

3.11 Recreation and Wilderness

3.11.1 Affected Environment

3.11.1.1 Recreation

Recreation use of the project area and a 50-mile radius surrounding it includes primarily deer, sage grouse, and chukar hunting, and trout fishing. Non-consumptive uses include rockhounding, hiking, visiting old mining camp sites, photography, and camping. There is little use of trail bikes and all-terrain vehicles (JBR 1999a).

According to a phone survey taken in 1986 by the Nevada Division of State Parks (Nevada Department of Conservation and Natural Resources 1992), the three main recreational activities of Lander County residents are golfing, hunting, and fishing. The three main activities for Lander County visitors are hunting, fishing, and gambling. For nearby counties, the major recreational activities include hunting, fishing, camping, and water sports, as well as more urban activities such as golf and softball.

The Willow Creek area receives a large amount of recreational use. It is an undeveloped area on BMG-owned land approximately 13 miles southwest of Battle Mountain. Reservoirs behind two small dams on the creek support a natural shade cover of willow and cottonwood. Camping and fishing are popular there. Willow Creek is managed under the “wild” fishery designation of the Nevada Coldwater Fishery Program Management Concepts (Nevada Division of Wildlife 1988). Angler use data for Willow Creek show a 15-year average of 165 angler days of use, with a high of 870 angler days in 1981 and a low of zero for several years (JBR 1999a).

In addition to fishing and camping, Willow Creek is popular with deer and upland bird hunters, as well as rockhounds and other non-consumptive users.

The Willow Creek reservoirs are small, man-made ponds originally built as a water supply for localized mining and livestock industries. In response to angling demand since the early 1960s, the reservoirs’ primary use is for fishing. The reservoirs have a surface area of approximately 1 acre and a maximum depth of approximately 8 feet. As such, the reservoirs have limited fishing potential. However, the Nevada

Division of Wildlife manages the reservoirs as a put-and-take fishery (JBR 1999a). The reservoirs have a 15-year average use of 1,364 angler days, with a high of 3,358 angler days in 1982 and a low of 728 angler days in 1980 (JBR 1997a).

Mill Creek Recreation Area is the only developed recreation area within a 50-mile radius of the town of Battle Mountain (see **Figure 3.11-1**). Located 24 miles south of Battle Mountain, the recreation area is shaded by tall cottonwoods in a canyon setting. The creek supports brook trout and is a popular fishing area. The 15-year average use is 745 angler days, with a high of 1,502 angler days in 1980 and a low of 348 angler days in 1992 (JBR 1999a). This area has 11 tent sites, 3 recreational vehicle (RV) campsites, picnic tables, fire rings, barbecue rings, and 2 restroom facilities. Potable water is not available. Electrical and septic hookups are not available for RVs. Recreation opportunities include camping, deer and upland bird hunting, fishing, mountain biking, hiking, geologic sightseeing, and rockhounding (JBR 1999a).

The BLM has completed plans to develop a second recreation area, Water Canyon, located approximately 10 miles south of the town of Winnemucca (Clemons 1999). Water Canyon will offer picnicking, bird watching, hiking, and camping. The year-round stream supports a lush riparian environment (JBR 1997a).

3.11.1.2 Wilderness

In November 1980, the final inventory decision was made for most Wilderness Study Areas in Nevada. A total of 103 Wilderness Study Areas were identified and analyzed through the wilderness inventory. In October 1991, the BLM Nevada State Office released its Statewide Wilderness Report, documenting the rationale and recommendations for the Wilderness Study Areas. The criteria considered in developing the wilderness recommendations included naturalness, solitude, primitive and unconfined recreation, and special features. To date, no action has been taken by Congress on this report (BLM 1991c).

Three Wilderness Study Areas are located within a 50-mile radius of the project area: China Mountain, Tobin Range, and Augusta Mountains (**Figure 3.11-1**).

The China Mountain Wilderness Study Area (NV-020-406P) includes 10,358 acres surrounding 80 acres of private lands. The China Mountain Wilderness Study Area is located approximately 14 miles due west of the Phoenix Project area on the east slope of the Tobin Range. The Statewide Wilderness Report (BLM 1991c) recommendation for the China Mountain Wilderness Study Area is to release all 10,358 acres for uses other than wilderness. The mineral and geothermal potential were considered to outweigh the wilderness values. Implementation would require using all practical means to avoid or minimize environmental impacts (BLM 1991c).

The Tobin Range Wilderness Study Area (NV-030-406Q) includes 13,107 acres of public lands surrounding 120 acres of private lands. This Wilderness Study Area is located approximately 22 miles west-southwest of the Phoenix Project area in eastern Pershing County. The recommendation for the Tobin Range Wilderness Study Area is to release all 13,107 acres for uses other than wilderness. Management emphasizing access to potential mineral resources was selected over management as designated wilderness because of energy and mineral resource potential. Implementation would require using all practical means to avoid or minimize environmental impacts (BLM 1991c).

