

## 5 CUMULATIVE IMPACTS

For the purposes of this SEIS, the cumulative impacts are the sum of all past, present (including proposed actions), and RFFAs resulting primarily from mining, commercial activities, and public uses. The purpose of the cumulative analysis in the SEIS is to evaluate the significance of the Proposed Action's contributions to cumulative impacts. A cumulative impact is defined under federal regulations as follows:

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

As required under the NEPA and the regulations implementing NEPA, this chapter addresses those cumulative effects on the environmental resources in the Cumulative Effects Study Areas (CESAs) which could result from the implementation of the Proposed Action and reasonable alternatives; past actions; present actions; and RFFAs. The extent of the CESA will vary with each resource, based on the geographic or biologic limits of that resource. As a result, the list of projects considered under the cumulative analysis may vary according to the resource being considered. In addition, the length of time for cumulative effects analysis will vary according to the duration of impacts from the Proposed Action on the particular resource.

For the purposes of this analysis and under federal regulations, 'impacts' and 'effects' are assumed to have the same meaning and are interchangeable. The cumulative impacts analysis was accomplished through the following three steps:

- Step 1: Identify, describe and map CESAs for each resource to be evaluated in this chapter;
- Step 2: Define timeframes, scenarios, and acreage estimates for cumulative impact analysis. Past and present disturbances and activities include commercial/public and mining operations with disturbed areas not reclaimed or unsatisfactorily reclaimed. Future scenarios address reasonably foreseeable commercial/public and mining operations identified in Notices, Plans of Operations, or best judgement based on recent mineral exploration history; and
- Step 3: Identify and quantify the location of possible specific impacts from the Proposed Action and judge the significance of these contributions to the overall impacts.

Information utilized in the cumulative impacts assessment was gathered from these sources: the BLM, the State of Nevada, local jurisdictions, private land owners, and mining companies. The past actions, present actions, and RFFAs have been updated from those identified in the South Pipeline Final EIS (BLM 2000a) analysis and are current as of August 15, 2003. Changes in actions after this date are not considered in this analysis.

## **5.1 Introduction**

Environmental consequences of the Proposed Action and the reasonable alternatives were evaluated in Chapter 4 for the various environmental resources. Based upon the analysis of the environmental resources as conducted in Chapter 4, the following resources could be impacted by the Proposed Action and reasonable alternatives: geology and minerals, water resources, air resources, visual resources, auditory resources, energy, socioeconomic values, and environmental justice. The above resources are considered to have the potential to be cumulatively impacted by actions within the identified CESA for that resource. Vegetation, wildlife and fisheries, soils and watershed, range, noxious weeds, cultural resources, ethnography, and paleontology are not considered to have the potential to be cumulatively impacted because there is no additional surface disturbance beyond that approved in the South Pipeline Final EIS (BLM 2000a) and subsequent approvals outlined in Table 2.1.1.

The geographical areas considered for the analysis of cumulative effects are essentially the same as the CESAs utilized in the South Pipeline Final EIS (BLM 2000a). See Figure 5.1.1 of the South Pipeline Project Final EIS (BLM 2000a, page 5-3) for the locations of the CESAs for each impacted resource. The locations vary in size and shape to reflect each evaluated environmental resource. For this cumulative impact analysis, geology and minerals, energy, visual resources, auditory resources, and environmental justice have a CESA that is generally bounded by the Cortez Mountains to the east; the town of Crescent Valley to the north; the Shoshone Range to the west; and the Toiyabe Range to the south. The area is approximately 371,200 acres in size.

The CESA for water resources and wildlife resources includes the Project Area, as well as a larger area including the Crescent Valley Hydrographic Basin (No. 54) and is referenced and identified in Section 4.3.2. The CESA for air resources includes the Project Area, as well as a larger area including the CVAQMA. This is also the area defined as the Crescent Valley Hydrographic Basin (No. 54). The area is approximately 471,098 acres in size.

The CESA boundary for socioeconomic includes Battle Mountain in Lander County, Beowawe and Crescent Valley in Eureka County, and Carlin and Elko in Elko County. Figure 1.1.1 shows the location of these communities and counties relative to the Project Area.

The cumulative impacts analysis for this SEIS uses a timeframe based on the estimated potential future duration of the impacts from the Proposed Action. Based on a Proposed Action approval in 2004, the timeframes over which the cumulative analysis was completed are as follows:

- Geology and minerals, auditory resources, socioeconomic values, and environmental justice - length of the mining and initial reclamation portions of the Project (through 2015);
- Water resources - timeframe for the maximum extent of drawdown (through 2025); and
- Air resources, energy and visual resources - length of the Project, including reclamation (through 2020).

The types of Project-specific impacts to the resources evaluated in Chapter 4 may also occur as a result of the past actions, other present actions, and RFFAs. The potential cumulative effects from the past actions, present actions, and RFFAs are discussed in Section 5.5. The individual projects described in Sections 5.2, 5.3, and 5.4 comprise the past and present actions, including the Proposed Actions, and RFFAs identified by the BLM's Battle Mountain and Elko Field Offices. The projects and uses include mining, commercial activities, and public uses. All of the projects and uses have the potential to impact the environmental resources of concern within the various CESAs. Table 5.1.1 outlines all the actions considered in the cumulative impacts analysis, their status, potential environmental impacts, and the area of the potential impact. Table 5.1.2 outlines the acres of surface disturbance associated with each of the actions considered in this cumulative impact analysis.

## **5.2 Past Actions**

The past actions have been associated primarily with livestock grazing, agricultural development, and mining. All portions of the CESAs have been utilized for livestock grazing. Agricultural development has altered the soils and vegetation. Native plant communities have been altered by grazing, rangeland fires, and the introduction of nonnative plants. In addition, small areas have been disturbed to accommodate water storage facilities and fencing.

### **5.2.1 Mining and Exploration-Related Actions**

Pre-1950 mining actions were generally small operations associated with the mining of vein-type deposits. The exception is Gold Acres, which was one of the first large-scale gold mining operations that used leaching to retrieve gold from low-grade ore. Mining activities since the 1980s have been larger scale gold and silver mining operations. All past mining and exploration related actions are described in the South Pipeline Final EIS (BLM 2000a, pages 5-5 through 5-11). Estimated disturbance acreage for the actions is shown in Table 5.1.2.

### **5.2.2 Utilities and Community Actions**

Past utility and community actions include the development of roads and powerlines. Roads have been developed by the State of Nevada (Highway 306), Lander and Eureka Counties, and the BLM. The communities of Crescent Valley and Beowawe are located within Crescent Valley. Individual ranches comprise the remainder of the inhabited areas in the valley. These past actions are further discussed under present utilities and community actions.

### **5.2.3 Other Development/Use Actions**

#### **5.2.3.1 Recreation Actions**

Past recreational activities are primarily oriented toward natural resource utilization. Activities included off-highway vehicle (OHV) use and hunting. Highway 306, Lander County Road 225, and BLM roads provide access for a variety of recreational activities, including small and big game hunting, OHV touring, and dispersed camping. Surface disturbance has occurred as a result of past recreation activities; however, the acreage for this disturbance has not been quantified and is likely minimal.

