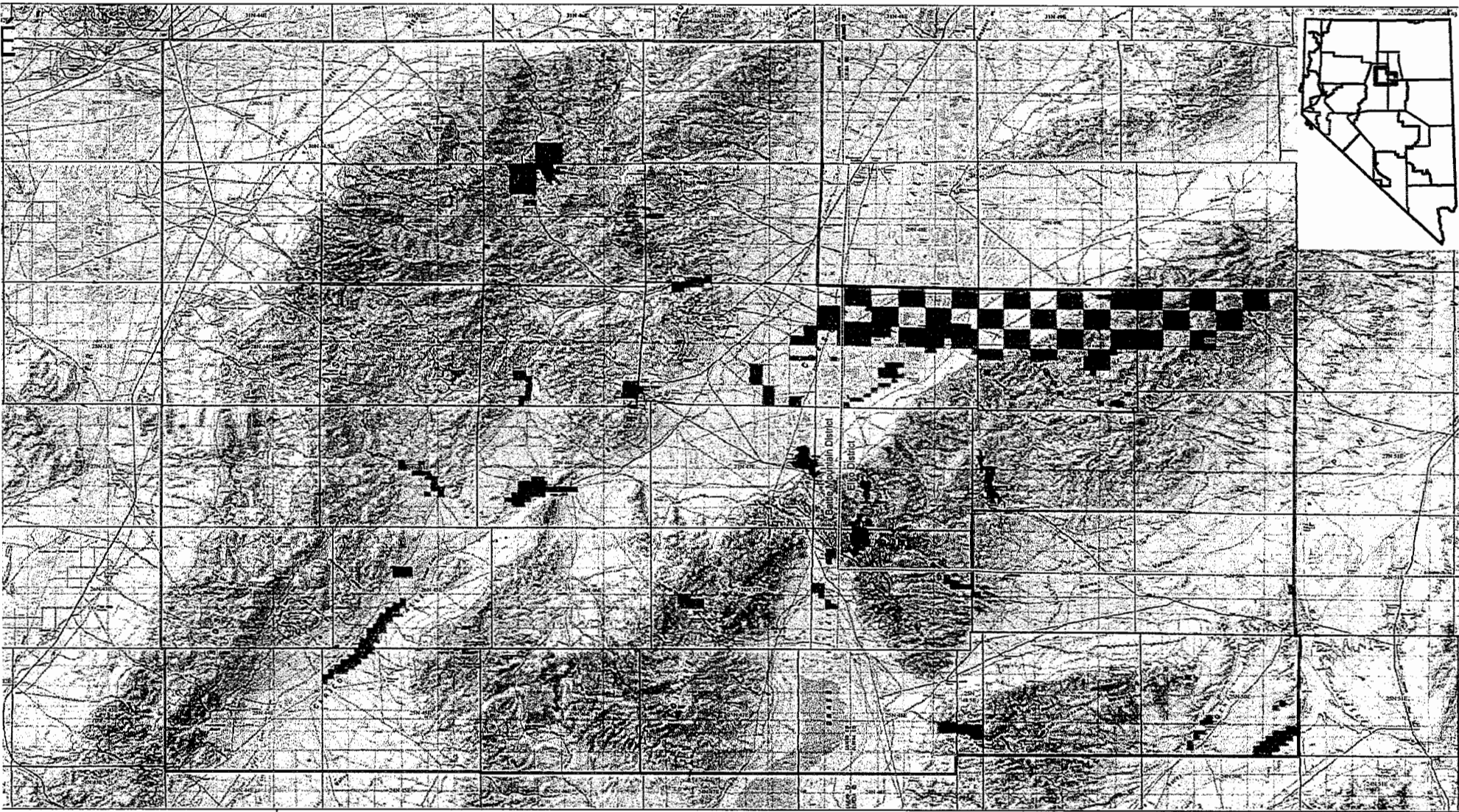
By: \_\_\_\_\_ Date: \_\_\_\_\_  
Theodore Howard  
Tribal Chair

## APPENDIX A: AREA OF IMPLEMENTATION (AOI)

Map of area covered by this Programmatic Agreement.

Includes all or portions of Township 25N, Ranges 44E, 45E, 46E, 47E, 48E, 48.5E, 49E, and 50E; Township 26N, Ranges 44E, 45E, 46E, 47E, 48E, 49E, and 50E; Township 27N, Ranges 44E, 45E, 46E, 47E, 48E, 49E, and 50E; Township 28N, Ranges 44E, 45E, 46E, 47E, 48E, 49E, and 50E; Township 29N, Ranges 44E, 44.5E, 45E, 46E, and 47E; and Township 30N, Ranges 44E, 44.5E, 45E, 46E, and 47E

Note: Shapefile available to BLM personnel at \\blm\dfs\nv\bm\pub\Cultural\Programmatic Agreements\Barrick Cortez

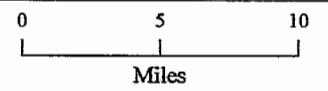


Provisional Map - This map was not prepared from a field survey and should not be relied on as a representation of legal land descriptions. Information on this map may not be complete or up to date and its accuracy not to be relied upon. This map is intended only as a general representation of land status and is for Barrick's use only.

Legend

- Programmatic Agreement Boundary
- BLM District Boundaries
- Barrick Private Lands
- Township

Barrick Cortez  
Programmatic Agreement  
Area of Interest



Map of Colorado Public Lands Administration, August 2014

## APPENDIX B: PA – SPECIFIC DEFINITIONS

*ACHP.* Advisory Council on Historic Preservation. Signatory to this PA.

*Adverse Effect.* Defined at 36 CFR § 800.5(a)(1), when an activity or Undertaking alters, directly or indirectly, any of the characteristics of a Historic Property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association.

*Area of Implementation (AOI).* The geographic area where this PA applies, described in Appendix A.

*Areas of Potential Effect (APEs).* The total geographic area or areas within which an Undertaking may directly or indirectly cause alterations in the character or use of Historic Properties, if any such properties exist (36 CFR § 800.16(d)).

*ARPA.* The Archaeological Resources Protection Act of 1979, 16 U.S.C. § 470aa et seq.

*Avoidance Buffer Zone.* Implementation can prevent a potential Adverse Effect to a Historic Property from occurring by partial or complete relocation of a proposed land use outside of the immediate area of the Historic Property. The default Avoidance Buffer Zone is thirty (30) meters, but the BLM may, on a case-by-case basis, agree to a smaller Avoidance Buffer Zone where appropriate based on the nature of the Historic Property and/or the nature of the proposed land use.

*BLM or BLM Agency Official.* The Bureau of Land Management, Mount Lewis and Tuscarora Field Offices are Signatories to this PA. The Mount Lewis Field Office Manager of the Battle Mountain District is the Agency Official who is responsible for administering this PA and ensuring all of its stipulations are carried out.

*BLM Guidelines or BLM Nevada's Guidelines.* The Nevada BLM Cultural Resources Inventory General Guidelines governing archaeological inventory (Guidelines and Standards for Archaeological Inventory, 5<sup>th</sup> edition, 2012) and the Guidelines governing architectural inventory (Guidelines for Recording and Reporting Architectural Resources in Nevada, November 2014).

*Class III Inventory.* A professionally conducted intensive field survey; a continuous, intensive survey of an entire target area, aimed at locating and recording all archaeological properties that have surface indications, by walking close-interval parallel transects spaced at 30 meters or less until the area has been thoroughly examined.

*Cultural Resource Information Form (CRIF).* A Section 106 planning document that establishes the Direct and Indirect Effects APEs, provides a summary of the known Cultural Resources present within the APEs, determines inventory needs, and lists the tribes and interested individuals to be consulted for specific Undertakings; BLM-SHPO concurrence is established for these processes upon agreement of the CRIF contents by both parties.

*CRM Contractor.* The BLM's or the Proponent's third party cultural resources management contractor that meets the Secretary of Interior's Qualifications Standards and whom performs Section 106 compliance work hereunder.

*Criteria or Criterion.* Requirements a Cultural Resource must meet to be eligible for inclusion in the National Register of Historic Places, as defined in 36 CFR § 800.16(r).

*Cultural Resource.* A definite location of human activity, occupation, or use identifiable through field inventory, historical documentation, or oral evidence. The term includes archeological, historic, or architectural sites, structures, or places with important public or scientific uses, and may include definite locations (sites or places) of traditional cultural or religious importance to specified social and/or cultural groups. Cultural Resources are concrete, material places and things that are located, classified, ranked and managed through a system of identification and protection set forth in the BLM Manual 8100 series. A Cultural Resource may or may not be Eligible for the National Register of Historic Places.

*Cumulative Effects.* Effects on the environment which result from the incremental effect of an action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes the actions. For the purposes of this PA, the APE for Cumulative Effects is the same as that for Direct and Indirect Effects.

*Direct Effects.* Those locations undergoing any exploration and development from such Undertaking within the AOI that are subject to surface disturbance.

*Effective Date.* Date of the last Signatories' signature which is the day this PA became effective.

*Eligible or Eligibility.* A Cultural Resource that meets the Criteria for listing on the NRHP.

*Evaluation Plan.* A plan for testing the data potential of a Cultural Resource to make a properly informed decision about a site's Eligibility to the NRHP.

*Exploration Plan.* A plan of operations submitted to the BLM under 43 CFR § 3809.400 for exploration activity that involves more than five (5) acres of surface disturbance.

*Exploration Project.* Surface exploration for minerals and associated infrastructure described in an Exploration Plan. This type of project includes a phased plan of exploration, including initial exploration on small scattered parcels to identify targets, followed by closer-spaced drilling to explore identified targets or to delineate mineral resources and ore bodies, along with drilling or other studies to establish baseline and underground conditions in preparation of a Mine Plan of operations. Facilities associated with an exploration plan of operations may include multiple drilling pads and sumps, access roads or overland travel, growth media stockpiles, pumps, water source, water tank, generators, laydown areas and portable sanitary facilities, sumps, light plants, communication towers, fuel skid, office trailers and storage areas.

*Historic Property.* Cultural resource Eligible for listing or listed in the NRHP, as defined in 36 CFR § 800.16(l)(1).



*Indirect Effects.* Those locations within the AOI deemed potentially affected by visual, vibrational, auditory, and atmospheric effects of such Undertaking.

*Invited Signatory.* In accordance with 36 CFR § 800.6(c)(2), a party that, upon signing, has obligations under a programmatic agreement and the authority to amend and terminate a programmatic agreement. The Proponent is the Invited Signatory to this PA.

*Keeper.* The Keeper of the National Register of Historic Places, as defined in 36 CFR § 60.3(f).

*Mine Plan.* A plan of operations submitted to the BLM under 43 CFR § 3809.400 et seq. for mining operations.

*Mining Project.* Open pit or underground mining and associated infrastructure associated with a Mine Plan. This type of project may include continued use of, proposed construction of, and/or expansion of an underground or open pit mine, which may include a new open pit or underground portal, shaft, ramp or raise, or expansion of such existing facilities, and expansion of ore stockpiles, heap leach and waste rock storage facilities, access roads and other ancillary facilities directly related to the mining and processing of ore from a mine expansion.

*NAGPRA.* The Native America Graves Protection and Repatriation Act of 1979, 25 U.S.C. § 3001 et seq.

*National Register of Historic Places (NRHP).* As defined in 36 CFR 60.

*NHPA.* The National Historic Preservation Act, 54 U.S.C. § 300101 et seq.

*No Adverse Effect.* Defined at 36 CFR § 800.5(b), when the Undertaking's effects do not meet the criteria of Adverse Effect, or the Undertaking is modified or conditions are imposed to avoid Adverse Effects.

*No Effect.* When an activity or Undertaking does not alter, directly or indirectly, any of the characteristics of a Historic Property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association.

*Notice to Proceed (NTP).* Communication issued by the BLM to confirm that requirements of an existing BLM authorization have been met and work may proceed under such existing authorization.

*Party or Parties.* Includes Signatories, the Invited Signatory (Proponent), and the Tribes.

*Property of Cultural and Religious Importance (PCRI).* For the purpose of this PA, the NRHP Eligible component(s) of a TCP that contains both Eligible and ineligible or unevaluated components. Specifically, this currently applies to the Mount Tenabo/White Cliffs and Horse Canyon PCRI as described in BLM Report 6-2352-1.

*Proponent.* The owner and operator of Mining, Support and Exploration Projects (Undertakings) in the AOI. Invited Signatory to this PA.

*Protected Information.* Specific locations, descriptions, and data protected by law about Cultural Resources, Historic Properties, PCRIs, and TCPs.

*Protocol.* The most current signed State Protocol Agreement between the BLM and the SHPO, and any associated guidelines and stipulations.

*Section 106.* Section 106 of the NHPA, codified as 54 U.S.C. § 306108.

*SHPO.* Nevada State Historic Preservation Officer. Signatory to this PA.

*Signatory.* In accordance with 36 CFR § 800.6(c)(1), a Signatory has the authority to execute, amend, or terminate the agreement. The BLM, the SHPO, and the ACHP are Signatories to this PA.

*Support Project.* Construction of any facility that is not associated with a specific Mine or Exploration Plan and may serve one or more facilities in the AOI, including access roads, transmission lines, pipelines, water management facilities, surface-disturbing baseline studies and other support facilities and activities.

