

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

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DATE: December 2013

Environmental Assessment

Barrick Cortez Inc. (NVN-67575 [11-3A]) 2011 Amendment to Plan of Operations and Reclamation Permit Application Proposed North Waste Rock Facility Realignment/Rangeland Fence Addition/Stockpile Relocation/Ancillary Addition

File Number: NVN-067575

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Mount Lewis Field Office



BLM Mission Statement

The Bureau of Land Management is responsible for the stewardship of our public lands. It is committed to manage, protect, and improve these lands in a manner to serve the needs of the American people for all times.

Management is based upon the principles of multiple use and sustained yield of our nation's resources within a framework of environmental responsibility and scientific technology. These resources include recreation, rangelands, timber, minerals, watershed, fish and wildlife, wilderness, air and scenic, scientific, and cultural values.

Abbreviations and Acronyms

µg/m ³	micrograms per cubic meter
AAQS	Ambient Air Quality Standards
ACEC	Areas of Critical Environmental Concern
ACHP	Advisory Council on Historic Preservation
amsl	above mean sea level
APE	area of potential effect
APLIC	Avian Power Line Interaction Committee
AUM	Animal Unit Month
BCI	Barrick Cortez, Inc.
BLM	Bureau of Land Management
BMP	best management practice
CDP	Census Designated Place
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CGM	Cortez Gold Mine
CO ₂ e	carbon dioxide equivalent
CO	carbon monoxide
CR	County Road
dBA	decibels, A-weighted
DNA	Determination of NEPA Adequacy
E	east
EA	environmental assessment
EIS	environmental impact statement
EO	Executive Order
ESA	Endangered Species Act
FLPMA	Federal Land Policy and Management Act of 1976
GBE	Great Basin Ecology, Inc.
GHG	greenhouse gas
gpm	gallons per minute
H:V	horizontal:vertical
HA	Hydrographic Area
HAP	hazardous air pollutants
HFRA	Healthy Forest Restoration Act
I-80	Interstate 80

IPCC	Intergovernmental Panel on Climate Change
JBR	JBR Environmental Consultants, Inc.
KOP	key observation point
L _{eq}	equivalent sound level
LOS	level of service
N	North
NAAQS	National Ambient Air Quality Standards
NAC	Nevada Administrative Code
NAGPRA	Native American Graves Protection and Repatriation Act
NDEP	Nevada Division of Environmental Protection
NDETR	Nevada Department of Employment, Training, and Rehabilitation
NDOT	Nevada Department of Transportation
NDOW	Nevada Department of Wildlife
NDWR	Nevada Division of Water Resources
NEPA	National Environmental Policy Act
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NHPA	National Historic Preservation Act
NNHP	Nevada Natural Heritage Program
N ₂ O	nitrous oxides
NO _x	oxides of nitrogen
NPS	National Park Service
NRHP	National Register of Historic Places
NWRFF	North Waste Rock Facility
PA	Programmatic Agreement
PM ₁₀	particulate matter with an aerodynamic diameter of 10 microns or less
PM _{2.5}	particulate matter with an aerodynamic diameter of 2.5 microns or less
PoO Amendment	Amendment to Plan of Operations and Reclamation Permit Application
PPH	preliminary priority habitat
R	Range
RFFA	reasonably foreseeable future action
RMP	resource management plan
ROD	Record of Decision
ROW	right-of-way
SHPO	State Historic Preservation Officer
SO ₂	sulfur dioxide
SR	State Route

SRK	SRK Consulting
T	Township
tpy	tons per year
U.S.	United States
USEPA	United States Environmental Protection Agency
USFS	United States Forest Service
USFWS	U.S. Fish and Wildlife Service
UTM	Universal Transverse Mercator
vpd	vehicles per day
VRM	Visual Resources Management
WSA	wilderness study areas

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1.0 Introduction

1.1 Background

Barrick Cortez Inc. (BCI), as manager of the Cortez Joint Venture, currently operates gold mining and processing operations within the Cortez Gold Mines (CGM) Operations Area, which is located approximately 24 miles south of Beowawe in Lander and Eureka counties, Nevada (**Figure 1-1**). On July 29, 2011, BCI submitted the Barrick Cortez Inc. (NVN-067575 [11-3A]) 2011 Amendment to Plan of Operations and Reclamation Permit Application (2011 PoO Amendment) to the Bureau of Land Management (BLM) Mount Lewis Field Office, proposing modifications to existing operations. The 2011 PoO Amendment submittal was revised and submitted on December 12, 2012 (BCI 2012a). The 2011 PoO Amendment proposes modifications to the following activities (the Proposed Action):

Cortez Hills Complex

- Reconfiguration of the North Waste Rock Facility (NWRP), associated storm water diversions, and power distribution line route within an area previously authorized for waste rock, ancillary, and conveyor corridor disturbance
- Development of an oxide (mill-grade) ore stockpile on top of the reconfigured NWRP

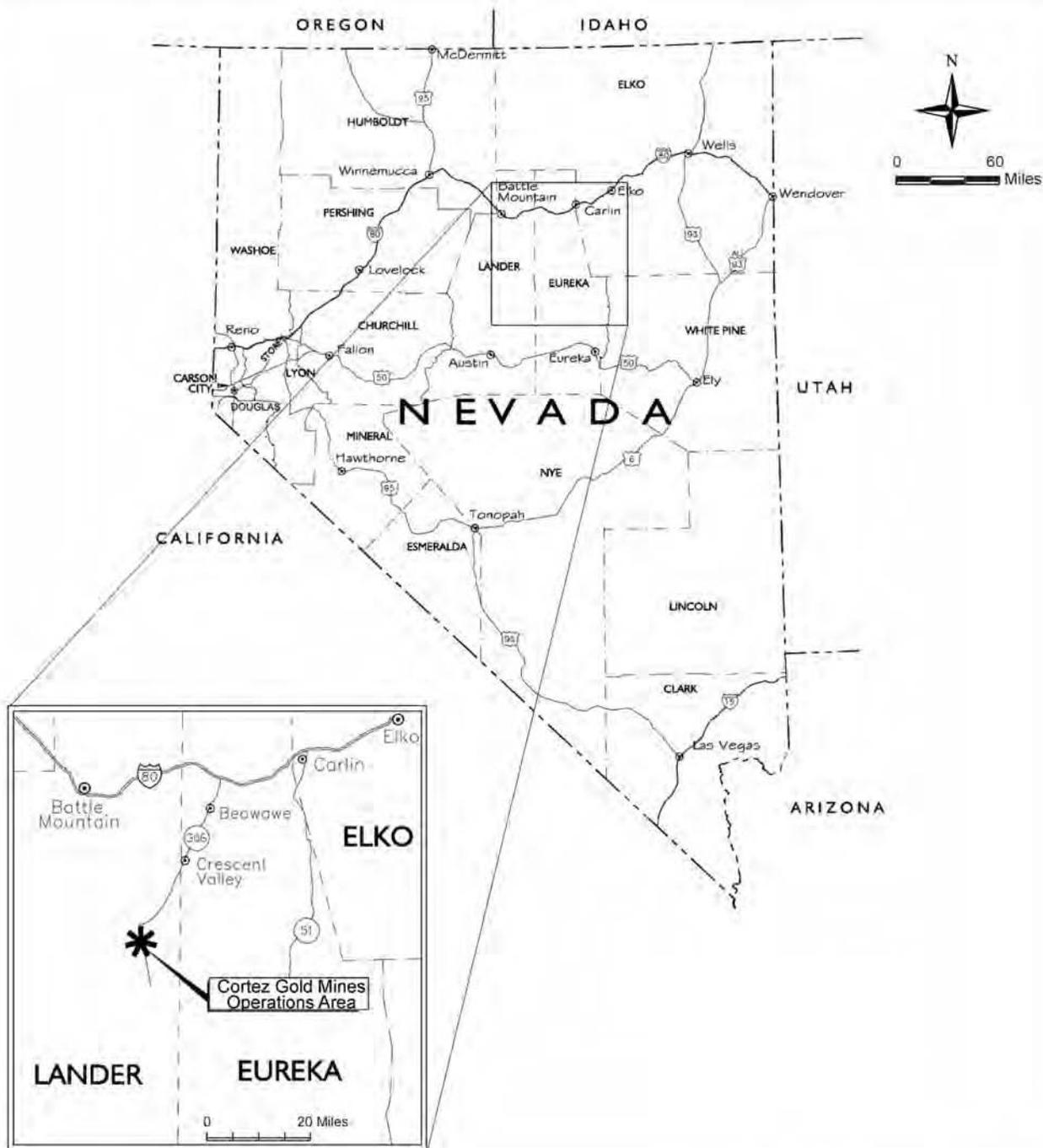
Pipeline Complex

- Relocation of 6 million tons of refractory ore from the stockpile at Pipeline to Barrick's Goldstrike Mill (Goldstrike) at the rate of approximately 800,000 tons per year (tpy) for approximately 8 years for subsequent processing
- Construction of ancillary facilities including a potable water well and associated water distribution pipeline and a bank of capacitors with transformer and associated power distribution line
- Installation of approximately 10 miles of rangeland fence adjacent to the previously relocated segment of County Road (CR) 225

Operations within the CGM Operations Area are located on public lands administered by the BLM and private lands owned by BCI. The proposed modifications within the CGM Operations Area would be located on BLM-administered land in Lander County within Township 27 North (T27N), Range 47 East (R47E), Sections 3, 10, and 25; T28N, R47E, Sections 15, 16, 21, 27, 28, 29, 30, and 34; and T27N, R48E, Section 30.

The proposed modifications would result in 41 acres of new surface disturbance at the Pipeline Complex and the reallocation of 98 acres of currently authorized disturbance at the Cortez Hills Complex. No modifications are proposed at the Cortez or Gold Acres complexes within the CGM Operations Area. With BLM approval of the 2011 PoO Amendment, the total approved disturbance area for operations within the CGM Operations Area would increase to 16,119 acres.

As required by the National Environmental Policy Act (NEPA), environmental impact statements (EISs) were prepared prior to the development of the Cortez/Gold Acres Project (BLM 1993), Cortez Pipeline Project (BLM 1996a), South Pipeline Project (*Amendment for the South Pipeline Project*) (BLM 2000), Pipeline/South Pipeline Pit Expansion (*Supplemental EIS for Pipeline/South Pipeline Pit Expansion Project*) (BLM 2004), and the Cortez Hills Expansion Project (BLM 2008a). A Supplemental EIS also was prepared for the Cortez Hills Expansion Project (BLM 2011a). In addition, an Environmental Assessment (EA) was prepared for the *Amendment to the Cortez Plan of Operations for the Underground Exploration Project and Modification to the Reclamation Permit (0217)* (BLM 2006a). Previous plans of operations



**2011 Plan of Operations
Amendment**

Figure 1-1
Project Vicinity



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and related amendments for mining operations at the CGM Operations Area are listed in Appendix 1 of the 2011 PoO Amendment (BCI 2012a).

Based on the proposed modifications in the CGM Operations Area as described in the 2011 PoO Amendment (BCI 2012a), the BLM has determined the need for an EA in compliance with NEPA. This EA was prepared in compliance with NEPA and other applicable laws and regulations. This EA tiers from the Cortez Hills Expansion Project Final EIS (BLM 2008a), which addressed potential impacts to most of the disturbance areas proposed in the 2011 PoO Amendment (BCI 2012a).

This EA describes the proposed modifications (Proposed Action) and the No Action Alternative. It also describes the affected environment and the environmental consequences of implementing the Proposed Action or the No Action Alternative.

1.2 Purpose of and Need for Action

1.2.1 BCI's Purpose

The purpose of BCI's Proposed Action is to provide for:

- A shorter haul from the existing Cortez Hills Pit to a mill-grade ore stockpile by locating the stockpile on the reconfigured NWRP;
- Shipment of additional refractory ore to Goldstrike for processing;
- A replacement source of potable water;
- Installation of capacitors to regulate power surges; and
- Construction of a rangeland fence along CR 225 to reduce the potential of livestock and large wildlife/vehicle collisions.

1.2.2 BLM's Purpose and Need

The BLM's purpose is to respond to BCI's proposed modifications in the CGM Operations Area as described in the 2011 PoO Amendment (BCI 2012a) and summarized in this EA. The BLM's need for the action is established by the agency's responsibility under Section 302 of the Federal Land Policy and Management Act of 1976 (FLPMA) and the BLM Surface Management Regulations at 43 Code of Federal Regulations (CFR) 3809, to respond to an exploration or mining plan of operations and to take any action necessary to prevent unnecessary or undue degradation of public lands as a result of actions taken to prospect, explore, assess, develop, and process locatable mineral resources on public lands.

1.3 Decision to be Made

The BLM's decision relative to this EA will consider the following: 1) approval of the 2011 PoO Amendment to authorize the proposed activities without modifications or additional mitigation measures; 2) approval of the 2011 PoO Amendment with additional mitigation measures that the BLM deems necessary; or 3) denial of the proposed 2011 PoO Amendment and associated activities if the BLM determines that the proposal does not comply with the 3809 regulations.

1.4 BLM Responsibilities and Relationship to BLM and Non-BLM Policies, Plans, and Programs and Land Use Plan Conformance

The BLM is responsible for the content of this EA, which was prepared in conformance with the policy guidance provided in the updated BLM NEPA Handbook H-1790-1 (BLM 2008b), the Council on Environmental Quality (CEQ) regulations (40 CFR 1500), and agency guidance on the analysis of cumulative impacts.

The Cortez Hills Expansion Project Final EIS (BLM 2008a) identified the policies, plans, and programs applicable to the CGM Operations Area, which also apply to the proposed modifications in the 2011 PoO Amendment (BCI 2012a). The Proposed Action would be in conformance with these policies, plans, and programs, including the Shoshone-Eureka Resource Management Plan (RMP) (BLM 1986a) and the Lander County Policy Plan for Federally Administered Lands (Lander County 2005).

1.5 Issues

The specific environmental issues for this EA (as identified below) are the same as identified in the Cortez Hills Expansion Project Final EIS (BLM 2008a), from which this document tiers.

- Geology and Minerals
- Water Resources, including Geochemistry
- Soils and Reclamation
- Vegetation
- Wildlife and Fisheries Resources
- Range Resources
- Paleontological Resources
- Cultural Resources
- Native American Traditional Values
- Air Quality
- Land Use and Access
- Recreation and Wilderness
- Social and Economic Values
- Environmental Justice
- Visual Resources
- Noise
- Hazardous Materials and Solid Waste

2.0 Alternatives Including the Proposed Action

2.1 Introduction

This chapter describes the proposed modifications to existing operations in the CGM Operations Area (Proposed Action) as described by BCI in the 2011 PoO Amendment (BCI 2012a), inclusive of supporting documents, and supplemental information provided by BCI (2012b, 2013a), in Section 2.2, as well as the No Action Alternative in Section 2.3. A summary of the past, present, and reasonably foreseeable future actions (RFFAs) considered in the cumulative impact assessment is included in Section 2.4.

2.2 Proposed Action

Under the Proposed Action, the following modifications would be made to existing operations at the Cortez Hills and Pipeline complexes within the CGM Operations Area. All other operations within the CGM Operations Area would continue under the terms of current permits and approvals as authorized by the BLM and State of Nevada. Currently authorized facilities within the CGM Operations Area are presented in **Figure 2-1**; proposed modifications are presented in **Figure 2-2**.

Cortez Hills Complex:

- Reconfiguration of the NWRP, associated storm water diversions, and power distribution line reroute
- Development of a 14-million-ton-capacity mill-grade ore stockpile on top of the NWRP

Pipeline Complex:

- Relocation of 6 million tons of refractory ore from the stockpile at Pipeline to Goldstrike for subsequent processing
- Construction of additional ancillary facilities (i.e., replacement potable water well and pipeline; bank of capacitors, power distribution line, and transformer)
- Installation of rangeland fence adjacent to relocated CR 225

The proposed modifications would result in 41 acres of new surface disturbance at the Pipeline Complex and the reallocation of use on 98 acres of currently authorized disturbance at the Cortez Hills Complex. The proposed modifications would occur on BLM-administered lands located within the currently authorized plan of operations boundary (NVN-067575 [11-3A]). Under the Proposed Action, the total disturbance area for operations within the CGM Operations Area would increase to 16,119 acres.

No change in the life of the operations within the CGM Operations Area would occur under the Proposed Action. No increase in BCI's current work force at the CGM Operations Area would be required; the proposed increase in refractory ore shipments would be handled by contract haulers. The additional refractory ore processing at Goldstrike would extend the employment period for the current work force at Goldstrike by approximately 11 months.

2.2.1 Proposed Modifications at the Cortez Hills Complex

The proposed oxide (mill-grade) ore stockpile would provide for a shorter ore haul distance from the existing Cortez Hills Pit. The natural terrain near the primary gyratory crusher, which is located north of the Cortez Hills Pit, is too steep for an ore stockpile. Therefore, BCI proposes to reconfigure the NWRP within an area currently authorized for disturbance to level the steep terrain in this area. The stockpile would be located on the reconfigured NWRP.

2.2.1.1 North Waste Rock Facility Reconfiguration

The currently authorized NWRF has not been constructed. Under the Proposed Action, the facility would be reconfigured, with the northern portion of the currently authorized disturbance footprint shifted to the southwest to an area currently authorized for ancillary disturbance (**Figure 2-2**). The capacity (up to 185 million tons from the currently authorized Cortez Hills Pit), maximum crest height (5,850 feet above mean sea level [amsl]), and operational and post-reclamation slope angles (1.3 horizontal [H] to 1 vertical [V] and 2.5H:1V, respectively) would be the same as for the currently authorized NWRF.

No new disturbance is proposed for the modified NWRF. However, to facilitate the shift in the disturbance footprint, 6 acres of currently authorized disturbance for the conveyor corridor and 92 acres of currently authorized ancillary disturbance would be reallocated to waste rock facility disturbance; 98 acres of the currently authorized waste rock facility disturbance footprint would be reallocated to ancillary disturbance (**Figure 2-2**). As a result, the overall disturbance area for this modified facility would be the same as for the currently authorized facility (257 acres).

The modified NWRF would be engineered, constructed, and reclaimed in the same manner as the currently authorized waste rock facilities within the CGM Operations Area to ensure long-term stability, provide for effective reclamation, and reduce the overall visual impact. Consistent with the approach for the currently permitted facilities, mined waste rock would be hauled to the NWRF and placed by end-dumping from the top of the active dump faces, resulting in working faces at the angle of repose. The modified waste rock facility would be constructed in 100- to 200-foot lifts. In addition, the margins of the waste rock area would be constructed such that variable topography would result during final grading, thereby providing a more natural post-mining landscape.

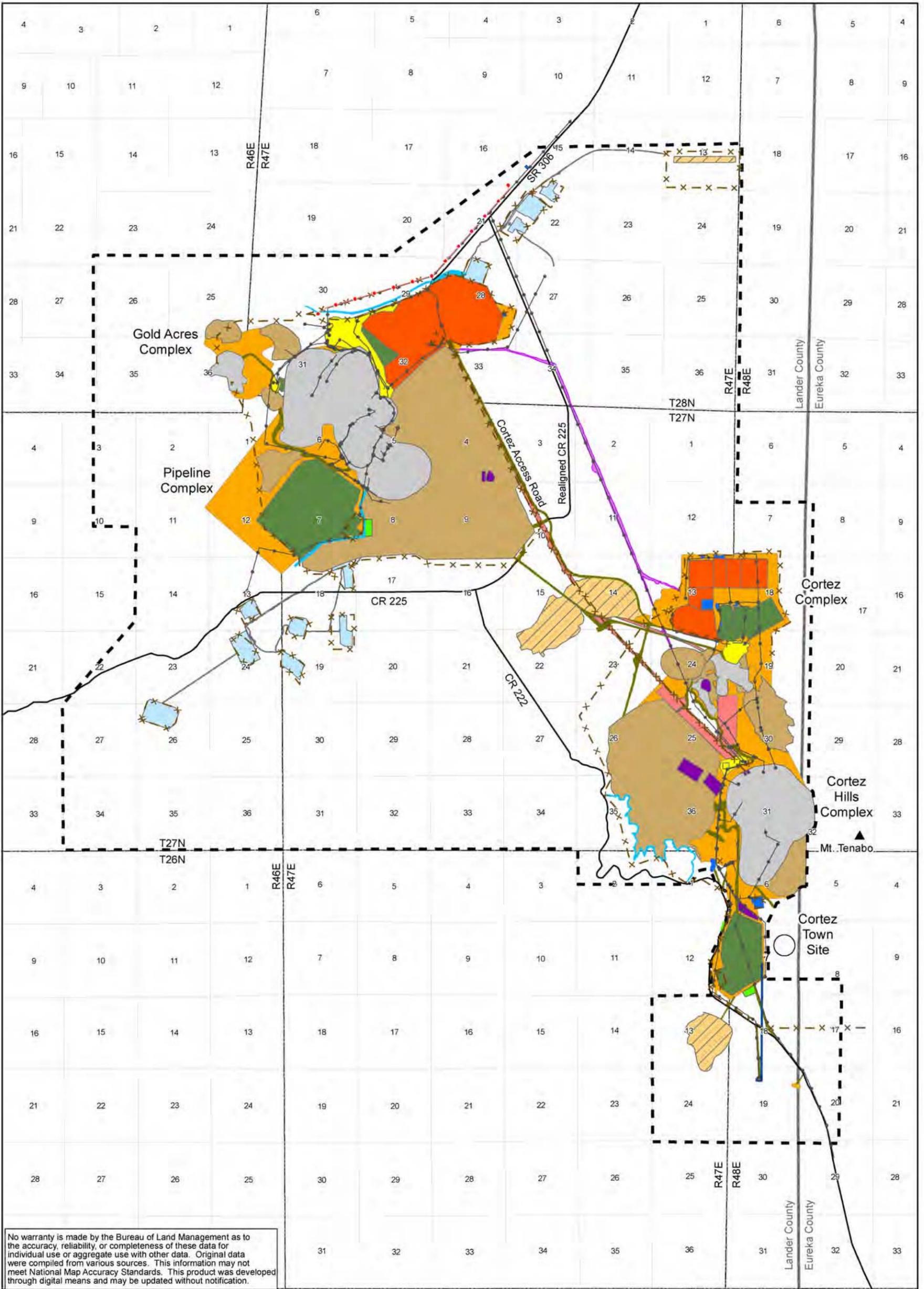
As required by Nevada Division of Environmental Protection (NDEP), quarterly samples of distinct waste rock units currently are collected from the active mine pits and subjected to meteoric water mobility and acid base accounting tests. Based on the results, any localized areas of acid generating waste rock are placed internal to the waste rock disposal facilities and encapsulated or blended with acid neutralizing waste rock prior to placement. These procedures also would be implemented for the modified NWRF in accordance with the existing Integrated Monitoring Plan (CGM and SRK Consulting [SRK] 2008).

To control erosion and for long-term stability of the waste rock facility, appropriate storm water controls (e.g., storm water diversion ditches) would be constructed and the waste rock piles appropriately graded to control storm water runoff and runoff. Engineered storm water diversions constructed upgradient of the facility, as needed, would be designed to accommodate flow from a 24-hour/100-year storm event and would route the flow to the drainages downgradient of the facility (**Figure 2-3**). In addition, the waste rock facility would be visually monitored following spring snowmelt and intense rain events to ensure that drainage and sediment control measures are effective and operating properly. Non-point source runoff from the waste rock facilities would flow directly to existing drainages.

To accommodate the proposed NWRF reconfiguration, the existing transmission line for the permitted operations would be rerouted within the previously authorized disturbance area (**Figure 2-2**). The power distribution line reroute would be approximately 400 feet shorter than the current alignment. This power distribution line is not part of the Nevada Energy power line right-of-way (ROW) and would be removed during mine closure and final reclamation.

2.2.1.2 New Ore Stockpile

Under the Proposed Action, a mill-grade ore stockpile would be placed on top of, and within the footprint and maximum crest elevation (5,850 feet amsl) of, the reconfigured NWRF (**Figures 2-2**), as described in Section 2.2.1. A schematic of the proposed stockpile is presented in **Figure 2-3**. The stockpile would



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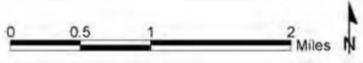
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| <ul style="list-style-type: none"> ■ Cortez Gold Mine Operations Area Boundary ■ Ancillary Facilities ■ Borrow Areas ■ Conveyor Corridor ■ Growth Media Stockpile ■ Haul Road ■ Heap Leach Facilities | <ul style="list-style-type: none"> ■ Infiltration Facilities ■ Open Pits ■ Process Facilities ■ Ore Stockpiles ■ Tailings Facilities ■ Utilities ■ Waste Rock Facilities ■ Water Storage Reservoirs | <ul style="list-style-type: none"> — Diversion Channel — Powerline × Rangeland Fence — Proposed Power Distribution Line — New Water Pipeline — Water Pipeline — Road |
|--|---|---|

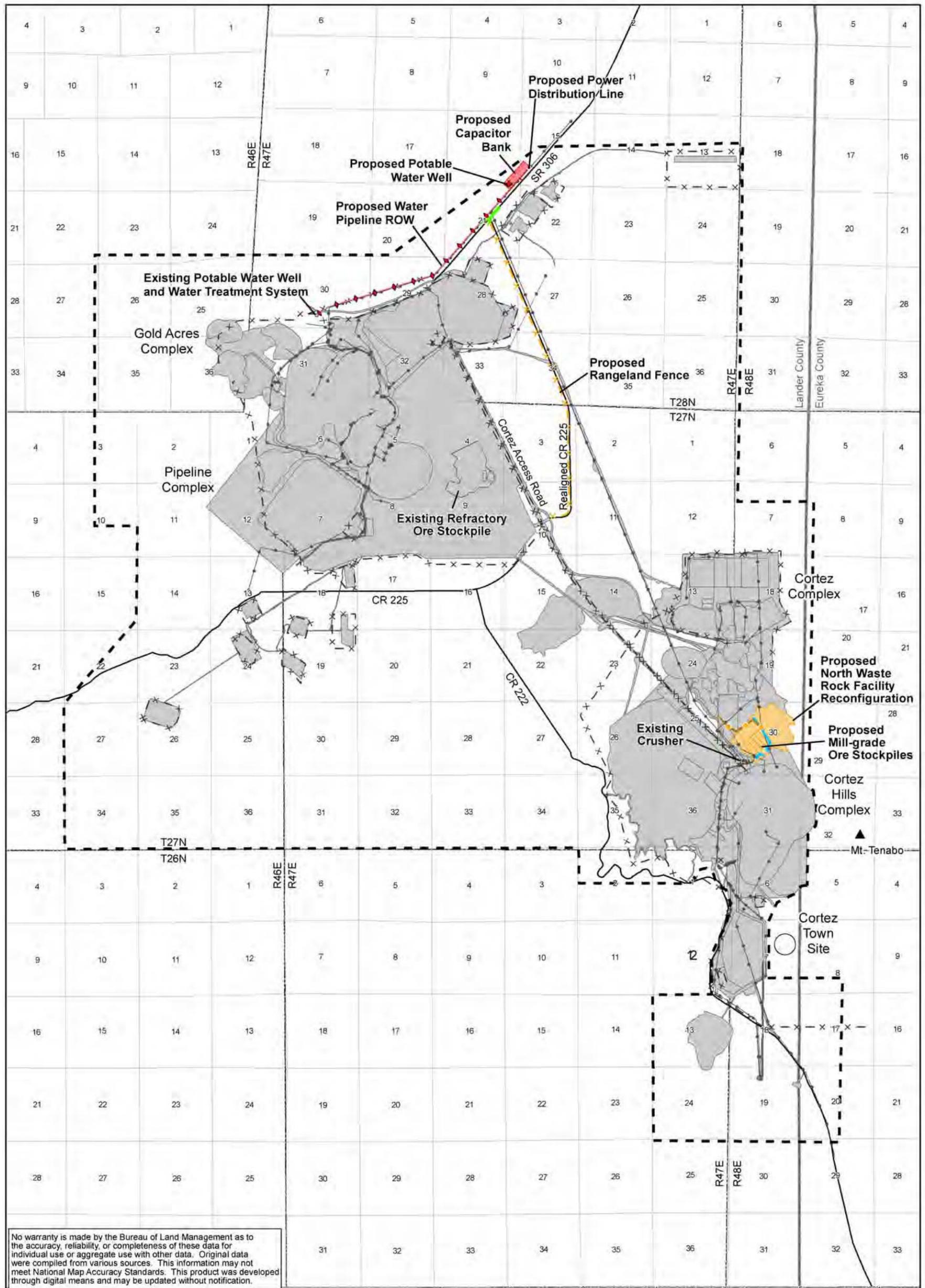


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2011 Plan of Operations Amendment

Figure 2-1
 No Action Alternative -
 Currently Authorized Facilities





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Legend

- Cortez Gold Mines Operations Area Boundary
- Proposed New Disturbance Areas
- Proposed Facility Modifications within Previously Authorized Disturbance Areas
- Currently Authorized Disturbance
- Proposed Potable Water Well
- Proposed Diversion Channel
- Proposed Power Distribution Line
- Proposed Water Pipeline
- Power Line (reconfiguration)
- Proposed Rangeland Fence
- Currently Authorized Fence
- Currently Authorized Power Line
- Fence

Note: Proposed rangeland fencing would be installed along both sides of the previously realigned segment of CR 225.

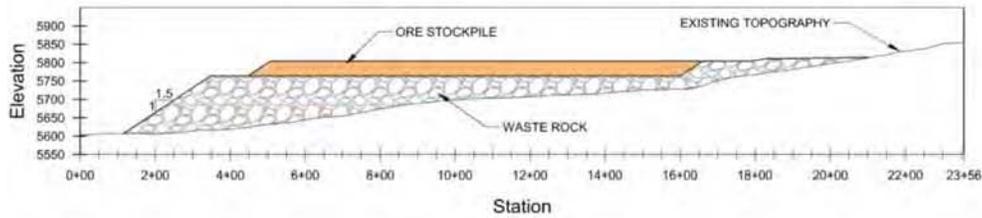
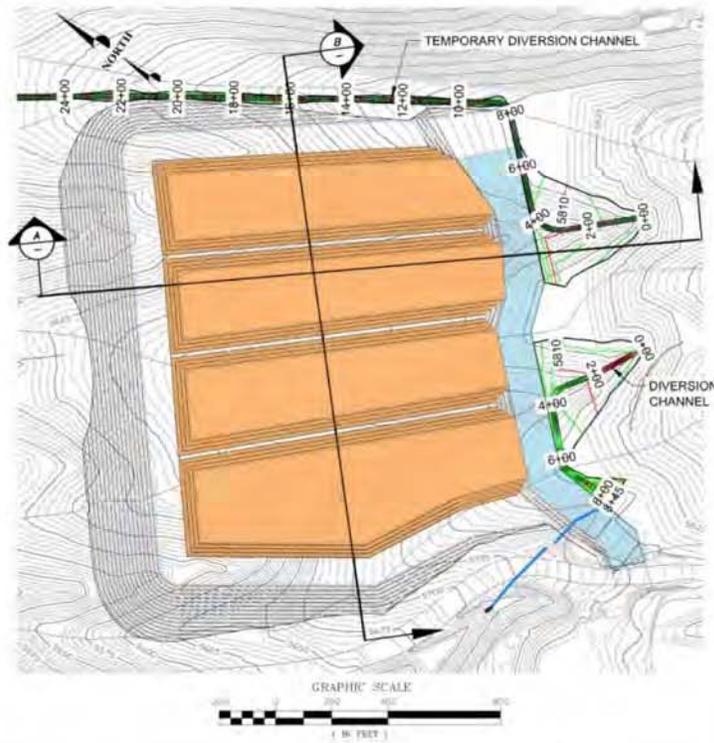


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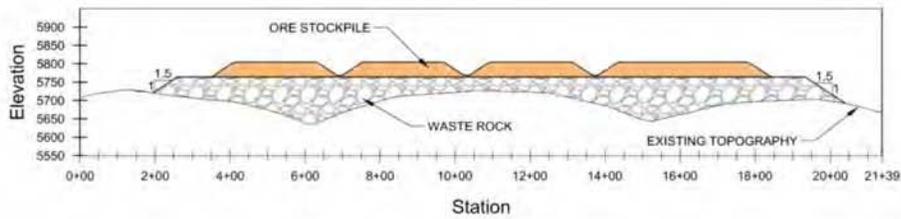
2011 Plan of Operations Amendment

Figure 2-2
 Proposed Action





A WRF SECTION
1" = 300'



B WRF SECTION
1" = 300'

**2011 Plan of Operations
Amendment**

Figure 2-3

Modified NWRP and
Ore Stockpile

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accommodate up to 14 million tons of mill-grade ore from the existing Cortez Hills Pit, in lieu of transport to the existing mill-grade ore stockpile on the existing Canyon Waste Rock Facility. It would be constructed in 50- to 100-foot lifts, with a maximum height of 300 feet. Runoff from the ore stockpile would be conveyed via storm water diversion ditches to adjacent unnamed drainages (**Figure 2-3**). The ore from this stockpile ultimately would be transported to the existing Pipeline Mill for on site processing, as currently authorized.

2.2.2 Proposed Modifications at the Pipeline Complex

2.2.2.1 Refractory Ore Relocation to Goldstrike

Refractory ore mined in the CGM Operations Area currently is, and would continue to be, trucked off site at a rate of approximately 400,000 tpy through 2021 for processing at Goldstrike under an ore sales agreement and current authorizations. Under the Proposed Action, approximately 6 million additional tons of refractory ore stockpiled at the Pipeline Waste Rock Facility would be relocated to Goldstrike for subsequent processing. The additional ore would be shipped incrementally at a rate of approximately 800,000 additional tpy over a period of 8 years (through approximately 2031 [BLM 2009]). The refractory ore from the CGM Operations Area, which has a higher gold content than the Goldstrike ore, temporarily would displace a portion of the current roaster throughput at Goldstrike. The additional ore would extend processing at the Goldstrike Mill by approximately 11 months. No increase in the currently authorized roaster throughput rate or the permitted tailings facility capacity would be required to accommodate the additional material.

The Goldstrike Mill is located on private land approximately 84 miles north of the CGM Operations Area. As currently done under existing operations, the refractory ore would be shipped by 35-ton trucks via State Route (SR) 306, Interstate 80 (I-80), SR 766, and the respective mine access roads. There would be approximately 68 additional daily round-trip truck trips associated with the shipment of the additional ore to Goldstrike.

2.2.2.2 Additional Ancillary Facilities

Proposed additional ancillary facilities include: 1) a replacement potable water well and associated water pipeline and 2) a bank of capacitors with a transformer and associated power distribution line. These facilities would result in 41 acres of new surface disturbance.

The proposed potable water well would be installed just northeast of the Pipeline Complex on the west side of SR 306 (**Figure 2-2**). The well would connect via an approximately 3.3-mile-long new underground pipeline to an existing underground water distribution pipeline that feeds the existing water treatment system near the Pipeline Complex administration building. The well would be powered by the existing electrical distribution system. Based on a design capacity of 16 gallons per minute (gpm), up to approximately 8.5 million gallons of water would be pumped per year.

A bank of capacitors is proposed for installation just north of the Pipeline Complex on the west side of SR 306 to support the voltage on Nevada Energy's high voltage distribution system (**Figure 2-2**). The location is preliminary and may change based on field conditions and Nevada Energy's siting requirements. Chain link security fencing (maximum height of 12 feet) would be installed around the site. The installation also would include a transformer and an approximately 650-foot-long, 120-kilovolt power distribution line (either above or below ground) that would be constructed to connect the proposed facility to the mine's existing power supply system. The installation would boost voltage during transient sags on the power system, assist in voltage regulation on the system, help to reduce line losses making the system more efficient in power delivery, and help postpone investment in new transmission facilities (which could include an additional power distribution line, a new power distribution line operating at a higher voltage, or other necessary measures) to serve mine loads. The surface of the fenced area would be covered with gravel and sprayed with a BLM-approved herbicide to prevent vegetative growth.