**Table 5.1.1: Summary of Activities That May Cumulatively Affect Resources**

PROJECT DESCRIPTIONS	STATUS	ANTICIPATED ENVIRONMENTAL ISSUES THAT COULD BE CUMULATIVE	PRIMARY/ SECONDARY IMPACT LOCATION
<b>MINING</b>			
Clipper	PS	3,4	S/C
Cortez Mine Area	PT	1,3,4,5,6,7,8,9,10	S/C
Cortez Silver Mining District	PS	3,4	S/C
Elder Creek	PS	3,4	S/C
Fox Mine	PS	3,4	S/C
Grey Eagle	PS	3,4	S/C
Gold Acres	PT	1,3,4,5,6,7,8,9,10	S/C
Hilltop	PS,PT	3,4	S
Hot Springs Sulfur Mine	PS	3,4	S/C
Mill Canyon	PS,PT	3,4	S/C
Mud Spring Gulch	PS	3,4	S/C
Pipeline/South Pipeline Project	PT,RF	1,2,3,4,5,6,7,8,9,10	C/E
Robertson	PT	1,3,4,6	S/C
Satellite Mine	RF	1,2,3,4,5,6,7,8,9,10	S/C
Pediment / Cortez Hills	PT,RF	1,2,3,4,5,6,7,8,9,10	S/E
Uhalde Placer	PT	1,2,3,4,5,6,7,8,9,10	S/C
Utah Mine & Camp	PS	3,4	S/C
<b>EXPLORATION</b>			
Notices (97) (BLM-BM)	PT	3,4,5	S/C
Plans (7) (BLM-BM)	PT	3,4,5	S/C
Notices (10) (BLM-E)	PT	3,4,5	S/C
Santa Fe Mill Canyon	PT	3,4,5,6	S/C
Cortez Underground Project	PT,RF	1,2	S/C
CGM HCCUEP	PT	3,4,5	S/C
CGM HCCUEP Amendment #1	PT	3,4,5	S/C
CGM West Pine Valley	PT	3,4,5	S
CGM West Side	PT	3,4,5	S
<b>UTILITIES/COMMUNITY</b>			
State Route 306	PT	3,4,5,6	S/C
Gravel Roads	PT	3,4,5,6	S/C
Dirt Roads	PT	3,4,5,6	S/C
Powerlines	PT	4,9	S/C
Wind Power Generation Projects	RF	4,5,6,7,8,9,10	S/C
Geothermal Power Plant	RF	3,4,6,8, 9,10	S/C
Towns of Crescent Valley and Beowawe	PT,RF	2,3,4,5,6,7,8,9,10	S/C
Yucca Mountain Supply Train	PT	3,4,5,6,8,9,10	S/C

PROJECT DESCRIPTIONS	STATUS	ANTICIPATED ENVIRONMENTAL ISSUES THAT COULD BE CUMULATIVE	PRIMARY/SECONDARY IMPACT LOCATION
<b>OTHER DEVELOPMENT/USES</b>			
Recreation	PT	4,5,6	S/C
Livestock	PS,PT	2,4,5,6,7,8,10	S/C
Wildlife	PT	2,4,5,10	S/C
Agriculture Development	PS,PT	2,4,6,7,8,10	S/C
BLM Land Sales	RF	6,7,8	S/C
Crescent Valley Water Supply	PT,RF	2	C
Source of Information BLM-B: BLM Battle Mountain Office BLM-E: BLM Elko Office CGM: Cortez Gold Mines DOE: Department of Energy	Status PS - Past PT - Present & Proposed RF - Reasonably Foreseeable	Issues 1 Geology & Minerals 2 Water 3 Air 4 Visual 5 Auditory 6 Land Use, Access & Public Safety 7 Socioeconomics 8 Environmental Justice 9 Energy 10 - Wildlife	Location: P - Project Area C - Crescent Valley S - Southern Crescent Valley E - Eureka & Elko Counties

**Table 5.1.2: Surface Disturbance Associated with Projects within the Cumulative Effects Study Area**

PROJECT	PAST (ACRES)	PRESENT/PROPOSED (ACRES)	RFFA (ACRES)	TOTAL (ACRES)
<b>MINING</b>				
Clipper	400	0	0	400
Cortez Mine Area <sup>a</sup>	0	1,662	0	1,662
Cortez Silver Mining District	92	0	0	92
Elder Creek	0	150	0	150
Fox Mine	4	0	0	4
Grey Eagle	5	0	0	5
Gold Acres	0	881	50	931
Hilltop	92	0	0	92
Hot Springs Sulfur Mine	5	0	0	5
Mill Canyon	18	0	0	18
Mud Spring Gulch	10	0	0	10
Pipeline/South Pipeline Project	0	7,616	2,000	9,616
Robertson	285	0	0	285
Satellite Mine	0	0	1,500	1,500
Pediment / Cortez Hills	0	1,766	500	2,266
Uhalde Placer	100	0	0	100
Utah Mine & Camp	6	0	0	6
<b>Subtotal</b>	<b>1,017</b>	<b>12,075</b>	<b>4,050</b>	<b>17,142</b>

PROJECT	PAST (ACRES)	PRESENT/ PROPOSED (ACRES)	RFFA (ACRES)	TOTAL (ACRES)
<b>EXPLORATION</b>				
Notices (97) BLM-BM	0	485	0	485
Plans (7) BLM-BM	0	306	0	306
Notices (10) BLM-E	0	50	0	50
Santa Fe Mill Canyon	0	250	0	250
Cortez Mine Area Exploration	0	62	0	62
Cortez Underground Project	0	0	0	0
CGM HCCUEP	0	50	0	50
CGM HCCUEP Amendment #1	0	200	0	200
CGM West Pine Valley	0	150	0	150
CGM West Side	0	200	0	200
<b>Subtotal</b>	<b>0</b>	<b>1,753</b>	<b>0</b>	<b>1,753</b>
<b>UTILITIES/COMMUNITY</b>				
State Route 306 (100 feet wide)	0	327	0	327
Gravel Roads (50 feet wide)	0	1,370	0	1,370
Dirt Roads (30 feet wide)	0	644	64	708
Powerlines (60 feet wide)	0	364	0	364
Wind Power Generation Projects	0	0	640	640
Geothermal Power Plant	0	0	20	20
Towns of Crescent Valley and Beowawe <sup>e</sup>	0	900	0	900
Yucca Mountain Supply Train (150 feet wide)	0	0	618	618
	0	3,605	1,342	4,947
<b>OTHER DEVELOPMENT</b>				
Recreation <sup>b</sup>	0	0	0	0
Livestock <sup>c</sup>	0	10	4,313	4,323
Wildlife	0	0	0	0
Agriculture Development <sup>d</sup>	0	7,950	1,800	9,750
BLM Land Sales	0	0	0	0
Crescent Valley Water Supply	0	2	0	2
<b>Subtotal</b>	<b>0</b>	<b>7,962</b>	<b>6,113</b>	<b>14,075</b>
<b>TOTAL</b>	<b>1,017</b>	<b>25,395</b>	<b>11,505</b>	<b>37,917</b>

- a These 62 acres for exploration in the Cortez Mine area and was previous approved in the many Notices and Plans of Operations for the Cortez Mine area. The 62 acres has been subtracted from the 1,722 acres for the Cortez Mine area mining operations
- b Surface disturbance associated with recreation activities has occurred; however, the acreages have not been quantified.
- c 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 from the seeding activities (change in vegetation and habitat), 0.5 acre per water development activity, and 43 acres for fencing and cattle guards.
- d Surface disturbance associated with agriculture development is based on the acreage under irrigation and assumes that a change in vegetation and habitat equates to surface disturbance. Acreage values were obtained from 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.
- e Surface disturbance associated with the Crescent Valley and Beowawe is assumed to be 640 acres and 160 acres respectively.

### 5.2.3.2 Livestock Actions

Past livestock actions are incorporated with the discussion under present livestock actions.

### 5.2.3.3 Wildlife Actions

Past wildlife management actions have focused on the enumeration of wildlife game species and the management of these species for harvest.

### 5.2.3.4 Water Supply Actions

Past water supply actions are minimal and those of any relevance are incorporated into the present actions.

### 5.2.3.5 Agricultural Actions

Past agricultural actions have been incorporated into the present agricultural actions.

All of the past actions result in approximately 1,017 acres of surface disturbance within the CESAs. Water use for the cumulative assessment is discussed in Section 5.5.3.

## 5.3 Present Actions, Including Proposed Actions

### 5.3.1 **Mining Related Actions**

Present mining related actions include the Proposed Action, the proposed Pediment Project, the Cortez Mine, the Gold Acres Mine, the Cortez Underground Exploration Project, and various other existing and proposed exploration projects. Except for the Proposed Action, the proposed Pediment Project, and the proposed exploration projects, all present mining and exploration related actions are described in the South Pipeline Final EIS (BLM 2000a, pages 5-5 through 5-11). Estimated disturbance acreages for the actions are shown in Table 5.1.2. Any modification to the projects outlined in the South Pipeline Final EIS or new projects are discussed below.

As outlined in Chapter 3, the Proposed Action would not result in any new surface disturbance (Table 3.1.1). In addition, current CGM water uses are discussed in Section 2.6.4. According to CGM's Pediment Plan (CGM 2001c), the proposed surface disturbance would occur within a Project Area of approximately 3,172 acres. The Pediment Project would result in approximately 1,766 acres of disturbance and include the following components:

- Development of one new open pit and associated facilities to mine a total of approximately 90,000,000 tons of leach grade (with a minor portion of mill grade) ore and waste rock;
- Utilization of three waste rock dumps for the storage of 390 million tons of waste rock;
- Haulage of ore to, and processing at, the new heap leach facility and the existing Pipeline and Cortez crushing and mill facilities;

- Construction of topsoil stockpiles, drainage diversions and sediment ponds, and other associated facilities;
- Construction of ground water extraction wells and water disposal facilities; and
- Water use at an anticipated rate of 1,500 gpm, with approximately 500 gpm provided through open pit dewatering.