*Traditional Cultural Property (TCP).* A particular kind of Cultural Resource as described in National Register Bulletin 38. Specifically, TCPs are Cultural Resources that are potentially considered Eligible for inclusion in the NRHP because of their association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community.

*Treatment Plan.* Provides a proposal for the mitigation of effects upon any Historic Property that an Undertaking would cause adversely affect. It can include a data recovery, documentation, restoration, or other measures.

*Tribal Monitor.* Individual tribal members designated by Tribal Governments in accordance with Appendix D who aid the CRM Contractor(s) in the monitoring of Historic Properties and PCRIs within an APE.

*Tribe(s); Tribal.* Federally recognized Indian Tribes who may attach religious and cultural significance to Historic Properties within the AOI, including the Te-Moak Tribe of Western Shoshone Indians, the Yomba Shoshone Tribe, the Duckwater Shoshone Tribe of the Duckwater Reservation, the Ely Shoshone Tribe, and Shoshone-Paiute Tribe of the Duck Valley Reservation.

*Undertaking.* A project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency, including those carried out on behalf of a Federal agency; those carried out with Federal financial assistance; and those requiring a Federal permit, equipment, license or approval. Undertakings are considered as a whole for Section 106 purposes, including

decisions pertaining to inventory requirements, determinations of Eligibility, and effect determinations. In this PA, Undertaking(s) include Mining Projects, Exploration Projects, and Support Projects within the AOI.

**APPENDIX C: PROPONENT OFFICIALS AUTHORIZED TO STOP WORK IN THE EVENT  
OF DISCOVERY**

Personnel listed in order of who should be contacted first:

1. Environmental Manager – (775) 468-4078
2. Environmental, Health, & Safety Manager – (775) 468-4407
3. Environmental On-Call – (775) 397-8639
4. General Manager of Operations – (775) 468-4454

#### APPENDIX D: TRIBAL MONITOR PROVISIONS

For all Undertakings subject to this PA, Tribal Monitors may be required by BLM during construction (for previously undisturbed land only), Class III Inventory, and/or in-field treatment of Historic Properties. If the BLM requires Tribal Monitors for any specific Undertaking under this PA, the Proponent shall bear the expense of Tribal Monitors and the following provisions shall apply:

1. *Tribal Monitors.* Tribal Monitors shall be required (a) within an existing Eligible TCP or PCRI; (b) upon initial surface disturbance; (c) for initial Class III inventories in areas where a previous Class III Inventory has not yet been performed; and (d) during data recovery. After inventories and initial surface disturbance have been completed, Tribal Monitors will not be required during the conduct of exploration drilling, mining, maintenance, or ongoing operations. Tribal Monitors are not required for new surface disturbance on previously disturbed and reclaimed areas, or in areas where a Class III Inventory (that has been accompanied by a Tribal Monitor) confirms there are no Historic Properties or unevaluated Cultural Resources.
2. *Availability of Tribal Monitors.* The BLM has delegated the task of securing a Tribal Monitor to the Proponent. The Proponent will make a good faith attempt to schedule Tribal Monitors with at least two (2) calendar days prior notice. As noted in Section 1 above, Tribal Monitors will be invited to participate during Class III inventories, during Project-related construction activities (i.e., new surface disturbance) and during any data recovery (i.e., archaeological excavation) within an APE. Notwithstanding the requirements of Section 1 of this Appendix D, work may proceed and shall not be delayed based on a lack of response or unavailability of Tribal Monitors.
3. *No Authority to Halt Approved Proponent Activity.* While Tribal Monitors do not have the authority to halt construction activities, if a Tribal Monitor notes that an activity may affect a Cultural Resource of importance to the Tribe(s) during construction, the Tribal Monitor shall inform the Proponent Official authorized to stop work and the designated BLM representative, as well as the CRM Contractor if present.

## APPENDIX E: AVOIDANCE PROCEDURES

If the BLM requires that Historic Properties be avoided during the Proponent's execution of a BLM approved exploration plan through implementation of an Avoidance Buffer Zone, the Proponent will implement the following internal procedures:

### A. Procedure in areas that have not been subject to a Class III Inventory:

1. Proponent shall delineate proposed drill locations on a map, taking into account topography to ensure minimal surface disturbance. Proponent will then send a crew to stake and flag the proposed drill locations and access routes.
2. Upon completion of flagging, Proponent will arrange for a CRM Contractor to conduct the inventory or fieldwork required by the BLM of the proposed exploration areas. The CRM Contractor will obtain a Fieldwork Authorization from the BLM.
3. After the required inventory or fieldwork has been completed, the CRM Contractor will submit an inventory report to the BLM, which will be reviewed and consultation conducted according to Stipulation K. A copy of this report will be provided to the Proponent for the purposes of avoiding activities near Eligible Historic Properties or unevaluated Cultural Resources.
4. If the BLM archaeologist determines in the course of the inventory or fieldwork that Historic Properties or unevaluated Cultural Resources may be impacted, then the Proponent, in consultation with the BLM, shall move the proposed drill location or access road to avoid such Historic Properties or unevaluated Cultural Resources. A Tribal Monitor will be required during such inventory, pursuant to Appendix D.
5. If necessary based on the completed inventory and fieldwork, a revised annual exploration plan showing any adjusted drilling and access locations to ensure avoidance will then be submitted to the BLM for approval.
6. Once BLM approves the workplan, Proponent will complete its internal Environmental Impact Request (EIR) approval process described in Section B of this Appendix E, review the staked disturbance with the earth moving contractor and ensure the contractor has the approved EIR and attendant maps in possession during earth moving activities.
7. Proponent shall mark all Avoidance Buffer Zones with blue flagging signaling a no-disturbance area.
8. If the exploration activity is proposed to take place within an existing PCRI or Eligible TCP, then a Tribal Monitor shall be required during initial surface disturbance, pursuant to Appendix D, to monitor for effects to elements and resources that contribute to the Eligible TCP or PCRI's Eligibility for the National Register.

9. At the conclusion of activities (including reclamation), the field survey crew will perform an as-built survey to confirm compliance with the Avoidance Procedures and remove the blue flagging used to mark any Avoidance Buffer Zones around Historic Properties.

B. Procedure in Areas Covered by Existing Class III Inventories:

1. Proposed drill holes are outlined on a map by the appropriate Proponent Project Manager. The Proponent Project Manager completes the Proponent internal procedure called an EIR form and submits to Proponent Environmental for review against existing Proponent knowledge of Class III Inventories. If that review confirms the area has been subject to a current Class III Inventory, Proponent Environmental then approves land surveying the proposed drill locations and access routes.

2. The Proponent Project Manager then assigns a field surveying crew to stake drill locations and flag proposed access routes included in an annual exploration workplan. Construction conditions are taken into consideration during this non-surface disturbing land survey to ensure the least amount of disturbance and optimal equipment access.

3. The flagged access routes and drill locations will be field-inspected by Proponent's Project Manager, Drilling Supervisor and Environmental Manager/Supervisor/Staff to ensure that the proposed disturbance is properly located and that all identified Historic Properties are avoided by at least thirty (30) meters, unless a smaller Avoidance Buffer Zone is approved by the BLM on a case-by-case basis.

4. After the specific drill location and access route has been identified as avoiding all identified Eligible Historic Properties, Proponent Environmental and Land Departments will approve the EIR form to allow exploration activity to commence. The approved EIR form is reviewed with the earth moving contractor and must be in that contractor's possession during road and drill pad construction activities.

5. Avoidance Buffer Zones (standard thirty (30) meters, but can be reduced by the BLM on a case-by-case basis) must be clearly marked with blue flagging signaling a no-disturbance area. Proponent shall ensure that flagging remains in place throughout exploration activities at each exploration location.

6. If the exploration activity is proposed to take place within an existing PCRI or Eligible TCP, then a Tribal Monitor shall be required during initial surface disturbance, pursuant to Appendix D, to monitor for effects to elements and resources that contribute to the Eligible TCP or PCRI's Eligibility for the NRHP.

7. At the conclusion of activities (including reclamation), the land survey crew will prepare an as-built survey to confirm compliance with these Avoidance Procedures for Exploration and remove the blue flagging used to mark any Avoidance Buffer Zones around known Historic Properties.

All Proponent employees and contractors involved in mineral exploration shall be reminded that if there is any doubt or uncertainty about the Avoidance Buffer Zone near a proposed disturbance, that no disturbance should be initiated until the status is confirmed by the Proponent and the CRM Contractor.



**APPENDIX F: NON-EXCLUSIVE EXAMPLES OF PROJECTS  
THAT MAY BE PROPOSED BY PROPONENT**

Undertakings that may be proposed by the Proponent include, but are not limited to the following:

1. MINING PROJECTS:

- a. Open pit mine under a new Mine Plan of operations, including, but not limited to, one or more open pits, waste rock storage facilities, gravel pits, heap leach facilities, tailings facility, wells, ore stockpiles, growth media stockpiles, ponds, access roads, haul roads, water management facilities and pipelines, rapid infiltration basins, water treatment facilities, reservoir, water tanks, truck shop, warehouse, laboratory, wash bay, fuel facilities, septic system, and administrative offices, security building, power distribution lines, solid waste landfill, hazardous waste storage area, communication towers, rock crushers, blasting magazine, core cutting and storage building, propane tanks, conveyor systems, and other ancillary facilities directly related to the mining and processing of ore from open pits.
- b. Underground mine under a new Mine Plan of operations, including, but not limited to, one or more underground portals, shafts, ramps or raises, escape and ventilation raises with fans, propane tanks, ore stockpiles, waste rock management facilities, heap leach facilities, growth media stockpiles, metals removal plant, septic system, parking and ready-line, access roads, haul roads, water management facilities and pipelines, rapid infiltration basins, wells, water treatment facilities, water tanks, ponds, tanks, fueling facilities, solid liquid separation plant, backfill plant, laboratory, propane tanks, core cutting and storage building, septic system, truck shop and administrative offices, power distribution lines, conveyor systems, and other ancillary facilities directly related to the mining and processing of ore from an underground mine.
- c. A combined open pit and underground mine under a new Mine Plan of operations, including the facilities named above.
- d. Expansion of an existing underground or open pit mine, which may include a new open pit or underground portal, shaft, ramp or raise, or expansion of such existing facilities, and expansion of ore stockpiles, heap leach and waste rock storage facilities, access roads and other ancillary facilities directly related to the mining and processing of ore from a mine expansion.
- e. Ore processing mill, rock crusher and conveying system, ore stockpiles, process ponds, a roaster, autoclaves, a vat leach processing facility, froth floatation, a carbon in column

leaching facility and/or other processing infrastructure, generally contained in a mill building, refinery, and associated event ponds and other infrastructure.

2. EXPLORATION PROJECTS:

- a. Exploration under a new Exploration Plan of operations, which may include a phased plan of exploration, including initial exploration on small scattered parcels to identify targets, followed by closer-spaced drilling to explore identified targets or to delineate mineral resources and ore bodies, along with drilling or other studies to establish baseline and underground conditions in preparation of a Mine Plan of operations. Facilities associated with an Exploration Plan of operations include multiple drilling pads and sumps, access roads or overland travel (depending on topography and resource constraints), growth media stockpiles, pumps, water source, water tank, generators, laydown areas and portable sanitary facilities, sumps, light plants, communication towers, fuel skid, office trailers and storage areas.
- b. Expansion or additional drilling of an existing Exploration Plan of operations, including additional drilling acreage and access.

3. SUPPORT FACILITIES:

This category of project would include any facility that is not associated with a specific mine or exploration plan of operations and may serve one or more facilities in the AOI. Such projects could include:

- a. Significant new maintenance of area access roads, power or distribution lines and other infrastructure that requires a new authorization by the BLM and that serves more than one facility and/or the public.
- b. Construction by the Proponent of new infrastructure that requires a new authorization by the BLM and that serves more than one facility and/or the public.
- c. Mitigation or conservation efforts, whether voluntary or required, that requires a new authorization by the BLM.

## APPENDIX G: EXEMPTED UNDERTAKINGS

1. Issuing permits, rights-of-way, or NEPA decisions where no new surface disturbance is authorized, such as power line/transmission line ROW renewals, communication site ROW renewals, road ROW renewals, pipeline ROW renewals, aerial seedings, and the reintroduction of native or endemic species.
2. Maintaining, replacing or modifying existing projects, facilities, routes, or programs that do not disturb additional surface area, or Historic Properties; or where the ground has been previously disturbed to the extent that Historic Properties could not exist; or where the facility itself is not a Historic Property.
3. Conducting, or approving permits for, non-archaeological data collection and monitoring activities, not associated with proposed Undertakings, which involve new surface disturbance less than 1 square meter. Such activities could include forage trend monitoring, stream gauges, weather gauges, research geophysical sensors, photo plots, traffic counters, animal traps, or other similar devices. The “less than 1 square meter” threshold is not cumulative for any given project; therefore multiple sub-meter disturbance zones up to a maximum of 25 may be exempted if they meet the other conditions of this exemption.
4. Assigning land use authorization where the assignment conveys no additional rights and the assignee agrees to abide by any Cultural Resource stipulations in the original authorization.
5. Installing facilities, such as recreational, special designation, regulatory, or information signs, visitor registers, kiosks, cattle guards, gates, temporary corrals, or portable sanitation devices in previously disturbed areas outside of known Historic Properties.
6. Issuing or modifying regulations, orders, standards, notices, and field rules where no new surface disturbance is authorized or is not subject to NHPA review.
7. Decisions and enforcement actions (that do not involve Cultural Resources) to ensure compliance with laws, regulations, orders, lease stipulations, and all other requirements imposed as conditions of approval, when the original approval was subject to the NHPA Section 106 process.
8. Existing range improvement projects such as spring boxes, pipelines, fences, and water troughs that cannot be assigned an original construction date suggesting that the features are at least 50 years in age, or lack integrity due to recent (post-1970) changes in character from continued maintenance activities, and where no new surface disturbance is proposed outside of the boundaries of the previously disturbed areas.
9. Approval of modifications to, or variances from, activities authorized in an approved mine or exploration plan of operations that do not involve additional surface disturbance.