2.2.2.3 Rangeland Fence

To minimize livestock and large wildlife/vehicle collisions and livestock mortalities, approximately 10 miles of rangeland fencing would be installed along the relocated portion of CR 225 to the east of the Pipeline Complex (**Figure 2-2**). Gates and/or cattle guards would be included to provide for continued grazing access to the north and west of CR 225 (BCI 2013c). The proposed fencing would be installed on either side of the road within the existing road ROW disturbance and would tie into the existing fence along SR 306. BLM-approved four-strand range fencing (three stands barbwire and a smooth bottom strand) would be used for the installation. The fence would be maintained by BCI throughout mine operations and reclamation and turned over to the BLM following closure.

2.2.3 Hazardous Materials and Waste Management

Procedures for reagent, fuel, and lubricant transportation and storage; waste management; and spill prevention and emergency response programs currently are in place and implemented for the existing operations in the CGM Operations Area (Barrick Gold of North America 2013; JBR Environmental Consultants, Inc. [JBR] 2006a) and for existing operations at Goldstrike (Barrick 2013; JBR 2006b). These procedures and plans would continue to be implemented under the Proposed Action.

Under the Proposed Action, there would be no change in the current fuel or reagent use at operations in the CGM Operations Area. There also would be no change in the types or annual quantities of hazardous materials (e.g., reagents, fuels, lubricants) currently used at Goldstrike; however, the period of use would increase to facilitate the proposed 11 months of additional ore processing. Transportation and handling of chemical reagents currently is, and would continue to be, conducted by licensed carriers and properly trained workers in accordance with applicable regulations. Material would continue to be transported to Goldstrike via I-80 and SR 766 to the mine access road.

The majority of the hazardous materials used at the Pipeline Complex and at Goldstrike for the proposed additional transport and processing of refractory ore, respectively, would be spent or consumed on site. Materials that are not spent or consumed (e.g., petroleum oils, antifreeze, etc.) currently are, and would continue to be, recycled, to the extent possible, or disposed of off site in an approved depository in accordance with all applicable federal and state regulations.

2.2.4 Applicant-committed Environmental Protection Measures

BCI's committed environmental protection measures for operations in the CGM Operations Area were identified in the Cortez Hills Expansion Project Final EIS (BLM 2008a) and Plan of Operations (CGM and SRK 2008) and incorporated into the Cortez Hills Expansion Project Record of Decision and Plan of Operations Amendment Approval (ROD) (BLM 2008c). Additional BLM-stipulated mitigation measures also were identified in the Final EIS and incorporated into the ROD. All of these measures currently are, and would continue to be, implemented as standard operating procedures to mitigate potential impacts to environmental and human resources to prevent undue and unnecessary degradation of the environment. The measures that specifically would apply to construction, operation, and reclamation of the currently proposed project modifications are identified below.

2.2.4.1 Water Resources

- Selective placement of waste rock, as needed, and routine monitoring of the waste rock disposal facilities during operations would be implemented to reduce the potential for acid rock drainage that does not meet applicable Nevada water quality standards.
- To limit erosion and reduce sediment transport from project disturbance areas, erosion control measures as outlined in the project's Storm Water Pollution Prevention Plan and Reclamation Plan would be installed, as needed, and maintained. To further reduce erosion potential, storm water diversions would be installed around project facilities, as needed, to divert storm water 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.

- Groundwater monitoring would be conducted in accordance with the currently approved Integrated Monitoring Plan to ensure compliance with permit criteria and to provide for early identification of potential impacts. If any monitoring wells go dry due to dewatering activities, the monitoring program would be re-evaluated in coordination with the NDEP.

2.2.4.2 Soils, Vegetation, and Invasive and Non-native Plant Species

- To minimize impacts to soils and provide for re-establishment of vegetation, suitable growth media would 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 disposal facilities).
- Best management practices (BMPs) (BCI 2013e) would be used to limit erosion from project facilities and disturbance areas during and following construction and operations. These practices may include, but would not be limited to, installation of storm water diversions to route water around disturbance areas and project facilities and the placement of erosion control devices (e.g., silt fences, staked weed-free straw bales, riprap, etc.). To ensure long-term erosion control, all sediment and erosion control measures would be inspected periodically, and repairs would be performed, as needed.
- Prior to the initiation of ground-disturbing activities in any unsurveyed areas, BCI would 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 would be conducted for the appropriate species prior to mine development in order to determine the extent of these populations. A survey report, which would include survey methods, results, summary, a map illustrating the areas surveyed, and any populations observed during the survey, would be submitted to the BLM. After BLM's review of the report, BCI would coordinate with the BLM to develop appropriate mitigation measures.
- Revegetation of disturbance areas would 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 non-native species in disturbance areas, and facilitate post-mining land uses. Following construction activities, areas such as cut and fill embankments and growth media stockpiles would be seeded. Concurrent reclamation would be conducted to the extent practical to accelerate revegetation of disturbance areas. Areas undergoing concurrent reclamation would be fenced, as necessary, to minimize livestock and wildlife access until vegetation has been re-established. All sediment and erosion control measures and revegetated areas would be inspected periodically to ensure long-term erosion control and successful reclamation.
- To minimize the introduction and spread of noxious weeds in project-related disturbance areas, the currently approved Noxious Weed Management Plan (SRK 2005) would be implemented. The plan outlines procedures for the prevention, monitoring, and treatment of noxious weed infestations. The results of the monitoring program would provide the basis for updating the plan, if needed.
- Certified weed-free seed mixes would be used for reclamation.
- Implementation of the project's fire control plan would minimize potential fire-related impacts to vegetation.

2.2.4.3 Wildlife, including Special Status Species

- Implementation of the Reclamation Plan would minimize habitat impacts for wildlife species. Implementation of the plan also would minimize impacts to range resources through the re-establishment of forage.
- The 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 (Avian Power Line Interaction Committee [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 outline 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 United States [U.S.] Fish and Wildlife Service [USFWS] 2005) would be incorporated, as applicable.
- To protect nesting birds, removal of migratory bird habitat on currently undisturbed lands in the proposed disturbance areas would be avoided to the extent possible between March 1 and July 31. Should removal of habitat be required during this period, BCI would coordinate with the BLM and Nevada Department of Wildlife (NDOW) to conduct breeding bird surveys and implement appropriate mitigation, such as buffer zones around occupied nests, as needed.

2.2.4.4 Paleontological Resources

- If vertebrate fossils are discovered during construction, operation, or reclamation, construction activities would be halted in the area of the discovery and BCI would contact the BLM Authorized Officer. The BLM Authorized Officer would evaluate the discovery within 5 working days of being notified. If the discovered paleontological resource is determined significant, appropriate measures would be developed to mitigate potential adverse effects. Construction activities would not resume until a notice to proceed is granted by the BLM Authorized Officer.

2.2.4.5 Cultural Resources

- If previously undocumented cultural resource sites are discovered during construction of the mine facilities, construction would be halted in the area of the discovery, and the BLM Authorized Officer would be contacted to evaluate the finding. If the site is eligible to the National Register of Historic Places (NRHP), impacts would be mitigated through avoidance or an appropriate data recovery program developed pursuant to the Programmatic Agreement (PA) (effective October 20, 2005) among the BLM, Nevada State Historic Preservation Officer (SHPO), and BCI.
- BCI would train employees and contractors in their responsibilities to protect cultural resources and enforce BCI's policy against off-road cross-country travel and the removal of artifacts.

2.2.4.6 Native American Traditional Values

- Formally trained Western Shoshone observers would be provided the opportunity to be present during project-related construction activities (i.e., new surface disturbance) and during any data recovery (i.e., archaeological excavation) within the project boundary.

2.2.4.7 Air Quality

- 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 (BCI 2013e) as approved by the NDEP Bureau of Air Pollution Control, currently are, and would continue to be, implemented.

- Temporary disturbance areas (e.g., growth media stockpiles, cut and fill embankments, etc.) would be seeded with an interim seed mix, and concurrent reclamation would be implemented on completed portions of the waste rock facilities, thereby minimizing fugitive dust emissions.

2.2.4.8 Visual Resources

- During operations, the margins of the waste rock facilities would be constructed to provide for variable topography during final regrading, thereby providing a more natural post-mining landscape.
- Concurrent reclamation would be implemented to the extent possible.

2.2.5 Reclamation

BCI's currently authorized Reclamation Plan for the CGM Operations Area, as incorporated into the existing Plan of Operations (BCI 2010, revised 2011), currently is, and would continue to be, implemented at the site. Currently authorized reclamation procedures that specifically would apply to the proposed project modifications are summarized below.

2.2.5.1 Reclamation Schedule

Revegetation of disturbance areas would be conducted as soon as practical to reduce the potential for wind and water erosion. Following construction activities, areas such as cut and fill embankments and growth media stockpiles would be seeded. Concurrent waste rock facility reclamation would occur during the life of the mine when practical and safe and would include recontouring and revegetating the completed sections of the waste rock facilities incrementally during operations. Upon completion of mining, final waste rock facility reclamation would be completed pursuant to the final closure plan and schedule that would be submitted to the BLM and NDEP for approval. The detailed closure plan would be prepared at least 2 years prior to the anticipated closure date (Nevada Administrative Code [NAC] 445A.447). The closure plan would conform with the Water Pollution Control regulations in effect at the time of closure.

2.2.5.2 Post-mining Land Uses and Reclamation Goals

Post-mining land uses (i.e., livestock grazing, wildlife habitat, and recreation) and reclamation goals would be the same as described in Section 2.4.12.2 of the Cortez Hills Expansion Project Final EIS (BLM 2008a).

2.2.5.3 Growth Media Stockpiling and Use

Suitable growth media would be salvaged during development of the NWRF for subsequent use in reclamation. Suitable alluvial material from the open pits also would be salvaged as growth media to supplement, as needed, growth media requirements for the NWRF and for final reclamation of other disturbance areas. Growth media would be placed in stockpiles within the proposed disturbance area (i.e., ancillary disturbance area or completed portions of the waste rock facilities) and would be located such that mining operations would not disturb them. To minimize wind and water erosion, the stockpiles would be recontoured to slopes of 2.5H:1V and seeded with an interim seed mix (**Table 2-1**). Diversion channels and/or berms would be constructed around the stockpiles, as needed, to prevent erosion from overland runoff. BMPs (e.g., silt fences or staked weed-free straw bales) also would be used, as necessary, to control sediment transport (BCI 2013e). Alternately, the growth media may be transported to, and redistributed on, portions of the NWRF undergoing concurrent reclamation. In addition, where waste rock facilities would be developed on slopes, available soil may be salvaged by dozer pushing the soil downhill prior to waste rock placement. The salvaged soil would be used to construct berm stockpiles at the toe of the waste rock facility, thereby preventing waste rock from scattering downhill during placement. Following final regrading of the waste rock, the growth media berm would be hauled up onto the reshaped waste rock facility for placement and spreading. The growth media replacement

depth for the NWRF would be a minimum of 6 inches. Ancillary facility disturbance areas also would be covered with growth media and revegetated.

Table 2-1 Interim Reclamation Seed Mix

Common Name	Scientific Name	Application Rate ¹ (pounds pure-live-seed per acre)
Alfalfa	<i>Medicago sativa</i>	1.0
Crested wheatgrass	<i>Agropyron cristatum</i>	1.0
Total Application Rate		2.0

¹ Application rate is for broadcast seeding.

Following placement of growth media, BMPs for erosion control (e.g., silt fences or staked weed-free straw bales) would be installed and maintained to minimize erosion from the NWRF until vegetation has been re-established. To further reduce erosion of growth media from the slopes of the facility, benches would be constructed every 100 to 200 vertical feet. All sediment and erosion control measures and revegetated areas would be inspected periodically to ensure long-term erosion control and successful reclamation.

2.2.5.4 Seed Mixes

Prior to seeding, disturbance areas would be recontoured, surfaces would be ripped or scarified (where conditions warrant), and growth media would be redistributed. Following the placement of growth media, the final surface would be contour scarified (as needed) to promote water retention, reduce erosion, and prepare the final seedbed. Seedbed preparation and seeding would be conducted in the fall to take advantage of winter and spring moisture.

Seeding would be conducted using a rangeland drill, a broadcast seeder and harrow, or hydroseeder depending on site accessibility. The seed mixes presented in **Tables 2-2** and **2-3** were developed and approved by the BLM (2008a,c) for use in the CGM Operations Area. The seed mixes are based on the species' effectiveness in providing erosion protection, the ability to grow within the constraints of the low annual precipitation experienced in the region, the species' suitability for site aspect, and the site elevation and soil type (BLM 2008a). Modification to the seed mixes, if needed, would be made in coordination with the BLM.

In addition to seeding the waste rock facilities, BCI would evaluate the planting of piñon pine seedlings in suitable areas as part of the reclamation program. Piñon pines are the dominant tree species in the Cortez Hills Complex area. The planting of seedlings could help accelerate re-establishment of the species in mine-related disturbance areas.

2.2.5.5 Noxious Weed Management

BCI's authorized Noxious Weed Management Program currently is, and would continue to be, implemented at the site as a property-wide program. The plan contains a risk assessment, management strategies, provisions for annual monitoring of mine facilities, and treatment evaluation and includes provisions for treatment. The results from annual monitoring would provide the basis for updating the plan and developing annual treatment programs. Weed control practices would be implemented in coordination with the BLM and Lander County Conservation District to limit the spread of noxious weeds in the project-related disturbance areas and to ensure successful reclamation.

Table 2-2 Reclamation Seed Mix for Elevations below 5,500 feet amsl

Common Name	Scientific Name	Application Rate ¹ (pounds pure-live-seed per acre)
Shrub Species (use four of the following shrubs at the rates identified)		
Four-winged saltbush	<i>Atriplex canescens</i>	4.0
Shadscale	<i>Atriplex confertifolia</i>	4.0
Winterfat	<i>Ceratoides lanata</i>	4.0
Forage kochia	<i>Kochia prostrata</i>	0.5
Nevada Mormon tea	<i>Ephedra nevadensis</i>	10.0
Spiny hopsage	<i>Grayia spinosa</i>	2.0
Douglas rabbitbrush	<i>Chrysothamnus viscidiflorus</i>	0.5
Forb Species (use two of the following forbs at the rates identified)		
Scarlet globemallow	<i>Sphaeralcea coccinea</i>	0.50
Palmer penstemon	<i>Penstemon palmeri</i>	0.25
Lewis flax	<i>Linum lewisii</i>	0.75
Grass Species (use four of the following grasses at the rates identified)		
Crested wheatgrass	<i>Agropyron cristatum</i>	1.0
Indian ricegrass	<i>Oryzopsis hymenoides</i>	1.0
Great Basin wildrye	<i>Elymus cinereus</i>	1.0
Bottlebrush squirreltail	<i>Sitanion hystrix</i>	1.0
Inland saltgrass	<i>Distichlis spicata stricta</i>	0.5
Alkali sacaton	<i>Sporobolus airoides</i>	0.1
Russian wildrye	<i>Elymus junceus</i>	1.0
Total Average Application Rate ²		18.1

¹ Drill seeding rates are provided. Rates would be doubled for broadcast seeding, if used.

² Total average application rate as identified in the Cortez Hills Expansion Project Final EIS (BLM 2008a).

Note: If seed mix and application rates need to be modified as a result of limited species availability, poor seed quality, and/or the results of concurrent reclamation and revegetation test plots, the modifications would be undertaken with the concurrence of the BLM.

Table 2-3 Reclamation Seed Mix for Elevations between 5,500 and 7,500 feet amsl

Common Name	Scientific Name	Application Rate ¹ (pounds pure-live-seed per acre)
Shrub Species (use four of the following shrubs at the rates identified)		
Wyoming big sagebrush	<i>Artemisia tridentata wyomingensis</i>	0.1
Four-winged saltbush	<i>Atriplex canescens</i>	2.0
Forage kochia	<i>Kochia prostrata</i>	0.25
Nevada Mormon tea	<i>Ephedra nevadensis</i>	4.0
Spiny hopsage	<i>Grayia spinosa</i>	1.0
Forb Species (use three of the following forbs at the rates identified)		
Scarlet globemallow	<i>Sphaeralcea coccinea</i>	0.5
Palmer penstemon	<i>Penstemon palmeri</i>	0.5
Lewis flax	<i>Linum lewisii</i>	1.0
Sweetvetch	<i>Hedysarum boreale</i>	2.0
Grass Species (use four of the following grasses at the rates identified)		
Crested wheatgrass	<i>Agropyron cristatum</i>	2.0
Indian ricegrass	<i>Oryzopsis hymenoides</i>	2.0
Great Basin wildrye	<i>Elymus cinereus</i>	2.0
Bottlebrush squirreltail	<i>Sitanion hystrix</i>	2.0
Total Average Application Rate ²		19.35

¹ Drill seeding rates are provided. Rates would be doubled for broadcast seeding, if used.

² Total average application rate as identified in the Cortez Hills Expansion Project Final EIS (BLM 2008a).

Note: If seed mix and application rates need to be modified as a result of limited species availability, poor seed quality, and/or the results of concurrent reclamation and revegetation test plots, the modifications would be undertaken with the concurrence of the BLM.

2.2.5.6 Facility Reclamation

Reclamation procedures specific to the proposed project modifications are summarized below.

Reclamation of Waste Rock Facilities

The reclamation goals for the waste rock facilities include stabilizing slopes, ensuring mass stability, rounding edges to minimize visual impacts, revegetating surfaces, and erosion control. Reclamation of the waste rock facilities would be conducted concurrently with operations, to the extent practical. As areas of the facilities reach their ultimate configuration and become permanently inactive, the slopes would be regraded. The final overall slopes of the reclaimed waste rock facilities would be approximately 2.5H:1V. Approximately 15-foot-wide benches would remain on facility slopes at intervals as needed to minimize surface water runoff velocities and associated erosion. Growth media subsequently would be placed on the prepared surfaces to a minimum depth of approximately 6 inches, and the areas reseeded. To minimize erosion until vegetation has re-established, silt fences, sediment traps, or other appropriate BMPs would be installed.

Reclamation of the proposed reconfigured NWRP would be consistent with these procedures. All mill grade ore from the stockpile currently proposed for placement on top of this reconfigured waste rock facility would be removed and transported to the Pipeline Mill for processing, prior to reclamation of the top of this facility. Alternately, if needed, the stockpile would be reclaimed as described above for the waste rock facilities.

Reclamation of Ancillary Facilities

During final mine closure, buildings and structures (including the proposed capacitors and transformer) would be dismantled, and materials would be salvaged or disposed of in one of the currently authorized on site Class III waived landfills or a permitted off site landfill. Concrete foundations and slabs would be broken up and buried in place under approximately 4 feet of material to prevent ponding and provide for revegetation. The associated disturbance areas subsequently would be covered with growth media and revegetated.

Above ground pipelines would be removed and properly disposed of in one of the currently authorized on site Class III waived landfills or a permitted off site landfill. Underground pipeline ends would be capped and the pipe left in place. Unneeded utility poles would be cut off at ground level, and the proposed rangeland fence would be removed; both would be disposed of at an approved off site location or in one of the currently authorized on site Class III waived landfills.

The proposed potable water well would be abandoned in accordance with applicable rules and regulations (NAC 534.420 through 534.424).

2.2.5.7 Post-reclamation Monitoring and Maintenance

Following mine closure, BCI would conduct maintenance, site inspections, and any other necessary monitoring for the period of reclamation responsibility. Post-mining groundwater quality would be monitored according to the requirements established by NDEP, with the goal of demonstrating non-degradation to waters of the state. Monitoring of revegetation success would be conducted annually for a minimum of 3 years or until the revegetation standards have been met, as determined by the jurisdictional agencies. In addition, noxious weed monitoring and control would be implemented for a period of 5 years.

2.3 No Action Alternative

Under the No Action Alternative, existing mining and processing operations and reclamation activities within the CGM Operations Area would continue under the terms of current permits and approvals as authorized by the BLM and State of Nevada; proposed modifications as described for the Proposed Action would not be implemented. The currently authorized operations (**Figure 2-1**) and associated impacts were described in detail in the Cortez Hills Expansion Project Final EIS (BLM 2008a) and Supplemental Final EIS (BLM 2011a). The existing plan of operations for BCI's current operations is the 2010 Amendment to Plan of Operations and Reclamation Permit Application (BCI 2010, revised 2011), which provided for the relocation of a portion of CR 225, placement of ore stockpiles on top of the Canyon Waste Rock Facility, acreage adjustments, and other project modifications and the BLM (2013a) approved amendment to the (NVN-067575 [12-1A]) Plan of Operations and Reclamation Permit Application for the Cortez Hills open pit east highwall step-back. The currently authorized surface disturbance for operations within the CGM Operations Area is 16,078 acres.

2.4 Past, Present, and Reasonably Foreseeable Future Actions

Cumulative impacts are defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and RFFAs regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor, but collectively significant actions taking place over a period of time" (40 CFR 1508.7).

Projects and actions considered in the cumulative effects analysis are defined for this EA as those past and present actions and RFFAs that could interact with the Proposed Action in a manner that would result in cumulative impacts. These past and present actions and RFFAs were described in detail in the Cortez Hills Expansion Project Final EIS (BLM 2008a) and updated for this EA analysis. These projects and actions are identified in **Table 2-4** and shown in **Figure 2-4**.

The area of concern for cumulative effects varies by resource, with impacts for certain resources being restricted to the actual area of disturbance. Other resources, such as livestock and wildlife, may range over a wide area, and cumulative impacts could involve more than surface disturbance. The resource-specific cumulative effects study areas for this EA analysis are the same as described in the Cortez Hills Expansion Project Final EIS (BLM 2008a), with a few exceptions as noted in specific resource sections of Chapter 3.0.

Table 2-4 Surface Disturbance Associated with Past and Present Actions and RFFAs

Action	Past and Present Approved Disturbance (acres)	RFFA Projected Disturbance (acres)	Total Approved/ Projected Disturbance (acres)
Mining Projects			
Black Rock Canyon Mine	117	0	117
Buckhorn Mine	820	0	820
Clipper Mine	400	0	400
BCI CGM Operations Area	16,078	0	16,078
BCI Horse Canyon	698	0	698
BCI Robertson Mine	285	0	285
BCI Satellite Mine Southeast of Cortez Hills (1)	0	1,500	1,500
BCI Satellite Mine North- Northwest of Pipeline/South Pipeline (2)	0	1,500	1,500
Cortez Silver Mining District ¹	92	0	92
Elder Creek Mine	143	0	143
Fox Mine	4	0	4
Greystone Mine	242	0	242
Grey Eagle Project	5	0	5
Hot Springs Sulfur Mine	5	0	5
May Mine	1	0	1
Mill Canyon ¹	18	0	18
Mud Spring Gulch	10	0	10
South Silicified Project	31	0	31
Utah Mine and Camp	6	0	6
Subtotal	18,955	3,000	21,955
Exploration			
Notices BLM-Battle Mountain District Office: 118 expired, 8 pending, and 30 authorized ²	265	0	265
Plans (7) BLM-Battle Mountain District Office ²	306	0	306
Notices (10) BLM-Ely Field Office ²	50	0	50

Table 2-4 Surface Disturbance Associated with Past and Present Actions and RFFAs

Action	Past and Present Approved Disturbance (acres)	RFFA Projected Disturbance (acres)	Total Approved/ Projected Disturbance (acres)
BCI CGM Operations Area	391	0	391
BCI Cortez Underground Exploration Project	5	0	5
BCI HC/CUEP/HC/CUEP	250	299	549
BCI West Pine Valley	150	0	150
BCI West Side	0	200	200
CGM Operations Area	0	600	600
BCI Hilltop Exploration/Mine	92	0	92
BCI Pipeline/South Pipeline/Gold Acres Exploration Project	50	0	50
BCI Robertson Project	12	0	12
Coral Resources Robertson Mine ³	22	0	22
Dean Mine	67	0	67
Fire Creek Exploration/Underground Project	50	0	50
Mud Springs	0	10	10
Robertson Exploration Project ³	194	100	294
Santa Fe Mill Canyon	250	0	250
South Roberts	0	3	3
Toiyabe Project	20	0	20
Uhalde Lease	100	0	100
Subtotal	2,274	1,212	3,486
Utilities/Community			
State Route 306 (100 feet wide)	327	0	327
Gravel Roads in Crescent Valley (50 feet wide)	1,370	0	1,370
Dirt Roads in Crescent Valley (30 feet wide)	644	64	708
Power lines in Crescent Valley (60 feet wide)	364	0	364
BCI Fiber Optic Cable (20 feet wide) ⁴	0	58	58
BCI Jeremy's Knob Communications Tower and ROW ⁵	0	0.5	0.5
Towns of Crescent Valley and Beowawe ⁶	900	0	900
Subtotal	3,605	123	3,728
Other Development and Actions			
BLM Fuels Reduction Projects ⁷	5,641	0	5,641
Wildfires ⁸	90,099	0	90,099
Recreation ⁹	0	0	0
Livestock ¹⁰	10	4,313	4,323
Wildlife	0	0	0
Agriculture Development ¹¹	9,750	0	9,750
BCI Additional Irrigation Pivots at Dean Ranch	0	640	640

Table 2-4 Surface Disturbance Associated with Past and Present Actions and RFFAs

Action	Past and Present Approved Disturbance (acres)	RFFA Projected Disturbance (acres)	Total Approved/ Projected Disturbance (acres)
Lodge at Pine Valley ¹²	30	0	30
Crescent Valley Water Supply	2	0	2
Subtotal	105,532	4,953	110,485
Total	130,366	9,288	139,654

¹ Historic mining- and exploration-related disturbance first began in 1862, prior to the promulgation of surface land management laws and regulations governing mining activities on public lands (e.g., FLPMA and 40 CFR 3809). Since there were no laws or regulatory programs in place at that time, there were no regulatory or administrative approvals granted. Therefore, the identified disturbance acreage does not include all historic mining-related disturbance in the area.

² Plans and notices outside of the general Crescent Valley area have not been quantified.

³ Coral Resources' Robertson Exploration Project boundary is located immediately north of, and partially within, the CGM Operations Area as shown in **Figure 2-4**.

⁴ ROW would run from the Lodge at Pine Valley to BCI Control #3. Projected ROW length of approximately 24 miles.

⁵ BCI facility located in T28N, R47E, S18SESE just north of the CGM Operations Area; ROW N-092170 (BCI 2013d).

⁶ Surface disturbance associated with the towns of Crescent Valley and Beowawe is assumed to be 640 and 160 acres, respectively, with approximately 100 acres of private developed land peripheral to the towns.

⁷ Inclusive of acreage associated with the Crescent Valley Wildland Urban Interface Fire Defense System, Tonkin Hazardous Fuels Reduction Project, and Red Hills Hazardous Fuels Reduction Project. Of the total acreage, planned prescribed burns would affect up to 2,537 acres of piñon-juniper woodland, and 800 acres of piñon-juniper woodland would be thinned.

⁸ Reflects acreage of vegetation affected by wildland fires from 1998 through 2006 within the vegetation cumulative effects study area. The acreage is inclusive of approximately 22,918 acres of fire-affected piñon-juniper woodland.

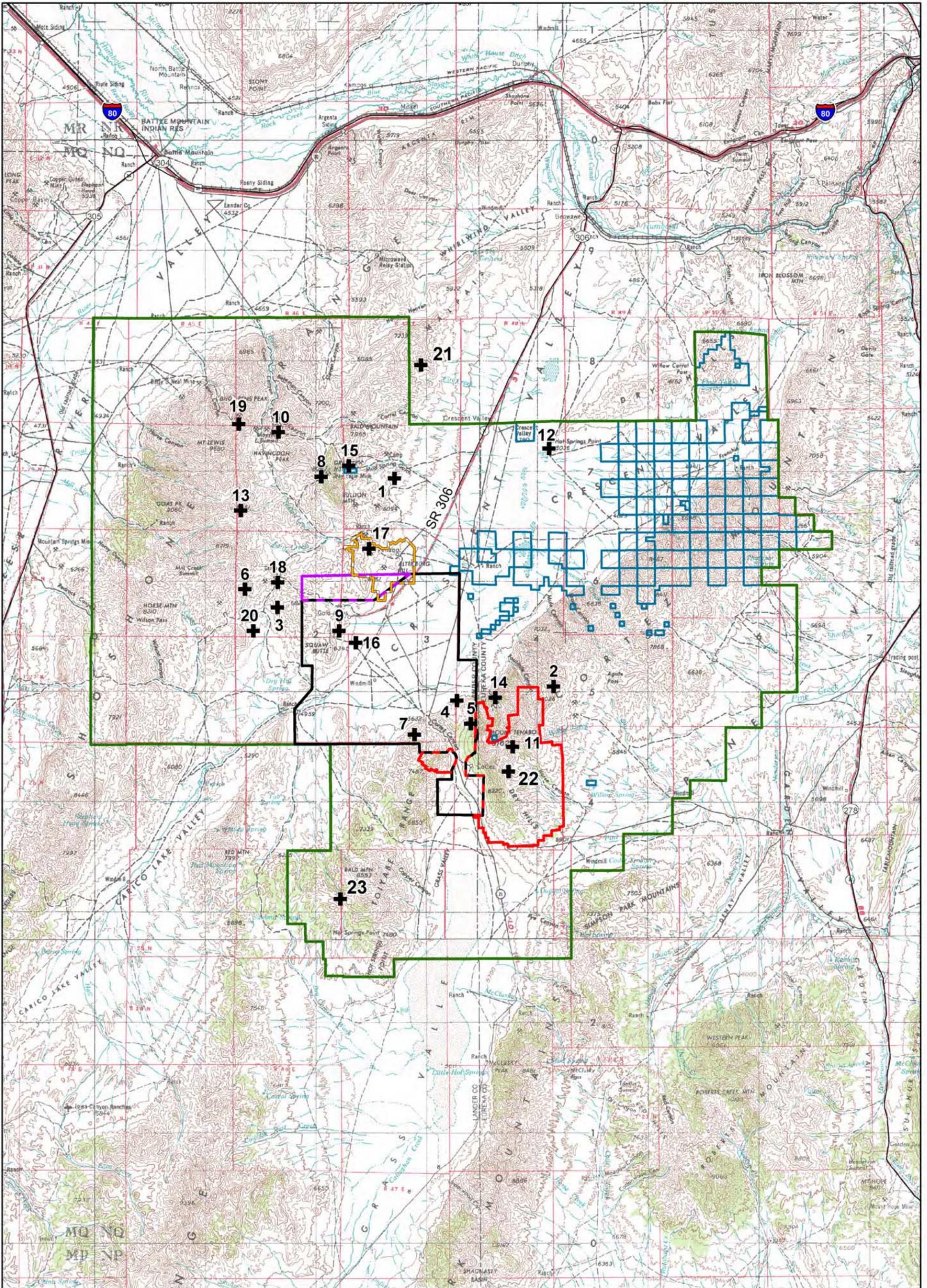
⁹ Surface disturbance associated with recreation activities has occurred; however, the acreages have not been quantified.

¹⁰ Surface disturbance associated with existing and proposed livestock water use is assumed to be 0.5 acre per water right. The surface disturbance associated with the livestock RFFAs is based on projected seeding activities (change in vegetation and habitat), 0.5 acre per water development activity, and 43 acres for fencing and cattle guards. Livestock-related activities outside of the Carico Lake allotment have not been quantified.

¹¹ Surface disturbance associated with agricultural development is based on the acreage under irrigation and assumes that a change in vegetation and habitat equates to surface disturbance. Acreage values were based on a February 15, 1998, special hydrographic abstract for Hydrographic Basin No. 054 from the NDWR. These values are based on permitted or authorized use of water and may not reflect actual use in a given year.

¹² This facility is located on the JD Ranch Road approximately 4 miles west of SR 278 at the BCI-owned JD Ranch (BCI 2013b). Construction of this facility was initiated in 2012 to address worker safety issues related to 12-hour shifts and long commute distances. Once completed, the facility will provide accommodations for up to 300 workers (Eureka County Board of Commissioners 2012).

Source: American Consolidated Minerals Corp. 2009; BCI 2013b, 2013d, 2012a; BLM 2013b, 2012a; 2006a,b, 2005a,b,c,d, 2003, 1996b; Inland Gold and Silver Corp. 1989; Klondex Mines Ltd. 2013.



- Legend**
- Cortez Gold Mines Operations Area Boundary
 - + Past and Present Actions RFFAs
 - Cortez Joint Venture Area
 - Dean Ranch
 - HC/CUEP
 - Pipeline/South Pipeline/Gold Acres Exploration Boundary
 - Robertson Exploration Project

- 1) Black Rock Canyon Mine
- 2) Buckhorn Mine
- 3) Clipper Mine
- 4) Cortez Mine
- 5) Cortez Silver Mining District
- 6) Elder Creek Mine
- 7) Fox Mine
- 8) Grey Eagle Project
- 9) Gold Acres
- 10) Hilltop Exploration/Mine
- 11) Horse Canyon Mine
- 12) Hot Springs Sulfur Mine
- 13) May Mine
- 14) Mill Canyon
- 15) Mud Springs Gulch
- 16) Pipeline/South Pipeline Project
- 17) Robertson Mine
- 18) Utah Mine and Camp
- 19) Dean Mine
- 20) Greystone Mine
- 21) Fire Creek Exploration/Underground
- 22) South Silicified Project
- 23) Toiyabe Project



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Figure 2-4
 Minerals -
 Past and Present Actions and RFFAs

0 1.25 2.5 5 Miles

Source: BLM 2013b, 2000a; BCI 2010b; Klondex Mines Ltd. 2013; U.S. Geological Survey (USGS) 2006.
 Note: The Lander/Eureka County line was adjusted subsequent to the date of this USGS map base.

3.0 Affected Environment and Environmental Consequences

This chapter describes the environment that would be affected by development of the Proposed Action, the anticipated direct and indirect impacts of the Proposed Action and the No Action Alternative, as well as potential cumulative impacts. The analysis of potential impacts of the Proposed Action assumes the implementation of the applicant-committed environmental protection measures identified in Section 2.2.4. Monitoring and mitigation identified for individual resources in response to anticipated impacts are discussed at the end of each resource section, as applicable. For resources where project-specific impacts are identified, the Proposed Action may result in cumulative effects with other past and present actions and RFFAs in the area. The period of potential cumulative impact is defined as the approximately 5-year remaining life of the project plus 3 years of reclamation.

The BLM's NEPA Handbook (BLM 2008b) and Nevada Instruction Memorandum 2009-030, Change 1, require that NEPA documents address specific elements of the environment that are subject to requirements specified in statute, regulation, or executive order (EO) (i.e., supplemental authorities). **Table 3-1** lists the supplemental authorities that must be addressed in all environmental analyses, as well as other resources deemed appropriate for evaluation by the BLM. Other resources of the human environment that have been considered for this EA are listed in **Table 3-2**. If the element or resource is present and potentially would be affected, the location in this chapter where the element or resource is addressed is identified in **Tables 3-1** and **3-2**. The elements and resources that do not occur in the project area or would not be affected, based on the rationale provided in **Tables 3-1** and **3-2**, are not discussed further in this EA. The elimination of non-relevant elements complies with the CEQ policy in 40 CFR 1500.4.

Table 3-1 Supplemental Authorities to be Considered

Supplemental Authority	Not Analyzed ¹	Analyzed	EIS Section Number or Rationale for Elimination
Air Quality		x	Section 3.10
Areas of Critical Environmental Concern (ACECs)	x		Would not be affected (No ACECs occur in the project vicinity.)
Cultural/Historical		x	Section 3.8
Environmental Justice		x	Section 3.14
Farmlands (prime or unique)	x		Would not be affected (No prime or unique farmlands occur in the proposed disturbance areas.)
Floodplains	x		Would not be affected (No Federal Emergency Management Agency-designated floodplain occurs in the proposed disturbance areas.) (See Figure 3.2-4 of the Cortez Hills Expansion Project Final EIS [BLM 2008a].)
Forests and Rangelands (Healthy Forest Restoration Act [HFRA] only)	x		Would not be affected (Project does not meet the requirements to qualify as a HFRA project.)
Human Health and Safety	x		This project may use herbicides in accordance with BCI's authorized Noxious Weed Management Plan (see Section 2.2.5.5); however, EO 13045 would not apply as pesticides and herbicides would not be used in locations where children would be exposed.