The Augusta Mountains Wilderness Study Area (NV-020-108) encompasses 89,372 acres of public lands with no state or private in-holdings. It is located approximately 33 miles southwest of the Phoenix Project area at the common junction of Pershing, Churchill, and Lander counties. The recommendation for the Augusta Mountains Wilderness Study Area is to release all 89,372 acres for uses other than wilderness. Management emphasizing access to potential mineral resources was selected over management as designated wilderness because of energy and mineral resource potential. Implementation would require using all practical means to avoid or minimize environmental impacts (BLM 1991c).

3.11.2 Environmental Consequences

Impacts to recreation and wilderness would be significant if the Proposed Action or No Action alternative were to result in the following:

- Permanent changes in recreation resource availability within, or adverse effects to the management of, county, state, or national

parks, wildlife refuges, wilderness areas, or Wilderness Study Areas

- Displacement of dispersed recreational use from an area for which there are no reasonable substitutes as a result of decreases in game population, aesthetic experience, loss of access, or other reasons related to the proposed project
- Increased total recreation demand in the region (as measured by population change) over baseline conditions that exceeds the current capacity of developed recreation facilities

3.11.2.1 Proposed Action

No parks, concentrated recreational use areas, BLM Wilderness Study Areas, designated wilderness areas, or protected natural areas would be affected by the Proposed Action. Therefore, there would be no significant impacts to these resources under the Proposed Action.

Implementation of the Proposed Action would result in an additional 2,382 acres of new surface disturbance on public lands (**Table 2-1**). However, most of this proposed new disturbance would occur either as an expansion to an existing mine facility, or within the existing mine perimeter fence, or both, and recreational use is already precluded from these areas for safety and security reasons.

Recreational activities, such as hunting, rockhounding, hiking, and camping would continue to be prohibited within the mine site during the life of the proposed project.

Overall, the displacement of dispersed recreationists would be a minimal adverse impact since existing recreational use in the project area is relatively light, the affected lands do not offer unique recreational opportunities, the acreage of public lands affected would be minor, and the area has abundant public open space lands available for dispersed recreational opportunities. Public access would not be restricted on existing public roads near the mine site or to Willow Creek and the Willow Creek reservoirs. Although no specific recreational use data are available for the public lands directly affected by the Proposed Action, the number of dispersed recreationists affected is expected to be minimal, and their displacement would not create overuse of other areas or degradation of the resource. Therefore, significant impacts would not occur from the displacement of

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dispersed recreationists under the Proposed Action.

Recreational facilities located within the town of Battle Mountain would be able to absorb any extra demand placed on them as a result of the anticipated new residents to the area.

Adverse impacts to big and small game populations could result from ground water drawdown at several springs in and near the project area due to implementation of the Proposed Action. Consequently, adverse impacts to hunting opportunities are expected. Similarly, adverse impacts to fisheries located in lower Willow Creek could occur as a result of operations under the Proposed Action (see Section 3.5.2, Wildlife and Fisheries Resources). Mitigation measures for water resources (Section 3.2.4) and wildlife and fisheries (Section 3.5.4) are recommended to address potential reductions in spring and stream flows.

Despite the potential adverse effects on game and fish habitats, the displacement of recreational uses from the area would be relatively minor. There are ample alternative opportunities for hunting in the vicinity. The Willow Creek reservoirs, where fishing is heaviest, would not be affected by ground water drawdown. Consequently, adverse recreational effects from ground water impacts would not be significant.

Implementing the Proposed Action would result in a temporary (12 to 18 months) increase in population of approximately 328 to 385 during construction (a 4.7 to 5.5 percent increase from the 1998 county population) (see **Tables 3.12-14** and **3.12-15**) and a permanent increase in population of approximately 416 to 453 during operations (a 6.4 percent increase from the 1998 county population) (see **Tables 3.12-16** and **3.12-17**). Developed recreational facilities within the region are not expected to be adversely impacted by the influx of this population. Facilities at the Mill Creek Recreation Area, located approximately 24 miles south of the town of Battle Mountain, could experience increased use as a result of transient workers camping during the construction period and the addition of new residents to the region during project operations. Other regional recreational facilities, such as Willow Creek, Willow Creek reservoirs, and Water Canyon, would likely experience increased demand during construction and operations.

Implementation of the Proposed Action would have no impact on wilderness areas or Wilderness Study Areas. The closest Wilderness Study Area is approximately 14 miles to the west (China Mountain Wilderness Study Area), and it is not anticipated that the disturbance associated with the Proposed Action would be visible from this area.

Closure and reclamation following the Proposed Action would return public lands to their premining land uses, including livestock grazing and wildlife habitat. With the exception of the open pits, BMG would return essentially all public lands to wildlife habitat and rangeland. Thus, the potential exists for hunting opportunities to be realized on the mine site following closure and reclamation. BMG would limit human access to the open pits by constructing berms and posting warning signs around the pit perimeters.