## **Appendix G: Impact Definitions**

Resource or Supplemental Authority	Intensity				Duration				Context	
	Negligible	Minor	Moderate	Major	Temporary	Short-term	Long-term	Permanent	Localized	Regional
Air Quality	Air emissions impacts would not be measurable.	Air emissions would increase as a result of the Goldrush Mine; however, impacts fall within all applicable air quality standards and would not exceed NAAQS or NVAAQS.	Air emissions would increase as a result of the Goldrush Mine; however, implementation of ACEPMs and/or mitigation measures would reduce impacts to a level that would fall within all applicable air quality standards and would not exceed NAAQS or NVAAQS. If mitigation were required, mitigation would not require careful coordination with local, state, and federal agencies to be effective.	Air emissions would increase significantly as a result of the Goldrush Mine and would exceed applicable NAAQS and NVAAQS regardless of applicant-committed ACEPMs. Mitigation would be required. To be effective, mitigation would have to be carefully coordinated and planned with local, state, and federal agencies if a permit to proceed were to be issued.	Changes in ambient air quality would occur during construction activities (i.e., six months to one year), or during maintenance activities.	Changes in ambient air quality occur during active mining activities (i.e., 24 years).	Changes in ambient air quality would remain during reclamation activities beyond the end of the mining activity.	Changes in ambient air quality would be permanent and would remain after mining and reclamation activities cease.	Impacts would occur within the Goldrush Mine Plan boundary.	Impacts would extend beyond the Goldrush Mine Plan boundary.
Cultural Resources	No Effect		No Adverse Effect	Adverse Effect	Effects would occur during construction activities (i.e., six months to one year), or during maintenance activities.	Effects would last for the duration of the Goldrush Mine.	Effects would last for the duration of the Goldrush Mine.	Effects to cultural resources would be permanent.	Effects would be limited to eligible or unevaluated sites within the area of analysis.	Effects would occur to eligible or unevaluated sites outside of the APE.
Environmental Justice	There would be no identifiable environmental, health, or socioeconomic impacts of the Goldrush Mine or options that would affect minority or low-income communities disproportionately relative to impacts on the total population of the area of analysis.	Environmental, health, or socioeconomic impacts on minority or low-income communities would occur, but impacts would be localized with minimal identifiable differences between impacts on minority or low-income populations compared to impacts on the population at large.	Environmental, health, or socioeconomic impacts on minority or low-income groups would occur, would be readily apparent, and would be measurable, but localized with moderate consequence. The Goldrush Mine would noticeably affect minority and low-income communities more than the total population of the area of analysis.	Environmental, health, or socioeconomic impacts would be predominantly born by minority or low-income communities, and the population at large of the area of analysis would not experience the impacts to a reasonably proportionate degree.	Impacts are anticipated to last no longer than one year during construction and maintenance.	Effects would last for the duration of the Goldrush Mine (i.e., 24 years).	Effects would last beyond the duration of the Goldrush Mine.	Impacts would remain after reclamation is completed.	Effects would occur within the area of analysis	Effects would extend beyond the area of analysis.
Geology and Minerals	Effects to geologic or mineral resources would occur, but they would be so slight as to not be measurable using normal methods.	Effects to geologic or mineral resources would occur, but would be small and just measurable using normal methods.	Effects to geologic or mineral resources would occur and would be readily detectable.	Effects to geologic or mineral resources would occur and would be large, measurable, and easily recognized by a human observer.	Effects would occur during construction activities (i.e., six months to one year), or during maintenance activities.	Effects lasting up to the duration of active mining at the Goldrush Mine (i.e., 24 years).	Effects would last after active mining for the Goldrush Mine is completed.	Effects to geology and minerals would be permanent.	Effects would be limited to within the proposed Goldrush Plan boundary.	Effects would extend beyond the proposed Goldrush Plan boundary.
Bald and Golden Eagles	Eagles would not be affected, or effects would not result in a loss of individuals or habitat. NGM would be in compliance with the BGEPA and its regulations.	Impacts on eagles would be measurable or perceptible and local; however, the overall viability of the population or subpopulation would not be affected and without further adverse effects the population would recover. Impacts on eagles, such as displacement of nests or migratory corridors, would be detectable. NGM would have to comply with the BGEPA and its regulations.	Impacts would be sufficient to cause a change in the population or subpopulation (e.g., abundance, distribution, quantity, or viability); however, the effect would remain local. The change would be measurable and perceptible, but the negative effects could be reversed. NGM would have to comply with the BGEPA and its regulations.	Impacts would be substantial, highly noticeable, and could be permanent in their effect on population or subpopulation survival without active management NGM would have to comply with the BGEPA and its regulations.	Impacts would occur during construction activities (i.e., six months to one year), or during maintenance activities.	Impacts would occur for one year or less for individual or habitat and five years or less for a population.	Impacts would occur for more than one year for individual or habitat and five years or more for a population.	Impacts would last beyond reclamation of the Proposed Action or options.	Effects are confined to a small part of the population, habitat, or range.	Effects would affect a widespread area of suitable habitat or the range of the population or species.
Hazardous Materials and Solid Waste	A negligible spill of hazardous materials or fuels would be one that is quite small, easily and quickly contained, and has no measurable impact on any natural resource. A	A minor spill of hazardous material or fuels would be one that has a measurable impact on soil or water resources but is quickly contained and remediated so that the duration and the	A moderate spill of hazardous material or fuels would be one that has a measurable impact over a large area, or a spill into a water resource. A moderate spill would have residual long-term impacts even after containment and remediation.	A major spill of hazardous material or fuels would be one that has extensive measurable impacts to water resources and requires the involvement of state and federal agencies to assess the impact and	A spill that would occur during construction activities and can be contained and remediated in	A spill that can be contained and remediated in less than one year.	A spill whose impacts to water, soil, or aquatic resources last more than one year.	A spill whose impacts to water, soil, or aquatic resources would be permanent.	A spill impacting an area the size of a small park, a parking lot, or an area	A spill impacting an area greater than 10 acres, or a flowing water

Resource or Supplemental Authority	Intensity			Duration				Context		
	Negligible	Minor	Moderate	Major	Temporary	Short-term	Long-term	Permanent	Localized	Regional
	diesel fuel leak from a hose during refueling would be an example.	extent of the spill are limited and there is no residual impact.		supervise the containment and remediation. This type of spill would have long-term impacts on natural resources and would require state and federal agency oversight for an extended period of time to ensure proper protection of critical resources and habitats. An example would be a large spill of sodium cyanide into a lake or an extensive fuel spill into a river.	less than six months.				consisting of less than 10 acres.	body, or a lake.
Land Use and Realty	Effects to land use, realty actions, and existing established communities would either not occur, or impacts would be so slight as to not be measurable or perceptible. No access restrictions to existing land use authorizations would occur. The Goldrush Mine would not result in any inconsistencies with existing land use plans, goals, and policies, or any inconsistencies could be resolved without modifications to land use plans.	Effects to land use, realty actions, and existing established communities would be measurable and perceptible, but would be small and would not affect the validity of existing land use authorizations, nor the ability to implement future realty or land use authorizations. Access to existing land use authorizations would be maintained. The Goldrush Mine would not result in any inconsistencies with existing land use plans, goals, and policies, or any inconsistencies could be resolved without modifications to land use plans. ACEPMs would effectively minimize impacts to land use and realty.	Effects to land use, realty actions, and existing established communities would be readily apparent and measurable, and they may affect the validity of existing land use authorizations, and the ability to implement future realty or land use authorizations. The Goldrush Mine would conflict with land use plans, goals, and policies, and may require modifications to these plans for conformance. Additional mitigation measures beyond ACEPMs may be required to minimize impacts to land use and realty, but monitoring of these measures likely would determine their effectiveness.	There would be significant conflicts with existing land uses, realty actions, and existing established communities, as well as the ability to implement future realty or land use authorizations. The Goldrush Mine would result in significant conflicts with land use plans, goals, and polices and modifications to these land use plans would be required. Mitigation measures beyond ACEPMs may be required to minimize impacts to lands use and realty, and these measures would have to be monitored and effectiveness is unknown.	Effects would occur during construction activities (i.e., six months to one year), or during maintenance activities.	Effects would last for the duration of active mining at the Goldrush Mine (i.e., 24 years).	Effects would last after active mining for the Goldrush Mine is completed.	Effects to land use or realty actions would be permanent.	Effects on lands uses or realty actions would be limited to the area of analysis (i.e., Goldrush Mine Plan boundary), or to one community.	Effects on land uses or realty actions would extend to multiple communities.
Native American Traditional Values	Impacts would result in a change in current conditions that would be too small to be physically measured using normal methods or would not be perceptible. There is no noticeable effect on the natural or baseline setting.	Impacts would result in a change in current conditions of areas of Native American concern that would be just measurable with normal methods or barely perceptible. While the qualities of individual cultural resources, PCRIs, and TCPs may be affected, they would not be negatively affected to a measurable degree. Resources of concern (i.e., plants, wildlife, water) would not be impacted to a measurable degree.	Some impacts to the current condition of areas of Native American concern would occur that would require some form of mitigation measure to minimize impacts. The qualities of individual cultural resources, PCRIs, and TCPs would be affected to a measurable degree; however, they would still maintain their integrity. Resources of concern (i.e., plants, wildlife, water) would be impacted requiring changes in management or utilization of the resource.	There would be significant impacts to areas of Native American concern. Changes to existing access would occur that would require specific mitigation measures to minimize impacts. The qualities of individual cultural resources, PCRIs, and TCPs would be substantially altered. Resources of concern (i.e., plants, wildlife, water) would be impacted changing the value or productivity of the resource. This impact may not be in compliance with applicable regulatory standards or impact thresholds, requiring large changes in management or utilization of the resource.	Effects would last no longer than one year.	Effects would last for the duration of the Goldrush Mine (24 years).	Effects would last after active mining for the Goldrush Mine is completed.	Impacts are those impacts that would remain after reclamation is completed.	Effects would be limited to prehistoric sites or properties of tribal importance within the area of analysis .	Effects would occur to prehistoric sites or properties of tribal importance outside of the area of analysis.
Noise	Changes in background noise levels from activities associated with the Proposed Action or options would not be perceptible at sensitive receptor sites and	Changes in background noise levels from activities associated with the Proposed Action or options would be perceptible but would not conflict with noise	Changes in background noise levels from activities associated with the Proposed Action or options would be perceptible and may result in elevated noise levels at sensitive receptor sites. Mitigation measures beyond the ACEPMs may be	Changes in noise levels from activities associated with the Proposed Action or options would be readily perceptible within and outside the area of analysis. The Proposed Action	Effects would occur during construction activities (i.e., six months to one year), or during	Effects would last for the duration of the Proposed Action.	Effects would last after active mining for the Goldrush Mine is completed.	Effects would be permanent.	Noise impacts are limited to the area of analysis.	Noise impacts occur within the five-mile radius of the