Table 3-1 Supplemental Authorities to be Considered

Supplemental Authority	Not Analyzed¹	Analyzed	EIS Section Number or Rationale for Elimination
Migratory Birds		x	Section 3.5
Native American Religious Concerns		x	Section 3.9
Noxious Weeds/Invasive Non-native Species		x	Section 3.4
Riparian/Wetlands	x		Would not be affected (No riparian or wetland areas occur in the proposed disturbance areas.)
Threatened and Endangered Species		x	Sections 3.4 and 3.5
Waste – Hazardous/Solid		x	Section 3.17
Water Quality		x	Section 3.2
Wild and Scenic Rivers	x		Would not be affected (No wild and scenic rivers occur in the project vicinity.)
Wilderness		x	Section 3.12

¹ Includes supplemental authorities determined to be not present or present but not affected.

Table 3-2 Other Resources of the Human Environment

Other Resources	Not Analyzed¹	Analyzed	EIS Section Number or Rationale for Elimination
Grazing Management		x	Section 3.6
Land Use Authorizations		x	Section 3.11
Minerals		x	Section 3.1
Paleontological Resources		x	Section 3.7
Recreation		x	Section 3.12
Socioeconomic Values		x	Section 3.13
Soils		x	Section 3.3
Vegetation		x	Section 3.4
Visual Resources		x	Section 3.15
Wild Horses and Burros	x		Would not be affected (The proposed project is outside the boundaries of designated herd management areas.)
Wildlife		x	Section 3.5

¹ Includes resources or uses determined to be not present or present but not affected.

As discussed in Section 2.2, Proposed Action, the proposed reconfigured NWRF and associated power distribution line reroute would be located in an area currently authorized for waste rock, ancillary facilities, and conveyor corridor disturbance. Potential impacts associated with these facilities previously were analyzed in the Cortez Hills Expansion Project Final EIS (BLM 2008a). The proposed placement of a mill-grade ore stockpile on top of a portion of the NWRF and the reconfiguration of storm water diversions around the ore stockpile (which were not part of the Final EIS analysis) would be wholly contained within the proposed footprint of the reconfigured NWRF (i.e., no new surface disturbance). Also, the overall height of this combined facility would not exceed that of the currently authorized NWRF configuration. The proposed construction of a rangeland fence along CR 225 would occur within the existing road ROW disturbance; the ROW disturbance was authorized by the BLM in the Determination of NEPA Adequacy (DNA) for the Cortez Gold Mines (NVN-067575) Amended Plan of Operations and Reclamation Permit Update dated December 2010 and revised through June 2011 (BLM 2011b). Also, BLM previously approved an amendment to the (NVN-067575 [12-1A]) Plan of Operations and Reclamation Permit Application for the Cortez Hills open pit east highwall step-back (BLM 2013a). Thus, the element of the Proposed Action that would result in new or previously unauthorized surface disturbance (total of 41 acres) is the proposed construction of ancillary facilities, including a potable water well and associated pipeline and a capacitor bank with associated transformer and power distribution line. The Proposed Action also includes the proposed relocation of approximately 6 million additional tons of refractory ore from the Pipeline Complex ore stockpile to Goldstrike, using existing roads. The processing of Pipeline refractory ore at the existing Goldstrike Mill would occur incrementally and would extend milling operations at Goldstrike for approximately 11 months.

The resource-specific project study areas and analyses for this EA focus on those elements, or certain aspects of elements, for which prior NEPA analyses have not been conducted or authorizations obtained. The proposed project components and their applicability to each resource are identified in **Table 3-3** and are further described in the introduction to each resource section.

The resource-specific cumulative effects study areas for most resources parallel those addressed in the Cortez Hills Expansion Project Final EIS (BLM 2008a) and are described in the introduction to each resource section in this EA. For resources for which the cumulative effects study area has been modified for this EA, the revised cumulative effects study area is described in the respective resource section of this EA. The past and present actions and RFFAs for the cumulative effects analyses are identified in **Table 2-4**; locations for minerals-related actions are shown in **Figure 2-4**.

Table 3-3 Project Elements that Comprise Resource-specific Study Areas and Analyses

Resource	NWRP Reconfiguration	New Mill-grade Ore Stockpile on Reconfigured NWRP	New Ancillary Facilities ¹	New Rangeland Fence along CR 225	Additional Refractory Ore Transport to Goldstrike	Additional Refractory Ore Processing at Goldstrike
Geology and Minerals	X	X	X			
Water Resources, including Geochemistry	X	X	X			
Soils and Reclamation			X			
Vegetation			X			
Noxious Weeds and Invasive and Non-native Species ²			X	X	X	
Wildlife and Fisheries Resources			X	X	X	
Range Resources			X	X		
Paleontological Resources			X			
Cultural Resources			X	X		
Native American Traditional Values			X	X		
Air Quality			X	X	X	X
Land Use and Access			X	X	X	
Recreation and Wilderness			X	X	X	X
Social and Economic Values			X	X	X	X
Environmental Justice			X	X	X	X
Visual Resources	X	X	X	X		
Noise			X	X	X	X
Hazardous Materials and Solid Waste			X	X		X

¹ Inclusive of proposed replacement potable water well/pipeline and capacitors/transformer/power distribution line.

² Noxious weeds and invasive and non-native species are addressed in Section 3.4, Vegetation.

3.1 Geology and Minerals

As discussed in the introduction to Chapter 3.0 and indicated in **Table 3-3**, the elements of the Proposed Action that potentially would result in impacts to geology and minerals include the proposed reconfiguration of the NWRFF, the new mill-grade ore stockpile on the reconfigured NWRFF, and the proposed water well and associated water pipeline (**Figure 2-2**).

The project study area for potential direct and indirect impacts to geology and minerals encompasses the area within the CGM Operations Area boundary (**Figure 2-2**). The cumulative effects study area, as shown in Figure 3.1-10 of the Cortez Hills Expansion Project Final EIS (BLM 2008a), encompasses the project study area and includes surface disturbance associated with past and present actions and RFFAs within a 30-mile radius.

3.1.1 Affected Environment

The geologic conditions, mineral resources, seismic conditions, and ground subsidence relevant to the Cortez Hills and Pipeline complexes are described in Section 3.1 of the Cortez Hills Expansion Project Final EIS (BLM 2008a). The following paragraphs provide a brief overview of the geologic conditions in the vicinity of the proposed reconfigured NWRFF and associated new ore stockpile and the proposed potable water well and associated water pipeline.

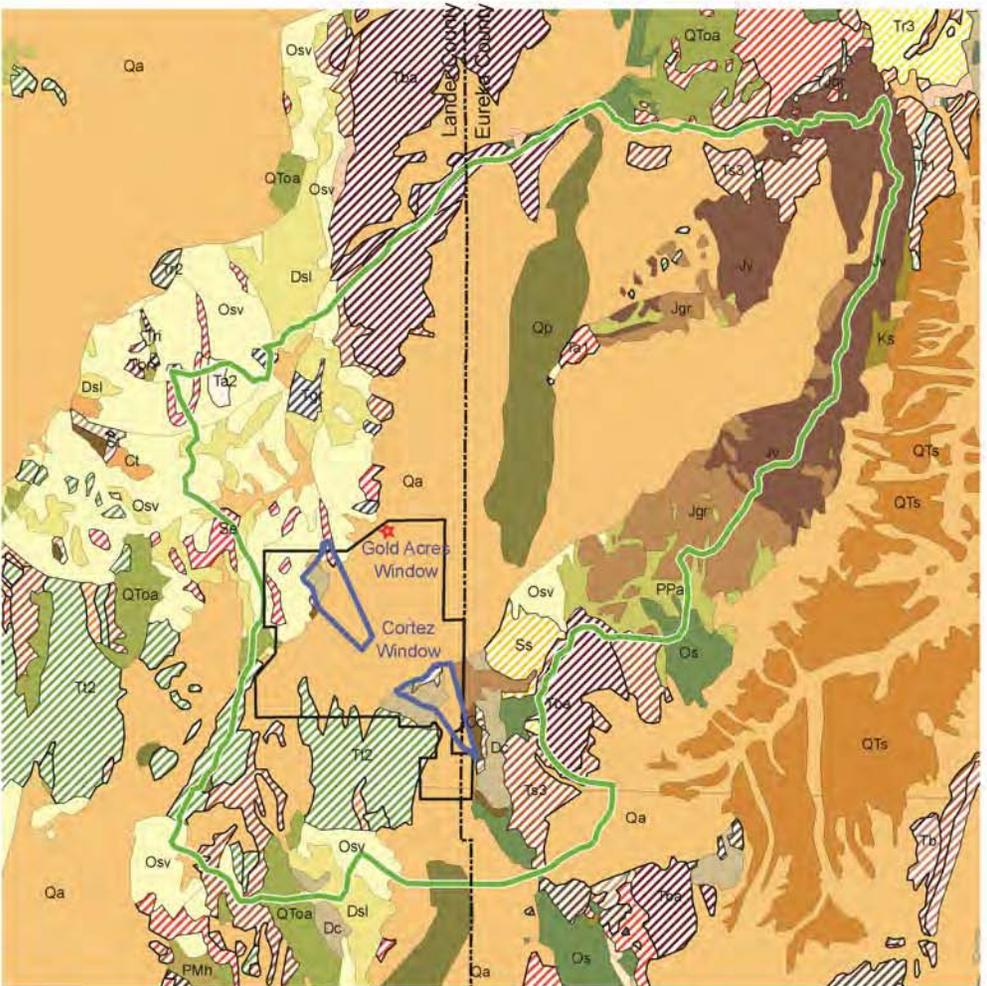
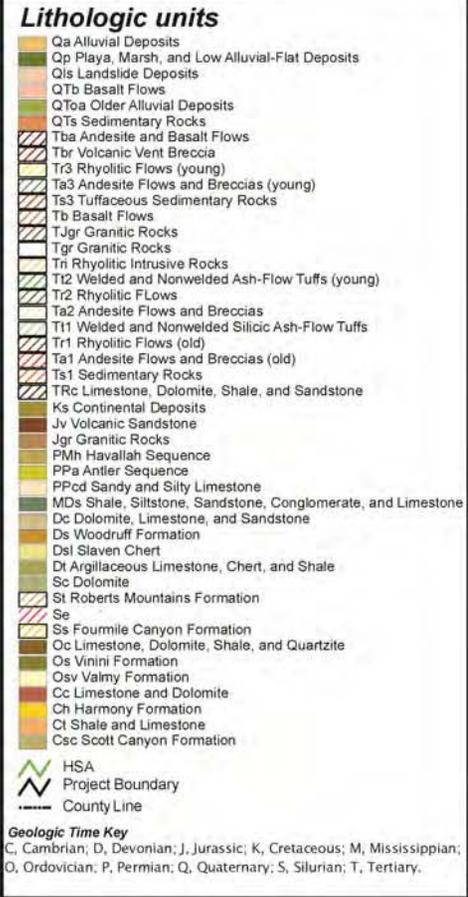
The geology of the Cortez Gold Mines Operations Area and surrounding region is shown in **Figure 3-1**; a general stratigraphic column is shown in **Figure 3-2**. The proposed reconfigured NWRFF and associated ore stockpile would be situated immediately north of the Cortez Hills Pit on a broad dissected pediment surface that slopes to the northwest. The slope is located to the west of the Cortez Fault and is mantled by alluvial fan and colluvial sediments. These surficial sediments overlie the Wenban limestone and other Paleozoic basement rocks in the Cortez window (Geomega 2006b; Gilluly and Masursky 1965).

The proposed new water well and associated pipeline would be located along the northern margin of the Pipeline Complex, as shown in **Figure 2-2**. This area is underlain by basin fill material that consists of unconsolidated to poorly consolidated sand and gravel deposits that are locally interbedded with silt and clay beds. The thickness of the basin fill is variable across the basin but tends to increase toward the center of the basin. Recent estimates based on geophysical surveys suggest that the basin fills have a maximum thickness of approximately 10,000 feet in Crescent Valley (Gilluly and Masursky 1965).

The lowering of groundwater levels associated with ongoing dewatering activities at the Pipeline Pit has resulted in ground subsidence and development of earth fissures in Crescent Valley in the vicinity of the Pipeline Pit. The earth fissures and the area identified as being favorable for future fissure development are discussed in Section 3.1.1.7 and shown in Figure 3.1-8 of the Cortez Hills Expansion Project Final EIS (BLM 2008a).

3.1.2 Environmental Consequences

Potential issues related to geology and minerals include: 1) geologic hazards created or exacerbated by development of the proposed project modifications; 2) damage to critical facilities caused by seismically induced ground shaking or groundwater withdrawal induced subsidence; and 3) exclusion of future mineral resource availability caused by the placement of mine facilities, such as the placement of permanent waste rock storage facilities.



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. Original data were compiled from various sources. This information may not meet National Map Accuracy Standards. This product was developed through digital means and may be updated without notification.

Legend
 ★ Proposed New
 Disturbance Area

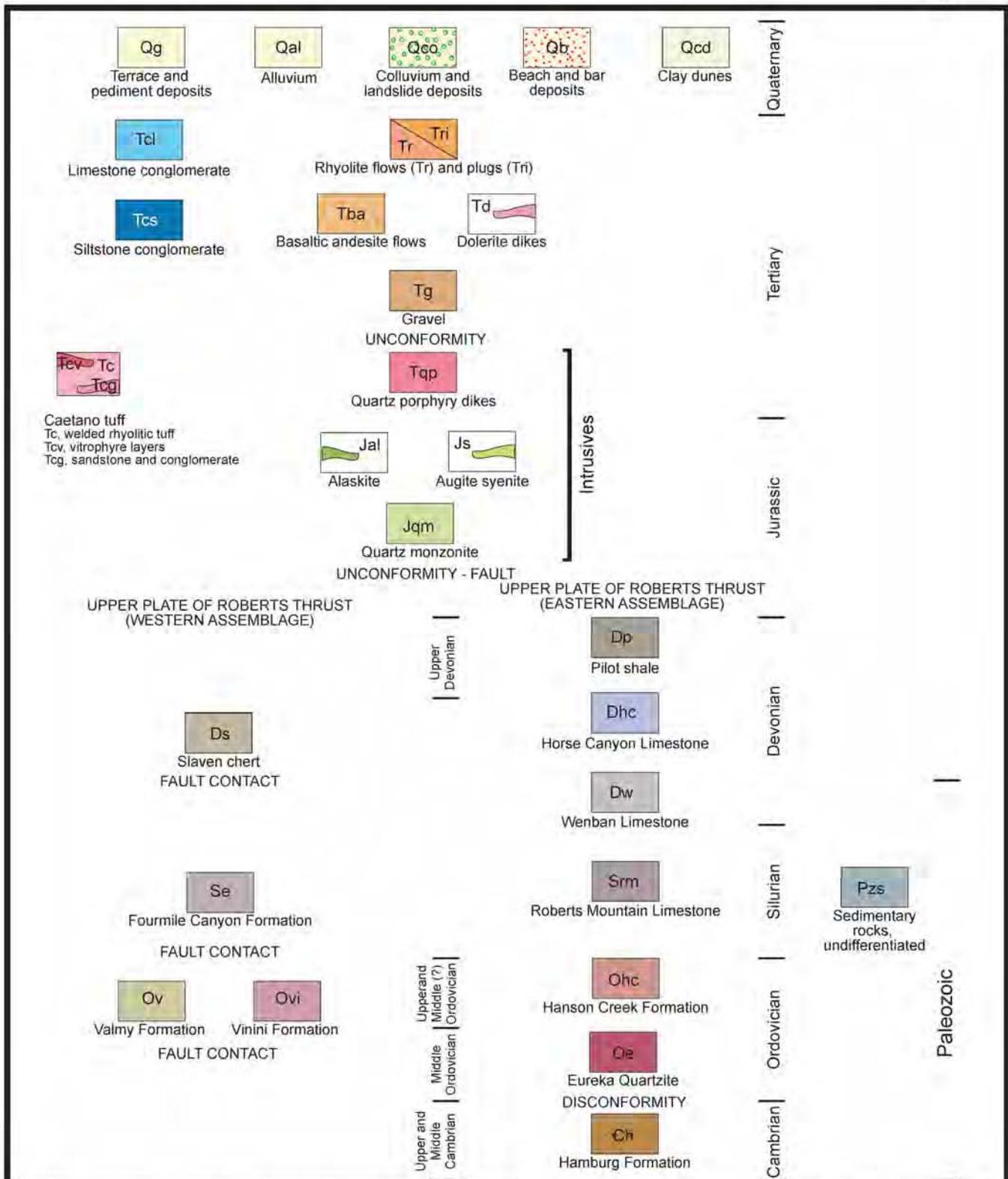
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Adapted from: BLM 2008a.
 From: Turner and Bawiec 1991.
 Source: Geomega 2006b.



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Figure 3-1
 Regional Geology



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. Original data were compiled from various sources. This information may not meet National Map Accuracy Standards. This product was developed through digital means and may be updated without notification.



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Figure 3-2
 Generalized Stratigraphic
 Column

Adapted from: BLM 2008a.
 Source: Geomega 2006a.

Exposure of rocks to air and water during and after mining can cause increased weathering reactions that could result in the mobilization of constituents from the exposed rocks and potentially affect surface and groundwater resources. Potential impacts to groundwater and surface water quality from the construction, operation, and closure of the reconfigured NWRFF and associated mill-grade ore stockpile are addressed in Section 3.2 (Water Resources including Geochemistry).

3.1.2.1 Proposed Action

NWRFF Reconfiguration and Mill-grade Ore Stockpile

The Proposed Action includes the proposed construction of a reconfigured NWRFF and a mill-grade ore stockpile located on top of the NWRFF, as described in Sections 2.2.1.1 and 2.2.1.2 of this EA. The capacity, maximum crest height, and operational and post-reclamation slope angles for the proposed reconfigured NWRFF would be the same as the currently authorized NWRFF. The reconfigured NWRFF would be constructed with 100- to 200-foot-thick lifts, and the side slopes of the NWRFF would be graded to approximately 2.5H:1V for reclamation.

The BCI geotechnical engineering group conducted a slope stability evaluation of the proposed NWRFF reconfiguration (BCI 2012c). The evaluation included analyses of both static and pseudo-static (i.e., seismic loading) conditions. The slope stability analysis was performed for four representative cross-sections through the proposed facility. The results of the slope stability analysis indicate that the minimum static and pseudo-static factors of safety for each case analyzed are above (i.e., better than) the generally accepted minimum factor of safety for waste rock facilities (1.3 static and 1.0 pseudo-static). A factor of safety is used to provide a design margin to ensure that a slope is stable and would not experience slumping or sliding (excluding minor surface sloughing or rock fall). A computed factor of safety greater than or equal to 1 indicates that the slope would be stable and support the design loads.

Water Well and Associated Pipeline

The proposed replacement potable water well and associated new water supply pipeline would be located in Crescent Valley along the northern margin of the Pipeline Complex. As described in Section 3.2.2.1, the proposed replacement water well would have a maximum pumping rate of 16 gpm. The proposed pumping for the potable water supply well would not result in an increase in groundwater drawdown in the project study area beyond the drawdown previously evaluated in the Cortez Hills Expansion Project Final EIS (BLM 2008a). (Note: water rights are discussed in Section 3.2.2.1.)

Future dewatering conducted under the currently authorized mining project is predicted to increase the areal extent and magnitude of drawdown compared to current conditions. As stated in the Cortez Hill Expansion Project Final EIS (Section 3.1.2.1, Proposed Action [BLM 2008a]):

“This additional dewatering would lower water levels in both fractured bedrock and basin sediments. As mine dewatering lowers the groundwater levels and water is expelled from the basin fill sediments, the load born by the sediments would increase and result in compaction of the sediment causing subsidence of the ground surface. Ground subsidence also can result in the development of cracks at the surface that are known as earth fissures. As discussed in Section 3.1.1.7 (Ground Subsidence and Earth Fissure), the lowering of groundwater levels associated with past dewatering activities at CGM’s operations in Crescent Valley has resulted in ground subsidence in the region surrounding the mine, and the development of earth fissures immediately south of the Pipeline Complex (Figure 3.1-8).”

Ground subsidence resulting from the currently authorized dewatering was estimated using the calibrated groundwater flow model and the MODFLOW Interbed-Storage package, as described in the groundwater flow modeling report for the proposed project (Geomega 2012a). The predicted subsidence resulting from dewatering indicates that the maximum subsidence would be approximately 6 feet and

would occur along the southeast margin of Crescent Valley between the Pipeline Pit and Cortez Hills Pit. The proposed potable water well and most of the proposed water line are located outside of the area predicted to experience greater than 0.5 feet of subsidence. However, the segment of the pipeline alignment located directly north of the Pipeline Pit near the administration buildings would cross a localized area that is predicted to have up to 3 to 4 feet of subsidence. Although it is possible that future subsidence could expand the development of earth fissures, and earth fissures (if undetected) potentially could damage a buried water supply pipeline, the risk of fissure development in this particular area appears to be low. The reasons for this low risk determination include the following: 1) all of the previously identified earth fissures were located in an area known as the Windmill Earth Fissure Field (AMEC 2003) that is located immediately south of the Pipeline Pit (and approximately 3 miles south of the proposed pipeline); 2) the areas of potential risk for future earth fissure development identified by AMEC (2003) also are located south of the Pipeline Pit (see mapped earth fissures and fissure risk zones provided in Figure 3.1-8 of the Cortez Hills Expansion Project Final EIS [BLM 2008a]); and 3) current operations at the Pipeline Complex include a monitoring and mitigation plan for ground subsidence and related earth fissure development for previously authorized activities (CGM 2005). Therefore, potential damage to the proposed water well and water supply pipeline and associated impacts are not anticipated.

3.1.2.2 No Action Alternative

Under the No Action Alternative, the proposed modifications to currently authorized mining operations within the CGM Operations Area would not be implemented, and there would be no impacts to geology and minerals beyond those currently authorized under existing permits. Mining, processing, and reclamation activities within the CGM Operations Area would continue under the terms of current permits and approvals authorized by the BLM and the State of Nevada.

3.1.3 Cumulative Effects

3.1.3.1 Proposed Action

For purposes of this analysis, geologic disturbance includes mine components (e.g., waste rock facilities) that permanently alter the natural topographic and geomorphic features in the cumulative effects study area, including post-reclamation. The proposed modification of the NWRP would not result in new surface disturbance or exceed the height or capacity of the currently authorized NWRP. Therefore, no additional cumulative impacts to topographic and geomorphic features would occur as a result of the Proposed Action. No direct or indirect impacts to mineral resources would occur under the Proposed Action; therefore, the proposed modifications would not contribute to cumulative impacts to geology or mineral resources.

3.1.3.2 No Action Alternative

Under the No Action Alternative, cumulative impacts to geology and mineral resources would be the same as described in the Cortez Hills Expansion Project Final EIS (BLM 2008a).

3.1.4 Monitoring and Mitigation Measures

BLM-stipulated mitigation measures that address the geotechnical design of waste rock facilities (Mitigation Measure GM1) and subsidence and earth fissures (Mitigation Measure GM3) were identified in the Cortez Hills Expansion Project Final EIS (BLM 2008a) and incorporated into the ROD (BLM 2008c). Based on the analysis in this EA, no additional monitoring or mitigation measures for geology and mineral resources are required.

3.1.5 Residual Adverse Effects

Residual effects to geology and mineral resources as a result of the proposed project modifications are not anticipated.

3.2 Water Resources, including Geochemistry

As discussed in the introduction to Chapter 3.0 and indicated in **Table 3-3**, the elements of the Proposed Action that potentially would result in impacts to water resources include the proposed reconfiguration of the NWRFF, the mill-grade ore stockpile on the reconfigured NWRFF, and the proposed water well and associated water pipeline (**Figure 2-2**).

The project study area for potential direct and indirect impacts to water resources encompasses the area within the CGM Operations Area boundary (**Figure 2-2**). The cumulative effects study area, as shown in Figure 3.2-1 of the Cortez Hills Expansion Project Final EIS (BLM 2008a), encompasses the Crescent Valley Hydrographic Area, northern portion of the Grass Valley Hydrographic Area, and westernmost portion of the Pine Valley Hydrographic Area.

3.2.1 Affected Environment

The hydrologic setting for surface water resources and groundwater resources relevant to the Cortez Hills and Pipeline complexes is described in Section 3.2.1 of the Cortez Hills Expansion Project Final EIS (BLM 2008a). The proposed facilities would be located within the Crescent Valley Hydrographic Area (HA) that is part of the Humboldt River Basin. Surface water features and seeps and springs are presented in **Figures 3-3** and **3-4**. Within the Crescent Valley HA, ephemeral (with occasional intermittent and perennial) streams drain mountain watersheds that discharge to alluvial fans along the mountain front, along the valley margin, and toward alkali flats (playas) in the lowest valley areas. On the valley floor, the playas are intermittently wet from runoff. Surface runoff from the project area does not contribute to the Humboldt River due to a low topographic divide just south of Beowawe and other watershed divides (BLM 2008a).

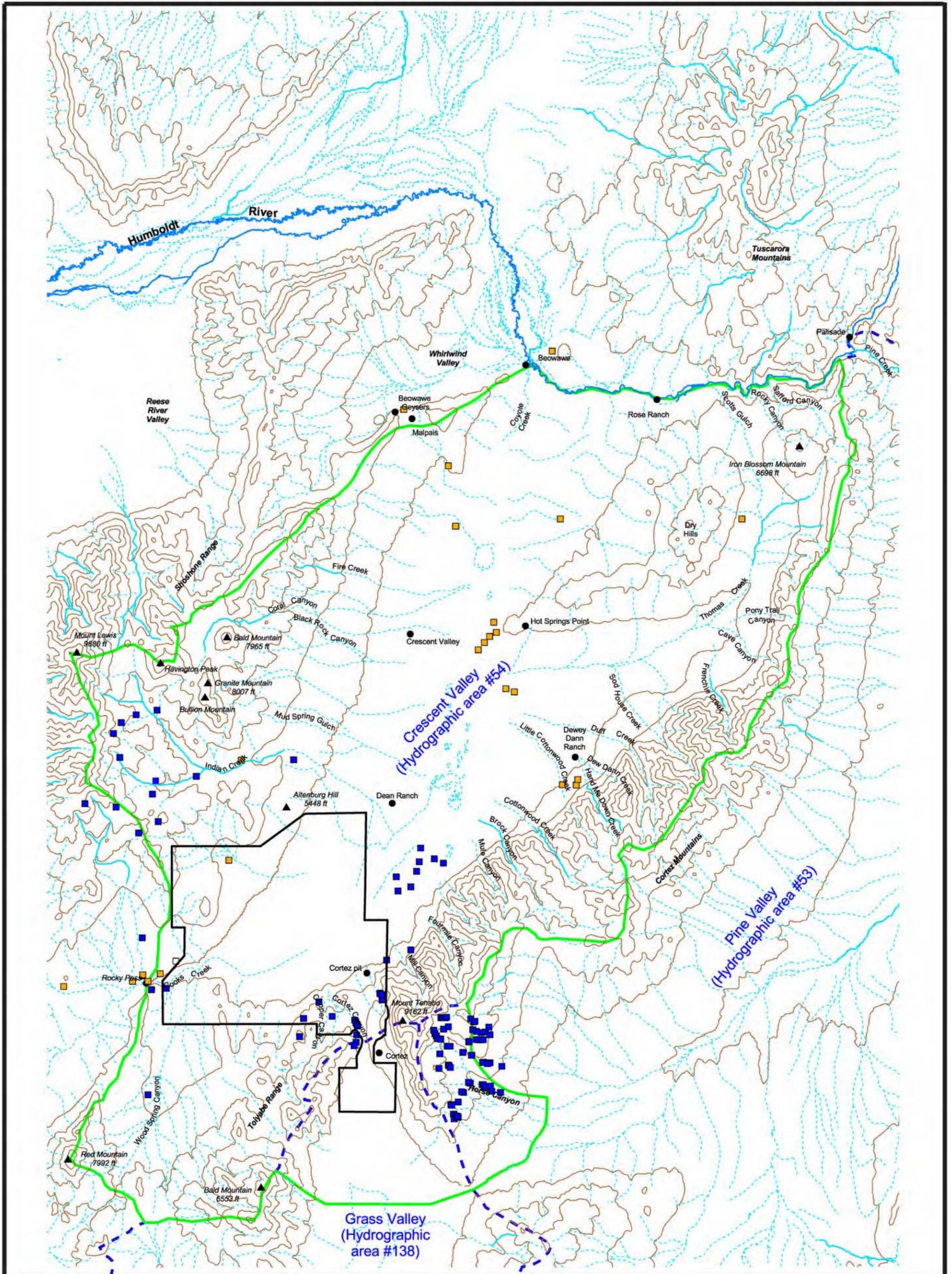
Seep and spring surveys have been conducted in the project study area. Selected seeps and springs have been monitored on a quarterly basis. Quarterly monitoring was started in 1996 and will continue through the life of the project. The location of inventoried seeps and spring and a summary of the monitoring results are provided in the Cortez Hills Expansion Project Final EIS (BLM 2008a) and the Cortez Hills Expansion Project Final Supplemental EIS (BLM 2011a).

The following subsections summarize the hydrogeologic conditions in the vicinity of the proposed reconfigured NWRFF and associated new ore stockpile and proposed potable well and other ancillary facilities.

3.2.1.1 Reconfigured NWRFF and Ore Stockpile

The proposed reconfigured NWRFF would be situated immediately north of the existing Cortez Hills Pit as shown in **Figure 2-2**. Drainage from the proposed reconfigured NWRFF site is toward the northwest and is controlled by several local unnamed ephemeral drainage channels that flow toward Crescent Valley. There are no perennial or intermittent streams, seeps or springs, or waters of the U.S. located within the footprint of the proposed facility (BLM 2008a).

The subsurface and groundwater conditions beneath the proposed footprint of the NWRFF are inferred based on available geologic mapping information and interpretive geologic cross-sections that traverse the area. This information includes the published U.S. Geological Survey geologic map of the area (Gilluly and Mazursky 1965) and geologic cross-section presented in Figure 3-9 in the water resources baseline characterization report for the Cortez Hills Expansion Project (Geomega 2006b). This information suggests that the footprint of the proposed reconfigured NWRFF is underlain by alluvial and colluvial soils that mantle Paleozoic carbonate bedrock (predominately Wenban Limestone). The Paleozoic carbonate rocks are associated with a geologic feature known as the Cortez window. The term “window” refers to an area where uplift and erosion has removed the upper plate (Western Assemblage) exposing the lower plate (Eastern Assemblage) rocks, as described in Sections 3.1 and 3.2 of the Cortez Hills Expansion Project Final EIS (BLM 2008a).



Perennial Streams,
Springs, and Seeps

Figure 3-3

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Legend:

- Cortez Gold Mine Operations Area Boundary
- Hydrographic Basin Boundary
- 2008 Hydrologic Study Area and Water Resources CESA
- Streams Dashed Where Intermittent
- Elevation Contours: 500-foot Interval
- Monitored Seeps and Springs
- Geothermal Springs

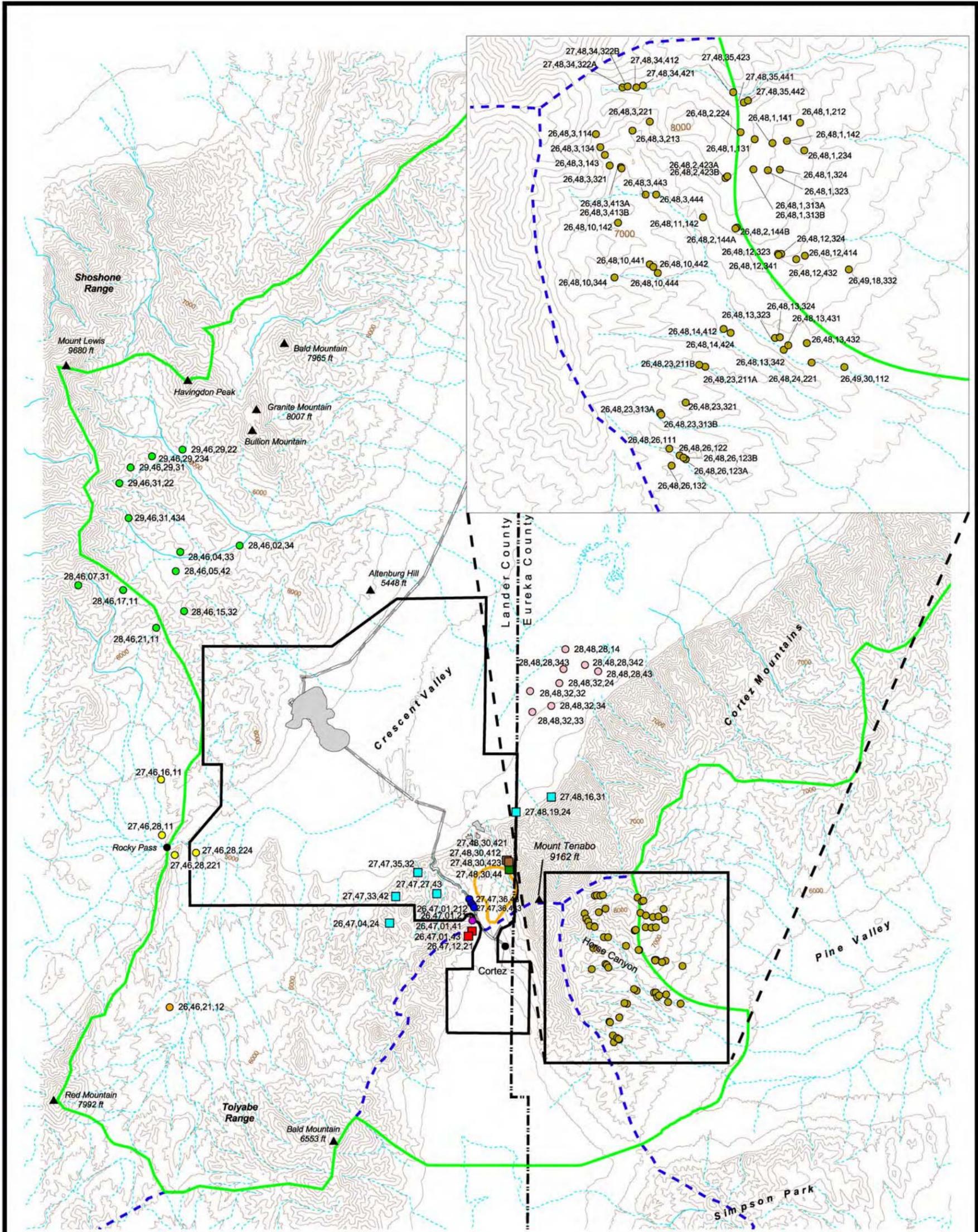
Note: Hydrogeographic area numbers from Rush 1968.
Adapted from: BLM 2008a.
Source: Geomega 2006a.

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Monitored Seeps and Springs
Figure 3-4

2011 Plan of Operations
Amendment

Legend

- Cortez Gold Mine Operations Area Boundary
- Pipeline Pit
- Proposed Cortez Hills Pit
- 2008 Hydrologic Study Area
- Hydrographic Basin Boundary
- Project Area
- Elevation Contours: 200 foot interval
- Roads
- County Line

Spring locations

- Horse Canyon Area (61)
- East Valley (8)
- Peripheral (1)
- Rocky Pass (4)
- Shoshone (12)
- Toiyabe Catchment (6)
- Cortez Canyon seeps (4)
- Mapped Cortez spring (1)
- NE Toiyabe seeps (2)
- NE Corner seeps and spring (3)
- NE Survey Area seep (1)

Note: Numbers reflect site identification numbers.
Adapted from: BLM 2008a.
Source: Geomega 2006b.



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0 1 2 3 4 5 Miles

The surface elevation of the footprint of the proposed reconfigured NWRP ranges from approximately 5,800 to 5,500 feet amsl (SRK 2011). The pre-mining groundwater elevation in this area is inferred to be approximately 4,600 feet amsl (Figure 3-9, Geomega 2006b), suggesting that the depth to groundwater in this area is 900 feet or more beneath the ground surface. This depth to groundwater is substantiated by water level data for monitoring well CHMW-01 located in the vicinity of the NWRP footprint. The groundwater elevation for CHMW-01 was 4,604 feet amsl prior to the initiation of dewatering activities for the Cortez Hills Expansion Project. The pre-dewatering groundwater gradient beneath this area was toward the west (Figure 3.2-6, BLM 2008a). As of June 2011, the groundwater elevation was 4,359 feet amsl (BCI 2011), indicating that dewatering had lowered water levels approximately 246 feet at the monitoring well.