3.11.2.2 No Action Alternative

No parks, concentrated recreational use areas, BLM Wilderness Study Areas, designated wilderness, or protected natural areas would be affected under the No Action alternative. Therefore, there would be no significant impacts to these resources under the No Action alternative.

Implementation of the No Action alternative would not remove any public lands currently available for dispersed recreation. Lands associated with developing the Sunshine Pit and Sunshine waste rock facility, exploration activities, and the pushback of the North Midas Pit and South Midas Pit highwalls are adjacent to existing mine facilities and within the existing mine perimeter fence. Recreational use is already precluded from these areas for safety and security reasons. Overall, the No Action alternative would not displace dispersed recreationists from the relatively light, existing recreational use in the project area. Therefore, significant impacts would not occur under the No Action alternative.

Developed recreational facilities within the region and within Battle Mountain are not expected to be adversely affected by the No Action alternative. The temporary resumption of mining under the No Action alternative would increase employment by 80 people and the population by an estimated 53 people for 6 months. The population increase is well short of the maximum number of people that lived in the area in 1998. Therefore, the increased demand on recreation resources would be within the capacity of the resources. Consequently,

significant impacts to developed recreation facilities would not occur under the No Action alternative.

3.11.3 Cumulative Impacts

The area of analysis for cumulative impacts to recreation and wilderness resources is defined as the area within a 50-mile radius of the town of Battle Mountain (see **Figure 3.11-1**). Past disturbance and present actions have resulted incrementally in the loss of public lands available for dispersed recreational activities and have generated, through an increase in the local population, a growing demand for dispersed and developed recreational opportunities. However, abundant public open space lands remain available for dispersed recreational opportunities. Cumulative development has adversely impacted both small and big game populations as a result of incremental habitat loss and displacement of game species. In addition, it has resulted in increased access to public lands from the construction of roads, which could be considered beneficial to hunting opportunities.

None of the cumulative development projects identified in Section 2.6, Past, Present, and Reasonably Foreseeable Future Actions, would directly affect any parks, concentrated recreational use areas, designated wilderness or Wilderness Study Areas, or other protected areas in the cumulative impact area.

The reasonably foreseeable future actions identified in Section 2.6.2 would result in, at most, a very small increase in the local population. Consequently, the cumulative demand for developed recreational facilities would not be expected to exceed the current supply.

3.11.4 Monitoring and Mitigation Measures

No significant impacts to recreation and wilderness resources were identified; therefore, monitoring and mitigation measures are not recommended.

3.11.5 Residual Adverse Effects

The only residual adverse effect on recreational resources would be the loss of future use of public lands associated with the open pits. There would be no residual adverse effects on wilderness resources.

3.12 Social and Economic Values

3.12.1 Affected Environment

3.12.1.1 Population

The population in Lander County is very closely tied to the population in the town of Battle Mountain. The county's population has been characterized by periods of relative stability followed by occasional brief periods of rapid growth. The population data in **Table 3.12-1** show this stability and growth relationship as well as the relationship of city to county. Census figures indicate the distribution of population between the northern and southern divisions of the county has remained relatively constant over the last 20 years. Approximately 83 percent of the population resides in the northern, i.e., Battle Mountain, division of the county. However, the proportion of population residing within the town of Battle Mountain, as opposed to within the unincorporated northern section of the county, declined between 1980 and 1990. While 84 percent of the northern division population resided within Battle Mountain in 1970, this had declined to 81 percent by 1980 and 67 percent of the population in 1990. This decrease most likely reflects growth of suburban areas, especially trailer and mobile home parks. Annual population figures are not available for the town of Battle Mountain.

3.12.1.2 Income

Table 3.12-2 provides a breakdown of personal income within Lander County between 1989 and 1994. Total personal income in Lander County increased from 1990 to 1994 except for a slight decrease in 1993. From 1989 to 1994, non-farm income made up over 95 percent of all income. Per capita income ranged from \$18,418 in 1990 to \$20,115 in 1994 and averaged \$19,352. There was a drop in per capita income from 1989 to 1990, but it has risen at an average 2.3 percent per year since 1990. Non-farm earnings have been consistently led by private sector earnings sources, which made up 90 percent of the total in 1989, gradually declining to 85 percent in 1994. Mining sector sources have dominated all sources, private and public, providing from 66 to 75 percent of private earnings and from 56 to 65 percent of total non-farm earnings between 1989 and 1994. Notably, these percentages peaked in 1991 and dropped to their lowest levels in 1994. Construction was a major earnings source in

1989, but 1989 was an unusual year as it has been dramatically lower both before and since then. Growth sectors have included wholesale trade and retail trade in the latter years of the analysis period and civilian federal, state, and local government sectors throughout the period.