The surface ownership includes primarily public lands administered by the BLM and a minor portion of private lands controlled by CGM. CGM controls mining claims on the public land portion of the Project Area. The Pediment Project is located approximately five miles southeast of the Project Area in Lander County, Nevada. Conventional open pit mining methods, including drilling, blasting, loading, and hauling, would be utilized to mine the Pediment deposit.

CGM has four present and proposed exploration projects near the southern end of Crescent Valley: Cortez Underground Exploration Project, West Pine Valley Exploration Project, HCCUEP, and the West Side Exploration Project. The Cortez Underground Exploration Project is the development of two portals at the existing Cortez Mine to further define the deep mineralization associated with the Cortez Hills discovery. Rock that is extracted from the development of the underground workings would be placed either on the existing Cortez waste rock dumps or in the existing Cortez open pits. Ground water encountered during the project would be piped to the Pipeline Mill for use as process water. Minimal surface disturbance would be associated with this project. The West Pine Valley Exploration Project proposes up to 150 acres of surface disturbance associated with exploration activities in the southern Cortez Range southeast of the Project Area. The HCCUEP proposes up to 250 acres of surface disturbance associated with exploration activities in the area between the historic town of Cortez and the CGM Cortez facilities. Exploration associated with HCCUEP will also utilize additional surface disturbance acreage associated with previous approved activities in the vicinity of the planned exploration. The West Side Exploration Project proposes up to 200 acres of surface disturbance associated with exploration activities in the Shoshone Range to the northwest of the Project Area.

Under the present actions for mining related actions, there are 13,828 acres of surface disturbance.

### **5.3.2 Utilities and Community Actions**

Present utility and community actions include the development of roads, powerlines, and towns. Roads have been developed by the State of Nevada (SR 306), Lander and Eureka Counties, and the BLM. In addition, the communities of Crescent Valley and Beowawe have developed within Crescent Valley.

Three general types of roads have been developed in Crescent Valley: paved roads, gravel surface roads, and dirt roads. Approximately 27 miles (327 acres) of roads are paved, including SR 306 and a few roads in the communities of Crescent Valley and Beowawe. Gravel roads are located throughout Crescent Valley and total approximately 226 miles (1,370 acres). Approximately 177 miles (644 acres) of dirt roads are located throughout Crescent Valley. The gravel and dirt roads are

based on the Lander and Eureka County road maps and do not include any dirt roads on public lands that are not inventoried by the counties.

Two transmission powerlines are located in Crescent Valley, distributing power from the main transmission lines north of Crescent Valley south to CGM's operations and to users in the southern portion of the valley. There are approximately 50 miles (364 acres) of transmission lines in the valley. In addition, numerous lower voltage distribution lines provide power to two communities, the ranches, and the commercial activities located throughout the valley. These lower voltage lines have not been specifically inventoried.

The towns of Crescent Valley and Beowawe are located in the central and northern portions of the valley respectively, and total an estimated 900 acres. These towns consist of roads, residences, commercial and public buildings, powerlines, fences, and other related development.

Under the present actions for utility and community actions there are 3,605 acres of surface disturbance.

### **5.3.3 Other Development/Use Actions**

No recreational improvements have been constructed or are proposed within the CESAs. Dispersed recreational activities have not required major improvements for recreational purposes. No new land use plan objectives have been proposed in the CESA, other than those previously identified and approved in the Shoshone-Eureka and Elko Rangeland Program Summaries (RPSs).

No new wildlife management objectives have been proposed within the CESAs other than those previously identified and approved in the Shoshone-Eureka and Elko RPSs

#### **5.3.3.1 Recreation Actions**

Present recreational activities are primarily oriented toward the observation and enjoyment of the area's scenery, and natural and historic resources. Activities include off-highway vehicle (OHV) use, hiking, birdwatching, and hunting. Highway 306 and Lander County Road 225 provide access for a variety of recreational activities, including small and big game hunting, OHV touring, and dispersed camping. These activities have not required major improvements for recreational purposes, as existing roads and trails are the primary facilities associated with these activities. Improved facilities, even relatively primitive campgrounds, are rare in the CESA. Surface disturbance has occurred as a result of recreation activities, and is either accounted for under other categories, or the disturbance has not been quantified.

#### **5.3.3.2 Livestock Actions**

Existing livestock water use includes 20 water rights at a projected total rate of 538 acre-feet per year. Surface disturbance associated with the livestock water use is assumed to be approximately 14 acres. In addition, a substantial amount of four-strand (three barbed and one smooth wire on the bottom) wire fencing has been constructed within the CESA. Surface disturbance has occurred as a result of present livestock use; however, the acreage for this disturbance has not been quantified and is likely minimal.

### 5.3.3.3 Wildlife Actions

BLM wildlife management objectives in the Carico Lake Allotment are specifically defined in the Shoshone-Eureka and the Elko RPSs. Within the CESA, a short-term goal is to improve 28,658 acres of big game habitat to good condition and 914 acres to excellent condition. Another short-term goal is to stop the downward trend on 33,228 acres and manage for upward trends on 32,064 acres. An overall objective is to manage rangeland habitats to maintain or enhance sage grouse leks and nesting areas.

NDOW plans to construct big game guzzlers for antelope north and west of the Project Area. Specific locations have not yet been identified, but they will most likely be outside of the CESAs (Personal Communication, Rory Lamp, Biologist, Nevada Division of Wildlife, May 21, 2002).

### 5.3.3.4 Water Supply Actions

Water for the town of Crescent Valley is currently supplied by one main well and one backup well. Water is stored in two tanks with capacities of 150,000 and 200,000 gallons. Surface disturbance associated with these activities is assumed to be approximately two acres.

### 5.3.3.5 Agricultural Actions

Existing agricultural development that has been identified as of August 31, 2003 consists of 6,700 acres under irrigation. All the past and present actions have resulted in approximately 7,950 acres of surface disturbance within the CESAs. Water use for the cumulative assessment is discussed in Section 5.5.3. Water from the dewatering operations is conveyed by means of a gravity-feed ditch/canal system to areas within Crescent Valley and used for agricultural irrigation. Disturbance associated with this activity is approximately 375 acres.

Under the present actions for other development/use actions, there are 7,962 acres of surface disturbance. All of the present and proposed actions result in approximately 25,395 acres of surface disturbance within the CESAs. Water use for the cumulative assessment is discussed in Section 5.5.3.

## **5.4 Reasonably Foreseeable Future Actions**

### **5.4.1 Mining Related Actions**

The South Pipeline Final EIS (BLM 2000a, pages 5-12 through 5-15) evaluated mining-related RFFAs. Refer to the South Pipeline Final EIS for discussions on the Pipeline/South Pipeline, Cortez and Gold Acres Mine Areas (BLM 2000a, page 2-12). Additional adjacent mineralization, future dewatering operations, refractory ore processing, and CGM exploration are also described in the South Pipeline Final EIS (BLM 2000a, pages 5-12 through 5-15). In addition, the following are mining related RFFAs that are added to those discussed in the South Pipeline Final EIS.

Subsequent to CGM's proposal for the Pediment Project, additional mineral resources have been identified between the Pediment Project and the Cortez Mine in an area called Cortez Hills. CGM

has informed the BLM in writing that the Pediment Project application will be revised. Cortez Hills would likely be developed as part of the Pediment Project. However, the mineralization at Cortez Hills is higher grade and would likely need to be processed through a mill rather than a heap leach system. The processing of the ore would be either at a new mill, the existing Cortez Mill, or the existing Pipeline Mill. A reasonable expectation is that the Pediment Project would expand by 1,600 acres to accommodate the development of the mineral resources at Cortez Hills (Pediment/Cortez Hills Project).

The proposed Cortez Underground Exploration Project could reasonably be used for future development and mining of underground resources associated with the Cortez Hills deposit that would not be developed by the Cortez Hills open pit. It is reasonable to assume that the ore from the underground operation would be transported to the Cortez Mill or the Pipeline Mill for processing. The presences of these underground operations also provides a potential opportunity to conduct a portion of all of the necessary dewatering activities for the Pediment/Cortez Hills Project through the underground workings rather than through the use of traditional dewatering wells. The water would likely be either used as process water or infiltrated through the existing infiltration system. Surface disturbance associated with these activities would likely be within the approved disturbance area for the Cortez Mine.