3.2.1.2 Proposed Water Well, Pipeline, and Other Ancillary Facilities

The proposed replacement potable water well and associated water supply pipeline and other proposed ancillary facilities located in Crescent Valley would be located along the northern margin of the Pipeline Complex, as shown in **Figure 2-2**. There are no perennial or intermittent streams, seeps, or springs, or waters of the U.S. located within the proposed facility footprints or within the vicinity of these proposed facilities (BLM 2008a).

The proposed well site is situated in an area underlain by basin fill sediments. Three test wells were drilled to identify the best location for the new water supply well (BCI 2012b). Test well POT-3, located closest to the proposed new water supply well, encountered 430 feet of basin fill sediments overlying bedrock. The current water level at this location is 252 feet beneath the ground surface (BCI 2012b).

3.2.2 Environmental Consequences

The primary issues related to water resources associated with the Proposed Action include: 1) potential impacts to groundwater and surface water quality from the construction, operation, and closure of the reconfigured NWRP and associated mill-grade ore stockpile; 2) potential impacts from flooding, erosion, and sedimentation associated with facility construction, operation, or closure activities; and 3) potential reduction in surface and groundwater quantity for current users and water-dependent resources from production well withdrawal.

3.2.2.1 Proposed Action

Reconfigured NWRP and Associated Ore Stockpile

Exposure of rocks to air and water during and after mining can cause increased weathering reactions that could result in the mobilization of constituents from the exposed rocks and potentially affect surface and groundwater resources. A key issue related to mine waste rock is the potential for acid generation through oxidation of sulfide minerals such as pyrite. Acid generated by sulfide mineral oxidation and associated metals releases from waste rock potentially can affect water quality.

The acid generating potential and waste rock leachate chemistry for the waste rock materials to be stored in the NWRP were described in Section 3.2.1.4, Waste Rock Characterization, in the Cortez Hills Expansion Project Final EIS (BLM 2008a). Waste rock was characterized by determining its acid generation potential using acid-base accounting analyses and geochemical composition through whole-rock chemical analyses. Leachate from the waste rock was characterized by performing kinetic tests that included humidity cell testing, column tests, and field oxidation tests. These leachate characterization results were used to establish the expected variations in leachate chemistry over time. Potential impacts to groundwater resources associated with the proposed waste rock facilities at the Cortez Hills Complex were evaluated quantitatively, using modeling of variably saturated flow and transport through the waste rock facilities and the underlying vadose zone (Geomega 2007). The results of the geochemical evaluation indicated that leachate generated from the waste rock would not adversely impact downgradient groundwater quality (i.e., exceed applicable water quality standards) (BLM 2008a).

Geomega (2012b) evaluated the potential for impacts to water resources resulting from the proposed reconfiguration of the NWRP and addition of the mill-grade ore stockpile on top of the NWRP. This evaluation was based on a comparison of available geochemical characterization data collected for waste rock and mill-grade ore from the Cortez Hills Pit with the waste rock characterization data used for the modeling in 2007 for the Cortez Hills Expansion Project Final EIS (BLM 2008a). The results of the comparison indicated that both materials (the waste rock and mill-grade ore) were geochemically equivalent to the waste rock materials characterized and used to model the facility in 2007 for the Cortez Hills Expansion Project Final EIS (BLM 2008a), and therefore, the results of the 2007 analyses apply to the proposed reconfigured NWRP and associated mill-grade ore storage (Geomega 2012b). Based on the geochemical evaluation, leachate generated from the waste rock (or mill-grade ore stockpile placed on top of the waste rock) is not expected to adversely impact downgradient groundwater quality (i.e., exceed applicable water quality standards).

Storm water diversions in the area of the proposed NWRP would be routed through riprap-lined collection ditches (SRK 2011). Diversions and storm water detention features would be designed and constructed in accordance with NDEP guidelines based on the 10-, 25-, or 100-year flood events, as appropriate. BMPs to control runoff, erosion, and sedimentation (BCI 2013e) would be implemented and maintained on new drainage features as part of permit approval and compliance. Therefore, impacts to surface water resources resulting from diversion of runoff around the facility are not anticipated.

Potable Water Well

The location of the proposed replacement potable water supply well is shown in **Figure 2-2**. The potable well would be designed to pump up to 16 gpm (BCI 2012b). Based on the site characterization information (summarized above in Section 3.2.1), it is assumed that the water supply well would be completed in the alluvial basin fill aquifer.

The average annual mine dewatering rate for the CGM Operations Area ranges from 8,400 to 36,100 gpm (Table 3.2-9 and Figure 3.2-10 of the Cortez Hills Expansion Project Final EIS [BLM 2008a]). The maximum pumping rate of 16 gpm for the proposed replacement potable well would not increase the annual groundwater withdrawal rate currently authorized for mining operations. Therefore, the proposed pumping for the potable water supply well would not increase groundwater drawdown in the project study area beyond the drawdown previously evaluated in the Cortez Hills Expansion Project Final EIS (BLM 2008a).

BCI has filed an application with the Office of the State Engineer for water rights for the new potable well to permit a change in the point of diversion and place of use of a portion of the public waters previously appropriated under an existing water rights permit (BCI 2012b). Other impacts to water rights associated with development and production of the well are not expected.

3.2.2.2 No Action Alternative

Under the No Action Alternative, the proposed modifications to currently authorized mining operations within the CGM Operations Area would not be implemented. Mining, processing, and closure and reclamation activities within the CGM Operations Area would continue under the terms of current permits and approvals authorized by the BLM and the State of Nevada. Potential impacts to water quantity and quality from construction, operation, and closure and reclamation of the currently permitted and approved facilities are described in the Cortez Hills Expansion Project Final EIS (BLM 2008a) and Final Supplemental EIS (BLM 2011a).

3.2.3 Cumulative Effects

3.2.3.1 Proposed Action

As described above, the proposed modifications to the currently authorized operations within the CGM Operations Area are not expected to result in substantial direct or indirect effects to water resources relative to the impacts evaluated for the Cortez Hills Expansion Project (BLM 2008a). Therefore, no additional cumulative impacts to water resources would occur as a result of the Proposed Action.

3.2.3.2 No Action Alternative

Under the No Action Alternative, cumulative impacts to water resources would be the same as described in the Cortez Hills Expansion Project Final EIS (BLM 2008a) and Final Supplemental EIS (BLM 2011a).

3.2.4 Monitoring and Mitigation Measures

No monitoring or mitigation measures are required for water resources and geochemistry.

3.2.5 Residual Adverse Effects

No residual adverse effects are anticipated for water resources and geochemistry.

3.3 Soils and Reclamation

As discussed in the introduction to Chapter 3.0, and indicated in **Table 3-3**, the element of the Proposed Action that would result in new or previously unauthorized disturbance to soils is the proposed construction of ancillary facilities, including a potable water well and associated pipeline and a capacitor bank with associated transformer and power distribution line (**Figure 2-2**).

The project study area for direct and indirect impacts to soils encompasses the proposed 41-acre disturbance area. The cumulative effects study area, as shown in Figure 3.1-10 of the Cortez Hills Expansion Project Final EIS (BLM 2008a), encompasses the project study area and includes surface disturbance associated with past and present actions and RFFAs within a 30-mile radius.

3.3.1 Affected Environment

Soils in the study area and cumulative effects study area are described in detail in Section 3.3, Soils and Reclamation, of the Cortez Hills Expansion Project Final EIS (BLM 2008a). Table 3.3-1 and Figure 3.3-1 in the Final EIS (BLM 2008a) indicate the soil mapping units that occur in the CGM Operations Area. A summary of the soil mapping units in the proposed new disturbance area is presented below in **Table 3-4**. Soils in proposed disturbance areas occur in the basin floor, which include soils on fan skirts and piedmonts or alluvial flats that are deep with medium or moderately fine textures. They typically have substantial salinity and alkalinity concentrations and may be seasonally flooded in the lowest topographic positions.

Table 3-4 Summary of Soil Mapping Units and Characteristics in Proposed New Disturbance Areas

Map Symbol	Soil Association or Series	Dominant Physiographic Position	General Soil Depth (inches)	Dominant Soil Texture	Major Slope Range (percent)	Erosion Hazard (water/wind)	Other Characteristics
1240	Redflame-Kingingham	Fan piedmonts	60+, 20	Very gravelly clay loam, gravelly sandy loam	2-15	Slight/slight	Stoniness, hardpan (Kingingham)
2060	Oxcorel-Beoska-Whirlo	Fan piedmonts	60+	Clay loam, silt loam, very gravelly sandy loam	0-8	Slight/slight	Salinity/alkalinity, hardpan, stoniness
3843	Jung, steep-Robson- Jung	Mountains	10-20	Very gravelly loam, very cobbly clay loam	30-50	Moderate/slight	Depth to rock, stoniness, slope

Sources: Soil Conservation Service 1992.

Growth media salvage, stabilization of disturbance areas, and revegetation efforts in both the study area and cumulative effects study area reflect the evolving practices in the mining industry over time. Modern gold production in the area began in 1968 at the Cortez Mine. Additional expansions of mining and processing facilities occurred in the 1980s, 1990s, and 2000s. Reclamation plans for the CGM Operations Area have been developed in accordance with federal and state regulations and the Memorandum of Understanding (NDEP, U.S. Forest Service [USFS], and BLM 2002) between NDEP, USFS, and BLM that exists for reclamation planning, bonding, implementation, and monitoring.

BCI has implemented reclamation plans for disturbed areas at the existing facilities within the CGM Operations Area that are no longer active and continues to conduct concurrent reclamation and erosion control efforts at ongoing activities. According to the BLM and NDEP, the reclamation efforts have been

successful in the area, particularly with respect to revegetation and weed control on reclaimed areas, aesthetic landscape shaping and recontouring, and growth media management (Sherve 2006; Suessmith 2006).

3.3.2 Environmental Consequences

3.3.2.1 Proposed Action

Surface disturbance associated with the proposed modifications under the Proposed Action would occur in previously disturbed and undisturbed areas. The element of the Proposed Action that would result in new or previously unauthorized disturbance (41 acres) to soils is the proposed construction of ancillary facilities, including a potable water well and associated pipeline and a capacitor bank with associated transformer and power distribution line.

Surface disturbing activities associated with the proposed ancillary facilities would increase the erosion potential by wind and water of disturbed soils until the completion of reclamation activities. Potential impacts of the Proposed Action would include increased soil erosion and decreased soil stability in the disturbed area, soil compaction and related effects (e.g., reduced porosity and infiltration rates) from equipment and vehicle traffic, availability of adequate growth media for use during reclamation, the mixing of existing soil horizons associated with installation of the proposed water pipeline, and the loss of soil productivity.

The potential impacts to the disturbed and reclaimed soils would be reduced by implementation of the site reclamation plan as discussed in Section 2.2.5 and the applicant-committed environmental protection measures identified in Section 2.2.4. To minimize impacts to soils and provide for re-establishment of vegetation, suitable growth media would be salvaged and stockpiled during the development of the open pits and during construction of the waste rock facilities for subsequent use in reclamation. Prior to seeding, disturbance areas would be recontoured, surfaces would be ripped or scarified (where conditions warrant) to relieve compaction, and growth media would be redistributed. BMPs would be used to limit erosion from project facilities and disturbance areas during and following construction and operations. These practices may include, but would not be limited to, installation of storm water diversions to route water around disturbance areas and project facilities and the placement of erosion control devices (e.g., silt fences, staked weed-free straw bales, riprap, etc.). To ensure long-term erosion control, all sediment and erosion control measures would be inspected periodically, and repairs would be performed, as needed. Therefore, the Proposed Action is not anticipated to result in substantial impacts to soils.

3.3.2.2 No Action Alternative

Under the No Action Alternative, existing mining and processing operations and reclamation activities within the CGM Operations Area would continue under the terms of current permits and approvals as authorized by the BLM and State of Nevada. Proposed modifications as described for the Proposed Action would not be implemented, and associated impacts to soils would not occur.

3.3.3 Cumulative Effects

3.3.3.1 Proposed Action

Past and present actions and RFFAs have resulted, or would result, in approximately 139,654 acres of soils disturbance, approximately 18 percent of which is associated with mining-related activities. The Proposed Action incrementally would increase soils disturbance and related impacts in the cumulative effects study area by 41 additional acres, resulting in an overall cumulative disturbance to soils of approximately 139,695 acres. It is assumed that portions of past mining-related disturbances have been reclaimed, ongoing reclamation at existing operations would continue, and disturbance associated with future operations would be reclaimed in accordance with permit requirements, thus reducing cumulative

impacts to soils. The incremental addition of soils impacts as a result of the Proposed Action would be temporary in nature, pending completion of successful reclamation.

3.3.3.2 No Action Alternative

Under the No Action Alternative, cumulative impacts to soils would be the same as described in the Cortez Hills Expansion Project Final EIS (BLM 2008a).

3.3.4 Monitoring and Mitigation Measures

No additional monitoring or mitigation is required for soils.

3.3.5 Residual Adverse Effects

Following mine closure and the successful reclamation of the proposed disturbance area, no residual effects to soils would be anticipated.

3.4 Vegetation

As discussed in the introduction to Chapter 3.0 and indicated in **Table 3-3**, the element of the Proposed Action that potentially would result in new or previously unauthorized disturbance to vegetation is the proposed construction of ancillary facilities, including a potable water well and associated pipeline and a capacitor bank with associated transformer and power distribution line (**Figure 2-2**).

The project study area for direct and indirect impacts to vegetation (including special status plant species, ethnobotanical plants, invasive and non-native species, and woodland products) encompasses the proposed 41-acre disturbance area. The cumulative effects study area, as shown in Figure 3.1-10 of the Cortez Hills Expansion Project Final EIS (BLM 2008a), encompasses the project study area and includes surface disturbance associated with past and present actions and RFFAs within a 30-mile radius.

3.4.1 Affected Environment

3.4.1.1 General Vegetation

There are 10 vegetation types (including disturbed lands) that occur within the overall CGM Operations Area, as shown in **Figure 3-5**. The project study area falls within the Loamy 5 to 8 inch precipitation zone (024XY002NV) ecological site and is completely occupied by the shadscale/budsage vegetation type (Great Basin Ecology, Inc. [GBE] 2012). This is the most common vegetation type within the CGM Operations Area, occupying approximately 43,700 acres of the CGM Operations Area. The soils associated with this vegetation type typically are neutral to strongly alkaline. Indurated duripans (i.e., strongly cemented silica hardpans) commonly are found in many soils associated with the vegetation type. Dominant plant species typically include shadscale (*Atriplex confertifolia*) and budsage (*Picrothamnus desertorum*), with an herbaceous understory primarily consisting of grass species such as bottlebrush squirreltail (*Elymus elymoides*), Indian ricegrass (*Achnatherum hymenoides*), and bluegrasses (*Poa* spp.), as well as globemallow (*Sphaeralcea* sp.). However, in the study area, many of the grasses and forbs normally present in this habitat are reduced in coverage and/or density and replaced by annual grasses (e.g., cheatgrass [*Bromus tectorum*]) (Back 2013). As reported in the GBE (2012) baseline report, vegetation in the study area is dominated by shadscale, budsage, cheatgrass, and Sandberg bluegrass (*Poa secunda*). Common invasive species within this vegetation type include cheatgrass, western tansymustard (*Descurainia pinnata*), and halogeton (*Halogeton glomeratus*).

3.4.1.2 Special Status Plant Species

Special status plant species include species that are listed as threatened or endangered under the Endangered Species Act (ESA), species that are proposed or are candidates for listing under the ESA, and species that are designated as sensitive by the BLM. These species are afforded an additional level of protection by law, regulation, or policy by federal or state agencies.

No federally listed plant species, federal candidate species, or species proposed for federal listing with potential to occur in or near the CGM Operations Area were identified in the Cortez Hills Expansion Project Final EIS (BLM 2008a). A recent review of the USFWS Nevada Fish and Wildlife Office's Protected Species by County (USFWS 2013) confirmed that no such species are known or expected to occur in the project study area.

The Cortez Hills Expansion Project Final EIS (BLM 2008a) identified six BLM sensitive plant species as having potential to occur in the CGM Operations Area: Elko rockcress (*Arabis falcifructa*), Nevada willowherb (*Epilobium nevadense*), windloving buckwheat (*Eriogonum anemophilum*), Eastwood's milkweed (*Asclepias eastwoodiana*), Colorado feverfew (*Parthenium ligulatum*), and Tiehm's beardtongue (*Penstemon tiehmii*). The potential for these species to occur in the CGM Operations Area was evaluated as part of the Cortez Hills Expansion Project Final EIS (BLM 2008a); the Colorado feverfew and Tiehm's beardtongue were eliminated from detailed analysis based on habitat

requirements and/or known distribution (BLM 2008a). Species-specific field surveys for the Elko rockcress, Nevada willowherb, windloving buckwheat, and Eastwood's milkweed previously were conducted for the Cortez Hills Expansion Project; no occurrences were identified (BLM 2008a). Also, none of these species are known to occur within the alkaline hardpan soils characteristic of the shadscale/budsage vegetation type.

One additional BLM sensitive plant species (Beatley buckwheat [*Eriogonum beatleyae*]) was included in the 2011 update to the Battle Mountain District sensitive species list. Based on NNHP information that identified this species as occurring within approximately 3 miles of the site (NNHP 2012), GBE (2012) recently assessed the potential for occurrence in the project study area. Based on that assessment, this species is not known to occur in salt desert scrub vegetation (GBE 2012), which includes the shadscale/budsage plant community. Thus, this species is unlikely to occur in the project study area.

3.4.1.3 Ethnobotanical Plant Species

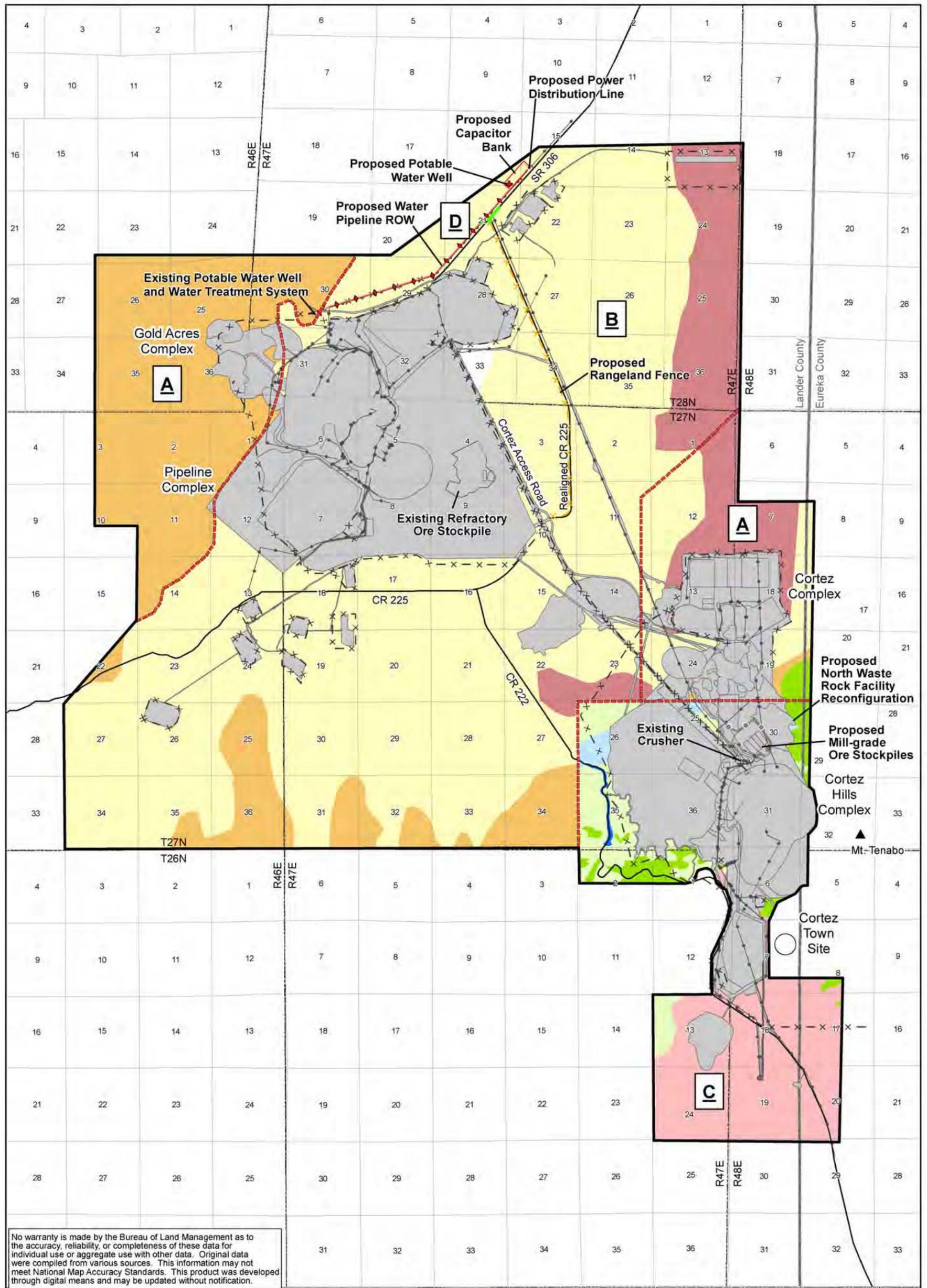
Lomatium dissectum, commonly referred to as fernleaf biscuitroot, desert parsley, giant lomatium, giant parsley, Indian parsley, and wild carrot, and as Toza by the Numic-speaking tribes of the Great Basin, has been valued and harvested for its medicinal properties by Native Americans throughout the West and Northwest for centuries (JBR 2002; Tilley et al. 2010). There is suitable habitat for *L. dissectum* in the Cortez Mountains, and the plant is abundant in numerous canyons throughout the range. It typically is associated with Wyoming big sagebrush, piñon-juniper, and mountain shrub communities (Tilley et al. 2010). Surveys for *L. dissectum* were conducted by JBR in 2000 and 2002, and no occurrences of this species were documented within the CGM Operations Area (JBR 2002, 2000). The species primarily was observed in the upper elevations of the Cortez Mountains (east-northeast of the CGM Operations Area). Based on the higher elevation occurrences of this species and known habitat association, no suitable habitat for this species occurs in the study area.

3.4.1.4 Noxious Weeds and Invasive and Non-native Species

A noxious weed is a plant species that has been defined as a pest by law or regulation. An invasive species is defined as a species that is non-native to the ecosystem under consideration and whose introduction causes or is likely to cause economic or environmental harm or harm to human health (EO 13112, signed February 3, 1999). The regulatory framework pertaining to noxious weeds and invasive and non-native species is discussed in the Cortez Hills Expansion Project Final EIS (BLM 2008a).

There are three invasive plant species that commonly occur in the shadscale/budsage vegetation type: cheatgrass, western tansymustard, and halogeton. In addition, there are several noxious weeds and other invasive plant species with potential to occur in the project study area. These species are listed in Table 3.4-2 of the Cortez Hills Expansion Project Final EIS (BLM 2008a). Since 2008, several of the invasive species listed in Table 3.4-2 of the Final EIS have been reclassified as noxious weeds. These species include cameltorn (*Alhagi maurorum*), Dyer's woad (*Isatis tinctoria*), hydrilla (*Hydrilla verticillata*), purple loosestrife (*Lythrum salicaria*, *L. virgatum* & cultivars), rush skeletonweed (*Chondrilla juncea*), medusahead (*Taeniatherum caput-medusae*), poison hemlock (*Conium maculatum*), and salt cedar (*Tamarix* spp.).

In accordance with the currently approved Noxious Weed Management Plan (SRK 2005), noxious weed and invasive and non-native species monitoring and treatment are conducted on an annual basis within the CGM Operations Area. The species, density of each identified infestation, chemicals used for treating each species, and plans for follow-up in the subsequent year are documented and the occurrence locations mapped. Based on the results of the 2013 survey (BCI 2013d), infestations of hoary cress, spotted knapweed, salt cedar, Russian knapweed, bull thistle, scotch thistle, and musk thistle were documented in discrete locations near mine facilities and roadways and treated. Evaluation of treatment success and follow-up treatment, as required, are planned for 2014.



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Legend

- Cortez Gold Mines Operations Area Boundary
- Proposed New Disturbance Areas
- Currently Authorized Disturbance
- + Proposed Potable Water Well
- Proposed Diversion Channel
- Vegetation Type Source Areas
- Proposed Power Distribution Line
- ◆ Proposed Water Pipeline
- Power Line (reconfiguration)
- Proposed Rangeland Fence
- x Currently Authorized Fence
- Currently Authorized Power Line
- Fence
- Basin Big sagebrush
- Low sagebrush
- Mixed sagebrush
- Pinon/juniper
- Sagebrush/grassland
- Shadscale/black greasewood
- Shadscale/budsage
- Wyoming sagebrush

Sources: Adapted from: BLM 2008a.
 Area A - BLM 1992.
 Area B - BLM 2000.
 Area C - JBR 2000, 2005 and ENSR 2006.
 Area D - GBE 2012 (proposed ancillary facilities).

Note: In localized areas where existing vegetation types were not previously delineated, aerial photographs were reviewed to identify vegetation types.



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Figure 3-5
 Vegetation Types



3.4.1.5 Woodland Products

As discussed above, the project study area comprises a shadscale/budsage vegetation type; no piñon-juniper woodlands are present in the project study area.

3.4.2 Environmental Consequences

3.4.2.1 Proposed Action

General Vegetation

The proposed disturbance for the new ancillary facilities, including the potable water well and associated pipeline and the capacitor bank and associated transformer and power distribution line, would result in the removal of 41 acres of the shadscale/budsage vegetation type. This impact would affect less than 0.1 percent of this vegetation type within the CGM Operations Area.

The disturbance area associated with the proposed water pipeline would be reclaimed following construction. The facilities site for the capacitor bank, transformer, and power distribution line would be reclaimed following the completion of mining. The entire 41 acres of proposed disturbance would be revegetated in accordance with BCI's current Reclamation Plan for the CGM Operations Area and the applicant-committed environmental protection measures outlined in Sections 2.5 and 2.2.4.3 of this EA, respectively. The seed mix developed and approved by the BLM (2008a,c) for use in the lower elevations of the CGM Operations Area (inclusive of the proposed disturbance area) is presented in **Table 2-2**.

The proposed surface disturbance would result in the conversion of shrub-dominated vegetation to grass/forb-dominated vegetation in the short term. Approximately 3 to 5 years following reclamation, the reclaimed plant community likely would consist of adequate herbaceous plant cover with sufficient diversity to substantially reduce the potential for soil erosion and provide forage for use by livestock and wildlife, thus supporting the post-mining land uses (see Section 2.2.5.2). Over the long term, shrubs would become re-established and increase in abundance as a result of reclamation and natural recolonization.

Special Status Plant Species

Based on known distribution, no impacts to federally listed or federal candidate plant species or species proposed for federal listing are anticipated.

Per BCI's committed environmental protection measure for special status plant species as presented in Section 2.2.4.3., information relative to known occurrences of special status species was obtained from the NNHP (2012). Based on GBE's (2012) subsequent evaluation, no potentially suitable habitat for these species exists within the project study area. Therefore, no impacts to BLM sensitive species are anticipated.

Ethnobotanical Plant Species

As discussed in Section 3.4.1.3, *L. dissectum* was not documented in the CGM Operations Area during earlier surveys (JBR 2002, 2000), and it is not known to occur in the shadscale/budsage vegetation type. Therefore, impacts to this species are not anticipated as a result of the proposed project modifications.

Noxious Weeds and Invasive and Non-native Species

Implementation of BCI's weed control program in conjunction with the reclamation plan (including use of weed-free seed mixes) and applicant-committed environmental protection measures as discussed in Sections 2.2.5.5, 2.2.5, and 2.2.4.3 of this EA, respectively, would minimize the potential for establishment and spread of noxious weeds, invasive, and/or non-native plant species as a result of the proposed 41 acres of new disturbance and the proposed rangeland fence installation. Also, in

accordance with the approved Noxious Weed Management Plan (SRK 2005), BCI would notify construction contractors that vehicles would need to be cleaned before entering the mine site. Following mine closure and reclamation, revegetation efforts would continue to be monitored, and the incidence and spread of noxious weeds would be controlled until reclamation is considered successful as discussed in Section 2.2.5.6 of this EA.

Contractor truck traffic associated with the proposed additional refractory ore transport to Goldstrike incrementally would increase the potential for spread of noxious weeds and invasive and non-native species along the transportation route (SR 306, I-80, and SR 766).

3.4.2.2 No Action Alternative

Under the No Action Alternative, existing mining and processing operations and reclamation activities within the CGM Operations Area would continue under the terms of current permits and approvals as authorized by the BLM and State of Nevada. Proposed modifications as described for the Proposed Action would not be implemented, and associated impacts to general vegetation, special status plant species, ethnobotanical plant species, and woodland products, and potential vegetation effects associated with noxious weeds and invasive and non-native plant species, would not occur.

3.4.3 Cumulative Effects

3.4.3.1 Proposed Action

Vegetation

Past and present actions (including wildfires) and RFFAs have resulted, or would result, in approximately 139,654 acres of disturbance to vegetation, approximately 18 percent of which is associated with mining-related activities. The Proposed Action incrementally would increase surface disturbance and related impacts to vegetation in the cumulative effects study area by 41 additional acres, resulting in an overall cumulative disturbance to vegetation of approximately 139,695 acres. It is assumed that portions of past mining-related disturbances have been reclaimed, ongoing reclamation at existing operations would continue, and disturbance associated with future operations would be reclaimed in accordance with permit requirements, thus reducing cumulative impacts to vegetation. The incremental addition of vegetation impacts as a result of the Proposed Action would be temporary in nature, pending completion of successful reclamation.

No direct or indirect impacts to special status plant species, ethnobotanical plant species, or woodland products from piñon-juniper woodlands would occur under the Proposed Action; therefore, the proposed modifications would not contribute to cumulative impacts to these resources.

Noxious Weeds and Invasive and Non-Native Species

It is assumed that the majority of the surface disturbance associated with past and present actions and RFFAs would be reclaimed, which would minimize the establishment of noxious weeds and invasive and non-native species. Disturbance areas not reclaimed would be prone to the establishment of noxious weeds and invasive and non-native species. In addition, implementation of BCI's committed environmental protection measures (Section 2.2.4.3), reclamation plan (Section 2.2.5), and the authorized Noxious Weed Management Plan (Section 2.2.5.5), would help minimize the establishment and spread of noxious weeds and invasive and non-native species in the proposed 41-acre disturbance area and, therefore, minimize the project's contribution to cumulative effects associated with these species.

3.4.3.2 No Action Alternative

Under the No Action Alternative, cumulative impacts to general vegetation, special status plant species, ethnobotanical plant species, and woodland products, and the potential vegetation effects associated with noxious weeds and invasive and non-native plant species, would be the same as described in the Cortez Hills Expansion Project Final EIS (BLM 2008a).

3.4.4 Monitoring and Mitigation Measures

Vegetation

No additional monitoring or mitigation is required for vegetation.

Noxious Weeds and Invasive and Non-Native Species

No additional monitoring or mitigation is required for noxious weeds and invasive and non-native plant species.

3.4.5 Residual Adverse Effects

Vegetation

Residual adverse effects to vegetation would include the long-term change in vegetation composition (i.e., shrub-dominated community to grass- and forb-dominated community) as a result of project development and operations. Over time, this effect would diminish as shrubs become re-established.

Noxious Weeds and Invasive and Non-native Species

Residual adverse effects to vegetation communities may occur as a result of noxious weed and invasive and non-native species infestations; it is anticipated these effects would diminish following the completion of successful reclamation.

3.5 Wildlife and Fisheries Resources

As discussed in the introduction of Chapter 3.0 and indicated in **Table 3-3**, the elements of the Proposed Action that potentially would result in new impacts to wildlife habitat and species include: 1) the newly proposed construction of ancillary facilities, including a potable water well and associated pipeline and a capacitor bank with associated transformer and power distribution line (**Figure 2-2**); 2) the proposed installation of a rangeland fence along CR 225 (potential effects on big game movement patterns); and 3) the proposed relocation of approximately 6 million additional tons of refractory ore (at a rate of approximately 800,000 tpy) from the Pipeline Complex ore stockpile to Goldstrike (vehicle-wildlife collision potential perspective).

The project study area for direct and indirect impacts to wildlife and fisheries resources (including special status species) includes the proposed 41-acre disturbance area, the proposed rangeland fence along CR 225, and the proposed transportation route from the Pipeline Complex to Goldstrike. The analysis of the proposed additional off site shipment of refractory ore to Goldstrike in Section 3.11, Land Use and Access, provides the basis for the associated wildlife collision potential analysis. The cumulative effects study area, as shown in Figure 3.1-10 of the Cortez Hills Expansion Project Final EIS (BLM 2008a), encompasses the project study area and includes surface disturbance associated with past and present actions and RFFAs within a 30-mile radius.

3.5.1 Affected Environment

3.5.1.1 Terrestrial Wildlife

Habitat

Wildlife habitat in the project study area comprises salt desert scrub dominated by shadscale/budsage as described in Section 3.4.1.1, Vegetation Types. In the study area, many of the grasses and forbs normally present in this habitat are reduced in coverage and/or density and replaced by annual grasses (e.g., cheatgrass) (Back 2013). The proposed disturbance area also is located immediately adjacent to SR 306 and existing mine facilities. As a result, this area is considered to have relatively low habitat value in comparison to more remote areas of salt desert scrub habitat.

Big Game Species

Mountain lion (*Felis concolor*), mule deer (*Odocoileus hemionus*), and pronghorn (*Antilocarpa americana*) are known to occur within the CGM Operations Area. Although mule deer may occur throughout the CGM Operations Area, NDOW-mapped mule deer seasonal ranges are largely confined to the benches, foothills, and mountains of the nearby Shoshone, Toiyabe, and Cortez mountain ranges. Exceptions to this are agricultural lands in Crescent Valley to the east and north of the study area, which NDOW has mapped as habitat for mule deer (**Figure 3-6**). Mountain lion tend to occur in close association with mule deer, their primary prey species. Crescent Valley, with its salt desert scrub vegetation and general lack of freshwater resources (outside of irrigated agricultural lands), provides marginal habitat for mule deer and, by association, mountain lion.

Pronghorn are more prevalent in valley habitats, and NDOW has mapped Crescent Valley, including the majority of the project study area, as pronghorn winter range (**Figure 3-7**). Year-long range for pronghorn is present in the remainder of the study area and on valley benches to the west and south of the study area. Pronghorn is the primary big game species likely to occur in the project study area. NDOW's 2012-2013 Big Game Status Book (NDOW 2013c) states that for Hunt Units 141, 143, 151-156, which surround the project study area, pronghorn population growth has been high over the last several years, likely due to the prevalence of annual and perennial grasses and forbs following the large-scale wildfires in 1999. The 2012 fawn-to-doe ratio was the lowest in 6 years and was directly related to the lack of precipitation. It is anticipated that the total amount and timing of precipitation ultimately will regulate this population's growth and distribution and, if drought conditions persist across the management area, the population will start to decline (NDOW 2013c).

Small Game Species

Upland game birds known to occur within the CGM Operations Area include greater sage-grouse (*Centrocercus urophasianus*), chukar (*Alectoris chukar*), mourning dove (*Zenaida macroura*), and gray partridge (*Perdix perdix*). The greater sage-grouse, a federal candidate species for listing under the ESA and a BLM sensitive species, is discussed further in Section 3.5.1.3, Special Status Species. Chukars and mourning doves occur in shadscale/budsage habitat in proximity to open water. Based on the limited amount of open water in the CGM Operations Area, these species are not likely to be prevalent in the project study area. Gray partridge tend to be associated with agricultural fields and grasslands during the breeding season and crop stubble (particularly cereal grains) and wooded cover in the winter.

Other small game species with potential to occur in the vicinity of the project study area include cottontail rabbits (*Sylvilagus* sp.) and white-tailed jackrabbits (*Lepus townsendii*), as well as furbearers including kit fox (*Vulpes macrotis*), gray fox (*Urocyon cinereoargenteus*), coyote (*Canis latrans*), bobcat (*Lynx rufus*), badger (*Taxidea taxus*), weasels (*Mustela* spp.), and striped skunk (*Mephitis mephitis*).