Resource or Supplemental Authority	Intensity				Duration				Context	
	Negligible	Minor	Moderate	Major	Temporary	Short-term	Long-term	Permanent	Localized	Regional
	would not conflict with noise thresholds set forth in federal, state, or local laws and management plans.	thresholds set forth in federal, state, or local laws and management plans. ACEPMS would minimize impacts to sensitive receptor sites.	required to be in compliance with noise thresholds set forth in federal, state, or local laws and management plans, but they would most likely be effective at reducing noise levels to be within applicable standards.	or options would result in conflicts with existing noise thresholds set forth in federal, state, or local laws and management plans. Mitigation measures beyond ACEPMS may be required to be in compliance with noise thresholds set forth in federal, state, or local laws and management plans, but they would most likely be effective at reducing noise levels to be within applicable standards.	maintenance activities.					area of analysis.
Grazing Management	Effects to livestock grazing would be slight and no reductions to AUMs or change in livestock management would be required.	Effects to livestock grazing would alter the availability of resources that livestock grazing depends on. Small reductions to AUMs may be necessitated. No adjustments to grazing management should be required.	Effects to livestock grazing affect livestock access to limiting resources. Reductions to AUMs are necessary and adjustments to livestock grazing should be considered. Adverse effects would be minimized with implementation of ACEPMS, BMPs, but reclamation would require long-term monitoring and maintenance.	Effects to livestock grazing management occur on a pasture or allotment level. Reductions in AUMs and a significant change in authorized use would be required. Adverse effects may be minimized with implementation of ACEPMS, BMPs, but reclamation would require long-term monitoring and maintenance.	Effects would occur during construction activities (i.e., six months to one year), or during maintenance activities.	Effects would last for the duration of the Goldrush Mine.	Effects would last after active mining for the Goldrush Mine is completed and following reclamation.	Effects on available forage for livestock would be permanent.	Effects would be limited to one allotment.	Effects would occur throughout one or more allotments; multiple lessees may be affected.
Recreation	Recreationists may notice changes to the recreational setting, but proposed activities would not affect their experience. The quality, quantity, and use of recreation areas would not be impacted to a measurable or detectable level. There would be no conflicts with existing federal, state, and local statutes or management plans.	Recreationists may notice changes in recreational setting and the availability of recreational opportunities, and these changes may affect the recreational experience. Effects to the quality, quantity, and use of recreation areas may be measurable and detectable, and displacement of recreationists to areas outside of the area of analysis likely would occur. However, overall access to recreational opportunities, and the ability to find comparable recreation experiences would not be affected. ACEPMS would effectively minimize impacts to recreational uses in the area.	Changes to the recreational setting and availability of recreation opportunities would be measurable and detectable within the area of analysis. Effects to the quality, quantity, and use of recreation areas within the area of analysis would be apparent, and would potentially restrict access to recreational areas, reduce recreational opportunities, and/or reduce the quality of recreational areas. Displacement of recreationists to areas outside of the area of analysis would occur, but it would not affect overall access to recreational opportunities outside of the area of analysis. Mitigation measures beyond ACEPMS may be necessary to offset adverse impacts, but these measures likely would be successful.	Changes to the recreational setting and availability of recreation opportunities would be measurable and detectable within and outside of the area of analysis. Effects to the quality, quantity, and use of recreation areas within and outside of the area of analysis would be apparent. There likely would be restricted access to recreational areas, reduced recreational opportunities, and/or reduced quality of recreational areas. Displacement of recreationists to areas outside of the area of analysis would occur, and it would impact quality and quantity of recreational opportunities outside of the area of analysis. Mitigation measures beyond ACEPMS may be necessary to offset adverse impacts, and these measures would need to be monitored to determine their effectiveness.	Effects would occur during construction activities (i.e., six months to one year), or during maintenance activities.	Effects would last for the duration of the Goldrush Mine.	Effects would last after active mining for the Goldrush Mine is completed.	Effects to recreation would be permanent.	Proposed activities would affect recreational activities and recreationists within the area of analysis.	Proposed activities would affect recreational activities and recreationists outside of the area of analysis to the larger region.
Social and Economic Values	There would be a very small impact on the local and regional economy, population, government revenues and/or expenditures, and on public services and infrastructure demands. The consequences of the action would have little to no measurable impact on the	There would be a small but noticeable impact on the local economy, population, government revenues and/or expenditures, and on public services and infrastructure demands, but there would be minimal to no impact on the regional socioeconomic environment.	There would be a measurable impact on the local and regional economy, population, government revenues and/or expenditures, and on public services and infrastructure demands. Adverse and beneficial impacts would not prove significant enough to result in long-term impacts to the socioeconomic environment.	There would be a substantial impact on the local and/or regional economy, population, government revenues and/or expenditures, and on public services and infrastructure demands. Effects would reverberate throughout the socioeconomic environment, significantly altering existing conditions, in beneficial or adverse ways.	Effects would occur during construction activities (i.e., up to one year), or during occasional maintenance activities in the operations period.	Effects would last for the duration of the Goldrush Mine.	Effects would last after active mining for the proposed Goldrush Mine is completed.	Effects would be permanent.	Effects would occur at a locally focused scale, including Elko, Spring Creek, Battle Mountain, and Carlin.	Effects would occur across a broader area, including all of Elko, Eureka, and Lander counties, or more.



Resource or Supplemental Authority	Intensity				Duration				Context	
	Negligible	Minor	Moderate	Major	Temporary	Short-term	Long-term	Permanent	Localized	Regional
	social or economic environment.									
Soil Resources	Effects to soils would be so slight as to not be measurable.	Effects to soils may occur, and would be detectable, but would be small and of little consequence to soil quality and productivity. Effects would occur within the area of analysis. Effects would be minimized with implementation of ACEPMs, BMPs, and reclamation of the Project.	Effects to soils would occur and would be measurable and would occur over a larger area. Effects to soil quality and productivity may occur. However, effects likely would still occur within the area of analysis. Additional mitigation measures beyond ACEPMs may be required to minimize impacts, but monitoring of these measures likely would determine their effectiveness.	Effects on soils would occur both within and outside of the area of analysis and would be measurable and apparent. Effects to soil quality and productivity likely would occur within and outside of the area of analysis. Mitigation measures beyond ACEPMs may be required to minimize impacts, and these measures would have to be monitored and effectiveness is unknown.	Effects would last only during construction, or a maximum of one year.	Effects would last for the duration of the Project (i.e., 24 years).	Effects would last after active mining ceases until reclamation is complete.	Effects on soil quality and productivity would be permanent.	Affecting only areas within the area of analysis.	Affecting an area beyond the area of analysis.
Transportation and Access	Effects on traffic conditions and access in the area of analysis would either not occur or would be so slight as to not be noticeable by most motorists. No access restrictions on area of analysis roadways would occur. There would not be a perceptible impact from traffic generation on current traffic conditions and roadway and intersection LOS would remain unchanged.	Effects on traffic flows and access would be measurable and may be noticeable to typical motorists but would be small and would not adversely affect traffic conditions. No access restrictions would occur on area of analysis roadways. There would be a measurable or perceptible effect on traffic generation and current conditions; however, traffic volume increases on roadways would be small and would not degrade area of analysis roadway and intersection LOS to an unacceptable level.	Effects on traffic flows and access would be measurable and readily apparent to typical motorists but would not degrade area of analysis roadway and intersection LOS to an unacceptable level. There would be a readily apparent, measurable traffic volume increase on the areas of analysis roadways and intersections that may result in increased traffic accidents. Additional mitigation measures beyond ACEPMs may be required to minimize adverse effects on transportation, but such measures likely would be successful.	Effects on traffic flows and access would be measurable and would be readily apparent to all motorists. There would be a substantial increase traffic volume which would degrade the area of analysis roadway and intersection LOS to an unacceptable level. Mitigation measures beyond ACEPMs may be required to minimize impacts to transportation, and such measures would have to be monitored to determine their effectiveness.	Effects would occur during construction or maintenance activities (i.e., six months to one year), or during maintenance activities.	Effects would last for the duration of the Goldrush Mine (i.e., 24 years).	Effects would last after active mining for the Goldrush Mine is completed.	Effects would be permanent.	Effects would be limited to the area of analysis.	Effects would extend beyond the area of analysis.
Vegetation Resources, Including Noxious Weeds, and Special Status Plant Species	Effects on vegetation would be so small it would not be measurable or perceptible. Plant communities would not be extensively altered and there would be no effect on the biological value or distribution of plant communities.	Effects on vegetation would be detectable, measurable, and perceptible, but would occur within the area of analysis and would not affect the overall biological value or distribution of plant communities. Effects would be minimized with implementation of ACEPMs, BMPs, and reclamation of the Goldrush Mine.	Effects on vegetation would be readily apparent, measurable, large, and of consequence, but would occur within the area of analysis. Effects may occur to the overall biological value or distribution of plant communities. Mitigation beyond the ACEPMs and BMPs may be necessary, but these measures would most likely be effective.	Effects on vegetation would occur and would substantially change the biological value or distribution of plant communities within and outside of the area of analysis. Mitigation beyond the ACEPMs and BMPs may be necessary, but these measures would need to be monitored to determine their effectiveness.	Effects would occur during construction activities (i.e., six months to one year), or during maintenance activities.	Effects would last for the duration of active mining at the Goldrush Mine (i.e., 24 years).	Effects would last from mine closures until 25 years following mine closure (the estimated time for mature shrubs to become re-established in the area of analysis).	Effects on vegetation productivity would be permanent.	Effects occur within the area of analysis.	Effects occur beyond the area of analysis.
Visual Resources	Effects would not result in any perceptible changes to existing viewsheds or the scenic quality of the existing characteristic landscape. Modifications to the scenic quality of the existing landscape would be consistent with VRM class objectives.	Effects would result in changes to the viewshed and the scenic quality of the existing characteristic landscape, but these impacts would not result in a significant degree of contrast with the existing landscape. Modifications to the scenic quality of the existing landscape would be consistent with VRM class objectives. Effects would be minimized with implementation of ACEPMs,	Changes to the viewshed and the scenic quality of the existing characteristic landscape would be readily apparent, which would result in a noticeable degree of contrast with the existing landscape. Visual impacts may not be consistent with VRM class objectives. Mitigation beyond the ACEPMs and BMPs may be necessary, but these measures most likely would be effective.	The Goldrush Mine would result in significant impacts to the viewshed and the scenic quality of the existing characteristic landscape, and it would introduce a strong degree of contrast with the existing landscape. Visual impacts would not be consistent with VRM class objectives. Mitigation beyond the ACEPMs and BMPs may be recommended to reduce adverse impacts, and these measures would need to be	Effects would occur during construction activities (i.e., six months to one year), or during maintenance activities.	Effects would last for the duration of the Goldrush Mine.	Effects would last after active mining for the Goldrush Mine is completed.	Effects to the viewshed would be permanent.	Activities would affect the viewshed within the area of analysis but would not be visible outside of the area of analysis.	Activities would affect the viewshed within the area of analysis, as well as outside of the area of analysis.

Resource or Supplemental Authority	Intensity			Duration				Context		
	Negligible	Minor	Moderate	Major	Temporary	Short-term	Long-term	Permanent	Localized	Regional
		BMPs, and additional mitigation measures.		monitored to determine their effectiveness.						
Water Resources and Geochemistry	Effects to water resources could occur, but they would be so slight as to not be measurable or distinguishable from natural conditions.	Effects to water resources would occur; but would be small and just measurable using normal methods. Effects are unlikely to affect quality, quantity, and beneficial uses of the surface or groundwater resources.	Effects to water resources would occur and would be readily detectable and may affect the quality, quantity, and beneficial uses of the surface or groundwater resources.	Effects to water resources would be large, measurable, and easily detected and would substantially impact the quality, quantity, and change beneficial uses of surface water or groundwater resources, or hydrologic regime over the area of analysis.	Effects would occur during construction activities (i.e., six months to one year), or during maintenance activities.	Effects would last for the duration of active mining at the Goldrush Mine (i.e., 24 years).	Effects would last after active mining for the Goldrush Mine is completed.	Effects to land use or realty actions would be permanent.	Effects would occur at specific site(s) or within the Goldrush Mine Plan boundary.	Effects would extend beyond the Goldrush Mine area throughout the entire area of analysis.
Wetland and Riparian Resources	The wetland and riparian resources within the area of analysis would not be affected, or impacts would not be measurable. Any impacts on the wetland and riparian resources would not be perceivable. Chemical, physical, or biological changes to water quality would not be affected, or impacts would not be measurable and would not affect the health of the aquatic resources. Any effects would be minimized with implementation of ACEPMs, BMPs, and reclamation of the Goldrush Mine.	Impacts on wetland and riparian resources, such as an increase or decrease in surface flow, loss of wetland acres, or changes in wetland vegetation would be slightly detectable. Chemical, physical, or biological changes to water quality would be slightly detectable. Effects would be minimized with implementation of ACEPMs, BMPs, and reclamation of the Goldrush Mine.	Impacts on wetland and riparian resources would result in detectable effects. These changes would not be permanent and the resource would rebound to pre-impact conditions after one season. Chemical, physical, or biological changes to water quality would be detectable, but the desired water quality conditions would only be temporarily degraded. Mitigation beyond the ACEPMs and BMPs may be necessary, but these measures would most likely be effective.	Effects on wetlands and riparian areas would be readily apparent and would substantially change the functional value of the wetland and riparian areas in the context of the Project area or region. Impacts on wetland and riparian resources would result in detectable effects which would likely result in permanent changes and would impact associated resources such as the biotic community, water quality, water availability, and habitat quality. In extreme cases, organisms may be extirpated from the area due to loss of habitat. Chemical, physical, and biological changes to water quality would represent a significant degradation from the historic baseline water quality conditions. Mitigation beyond the ACEPMs and BMPs may be necessary to reduce adverse impacts, and these measures would need to be monitored to determine their effectiveness.	Impacts are those impacts that are anticipated to last no longer than one year.	Impacts are those impacts that are anticipated to begin and end within the first 10 years after the Proposed Action is implemented.	Impacts are those impacts lasting beyond 10 years to the end of mining operations and through reclamation.	Impacts are those impacts that would remain after reclamation is completed.	Effects would occur to wetland or riparian zones inside the proposed Goldrush Mine Plan boundary.	Effects would occur to wetland or riparian zones outside of the proposed Goldrush Mine Plan boundary.
Wildlife Resources, Including Special Status Species and Migratory Birds	Wildlife would not be affected, or impacts would not result in a loss of individuals or habitat.	Impacts on wildlife would be measurable or perceptible and local; however, the overall viability of the population or subpopulation would not be affected and without further adverse impacts the population would recover. Impacts on wildlife, such as displacement of nests or dens or obstruction of corridors, would be detectable. If mitigation is needed to reduce or rectify adverse impacts, it would be relatively simple to implement.	Impacts would be sufficient to cause a change in the population or subpopulation (e.g., abundance, distribution, quantity, or viability); however, the effect would remain local. The change would be measurable and perceptible, but the negative effects may be reversed. Mitigation may be necessary to reduce or rectify adverse impacts.	Impacts would be substantial, highly noticeable, and may be permanent in their effect on population or subpopulation survival without active management. Extensive mitigation likely would be necessary to reduce or rectify adverse impacts, and its success may not be guaranteed.	Impacts would occur during construction activities (i.e., six months to one year), or during maintenance activities.	Impacts would occur for one year or less for individual or habitat; five years or less for a population.	Impacts would occur for greater than one year for individual or habitat; greater than five years for a population.	Impacts on wildlife habitat would be permanent.	Impacts are confined to a small part of the population, habitat, or range.	Impacts would affect a widespread area of suitable habitat or the range of the population or species.