Depending on the results of the ongoing research, CGM may construct a facility for the processing of refractory ores with alternative heap solutions. A facility of up to 100 acres would be constructed on permitted disturbance (such as a waste rock dump or completed portion of a heap leach pad), and would likely consist of a large on-off pad system where ore would be crushed, loaded by conveyor or truck onto a pad system, leached, and subsequently off loaded by loader and truck. The process may utilize ammonium thiosulfate, bioleach, or other technologically cost effective techniques for extracting gold from refractory ore.

A potential Satellite Mine consists of one or more open pits and associated waste rock dumps from which ore is mined and then transported for processing to a previously approved existing process facility. This hypothetical Satellite Mine is assumed to be located approximately 1.5 miles north-northwest of the Pipeline mill facility at an elevation of approximately 5,500 feet. The ore would be hauled to the Pipeline mill or to the SAHL. New heap leach pads and a processing facility could be constructed near the mine area to reduce hauling costs. The roads would be designed for the existing mining fleet. The waste rock would be hauled to waste rock dumps located south and southwest of the potential Satellite Mine open pit. The waste rock, as with the ore, is oxidized and would therefore not be a potential source of ARD. The waste rock dumps would be constructed in a manner so that they could be reshaped and reclaimed to blend with the present topography.

Total additional disturbance associated with the assumed Satellite Mine would be approximately 1,500 acres. It would consist of one open pit, haul roads, two waste rock dumps, and a possible new heap leach facility. Existing ancillary facilities such as the explosives magazine, truck shops, offices, etc., located at the Project Area would be utilized for these mining operations.

The anticipated life of the Satellite Mine Project would be six years, and this project would be mined concurrently with and following the Project open pit. The Satellite Mine would add approximately three additional years of operation to the Project. Reclamation of the Satellite Mine components

would be partially completed during mining, but final reclamation would take a minimum of three years after completion of the open pit.

At the Pipeline/South Pipeline Project, additional management activities for the dewatering water may be necessary during certain years of the planned dewatering schedule. It is reasonable to expect that the additional management activities would include the need to consumptively use an additional 2,000 gpm (3,220 acre-feet per year) through irrigation or other activities. This would result in a total of up to 12,000 gpm (19,320 acre-feet per year) of water being consumptively used during certain years of the Project life.

Continuing geologic exploration to the west of the Pipeline/South Pipeline open pit (Stages 8 and 9) indicates that mineralization may extend beyond the currently proposed open pit. Additional geologic work and drilling may prove the existence of economic mineralization, which would require an expansion of the Gap and Pipeline/South Pipeline open pits in order to mine the additional ore resource.

A future expansion of the open pits in this area would not likely impact the currently planned dewatering schedule nor impact ground water or pit lake water quality. The future expansion would occur within the permitted disturbance for the Project and would require removal of a portion or all of the 5.4 million ton Gold Acres Heap Leach Facility. This partially leached material would be hauled to the SAHL Facility for further processing.

Under the RFFAs for mining related actions, there are 4,050 acres of surface disturbance.

#### **5.4.2 Utilities and Community Actions**

Development of additional roads is reasonable to anticipate; however, these roads are likely to be dirt roads created by recreational use of the public lands in Crescent Valley. A ten percent increase in the amount of dirt roads is estimated. The towns of Crescent Valley and Beowawe are not expected to expand beyond their area limits; however, additional development within those identified areas can reasonably be expected. Need for new transmission lines within Crescent Valley is not anticipated; however, it is reasonable to expect that additional distribution lines would be constructed.

The U.S. Department of Energy (DOE) has proposed the development of a geologic repository for the disposal of spent nuclear fuel and high-level radioactive waste at Yucca Mountain in Nye County, Nevada (Yucca Mountain). The DOE has analyzed the potential impacts of Yucca Mountain, including the transportation of the materials (DOE 2002). Transportation of the materials would be by road and rail from across the United States to and through Nevada. Transportation by rail through Nevada would be via one of five alternative routes (DOE 2002; pages 2-51 through 2-54). One of these routes is through Crescent Valley and the Project Area (DOE 2002; figure 2-25). This proposed potential route through the CESA has been included under the RFFA discussion because the DOE has not identified any of the five routes through Nevada as the proposed route. The DOE proposes that construction would begin in 2005 with transportation of materials to Yucca Mountain beginning in 2010. If the rail route through Nevada were constructed through Crescent Valley, the DOE would likely commence construction in 2006 or 2007. This route would be

approximately 34 miles long and 150 feet wide (618 acres). Approximately five trains per week would utilize the route.

Wind power generation projects are a type of use that is an RFFA. A wind monitoring tower is approved by the BLM for placement on the waste rock dump at the Project. This type of project could be developed in Crescent Valley or on the mountain ranges on either side of the valley. Wind power generation projects generally require the installation of a number of wind turbines mounted on towers that are 100 to 300 feet tall. The turbines are connected to the utility grid with transmission lines that are generally above ground. In addition, a network of roads is necessary for construction and maintenance of the turbines. The land around the turbines is generally fenced to limit public access and use, primarily for safety reasons. An area of up to a mile square (640 acres) may be fenced.

Crescent Valley has known geothermal activity (Hot Springs Point and the nearby Beowawe geothermal plant) and future development of a potential geothermal resource is a reasonably foreseeable activity. It is anticipated that any future geothermal development would likely utilize the standard binary plant configuration, which allows the development of lower temperature resources. As a result, it is reasonable to assume that the geothermal power plant would not consumptively use water and surface disturbance would likely be less than 20 acres.

Under the RFFAs for utilities and community actions, there are 1,342 acres of surface disturbance.

### **5.4.3 Other Development/Use Actions**

#### **5.4.3.1 Recreation Actions**

Recreational use within the cumulative effects area of the Project is expected to continue to be limited, with dispersed outdoor recreational activities being the predominant type of recreation. No recreational improvements have been identified for the reasonably foreseeable future within the CESA; however, the BLM and NDOW have expressed an interest in utilizing the Project pit lake that will form at the end of mining as a recreational area. This could involve stocking the lake with fish, building boat ramps, parking lots, picnic areas, and sanitary facilities.

Opportunities for post-mining land use would be evaluated during the life of the Project. The NDOW and some members of the public, through scoping, have suggested using the post-mining pit lake for recreation and wildlife. The public or private party making future proposals for post-mining land use would be responsible for potential analysis and for management of the facility, including further NEPA analysis.

#### **5.4.3.2 Livestock**

As outlined in the Shoshone-Eureka RPS, the activities described below would occur under the RFFA scenario. The long-term goal is to increase licensed grazing use to 30,892 Animal Unit Months (AUMs), a 13.7 percent increase. If 70 percent of this goal were completed during the 15-year cumulative assessment period, then the licensed grazing use would be increased by 2,605 AUMs. However, the Carico Lake Allotment is currently under evaluation and these figures may not accurately reflect the final goals of the evaluation. Based on the activities outlined in the

Shoshone-Eureka RPS, surface disturbance, including the seeding activities, is assumed to result in approximately 4,313 acres.

#### 5.4.3.3 Wildlife Actions

No new wildlife management objectives have been identified for the reasonably foreseeable future within the CESA. Wildlife management objectives for the Carico Lake Allotment are specifically defined in the Shoshone-Eureka and Elko RPSs.

#### 5.4.3.4 Water Supply Actions

Future water needs for the town of Crescent Valley include additional storage for fire protection. A new 200,000 gallon storage tank was added in 1999. The town is not expected to request additional water rights during the RFFA period.

#### 5.4.3.5 Agricultural Actions

Additional agricultural development is reasonably expected to occur in the form of additional pivot irrigation. This development would likely be three new pivots that would cover approximately 1,800 acres. The water for this irrigation would likely be CGM dewatering water that would be piped to the Dean Ranch.

All of the commercial and public access RFFAs result in approximately 10,945 acres of surface disturbance within the CESA. Water use for the cumulative assessment is discussed in Section 5.5.3.