Nongame Species

Although the lack of water and generally low vegetation volume and structural diversity likely limit the diversity and abundance of wildlife that occur in the vicinity of the project study area, a variety of nongame species including small mammals, songbirds, raptors, and reptiles potentially could occur in the area. No raptor nests have been documented within 1 mile of the project study area (NDOW 2013b); however, to the extent that rabbits, jackrabbits, and other small mammals such as Townsend's ground squirrel (*Urocitellus townsendii*) are common in the vicinity of the project study area, foraging raptors such as the golden eagle (*Aquila chrysaetos*) and red-tailed hawk (*Buteo jamaicensis*) may occur. Songbirds likely to occur within the project study area include horned lark (*Eremophila alpestris*) and western meadowlark (*Sturnella neglecta*). A number of bat species potentially occur in the project study area as foraging individuals. Most of these bat species are considered sensitive by the BLM and are discussed further in Section 3.5.1.3, Special Status Species. Other nongame species likely to occur in the project study area include common reptiles such as the western fence lizard (*Sceloporus occidentalis*), collared lizard (*Crotaphytus collaris*), gopher snake (*Pituophis melanoleucus*), and Great Basin rattlesnake (*Crotalus viridis lutosus*). A comprehensive list of nongame species observed within the CGM Operations Area is provided in Table C-1 in Appendix C of the Cortez Hills Expansion Project Final EIS (BLM 2008a).

Migratory Birds

The Migratory Bird Treaty Act and EO 13186 provide for the protection of migratory birds. Pursuant to EO 13186, a Memorandum of Understanding was drafted among the BLM, USFS, and USFWS to promote conservation and protection of migratory birds. The BLM Nevada State Office prepared Migratory Bird BMPs for the Sagebrush Biome in order to assist BLM field offices in considering the effects of land management activities on migratory birds. Breeding bird surveys were conducted in the CGM Operations Area in May and June 2005 (JBR 2005). Bird species observed during these survey efforts are listed in Tables C-1 (general wildlife) and Table C-2 (special status species) of Appendix C in the Cortez Hills Expansion Project Final EIS (BLM 2008a). A number of species identified by the USFWS (2008) as birds of conservation concern in the Great Basin Bird Conservation Region (BCR 9) are identified in these tables. Those known to occur in the CGM Operations Area include the golden eagle (*Aquila chrysaetos*), pinyon jay (*Gymnorhinus cyanocephalus*), sage thrasher (*Oreoscoptes montanus*), and Brewer's sparrow (*Spizella breweri*). Additional birds of conservation concern identified in Table C-2 of the Final EIS (BLM 2008a) as having potential to occur in the CGM Operations Area include the bald eagle (*Haliaeetus leucocephalus*), ferruginous hawk (*Buteo regalis*), and loggerhead shrike (*Lanius ludovicianus*). Of these species, only the Brewer's sparrow and loggerhead shrike have the potential to nest within the project study area. Five golden eagle nests have been documented within 10 miles of the project study area (NDOW 2013b). Two of these were recorded in 1974 and 1975, one in 2000, and two in 2012. Of these, the two nests documented in 2012 are the most likely to still be used; the closest of

these is located approximately 8.5 miles from the southern end of the proposed rangeland fence and 12 miles from the proposed ancillary facilities site. The nearest documented ferruginous hawk nest found in 2012 is located almost 11 miles from the southern end of the proposed rangeland fence and over 14 miles from the proposed ancillary facilities site.

3.5.1.2 Fisheries

Based on the lack of suitable habitat (perennial surface water bodies), no fisheries resources occur within or adjacent to the project study area.

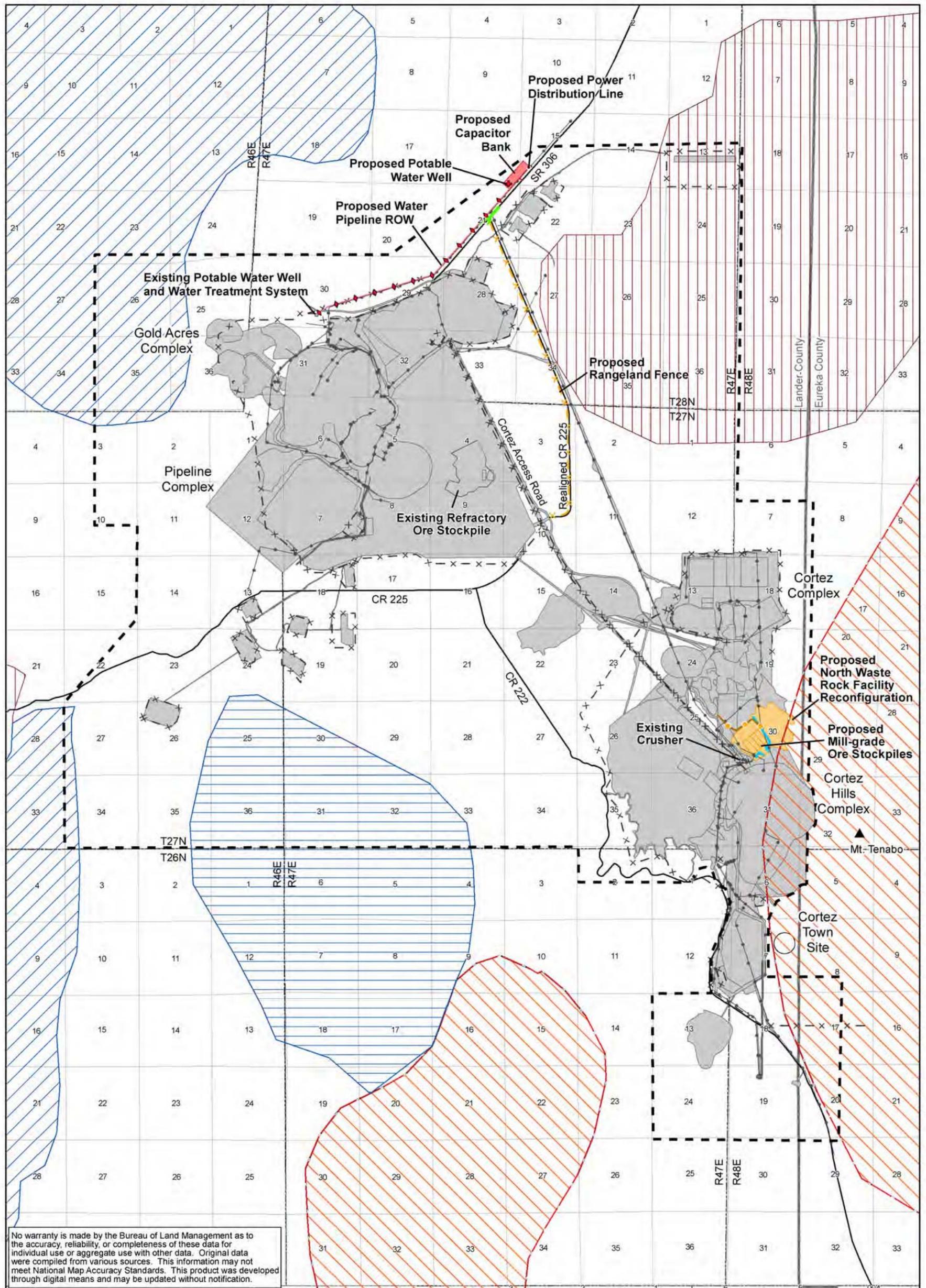
3.5.1.3 Special Status Species

Special status species include species that are protected under the ESA, species that are proposed or candidates for listing under the ESA, and species that are designated as sensitive by the BLM. These species are afforded an additional level of protection by law, regulation, or policy by state or federal agencies.

No federally listed wildlife species, federal candidate species, or species proposed for federal listing with potential to occur in or near the project study area were identified in the Cortez Hills Expansion Project Final EIS (BLM 2008a). Since that time, listing of the greater sage-grouse as threatened or endangered was found to be warranted but precluded by higher priority listing actions (Federal Register, March 5, 2010). As a result, the greater sage-grouse is now considered a federal candidate species. The greater sage-grouse also is considered a BLM sensitive species and is discussed further below.

There are a number of BLM Battle Mountain District sensitive species that have the potential to occur in the project study area. Most of these species are described in detail in the Cortez Hills Expansion Project Final EIS (BLM 2008a); however, there have been changes in the BLM sensitive species list since 2008. Some of the sensitive species analyzed in the 2008 EIS (BLM 2008a) have been dropped and others have been added (GBE 2012). Current BLM sensitive species that have been documented or have the potential to occur in the project study area are listed in **Table 3-5**. Those species with moderate or high potential to occur in the project study area are addressed in the impact analysis in Section 3.5.2. Habitat within the project study area generally is considered unsuitable for species identified as having a low potential for occurrence. Bird and bat species with low occurrence potential may occur within the project study area on a transitory basis during migration or during daily flights among patches of suitable habitat outside of the project study area; however, the study area does not provide substantive food, cover, or shelter for these species. Project-related impacts to this habitat therefore would have no discernible effects on these species, and they are not addressed in the impact analysis.

Pertinent life history information on the species with moderate or high potential to occur in the project study area is presented in Section 3.5.1.3 of the Cortez Hills Expansion Project Final EIS (BLM 2008a). Species added to the BLM Battle Mountain District's sensitive species list since the 2008 Final EIS that have moderate or high potential to occur in the project study area include the dark kangaroo mouse, sage thrasher, and Brewer's sparrow. Brief species accounts are provided for these species below. Because of its more recent status as a candidate for federal listing, additional information on the greater sage-grouse is presented below.



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Legend

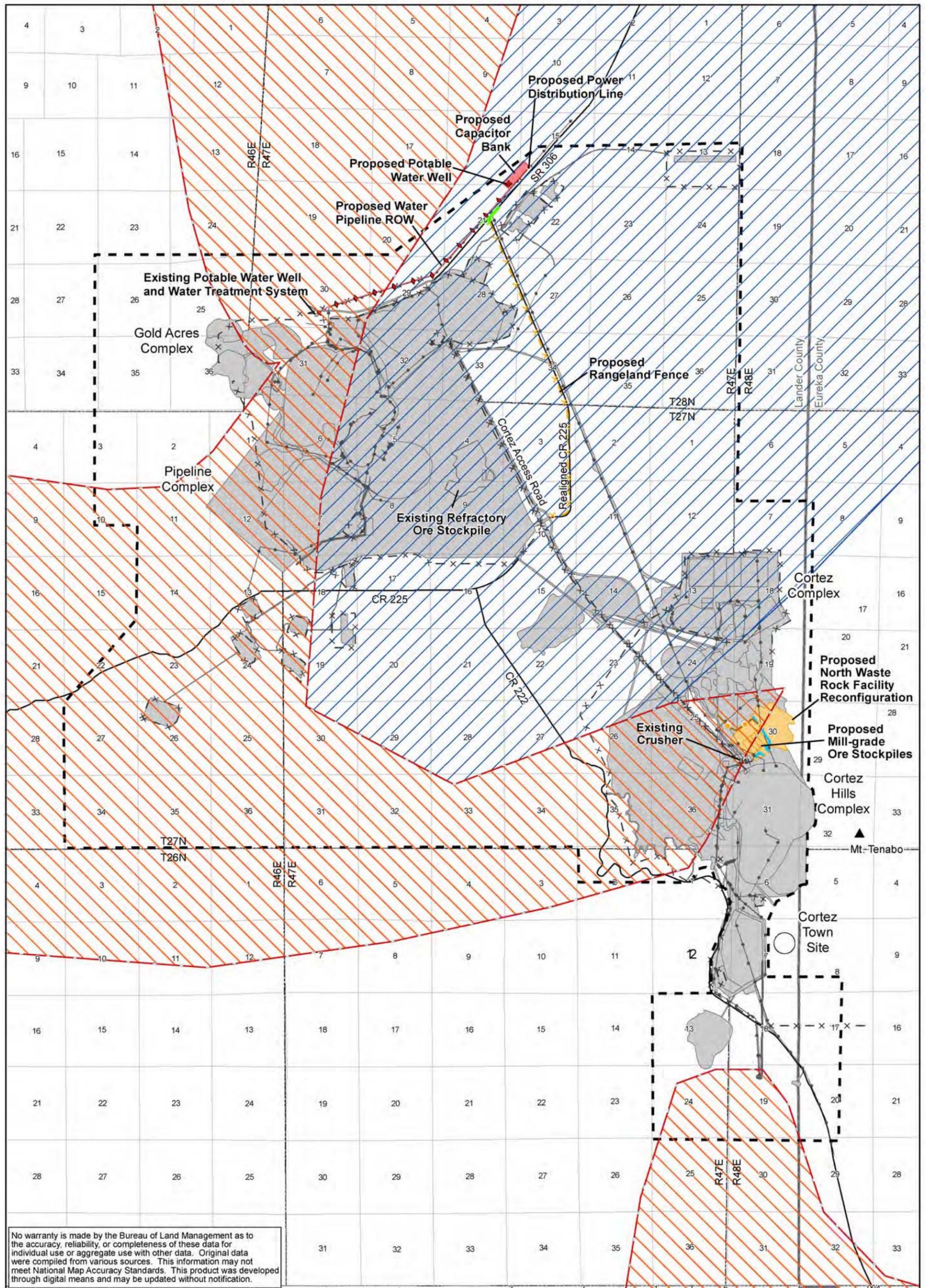
- Cortez Gold Mines Operations Area Boundary
- Proposed New Disturbance Area
- Proposed Facility Modifications within Previously Authorized Disturbance Area
- Currently Authorized Disturbance
- + Proposed Potable Water Well
- Proposed Diversion Channel
- Proposed Power Distribution Line
- ◆ Proposed Water Pipeline
- Power Line (reconfiguration)
- x Proposed Rangeland Fence
- x Currently Authorized Fence
- Currently Authorized Power Line
- Fence
- Mule Deer Agricultural Range
- Mule Deer Crucial Winter Range
- Mule Deer Winter Range
- Mule Deer Year-long Range

Note: Proposed rangeland fencing would be installed along both sides of the previously realigned segment of CR 225.
Source: NDOW 2013a.

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Mount Lewis Field Office
50 Bastian Road
Battle Mountain, Nevada 89820

2011 Plan of Operations Amendment

Figure 3-6
Designated Mule Deer Range



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Legend

- Cortez Gold Mines Operations Area Boundary
- Proposed New Disturbance Area
- Proposed Facility Modifications within Previously Authorized Disturbance Area
- Currently Authorized Disturbance
- + Proposed Potable Water Well
- Proposed Diversion Channel
- Proposed Power Distribution Line
- Proposed Water Pipeline
- Power Line (reconfiguration)
- x Proposed Rangeland Fence
- x Currently Authorized Fence
- Currently Authorized Power Line
- Fence
- Pronghorn Winter Range
- Pronghorn Year-long Range

Note: Proposed rangeland fencing would be installed along both sides of the previously realigned segment of CR 225.
Source: NDOW 2013a.

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50 Bastian Road
Battle Mountain, Nevada 89820

2011 Plan of Operations Amendment

Figure 3-7
Designated Pronghorn Range

Table 3-5 BLM Sensitive Species with Potential to Occur in the Project Study Area

Common Name	Scientific Name	Documented in CGM Operations Area ¹	Potential to Occur in Project Study Area ^{2,3}
Mammals			
Pallid bat	<i>Antrozous pallidus</i>	Yes	High
Big brown bat	<i>Eptesicus fuscus</i>	Yes	Moderate
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	Yes	Low
Silver-haired bat	<i>Lasionycteris notivagans</i>	No	Low
Western small-footed myotis	<i>Myotis ciliolabrum</i>	No	High
Long-eared myotis	<i>Myotis evotis</i>	Yes	Low
Fringed myotis	<i>Myotis thysanodes</i>	No	Low
Long-legged myotis	<i>Myotis volans</i>	No	Low
Spotted bat	<i>Euderma maculatum</i>	No	Moderate
Western pipistrelle	<i>Pipistrellus hesperus</i>	Yes	High
Little brown bat	<i>Myotis lucifugus</i>	Yes	Moderate
California myotis	<i>Myotis californicus</i>	Yes	Moderate
Yuma myotis	<i>Myotis yumanensis</i>	No	Low
Hoary bat ⁴	<i>Lasiurus cinereus</i>	Yes	Low
Pygmy rabbit	<i>Brachylagus idahoensis</i>	No	Low
Dark kangaroo mouse	<i>Microdipidops megacephalus</i>	No	Moderate
Birds			
Northern goshawk	<i>Accipiter gentilis</i>	No	Low
Bald eagle	<i>Haliaeetus leucocephalus</i>	No	Low
Golden eagle	<i>Aquila chrysaetos</i>	Yes	High
Ferruginous hawk	<i>Buteo regalis</i>	No	Moderate
Swainson's hawk	<i>Buteo swainsoni</i>	No	Low
Greater sage-grouse	<i>Centrocercus urophasianus</i>	Yes	Moderate
Western snowy plover ⁴	<i>Charadrius alexandrinus nivosus</i>	No	Low
Peregrine falcon ⁴	<i>Falco peregrinus</i>	No	Low
Western burrowing owl	<i>Athene cunicularia hypugaea</i>	Yes	High
Pinyon jay	<i>Gymnorhinus cyanocephalus</i>	Yes	Low
Loggerhead shrike	<i>Lanius ludovicianus</i>	Yes	High
Black rosy finch ⁴	<i>Leucosticte atrata</i>	No	Low
Lewis's woodpecker	<i>Melanerpes lewis</i>	No	Low

Table 3-5 BLM Sensitive Species with Potential to Occur in the Project Study Area

Common Name	Scientific Name	Documented in CGM Operations Area ¹	Potential to Occur in Project Study Area ^{2,3}
Sage thrasher	<i>Oreoscoptes montanus</i>	No	Moderate
Brewer's sparrow	<i>Spizella breweri</i>	Yes	Moderate

¹ Based on Appendix C of the Cortez Hills Expansion Project Final EIS (BLM 2008a).

² Based on GBE (2012) report and Cortez Hills Expansion Project Final EIS (BLM 2008a) analysis.

³ Low = Little or no potentially suitable habitat (food, cover, or shelter) in study area and few or no records of occurrence in CGM Operations Area
Moderate = Potentially suitable food, cover, or shelter habitat in study area and record of species occurrence in CGM Operations Area.
High= Suitable food, cover, and shelter habitat in study area and multiple observations in CGM Operations Area.

⁴ The life history attributes of these species were not described in the Cortez Hills Expansion Project Final EIS (BLM 2008a). Because they have low potential to occur in the current project study area and are not being addressed in the impact analysis, no additional life history information is provided.

Dark Kangaroo Mouse

Based on Linzey and NatureServe (2008), the dark kangaroo mouse is found in the western U.S. from west-central Utah through central and northwestern Nevada into northeastern California and southeastern Oregon. Habitat consists of shadscale scrub, sagebrush scrub, and alkali sink plant communities in loose sand and gravel substrates. The species is active from March through October, and young typically are born in May and June. This species is nocturnal and, thus, primary predators include owls, badgers, and foxes. In west-central Nevada, the mean yearly circular home range was observed as 1.6 acres for males and 1.0 acre for females (O'Farrell and Blaustein 1974). The dark kangaroo mouse feeds primarily on seeds and some insects. The species does not appear to require free water. Although no occurrence data are available, the project study area appears to provide suitable habitat within the range of this species. However, due to the relative lack of native grasses and forbs (Back 2013), habitat quality for the dark kangaroo mouse in the project study area is likely to be marginal, and the species, if it occurs on the site, is likely to be present in low numbers.

Greater Sage-grouse

Greater sage-grouse are known to occur in the eastern and southern portions of the CGM Operations Area on the northern end of Grass Valley, approximately 10 miles from the proposed ancillary facilities and approximately 5 miles from the southern end of the proposed rangeland fence. Leks, or strutting grounds, are the sites of greater sage-grouse reproductive activities and tend to be located in flat, open, sparsely vegetated sites in or adjacent to sagebrush-dominated vegetation types. Most greater sage-grouse nests are located within a few miles of a lek. Based on NDOW (2013b) data, there is a historic greater sage-grouse lek (the Tenabo lek) located outside of the CGM Operations Area approximately 1.4 miles from the project study area. The status of this lek is unknown (NDOW 2013b). However, given that the last survey was in 1947 and that the lek site is surrounded by historic mine workings, it is highly unlikely that this lek is still active. Based on recommendations from NDOW (2012a), surveys of the Tenabo lek are not warranted based on the current disturbance in the area (BLM 2012b). The nearest potentially active leks to the project study area are the Utah Mine Camp 2 and 3 leks, which are over 7 miles away (NDOW 2013b).

Big sagebrush (*Artemisia tridentata*) is a key component of greater sage-grouse habitat providing forage as well as nesting, security, and thermal cover on a year-round basis. Plant communities that provide succulent herbaceous vegetation, have relatively high insect concentrations, and occur in the general vicinity of nesting areas are important foraging areas for chicks and are used as brood-rearing habitat during the summer months. During the winter, greater sage-grouse are found exclusively in sagebrush

communities where sagebrush is tall enough to extend above the snow, generally south- or west-facing slopes and wind-blown ridges where snow depths tend to be lower.

Based on Figure 3.5-3 in the Cortez Hills Expansion Project Final EIS (BLM 2008a), late summer habitat for greater sage-grouse occurs north and east of the Pipeline Complex, with the area to the north and northeast of the complex also identified as winter habitat (NDOW 2005). Based on more recent mapping by NDOW (2012b) and the BLM and USFS (2012), preliminary priority habitat (PPH) for greater sage-grouse occurs to the north of the Pipeline Complex, preliminary general habitat occurs to the northeast, and the area to the southeast is identified as non-habitat for the species. Based on BLM and USFS (2012) mapping, the portion of the study area in which the proposed ancillary facilities would be located falls within PPH. However, the results of a site evaluation conducted by GBE (2012) indicate that the classification of greater sage-grouse habitat in this area as PPH is inconsistent with the local field conditions. As described above in Section 3.4.1.1, Vegetation Types, the project study area is located entirely in the shadscale-budsage vegetation type. As reported in the GBE (2012) baseline report, vegetation in the study area is dominated by shadscale, budsage, cheatgrass, and Sandberg bluegrass. The lack of big sagebrush, sparse vegetation, relative paucity of herbaceous species, and lack of moisture in this vegetation type confer little or no habitat value to greater sage-grouse.

Sage Thrasher

During the breeding season, the sage thrasher is found across much of the western U.S. from northern New Mexico and Arizona northward into Montana, Washington, and adjacent portions of southern Canada. The species winters from central New Mexico and Arizona south into central Mexico, westward into the southern tip of California, and southward throughout the Baja Peninsula. It occurs in shrub-steppe habitats dominated by big sagebrush and is considered a sagebrush obligate species (Dobler et al. 1996), although in Nevada the species has been noted in black greasewood (*Sarcobatus vermiculatus*) habitat (Medin 1990). The sage thrasher's primary food during the breeding season consists of insects and a relatively small amount of other arthropods and plant material including berries and fruit, if available (Reynolds et al. 1999). Nests are most commonly found in big sagebrush but occasionally are located in low sagebrush, black greasewood, rabbitbrush, horsebrush, and juniper habitats (Reynolds et al. 1999). Sage thrashers have some potential to occur in the project study area; however, based on the species affinity for sagebrush, they are more likely to nest and forage in sagebrush-dominated habitats to the west of the study area.

Brewer's Sparrow

The seasonal distribution of the Brewer's sparrow is very similar to that of the sage thrasher described above. Like the sage thrasher, it is most closely associated with big sagebrush habitats where it is often the most abundant bird species. During the winter, this species uses a broader variety of vegetation types including habitats dominated by saltbush species (*Atriplex* spp.) and creosote bush (*Larrea tridentate*). During spring and fall migration, the species will use habitats similar to its typical breeding and wintering habitats (Rotenberry et al. 1999). Brewer's sparrow forages primarily on small insects gleaned from the bark and foliage of shrubs and small trees. It also eats seeds, which are usually taken from the ground (Rotenberry et al. 1999). Given this species' close association with sagebrush, it is unlikely to be prevalent in the project study area during the breeding season; it is more likely to use this area during spring and fall migration.

3.5.2 Environmental Consequences

3.5.2.1 Proposed Action

Ancillary Facilities

Terrestrial Wildlife

Construction of the proposed ancillary facilities would result in temporary impacts to 41 acres of shadscale/budsage vegetation, a type of salt desert scrub habitat. This habitat is prevalent within the

CGM Operations Area and throughout the Great Basin region. Because the proposed disturbance area would be located immediately adjacent to existing developed and disturbed sites associated with the Pipeline Complex and SR 306, it is assumed that habitat fragmentation-related effects would be minimal. Implementation of BCI's Reclamation Plan as discussed in Section 2.2.5, would minimize habitat impacts; however, the Proposed Action would result in the long-term conversion of 41 acres of salt desert scrub habitat to a grassland habitat until woody species have become re-established and reach maturity (approximate 25 years). It is anticipated that the incremental temporary reduction in salt desert scrub habitat as a result of the Proposed Action would have a minor effect on the overall quality and abundance of this habitat type in the CGM Operations Area (affecting less than 0.1 percent of this habitat type) and a minimal effect in relation to its overall availability in the region. Construction of the proposed ancillary facilities incrementally would contribute to the potential introduction and/or spread of noxious weeds and other invasive plant species in the area, with an associated potential to degrade wildlife habitat surrounding the site. These impacts would be minimized through implementation of BCI's approved Noxious Weed Management Plan (SRK 2005), reclamation plan, and the use of certified weed-free seed mixes based on the applicant-committed measures identified in Section 2.2.4.3.

Impacts to big game species primarily would be limited to pronghorn. Potential direct impacts would include the long-term reduction of approximately 41 acres of year-long range for this species. However, given the prevalence of this habitat throughout the CGM Operations Area and Crescent Valley as a whole, no appreciable effects on pronghorn are anticipated. Successful reclamation of disturbance areas following mine closure would further minimize long-term impacts.

Construction and operation of the proposed ancillary facilities would result in a 41-acre reduction in bird foraging and nesting habitat until revegetation has been completed and vegetation re-established. To minimize construction-related impacts to breeding birds, BCI has committed to conducting breeding bird surveys and implementing appropriate mitigation measures, as needed, in the event that project construction should occur during the breeding season (see Section 2.2.4.4). Based on the mobility of avian species, the applicant-committed environmental protection measure, and the overall availability of salt desert scrub habitat in the CGM Operations Area and Crescent Valley as a whole, it is unlikely that this reduction in habitat would have a discernible impact on these species.

If the proposed approximately 650-foot-long, 120-kilovolt power distribution line is installed above ground, the installation could pose an electrocution hazard for raptor species attempting to perch on the structures. To minimize this potential impact, BCI has committed to using a raptor-detering design as discussed in Section 2.2.4.4. The new power distribution line also would incrementally increase collision potential for migrating and foraging bird species, although this potential would be minimized to an extent based on the proposed location adjacent to existing mine facilities. To further minimize collision potential, BCI has committed to the use of APLIC design standards for the proposed power distribution line (see Section 2.2.4.4).

Small game mammals (e.g., mountain cottontail) and nongame mammals (e.g., Townsend's ground squirrel, western fence lizard, gopher snake) are somewhat less mobile and, if occupied burrows are present in the proposed ancillary facilities area during construction, there would be the potential for direct loss of adults and young. It also is likely that increased vehicle activity during construction would result in increased direct mortality of these species due to vehicle collisions. Although construction and operation of the Proposed Action potentially would result in some direct mortality to small game mammal species, these species generally are common, short-lived, and have high reproductive rates. Consequently, losses of individuals during construction and the long-term loss of 41 acres of desert salt scrub habitat during operations would be unlikely to have a measurable effect on local populations of these species in the CGM Operations Area and surrounding region. Successful reclamation of disturbance areas following mine closure would further minimize long-term impacts.

Special Status Species

There are no federally listed threatened or endangered species or species proposed for federal listing that would be affected by construction and operation of the proposed ancillary facilities. One federal candidate species, the greater sage-grouse, potentially may occur in the CGM Operations Area. However, the proposed ancillary facilities site is located in shadscale/budsage vegetation, which has little or no habitat value for greater sage-grouse. Consequently, it is anticipated that construction and operation of the ancillary facilities would have little or no effect on greater sage-grouse.

Several BLM sensitive mammal species (i.e., bats and dark kangaroo mice) have moderate to high potential to occur on or adjacent to the proposed disturbance area (**Table 3-5**). No suitable bat roosting or hibernating habitat is present within the project study area; therefore, occurrence would be limited to foraging or migrating bats. Given the lack of water in the area, it is unlikely that bats currently spend much time foraging over the proposed ancillary facilities site. Consequently, it is anticipated that the temporary loss of 41 acres of desert scrub habitat would have little or no effect on bat species. However, to the extent that the electrical facilities are lighted at night during operations, there is potential for these facilities to temporarily attract and concentrate insects, and in turn attract foraging bats during operations. Habitat quality for dark kangaroo mice in the proposed disturbance area is considered marginal; however, if individuals are present, they likely would be lost during construction.

Potential project-related impacts to BLM sensitive bird species with moderate to high potential to occur in the project study area (**Table 3-5**) would be identical to those described above for other avian species. Potential impacts to the burrowing owl, if present, would be similar to those described above for small game mammals. Implementation of the applicant-committed environmental protection measure to protect nesting birds would avoid or minimize impacts to any BLM sensitive bird species that may nest within the proposed disturbance area.

Rangeland Fence Along CR 225

Terrestrial Wildlife

Construction of the proposed rangeland fence along CR 225 would take place within the existing road ROW disturbance along the margins of the realigned road. However, by acting as a partial barrier or impediment to wildlife movement, it could cause an incremental reduction in habitat quality for some species.

The proposed rangeland fence would be placed along both sides of CR 225 and would be constructed in accordance with BLM specifications designed to allow big game species such as mule deer and pronghorn to pass over or under the fence while keeping cattle and other domestic livestock from entering the road ROW. The proposed fence would not be located in any known big game migration corridors (NDOW 2013a). Furthermore, to the extent that there is any appreciable mule deer movement between winter ranges in the foothills of the Cortez Mountains southeast of the project study area and the Shoshone Range to the northwest, the fence would lie parallel to the general direction of movement, presenting little or no impediment to these animals. Pronghorn, for which the project study area and much of the CGM Operations Area is considered year-long range, have more potential to be affected by the proposed fence. However, given that the fence would be constructed with a smooth bottom wire designed to allow pronghorn to pass under it, potential impacts to pronghorn are expected to be minor.

Special Status Species

Fences can be both a direct and indirect source of mortality for greater sage-grouse (Connelly et al. 2011; Knick et al. 2011). Fences can contribute to direct mortality of greater sage-grouse when individuals collide with them during flight. Indirect adverse effects may occur where fences increase greater sage-grouse predation rates by providing perches for raptors. Given that the proposed location of the rangeland fence lies entirely within shadscale/budsage vegetation, which confers little or no habitat

value to greater sage-grouse, it is anticipated that installation of the proposed rangeland fence would have a negligible effect on this species.

Additional Transport of Ore

The proposed increase in refractory ore transport from the Pipeline Complex to Goldstrike would result in approximately 68 additional round-trips of truck traffic per day (i.e., 136 vehicles per day [vpd]) on SRs 306 and 776 and I-80, with the potential to increase direct mortality of wildlife as a result of vehicle collisions. Based on the average traffic volumes from 2003 to 2011 reported for the applicable segments of these roads (Nevada Department of Transportation [NDOT] 2011; see Section 3.11.1.2, Affected Environment - Access), an increase of 136 vpd would result in an increase in traffic volumes of approximately 13 to 25 percent on SR 306, 6 percent on SR 776, and 2 percent on I-80. This increase in traffic likely would result in an incremental increase in small mammal mortality associated with vehicle-wildlife collisions. However, given the lack of data on small mammal collisions, it is not possible to quantify this impact. The only wildlife species reported as having been involved in more than one vehicle collision along the above road segments between 2003 and 2011 is the mule deer. Based on the reported number of accidents involving mule deer on these road segments over this period (NDOT 2013), the average mule deer/vehicle collision rates are 0.0002 to 0.0003 deer hit per vehicle per day on SRs 306 and 766 and 0.0007 deer hit per vehicle per day on I-80. The increase in truck traffic resulting from the proposed increased ore transport would have no appreciable effect on these calculated collision rates. Consequently, the incremental increase in vehicle/wildlife collisions under the Proposed Action is expected to be negligible.

3.5.2.2 No Action Alternative

Under the No Action Alternative, existing mining and processing operations and reclamation activities within the CGM Operations Area would continue under the terms of current permits and approvals as authorized by the BLM and State of Nevada. Proposed modifications as described for the Proposed Action would not be implemented, and associated impacts to wildlife would not occur.

3.5.3 Cumulative Effects

3.5.3.1 Proposed Action

The cumulative effects study area for terrestrial wildlife and fisheries resources is shown in Figure 3.1-10 of the Cortez Hills Expansion Project Final EIS (BLM 2008a). The past and present actions and RFFAs presented in **Table 2-4** have resulted, or would result, in approximately 139,654 acres of disturbance to wildlife habitat, with associated impacts to wildlife species (including special status species). Of this total, approximately 90,099 acres of disturbance have been related to wildland fires and approximately 5,641 acres have been related to BLM fuel reduction programs. The Proposed Action incrementally would increase wildlife habitat disturbance by 41 additional acres, resulting in an overall cumulative disturbance to wildlife habitat of approximately 139,695 acres. A portion of the cumulative disturbance area has been, or would be, reclaimed or has recovered materially (i.e., wildfire areas). The incremental addition of habitat impacts as a result of the Proposed Action would be temporary in nature, pending completion of successful reclamation. The reclaimed areas and areas associated with habitat conversion within the cumulative effects study area would be capable of supporting wildlife use; however, species composition and densities likely would change from pre-disturbance conditions.

No direct or indirect impacts to fish species would occur under the Proposed Action; therefore, the proposed modifications would not contribute to cumulative impacts to these species.

3.5.3.2 No Action Alternative

Under the No Action Alternative, cumulative impacts to wildlife and fisheries resources would be the same as described in the Cortez Hills Expansion Project Final EIS (BLM 2008a).

3.5.4 Monitoring and Mitigation Measures

No additional monitoring or mitigation measures are required for wildlife.

3.5.5 Residual Adverse Effects

Residual adverse effects to wildlife resources would include long-term habitat conversion (i.e., desert scrub habitat to grassland habitat) as a result of project development and operations. Over time, this effect would diminish as shrubs become re-established.

3.6 Range Resources

As discussed in the introduction of Chapter 3.0 and indicated in **Table 3-3**, the elements of the Proposed Action that potentially would result in new impacts to range resources include: 1) the newly proposed construction of ancillary facilities, including a potable water well and associated pipeline and a capacitor bank with associated transformer and power distribution line (**Figure 2-2**); and 2) the proposed installation of a rangeland fence along CR 225 (from a range exclusion perspective).

The project study area for direct and indirect impacts to range resources includes the proposed 41-acre disturbance area and the proposed rangeland fence along CR 225. The cumulative effects study area, as shown in Figure 3.1-10 of the Cortez Hills Expansion Project Final EIS (BLM 2008a), encompasses the eastern portion of the Carico Lake Allotment, western portion of the South Buckhorn Allotment, northern portion of the Grass Valley Allotment, southwestern portion of the Thomas Creek Fenced Federal Ranges, southern portion of the Scotts Gulch Allotment, southern portion of the Geyser Allotment, and the southeastern portion of Argenta Allotment.

3.6.1 Affected Environment

Livestock grazing is one of the predominant land uses within the project study area. Three grazing allotments encompass portions of the CGM Operations Area as discussed in Section 3.6 and shown in Figure 3.6-1 of the Cortez Hills Expansion Project Final EIS (BLM 2008a). The Carico Lake and Grass Valley allotments are administered by the BLM Mount Lewis Field Office, and the South Buckhorn Allotment is administered by the BLM Tuscarora Field Office. The portions of these allotments that occur within the CGM Operations Area predominantly are used for cattle grazing. The current authorized animal unit months (AUMs) present within the use areas coinciding with the CGM Operations Area include 1,742 AUMs for the Carico Lake Allotment; 3,517 AUMs for the Grass Valley Allotment; and 2,810 AUMs for the South Buckhorn Allotment. An AUM is the amount of forage required for a cow/calf pair for 1 month. Livestock movement corridors are not known to occur within any of these grazing allotments. All of these allotments include in-holdings of private property, which commonly include fences that have been constructed along the boundaries of these properties.