3.12.1.3 Employment

Employment in Lander County is dominated by the mining industry, which accounted for 46.9 percent of total employment in 1998 (**Table 3.12-3**). The percentage of employment represented by mining has ranged from 55.4 in 1982 to 40.2 in 1994, with no discernible pattern to the variation. It has averaged over 48 percent since 1980. The next largest employers in the county were government, wholesale/retail trade, and services, which made up 21.3 percent, 15.8 percent, and 8.4 percent, respectively, of total employment in 1998 (JBR 1999c).

As shown in **Table 3.12-3**, employment has fluctuated over the last two decades, peaking in 1989, then gradually declining to 1993 before regaining ground through 1998. Analysis of the composition of employment during the period from 1970 to the present indicates that, while mining remains the largest single industry, the county has diversified somewhat by increasing employment in government and trade plus a small manufacturing sector during recent years. Additionally, mining activities have generated activity in non-basic industries such as retail trade; finance, insurance and real estate; and services. Secondary employment generated by mining activity in rural Nevada is estimated using a multiplier of 1.24. For every direct new job in the mining industry, 0.74 indirect new jobs are created in the local economy and 0.5 jobs are created in the larger urban centers of the state (JBR 1999c).

Table 3.12-4 shows the distribution of employment by both place of work and place of residence. Comparing these two distributions is useful for determining whether changes in employment will primarily affect the county where the job site is located. Figures for Lander County indicate that most employment generated within the county is filled by county residents. The mining sector is somewhat higher for place of work than place of residence, possibly indicating that some commuting from neighboring counties may be occurring. However, residential mining employment is still over 90 percent of total mining jobs in the county.

3.0 AFFECTED ENVIRONMENT/ENVIRONMENTAL CONSEQUENCES

**Table 3.12-1
Project Area Population**

Year	Lander County	Battle Mountain Census Division		Battle Mountain Census Designated Place ²
		Population ¹	Percent Change	
1970	2,653	2,207		1,856
1975	3,000	2,496	13.09	
1980	4,076	3,391	35.86	2,749
1985	4,520	3,761	10.91	
1986	4,510	3,752	-0.24	
1987	4,600	3,827	2.00	
1988	5,480	4,559	19.13	
1989	6,270	5,217	14.43	
1990	6,340	5,276	1.13	3,542
1991	6,370	5,300	0.45	
1992	6,380	5,308	0.15	
1993	6,430	5,350	0.79	
1994	6,420	5,341	-0.17	
1995	6,420	5,341	0.00	
1996	6,710	4,932	-7.66	
1997	7,030	5,170	4.83	
1998	7,040	5,360	3.68	

Source: JBR 1999c.

¹Actual population for census years; intercensal estimates using constant population distribution.

²Census Designated Place = a statistical area defined for a census as a densely settled concentration of population that is not incorporated but that resembles an incorporated place in that it can be identified with a name.

**Table 3.12-2
Lander County Personal Income by Major Source and Earnings by Industry
(in \$1,000s unless noted otherwise)**

Item	1989	1990	1991	1992	1993	1994
Income by place of residence						
Total personal income	117,272	116,160	122,525	127,759	125,905	132,389
Nonfarm personal income	114,685	114,621	121,308	126,417	124,033	130,717
Farm Income	2,587	1,539	1,217	1,342	1,872	1,672
Per capita personal income (dollars)	20,002	18,418	19,118	19,221	19,202	20,151
Derivation of total personal income						
Earnings by place of work	104,615	97,440	101,461	106,747	101,187	106,051
Earnings by industry						
Farms earnings	2,587	1,539	1,217	1,342	1,872	1,672
Nonfarm earnings	102,028	95,901	100,244	105,405	99,315	104,379
Private earnings	91,670	84,056	87,278	91,586	84,795	88,852
Agricultural services, forestry, fishing, and other ¹	96	(D) ²	110	104	104	101
Mining	60,191	61,682	65,007	66,089	59,463	58,780
Construction	13,243	3,846	(D) ²	(D) ²	(D) ²	(D) ²
Manufacturing	347	(D) ²	(D) ²	1,836	2,196	2,308
Nondurable goods	(D) ²	(D) ²	(D) ²	1,836	2,196	2,308
Durable goods	(D) ²	0	0	0	0	0
Transportation and public utilities	3,666	3,782	3,410	(D) ²	(D) ²	(D) ²
Wholesale trade	803	1,053	624	602	1,668	2,167
Retail trade	5,894	5,127	5,088	5,757	6,189	7,283
Finance, insurance, and real estate	670	675	540	567	617	521
Services	6,760	7,480	8,611	8,581	7,081	6,194
Government and government enterprises	10,358	11,845	12,966	13,819	14,520	15,527
Federal, civilian	2,664	2,867	2,996	3,169	3,450	3,709
Military	107	128	121	135	126	124
State and local	7,587	8,850	9,849	10,515	10,944	11,694

Source: JBR 1996a.

¹“Other” consists of wages and salaries of U.S. residents employed by international organizations and foreign embassies and consulates in the U.S.

²(D) Data are either not reported or too few sample points were reported to maintain confidentiality. As a result, data are not shown to avoid disclosure of confidential information.