#### 5.4.3.6 Public Land Sales

Future public land sales are considered possible under RFFAs. These land sales could include lands associated with community development or specific resource development projects, such as CGM's operations in the southern portion of Crescent Valley. Any future land sale would be subject to congressional requirements in the implementing legislation. Public lands converted to private ownership would be subject to all applicable state environmental laws, which incorporate applicable federal environmental laws. If a land sale involved community development land, there would likely be a future change in use from wildlife habitat to residential and commercial development. If a land sale involved a resource development project, the current resource use would likely continue into the future with possible expansion of the use. Long-term use of the land after the resource use has been completed may be an activity or use other than livestock use and wildlife habitat, which would be the use if the land remained under BLM management. Long-term use of privatized land would be subject to any covenants agreed to at the time of sale.

Under RFFAs for other development/use actions, there are 6,113 acres of surface disturbance.

Under all RFFAs there are 11,505 acres of surface disturbance.

Under all the past actions, present actions, and RFFAs, there are 37,917 acres of surface disturbance.

## **5.5 Evaluation of Potential Proposed Action Cumulative Impacts and Mitigation**

### **5.5.1 Geology and Mineral Resources**

#### **5.5.1.1 Significance Criteria**

Environmental impacts to geology and minerals would be significant if an action resulted in any of the following:

- Impacts to the facility site or design caused by geologic hazards, including landslides and catastrophic slope failures or ground subsidence;
- Structural damage or failure of a facility caused by seismic loading from earthquakes; or
- Restriction of future extraction of known mineral resources.

#### **5.5.1.2 Environmental Consequences and Mitigation Measures**

**Past Actions** – The past actions that had the potential to affect geology and mineral resources were mining-related actions. Most past mining operations were of smaller scale and consisted of underground operations with small disturbance footprints. Most geology and minerals impacts resulted from a limited amount of mineral resource development activities. Historically, this area has been mined for gold, silver, barite, turquoise, copper, lead, and arsenic.

**Present Actions** – The present and proposed actions that have the potential to affect geology and mineral resources are mining-related actions. These present mining related actions are surface mining activities that affect geology and mineral resources by excavating, modifying, or covering natural topographic and geomorphic features and by removing mineral deposits.

**RFFAs** – The RFFAs that have the potential to affect geology and mineral resources are also mining-related actions, as well as the Yucca Mountain supply train. These RFFA mining related actions would be surface mining activities that affect geology and mineral resources by excavating, modifying, or covering natural topographic and geomorphic features and by removing mineral deposits. The Yucca Mountain supply train would result in the BLM withdrawing from mineral entry those lands associated with the rail line (618 acres).

Mining disturbance has included open pit and underground mining, waste rock disposal, heap leach ore processing, ore milling and processing, tailings disposal, and exploration (drilling, trenching, sampling, and road construction). The past surface disturbance is 1,017 acres, the present and proposed disturbance is 12,135 acres, and approximately 5,150 acres of disturbance is foreseen under the RFFAs. These total 18,302 acres of disturbance.

Mining is a major activity in the area and it is likely that exploration activities and mining would continue. The long-term impact would be the creation in the foreseeable future of additional or expansion of existing open pits, waste rock dumps, heap leach pads, and tailings facilities. The direct impacts affecting the geology and mineral resources of the Project Area due to open pit mining are the permanent removal and loss of resources for future generations. Withdrawal of the 618 acres

associated with the Yucca Mountain supply train may result in a restriction on future extraction of mineral resources. Under the Proposed Action and the RFFAs for mineral development, these direct impacts to geology and minerals would not be significant and would not be mitigated. Under the RFFA for the Yucca Mountain supply train, the impacts to geology and minerals are potentially significant; however, no significant cumulative impacts are anticipated.

## **5.5.2 Water Resources**

### **5.5.2.1 Significance Criteria**

Criteria for assessing the significance of potential impacts to the quality and quantity of water resources in the study area are described in the following four sections. Impacts to water resources are considered to be significant if these criteria are predicted to occur as a result of an action.

#### **5.5.2.1.1 Surface Water**

- Modification or sedimentation of natural drainages resulting in increased area or incidence of flooding.
- Reduction in flow of springs, seeps, or streams. Predicted impacts are considered to be significant where the modeled ten-foot ground water drawdown contour encompasses a spring, seep, or stream and where the surface water feature is hydraulically connected to the aquifer affected by drawdown.
- Diversion and/or consumptive use of surface water that adversely affects other water rights holders. This criterion includes flows to springs, seeps, or streams where existing beneficial water uses are affected.
- Release of mining-related contaminants such as cyanide, or metals such as arsenic and lead, into drainages by spills or flooding that results in soil/sediment contamination in excess of NDEP guidance levels (ten times any applicable State of Nevada MCL) as measured in a meteoric water mobility procedure (MWMP), or release of fuels and lubricants into drainages resulting in soil contamination exceeding the NDEP guidance level (100 mg/kg of TPH). A discharge or change in water quality that results in an exceedance of the applicable NDEP standards (Table 4.4.1) for municipal or domestic supplies, aquatic life, irrigation, livestock, or other applicable standards to protect existing or potential beneficial uses in perennial streams, springs, seeps, and the post-mining pit lake.

#### **5.5.2.1.2 Ground Water**

- Lowering of the water table that results in impacts to other ground water users. The threshold for identifying significant impacts to wells is the modeled ten-foot drawdown contour. Therefore, for the purposes of this study, significant impacts are indicated where the ten-foot contour encompasses an existing well with an active water right and the well is hydraulically connected to the aquifer affected by drawdown.

- A long-term consumptive use of water resources that does not provide water for a beneficial use.
- Degradation of natural ground water quality by chemicals such that concentrations exceed State of Nevada MCLs for drinking water, or render water unsuitable for other existing or potential beneficial uses. For ground water that does not meet State of Nevada MCLs for baseline conditions, degradation will be considered significant where a change in water quality would render the water unsuitable for an existing or potential beneficial use. This criterion is based on NAC 445A.424.
- Degradation of natural soil chemistry by cyanide, trace metals, or other compounds such that concentrations exceed NDEP guidance levels. NDEP guidance levels for soils are based on results of meteoric water mobility testing that are ten times the drinking water standard for each compound. This guidance is designed to protect ground water from contamination by leachate from overlying soils.

### 5.5.2.2 Environmental Consequences and Mitigation Measures

Cumulative impacts to water resources within the study area are considered from surface water, ground water, and water quality perspectives. Assessment of cumulative impacts from present actions and RFFAs that are developed would be incorporated into the annual ground water flow model and five-year pit lake chemistry model updates as specific activities and associated water resource stresses evolve and are quantified by data collection under the Integrated Monitoring Plan.

#### 5.5.2.2.1 Surface Water

**Past Actions** – Prior to the initiation of the Clean Water Act, few if any measures to control or minimize impacts to surface water resources were required. Most mining operations were of smaller scale and consisted of underground operations with small disturbance footprints. Most surface water quality impacts consisted of generation of sediment during exploration road building, trenching, and mining. Potential exists for acid rock drainage from these past actions; however, there are no reports of any current discharges.

**Present Actions** – If the expansion of the Pipeline/South Pipeline open pit is implemented, the resulting pit lake that would eventually form after mining ceases could be either larger or smaller than the size of the lake for the Proposed Action. Long-term evaporation losses from the cumulative pit lake may either increase or decrease, depending upon the resulting pit configuration and backfill placement, compared to the Proposed Action's long-term consumptive use of up to 1,185 acre-feet annually. This is potentially a significant impact.

**RFFAs** – Potential erosion and sedimentation impacts to ephemeral drainages would increase somewhat if the RFFA projects were implemented sequentially to the Proposed Action. Ephemeral drainages may need to be rerouted around a larger facility, making the courses longer and increasing the potential for erosion and sedimentation impacts. In addition, mining-related RFFAs anticipate additional dewatering and therefore the potential for future pit lakes. This would result in additional consumptive use of water through evaporation. This is also a potentially significant cumulative impact.

Cumulative impacts to the perennial streams of Crescent Valley would not be anticipated because none of the perennial drainages are located within the area that is likely to be hydrologically affected by the Proposed Action, other proposed actions, or RFFAs.

#### 5.5.2.2.2 Ground Water Quantity

Past Actions – Most mining operations and agricultural development were of smaller scale and utilized relatively small quantities of ground water. Most ground water quantity impacts consisted of the consumption of ground water for the underground mines and irrigation.