The project study area occurs within the northeastern portion of the Carico Lake Allotment. The Carico Lake Allotment encompasses approximately 53,098 acres of public land within the CGM Operations Area. The stocking rate for rangeland within this allotment ranges from 22 to 55 acres per AUM (BLM 2008a). The Carico Lake Allotment has been categorized as an “I” (improve the current unsatisfactory condition) allotment. “I” category allotments may have the following characteristics:

- C1 – Ecological conditions are poor to fair.
- C2 – Vegetation types have the capability of increased production.
- C3 – The range trend is declining or static.
- C4 – A high potential exists for positive economic return of public investments.
- C5 – The degree to which social/political controversy or interest conflict with present management is moderate to high.
- C6 – Resource management objectives are not being met; the allotment is in need of an allotment management plan or grazing system, or major revisions are needed to an existing allotment management plan.
- C7 – Additional range improvements are required to meet management objectives.
- C8 – Land status, exchange-of-use agreements, and size are not prohibitive factors for future management practices if there is a history of prior trespass.

- C9 – It is feasible to implement more intensive grazing management and to further develop range improvements (as compared to other allotments considering constraints of 10-year projections of funding and manpower availability).
- C10 – One or more major resource conflicts are present with critical wildlife habitat, wild horse and burro/livestock use areas, recreation, water rights, mining, lands action, ACECs, reintroduction of plants and animals, soil, water, and air quality.
- “I” category allotments receive the highest priority for development because grazing management is most needed to improve the basic resources and/or resolve serious resource use conflicts.

An allotment evaluation was completed for the Carico Lake Allotment in 2005. Through the evaluation and decision processes, appropriate stocking rates and grazing schedules for the allotment were implemented to improve rangeland health. As discussed in the Cortez Hills Expansion Project Final EIS (BLM 2008a), rangeland in mine-related disturbance areas temporarily would be degraded during mine development and operation; however, successful reclamation of surface disturbance likely would result in enhanced rangeland condition relative to the pre-mining rangeland condition.

Information regarding the operator, number and kind of livestock, use dates, and AUMs associated with the portion of the Carico Lake Allotment that encompasses the Cortez Gold Mines Operations Area is provided in **Table 3-6**. The 41-acre project study area falls within the Loamy 5 to 8 inch precipitation zone (024XY002NV) ecological site (GBE 2012). An ecological site consists of a specific combination of soils and vegetation that have occurred over the long term as a result of factors including landscape position, elevation, aspect, precipitation levels, and geologic substrate. The portion of the Carrico Lake Allotment that occurs within the project study area does not include water-related range improvements.

Vegetation types within the project study area, which provide forage for livestock grazing, are described in Section 3.4, Vegetation. In addition, information regarding soil types present within the study area is described in Section 3.3, Soils and Reclamation.

Table 3-6 Livestock Grazing Permit for the Cortez Joint Venture Use Area Portion of the Carico Lake Allotment

Operator/Operator	Use Area	Livestock Number	Livestock Kind	Use Dates	AUMs
C Ranches/ 2702908 (leased from Cortez)	Cortez Joint Venture Use Area	898	Cattle	2/1 – 3/31	1,741

Source: McDaniel 2006.

3.6.2 Environmental Consequences

3.6.2.1 Proposed Action

As stated in Section 2.2.2.3, Rangeland Fence, in order to minimize livestock and large wildlife/vehicle collisions and livestock mortalities, approximately 10 miles of rangeland fencing would be installed along the relocated portion of CR 225 to the east of the Pipeline Complex. Gates and/or cattle guards would be included to provide for continued grazing access to the north and west of CR 225. The proposed fencing would be installed along either side of the road within the existing road ROW disturbance and would tie into the existing fence along SR 306. BLM-approved four-strand range fencing (three stands barbwire and a smooth bottom strand) would be used for the installation. The fence would be maintained by BCI throughout mine operations and reclamation and turned over to the BLM following closure.

As discussed in Section 2.2.2.3, construction of the rangeland fence would include the installation of gates and/or cattle guards to provide for continued grazing access to the north and west of CR225. As a

result, no water wells or rangeland within the Carico Lake Allotment would be excluded from livestock use. Based on a stocking rate of approximately 54 acres per AUM for the CGM Operations Area of the Carico Lake Allotment, the proposed 41 acres of surface disturbance for ancillary facilities would result in the temporary loss of approximately 1 AUM on BLM-administered land. No direct impacts to existing range improvements are anticipated as all current improvements lie outside of the area of proposed disturbance.

The proposed surface disturbance within the project study area would be reclaimed (see Section 2.2.5, Reclamation). Successful reclamation of disturbed areas on BLM-administered lands would increase plant cover and provide an adequate amount of forage to recover the 1 AUM lost during construction and operation of the proposed ancillary facilities. As authorized by the BLM in the future, livestock grazing may be resumed after re-established vegetation is capable of supporting grazing (i.e., approximately 3 to 5 growing seasons after final revegetation).

3.6.2.2 No Action Alternative

Under the No Action Alternative, existing mining and processing operations and reclamation activities within the CGM Operations Area would continue under the terms of current permits and approvals as authorized by the BLM and State of Nevada. Proposed modifications as described for the Proposed Action would not be implemented, and associated impacts to range resources would not occur.

3.6.3 Cumulative Effects

3.6.3.1 Proposed Action

The Proposed Action would contribute to cumulative impacts in the Carico Lake Allotment; the remainder of the allotments in the range resources cumulative effects study area would not be affected by activities related to the Proposed Action. Surface disturbance related to past and present actions and RFFAs within the Carico Lake Allotment have affected, or would affect, a total of approximately 17,888 acres of rangeland. Based on an average stocking rate of 38 acres per AUM, this disturbance has, or would result in the loss of approximately 471 AUMs, an unquantifiable portion of which has been, or would be, reclaimed. The Proposed Action incrementally would increase surface disturbance by 41 acres, resulting in the incremental loss of approximately 1 AUM. The incremental additional impacts as a result of the Proposed Action would be temporary in nature, pending completion of mining and successful reclamation.

3.6.3.2 No Action Alternative

Under the No Action Alternative, cumulative impacts to range resources would be the same as described in the Cortez Hills Expansion Project Final EIS (BLM 2008a).

3.6.4 Monitoring and Mitigation Measures

No monitoring or mitigation measures are required for range resources.

3.6.5 Residual Adverse Effects

Residual adverse effects to range resources are not anticipated assuming successful reclamation following the completion of mining.

3.7 Paleontological Resources

As discussed in the introduction of Chapter 3.0 and indicated in **Table 3-3**, the element of the Proposed Action that potentially would result in new or previously unauthorized disturbance is the proposed construction of ancillary facilities, including a potable water well and associated pipeline and a capacitor bank with associated transformer and power distribution line (**Figure 2-2**).

The project study area for direct and indirect impacts to paleontological resources encompasses the proposed 41-acre disturbance area for ancillary facilities. The cumulative effects study area, as shown in Figure 3.1-10 of the Cortez Hills Expansion Project Final EIS (BLM 2008a), encompasses the project study area and includes surface disturbance associated with past and present actions and RFFAs within a 30-mile radius.

3.7.1 Affected Environment

Paleontological resources identified on public lands are considered by the BLM as a fragile and nonrenewable scientific record of the history of life on earth and, therefore, are considered to represent an important and critical component of America's natural history. Once damaged, destroyed, or improperly collected, their scientific and educational value may be reduced or lost forever. In addition to their scientific, educational, and recreational values, paleontological resources can be used to inform land managers about interrelationships between the biological and geological components of ecosystems over long periods of time.

3.7.2 Regulatory Framework

The BLM manages paleontological resources under a number of federal laws including FLPMA Sections 310 and 302(b), which directs the BLM to manage public lands to protect the quality of scientific and other values; 43 CFR 8365.1-5, which prohibits the willful disturbance, removal, and destruction of scientific resources or natural objects; and 43 CFR 3622, which regulates the amount of petrified wood that can be collected for personal, non-commercial purposes without a permit.

Fossils occur in a wide variety of sedimentary rocks, including those found in caves, lake bottoms, and older alluvial surfaces. The purpose of paleontological resource location and evaluation is to identify areas that are likely to produce fossils. Classification is a method used to rank areas according to their potential to contain vertebrate fossils, or noteworthy occurrences of invertebrate or plant fossils. These rankings are used by the BLM in its land use planning process, as well as to identify areas that may warrant special management based on their potential to contain such fossils using the following criteria:

- Condition 1. Areas that are known to contain fossil localities.
- Condition 2. Areas with exposures of geological units or settings that are likely to contain fossils.
- Condition 3. Areas that are very unlikely to produce fossils based on their surficial geology.

In keeping with the historical policies adopted by the Department of the Interior and the BLM, these classification guidelines apply primarily to vertebrate fossils. However, where noteworthy occurrences of invertebrate or plant fossils are known or expected, the same procedures are followed.

3.7.3 Paleontological Investigations

The paleontological resources analysis conducted for the Cortez Hills Expansion Project Final EIS (BLM 2008a) identified exposures of Tertiary age (2 to 24 million years ago) alluvial gravel and sand deposits, and Quaternary (present to 2 million years ago) deposits of valley alluvium, alluvial fans flanking the mountains, playa, talus, and landslide deposits within the CGM Operations Area. These deposits are considered as Condition 3 for paleontological sensitivity. In addition, a 1991 paleontological resources report that addresses vertebrate and invertebrate fossils in the CGM Operations Area

indicated that no fossil vertebrate localities have been confirmed within the area through literature searches, BLM paleontological inventories, or queries to other paleontologists (BLM 2008a; Firby 1991). The report states that the potential for the occurrence of vertebrate fossils is considered low, and sensitivity ranking for invertebrate fossil localities would be at the least sensitive level.

3.7.4 Environmental Consequences

To be considered significant, a paleontological resource must retain integrity and satisfy at least one of the following criteria:

- Impacts to unique or site-specific invertebrate, vertebrate, or paleobotanical fossils.
- Impacts to scientifically significant or critical fossil resources requiring protection under FLPMA and BLM Manual H-8270.

3.7.4.1 Proposed Action

The Tertiary-age alluvial gravel and sand deposits and Quaternary deposits of valley alluvium, alluvial fans flanking the mountain, playa, talus, and landslide deposits encompassing the project study area are considered as Condition 3 for paleontological sensitivity and are unlikely to produce vertebrate or invertebrate fossils. In addition, an assessment of paleontological resources through the examination of inventories prepared by the BLM and review of the literature found no known vertebrate or invertebrate localities within the CGM Operations Area.

Since fossils usually are buried, their locations cannot be confirmed until excavation associated with project construction occurs. Per the applicant-committed environmental protection measures, if vertebrate fossils are discovered during construction, operation, or reclamation, activities would be halted in the area of the discovery, and BCI would contact the BLM Authorized Officer. The BLM Authorized Officer would evaluate the discovery within 5 working days of being notified. If the discovered paleontological resource is determined significant, appropriate measures would be developed to mitigate potential adverse effects. Construction activities would not resume until a notice to proceed is granted by the BLM Authorized Officer.

3.7.4.2 No Action Alternative

Under the No Action Alternative, existing mining and processing operations and reclamation activities within the CGM Operations Area would continue under the terms of current permits and approvals as authorized by the BLM and State of Nevada. Proposed modifications as described for the Proposed Action would not be implemented, and associated impacts would not occur.

No new ground-disturbing activities beyond those previously authorized would occur under this alternative. As a result, there would be no potential direct impacts to paleontological resources beyond those analyzed in previous NEPA documents for existing operations within the CGM Operations Area. Indirect impacts (e.g., erosional effects and potential collecting) would continue to occur at a rate similar to that currently occurring in the project study area.

3.7.5 Cumulative Effects

3.7.5.1 Proposed Action

According to the paleontological resources report that addresses vertebrate and invertebrate fossils in the CGM Operations Area (Firby 1991), no vertebrate fossil localities were confirmed within the area through literature searches, BLM paleontological inventories, or queries to other paleontologists. Additionally, the report states that the potential for the occurrence of vertebrate fossils is considered low. Therefore, the Proposed Action is not anticipated to contribute to cumulative paleontological resources impacts in the cumulative effects study area.

3.7.5.2 No Action Alternative

Under the No Action Alternative, cumulative impacts to paleontological resources would be the same as described in the Cortez Hills Expansion Project Final EIS (BLM 2008a).

3.7.6 Monitoring and Mitigation Measures

No additional monitoring or mitigation measures are required for paleontological resources.

3.7.7 Residual Adverse Effects

Since no known scientifically significant paleontological resources have been identified in the study area, no adverse impacts to the resource are anticipated, and no residual adverse effects are expected to occur.

3.8 Cultural Resources

3.8.1 Regulatory Framework

Federal historic preservation laws provide a legal environment for documentation, evaluation, and protection of cultural resources that may be affected by federal undertakings. NEPA states that federal undertakings shall consider impacts to the natural environment with respect to an array of resources, and that alternatives to the proposed federal action must be considered. The courts have made clear that cultural resources are regarded as part of the natural environment. The National Historic Preservation Act (NHPA) of 1966, as amended, established the Advisory Council on Historic Preservation (ACHP) and the NRHP. The NHPA mandates that federal agencies consider an undertaking's effects on cultural resources that are listed or eligible for listing on the NRHP. Section 106 of the NHPA establishes a review process by which these resources are given consideration during the conduct of federal undertakings. Cultural resources that are listed or eligible for listing on the NRHP are referred to as historic properties.

Regulations in 36 CFR 800 outline the process through which historic preservation legislation under the NHPA is administered. Regulations in 36 CFR 800.14 allow federal agencies to adopt program alternatives to 36 CFR 800 and to tailor the Section 106 process to better fit agency procedures. The most common program alternative is a PA negotiated between the agency and the ACHP. In October 2005, a PA among the BLM Battle Mountain and Elko field offices, Nevada SHPO, and CGM (currently known as BCI) for the Cortez Hills Expansion Project was finalized (BLM 2008a). The PA defines general and specific measures that would be undertaken by the BLM, SHPO, and BCI to ensure that the BLM's objectives and responsibilities regarding the protection of historic properties under the NHPA would be fulfilled. Specifically, the PA outlines the steps to be taken to: 1) identify cultural resources; 2) evaluate them for NRHP-eligibility; 3) identify potential adverse effects; 4) develop measures to minimize or mitigate adverse effects; and 5) address inadvertent discoveries. Per Stipulation H of the Cortez Hills PA, the agreement went into effect in October 2005 and automatically will terminate on the tenth anniversary thereof, unless the BLM, SHPO, and BCI agree to extend the term. The 2005 PA would apply to the Proposed Action.

3.8.2 Eligibility Criteria for Listing Cultural Resources on the NRHP

The NRHP, maintained by the National Park Service (NPS) on behalf of the Secretary of the Interior, is the nation's inventory of NRHP-eligible properties. The NPS has established three main standards that a property must meet to qualify for listing on the NRHP: age, integrity, and significance. To meet the age criteria, a property generally must be at least 50 years old. To meet the integrity criteria, a property must "possess integrity of location, design, setting, materials, workmanship, feeling, and association" (36 CFR 60.4). Finally, a property must be significant according to one or more of the following criteria:

- Criterion a – Be associated with events that have made a significant contribution to the broad patterns of U.S. history.
- Criterion b – Be associated with the lives of persons significant in U.S. history.
- Criterion c – Embody the distinctive characteristics of a type, period, or method of construction, or represent the work of a master, or possess high artistic values, or represent a significant and distinguishable entity whose components may lack individual distinction.
- Criterion d – Have yielded, or may likely yield, information important in prehistory or history.

3.8.3 Study Area

The project study area for cultural resources encompasses the proposed 41-acre disturbance area or the "area of potential effect" (APE) and the proposed rangeland fence (relative to unanticipated discoveries). Under Section 106 of the NHPA, the APE is defined as "those areas in which impacts are planned or are

likely to occur. Specifically, the APE is defined as the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist. Additionally, the APE is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking (36 CFR 800.16[d]).”

As discussed in the introduction of Chapter 3.0 and indicated in **Table 3-3**, the element of the Proposed Action that potentially would result in new or previously unauthorized disturbance is the proposed construction of ancillary facilities, including a potable water well and associated pipeline and a capacitor bank with associated transformer and power distribution line (**Figure 2-2**).

The newly proposed 41-acre disturbance area for ancillary facilities and the proposed installation of rangeland fence adjacent to CR 225 comprise the APE for direct and indirect impacts to cultural resources. The APE for cumulative effects includes the area within the CGM Operations Area boundary and surrounding lands from approximately 1 to 6 miles from the boundary, including portions of the Cortez Mountains and portions of the Shoshone and Toiyabe ranges as shown in Figure 3.8-1 of the Cortez Hills Expansion Project Final EIS (BLM 2008a).

3.8.4 Affected Environment

A total of six previously recorded cultural resources have been identified within the APE for direct and indirect effects (Summit 2012). Previous evaluations of the six sites, which are historic in nature, determined that none are eligible for listing on the NRHP. No further work (i.e., mitigation) is recommended for these sites.

3.8.5 Environmental Consequences

Potential impacts to historic properties are assessed using the “criteria of adverse effect” (36 CFR 800.5[a][1]): “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 National Register in a manner that would diminish the integrity of the property’s location, design, setting, materials, workmanship, feeling, or association.” There are five broad categories of effect:

- Physical destruction or alteration of a property or relocation from its historic location;
- Isolation or restriction of access;
- Change in the character of the property’s use or of physical features within the property’s setting, or the introduction of visible, audible, or atmospheric elements that are out of character with the significant historic features of the property;
- Neglect that leads to deterioration or vandalism; and
- Transfer, sale, or lease from federal to non-federal control, without adequate and legally enforceable restrictions or conditions to ensure the preservation of the historic significance of the property.

3.8.5.1 Proposed Action

A total of six previously recorded cultural resources are located within the project study area. None of the six cultural resources are eligible for the NRHP; therefore, no further work is recommended for these sites.

The potential for the discovery of unanticipated cultural resources during construction activities exists within proposed disturbance areas and could result in direct impacts. As provided in the 2005 PA, if previously undocumented cultural resources are discovered during construction activities, construction would be halted in the area of the discovery, and the BLM Authorized Officer would be contacted to evaluate the find. If the site is eligible to the NRHP, impacts would be mitigated through avoidance or an

appropriate data recovery plan. Construction would not resume in the area of the discovery until the BLM Authorized Officer has issued a notice to proceed.

Per the 2005 PA, if construction or other project personnel discover what may be human remains, funerary objects, or items of cultural patrimony, construction would cease within 300 feet of the discovery, and the BLM Authorized Officer would be notified of the find. Any discovered Native American human remains, funerary objects, or items of cultural patrimony would be handled in accordance with the Native American Graves Protection and Repatriation Act (NAGPRA) and procedures detailed in the PA. Non-Native American human remains would be handled in accordance with Nevada law and the PA. Construction would not resume in the area of the discovery until the BLM Authorized Officer has issued a notice to proceed.

3.8.5.2 No Action Alternative

Under the No Action Alternative, existing mining and processing operations and reclamation activities within the CGM Operations Area would continue under the terms of current permits and approvals as authorized by the BLM and State of Nevada. Proposed modifications as described for the Proposed Action would not be implemented, and associated impacts would not occur.

No new ground-disturbing activities beyond those previously authorized would occur under this alternative. As a result, there would be no potential direct impacts to historic properties beyond those analyzed in previous NEPA documents for existing operations within the CGM Operations Area.

3.8.6 Cumulative Effects

3.8.6.1 Proposed Action

No known NRHP-eligible sites would be adversely affected as a result of the Proposed Action. Unanticipated discoveries, including human remains, would be handled in accordance with the 2005 PA. Therefore, the Proposed Action is not expected to contribute to cumulative effects to NRHP-eligible sites.

3.8.6.2 No Action Alternative

Under the No Action Alternative, cumulative impacts to cultural resources would be the same as described in the Cortez Hills Expansion Project Final EIS (BLM 2008a).

3.8.7 Monitoring and Mitigation Measures

No additional monitoring or mitigation measures are required for cultural resources.

3.8.8 Residual Adverse Effects

No known historic properties are located in the direct or indirect APE. Unknown historic properties that may be discovered during construction activities would be handled in accordance with the 2005 PA. Therefore, no adverse effects to known or unknown historic properties are anticipated, and no residual adverse effects are expected to occur.

3.9 Native American Traditional Values

As discussed in the introduction of Chapter 3.0 and indicated in **Table 3-3**, the element of the Proposed Action that would result in new or previously unauthorized disturbance is the proposed construction of ancillary facilities, including a potable water well and associated pipeline and a capacitor bank with associated transformer and power distribution line (**Figure 2-2**).

The newly proposed 41-acre disturbance area for ancillary facilities and the proposed rangeland fence (relative to unanticipated discoveries) comprise the project study area for direct and indirect impacts to Native American traditional values. The cumulative effects study area encompasses recent hard-rock mines in north-central Nevada 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 CGM Operations Area boundary as shown in Figure 3.9-2 of the Cortez Hills Expansion Project Final EIS (BLM 2008a).

3.9.1 Affected Environment

3.9.1.1 Regulatory Framework

Federal law and agency guidance require BLM to consult with Native American tribes concerning the identification of cultural values and traditional practices of Native American people that may be affected by actions on BLM-administered lands. This consultation includes the identification of places (i.e., physical locations) of traditional cultural importance to Native American tribes. Places that may be of traditional cultural importance to Native American people include, but are not limited to, locations associated with the traditional beliefs concerning tribal origins, cultural history, or the nature of the world; locations where religious practitioners go, either in the past or the present, to perform ceremonial activities based on traditional cultural rules or practice; ancestral habitation sites; trails; burial sites; and places from which plants, animals, minerals, and waters possessing healing powers or used for other subsistence purposes, may be taken.

3.9.1.2 Government-to-government Consultation

In compliance with federal mandates, the BLM initiated government-to-government consultation for the Proposed Action on October 4, 2012, by sending letters to the following tribal groups: Te-Moak Tribe of the Western Shoshone, Elko Band, Battle Mountain Band, Duckwater Shoshone Tribe of the Duckwater Reservation, and Yomba Shoshone Tribe. The letters were sent to inform the various tribes and bands of the proposed undertaking and to solicit their concerns regarding the possible presence of properties of traditional religious and cultural importance to the tribes in the project study area. A map of the proposed modifications was attached to the letters.

3.9.2 Environmental Consequences

For purposes of this analysis, the effects of federal undertakings on properties of traditional religious and cultural importance to contemporary Native Americans are given consideration under the provisions of EO 13007 (Sacred Sites), the American Indian Religious Freedom Act, and recent amendments to the NHPA. As amended, the NHPA now integrates Indian tribes into the Section 106 compliance process, and also strives to make the NHPA and NEPA procedurally compatible. Furthermore, under the NAGPRA, culturally affiliated Indian tribes and the BLM jointly may develop procedures to be undertaken when Native American human remains are discovered on federal lands.

3.9.2.1 Proposed Action

Previous Native American consultation and cultural resources inventories conducted for the Cortez Hills Expansion Project Final EIS (BLM 2008a) identified six cultural resources within the project study area (Summit 2012). Of the six resources, five are historic debris scatters and one is a historic road. None of the six resources are eligible for the NRHP.

The potential for the discovery of subsurface cultural resources (including sites of tribal importance) during construction activities exists within proposed disturbance areas and could result in direct impacts. Per the 2005 PA and applicant-committed environmental protection measures (Section 2.2.4), if previously undocumented cultural resources are discovered during construction activities, construction would be halted in the area of the discovery, and the BLM Authorized Officer would be contacted to evaluate the find. If the site is eligible to the NRHP, impacts would be mitigated through avoidance or an appropriate data recovery plan. Construction would not resume in the area of the discovery until the BLM Authorized Officer has issued a notice to proceed.

Per the 2005 PA, if construction or other project personnel discover what may be human remains, funerary objects, or items of cultural patrimony, construction would cease within 300 feet of the discovery, and the BLM Authorized Officer would be notified of the find. Any discovered Native American human remains, funerary objects, or items of cultural patrimony would be handled in accordance with the NAGPRA and procedures detailed in the 2005 PA. Non-Native American human remains would be handled in accordance with Nevada law and the PA. Construction would not resume in the area of the discovery until the BLM Authorized Officer has issued a notice to proceed.

If requested by the tribes or bands, formally trained Western Shoshone observers would be provided the opportunity to be present during project-related construction activities (i.e., new surface disturbance) (see Section 2.2.4, Applicant-committed Environmental Protection Measures).

3.9.2.2 No Action Alternative

Under the No Action Alternative, existing mining and processing operations and reclamation activities within the CGM Operations Area would continue under the terms of current permits and approvals as authorized by the BLM and State of Nevada. Proposed modifications as described for the Proposed Action would not be implemented, and associated impacts would not occur.

No new ground-disturbing activities beyond those previously authorized would occur under this alternative. As a result, there would be no potential impacts to Native American traditional values beyond those analyzed in previous NEPA documents for existing operations within the CGM Operations Area.

3.9.3 Cumulative Effects

The cumulative effects study area for Native American traditional values is shown in Figure 3.9-2 in the Cortez Hills Expansion Project Final EIS (BLM 2008a).

3.9.3.1 Proposed Action

No known places of traditional religious and cultural importance to Native American tribes or bands would be adversely affected as a result of the Proposed Action. Unanticipated discoveries, including human remains, would be handled in accordance with the 2005 PA. Therefore, the Proposed Action is not expected to contribute to cumulative effects to Native American traditional values.

3.9.3.2 No Action Alternative

Under the No Action Alternative, cumulative impacts to Native American traditional values would be the same as described in the Cortez Hills Expansion Project Final EIS (BLM 2008a).

3.9.4 Monitoring and Mitigation Measures

No additional monitoring or mitigation measures are required for Native American traditional values.

3.9.5 Residual Adverse Effects

No properties of traditional religious and cultural importance to the tribes or bands have been identified through previous cultural resources inventory or Native American consultation. Unknown sites of tribal importance that may be discovered during construction activities would be handled in accordance with the 2005 PA. Therefore, no adverse effects to Native American traditional values are anticipated, and no residual adverse effects are expected to occur.

3.10 Air Quality

As discussed in the introduction to Chapter 3.0 and indicated in **Table 3-3**, the elements of the Proposed Action that potentially would result in new or extended impacts to air quality include: 1) newly proposed construction activities associated with installation of a rangeland fence along CR 225 and installation of new ancillary facilities (i.e., potable water well/pipeline and capacitor bank/transformer/power distribution line) (**Figure 2-2**); 2) the proposed relocation of approximately 6 million additional tons of refractory ore (at a rate of approximately 800,000 tpy) from the Pipeline Complex ore stockpile to Goldstrike for processing; and 3) the associated 11-month extension of ore processing at Goldstrike. Potential air quality impacts associated with the currently authorized off site shipment and processing of refractory ore at Goldstrike were analyzed in the Cortez Hills Expansion Project Final Supplemental EIS (BLM 2011a).

The project study area for air quality encompasses the proposed project modifications in the vicinity of the Pipeline Complex, the area within 10 kilometers (6.2 miles) of the CGM Operations Area, the proposed transportation route for the additional off site shipment of refractory ore to Goldstrike, and the Goldstrike Mill (relative to mercury emissions associated with processing of refractory ore from Pipeline and the temporal effects associated with the proposed 11-month extension in ore processing). The cumulative effects study area (**Figure 3-8**) encompasses the Crescent Valley, Marys Creek, and Maggie Creek hydrographic basins as defined by the NDWR (2012).

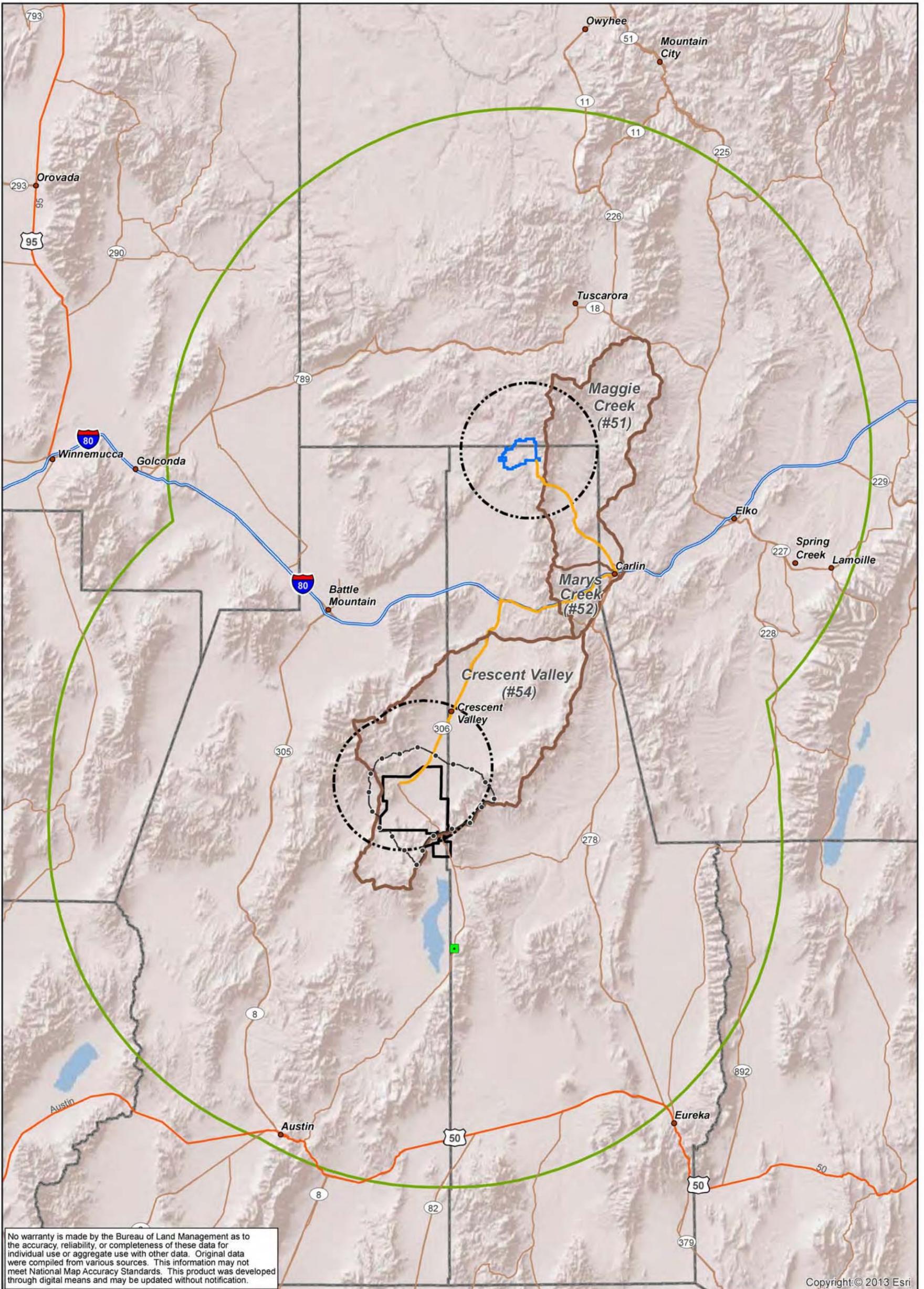
3.10.1 Affected Environment

Meteorology, air quality, and dispersion conditions in the project study area were characterized in the Cortez Hills Expansion Project Final EIS (BLM 2008a) and the Draft Supplemental EIS for the Betze Pit Expansion Project (BLM 2008d) based on data records from climate monitoring stations at Elko and, specific to the Cortez Hills EIS, at the Beowawe University of Nevada Ranch observation site (see **Figure 3-8**). Elko weather represents the regional climate for upper air winds and mixing heights used to characterize dispersion conditions; the Beowawe University of Nevada Ranch site is more representative of the local temperature and rainfall in the vicinity of the CGM Operations Area. The climate in the project study area is classified as arid, with elevations below 6,500 feet amsl receiving the least amount of precipitation (5 to 9 inches per year is common) while the mountainous areas are substantially wetter (receiving 11 to over 16 inches of precipitation annually). An arid climate is characterized by low rainfall, low humidity, clear skies, and relatively large annual and diurnal temperature ranges.

3.10.1.1 Climate and Meteorology

Three important meteorological factors influence the dispersion of pollutants in the atmosphere: mixing height, wind (speed and direction), and stability. Mixing height is the height above ground within which rising warm air from the surface will mix by convection and turbulence. Local atmospheric conditions, terrain configuration, and source location determine dilution of pollutants in this mixed layer. Mixing heights vary diurnally, with the passage of weather systems, and with the season. For the study area, the mean annual morning mixing height is estimated to be approximately 300 meters; however, during the winter months, the mean morning mixing height is approximately 220 meters (Holzworth 1972). The mean annual afternoon mixing height exceeds 2,400 meters.

During the warm seasons, spring through early fall, morning atmospheric conditions tend to be stable and become neutral to unstable during the afternoon. During the coldest seasons, stable conditions may persist throughout the day, resulting in higher concentrations of air pollutants (Holzworth 1972).



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- Legend**
- Cortez Gold Mines Operations Area Boundary
 - Goldstrike Mine Operations Boundary
 - Air Quality Cumulative Effects Study Area (Based on hydrographic basins)
 - Noise Cumulative Effects Study Area
 - Wilderness Cumulative Effects Study Area
 - Recreation Cumulative Effects Study Area
 - Proposed Ore Transportation Route
 - Beowawe University of Nevada Ranch Meteorological Monitoring Site

Note: The CESA for noise also includes a 2-mile-wide corridor centered on the proposed ore transportation route. The CESA for recreation resources also includes a 5-mile-wide corridor centered on the proposed ore transportation route.
Source: NDWR 2012.

12/11/2013


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Figure 3-8
Cumulative Effects Study Area for Various Resources

0 5 10 20 Miles

Elko, Nevada, is located approximately 45 air miles northeast of the CGM Operations Area and approximately 45 air miles southeast of Goldstrike. The wind rose for Elko (**Figure 3-9**) is representative of the regional wind climatology. The Elko wind rose indicates that winds are predominantly from the west; however, it also shows that there is a secondary maximum of wind occurrences from the south. Climate data from Elko indicate that the potential for air pollution episodes to last 5 or more days is nearly zero (Holzworth 1972). A potential air pollution episode is defined as a period of time with wind speeds less than 2 meters per second and mixing heights less than 1,000 meters.

The Beowawe University of Nevada Ranch observation site is located within approximately 15 miles of the CGM Operations Area at approximately the same elevation. Table 3.10-1 in the Cortez Hills Expansion Project Final EIS (BLM 2008a) shows the maximum, average, and minimum temperatures at the observation site during the period 1972 through 2001, and precipitation totals by month.

3.10.1.2 Air Quality

Air quality is defined by the concentration of various pollutants and their interactions in the atmosphere. The relative importance of pollutant concentrations can be determined by comparison with appropriate national and/or state Ambient Air Quality Standards (AAQS). Air pollutant concentrations within the standards generally are not considered to be detrimental to public health and welfare.

National and state AAQS are presented in **Table 3-7**. An area is designated by the U.S. Environmental Protection Agency (USEPA) as being in attainment for a pollutant if ambient concentrations of that pollutant are below the National Ambient Air Quality Standards (NAAQS). An area is not in attainment if violations of NAAQS for that pollutant occur. Areas where insufficient data are available to make an attainment status designation are listed as unclassifiable and are treated as being in attainment for regulatory purposes.

The existing air quality of the project study area is typical of the largely undeveloped regions of the western U.S. For the purposes of statewide regulatory planning, this area has been designated as in attainment for all pollutants that have an AAQS. Current sources of air pollutants in the region include several precious metals mines that are sources for particulate matter with an aerodynamic diameter of 10 microns or less (PM₁₀) and particulate matter with an aerodynamic diameter of 2.5 microns or less (PM_{2.5}).