**Table 3.12-3
Lander County Non-Farm Employment by Industrial Classification¹ (Percent)**

Year									Total
	Gov't.	Mining	Const.	Manuf.	T&PU ²	Trade	FIRE ³	Serv.	
1969	<1.50	64.71	<1.50	<1.50	2.62	23.27	2.31	5.39	649
1970	20.43	48.32	0.43	0	4.32	18.27	1.95	6.27	925
1975	19.80	49.84	3.03	0	3.10	18.24	0.39	5.59	1,288
1980	18.30	51.19	3.50	0	2.22	18.56	1.18	5.05	1,940
1981	16.85	54.46	1.23	0	2.22	19.82	1.08	4.34	2,119
1982	18.63	55.39	0.11	0	2.50	17.48	1.36	4.52	1,836
1983	19.94	50.82	0.25	0.51	2.53	14.11	1.26	10.57	1,580
1984	20.46	48.58	0.47	1.01	3.68	12.04	1.30	12.45	1,686
1985	19.16	51.15	1.03	0.60	3.75	12.76	1.45	10.10	1,654
1986	20.66	46.53	3.05	0.19	3.69	12.84	1.27	11.76	1,573
1987	17.44	53.50	2.62	0.19	3.14	10.05	1.05	12.01	2,099
1988	16.38	47.29	8.29	0.53	2.99	10.15	1.09	13.27	2,472
1989	15.17	48.08	11.05	0.21	2.89	10.50	1.01	11.09	2,868
1990	16.75	51.79	3.39	0.15	3.13	10.32	0.95	13.52	2,626
1991	17.57	49.92	3.26	0.70	2.92	10.34	1.01	14.27	2,572
1992	17.90	48.03	3.16	1.13	3.83	11.29	1.02	13.64	2,559
1993	21.01	43.28	2.10	1.68	5.04	13.44	1.26	12.18	2,380
1994	21.31	40.16	4.92	1.64	4.92	16.80	1.23	9.43	2,440
1995	20.12	43.89	3.85	1.54	3.08	17.52	1.01	9.73	2,465
1996	18.90	44.95	3.81	1.52	2.85	17.46	1.00	9.49	2,698
1997	19.35	47.64	1.26	1.59	3.32	16.91	1.22	9.08	2,708
1998	21.25	46.89	0.73	1.47	4.03	15.75	1.47	8.42	2,730

Source: JBR 1999c.

¹ Reflects employment by place of work. Does not necessarily coincide with county of residence. Includes multiple job holders.

² Transportation and Public Utilities.

³ Finance, Insurance, Real Estate.

**Table 3.12-4
Lander County 1990 Employment Distribution by Place of Work and Place of Residence**

	Employment by Place of Work ¹	Employment by Place of Residence
Agriculture	(D)	168
Mining	1,360	1,231
Construction	89	216
Manufacturing	(D)	89
Transportation	82	142
Trade	271	388
Finance	25	35
Service	355	649
Government	440	N/A
Total Non-Farm	>2,622	2,750
Total	N/A	2,918

Source: JBR 1996a.

¹ Reflects multiple job holders.

(D) Not shown to avoid disclosure of confidential information.

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**Table 3.12-5
Labor Force and Unemployment**

Year	Labor Force		Unemployment		Unemployment Rate (Percent)		
	Lander County	Nevada	Lander County	Nevada	Lander County	Nevada	United States
1970	1,180	218,300	30	12,800	2.4	5.9	4.9
1975	1,510	288,400	50	27,800	3.6	9.6	8.5
1980	2,340	430,000	90	27,000	3.9	6.3	7.1
1981	2,630	463,000	110	33,000	4.0	7.1	7.6
1982	2,530	483,000	240	49,000	9.5	10.1	9.7
1983	2,300	486,000	280	48,000	12.2	9.9	9.6
1984	2,100	500,000	160	39,000	7.4	7.8	7.5
1985	2,160	521,000	180	42,000	8.1	8.0	7.2
1986	2,090	532,000	200	32,000	9.4	6.0	7.0
1987	2,480	557,000	150	35,000	6.3	6.3	6.2
1988	2,930	586,000	140	30,000	5.0	5.2	5.5
1989	3,260	602,000	190	30,000	5.9	5.0	5.3
1990	3,080	667,000	210	33,000	6.7	4.9	5.5
1991	3,020	693,000	170	38,000	5.5	5.5	6.7
1992	3,140	715,000	250	47,000	7.8	6.6	7.4
1993	2,980	746,000	340	54,000	11.8	7.2	6.8
1994	2,890	779,000	300	48,000	10.3	6.2	6.1
1995	2,980	816,000	250	45,000	8.4	5.6	5.6
1996	3,070	840,600	280	45,500	8.6	5.4	5.4
1997	3,040	883,200	210	36,200	8.9	4.1	4.8
1998	2,920	924,200	290	38,400	9.7	4.2	4.5

Source: JBR 1999c.