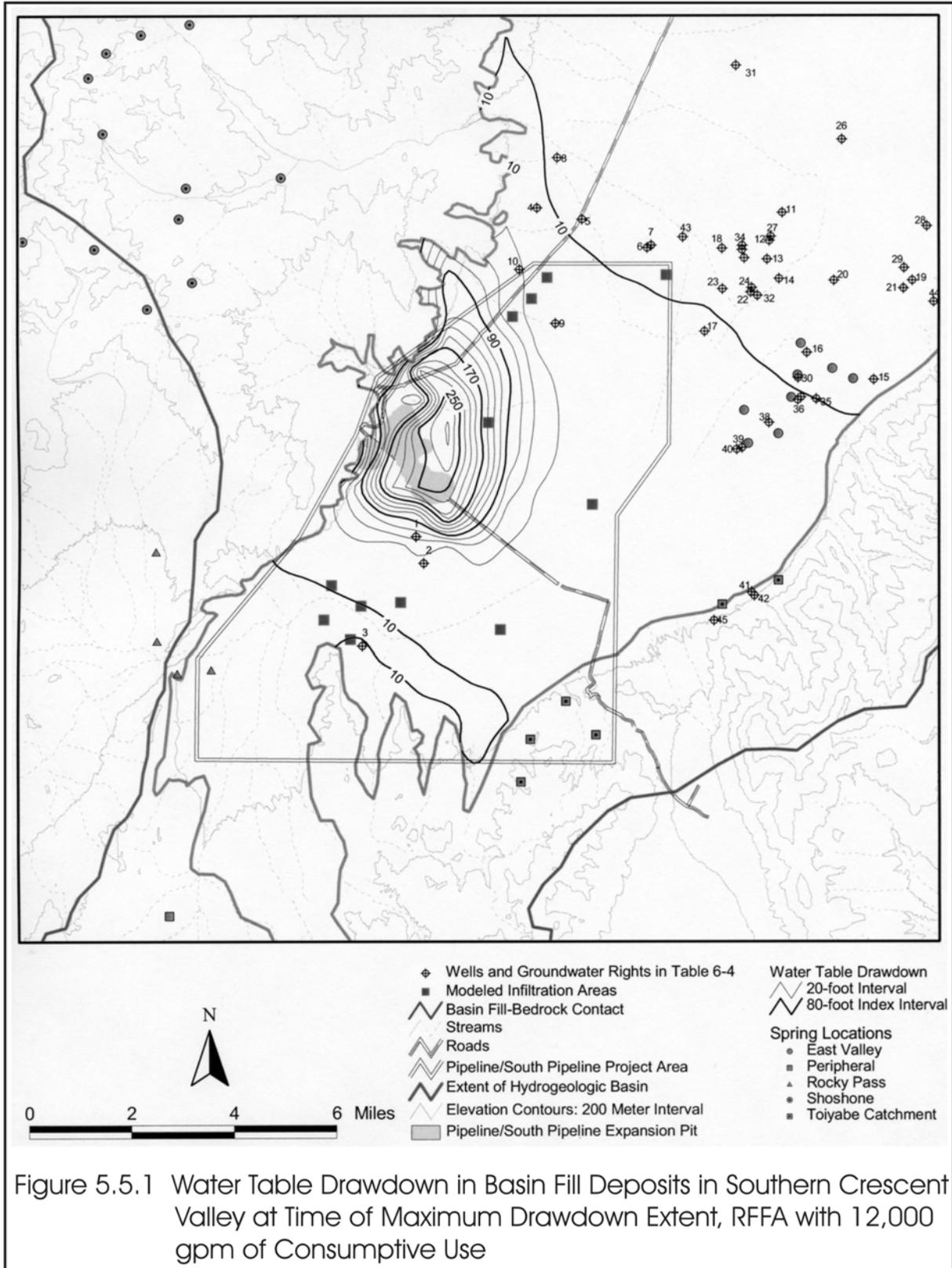
Present Actions –The expansion of the Pipeline/South Pipeline open pit or the development of the Pediment/Cortez Hills Project would involve continued and additional dewatering. The impacts of this dewatering pumping would result in a cone of drawdown in the water table that would correspond to the model results of impacts for the Proposed Action at the end of mining (Section 4.3.3.1.2). The drawdown would probably expand during the years after the end of dewatering as the pit lake fills, eventually encompassing a larger area and potentially affecting additional wells, springs, and water rights within the ten-foot drawdown contour than predicted for the Proposed Action.

Decreased ground water contribution to the baseflow of the Humboldt River could result from increased consumptive use of water within the Crescent Valley basin. Increased water use from mining is possible as present actions.

RFFAs – Cumulative impacts related to continuation of mine dewatering are considered as RFFAs for the South Pipeline expansion or development of underground mining. Other reasonably foreseeable mining projects within the Crescent Valley Hydrographic Basin would likely involve dewatering, and may contribute to consumption of water resources by withdrawal of ground water for mine uses during operations.

The further expansion of the South Pipeline open pit or underground mining would involve continued dewatering at a similar or slightly greater pumping rate than predicted for the Proposed Action. The impacts of continued dewatering pumping would result in a cone of drawdown in the water table that would generally correspond to the model results of impacts for the Proposed Action at the end of mining (Section 4.3.3.1.2), since the extent of drawdown would be limited by the surrounding infiltration sites. The drawdown would probably expand during the years after the end of dewatering as the expanded pit lake fills, eventually encompassing a larger area and potentially affecting additional wells, springs, and water rights within the ten-foot drawdown contour than predicted for the Proposed Action.

Decreased ground water contribution to the baseflow of the Humboldt River could result from increased consumptive use of water within the Crescent Valley basin. Increased water uses for agriculture, livestock, municipal, domestic, and mining in Crescent Valley are possible as RFFAs. Figure 5.5.1 shows the potential impacts for a consumptive use of up to 12,000 gpm, along with the proposed dewatering under the Proposed Action, on the water table in the vicinity of the Project at the time frame for maximum impact.



This Page Intentionally Left Blank

The contribution to cumulative ground water impacts from the Proposed Action is significant, as described in Section 4.3.3.1.2 for the Proposed Action alone; therefore, the cumulative impacts are also significant. The mitigation of potential cumulative impacts could involve the same measures as discussed for the Proposed Action. Since Crescent Valley is a semi-closed basin that does not contribute significantly to the flow of the Humboldt River, the cumulative impacts to this flow would be less than significant.

#### 5.5.2.2.3 Ground Water Quality

**Past Actions** – Prior to the initiation of the CWA, few if any measures to control or minimize impacts to ground water quality were required. Most mining operations were of smaller scale and consisted of underground operations with small disturbance footprints. Most ground water quality impacts consisted of the consumption of ground water for the underground mines or irrigation, and contamination from process discharges and spills.

**Present Actions** – Process facilities of the present actions, the Proposed Action, and the proposed Pediment/Cortez Hills Project, including some or all of the heap leach facilities and tailings facilities, would be designed and constructed as zero-discharge units in accordance with NDEP regulations. As such, their contribution to cumulative ground water quality degradation is considered to be low.

Construction and operation of the Proposed Action's waste and ore processing facilities have a low potential to impact water quality due to the arid site environment, depth (250 feet) to the water table, lack of perennial surface drainage on site, and the zero discharge design of the facilities. Ore stockpiles, waste rock piles, leach pads, tailings, and rock exposed in pit walls for the Proposed Action contain low sulfide high neutralization potential rock types that are not likely to contribute to ARD. Existing wastes associated with past activities in the Cortez open pit, Crescent open pit, and Gold Acres areas, some of which are presently in the Project Area, are similarly categorized as having low potential to generate ARD. These past, present, and proposed mining activities would not significantly contribute to any cumulative ARD impacts.

As mentioned in Section 4.4.3, the post-mining South Pipeline pit lake water quality is initially good, but would eventually exceed baseline concentrations and the Nevada water quality standards due to evapoconcentration. Despite the conclusion that present beneficial uses would not be degraded by pit lake seepage, some potential would exist for degradation to future beneficial uses. In addition, there would be some potential for pit waters to eventually migrate into the adjacent aquifers. The areal extent of such seepage migration is uncertain, but is expected to be quite localized since the pit lake is predicted to act as a ground water sink for most of the year. Hundreds of years and complete filling of the pit would be necessary before any outward migration would occur. Future corrective actions using the best available technology would be used to mitigate or remediate any potentially significant impacts caused by the formation and seepage of evapoconcentrated pit lake waters.

The host rock for the mineralization at the Pediment/Cortez Hills Project is carbonate rock and alluvium with little to no sulfides present. Therefore, no potential for ARD exists. Open pit lake and waste rock chemistry will have a neutral pH with solute contributions comparable to those at the Project because of similarities in host rock and ambient ground water chemistry (Geomega 2002d).