## Appendix H: List of Preparers

**Table H-1 BLM Interdisciplinary Team**

Name	Title and/or Document Area of Responsibility
Jon Sherve	Field Manager – MLFO
Justin Ferris, Delmetria Taylor	Assistant Field Manager – MLFO
Scott Distel	Project Manager
Madeline Ware Van der Voort, Timothy Van der Voort, Andrew Monastero	Cultural Resources
Wilfred Nabahe	Native American Coordination and Consultation
Julie Suhr Pierce, Bill Stevens, Matthew Fockler	Socioeconomics/Environmental Justice
Cassie Ault	Lands and Realty
Alexandra Bettinger, Logan Gonzales	Recreation/Visual Resources/Wilderness
Elin Pierce, Rachelle Peppers	Wildlife/Migratory Birds/Special Status Species/Threatened and Endangered Species
Tom Gibbons	Water Resources
Sam Ault	Range Resources/Vegetation/Soils
Jess Harvey	Public Affairs
Anna O'Brien, Natalie Otto, Maryjane Heckle	Noxious Weeds/Invasive Species/Non-Native Species
Frank Giles	Air Quality/Climate Change
Delmetria Taylor	Geology/Minerals/Hazardous Materials
Jonathan Hall	Mining Engineering
Danielle Harvey	GIS
Brock Uhlig, K.C. Shedden, Robert Burdick	Forestry/Fuels/Fire Management

**Table H-2 Cooperating Agencies**

Name	Title	Document Area of Responsibility
<b>U.S. Environmental Protection Agency</b>		
Hannah Dailey	Environmental Protection Specialist	NEPA
<b>U.S. Fish and Wildlife Service</b>		
Stephen Fettig	Migratory Bird Program	Wildlife Resources, Including Special Status Species and Migratory Bird, Bald and Golden Eagles
Heather Beeler	Migratory Bird Program	Bald and Golden Eagles, Eagle Permit
Genevieve Skora	Fish & Wildlife Biologist	Wildlife Resources, Including Special Status Species
<b>Nevada Department of Wildlife</b>		
Lindsey Lesmeister	Habitat Biologist	Wildlife Resources, Including Special Status Species and Migratory Birds, Vegetation Resources, Including Noxious Weeds and Special Status Plant Species, Wetland and Riparian Resources, and Water Resources and Geochemistry
<b>Eureka County</b>		
Jake Tibbetts	Natural Resources Manager	NEPA

**Table H-3 Stantec Consulting Services Inc.**

<b>Name</b>	<b>Title and/or Document Area of Responsibility</b>	<b>Degree and Experience</b>
Ben Veach	Principal-in-Charge	BS Forestry 35 years' experience
Kristi Schaff	Project Manager	BS Land Rehabilitation 17 years' experience
Michele Lefebvre	Assistant Project Manager	Ph.D. Biology BA Biology 17 years' experience
Kim Carter	Visual Resources/ Recreation/Transportation/Land Use and Access	BA Journalism 17 years' experience
Jen Sojka	Co-Lead Author/Project Coordinator/Wildlife/Socioeconomics/ Environmental Justice	MS Biological Sciences BA Biology 5 years' experience
Shelby Hockaday	Co-Lead Author	MS Geography BS Earth Sciences 5 years' experience
Bobby Taylor	GIS Specialist Lead	BS Geography 5 years' experience
Josh Vittori	Wildlife including Migratory Birds and Noise/Special Status Species	BS Forestry and Rangeland Management 16 years' experience
Erica Freese	Range Resources/Vegetation including Noxious Weeds, Invasive Species, Non-native Species	MS Rangeland Ecology and Management BS Rangeland Ecology and Management 16 years' experience
Nancy Lightfoot	Soils/Hazardous Materials/ Geology and Minerals	BS Geology 30 years' experience
Diana Eck	Wetlands/Riparian	BS Wildlife Biology 12 years' experience
Jenni Prince-Mahoney	Cultural Resources/Native American Traditional Values	Graduate Certificate, NEPA BA Anthropology 30 years' experience
Walt Martin	Geology and Minerals	MS Geology BS Geological Sciences 37 years' experience
Shantanu Kongara	Air Quality and Climate Change	MS Mechanical Engineering BS Technology, Mechanical Engineering 12 years' experience
Jim Finley	Geochemistry	Ph.D. Geology MS Geology BS Forestry 27 years' experience

**Table H-4 Proponent – Nevada Gold Mines LLC**

<b>Name</b>	<b>Title</b>
Kim Wolf	Permitting Manager
Timothy Webber	Engineering and Project Controls Manager
Steve Schoen	Permitting Manager
Joel Donalson	Head of Permitting, Environmental, Ranches & Land

## Appendix I: References

- Assembly Bill 495 (AB 495). 2021. 81<sup>st</sup> Nevada Legislative Session, Assembly Committee on Ways and Means. Assembly and Senate Final Passage May 31, 2021. Text available online at: <https://www.leg.state.nv.us/App/NELIS/REL/81st2021/Bill/8244/Text#>
- Air Sciences Inc. (ASI) 2016. Barrick Cortez Deep South Expansion Project NEPA Air Quality Impact Analysis Report. Prepared for Barrick Cortez Inc. Project No.59-58-4. January 8, 2016.
- Air Sciences Inc. (ASI) 2020. NEPA Air Quality Impact Analysis Report Goldrush Mine. Prepared for Nevada Gold Mines LLC. Project No.59-70-9. February 2020 revised in March 2020.
- Ambrose, S., C. Florian, J. Olnes, J. MacDonald, and T. Hartman. 2020. The Effects of Gas-Field Sounds on Greater Sage-Grouse. *Western Birds* 52:23-46.
- AMEC Environment & Infrastructure, Inc. 2014. 2013 Annual Ground Subsidence and Earth Fissure Monitoring Report. Pipeline/South Pipeline Project. Lander County, Nevada. Submitted to Barrick Cortez, Inc. AMEC Project N. 13-417-01063. March 17, 2014.
- Avian Power Line Interaction Committee (APLIC). 2006. Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006.
- Avian Power Line Interaction Committee (APLIC). 2012. Reducing Avian Collisions with Power Lines. December 2012.
- Avian Power Line Interaction Committee (APLIC) and U.S. Fish and Wildlife Service (USFWS). 2005. Avian Protection Plan (APP) Guidelines. April 2005.
- Bailey, R.G., P.E. Avers, T. King, and W.H. McNab, eds. 1994. Ecoregions and subregions of the United States (map): Washington, D.C. USDA forest Service. Scale 1:7,500,000. Accessed September 30, 2020 online at: <https://www.fs.fed.us/land/pubs/ecoregions/ecoregions.html>
- Barrick Cortez Gold Mines (Barrick) and JBR Environmental Consultants, Inc. (JBR). 2010. Technical Memorandum Contingency Mitigation Plans for Surface Waters Cortez Hills Expansion Project Lander and Eureka Counties, Nevada. JBR Project Number B.A01017.00. May 24, 2010.
- Barrick Cortez Inc. (BCI) 2018a. Barrick Cortez Solid and Hazardous Waste Management Plan. November 2015. Revised October 2018.
- Barrick Cortez Inc. (BCI). 2018b. Barrick Cortez Emergency Response Plan.
- Barrick Cortez Inc (BCI). 2019. Deep South Expansion Project Amendment to Plan of Operations and Reclamation Permit Application #0093. July 2019.
- Barrick Cortez Inc. and Stantec Consulting Services Inc. (BCI and Stantec). 2018. Technical Memorandum, Contingency Mitigation Plans for Surface Waters, Deep South Expansion Project, Lander and Eureka Counties, Nevada. March 27, 2018.
- Barrick Gold Exploration Inc. (Barrick). 2017. Amendment to the Horse Canyon/Cortez Unified Exploration Project Plan of Operations Amendment (NVN-066621[16-1A]) and Reclamation Permit No. 0159 – Twin Declines for Underground Exploration. June 2017.
- Broadbent & Associates, Inc. 2018. Petroleum Contaminated Soil (PCS) Management Plan, Cortez Hills, Pipeline Project, Pipeline Infiltration Project, and Horse Canyon/Cortez Unified Exploration Project, Crescent Valley, Nevada. Prepared for Barrick Cortez Inc. January 12, 2018.

- Bureau of Labor Statistics. 2020. The Employment Situation — July 2020. News Release. Bureau of Labor Statistic, U.S. Department of Labor. August 7, 2020.
- Bureau of Land Management (BLM), U.S. Fish and Wildlife Service (USFWS), and Barrick Gold of North America (Barrick). 2015. Barrick Nevada Sage-Grouse Bank Enabling Agreement. March 25, 2015.
- Bureau of Land Management (BLM). 1986a. Shoshone-Eureka Resource Management Plan Record of Decision. United States Department of the Interior, Bureau of Land Management. Battle Mountain District. Nevada. March 10, 1986.
- Bureau of Land Management (BLM). 1986b. Elko Proposed Resource Management Plan Amendment and Final Environment Impact Statement. Elko District Office. Elko, Nevada. United States Department of the Interior. Bureau of Land Management, Elko District Office, Elko, Nevada.
- Bureau of Land Management (BLM). 1987a. Elko Resource Management Plan Amendment Record of Decision. Elko District Office. Elko, Nevada. United States Department of the Interior. Bureau of Land Management, Elko District Office, Elko, Nevada. March 11, 1987.
- Bureau of Land Management (BLM). 1987b. Elko Resource Management Plan, Rangeland Program Summary. Elko District Office, Elko, Nevada.
- Bureau of Land Management (BLM). 1988. Shoshone-Eureka Rangeland Program Summary. Battle Mountain District Office, Battle Mountain, Nevada. December 1988.
- Bureau of Land Management (BLM). 1991. Draft Environmental Impact Statement Betz Project Barrick Goldstrike Mines Inc. Elko District Office, Elko, Nevada. January 1991.
- Bureau of Land Management (BLM). 1993. Draft Environmental Impact Statement Newmont Gold Company's South Operations Area Project. Elko District, Elko, Nevada. May 1993.
- Bureau of Land Management (BLM). 2004. Environmental Assessment. West Pint Valley Exploration Project. NVN-77213. U.S. Department of the Interior. Bureau of Land Management. Elko Field Office and Battle Mountain Field Office. March 2004.
- Bureau of Land Management (BLM). 2008a. H-1790-1 National Environmental Policy Act Handbook. Washington D.C.; U.S. Department of the Interior. Bureau of Land Management. January 2008.
- Bureau of Land Management (BLM). 2008b. Cortez Hills Expansion Project Final Environmental Impact Statement. NVN-067575. NV063-EIS06-011. U.S. Department of the Interior, Bureau of Land Management, Battle Mountain Field Office. September 2008.
- Bureau of Land Management (BLM). 2010. Draft Environmental Impact Statement Genesis Project Newmont Mining Corporation. Elko District, Elko, Nevada. February 2010.
- Bureau of Land Management (BLM). 2012. Manual 6330 – Management of BLM Wilderness Study Areas. July 13, 2012.
- Bureau of Land Management (BLM). 2014. Draft Statewide Wildlife Survey Protocols. Bureau of Land Management, Nevada.
- Bureau of Land Management (BLM). 2015a. Record of Decision and Approved Resource Management Plan Amendments for the Great Basin Region, Including the Greater Sage-Grouse Sub-Regions of Idaho and Southwestern Montana, Nevada and Northeastern California, Oregon, and Utah. U.S. Department of the Interior, Bureau of Land Management, Washington D.C. Office. September 2015.

Bureau of Land Management (BLM). 2015b. Nevada and Northeastern California Greater Sage-Grouse Approved Resource Management Plan Amendment. Attachment 2 from the USDI 2015 Record of Decision and Approved Resource Management Plan Amendments for the Great Basin Region including the Greater Sage-Grouse Sub- Regions of: Idaho and Southwestern Montana, Nevada and Northeastern California, Oregon, and Utah. U.S. Department of the Interior, Bureau of Land Management Nevada State Office. September 15, 2015.

Bureau of Land Management (BLM), U.S. Fish and Wildlife Service (USFWS), and Barrick Gold of North America (Barrick) (BLM et al.). 2015. Barrick Nevada Sage-Grouse Bank Enabling Agreement. March 25, 2015.