County, state, and federal labor force and unemployment rates are presented in **Table 3.12-5**. Over the last 25 years, Lander County unemployment rates have ranged from 2.4 percent in 1970 to 12.2 percent in 1983. State of Nevada unemployment rates have ranged from 4.9 percent in 1990 to 10.1 percent in 1982. National unemployment rates have ranged from 4.9 percent in 1970 to 9.7 percent in 1982.

During the 1970s and early 1980s, the county had low unemployment rates of 2 to 4 percent. Following the mine closures in late 1981, two effects were seen: unemployment increased and labor force decreased. These two effects reflect the choices facing people who were laid off; they could either remain in the county and try to obtain other employment, or relocate out of the county. A closer look at labor market changes following the 1981 mining reductions indicates that construction workers left the area labor force within 3 months of being laid off while many mining employees remained in the area for up to a year and a half. Mining company layoffs have occurred throughout the 1990s, resulting in some labor force emigration

and increased unemployment rates, which have been significantly higher in Lander County than state and national rates.

3.12.1.4 Public Finance

The mining industry has substantially influenced the public finances of Lander County. As seen in **Table 3.12-6**, Lander County revenues increased dramatically during the late 1980s, which coincides with an increase in hiring in the mining industry. Most of this increase in revenues can be attributed to two sources: 1) ad valorem or property taxes (which reflect mine and mill improvements and net proceeds) and 2) sales taxes (which reflect mine construction and operations purchases). For the 18 years illustrated, only 6 showed a decrease from the previous year. In five of the six cases, the fund levels recovered within 1 to 3 years and continued to grow such that the increase from 1980 to 1997-98, including the drop in the last year indicated, has averaged 7.8 percent per year.

**Table 3.12-6
Lander County General Fund Revenues**

Year	Revenues	Year	Revenues
1980	\$1,454,759	1989	\$3,422,695
1981	\$1,633,404	1990	\$3,882,947
1982	\$1,629,949	1991	\$4,280,893
1983	\$1,586,894	1992	\$4,147,999
1984	\$1,599,205	1993	\$3,890,817
1985	\$1,929,918	1994	\$4,682,661
1986	\$1,809,694	1995	\$5,544,399
1987	\$2,306,874	FY 1996-97	\$5,876,662
1988	\$3,202,667	FY 1997-98	\$5,189,779

Source: JBR 1999c.

Table 3.12-7 compares the distribution of revenue sources for Lander County and the statewide average for counties in Nevada. Lander County has notably higher proportionate shares contributed by State City County Relief Tax and Intergovernmental Revenues (sales taxes).

Because of the high share of sales tax revenues, an important issue facing Lander County is its status as a sales tax exporting county. In 1991, the Nevada State Legislature assigned counties to one of two categories for purposes of determining their share of retail sales taxes: exporting or guaranteed. The guaranteed counties received a pre-determined amount of sales tax revenues based upon total statewide sales and local population growth. Most of Nevada's rural counties are in the guaranteed category. The exporting counties were those with sales tax revenues, generated by local county sales, that were sufficiently large that they did not need a state subsidy. Instead, such counties would export a portion of their sales taxes to other counties. The primary importance of this status is that an exporting county's sales taxes are dependent upon local county economic conditions and, therefore, may fluctuate widely. Because of Lander County's large sales tax revenues and rapid growth in taxable sales associated with the late 1980s mining industry expansion, it was placed in the export county status. The mining industry stabilized in the early 1990s, reducing construction purchases significantly. The subsequent mining industry contraction reduced

taxable sales to a level below their 1991-92 peak, although they again raced upward from 1994-95 through 1996-97. The fluctuations in taxable sales for the county are shown in **Table 3.12-8**.

The effect of the mining industry expansion on Lander County's property tax base can be seen in **Table 3.12-9**. The total value of mining-related property increased from \$58 million in 1986 to over \$176 million in 1993-94, although it dropped again after that. As shown in **Table 3.12-9**, net proceeds of mines have fluctuated over the past few years from over \$95 million in 1993-94 to less than \$20 million in 1997-98. **Table 3.12-10** shows the relative importance of mining to Lander County property values in 1993. Mining provided over 49 percent of Lander County's taxable property base, compared with the statewide average of just 5.7 percent.

3.12.1.5 Public Education

In the state of Nevada, education monies are allocated to the districts on a per-pupil basis. At the end of the first school month of each school year, the number of pupils is counted for each district, and the state allocates its funds accordingly.

Lander County School District operates two high schools, one junior high, and four elementary schools. One high school and one elementary school are located in Austin while the rest are in Battle Mountain. Attendance in Battle Mountain schools is shown in **Table 3.12-11**.

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**Table 3.12-7
Comparative Sources of General Fund Revenue (1989)**

Source	Lander County Average (percent)	State Average (percent)
Opening Fund	26.64	12.12
Ad Valorem	16.63	16.39
State City County Relief Tax	26.50	24.93
Fines, Permits	5.79	13.18
Intergovernmental	15.87	10.71
Charges for Services	4.41	5.99
Other	4.16	16.68
TOTAL	100.00	100.00

Source: JBR 1996a.