RFFAs – For reasonably foreseeable mining projects, similar facilities as outlined under present actions using similar chemicals would be constructed and operated. If the facilities were also designed and constructed as zero-discharge units, they would have a similarly low potential for degrading ground water quality.

Some of the identified RFFA possible mining projects could involve sulfide ores with greater potential for ARD that may require particular waste handling procedures or development of containment designs for the future plans of operations.

The long-term impacts of evapoconcentration in the pit lake and mobilization of salts from soil zones beneath infiltration ponds would not likely contribute to cumulatively significant water quality impacts in Crescent Valley by altering the basin's salt balance. However, virtually any development and beneficial use of water in a semi-closed basin in an arid climate is likely to contribute to the increasing concentration of dissolved solids in the ground water of the basin. In the case of Crescent Valley, the Proposed Action and each of the RFFAs that uses water for irrigation, livestock, municipal, domestic, and mining would have a marginal contribution to the cumulative long-term increase of TDS in the basin's ground water. This increase of dissolved solids in the basin would take centuries to develop, and no existing water rights or uses can be identified as particularly affected. The long-term increases in TDS are considered potentially significant to future beneficial water uses; there are no mitigation measures that appear to be feasible.

### **5.5.3 Air Resources**

#### **5.5.3.1 Significance Criteria**

An action would have a significant effect on the environment if any of the following would occur:

- Violate any regulatory requirement of the BAPC;
- Violate any state or federal ambient air quality standard;
- Contribute substantially to an existing or projected air quality violation; or
- Expose sensitive receptors to substantial pollutant concentrations.

#### **5.5.3.2 Environmental Consequences and Mitigation Measures**

Past Actions – Prior to the initiation of the CAA, few if any measures to control or minimize impacts to air quality were required. Most mining operations were of smaller scale and consisted of underground operations with small disturbance footprints. Most air quality impacts consisted of generation of fugitive dust during exploration road building, trenching, and mining. Historic small retorts may have also contributed pollutants affecting air quality.

Present Actions – Essentially all of the present emissions, including the Proposed Action, are situated in the CVAQMA, (Basin 54). Impacts to air quality from mining-related activities include generation of fugitive dust from blasting, exploration drilling, road building, and crushing

operations. Other air emissions are generated from processing facilities and burning of fossil fuels by heavy equipment and other vehicles. These impacts would be localized and minimized due to implementation of environmental protection measures, which include watering roadways and utilizing sprayers during crushing. Emissions from processing and mill facilities would comply with requirements of applicable BAPC air quality permits. Air quality impacts from utility and community actions are primarily related to combustion products from vehicle exhaust and fugitive dust from vehicle travel on gravel and dirt roads.

RFFAs – Air quality impacts from RFFAs could include generation of fugitive dust during hard rock exploration, mineral development, and the development and operation of the geothermal power plant. Emissions may also be generated from processing facilities, burning of fossil fuels by heavy equipment and other vehicles, vehicle travel on the paved and unpaved roads, fugitive dust from travel on unpaved roads, and combustion products from the Yucca Mountain Supply Train. Some of these emissions would be localized and minimized due to implementation of environmental protection measures. Others would be more long term and basin-wide. Some of these emissions would be subject to BAPC air quality permits and compliance, development of mitigation measures, and implementation of environmental protection measures.

The identified individual projects within the CESA, including existing and proposed mining operations, each emit criteria air pollutants. With the possible exception of motor vehicle emissions, the existing and proposed mining operations are the major sources of criteria air pollutants within the CESA. Since the monitored levels of these pollutants ( $PM_{10}$ ) within the CESA are below the applicable established ambient standards, no significant impacts to air resources exist within the CESA. The air quality modeling for the Proposed Action shows the levels of these pollutants below applicable standards. The Proposed Action would not result in a significant cumulative impact to air resources. The RFFAs would result in additional emissions similar to those currently emitted by existing operations; however, most of the activities under the RFFAs would operate under permit conditions established by the BAPC and therefore would likely also not be significant.

#### **5.5.4 Visual Resources**

##### **5.5.4.1 Significance Criteria**

The assessment of visual impacts is based upon impact criteria and methodology described in the BLM Visual Contrast Rating System (BLM Manual Handbook, Section 8431-1). Effects to visual resources are assessed for the construction, operation, and closure of the Proposed Action. Quality of the visual environment is defined by BLM VRM classes. Two issues are addressed in determining impacts: (a) the type and extent of actual physical contrast resulting from an action and related activities, and (b) the level of visibility of a facility, activity, or structure. Impacts are considered significant if visual contrasts resulting from landscape modifications affect the following:

- The quality of any scenic resources;
- Scenic resources having rare or unique values;
- Views from, or the visual setting of, designated or planned parks, wilderness areas, natural areas, or other visually sensitive land uses; or

- Views from, or the visual setting of, travel routes; and/or views from, or the visual setting of, established, designated, or planned recreational, educational, or scientific facilities, use areas, activities, viewpoints, or vistas.

The extent to which an action would affect the visual quality of the viewshed depends upon the amount of visual contrast created between the proposed facilities and the existing landscape elements (form, line, color, and texture) and features (land and water surface, vegetation, and structures). The magnitude of change relates to the contrast between each of the basic landscape elements and each of the features. Assessing an action's contrast in this manner indicates the potential impacts and guides the development of mitigation measures that fulfill the VRM objectives.

#### 5.5.4.2 Environmental Consequences and Mitigation Measures

**Past Actions** – The past actions that would have affected visual resources are agriculture and mining operations. The mining operations were of smaller scale and consisted of underground operations with small disturbance footprints. Most visual resource impacts consisted of changes to line, form, color, and texture during exploration road building, trenching, mining, and agricultural development.

**Present Actions** – The area of analysis for cumulative effects to visual resources is the area bound on the west by the crest of the Shoshone Range, on the east by the crest of the Cortez Mountains, and on the south by the Toiyabe Mountains. On the north, the boundary is located several miles north of the town of Crescent Valley (BLM 2000a, page 4-151, Figure 4.12.1). The area incorporates the entire viewshed of the Proposed Action. Present and proposed activities are encompassed in the description of the affected environment (Section 4.6.2), with the exception of the proposed Pediment/Cortez Hills Project. This additional project would result in similar impacts to the visual resources that are discussed in Section 4.6.3.

**RFFAs** – The only projects that have the potential to result in cumulative impacts, when considered in concert with the Proposed Action or alternatives, would be the Cortez Hills area and any adjacent mineral development, the Satellite Mine, any expansion of operations within the Project Area, and the geothermal power plant. Total additional disturbance associated with these activities would be approximately 5,150 acres and would consist of open pits, underground operations, haul roads, waste rock dumps, and processing facilities. Existing ancillary facilities such as explosives magazines, truck shops, and offices located at the Project Area would likely be utilized for these mining operations.

All the development activities in the visual resources CESA would occur in an area under BLM visual Class IV, where major modification of the existing landscape is allowed. Disturbance within this classification would be allowed to dominate the view and be a major focus of viewer attention (Table 4.6.1). Consequently, all development under this cumulative analysis would not exceed visual management objectives for public lands within the Project Area and therefore would not generate significant cumulative impacts.

### **5.5.5 Auditory Resources**

#### **5.5.5.1 Significance Criteria**

Noise impacts from mining would be considered significant if an action would result in the following:

- Noise levels in excess of 55 dBA, as measured outside at a sensitive receptor site.

Noise impacts from blasting would be considered significant if the Proposed Action resulted in the following:

- Maximum noise levels in excess of 70 dBA measured outside at a sensitive receptor site; or
- Ground vibration as a result of blasting that could initiate or extend observable cosmetic cracking of structures at a sensitive receptor site.

#### **5.5.5.2 Environmental Consequences and Mitigation Measures**

**Past Actions** – Past actions generally did not consider potential impacts to auditory resources. However, any potential impacts would not persist, since any impacts would have been very short term in nature and would not carry forward to the present.

**Present Actions** – Impacts to auditory resources from mining-related activities include noise generation from blasting, exploration drilling, road building, and crushing operations. Other noise is generated from processing facilities, heavy equipment, and other vehicles. These impacts would be localized and minimized due to implementation of environmental protection measures. Auditory resource impacts from the utility and community actions are primarily related to noise from vehicles traveling on paved and unpaved roads.