Bureau of Land Management (BLM). 2016a. Environmental Assessment for the Amendment for the Horse Canyon/Cortez Unified Exploration Project. Plan of Operations (NVN-066621 [16-1A]) and Reclamation Permit No. 0159. Twin Declines for Underground Exploration. U.S. Department of the Interior. Bureau of Land Management. Battle Mountain District Office. September 8, 2016.

Bureau of Land Management (BLM). 2016b. Environmental Assessment. Klondex Gold & Silver Mining Company, Fire Creek Mine Project, Lander County, Nevada. File Number NVN-091111. Battle Mountain District office, Mount Lewis Field Office. January 2016.

Bureau of Land Management (BLM). 2017. Final BLM NV Sensitive and Special Status Species List.

Bureau of Land Management (BLM). 2019a. Final Deep South Expansion Project Supplemental Environmental Report – Land Use and Access. Prepared in Support of: File Number NVN-067575 (16-1A). DOI-BLM-NV-B010-2016-0052 EIS. United States Department of the Interior, Bureau of Land Management. Battle Mountain District Office.

Bureau of Land Management (BLM). 2019b. Deep South Expansion Project Final Environmental Impact Statement (NVN-067575 16-1A). DOI-BLM-NV-B010-2016-0052 EIS. Battle Mountain District Office, Mount Lewis Field Office, Battle Mountain, Nevada.

Bureau of Land Management (BLM). 2019c. Final Deep South Expansion Project Supplement Report. Detailed Description of Proposed Action. Prepared in Support of: File Number: NVN-067575 (16-1A). DOI-BLM-NV-B010-2016-0052 EIS. U.S. Department of the Interior. Bureau of Land Management. Battle Mountain District Office. Mount Lewis Field Office. 2019.

Bureau of Land Management (BLM). 2019d. Final Deep South Expansion Project Supplemental Environmental Report – Geology and Minerals. Prepared in Support of: File Number NVN-067575 (16-1A). DOI-BLM-NV-B010-2016-0052 EIS. United States Department of the Interior, Bureau of Land Management. Battle Mountain District Office.

Bureau of Land Management (BLM). 2019e. Supplemental Environmental Report for Hazardous Materials and Solid Waste. In support of: Deep South Expansion Project Final Environmental Impact Statement (NVN-067575 16-1A). DOI-BLM-NV-B010-2016-0052 EIS. Battle Mountain District Office, Mount Lewis Field Office, Battle Mountain, Nevada.

Bureau of Land Management (BLM). 2019f. Final Deep South Expansion Project Supplemental Environmental Report – Native American Traditional Values. Prepared in Support of: File Number: NVN-067575 (16-1A). DOI-BLM-NV-B010-2016-0052 EIS. U.S. Department of the Interior, Bureau of Land Management. Battle Mountain District Office.

Bureau of Land Management (BLM). 2019g. Final Deep South Expansion Project Supplemental Environment Report – Recreation and Wilderness. Prepared in Support of: File Number: NVN-067575 (16-1A). DOI-BLM-NV-B010-2016-0052-EIS. U.S. Department of the Interior, Bureau of Land Management, Battle Mountain District Office, Mount Lewis Field Office, Battle Mountain, Nevada.



Bureau of Land Management (BLM). 2019h. Final Deep South Expansion Project Supplemental Environmental Report – Social and Economic Values. DOI-BLM-NV-B010-2016-0052 EIS. Battle Mountain District Office, Mount Lewis Field Office, Battle Mountain, Nevada.

Bureau of Land Management (BLM). 2019i. Deep South Expansion Project Supplemental Environmental Report – Water Resources and Geochemistry. Case File Number: NVN-067575 (16-1A). DOI-BLM-NV-B010-2016-0052 EIS. US Department of the Interior, Battle Mountain Field Office.

Bureau of Land Management (BLM). 2019j. Final Deep South Expansion Project Supplemental Environmental Report – Wildlife and Aquatic Biological Resources. U.S. Department of the Interior, Bureau of Land Management, Battle Mountain District Office.

Bureau of Land Management (BLM). 2019k. Final Deep South Expansion Project Supplemental Environmental Report – Environmental Justice. Prepared in Support of File Number: NVN-067575 (16-1A), DOI-BLM-NV-B010-2016-0052 EIS.

Bureau of Land Management (BLM). 2020a. Nevada and Northeastern California Greater Sage-Grouse Draft Supplemental Environmental Impact Statement. February 10, 2020.

Bureau of Land Management (BLM). 2020b. Nevada and Northeastern California Greater Sage-Grouse Final Supplemental Environmental Impact Statement. November 2020.

Bureau of Land Management (BLM). 2020c. Land and Mineral Legacy Rehost 200 System-LR2000. United States Department of the Interior, Bureau of Land Management. Accessed multiple days online at: <https://reports.blm.gov/reports.cfm?application=LR2000>

Bureau of Land Management (BLM). 2020d. Master Title Plats for the Project Area and Alternatives. Lands Record Search. Accessed multiple days online at: <https://www.nv.blm.gov/LandRecords/>

Bureau of Land Management (BLM). 2020e. General Land Office Records. Patents Record Search. Accessed multiple days online at: <https://gloreports.blm.gov/search/>

Bureau of Land Management (BLM). 2020f. Barrick Nevada Sage-Grouse Bank Enabling Agreement Public Land Project Plan Final Environmental Assessment. DOI-BLM-NV-B010-2019-0012-EA. April 2020.

Bureau of Land Management. 2021. Goldrush Mine Environmental Impact Statement Public Scoping Report. September 29, 2021.

Bureau of Land Management (BLM). 2021a. Project Alternatives Supplemental Information Report for the Goldrush Mine Project. United States Department of the Interior, Bureau of Land Management. Battle Mountain District Office.

Bureau of Land Management (BLM). 2021b. Air Quality Supplemental Environmental Report for the Goldrush Mine Project. United States Department of the Interior, Bureau of Land Management. Battle Mountain District Office. October 13, 2021.

Bureau of Land Management (BLM). 2021c. Cultural Resources Supplemental Environmental Report for the Goldrush Mine Project. United States Department of the Interior, Bureau of Land Management. Battle Mountain District Office. October 13, 2021.

Bureau of Land Management (BLM). 2021d. Environmental Justice Supplemental Environmental Report for the Goldrush Mine Project. United States Department of the Interior, Bureau of Land Management. Battle Mountain District Office. October 13, 2021.

Bureau of Land Management (BLM). 2021e. Geology and Minerals Supplemental Environmental Report for the Goldrush Mine Project. United States Department of the Interior, Bureau of Land Management. Battle Mountain District Office. October 13, 2021.

Bureau of Land Management (BLM). 2021f. Bald and Golden Eagles Supplemental Environmental Report for the Goldrush Mine Project. United States Department of the Interior, Bureau of Land Management. Battle Mountain District Office. October 13, 2021.

Bureau of Land Management (BLM). 2021g. Hazardous Materials and Solid Waste Supplemental Environmental Report for the Goldrush Mine Project. United States Department of the Interior, Bureau of Land Management. Battle Mountain District Office. October 13, 2021.

Bureau of Land Management (BLM). 2021h. Land Use and Realty Supplemental Environmental Report for the Goldrush Mine Project. United States Department of the Interior, Bureau of Land Management. Battle Mountain District Office. October 13, 2021.

Bureau of Land Management (BLM). 2021i. Native American Traditional Values Supplemental Environmental Report for the Goldrush Mine Project. United States Department of the Interior, Bureau of Land Management. Battle Mountain District Office. October 13, 2021.

Bureau of Land Management (BLM). 2021j. Noise Supplemental Environmental Report for the Goldrush Mine Project. United States Department of the Interior, Bureau of Land Management. Battle Mountain District Office. October 13, 2021.

Bureau of Land Management (BLM). 2021k. Grazing Management Supplemental Environmental Report for the Goldrush Mine Project. United States Department of the Interior, Bureau of Land Management. Battle Mountain District Office. October 13, 2021.

Bureau of Land Management (BLM). 2021l. Recreation Supplemental Environmental Report for the Goldrush Mine Project. United States Department of the Interior, Bureau of Land Management. Battle Mountain District Office. October 13, 2021.

Bureau of Land Management (BLM). 2021m. Social and Economic Values Supplemental Environmental Report for the Goldrush Mine Project. United States Department of the Interior, Bureau of Land Management. Battle Mountain District Office. October 13, 2021.

Bureau of Land Management (BLM). 2021n. Soils Supplemental Environmental Report for the Goldrush Mine Project. United States Department of the Interior, Bureau of Land Management. Battle Mountain District Office. October 13, 2021.

Bureau of Land Management (BLM). 2021o. Transportation and Access Supplemental Environmental Report for the Goldrush Mine Project. United States Department of the Interior, Bureau of Land Management. Battle Mountain District Office. October 13, 2021.

Bureau of Land Management (BLM). 2021p. Vegetation, Including Noxious and Invasive Non-native Species and Special Status Plants Supplemental Environmental Report for the Goldrush Mine Project. United States Department of the Interior, Bureau of Land Management. Battle Mountain District Office. October 13, 2021.

Bureau of Land Management (BLM). 2021q. Visual Resources Supplemental Environmental Report for the Goldrush Mine Project. United States Department of the Interior, Bureau of Land Management. Battle Mountain District Office. October 13, 2021.

Bureau of Land Management (BLM). 2021r. Water Resources and Geochemistry Supplemental Environmental Report for the Goldrush Mine Project. United States Department of the Interior, Bureau of Land Management. Battle Mountain District Office. October 13, 2021.

- Bureau of Land Management (BLM). 2021s. Wetlands and Riparian Areas Supplemental Environmental Report for the Goldrush Mine Project. United States Department of the Interior, Bureau of Land Management. Battle Mountain District Office. October 13, 2021.
- Bureau of Land Management (BLM). 2021t. Wildlife Resources, Including Migratory Birds and Special Status Wildlife Supplemental Environmental Report for the Goldrush Mine Project. United States Department of the Interior, Bureau of Land Management. Battle Mountain District Office. October 13, 2021.
- Bureau of Land Management (BLM). 2022. Plan Maintenance Action No. 5. National Environmental Policy Act Compliance Record for Categorical Exclusions (CX). DOI-BLM-NV-0000-2022-0006-CX. May 2022.
- Cedar Creek Associates, Inc. 2019a. Enhanced Baseline Report Native American Values. Nevada Gold Mines Goldrush Mine Project. Fort Collins, Colorado. November 2019.
- Cedar Creek Associates, Inc. 2019b. Enhanced Baseline Report, Social and Economic. Nevada Gold Mines Goldrush Mine Project. December 2019.
- Cedar Creek Associates, Inc. 2020. Enhanced Baseline Report Noise-Nevada Gold Mines Goldrush Project. Prepared by Cedar Creek for Nevada Gold Mines, LLC. July 2020.
- Cedar Creek Associates, Inc. 2021. Revised Visual Simulations for the Goldrush Project. Nevada Gold Mines. August 19, 2021.
- Comer, P., P. Crist, M. Reid, J. Hak, H. Hamilton, D. Braun, G. Kittel, I. Varley, B. Unnasch, S. Auer, M. Creutzburg, D. Theobald, and L. Kutner. 2013. Central Basin and Range Rapid Ecoregional Assessment Report. Prepared for the U.S. Department of the Interior, Bureau of Land Management.
- Cortez Gold Mines (CGM). 1990. The 1990 Plan of Operations for the Horse Canyon, Cortez Canyon, and Gold Acres Areas. Lander and Eureka Counties, Nevada. February 1990.
- Cortez Gold Mines (CGM). 2004. Exploration Plan of Operations for the West Pine Valley Project. March 2004.
- Council on Environmental Quality (CEQ). 1997. Environmental Justice: Guidance Under the National Environmental Policy Act. Washington, D.C. December 1997.
- Council on Environmental Quality (CEQ). 2020. Update to the Regulations Implementing the Procedural Provisions of the National Environmental Policy Act. Final Rule. 85 Federal Register 43304.
- Dixon, G., and R. McGonagle. 2004. Mount Tenabo Properties of Cultural and Religious Importance Determinations of Eligibility to the National Register of Historic Places. On file, Bureau of Land Management, Mount Lewis Field Office, Battle Mountain, Nevada.
- Desert Research Institute (DRI). 2016. Landsat Derived Phreatophyte Groundwater Evapotranspiration, Crescent Valley, Pine Valley, Carico Lake Valley, and Grass Valley, Central Nevada. Prepared for Barrick Gold Corporation. December 2016.
- Elko County. 2020. Elko County Fire Protection District. Accessed November 4, 2020 online at: <https://www.elkocountynv.net/departments/ecfpd - fire district/index.php>
- Environmental Resource Management (ERM). 2018. Goldrush Comprehensive Biological Baseline Report, 2014-2018. November 2018.
- Eureka County. 2005. Eureka County Road Map. November 2005.