**Table 3.12-8
Lander County Taxable Sales**

Year	Sales
1985-1986	\$36,882,194
1986-1987	\$36,603,042
1987-1988	\$59,565,770
1988-1989	\$73,920,426
1989-1990	\$95,240,506
1990-1991	\$95,248,507
1991-1992	\$97,619,646
1992-1993	\$82,584,324
1993-1994	\$84,828,664
1994-1995	\$93,818,075
1995-1996	\$128,237,907
1996-1997	\$162,887,144
1997-1998	\$110,238,996

Source: JBR 1999c.

**Table 3.12-9
Lander County Mining Property Value (in \$1,000s)**

Fiscal Year	Value of Mining Property	Net Proceeds	Total Mining-Related
1986	\$18,459	\$39,387	\$57,846
1987	\$30,938	\$69,458	\$100,396
1988	\$35,494	\$78,537	\$114,031
1989	\$38,021	\$58,796	\$96,817
1990	\$75,852	\$63,667	\$139,519
1991	\$92,768	\$68,335	\$161,103
1991-92 ¹	\$90,911	\$68,335	\$159,246
1992-93	\$88,501	\$58,140	\$146,641
1993-94	\$81,551	\$95,483	\$176,704
1994-95	\$78,101	\$88,373	\$166,474
1995-96 ²	\$81,023	\$92,742	\$173,765
1996-97 ²	\$105,086	\$37,698	\$147,731
1997-98	\$130,869	\$19,614	\$150,483

Source: JBR 1999c.

¹Reporting changed from calendar year to fiscal year in 1992.

²Values reflect changes made by the State Board of Equalization.

**Table 3.12-10
Comparative Segregation of Property Values, 1992-93
(all dollar values in \$1,000s)**

	State		Lander County	
	Value	Percent	Value	Percent
Real Property				
Vacant	\$ 3,665,494	12.8	\$ 5,308	3.1
Agricultural	\$166,019	0.6	\$5,921	3.4
Improved				
Residential	\$11,498,816	40.2	\$15,133	8.8
Commercial	\$7,583,076	26.5	\$20,001	11.6
Mining	\$422,234	1.5	\$68,167	39.7
Net Proceeds	\$672,256	2.3	\$0	0.0
Public Utilities	\$1,788,278	6.2	\$32,261	18.8
Other	\$343,760	1.2	\$335	0.2
Personal Property				
Machinery	\$1,469,661	5.1	\$767	0.4
Mobile Homes	\$242,392	0.8	\$5,633	3.3
Mining Equipment	\$536,467	1.9	\$16,888	9.8
Other	\$212,492	0.7	\$1,339	0.8
Gross Total	\$28,600,945	100.0	\$171,753	100.0
Total Mining¹	\$1,630,957	5.7	\$85,055	49.5

Source: JBR 1996a.

¹Total Mining is comprised of Mining, Net Proceeds, and Mining Equipment.

**Table 3.12-11
Battle Mountain School Enrollment**

Schools	Students					
	1989-90	1992-93	1993-94	1994-95 ¹	1996-97 ²	1998-99 ¹
Battle Mountain High School	314	344	390	387	358	403
Battle Mountain Junior High	315	336	344	319	392	243
Mary S. Black Elementary	311	354	366	330	361	283
Eliza Pierce Elementary	398	377	400	385	529	329
Lemaire Middle School ³	--	--	--	--	--	367
TOTAL	1,338	1,411	1,611	1,523	1,640	1,625

Source: JBR 1996.

¹First enrollment count.

²End of year enrollment count.

³Opened in 1998.

Table 3.12-12 summarizes the school enrollment in the county from 1983-84 through 1998-99. A 1987 population increase, largely associated with increased mining, resulted in enrollment increases exceeding 38 percent over 2 years and caused overcrowded conditions. Most of this increase occurred in the Battle Mountain area of the county. To accommodate this increase, and much slower continuing growth in subsequent years, the district used portable classrooms until the new Lemaire elementary school was opened in 1998. Continuing budget constraints have caused the district to institute a hiring freeze. As a consequence, the student:teacher ratio is now approximately 17:1, up substantially from 13:1 in 1992-93.

3.12.1.6 Housing

Census data showed that 62 percent of housing in Lander County, and almost 65 percent of housing in the northern part of the county around Battle Mountain, consists of mobile homes or other manufactured housing. **Table 3.12-13** illustrates that most of the new housing available between 1980 and 1990 consisted of mobile homes. While single family, detached houses increased by 13.1 percent, mobile homes increased by over 133 percent. The rapid growth strained the capacity of the local infrastructure and utilities. The 1989 Environmental Assessment for BMG's Copper Basin/Copper Canyon project stated that "the housing situation is very near capacity...low water pressure...and limited sewage treatment capacity place constraints on future development" (BLM 1989). By 1991, however, the pressure had eased somewhat, reflecting reduced population growth and, hence, reduced demand (BLM 1991a). The vacancy rate in 1990 was 7.9 percent. However, this has increased with the mining slowdown. The

housing market has continued to loosen since 1991 as the mining industry has reduced employment, and population growth has slowed or even stabilized. Approximately 5 percent of the housing stock was available for sale or rent in 1996.