Mercury and Mercury Emissions

Mercury emissions to the atmosphere come from both background and man-made or anthropogenic sources. Background sources of mercury include natural sources such as naturally enriched soils and volcanoes. There are both global and local anthropogenic sources of mercury. Mercury speciation, deposition, and bioaccumulation are discussed in the Cortez Hills Expansion Project Final EIS (BLM 2008a).

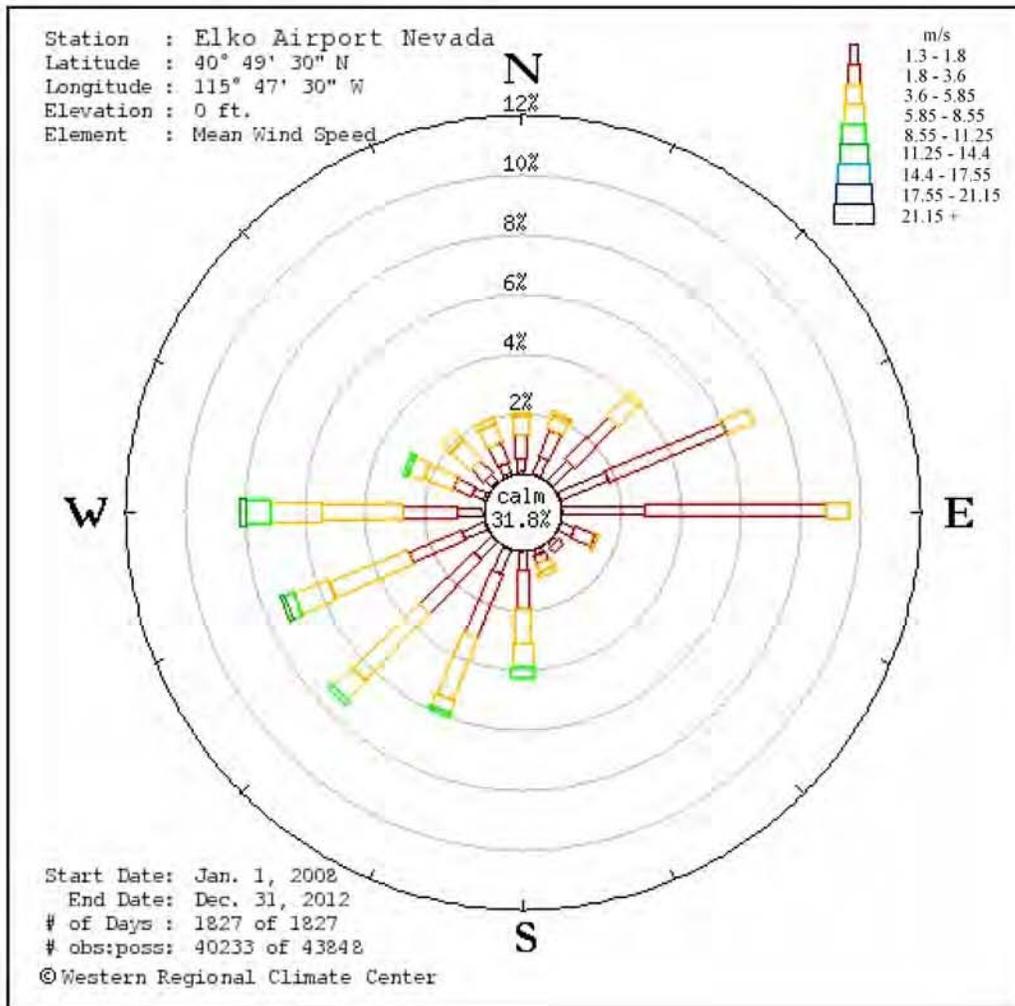
When bound in mineral forms that typically appear in ore (e.g., cinnabar), mercury is a stable compound that remains in solid form. Ore processing has the potential to liberate mercury from these stable minerals by dissolving it in process solutions. Because it has a boiling point of 675 degrees Fahrenheit, mercury has the potential to volatilize into a gaseous form when subjected to thermal processes in a recovery and refining circuit.

Table 3-7 National and State of Nevada Ambient Air Quality Standards

Pollutant	Averaging Time	Nevada Standards	National Standards	
		Concentration ($\mu\text{g}/\text{m}^3$)	Primary ($\mu\text{g}/\text{m}^3$)	Secondary ($\mu\text{g}/\text{m}^3$)
Ozone	1-hour	235	NA	NA
	8-hour	157	157	157
Carbon monoxide (CO)	1-hour	40,000	40,000	40,000
CO less than 5,000 feet amsl	8-hour	10,000	10,000	10,000
CO at or greater than 5,000 feet amsl	8-hour	6,670		
Sulfur dioxide (SO ₂)	1-hour	NA	196	None
	3-hour	1,300	None	1,300
	24-hour	365	365	None
	Annual average	80	80	None
Nitrogen dioxide (NO ₂)	1-hour	--	189	None
	Annual average	100	100	100
PM ₁₀	24-hour	150	150	150
	Annual average	50	NA	NA
PM _{2.5}	24-hour	35	35	35
	Annual average	12	12	15
Lead	Rolling 3-month average	0.15	0.15	0.15
	Quarterly arithmetic mean	1.5	1.5	1.5
Hydrogen sulfide	1-hour	112	--	--

$\mu\text{g}/\text{m}^3$ – micrograms per cubic meter.

Source: NAC 445B.22097 Standards of Quality for Ambient Air (Nevada Revised Statutes 445B.210, 445B.300); USEPA 2013.



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Figure 3-9

Wind Rose for Elko, Nevada (2008-2012)



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Source: Western Regional Climate Center 2012.

Mercury is not considered a criteria pollutant, and no NAAQS have been established under the Clean Air Act Amendments for mercury. Mercury is included on the federal list of hazardous air pollutants (HAPs), which has been adopted by reference in the Nevada air quality regulations. Nevada air quality regulations (NAC 445B.349) prohibit the “discharge into the atmosphere from any stationary source of any hazardous air pollutant or toxic regulated air pollutant that threatens the health and safety of the general public, as determined by the director.” The USEPA has issued a final rule on National Emissions Standard for HAPs (NESHAPs) for gold mines and gold processing facilities (40 CFR 63 Subpart EEEEEEE). The rule establishes a NESHAPs for mercury emissions from gold ore processing facilities. For existing ore pretreatment processes, the emissions limit is no more than 127 pounds of mercury per million tons of ore processed. HAPs are controlled through emissions limits at the source rather than ambient air concentrations. Mercury emissions associated with precious metals operations are regulated and controlled pursuant to the Nevada Mercury Control Program (NAC 445B.3611-3689 Nevada Mercury Control Program).

Climate Change

Scientific research has identified the potential impacts of anthropogenic greenhouse gas (GHG) emissions and changes in biological carbon sequestration due to land management activities on global climate. A summary of this research is presented in the Cortez Hills Expansion Project Final EIS (BLM 2008a). More recent reporting of trends in global mean surface temperatures by Hansen et al. (2010) and studies of climate change, such as the Berkeley Earth Surface Temperature Study (Berkeley 2011) and The Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation (Intergovernmental Panel on Climate Change [IPCC] 2011), provide further evidence that the earth is getting warmer and further describe the potential impacts of climate change.

Although greenhouse gas emissions have been cited as a contributing factor to climate change (IPCC 2007), at present there is no regulatory program that requires reductions in greenhouse gas emissions, and the tools necessary to quantify climatic impacts presently are unavailable. However, in response to a Supreme Court decision interpreting the Clean Air Act, on July 30, 2008, the USEPA published an advanced notice of proposed rulemaking addressing regulatory mechanisms for regulating greenhouse gas emissions for purposes of addressing climate change. Congress also may consider legislation that would impose regulatory controls or incentives for reducing greenhouse gas emissions.

3.10.2 Environmental Consequences

3.10.2.1 Proposed Action

The Proposed Action has the potential to emit air pollutants as a result of the proposed project modifications described in Chapter 2.0.

These activities include potential emissions during construction of the ancillary facilities at the Pipeline Complex and construction of the proposed rangeland fence along the previously rerouted CR 225. There also would be air quality impacts associated with the transport of additional refractory ore to Goldstrike, the processing of this ore at the Goldstrike Mill, and the 11-month extension of operations at the Goldstrike Mill. No change in the current life of the operations within the CGM Operations Area would occur.

Ancillary Facilities

Under the Proposed Action, construction of the ancillary facilities would result in 41 acres of additional disturbance at the Pipeline Complex, an approximately 0.2 percent increase in the disturbance area for this complex. Construction of the rangeland fence along CR 225 would occur within the existing ROW disturbance. As a result of the minor incremental increase in the disturbance area, the impacts from construction and operation of the ancillary facilities would be approximately the same as for the currently authorized facilities at Pipeline.

Rangeland Fence along CR 225

Approximately 10 miles of rangeland fencing would be installed along the relocated portion of CR 225 to the east of the Pipeline Complex. Installation of rangeland fence would cause very little disturbance of the soil from setting fence posts, so there would be very little potential for the generation of additional fugitive dust. The main impact would be due to additional tailpipe emissions mostly from light trucks (pickups) along with some additional potential for fugitive dust on paved and unpaved roads as they move material and workers to and from the temporary work sites. It is anticipated that the increase in air pollutant emissions would be negligible and would not result in an exceedence of the NAAQS.

Off Site Ore Transport

Enviroscientists (2013) analyzed the total potential truck emissions associated with the currently authorized transport of 400,000 tpy of refractory ore to Goldstrike and the proposed transport of 800,000 additional tpy of refractory ore. The estimated total annual emissions to transport 1.2 million total tons of ore to Goldstrike each year are presented in **Table 3-8**. Due to the travel distance involved (approximately 84 miles, including mine site roads), concentrations of fugitive dust from paved and unpaved roads and tail pipe emissions from haul trucks would be unlikely to cause a violation of NAAQS for PM₁₀, CO, oxides of nitrogen (NO_x), or SO₂.

Table 3-8 Total Potential Truck Traffic Emissions (tpy)

Pollutant/Emissions (tpy)				
PM ₁₀	PM _{2.5}	CO	NO _x	Sulfur Dioxide
60.36	112.95	24.83	112.61	0.23

Source: Enviroscientists 2013.

From previous dispersion modeling results provided in support of the Cortez Hills Expansion Project Final Supplemental EIS (BLM 2011a), the highest annual total PM_{2.5} concentration occurs approximately 500 meters south of the haul road used to transport ore to Goldstrike (Enviroscientists 2010) (**Table 3-9**). Based on the use of fugitive dust controls on haul roads (e.g., water application and chemical dust suppressant) as discussed in Section 2.2.4.7 of this EA, it is unlikely that the increase in haul road traffic would change these maximum modeled PM_{2.5} impact results that indicate the project would not violate the NAAQS.

Table 3-9 Highest Modeled PM_{2.5} Concentrations

Averaging Time	Receptor Location		Modeled Impact	Total Impact with Background	Ambient Standard
	UTM East (meter)	UTM North (meter)	(µg/m ³)	(µg/m ³)	(µg/m ³)
24-hour	532,089	4,444,943	19.83	22.21	35
Annual	530,495	4,449,133	9.57	11.95	12

UTM = Universal Transverse Mercator.

Source: Enviroscientists 2010.

Off Site Ore Processing at Goldstrike

Annual and short-term emissions at Goldstrike would not increase due to processing of refractory ore from the CGM Operations Area at Goldstrike since that ore temporarily would displace a portion of the roaster throughput at Goldstrike. However, the additional ore processing would extend operations at Goldstrike for approximately 11 months. The Betze Pit Expansion Project Draft Supplemental EIS (BLM 2008d) addressed the potential impacts from PM₁₀, SO₂, NO_x, and CO emissions at Goldstrike. Based

on the Betze EIS analysis, the total impacts from Goldstrike would be below the NAAQS for these pollutants. Since emissions at Goldstrike would be unchanged under the Proposed Action, the NAAQS would continue to be met in the vicinity of Goldstrike.

Air Sciences Inc. (2010a) previously analyzed the projected PM_{2.5} emissions from the total ore processed at Goldstrike relative to the PM_{2.5} emissions from the currently authorized processing of 400,000 tpy of refractory ore from the CGM Operations Area as presented in the Cortez Hills Expansion Project Final Supplemental EIS (BLM 2011a). Under the Proposed Action, an increased percentage of the total PM_{2.5} emissions at Goldstrike would result from the processing of 800,000 additional tpy of refractory ore from the CGM Operations Area; however, the total annual PM_{2.5} emissions would not increase since the ore would displace a portion of the current roaster throughput (800,000 tpy), with a related temporal effect associated with the proposed 11 months of additional processing. Therefore, as discussed in the Cortez Hills Expansion Project Final Supplemental EIS (BLM 2011a), the total annual PM_{2.5} emissions at Goldstrike would not cause or contribute to a violation of PM_{2.5} NAAQS.

Under the Proposed Action, an increased percentage of the mercury emissions at Goldstrike would result from the processing of 800,000 tpy of refractory ore from the CGM Operations Area; however, the total annual emissions of mercury at Goldstrike would not increase since the ore, which has a mercury content within the same range as the Goldstrike ore (Air Sciences Inc. 2012), temporarily would displace a portion of the current roaster throughput and result in approximately 11 months of additional processing. Therefore, impacts from local or long-range deposition of mercury would be unchanged or lower than the levels discussed in the Cortez Hills Expansion Project Final Supplemental EIS (BLM 2011a).

Total HAPs emissions at Goldstrike (7.96 tpy from mining and processing operations per the 2006 emissions inventory) and the percent contribution from the currently authorized processing of 400,000 tpy of refractory ore from the CGM Operations Area (as analyzed by Air Sciences Inc. [2010b]) are discussed in the Cortez Hills Expansion Project Final Supplemental EIS (BLM 2011a). Under the Proposed Action, an increased percentage of the total processing-related HAPs emissions at Goldstrike would be associated with the processing of refractory ore from the CGM Operations Area. However, it is anticipated that total HAPs emissions at Goldstrike would remain well below the major source limit of 25 tpy, as discussed in the Cortez Hills Expansion Project Final Supplemental EIS (BLM 2011a).

GHG emissions specifically include CO₂, methane (CH₄), and nitrous oxides (N₂O) from combustion emissions. Enviroscientists (2013) analyzed the total potential GHG emissions associated with the currently authorized transport of 400,000 tpy of refractory ore to Goldstrike and the proposed transport of 800,000 additional tpy of refractory ore. Because the various GHG emissions each have a different global warming potential (GWP) that relates to the potential of the gas to trap heat in the atmosphere over a specified period of time, the relative contribution method established by the Intergovernmental Panel on Climate Change was used in the analysis to assign a GWP to each GHG to estimate a total GHG weighted emission. Based on the methodology, CO₂ has been established as the reference gas equivalent expressed as carbon dioxide equivalent (CO₂e) with a GWP of one. The GWP equivalents for CH₄ and N₂O are 21 and 310, respectively (Enviroscientists 2013). Based on these factors, the estimated total annual GHG emissions from the hauling of 1.2 million tpy of ore to Goldstrike are presented in **Table 3-10**. As indicated in the table, the estimated total annual CO₂e emission is 30,229 metric tons. The additional 800,000 tpy of refractory ore proposed for transport to Goldstrike would represent approximately 67 percent of the total 1.2 tpy used by Enviroscientists (2013) in the analysis, and therefore, proportionally would represent approximately 20,253 metric tons of the total estimated annual CO₂e emission.

CEQ advises federal agencies to consider analysis of the direct and indirect GHG emissions from proposed projects if a proposed action would be reasonably anticipated to cause direct emissions of 25,000 metric tons or more of CO₂e GHG emissions on an annual basis. Agencies are advised to consider this an indicator that a quantitative and qualitative assessment may be meaningful to decision

makers and the public. Based on the analysis presented above, the total estimated CO₂e emissions associated with the proposed transport of 800,000 tpy of refractory ore to Goldstrike would be less than the CEQ-advised threshold for conducting a CO₂e emissions analysis.

Table 3-10 Total Estimated GHG Emissions Associated with Refractory Ore Transport to Goldstrike

GHG	Emissions (tpy)	CO ₂ e (metric tons)
CO ₂	33,305	30,214
CH ₄	0.46	8.76
N ₂ O	0.023	6.47
Total	--	30,229

Source: Enviroscientists 2013.

3.10.2.2 No Action Alternative

Under the No Action Alternative, existing mining and processing operations and reclamation activities within the CGM Operations Area would continue under the terms of current permits and approvals as authorized by the BLM and State of Nevada, and there would be no temporal increase in operations at Goldstrike. Proposed modifications as described for the Proposed Action would not be implemented, and associated impacts would not occur.

3.10.3 Cumulative Effects

3.10.3.1 Proposed Action

Under the Proposed Action, cumulative air quality impacts in the vicinity of the proposed project modifications would be very slight since the annual and 24-hour contributions from the proposed project sources would not cause the air quality in the region to degrade below National or state AAQS. Also, while a higher percentage of the mercury emissions at Goldstrike would be attributed to the processing of refractory ore from the CGM Operations Area, there would be no increase in the total annual mercury emissions at Goldstrike and, therefore, no increase in the total contribution to cumulative annual mercury emissions. However, the contribution to cumulative annual mercury emissions would continue for 11 additional months.

Past and present actions and RFFAs within the study area may generate GHGs, while other activities such as managing vegetation to favor perennial grasses and increased vegetative cover may sequester carbon, which may contribute to increased organic carbon in soils and function as carbon sinks. The proposed transport of additional refractory ore to Goldstrike incrementally would contribute approximately 20,253 metric tons of the total estimated annual CO₂e emissions.

The assessment of climate-changing pollutant emissions and climate change is in its formative phase; therefore, it is not yet possible to assess with confidence the net impact of GHG emissions to climate. The lack of scientific tools designed to predict climate change on regional or local scales limits the ability to quantify potential future impacts; therefore, an established methodology does not yet exist to accurately predict the effect of these local and regional activities on global climate change.

3.10.3.2 No Action Alternative

Under the No Action Alternative, cumulative air quality impacts in the vicinity of the CGM Operations Area would be the same as those identified in the Cortez Hills Expansion Project Final EIS (BLM 2008a) and Final Supplemental EIS (BLM 2011a).

3.10.4 Monitoring and Mitigation Measures

It is assumed that the current meteorological monitoring programs at the mine would continue. No additional monitoring or mitigation measures are required, since annual mercury emissions would not change, and the air quality analysis indicates that there would be no exceedence of the NAAQS anticipated as a result of the Proposed Action.

3.10.5 Residual Adverse Effects

There would be no residual adverse impacts to air quality from the proposed project modifications since reclamation and revegetation would stabilize exposed soil and control fugitive dust emissions. As vegetation becomes established, particulate levels should return to what is typical for a dry desert environment. Once the disturbance ceases and wind erodible surfaces are reclaimed, the resource would return to approximately its premining condition. Also, emissions related to the transport and processing of additional refractory ore would cease following the completion of mining.

3.11 Land Use and Access

As discussed in the introduction to Chapter 3.0 and indicated in **Table 3-3**, the elements of the Proposed Action that potentially would result in new or extended land use or access impacts include:

1) construction and operation of a rangeland fence along CR 225 and installation of new ancillary facilities (i.e., potable water well/pipeline and capacitor bank/transformer/power distribution line) (**Figure 2-2**); 2) increased truck traffic levels associated with the relocation of approximately 6 million additional tons of refractory ore (at a rate of approximately 800,000 tpy) from the Pipeline Complex ore stockpile to Goldstrike for processing; and 3) the associated 11-month extension of ore processing at Goldstrike.

The project study area for land use encompasses the proposed modifications in the vicinity of the Pipeline Complex and the area within approximately 2 miles the CGM Operations Area. The study area for access encompasses the CGM Operations Area and the primary access roads between the project area and Goldstrike. No physical project modifications are proposed for the Goldstrike Mill, which is located within the current disturbance area of the Goldstrike Mine. Consequently, potential project effects in that area are expected to be limited to effects of ore transport and the temporal effects of extended fuel and reagent transport to Goldstrike to facilitate the proposed 11 months of additional processing. The cumulative effects study area for both land use and access encompasses the past and present actions and RFFAs within a 30-mile radius of the CGM Operations Area, as shown in Figure 3.1-10 of the Cortez Hills Expansion Project Final EIS (BLM 2008a), and for access, the primary access roads between the project study area and Goldstrike (i.e., CRs 306 and 766 and I-80).

3.11.1 Affected Environment

3.11.1.1 Land Use

The proposed project modifications are within the jurisdiction of the BLM Shoshone-Eureka RMP (BLM 1986a). The BLM Battle Mountain District Office is in the process of preparing a new RMP for the area; however, the revised plan is not scheduled to be completed until 2014. The proposed modifications also are covered by several Lander County plans and regulations, including the Policy Plan for Federally Administered Lands (Lander County 2005), the Lander County Master Plan (Lander County 2010), and Lander County Zoning Regulations (Lander County 1994).

The Shoshone-Eureka RMP (BLM 1986a) provides that the public lands will be open for mining and prospecting unless withdrawn or restricted from mineral entry as discussed in Section 1.4, Land Use Plan Conformance. No such withdrawals or restrictions occur within the project area.

The Lander County 2005 Policy Plan for Federally Administered Lands emphasizes the county's support for, and dependence on, mineral resources development. Specifically, Policy 13-1 states, "Retain existing mining areas and promote the expansion of mining operations and areas" (Lander County 2005).

The project study area is zoned A-3, Farm and Ranch District, under Lander County's zoning code. The A-3 zone requires the proponent of a mining project to obtain a Special Use Permit from the County Planning Commission (Little 2011; Teske 2006). The Lander County Master Plan (Lander County 2010) is policy oriented and general in nature, focusing primarily on the areas in and around the county's three major communities; the plan is only generally applicable to the project study area.

Mining constitutes the dominant land use in the study area. There are no Indian Reservations within the project study area. BLM has initiated government-to-government consultation with potentially affected tribal groups for the proposed project modifications, as discussed in Section 3.9, Native American Traditional Values. Livestock grazing is an established use in the area surrounding the project study area, particularly in Crescent Valley and in some foothills areas (see Section 3.6, Range Resources).

The land use study area encompasses portions of the Carico Lake, Grass Valley, and South Buckhorn allotments. There are no prime or unique farmlands in the project area.

The area potentially affected by the proposed project modifications is composed entirely of public land administered by the BLM.

Existing ROWs and other land use authorizations in the project study area were summarized in Table 3.11-1 and shown in Figure 3.11-1 of the Cortez Hills Expansion Project Final EIS (BLM 2008a). The authorizations have not changed in the interim.

3.11.1.2 Access

The CGM Operations Area is served by a sparse network of roadways typical of rural Nevada. I-80 is the primary east-west traffic artery across northern Nevada, connecting northern Lander County with Reno, Nevada, to the west and Elko, Nevada, and Salt Lake City, Utah, to the east. I-80 is approximately 35 miles north of the CGM Operations Area.

SR 306 provides access to the mine vicinity from I-80 through Beowawe and the Town of Crescent Valley. SR 306 is a paved, two-lane highway designated by the NDOT as a “rural major collector” north of Crescent Valley and a “rural minor collector” south of Crescent Valley (NDOT 2003). SR 306 crosses Union Pacific’s double-track main line in Beowawe; the at-grade crossing is protected by automated gates and flashing signals. SR 306 ends in the northwest quadrant of the CGM Operations Area, at the existing mine office parking area. Traffic volumes on SR 306 in 2011 averaged 1,300 vpd just south of I-80 and 660 vpd south of Crescent Valley (NDOT 2011). These volumes were 35.6 and 28.2 percent, respectively, above the 10-year averages for the two road sections. Peak hour traffic volumes are estimated at less than 10 percent of hourly roadway capacity. Existing traffic conditions on SR 306 are at level of service (LOS) A. (Note: LOS are rated A through F, with A generally representing free flowing traffic conditions with few restrictions [Transportation Research Board 2000].)

SR 766 is the main access to Goldstrike, intersecting I-80 at exit 280 in Carlin, Nevada. SR 766 is a paved, two-lane highway designated by NDOT as a “rural major collector” (NDOT 2004). Traffic averaged 2,200 vpd north of I-80, which was 3.3 percent below the 10-year average for the highway (NDOT 2011). Peak hour traffic volumes are estimated at approximately 15 percent of hourly capacity. Existing traffic conditions on SR 766 are at LOS B, just slightly below LOS A.

I-80 is a high quality, interstate class, 4-lane divided freeway. Traffic volumes in 2011 averaged 7,700 vpd east of the Beowawe interchange (exit 261) and 6,900 vpd east of the west Carlin interchange (exit 279) (NDOT 2011). The Beowawe volume was approximately 7.5 percent above the 10-year average for the location, and the Carlin volume was approximately 1.2 percent below the 10-year average for that location. Both numbers were well below the capacity for I-80, which is rated LOS A throughout the project study area and cumulative effects study area.

3.11.2 Environmental Consequences

3.11.2.1 Proposed Action

Land Use

The proposed ancillary facilities would result in an additional 41 acres of disturbance in the project study area, and approximately 10 miles of new rangeland fence would be constructed within the existing CR 225 disturbance ROW. The proposed 41 acres of new disturbance temporarily would reduce the acreage of available rangeland within the 53,098-acre Carico Lake grazing allotment during the life of the mine by less than 0.1 percent. The exclusion of approximately 1,920 acres as a result of the rangeland fence installation (which would be turned over to the BLM following closure) permanently would reduce

the acreage of available rangeland in the allotment by approximately 4 percent (see Section 3.6, Range Resources).

The Proposed Action would be consistent with applicable land use plans for the area. The Proposed Action would not conflict with any existing ROWs or other land use authorizations.

Access

The Proposed Action would have no measurable effect on public access in the project study area.

The trucking of approximately 800,000 additional tpy of refractory ore to Goldstrike would generate additional truck traffic on SR 306, I-80, and SR 766. Employing 35-ton trucks, operating 7 days per week throughout the year would result in an estimated 68 additional round trips per day, including loaded trips outbound from the Pipeline Complex and empty returns from Goldstrike. Although heavy truck movements would result in some delays for other traffic on the state highway segments where passing is prohibited, existing traffic is light enough that adverse effects on traffic flows likely would be minor. The project-related increase in traffic would not be sufficient to degrade traffic LOS below the existing LOS A on SR 306 and I-80 or below the existing LOS B on SR 766.

Highway safety partially is a function of traffic levels. Therefore, the addition of a small volume of traffic would increase the risk of accidents on the route, although the increased risk likely would be small.

3.11.2.2 No Action Alternative

Under the No Action Alternative, existing mining and processing operations and reclamation activities within the CGM Operations Area would continue under the terms of current permits and approvals as authorized by the BLM and State of Nevada, and there would be no temporal increase in operations at Goldstrike. As a result, land use and access considerations would continue in their current condition. No changes in use of lands or access and traffic conditions associated with the Proposed Action would occur.

3.11.3 Cumulative Effects

3.11.3.1 Proposed Action

Land Use

Past and present actions and RFFAs have resulted, or would result, in approximately 139,654 acres of disturbance. The Proposed Action incrementally would increase temporary surface disturbance in the cumulative effects study area by approximately 41 additional acres, resulting in an overall cumulative disturbance of approximately 139,695 acres. The total cumulative disturbance would be consistent with Lander County and BLM plans, policies, and ordinances.

Access

Traffic flows from past and present actions are included in the existing traffic counts noted in the affected environment discussion. Traffic from RFFAs and the Proposed Action would result in moderate increases in traffic on the highway segments, which would not be expected to reduce the levels of service below the existing LOS A and LOS B.

3.11.3.2 No Action Alternative

Under the No Action Alternative, cumulative impacts to land use and access in the vicinity of the CGM Operations Area would be the same as those identified in the Cortez Hills Expansion Project Final EIS (BLM 2008a).

3.11.4 Monitoring and Mitigation Measures

No monitoring or mitigation measures are required for land use or access effects.

3.11.5 Residual Adverse Effects

Following mine closure, land uses would revert to the post-mine land use plan. Traffic and access also would return to pre-mine conditions. As a result, no residual adverse impacts have been identified.

3.12 Recreation and Wilderness

As discussed in the introduction to Chapter 3.0 and indicated in **Table 3-3**, the elements of the Proposed Action that potentially would result in new or extended recreation or wilderness impacts include:

1) newly proposed construction activities associated with installation of a rangeland fence along CR 225 and installation of new ancillary facilities (i.e., potable water well/pipeline and capacitor bank/transformer/power distribution line) (**Figure 2-2**); 2) increased truck traffic levels associated with the relocation of approximately 6 million additional tons of refractory ore (at a rate approximately 800,000 tpy) from the Pipeline Complex ore stockpile to Goldstrike for processing; and 3) the associated 11-month extension of ore processing at Goldstrike.

The analysis areas for recreation and wilderness issues are based on the anticipated potential extent of effects from the Proposed Action. For recreation, the project study area comprises the proposed modifications in the vicinity of the Pipeline Complex and the area within approximately 2 miles of the CGM Operations Area, plus a 2-mile-wide corridor centered on the ore transport route from the Pipeline Complex to Goldstrike. The cumulative effects study area for recreation encompasses an area that generally includes the southern portions of Crescent Valley and the Cortez Mountains and portions of the Shoshone and Toiyabe ranges (**Figure 3-3**), plus a corridor within approximately 5 miles of the ore transport route to Goldstrike. The project study area for wilderness issues is the same for both direct/indirect and cumulative effects, encompassing an area within a radius of approximately 50 miles from the proposed project modifications and Goldstrike (**Figure 3-3**).

3.12.1 Affected Environment

3.12.1.1 Recreation

There are no developed recreation facilities in the CGM Operations Area or its immediate surroundings. The nearest developed BLM facility is the Mill Creek Recreation Area, a small camping, fishing, and picnicking area in the Reese River Valley, more than 35 air miles northwest of the CGM Operations Area. Crescent Valley has a park with tennis and basketball courts, a ball field, picnic areas, and a playground. Many BCI employees live in Elko, Carlin, and Battle Mountain, all of which provide park and recreation facilities for residents.

Dispersed outdoor recreation activities are the main recreation uses of the project study area. Public lands in the study area are managed by the BLM and generally are open for dispersed public recreation use, except for mining areas that are fenced off for protection of the public and to prevent interference with mining activities. Uses in and near the CGM Operations Area likely are limited to photography and sightseeing at the old Cortez townsite; hiking and camping; firewood collecting; rockhounding; off-highway vehicle use; fishing in the Humboldt River; and hunting for chukar, greater sage-grouse, and mule deer.

3.12.1.2 Wilderness

There are currently eight wilderness study areas (WSAs) but no designated wilderness areas within 50 miles of the project study area. The criteria considered in developing Nevada wilderness recommendations included naturalness, solitude, primitive and unconfined recreation, and special features.

The eight WSAs are: Cedar Ridge WSA, China Mountain WSA, Tobin Range WSA, Augusta Mountains WSA, Simpson Park WSA, Little Humboldt River WSA, Red Spring WSA and Roberts Mountain WSA. Wilderness designation was recommended for 29,775 acres (70.5 percent) of the Little Humboldt River WSA. The Roberts Mountain WSA was recommended for designation as wilderness in the Statewide Wilderness Report (BLM 1991); however, the recommendation was reversed by the Secretary of Interior in 1992. The other five areas were recommended for release from consideration for wilderness

designation because other values, including known or potential mineral resources in four of the five areas, were considered relatively more important than the wilderness values they contained.

The Little Humboldt River WSA (NV-010-132) is located approximately 35 miles northwest of the project study area and cumulative effects study area. The entire area includes 42,213 acres; it contains two privately owned inholdings of 40 acres and 160 acres. Wilderness designation was recommended for 29,775 acres of the WSA because it contains “diverse ecosystems with high wilderness values.” Terrain varies from deep canyons to mesas and high rocky ridges to wide plains. Numerous wildlife species are found in the area. Recreation opportunities include photography, hunting, fishing, camping, hiking, horseback riding, rock climbing, and wild horse viewing (BLM 2010b). The area is natural appearing and has “outstanding” opportunities for both solitude and primitive and unconfined recreation.

The Roberts Mountain WSA (NV-060-541) encompasses 15,090 acres with no private in-holdings. The WSA is located in the Roberts Mountains 20 miles southeast of the CGM Operations Area; it is the closest WSA to the project study area. The BLM recommended the entire 15,090 acres for designation as wilderness based on “outstanding wilderness values not common in central Nevada,” including naturalness, unusual vegetation communities, opportunities for primitive and unconfined recreation, prominent Roberts Mountain Thrust geologic features, and unique paleontological probability. Despite the countervailing action by the then Secretary of the Interior, a subsequent lawsuit settlement provided that this and all other candidate wilderness areas would receive a “fresh look” when Congress considers specific designation bills.

3.12.2 Environmental Consequences

3.12.2.1 Proposed Action

Recreation

Proposed ancillary facilities would result in an additional 41 acres of disturbance in the project study area and approximately 10 miles of new rangeland fence parallel to CR 225. The additional disturbance would reduce the availability of public lands for dispersed recreation by a negligible amount in the context of the large amount of public land available for such recreation in the project study area and the region.

Further, the lands proposed for disturbance are not considered high quality recreation lands due to their proximity to the ongoing mining operations. The proposed fence would make access to the area west of CR 225 slightly more difficult; however, use of the area for recreation is likely minimal because of its location adjacent to mine activities and the lack of identifiable recreation resources.

Shipping of additional refractory ore from the Pipeline Complex to Goldstrike would have little, if any, effect on recreation opportunities in the area. All of the associated truck traffic would occur on existing highways with existing traffic, some of which currently is truck traffic. The additional traffic likely would not be noticeable to casual observers, including recreationists. As discussed in Section 3.5, Wildlife and Fisheries Resources, no appreciable effect on wildlife/vehicle collisions would be anticipated as a result of the additional traffic; therefore, it is anticipated that related effects on hunter success rate would be negligible.

Wilderness

There would be no direct effects, or measurable indirect effects (i.e., air quality effects [see Section 3.10, Air Quality]), from the Proposed Action on wilderness areas or WSAs within 50 miles of the project study area. The Proposed Action would conform to the Wilderness Act of 1964 and the BLM Interim Wilderness Management Policy.

3.12.2.2 No Action Alternative

Recreation

Under the No Action Alternative, the proposed activities would not occur. Existing recreation opportunities would continue throughout the project vicinity, primarily the dispersed recreation activities on the public lands.

Wilderness

There would be no direct effects, or measurable indirect effects, on wilderness areas or WSAs within 50 miles of the proposed project. The Proposed Action would conform to the Wilderness Act of 1964 and the BLM Interim Wilderness Management Policy.

3.12.3 Cumulative Effects

3.12.3.1 Proposed Action

Recreation

Past and present actions and RFFAs have resulted, or would result, in approximately 139,654 acres of disturbance, an unquantifiable portion of which has been or would be reclaimed. The Proposed Action incrementally would increase temporary surface disturbance in the cumulative effects study area by 41 additional acres, resulting in an overall cumulative disturbance of approximately 139,695 acres. This disturbance acreage is small relative to the acreage of public land available for recreation in the cumulative effects study area.

Wilderness

The Proposed Action would have no direct or measureable indirect effects on WSAs within 50 miles of the project study area and, therefore, would not contribute to cumulative impacts to wilderness.

3.12.3.2 No Action Alternative

Under the No Action Alternative, cumulative impacts to recreation and land use would be the same as those identified in the Cortez Hills Expansion Project Final EIS (BLM 2008a).

3.12.4 Monitoring and Mitigation Measures

No monitoring or mitigation measures are required for recreation or wilderness resources.

3.12.5 Residual Adverse Effects

Lands disturbed under the Proposed Action would revert to previous open, public access and uses upon completion of the proposed project and reclamation of the disturbed areas. Therefore, there would be no residual adverse effects to recreation or wilderness resources.

3.13 Social and Economic Values

As discussed in the introduction to Chapter 3.0 and indicated in **Table 3-3**, the elements of the Proposed Action that potentially would result in new or extended social or economic effects include: 1) newly proposed construction activities associated with installation of a rangeland fence along CR 225 and installation of new ancillary facilities (i.e., potable water well/pipeline and capacitor bank/transformer/power distribution line) (**Figure 2-2**); 2) the proposed relocation of approximately 6 million additional tons of refractory ore (at a rate approximately 800,000 tpy) from the Pipeline Complex ore stockpile to Goldstrike for processing; and 3) the associated 11-month extension of ore processing at Goldstrike.