**RFFAs** – Auditory resource impacts from RFFAs could include noise generation during hard rock exploration and mineral development. Other noise may also be generated from processing facilities; heavy equipment and other vehicles; vehicle travel on paved and unpaved roads; and the Yucca Mountain Supply Train. These impacts would tend to be localized.

The identified individual projects within the CESA, including existing and proposed mining operations, each contribute noise to the natural environment. Since all the existing actions, proposed actions, and RFFA are widely dispersed throughout the CESA, none of the projects, including the Proposed Action, would result in a significant cumulative impact to the auditory resources.

### **5.5.6 Socioeconomic Values**

#### **5.5.6.1 Significance Criteria**

NEPA (Section 1508.14) states that "...economic or social effects are not intended by themselves to require preparation of an environmental impact statement. When an environmental impact statement is prepared and economic or social and natural or physical environmental effects are

interrelated, then the environmental impact statement will discuss all of these effects on the human environment.” Simply put, this means that social or economic differences are not enough to result in a potentially significant adverse effect, but they need to manifest themselves with some physical change, as described in NEPA (Section 1508.8(b)), “...effects may include growth inducing impacts and other effects related to induced changes in the pattern of land use, population density or growth rate”.

As identified during the scoping process and from the Pipeline Final EIS (BLM 1996a, pages 4-54 through 4-56), an action would normally have a significant effect on the environment if the following would occur:

- Induce substantial growth or concentration of population;
- Displace a large number of people;
- Cause a substantial reduction in employment;
- Substantially reduce wage and salary earnings;
- Cause a substantial net increase in county expenditures; or
- Create a substantial demand for public services.

#### 5.5.6.2 Environmental Consequences and Mitigation Measures

Past Actions – The historic activities within the socioeconomic CESA resulted in the development of existing rural, resource-based communities in northern Nevada. Most socioeconomic impacts consisted of the generation of economic activity during agricultural development, mining, and associated commercial activities.

Present Actions – The present and proposed actions would produce socioeconomic effects which are either beneficial or below the level of significance. Continued utilization of public services under these actions would not result in significant impacts. Numerous present mining operations and other activities occur in the three-county CESA. Modern mining has essentially created (or reestablished) communities in the CESA and contributed significantly to the high population growth of CESA communities during the 1980s, and continued slower growth during the 1990s (see Table 4.8.1). The Proposed Action represents only a continuation of a present approved action.

RFFAs – The RFFAs include other mineral development projects by CGM to occur in the vicinity of the Project Area, including the Satellite Mine and Cortez Hills area, adjacent mineral development, and the geothermal power plant. Like the Proposed Action, the Cortez Hills and other adjacent development would likely utilize existing CGM employees, extending their employment and the beneficial impacts determined in Section 4.8.3 by an estimated ten additional years.

Specific information regarding the timing, duration, and level of employment are not available for other future actions which may occur throughout the three-county CESA, precluding a

comprehensive analysis of potential cumulative impacts. However, other future mining projects in the CESA would provide employment opportunities in Elko, Eureka, and Lander Counties where 30, 33, and 42 percent (respectively) of the population already relies on employment in the mining industry (see Table 4.8.6), and where the future of mining employment is uncertain. The Nevada State Demographer's middle-range population estimate scenarios, used to make population projections for each county, assumed that each CESA county would experience some level of mining employment layoff, as well as some new mining and continued mineral exploration. In the volatile economy of the foreseeable future, it is expected that the cumulative and incremental socioeconomic and public service effects of the Proposed Action would be positive and not significant.

## **5.5.7 Environmental Justice Effects**

### **5.5.7.1 Significance Criteria**

EPA's Interim Final Guidance For Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analyses (EPA 1998) suggests a screening process to identify environmental justice concerns. This two-step process defines the significance criteria for this issue; if either criteria is unmet, there is little likelihood of environmental justice effects occurring. The two-step process is as follows:

- (1) Does the potentially affected community include minority and/or low-income populations?
- (2) Are the environmental impacts likely to fall disproportionately on minority and/or low-income members of the community and/or tribal resource?

If the two-step process discussed under Study Methods indicates that potential exists for environmental justice effects to occur, the following analyses are conducted to consider:

- Whether there exists a potential for disproportionate risk of high and adverse human health or environmental effects;
- Whether communities have been sufficiently involved in the decision-making process; and
- Whether communities currently suffer, or have historically suffered, from environmental and health risks and hazards.

### **5.5.7.2 Environmental Consequences and Mitigation Measures**

Initial analysis concluded that the potential effects of the Project are not expected to disproportionately affect any particular population. Environmental effects that may occur at a greater distance, such as auditory resource or air impacts, would affect the area's population equally, without regard to nationality or income level. According to Section 4.9.2, no traditional cultural properties or E.O. 13007 (Indian Sacred Sites) sites have been identified within the Project Area that might be impacted by the Proposed Action or either of the alternatives. In addition, no traditional cultural properties have been identified in areas of RFFAs. Therefore, no impacts are associated with past actions, present actions, the Proposed Action, other proposed actions, or RFFAs on traditional

Native American religious concerns. Since no disproportionate effect on an identified minority population results from the Proposed Action or the RFFAs, no further environmental justice analyses are required.

### **5.5.8 Wildlife Resources**

#### **5.5.8.1 Significance Criteria**

Based upon NEPA guidelines and commonly accepted criteria, a project would normally be considered to have a significant effect on wildlife resources if it resulted in the following:

- Substantially disturb critical wildlife habitat;
- Cause the loss of a species or habitat afforded protection under either the ESA or state law; or designated as having special status (e.g., Species of Concern, Sensitive Species, etc.) by an overseeing agency;
- Cause loss of birds or nests with eggs protected by the Migratory Bird Treaty Act;
- Eliminate a natural plant community from the Project Area;
- Result in acute or chronic toxicity resulting from exposure to toxic materials in the tailings or heap leach facilities; or
- Cause destruction of active bat roosts or maternity sites.

#### **5.5.8.2 Environmental Consequences and Mitigation Measures**

**Past Actions** – Past actions that could impact wildlife’s issue of water would have been limited and may have included the smaller scale mining operations and agriculture and ranching operations that used or impacted water resources.

**Present Actions** – If the expansion of the Pipeline/South Pipeline open pit is implemented, the resulting pit lake that would eventually form after mining ceases could be either larger or smaller than the size of the lake for the Proposed Action , which creates a long-term evaporation losses from the cumulative pit lake may either increase or decrease, depending upon the resulting pit configuration and backfill placement. Water infiltration ponds and agricultural operations also create opportunities for wildlife to utilize water resources. When these types of activities use ground water there is a potential decrease in flows from springs in the vicinity of the ground water use.

**RFFAs** – Potential impacts to water availability for wildlife would increase somewhat if the RFFA projects were implemented sequentially to the Proposed Action. In addition, mining-related RFFAs anticipate additional dewatering and therefore the potential for future pit lakes and dewatering infiltration ponds. These potential cumulative impacts are not considered potentially significant cumulative impacts.

### **5.6 No Backfill Alternative Impact Analysis**

The resources which may be cumulatively impacted by the No Backfill Alternative include air quality, soils, water resources, vegetation, wildlife, special status species, visual, socioeconomics, geology, minerals, invasive nonnative species, cultural, and wild horses and burros. The cumulative impacts under the No Backfill Alternative are similar to the Proposed Action; the No Backfill Alternative would have a slightly greater incremental increase in cumulative impacts to some of the resources and would result in more long-term surface disturbance compared to the Proposed Action.

### **5.7 Complete Backfill Alternative Impact Analysis**

The resources which may be cumulatively impacted by the Complete Backfill Alternative include air quality, soils, water resources, vegetation, wildlife, special status species, visual, socioeconomics, geology, minerals, invasive nonnative species, cultural, and wild horses and burros. The cumulative impacts under the Complete Backfill Alternative are similar to the Proposed Action, although the Complete Backfill Alternative would have a slightly greater incremental increase in cumulative impacts to some of the resources and would result in less long-term surface disturbance compared to the Proposed Action.

### **5.8 No Action Alternative Impact Analysis**

The resources which may be cumulatively impacted by the No Action Alternative include air quality, soils, water resources, vegetation, wildlife, special status species, visual, socioeconomics, geology, minerals, invasive nonnative species, cultural, and wild horses and burros. The cumulative impacts under the No Action Alternative are essentially the same as under the Proposed Action, since the Proposed Action would have such a small incremental increase in cumulative impacts to all the resources and would result in less long-term surface disturbance.

This Page Intentionally Left Blank