- Eureka County. 2010. Eureka County Master Plan. April 6, 2010. Accessed online at: [http://www.co.eureka.nv.us/PDF/Master\\_Plan\\_Final%202010.pdf](http://www.co.eureka.nv.us/PDF/Master_Plan_Final%202010.pdf)
- Eureka County. 2018. Eureka County, Nevada Socioeconomic Conditions & Trends Update 2018. July 2018. Accessed August 15, 2020 online at: <https://www.yuccamountain.org/trends18/cover.htm>
- Eureka County. 2019. Eureka Water Association Consumer Confidence Report – 2020, Covering Calendar Year – 2019. Accessed August 15, 2020 online at: <http://www.co.eureka.nv.us/public/2019%20EUREKA%20WATER%20ASSOCIATION-NV0000044.pdf>
- Eureka County. 2020. Eureka County Emergency Medical Service. Accessed December 2020 online at: [http://www.co.eureka.nv.us/ems/index\\_website/index.html](http://www.co.eureka.nv.us/ems/index_website/index.html)
- Eureka County. 2021. Eureka County Domestic Well Log. April 6, 2021.
- Federal Bureau of Investigation (FBI). 2018. Offenses Known to Law Enforcement by Metropolitan and Nonmetropolitan Counties, 2018. Accessed August 16, 2020 online at: <https://ucr.fbi.gov/crime-in-the-u.s/2018/crime-in-the-u.s.-2018/tables/table-10/table-10-state-cuts/nevada.xls>
- Floyd, T., C. S. Elphick, G. Chisholm, K. Mack, R. G. Elston, E. M. Ammon, and J. D. Boone. 2007. Atlas of the Breeding Birds of Nevada. University of Nevada Press. 581 pp.
- Geomega Inc. 2006. Cortez Hills Expansion Project Baseline Characterization Report. September 12, 2006.
- Geomega Inc. 2016. Cortez Deep South Expansion Pit Lake and Backfill Pore Water Chemistry, September 2016.
- Geomega Inc. 2020. Goldrush Underground Aqueous Geochemistry, Eureka County, Nevada. Prepared for Nevada Gold Mines. July 7, 2020.
- Geomega Inc. 2021. Re-evaluation of the Cortez Goldrush Rapid Infiltration Basins in West Pine Valley Eureka County, Nevada. Prepared for Nevada Gold Mines. May 12, 2021.
- Gibson, D., E. J. Blomberg, M. T. Atamian, S. P. Espinosa, and J. S. Sedinger. 2018. Effects of power lines on habitat use and demography of greater sage-grouse (*Centrocercus urophasianus*). Wildlife Monographs. October 23, 2018.
- Great Basin Water Company. 2018. Spring Creek Housing Section, Annual Water Quality Report 2018.
- HDR Engineering, Inc. 2014. Goldrush Seep and Spring Monitoring Annual Report – 2013. Eureka and Lander Counties. Prepared for Barrick Gold of North America. March 5, 2014.
- HDR Engineering, Inc. 2015a. Goldrush Seep and Spring Reconnaissance and Monitoring annual Report – 2014. Prepared for Barrick Gold of North America. April 8, 2015.
- HDR Engineering, Inc. 2015b. Goldrush Seep and Spring Reconnaissance and Monitoring annual Report – 2014. Prepared for Barrick Gold of North America. December 9, 2015.
- HDR Engineering, Inc. 2017. Goldrush Seep and Spring Reconnaissance and Monitoring annual Report – 2016. Prepared for Barrick Gold of North America. March 2, 2017.
- HDR Engineering, Inc. 2018a. Goldrush Seep and Spring Reconnaissance and Monitoring annual Report – 2017. Prepared for Barrick Gold of North America. February 15, 2018.

- HDR Engineering, Inc. 2018b. Goldrush Surface Water Monitoring Annual Report-2017. Prepared for Barrick Gold of North America. February 15, 2018.
- HDR Engineering, Inc. 2019. Goldrush Seep and Spring Monitoring Annual Report-2018. Eureka and Lander Counties. Prepared for Barrick Gold of North America. January 2019.
- HDR Engineering, Inc. 2020. Goldrush Seep and Spring Monitoring Annual Report-2019. Eureka and Lander Counties. Prepared for Barrick Gold of North America. January 2020.
- Headwaters Economics. 2020. A Demographic Profile: Nevada. Produced by Headwaters Economics' Economic Profile System. Accessed June 1, 2020 online at: <https://headwaterseconomics.org/eps>
- HydroGeo Group. 2017. Technical Memo from A. L. Mayo, HydroGeo Group, to S. Schoen, Barrick, Re: Springs Investigation Springs Investigation. August 23, 2017.
- IMPLAN Group, LLC. 2020. Induced Effects. Huntersville, NC. Accessed November 4, 2020 online at: <https://implanhelp.zendesk.com/hc/en-us/articles/115009668568-Induced-Effects>
- IMPLAN Group, LLC. 2021. Goldrush Environmental Impact Statement Economic Impact Results. Huntersville, NC. IMPLAN.com. April 2021.
- Innes, Robin J. 2017. Artemisia tridentata subsp. vaseyana, mountain big sagebrush. In: Fire Effects Information System, U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Missoula Fire Sciences Laboratory. Accessed August 28, 2020 online at: <https://www.feis-crs.org/feis/>
- Intergovernmental Panel on Climate Change (IPCC). 2007. Contribution of Working Group 1 to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge and New York: Cambridge University Press.
- Itasca Denver, Inc. 2016. Barrick Cortez Four-Basin (Carico Lake Valley, Crescent Valley, Grass Valley, and Pine Valley) Groundwater Flow Modeling Report. #4008. January 2016.
- Itasca Denver, Inc. 2020. Goldrush Underground Mine Project – Waste Rock Management Plan. Prepared for Nevada Gold Mine LLC. February 2020.
- JBR Consultants Group. 1993. Cortez Gold Mining Company Seep and Spring Report. Prepared for Cortez Gold Mining Company, Crescent Valley, Nevada. September 13, 1993.
- JBR Environmental Consultants, Inc. 2000. Delineation of Wetlands and Waters of the United States, Pediment Baseline Study Area. JBR Report Number 274. August 2000.
- JBR Environmental Consultants, Inc. 2009. Letter to the Nevada Department of Wildlife regarding Horse Creek Baseline Survey. JBR Project Number B.A09108.00. November 5, 2009.
- JBR Environmental Consultants, Inc. 2012. Recommended Monitoring Locations Report Goldrush Project Seep and Spring Project. Eureka County, Nevada. Prepared for Barrick Gold of North America. June 27, 2012.
- JBR Environmental Consultants, Inc. 2013. Goldrush Project Seep & Spring Monitoring. Fall 2012. Prepared for Barrick Gold of North America. March 5, 2013.
- Kochert, M. N. and K. Steenhof. 2002. Golden Eagles in the U.S. and Canada: Status, Trends, and Conservation Challenges. Journal of Raptor Research. 36(supplement):33-40. March 2002.
- Lander County. 2005. Policy for Federally Administered Lands. Prepared by the Lander County Public Land Use Advisory Planning Commission.

- Lander County. 2010. Lander County Master Plan. Accessed online at: [http://www.landercountynv.org/document\\_center/Planning/Lander%20County%20Master%20Plan%20-%202010.pdf](http://www.landercountynv.org/document_center/Planning/Lander%20County%20Master%20Plan%20-%202010.pdf)
- Lander County. 2019. Lander County Zoning Ordinance (Ordinance 2019-01, Title 17-Zoning). Battle Mountain, Nevada. Accessed online at: [https://library.municode.com/nv/lander\\_county/codes/code\\_of\\_ordinances?nodeId=TIT17ZO](https://library.municode.com/nv/lander_county/codes/code_of_ordinances?nodeId=TIT17ZO)
- Lander County. 2020. Emergency Services. Accessed November 4, 2020 online at: [http://www.landercountynv.org/residents/emergency\\_services.php](http://www.landercountynv.org/residents/emergency_services.php)
- Matrix Design Group Inc. 2020. Nevada Gold Mine Traffic Impact Study. Prepared by Matrix Design Group, Inc. for Knight-Piésold and Company. August 31, 2020.
- Natural Resources Conservation Service (NRCS). 2020a. Custom Soil Resource Report for Eureka County Area, Nevada; and Lander County, Nevada, North Part. U.S. Department of Agriculture. September 28, 2020.
- Natural Resources Conservation Service (NRCS). 2020b. Custom Soil Resource Report for Eureka County Area, Nevada; and Lander County, Nevada, North Part, Goldrush Mine, Hydric Rating by Map Unit. U.S. Department of Agriculture. April 17, 2020.
- Natural Resources Conservation Service (NRCS). 2020c. Central Nevada Basin and Range Ecological Site List, MLRA 028B. Accessed May 26, 2020 online at: [https://www.nrcs.usda.gov/Internet/FSE\\_DOCUMENTS/nrcs142p2\\_050898.pdf](https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_050898.pdf)
- Nevada Bureau of Mines and Geology (NBMG). 2019. Major Mines of Nevada 2018. Mineral Industries in Nevada's Economy.
- Nevada Department of Education. 2020a. Enrollment for Nevada Public Schools. Accessed August 15, 2020 online at: <http://www.doe.nv.gov/DataCenter/Enrollment/>
- Nevada Department of Education. 2020b. Nevada Accountability Portal. Accessed August 16, 2020 online at: <http://nevadareportcard.nv.gov/di/>
- Nevada Department of Education. 2020c. Report to the State Board of Education: Class Size Reduction Variances and Justifications, 1st Quarter Fiscal Year 2020 (August 1-October 31, 2019). February 26, 2020.
- Nevada Department of Employment, Training & Rehabilitation (NDETR). 2019. 2019 Fourth Quarter Employment and Wages by Industry-Quarterly Census of Employment and Wages (QCEW). Accessed August 31, 2020 online at: <http://nevadaworkforce.com/Home/DS-Results-QCEW2>
- Nevada Department of Employment, Training & Rehabilitation (NDETR). 2020a. 2020 First Quarter Employment and Wages by Industry-Quarterly Census of Employment and Wages (QCEW). Accessed August 31, 2020 online at <http://nevadaworkforce.com/Home/DS-Results-QCEW2>
- Nevada Department of Employment, Training & Rehabilitation (NDETR). 2020b. Local Area Unemployment Statistics (LAUS). Accessed August 7, 2020 online at: <http://nevadaworkforce.com/LAUS>
- Nevada Department of Wildlife (NDOW). 2020a. Personal communication email from Lindsey Lesmeister, Habitat Biologist with NDOW to Steve Morton (Stantec Consulting Services Inc.). June 8, 2020.
- Nevada Department of Wildlife (NDOW). 2020b. Hunting Unit Information. Accessed August 2020 online at: [http://www.ndow.org/Hunt/Hunting\\_Units/](http://www.ndow.org/Hunt/Hunting_Units/)



Nevada Department of Wildlife (NDOW). 2020c. Data Request Response from Jinna Larkin and Timothy M. Herrick (NDOW) to Jen Sojka (Stantec) Re: Goldrush Mine Project. January 30, 2020 and July 7, 2020.

Nevada Department of Wildlife (NDOW). 2020d. 2019-2020 Big Game Status.

Nevada Department of Wildlife (NDOW). 2020e. Mountain Lion. Accessed July 27, 2020 online at: [http://www.ndow.org/Species/Furbearer/Mountain\\_Lion/](http://www.ndow.org/Species/Furbearer/Mountain_Lion/)

Nevada Division of Environmental Protection (NDEP). 2020a. The Nevada Division of Environmental Protection, Bureau of Sustainable Materials Management. Permitted Solid Waste Landfills in Nevada. Accessed November 4, 2020 online at: <https://ndep.nv.gov/land/waste/solid-waste/facilities>

Nevada Division of Environmental Protection (NDEP). 2020b. Nevada Statewide Greenhouse Gas Emissions Inventory and Projections, 1990-2040. Nevada Division of Environmental Protection, 2020 Supplemental Report.

Nevada Division of Water Resources (NDWR). 2021a. Water Rights Mapping Application. Accessed January 2021 online at: <http://water.nv.gov/mapping.aspx?mapping=Mapping%20Application%20Links>

Nevada Division of Water Resources (NDWR). 2021b. Well Log Data File. Accessed January 2021 online at: <http://water.nv.gov/mapping.aspx?mapping=Well%20Drilling%20and%20Dam%20Data>

Nevada Gold Mines LLC (NGM). 2019. Launch Presentation. March 2019. Accessed online April 21, 2020 at: <https://barrick.q4cdn.com/788666289/files/presentation/2019/07/Nevada-Gold-Mines-Launched.pdf>

Nevada Gold Mines LLC (NGM). 2020a. Amendment to the Horse Canyon/Cortez Unified Exploration Project Plan of Operations Amendment (NVN-066621[16-1A]) and Reclamation Permit No. 0159 – Plan Boundary Modification and Horse Creek Mitigation. August 2020. Revised September 2020.

Nevada Gold Mines LLC (NGM). 2020b. Enhanced Baseline Report. Project Summary. Nevada Gold Mines Goldrush Mine Project. March 2020.

Nevada Gold Mines LLC (NGM). 2020c. Goldrush Project Technical Feasibility of Alternatives. From Kim Wolf, Nevada Gold Mines to Jon Sherve and Scott Distel, Bureau of Land Management. January 6, 2021.

Nevada Gold Mines LLC (NGM). 2020d. Eagle Conservation Plan, Goldrush Project, Lander and Eureka Counties, Nevada. Prepared by Stantec Consulting Services Inc. for NGM. April 10, 2020.