The project study area and cumulative effects study area for social and economic values include portions of Elko, Eureka, and Lander counties as shown in Figure 3.12-2 of the Cortez Hills Expansion Project Final EIS (BLM 2008a). The rationale for the study area is that a majority of the workers employed by BCI at operations in the CGM Operations Area and at Goldstrike live in the communities of Elko/Spring Creek (67 percent), Carlin (9 percent), Crescent Valley/Beowawe (11 percent), and Battle Mountain (11 percent). Although the study area is focused on these communities, some data are presented for entire counties when data were not readily available for sub-county areas. County-wide data are reasonably representative of the study area as the four communities represent nearly two-thirds of the total population of the three-county area (**Table 3-11**).

3.13.1 Affected Environment

3.13.1.1 Population

Elko County is the largest of the three counties in the project study area and cumulative effects study area, and a sizable majority of the workers employed at the CGM Operations Area and at Goldstrike live in Elko County, particularly in the Elko-Spring Creek area. **Table 3-11** presents population levels and growth rates for study area counties and major communities from 1980 through 2010.

Table 3-11 Population Characteristics

Area	1980	1990	2000	2010	Average Annual Percent Change 1980-1990	Average Annual Percent Change 1990-2000	Average Annual Percent Change 2000-2010
Elko City	8,771	14,736	16,708	18,297	5.3	1.3	0.9
Spring Creek CDP ¹	2,002	5,866	10,548	12,361	11.3	6.0	1.6
Carlin	1,233	2,220	2,161	2,368	6.1	(0.3)	0.9
Elko County	17,269	33,530	45,291	48,818	6.9	3.1	0.8
Eureka County	1,198	1,550	1,651	1,987	2.6	0.6	1.9
Battle Mountain CDP ¹	2,749	3,542	2,871	3,635	2.6	(2.1)	2.4
Lander County	4,076	6,266	5,794	5,775	4.4	(0.8)	0.0
Nevada	800,493	1,201,833	1,998,257	2,700,551	4.1	5.2	3.1

¹ CDP – Census Designated Place.

Source: U.S. Census Bureau 2010a, 2000, 1981.

Ethnically and racially, the project study area and cumulative effects study area counties are notably less diverse than the state as a whole with substantially fewer black and Asian residents, and somewhat lower percentages of people of Hispanic origin. The counties do have higher percentages of Native

Americans than the state does, particularly in Elko and Lander counties (4.7 and 3.4 percent, respectively) compared with 0.9 percent for the entire state. Additional information relative to minority or low income populations is presented in Section 3.14, Environmental Justice.

3.13.1.2 Employment

Employment in the project study area and cumulative effects study area demonstrates a distinct difference between Elko County and Eureka and Lander counties. 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. When wage and salary workers are tabulated by county of residence (rather than county of workplace), Elko County has 12.6 percent working in the natural resources and mining sector, Lander County has 56.9 percent working in the sector, and Eureka County has 89.7 percent of its employment coming from natural resources and mining (Nevada Department of Employment, Training, and Rehabilitation [NDETR] 2012a).

The average annual unemployment rates for 2011 for Elko, Eureka, and Lander counties were 7.1, 6.0, and 6.6 percent, respectively, compared with 13.5 percent for Nevada as a whole (NDETR 2012b). Total unemployment in the study area averaged 2,505 for the year, substantially above historical lows, but much lower than the statewide average (**Table 3-12**).

Table 3-12 2011 Labor Force, Employment, and Unemployment

Location	Labor Force	Employment	Unemployment	Unemployment Rate (percent)
Elko County	30,318	28,173	2,145	7.1
Eureka County	1,115	1,048	67	6.0
Lander County	4,458	4,165	293	6.6
Total	35,891	33,386	2,505	7.0
Nevada	1,385,872	1,198,140	187,732	13.5

Source: NDETR 2012b.

3.13.2 Environmental Consequences

Based on the proposed use of the existing work force at both the CGM Operations Area and at Goldstrike and the minimal (11-month) extension of milling operations at Goldstrike, it is unlikely that the proposed project modifications would result in measurable changes to housing demand, public facilities and services, emergency and health care services, public education, or public finance. Therefore, these social and economic considerations have been eliminated from further consideration in this EA analysis.

3.13.2.1 Proposed Action

The existing mine work force would be used for most, if not all, of the on site activities. Installation of the proposed rangeland fence and construction of the ancillary facilities related to the well and electrical equipment would entail use of specialty contractors. Employment of contract personnel for these activities likely would be very short-term in nature – on the order of a few weeks – and likely would utilize existing contractors from within the three-county study area. Consequently, it is likely that these workers currently are residents of the study area and would not affect the study area population.

Relocation of 800,000 tons of refractory ore to Goldstrike would occur over an 8-year period using 35-ton trucks. This schedule would require approximately 24,000 truck trips per year. The ore transport would

be handled by contract haulers. It is estimated that it would require approximately 20 full-time truck drivers for the 8-year period to accomplish the proposed transport of the refractory ore to Goldstrike. There are an estimated 2,500 unemployed individuals in the three-county study area (see **Table 3-11**). Consequently, it is anticipated that all of the 20 additional drivers would come from the local area. Although the cost of the proposed contract ore hauling is unknown, it is reasonable to estimate in excess of \$1 million per year in direct worker income would be injected into the local economy, which would result in an increase in purchasing of goods and services and an increase in tax revenues to local jurisdictions for the 8-year duration of the ore shipping. The ore transport also would require additional fuel and maintenance purchases by the contract haulers and perhaps additional trucks and trailers. These requirements would result in additional economic expenditures within the project study area over the 8-year period of ore hauling.

The processing of the additional Pipeline refractory ore at Goldstrike would extend the current life of operations at the Goldstrike Mill (projected through year 2031 [BLM 2009]) by approximately 11 months. This would result in an extended employment period for the existing work force at Goldstrike by the same 11-month period. This extension would result in continued payment of wages and benefits for the 11-month period, which would affect the local economy through purchases of goods and services and payment of taxes. The 11-month extension also would result in additional purchase of materials and supplies for operation of the Goldstrike Mill.

3.13.2.2 No Action Alternative

Under the No Action Alternative, existing mining and processing operations and reclamation activities within the CGM Operations Area would continue under the terms of current permits and approvals as authorized by the BLM and State of Nevada, and there would be no temporal increase in operations at Goldstrike. As a result, proposed modifications as described for the Proposed Action would not be implemented, and the associated social and economic impacts would not occur.

3.13.3 Cumulative Effects

3.13.3.1 Proposed Action

The social and economic effects of past and present actions are reflected in the affected environment description in Section 3.13.1. Consequently, any potential cumulative effects are addressed in the discussion of environmental consequences (Section 3.13.2). Anticipated schedules for increases or decreases in employment for the RFFA projects in the cumulative effects study area are not known. However, the anticipated use of existing local workers for any additional employment needed for the Proposed Action indicates a modest positive contribution to the local economy, with no additional demand for housing or public facilities and services, and no effect on cumulative employment and associated impacts.

3.13.3.2 No Action Alternative

Under the No Action Alternative, cumulative impacts to social and economic values would be the same as those identified in the Cortez Hills Expansion Project Final EIS (BLM 2008a).

3.13.4 Monitoring and Mitigation Measures

No monitoring or mitigation measures are required for social and economic values.

3.13.5 Residual Adverse Effects

There would be no residual adverse effects to social and economic values as a result of the Proposed Action.

3.14 Environmental Justice

As discussed in the introduction to Chapter 3.0 and indicated in **Table 3-3**, the elements of the Proposed Action that potentially would result in new or extended environmental justice effects include: 1) newly proposed construction activities associated with installation of a rangeland fence along CR 225 and installation of new ancillary facilities (i.e., potable water well/pipeline and capacitor bank/transformer/power distribution line) (**Figure 2-2**); 2) the proposed relocation of approximately 6 million additional tons of refractory ore (at a rate approximately 800,000 tpy) from the Pipeline Complex ore stockpile to Goldstrike for processing; and 3) the associated 11-month extension of ore processing at Goldstrike.

The environmental justice analysis addresses the potential for the proposed project or alternatives to adversely affect minority or low-income populations to a disproportionate degree, relative to their representation in the larger population. The project study area and cumulative effects study area for environmental justice include portions of Elko, Eureka, and Lander counties as shown in Figure 3.12-2 of the Cortez Hills Expansion Project Final EIS (BLM 2008a). The rationale for the project study area is that a majority of the workers employed at operations in the CGM Operations Area and at Goldstrike live in the communities of Elko/Spring Creek (67 percent), Carlin (9 percent), Crescent Valley/Beowawe (11 percent), and Battle Mountain (11 percent). Although the study area is focused on these communities, some data are presented for entire counties when data were not readily available for sub-county areas. County-wide data are reasonably representative of the study area as the four communities represent nearly two-thirds of the total population of the three-county area (**Table 3-10**).

3.14.1 Affected Environment

EO 12898, “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations” was issued February 11, 1994 (59 Federal Register 7629). EO 12898 “is intended to promote nondiscrimination in Federal programs substantially affecting human health and the environment, and to provide minority communities and low-income communities access to public information on, and an opportunity for participation in, matters relating to human health and the environment.” It requires each federal agency to achieve environmental justice as part of its mission by identifying and addressing, as appropriate, potential disproportionately high and adverse human health or environmental effects, including social and economic effects, of its programs, policies, and activities on minority and low-income populations.

Pursuant to EO 12898, the President’s CEQ prepared “Environmental Justice: Guidance Under the Environmental Policy Act” (1997) to assist federal agencies with their NEPA procedures “... so that environmental justice concerns are effectively identified and addressed.” This analysis was conducted with the assistance of the CEQ guidance document.

EO 12898 states that population groups defined as minorities include: American Indian or Alaskan Native; Asian or Pacific Islander; Black, not of Hispanic/Latino origin; or Hispanic/Latino. CEQ guidelines for evaluating potential adverse environmental justice effects indicate minority populations should be identified when either: 1) a minority population exceeds 50 percent of the population of the affected area; or 2) a minority population represents a “meaningfully greater increment” of the affected area population than the population of some appropriate larger geographic unit, as a whole.

Low-income populations are those communities or sets of individuals whose median income is below the current poverty level of the general population. According to the guidance, low-income populations in an affected area should be identified using the annual statistical poverty thresholds from the Bureau of the Census’ Current Population Reports, Series P-60 on Income and Poverty. In identifying low-income populations, federal agencies may consider as a community either a group of individuals living in geographic proximity to one another or a set of individuals (such as migrant workers or Native Americans) where either type of group experiences common conditions of environmental exposure or effect.

3.14.1.1 Minority Population

All three of the study area counties have notably higher percentages of white, non-Hispanic residents than the state as a whole. Eureka County, in particular, is over 83 percent white, non-Hispanic, compared with 54 percent for Nevada (**Table 3-13**). All three counties have 1 percent or fewer blacks or Asians compared with nearly 8 percent for each group state-wide. All three counties also have lower percentages of Hispanics than the state. All three counties have higher percentages of American Indian, Eskimo, or Aleut populations; Eureka County has more than double the statewide percentage.

Table 3-13 2010 Race and Ethnicity by County

Race/Ethnicity	Elko County	Eureka County	Lander County	State of Nevada
White Not of Hispanic Origin	69.1	83.6	73.7	54.1
Black Not of Hispanic Origin	0.7	0.1	0.3	7.7
American Indian, Eskimo or Aleut	4.7	2.1	3.4	0.9
Asian or Pacific Islander Non-Hispanic	1.0	0.9	0.3	7.7
Other and Two or More Races	1.7	1.3	1.1	3.1
Hispanic Origin of Any Race	22.9	12.0	21.1	26.5

Source: U.S. Census Bureau 2010a.

With reference to the CEQ guidance, no racial or ethnic group exceeds 50 percent of the population of any of the study area counties. The population percentages of American Indians in all three study area counties would be considered “meaningfully greater” than for the state as a whole, however, ranging from 2.3 times greater for Eureka County to 5.2 times greater for Elko County. Therefore, for the purpose of identifying environmental justice concerns, a minority population, as defined by the guidance, exists in the project study area.

3.14.1.2 Low-income Population

Poverty status is determined by comparing annual household 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. Weighted average poverty thresholds for 2010 ranged from \$10,458 for a single individual 65 years and over to \$45,224 for a household of nine or more people. Census estimates indicated 14.8 percent of the people in Nevada were in household with incomes below the poverty level in 2010 (U.S. Census Bureau 2010b).

With mining as the dominant industry in much of the project study area, mining wages and salaries typically are higher than average for the economy as a whole. As shown in **Table 3-14**, the result of this differential is substantially higher median household incomes in project study area counties than statewide. Nevertheless, there are households in all counties with incomes well below the median. The poverty threshold noted in **Table 3-14** is the weighted average for a 3-person household, approximately the average size for the project study area. Official census estimates for 2010 indicate the percentages of both total population and of persons under age 18 in poverty were well below the comparable statewide averages. Consequently, county populations in the project study area are not considered to be low-income for EO 12898 purposes according to CEQ guidance.

Table 3-14 2010 Household Income and Poverty Levels

State/County	Median Household Income	Poverty Threshold 3-person Household	Population in Poverty (%)	
			Total	Under Age 18
Elko County	\$66,210	\$17,373	8.3	11.2
Eureka County	\$58,391	\$17,373	10.1	12.5
Lander County	\$70,176	\$17,373	10.0	12.4
Nevada	\$50,987	\$17,373	14.8	21.3

Source: U.S. Census Bureau 2011, 2010b.

3.14.2 Environmental Consequences

3.14.2.1 Proposed Action

The potential effects of the Proposed Action would not be expected to disproportionately affect any particular population. The area in the immediate vicinity of the proposed project modifications and along the transportation route to Goldstrike is sparsely populated and does not have an unusually high minority population. Environmental effects that would occur at a greater distance, such as visual or air quality impacts, would affect the population equally, without regard to race or ethnicity.

3.14.2.2 No Action Alternative

Under the No Action Alternative, existing mining-related activities would continue under the terms of current permits and approvals as authorized by the BLM and State of Nevada, and there would be no temporal increase in operations at Goldstrike. There would be no measurable change to environmental or socioeconomic effects that would be expected to disproportionately affect a particular population.

3.14.3 Cumulative Effects

3.14.3.1 Proposed Action

No direct or indirect effects relative to environmental justice would occur under the Proposed Action; therefore, the proposed project modifications would not contribute to cumulative environmental justice impacts.

3.14.3.2 No Action Alternative

There would be no cumulative environmental justice impacts associated with the No Action Alternative.

3.14.4 Monitoring and Mitigation Measures

No adverse environmental justice effects have been identified; therefore, no monitoring or mitigation measures are required.

3.14.5 Residual Adverse Effects

No residual adverse effects that could affect minority or low-income populations would occur as a result of the Proposed Action.

3.15 Visual Resources

As discussed in the introduction to Chapter 3.0 and as indicated in **Table 3-3**, the elements of the Proposed Action that potentially would result in new or modified visual impacts include: 1) installation of a rangeland fence along CR 225 and installation of new ancillary facilities (i.e., potable water well/pipeline and capacitor bank/transformer/power distribution line) (**Figure 2-2**); and 2) reconfiguration of the NWRP footprint and storm water diversion within previously authorized disturbance areas and incorporation of an ore stockpile on the top of the NWRP.

The project study area for direct and indirect impacts to visual resources encompasses the proposed modifications within the CGM Operations Area as seen from the three key observation points (KOPs) identified in the Cortez Hills Expansion Project Final EIS (BLM 2008a). The cumulative effects study area encompasses the viewshed of the proposed project modifications or, generally, the area within 20 miles of the proposed project modifications from which the project modifications would be visible as shown in Figure 3.15-4 of the Cortez Hills Expansion Project Final EIS (BLM 2008a).

3.15.1 Affected Environment

The BLM is responsible for identifying and protecting scenic values on public lands under several provisions of the FLPMA and NEPA. The BLM Visual Resource Management (VRM) system was developed to facilitate the effective discharge of that responsibility in a systematic, interdisciplinary manner. The VRM system includes an inventory process, based on a matrix of scenic quality, viewer sensitivity to visual change, and viewing distances, which leads to classification of public lands and assignment of visual management objectives. Four VRM classes have been established, which serve two purposes: 1) as an inventory tool portraying relative value of existing visual resources; and 2) as a management tool portraying visual management objectives for the respective classified lands. All proposed physical landscape modifications in the CGM Operations Area would be located in VRM Class IV areas. VRM Class IV is the least restrictive of the four management classes. The management objective of VRM Class IV is, "... to provide for management activities, which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic (design) elements" (BLM 1986b).

The VRM system also includes a "contrast rating" procedure for evaluating the potential visual effects of a proposed project or management activity. The VRM system was used to evaluate the visual impact of the proposed project modifications.

Under the VRM system, the affected environment for visual resources is characterized using an inventory and evaluation process that addresses scenic quality, viewer sensitivity, and distance between viewers and a proposed modification to the landscape. Landscape characteristics contributing to the inventory process for the project study area are described below, followed by VRM class designations for the visual area of influence.

The project study area is located in the Basin and Range physiographic province as defined by Fenneman (1931). The province is characterized by alternating valleys and low, north-south trending mountain ridges common to central Nevada. Topography in the vicinity of the CGM Operations Area is nearly table flat in Crescent Valley. Crescent Valley is at an elevation of approximately 4,950 feet amsl at its highest (southern) end where the CGM Operations Area is located. Topography of the Toiyabe Range, southwest of the CGM Operations Area, is rounded and irregular, peaking at approximately 7,480 feet amsl.

The proposed physical modifications in the CGM Operations Area would be located within the Cortez Hills Complex on the northern slope of the saddle between Mount Tenabo and the north end of the

Toiyabe Range, in Crescent Valley between the Cortez Hills and Pipeline complexes, and along the north-northeast side of the Pipeline Complex (**Figure 2-2**).

Vegetation in the vicinity of the Pipeline Complex is sparse, primarily low shadscale, budsage, and grasses. The area within the Cortez Hills Complex is largely, if not entirely, disturbed with little or no remaining native vegetation. Vegetation colors include medium greens that are in evidence for periods in the spring, with beige, tans, and muted gold present during the drier and colder months.

Native soils are light beige to pale whitish gray with rock outcrops adding generally muted browns, oranges, and some mauve to purple hues.

Color differences, though generally not sharply contrasting, can be easily distinguished at distances of a mile or more, especially with early morning or late afternoon sun at the viewer's back. Colors blend together and become very subtle or undistinguishable at greater distances and under other light conditions, such as high mid-day sun or the light haze often seen in this part of Nevada.

Current mining operations within the CGM Operations Area exhibit strong color contrast with the natural surroundings and moderate to strong line, landform, and surface texture contrast. The light tans and grays of the waste rock facilities and tailings stand out strongly from the natural background on the west face of Mount Tenabo. They produce slightly less contrast under overcast sky conditions when the light angle or intensity does not emphasize the color differences between exposed rock materials and natural vegetation. The pit benches and other major features are predominantly horizontal in character. The individual surfaces of the bench faces generally are smooth textured, although from a distance of 6,000 feet, the overall visual effect suggests a horizontal "corduroy" ribbed texture.

Structures in the visual analysis area are limited to historic and current mining structures; they are geometric in form and light gray to white in color. Road scars are prominent linear, man-made features in the vicinity.

3.15.2 Environmental Consequences

3.15.2.1 Proposed Action

Potential visual impacts associated with the proposed modifications in the CGM Operations Area were analyzed using the procedures outlined in the BLM Visual Contrast Rating Handbook H-8431-1 (BLM 1986). Potential visual impacts were determined by comparing visual contrast for the Proposed Action with the VRM class objectives for the locations of the proposed modifications, which would all be in designated Class IV areas. The process involved comparing the degree of visual contrast from the proposed modifications in the CGM Operations Area with the natural landscape character both during active mining and following the completion of final reclamation. The contrast rating process used the three KOPs shown in Figure 3.15-1 of the Cortez Hills Expansion Project Final EIS (BLM 2008a) as the viewpoints for conducting the visual impact analysis for this EA. KOP #1, located at the Dean Ranch Road intersection with SR 306, represents the view for travelers approaching from the north. KOP #2 at Rocky Pass on CR 225 represents the view for travelers approaching from Carico Lake Valley. KOP #3 is located on CR 222 approximately 1 mile southeast of the Lander-Eureka County line and represents the view for travelers approaching from Grass Valley or from Pine Valley to the east. Potential visual impacts associated with the proposed project modifications also have been evaluated from two sensitive, but lightly used, viewpoints: Shoshone Wells and the top of Mount Tenabo (Figure 3-15-1 of the Final EIS [BLM 2008a]).

Under the Proposed Action, visual modifications would include the proposed rangeland fence, ancillary water and electric facilities, and modifications to the NWRP with inclusion of a mill-grade ore stockpile. The fence would introduce a minor linear feature adjacent to existing CR 225; it would introduce minimal additional contrast in the context of the existing road as seen from KOPs #1 and #2. The fence would not

be visible from KOP #3 or from Shoshone Wells. It would be barely visible with the naked eye from the top of Mount Tenabo. The proposed ancillary facilities would be visible to motorists on SR 306 (KOP #1); however, they would be a minor visual feature against the large-scale existing backdrop of the Pipeline tailings facility. The ancillary facilities also would be visible from the top of Mount Tenabo; however, the additional visual contrast would be minimal in the context of previous visual modifications in the area. The ancillary facilities would not be visible from KOPs #2 or #3 or from Shoshone Wells because existing terrain or mine features would block the line of sight. Modifications to the NWRF (and inclusion of the new ore stockpile) would appear very small in the context of the existing and/or approved tailings and waste rock facilities. Although the modifications would be visible from KOP #1 and from the top of Mount Tenabo, and may be visible from Shoshone Wells, the casual observer would not be able to discern the visual changes the NWRF modifications would make from existing and previously approved facilities. The NWRF modifications would not be visible from KOPs #2 or #3.

All of the proposed visual changes are proposed within VRM Class IV areas, which permit major modifications. Since the proposed visual modifications would be minor, they would meet the standards of the VRM class guidelines.

3.15.2.2 No Action Alternative

Under the No Action Alternative, existing mining and processing operations and reclamation activities within the CGM Operations Area would continue under the terms of current permits and approvals as authorized by the BLM and State of Nevada. Proposed modifications as described for the Proposed Action would not be implemented, and associated impacts to visual resources would not occur.

3.15.3 Cumulative Effects

3.15.3.1 Proposed Action

Visual impacts associated with the Proposed Action are anticipated to be negligible and, therefore, would not contribute to cumulative visual impacts.

3.15.3.2 No Action Alternative

Under the No Action Alternative, cumulative impacts to visual resources would be the same as those identified in the Cortez Hills Expansion Project Final EIS (BLM 2008a).

3.15.4 Monitoring and Mitigation Measures

No monitoring or mitigation measures are required for visual resources.

3.15.5 Residual Adverse Effects

Residual visual effects would be limited to minor modifications associated with the NWRF, which would be minimized by final reclamation activities and would not be discernible from the visual effects that would occur under the No Action Alternative.

3.16 Noise

As discussed in the introduction to Chapter 3.0 and indicated in **Table 3-3**, the elements of the Proposed Action that potentially would result in new or extended noise impacts include: 1) newly proposed construction activities associated with installation of a rangeland fence along CR 225 and installation of new ancillary facilities (i.e., potable water well/pipeline and capacitor bank/transformer/power distribution line) (**Figure 2-2**); 2) increased loading operations and truck traffic levels associated with the proposed relocation of approximately 6 million additional tons of refractory ore (at a rate of approximately 800,000 tpy) from the Pipeline Complex ore stockpile to Goldstrike for processing; and 3) the associated 11-month extension of ore processing at Goldstrike.

The project study area for noise effects encompasses an area within a 10-mile buffer of the proposed new construction areas in the vicinity of the Pipeline Complex and an area within a 10-mile buffer of Goldstrike (as related to extended ore processing operations). It also includes a 2-mile-wide corridor centered on the ore transport route from the Pipeline Complex to Goldstrike. The cumulative effects study area (**Figure 3-3**) is the same as the project study area.

3.16.1 Affected Environment

The proposed project modifications within the CGM Operations Area would be located in a relatively remote area where existing development primarily consists of mining activities. There are four occupied ranches in the vicinity, including the Barrick-owned Wintle and Dean ranches, both in Crescent Valley on the northern edge of the CGM Operations Area; the privately owned Filippini Ranch, located approximately 1.0 mile to the west; and the Dann Ranch, located approximately 9.5 miles to the northeast. The community of Crescent Valley is approximately 7.5 miles north of the CGM Operations Area. Goldstrike is similarly located in a remote area dominated by existing mining operations on the Carlin Trend in northern Eureka County as shown in Figure 3.9-2 of the Cortez Hills Expansion Project Final EIS (BLM 2008a). Based on review of satellite imagery (Google 2013) and previous field reconnaissance of part of the area, no ranches or other potential noise-sensitive land uses have been identified within 10 miles of the site.

Natural sounds, including wind, insects, and birds, are the principal contributors to ambient noise in outlying portions of the project study area. Variations in wind speeds can have a dramatic effect on noise levels in the area. Ranching, dispersed recreation, and mining activities in the area generate occasional vehicular noise, although the traffic is light. The principal sources of noise in the vicinity of the mining activities are associated with heavy equipment noise and once daily blasting at the existing mine pits. Military aircraft flyovers, which occur several times a day, often at very low altitudes, produce noise at high levels relative to all other noise sources in the project vicinity. Mill operations at Goldstrike are one point source of noise contributing to the total ambient noise from the existing large-scale mining activity surrounding the mill.

Noise levels in the CGM Operations Area previously were determined from measurements taken at seven locations in the project vicinity for the Cortez Hills Expansion Project Final EIS (BLM 2008a). Noise levels generally were very low throughout the area. As would be expected in a rural area, levels were highest in high activity areas near the existing mine operations. Noise levels in the vicinity of the Goldstrike mill are assumed to be similar to those in the vicinity of milling operations within the CGM Operations Area, based on the similar types of activities.

Based on these earlier measurements, background noise is very low in outlying portions of the study area, ranging from 29.5 decibels, A-weighted (dBA) to 32.6 dBA, which is equivalent to a library reading room. Background levels in close proximity to existing mining activities were somewhat higher, ranging from 41.0 to 53.0 dBA, which would be similar to a quiet urban environment. Average equivalent continuous sound levels (L_{eq}) ranged from 37.3 to 45.6 dBA in outlying areas, influenced by low level aircraft flyovers. With flyovers deleted, the range dropped to 34.2 to 41.1 dBA. The measured L_{eq} for

areas closer to existing mining activities ranged from 48.1 to 57.3 dBA. Noise from blasting and from the warning sirens that precede it were audible above background noise, although, even at relatively close measurement locations, the measured maximum level was less than 70 dBA at the time of the measurements.

3.16.2 Environmental Consequences

3.16.2.1 Proposed Action

The Proposed Action would generate noise from operation of mechanical equipment associated with the proposed project modifications. Construction activities associated with the proposed project modifications near the Pipeline Complex are anticipated to employ drilling and trenching equipment for the well and pipeline, medium duty trucks for the electrical facility construction, and light to medium duty trucks for the fence construction. Transport of refractory ore to Goldstrike would employ 35-ton trucks. The proposed extension of milling operations at Goldstrike would be conducted as per current operations, utilizing existing equipment for an additional 11 months.

Noise emissions from the proposed ancillary facilities at the Pipeline Complex would be highest during construction. Noise from operation of the facilities would be minimal. Maximum noise levels from construction activities are estimated at approximately 89 dBA at a reference distance of 50 feet (USEPA 1971). The nearest noise-sensitive receptor to the ancillary facilities is the Barrick-owned Wintle Ranch, which is just over 2 miles away. At this distance, the highest noise level from construction of the ancillary facilities would be conservatively estimated at less than 43 dBA (USEPA 1971). Under most atmospheric conditions, this level of noise would be barely audible at the Wintle Ranch. Construction of the ancillary facilities would be short-term in nature, and maximum noise emissions would not occur consistently during construction.

The 35-ton trucks used to transport ore to Goldstrike would generate maximum noise levels of approximately 80 dBA at the 50-foot reference distance (USEPA 1971). The nearest residences along the transportation route to Goldstrike are in Crescent Valley, approximately 200 feet from the roadway. At 200 feet, maximum truck noise would be approximately 68 dBA (USEPA 1971). Because of the nature of truck activity, this level of noise would be experienced only for brief periods, and the 35-mile-per-hour speed limit through Crescent Valley suggests that most trucks would not be operating at maximum levels near the residences. Similar truck movements currently occur in this area; therefore, it is anticipated that the Proposed Action would result in a minor to moderate incremental increase in noise at residences along the route.

Project-related activities at Goldstrike would not change; therefore, noise levels would not be expected to change from current conditions. The Proposed Action would extend the current mill operations and associated noise levels for an additional 11 months. However, there are no noise-sensitive receptors near Goldstrike.

3.16.2.2 No Action Alternative

Under the No Action Alternative, existing mining and processing operations and reclamation activities within the CGM Operations Area would continue under the terms of current permits and approvals as authorized by the BLM and State of Nevada, and there would be no temporal increase in operations at Goldstrike. Proposed modifications as described for the Proposed Action would not be implemented; therefore, noise emissions and noise levels at sensitive receptors would not change from current conditions.

3.16.3 Cumulative Effects

3.16.3.1 Proposed Action

Noise impacts associated with the Proposed Action are anticipated to be negligible and, therefore, would not be anticipated to contribute to cumulative noise impacts.

3.16.3.2 No Action Alternative

Under the No Action Alternative, cumulative impacts to noise resources would be the same as those identified in the Cortez Hills Expansion Project Final EIS (BLM 2008a). In addition, there would be no temporal extension of milling operations at Goldstrike or associated noise impacts.

3.16.4 Monitoring and Mitigation Measures

No monitoring or mitigation measures are required for noise.

3.16.5 Residual Adverse Effects

Upon completion and reclamation of project-related activities, project-related noise emissions would cease; therefore, there would be no residual adverse noise effects.

3.17 Hazardous Materials and Solid Waste

As discussed in the introduction of Chapter 3.0 and indicated in **Table 3-3**, the elements of the Proposed Action that potentially would result in new or additional hazardous materials and solid waste impacts include: 1) newly proposed construction activities associated with installation of a rangeland fence along CR 225 and installation of new ancillary facilities (i.e., potable water well/pipeline and capacitor bank/transformer/power distribution line) (**Figure 2-2**); 2) increased loading operations and truck transport associated with the proposed relocation of approximately 6 million additional tons of refractory ore (at a rate approximately 800,000 tpy) from the Pipeline Complex ore stockpile to Goldstrike for processing; and 3) the associated 11-month extension of ore processing at Goldstrike.

The project study area for direct, indirect, and cumulative impacts for hazardous materials and solid waste encompasses the proposed new construction activities and increased ore loading operations within the CGM Operations Area; the main transportation routes to the site, including SR 306 to I-80 and the access roads to the mine facilities from SR 306 as shown in Figure 3.1-10 of the Cortez Hills Expansion Project Final EIS (BLM 2008a); and the operations at Goldstrike (related to the proposed extended period of ore processing).

3.17.1 Affected Environment

The affected environment for hazardous materials includes air, water, soil, and biological resources that potentially could be affected by an accidental release of hazardous materials during transportation to and from the mine, during storage and use at the Pipeline Complex, or during the extended transport, storage, and use for extended refractory ore processing operations at Goldstrike.

The proposed construction and maintenance activities and the proposed processing of additional refractory ore from the CGM Operations Area at Goldstrike would require the use of the following materials classified as hazardous. These materials currently are, and would continue to be, used at both sites in accordance with their respective spill prevention and response plans.

- Diesel fuel, gasoline, oils, greases, anti-freeze, and solvents used for equipment operation and maintenance; and
- Sodium cyanide, sodium hydroxide, acid, flocculants, lime, and antiscalants used in mineral extraction processes (at Goldstrike) (BLM 2008d).

The regulatory framework for hazardous materials and solid waste are described in the Cortez Hills Expansion Project Final EIS (BLM 2008a) and the Betze Pit Expansion Project Draft Supplemental EIS (BLM 2008d).

3.17.2 Environmental Consequences

3.17.2.1 Proposed Action

As discussed in Section 2.2, under the Proposed Action there would be no change in the current fuel, lubricant, or reagent consumption rates at the CGM Operations Area. Also as discussed in Section 2.2, there would be no change in the type or annual consumption rates of reagents, fuels, or lubricants at Goldstrike; however, there would be an increase in the period of use for the proposed extended processing period. It is anticipated that the proposed additional 11 months of ore processing would not meaningfully increase the risk of a release of diesel fuel or other chemicals used in processing at Goldstrike.

Existing spill prevention and response plans for the CGM Operations Area and Goldstrike would remain in effect, minimizing the potential for a spill and the associated environmental impacts in the event of a spill.

As with existing operations, non-hazardous solid waste would continue to be disposed of in the currently authorized Class III landfills.

3.17.2.2 No Action Alternative

Under the No Action Alternative, existing mining and processing operations and reclamation activities within the CGM Operations Area would continue under the terms of current permits and approvals as authorized by the BLM and State of Nevada, and there would be no temporal increase in operations at Goldstrike. Proposed modifications as described for the Proposed Action would not be implemented and associated potential impacts relative to hazardous materials transportation, use, and storage would not occur.

3.17.3 Cumulative Effects

3.17.3.1 Proposed Action

Past and present actions and RFFAs are described in Section 2.4 of this EA. Under the Proposed Action, there would be no increase in the current fuel, lubricant, or reagent consumption rates and, therefore, no contribution to the amount of hazardous materials being transported and used within the cumulative effects study area. There would, however, be a temporal contribution to cumulative effects, with an associated small increase in the probability of a spill or release of hazardous materials during the 11 months of proposed additional refractory ore shipping and processing.

3.17.3.2 No Action Alternative

Under the No Action Alternative, cumulative hazardous materials-related impacts would be the same as those identified in the Cortez Hills Expansion Project Final EIS (BLM 2008a).

3.17.4 Monitoring and Mitigation Measures

Because of the existing legal framework (and associated requirements) that regulates the transportation, storage, and use of hazardous materials and disposal of solid waste, no additional monitoring or mitigation measures are required.

3.17.5 Residual Adverse Effects

Residual adverse effects from the use of hazardous materials under the Proposed Action would depend on the substance, quantity, timing, location, and response involved in the event of an accidental spill or release. Operation in accordance with the facilities' Hazardous Materials Spill and Emergency Response Plans, and prompt cleanup of potential spills and releases, would minimize the potential for residual adverse effects.

4.0 Public Coordination

4.1 Agencies Contacted

The agencies contacted during preparation of the Cortez Hills Expansion Project Final EIS (BLM 2008a), from which this EA tiers, are identified in Chapter 4.0 of the Cortez Hills Expansion Project Final EIS (BLM 2008a). Additional contact was made with NDOT and NDOW during preparation of this EA. Information also was obtained from agency websites (e.g., USFWS species list) during preparation of this EA, as documented in Chapter 6.0, References.

4.2 Native American Consultation (from Chapter 3.0)

In compliance with federal mandates, the BLM initiated government-to-government consultation for the Proposed Action on October 4, 2012, by sending letters to the following tribal groups: Te-Moak Tribe of the Western Shoshone, Elko Band, Battle Mountain Band, Duckwater Shoshone Tribe of the Duckwater Reservation, and Yomba Shoshone Tribe. The letters were sent to inform the various tribes and bands of the proposed undertaking and to solicit their concerns regarding the possible presence of properties of traditional religious and cultural importance to the tribes in the project study area. A map of the proposed modifications was attached to the letters.

5.0 List of Preparers/Reviewers

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Bernhard Strom (Planera) Land Use and Access, Recreation and Wilderness, Social and Economic Values, Environmental Justice, Visual Resources, Noise

William Berg Hazardous Materials and Solid Waste

5.3 Barrick Cortez Inc.

Kimberly Wolf, Regional Permitting Specialist

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