Nevada Gold Mines LLC (NGM). 2021. Goldrush Mine Plan of Operations and Reclamation Permit Application. September 2019. Revised May 2020. Revised August 2020. Revised October 2020. Revised June 2021.

Nevada Legislature. 2019. Assembly Amendment No. 1135 to Senate Bill No. 543 First Reprint. 2019 Session (80<sup>th</sup>). Accessed April 20, 2021 online at: <https://www.leg.state.nv.us/App/NELIS/REL/80th2019/Bill/7052/Overview>

Nevada Natural Heritage Program (NNHP). 2020. Data Request Response for endangered, threatened, candidate, and/or at risk plant and animal taxa recorded at or near the Goldrush Mine Project in Lander and Eureka counties. Response from Eric Miskow (NNHP) received by Jen Sojka (Stantec). June 29, 2020.



- Pagel, J.E., D.M. Whittington, and G.T. Allen. 2010. Interim Golden Eagle Inventory and Monitoring Protocols; and Other Recommendations. U.S. Fish and Wildlife Service. February 2010.
- Parkhurst, D.L. and C.A.J. Appelo. 2013. Description of Input and Examples for PHREEQC version 3—A Computer Program for Speciation, Batch-Reaction, One-Dimensional Transport, and Inverse Geochemical Calculations: U.S. Geological Survey Techniques and Methods. Book 6.
- Plumlee, G.S. 1999. The Environmental Geology of Mineral Deposits. In, The Environmental Geochemistry of Mineral Deposits, Part A. Processes, Techniques, and Health Issues, Society of Economic Geologists, Reviews in Economic Geology, 6A, 71-116, 1999.
- Recreation.gov. 2020. Mill Creek Recreation Area, NV. Accessed August 2020 online at: <https://www.recreation.gov/camping/gateways/2027>
- Rucks, M. 2000. A Report on Ethnographic Study Conducted to Assist the Bureau of Land Management in the Evaluation of Traditional Cultural Properties in the Mt. Tenabo Area of Lander and Eureka Counties, Nevada. Summit Envirosolutions, Inc., Carson City, Nevada. In: Bureau of Land Management (BLM). 2008. Cortez Hills Expansion Project Final Environmental Impact Statement. Battle Mountain District Office, Battle Mountain, Nevada. September 2008.
- Rucks, M. 2004. An Ethnographic Study Completed for the Cortez Gold Mines Pediment Project. Summit Envirosolutions, Inc., Carson City, Nevada. April 23, 2004. In: Bureau of Land Management (BLM). 2008. Cortez Hills Expansion Project Final Environmental Impact Statement. Battle Mountain District Office, Battle Mountain, Nevada. September 2008.
- Sagebrush Ecosystem Program and the State of Nevada. 2018. 2018 Nevada Greater Sage-grouse Conservation Plan. April 5, 2018.
- Saxelby Acoustics LLC. 2020a. Goldrush Project Noise Study, Eureka County, Nevada. Prepared for Cedar Creek Associates, Inc. May 18, 2020.
- Saxelby Acoustics LLC. 2020b. Cumulative Noise Levels for the Nevada Gold Mines Goldrush Project, Eureka County, Nevada. August 24, 2020.
- Saxelby Acoustics LLC. 2020c. Updated Cumulative Noise Levels for the Nevada Gold Mines Goldrush Project, Eureka County, Nevada. October 30, 2020.
- Saxelby Acoustics LLC. 2021. Corrections to the Goldrush Project Cumulative Noise Level Report. March 11, 2021.
- Smith Environmental & Engineering. 2014. Soils Investigation of the Horse Canyon-Cortez Unified Exploration Project Plan of Operations Area in Eureka and Lander Counties, Nevada. November 13, 2014.
- SRK Consulting (U.S.), Inc. 2016. Groundwater Flow Model Report Deep South Expansion Project Crescent Valley, Nevada. Report prepared for Barrick Cortez Inc. August 2016.
- SRK Consulting (U.S.), Inc. 2017. Deep South Expansion Project – Cumulative Effects, Groundwater Flow Modeling Report. SRK Project No. 460100.070. March 2017.
- SRK Consulting (U.S.), Inc. 2019. Goldrush Mine Noxious Weed Management Plan. Prepared for Nevada Gold Mines LLC. September 2019.
- SRK Consulting (U.S.), Inc. 2020a. Goldrush Project – Subsidence Report. Prepared for Nevada Gold Mines LLC. April 2020.

SRK Consulting (U.S.), Inc. 2020b. Goldrush Project – Groundwater Flow Modeling Report. SRK Project No. 551200.010. April 2020.

SRK Consulting (U.S.), Inc. 2020c. Goldrush Mine Enhanced Baseline Report Water Resources and Geochemistry. SRK Project No. 551200.010. May 2020.

SRK Consulting (U.S.), Inc. 2020d. Goldrush Project – Subsidence Report. Prepared for Nevada Gold Mines. LLC. April 2020.

Sagebrush Ecosystem Program (SEP). 2021a. Letter from Kelly McGowan (Sagebrush Ecosystem Program) to Kim Wolf (NGM) regarding the Goldrush Mine Project. September 7, 2021.

Sagebrush Ecosystem Program (SEP). 2021b. Letter from Kelly McGowan (Sagebrush Ecosystem Program) to Kim Wolf (NGM) regarding the Goldrush Exploration Project. September 24, 2021.

Stantec Consulting Services Inc. 2016. 2016 Seep and Spring Baseline Survey Wilson Canyon-Cooks Creek Carico Valley. Prepared for Barrick Cortez Inc. Stantec Project Number 203703132. August 31, 2016.

Stantec Consulting Services Inc. 2019. 2019 Golden Eagle and Raptor Nesting Survey, Cortez District, Lander and Eureka Counties, Nevada. Prepared for Nevada Gold Mines LLC, Cortez Mine. Stantec Project Number 203721216. August 29, 2019.

Stantec Consulting Services Inc. 2021. 2021 Golden Eagle and Raptor Nesting Survey, Cortez District, Lander and Eureka Counties, Nevada. Prepared for Nevada Gold Mines LLC. Stantec Project Number 203722201. August 21, 2021.

Summit Envirosolutions. 2020. Cultural Resources Site Data provided in an Excel file.

Tibbitts, Jake. 2020. Comments Received by Jake Tibbitts with Eureka County on the Draft Social and Economic Values Supplemental Environmental Report for the Goldrush Mine Project. Comments received November 25, 2020.

Tibbitts, Jake. 2021. Goldrush – Housing in Eureka County. Email from Jake Tibbitts (Eureka County) to Steven Morton (Stantec), Kristi Schaff (Stantec), and Scott Distel (BLM). April 9, 2021.

Tilley, D., St. John, L. Ogle, D., Shaw, N., and J. Cane. 2010. Plant guide for fernleaf biscuitroot (*Lomatium dissectum*). U.S. Department of Agriculture Natural Resources Conservation Service, Idaho Plant Materials Center. Aberdeen, ID.

Ulmschneider, H., D. Hays, H. Roberts, J. Rachlow, T. Forbes, J. Himes, E. Sequin, M. Haworth, T. Katzner, A. Kozlowski, R. Rauscher, and P. Lauridson. 2008. Surveying for Pygmy Rabbits (*Brachylagus idahoensis*). Interagency Pygmy Rabbit Working Group.

United States Army Corps of Engineers (USACE). 2016. Jurisdictional determination letter for the Deep South Expansion Project from J. Gipson, USACE, to M. Gili, Barrick Cortez Inc. SPK-2015-01039, February 10, 2016.

United States Army Corps of Engineers (USACE). 2020a. Jurisdictional determination letter for the Mill Canyon site from J. Gipson, USACE, to K. Wolf, Nevada Gold Mines LLC. SPK-2014-00139, November 25, 2020.

United States Army Corps of Engineers (USACE). 2020b. Jurisdictional determination letter for the Barrick Cottonwood Creek and Brock Creek site from J. Gipson, USACE, to K. Wolf, Nevada Gold Mines LLC. SPK-2015-00066, December 31, 2020.

- United States Bureau of Economic Analysis (USBEA). 2019. Personal Income by County, Metro, and Other Areas, Local Area Personal Income, 2018. November 14, 2019.
- United States Census Bureau (USCB). 2001. Population Change and Distribution 1990 to 2000. U.S. Department of Commerce, Economics and Statistics Administration, Bureau of the Census. April 2001.
- United States Census Bureau (USCB). 2011. Population Distribution and Change 2000 to 2010. U.S. Department of Commerce, Economics and Statistics Administration, Bureau of the Census. March 2011.
- United State Census Bureau (USCB). 2018. 2018 TIGER/Line Shapefiles and Technical Documentation. September 2018.
- United States Census Bureau (USCB). 2020a. 2019 Poverty Thresholds by Size of Family and Number of Children. Accessed September 2020 online at: <https://www.census.gov/data/tables/time-series/demo/income-poverty/historical-poverty-thresholds.html>
- United States Census Bureau (USCB). 2020b. Quick Facts: Nevada; Elko City, Nevada; Eureka County, Nevada; Lander County, Nevada; Elko County, Nevada; Spring Creek CDP, Nevada. Population, Census, April 1, 2020. Accessed September 30, 2021 online at: <https://www.census.gov/quickfacts/fact/table/NV.springcreekcdpnevada,eurekacountynevada,landercountynevada,elkocountynevada,elkocitynevada/PST045219>
- United States Census Bureau (USCB). 2020c. Explore Census Data. Accessed August 1, 2020 online: <https://data.census.gov/cedsci/>.
- United States Environmental Protection Agency (USEPA). 1978. Protective Noise Levels Condensed Version of EPA Levels Document. November 1978.
- United States Environmental Protection Agency (USEPA). 2016. What Climate Change Means for Nevada. August 2016. Accessed January 18, 2022 online: <https://19january2017snapshot.epa.gov/sites/production/files/2016-09/documents/climate-change-nv.pdf>
- United States Environmental Protection Agency (USEPA). 2020a. Greenhouse Gas Equivalencies Calculator – Proposed Action. Accessed April 2, 2020 at <https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>
- United States Environmental Protection Agency (USEPA). 2020b. EJSCREEN: Environmental Justice Screening and Mapping Tool. EJSCREEN ACS 2013-2017 Summary Report for Census Block Groups 320079516001, 320079516002, 320110001001, 320150003001, 320150003002, 320150003003, 320150003004, and 320150003005. Accessed June 2020 online at: <https://www.epa.gov/ejscreen>
- United States Environmental Protection Agency (USEPA). 2020c. Environmental Justice Screening and Mapping Tool. EJSCREEN. Low Income Population (National Percentiles). Census Block Groups 320079516001, 320079516002, 320110001001, 320150003001, 320150003002, 320150003003, 320150003004, and 320150003005. Accessed September 2020 online at: <https://www.epa.gov/ejscreen>
- United States Fish and Wildlife Service (USFWS). 2017. Recommended Buffer Zones for Ground-based Human Activities around Nesting Sites of Golden Eagles in California and Nevada. United States Department of the Interior Fish and Wildlife Service, Pacific Southwest Region, Migratory Bird Program. December 2017.
- United States Fish and Wildlife Service (USFWS). 2020. Goldrush Project EIS-Cooperating Agency Data Review. Email from Genevieve Skora (USFWS) to Steve Morton (Stantec). May 12, 2020.

- United States Geological Survey (USGS). 2005. Southwest Regional GAP Analysis Project—Land Cover Descriptions. National Gap Analysis Program. RS/GIS Laboratory, College of Natural Resources, Utah State University.
- United States Geological Survey (USGS). 2011. Quaternary Fault and Fold Database of the United States, Fault number 1178, Simpson Park Mountains fault zone. Accessed online August 8, 2020 at: <https://earthquakes.usgs.gov/hazards/qfaults>
- United States Geological Survey (USGS). 2020a. Earthquake Hazards Program, Latest Earthquakes Interactive Map. Accessed online April 20, 2020 at: <https://earthquake.usgs.gov/earthquakes/map/>
- United States Geological Survey (USGS). 2020b. National Hydrography Dataset. Available online at: <https://www.usgs.gov/core-science-systems/ngp/national-hydrography/access-national-hydrography-products>
- University of Nevada Reno Extension (UNR). 2020a. Nevada Economic Assessment Report. Socioeconomic Baseline Report: Elko County. April 2020.
- University of Nevada Reno Extension (UNR). 2020b. Nevada Economic Assessment Report. Socioeconomic Baseline Report: Eureka County. April 2020.
- University of Nevada Reno Extension (UNR). 2020c. Nevada Economic Assessment Report. Socioeconomic Baseline Report: Lander County. April 2020.
- Western Biological. 2021. Cortez Mine District 2021 Raptor Survey Report. Prepared for Nevada Gold Mines LLC. August 2021.
- Western Regional Climate Center (WRCC). 2020. Period of Record Monthly Climate Summaries. Accessed April 23, 2020 at: <https://wrcc.dri.edu/>
- William Bee Ririe (WBR). 2020. William Bee Ririe Critical Access Hospital and Rural Health Eureka Clinic. Accessed December 2020 online at: <http://www.wbrhely.org/clinics/eureka.php>