According to the 1990 Census, the county's housing was primarily owner-occupied (approximately 71 percent) and that is believed to still be true in 1999 (JBR 1999c). Most of the rentals available are mobile homes. An average of approximately 40 properties are available for sale at any one time, typically staying on the market for 4 to 6 months. Temporary housing is available in nine motels/hotels in Battle Mountain comprising over 386 rooms (JBR 1999c).

3.12.1.7 Other Public Services

Water and Sewer

Battle Mountain Water and Sewer serves approximately 4,300 people in the Battle Mountain area. Water use is approximately 2 million gallons per day in the summer, though the annual average is 1 million gallons per day. Water comes from three wells that are used at approximately half capacity with a fourth well scheduled to come on-line southwest of town in 1997. Growth should not be a problem for water and sewer services in the community (JBR 1996a).

Battle Mountain Water and Sewer handles 0.64 million gallons per day in sewage. The system can handle up to 1.2 million gallons per day. Expansion is currently being considered. More ponds will be added, if needed, as the community grows (JBR 1996a).

**Table 3.12-12
Lander County Enrollment and Teaching Staff**

Year	Enrollment	Teachers	Student:Teacher Ratio
1983-84	1,093		
1984-85	1,043		
1985-86	1,009		
1986-87	1,033	59	18:1
1987-88	1,099	61	18:1
1988-89	1,336	66	20:1
1989-90	1,522	73	21:1
1990-91	1,536	88	17:1
1991-92	1,523	96	16:1
1992-93	1,411	110	13:1
1993-94	1,611	104 ¹	15:1 ¹
1994-95	1,523	99	15:1
1995-96	1,668	98	17:1
1996-97	1,726	97	18:1
1997-98	1,697	98	17:1
1998-99	1,694	98	17:1

Source: JBR 1996a,c.

¹Including support personnel, so student:teacher ratio would be higher.

**Table 3.12-13
Battle Mountain and Lander County Housing by Type**

Type of Unit	Battle Mountain Division 1990	Lander County 1990	Lander County 1980	Lander County Percent Change 1980 to 1990
Single Family, Detached	627	867	766	13.1
Multi-Family	101	118	151	-21.8
Mobile Home, Trailer	1,321	1,602	686	133.5
Total	2,049	2,586	1,603	61.3

Source: JBR 1996a.

Waste Management

The waste disposal facility for Battle Mountain is a Class 1 industrial/municipal facility, which has the capability to process up to 20 tons of waste per day. The facility does not have process scales fully operational, and actual figures of present utilization are lacking. The facility is expected to be able to handle the area's waste disposal needs for more than 20 years with growth continuing at its current rate. A moderate increase in the rate of growth can be absorbed by the current facility (JBR 1996a).

Fire Protection

The volunteer fire department in Battle Mountain has 25 members. Ten of the volunteers are

certified Emergency Medical Technicians (JBR 1999c).

Equipment available to the department consists of six trucks, all equipped with first aid kits. Volunteers respond to accidents, structural fires, hazmat incidents, and wildland fires, and assist the Battle Mountain Ambulance Service with extrications. The department is generally responsible for an area that extends 27 miles west, 35 miles east, 55 miles south, and 25 miles north of Battle Mountain, although the department has responded to calls at greater distances on occasion. The department has a mutual aid agreement with the BLM and the Nevada Division of Forestry, which maintain significant equipment and personnel in the area during the summer wildfire season (JBR 1999c).

Medical Services

Medical services in Battle Mountain are handled primarily by the Battle Mountain General Hospital and Nursing Home. In 1990, with funds provided by a grant, the hospital began a 5-year strategic planning process. The result was a new patient wing with 23 beds (16 designated long-term care and 7 acute), a new emergency/trauma suite, laboratory, x-ray, respiratory therapy, and physical therapy facilities completed in 1996. The second phase of the project relocated the clinic into the existing hospital's patient wing in 1997. The old clinic is occupied by public health.

The hospital provides 24-hour service, including the emergency/trauma suite. There is a full-time staff of 63, including physicians, medical technologists, nurses, respiratory therapists, physical therapists, and support personnel.

Lander County contributes to health care in Battle Mountain through its Public Health Department. Staff and facilities are adequate to handle the caseload for the county, however, an influx of people could pose problems, and staffing/facilities would have to be re-evaluated (JBR 1999c).

Nevada Home Health Service, a private, non-profit home health agency based in Elko, also supplies medical services to the Battle Mountain community. Staff is adequate for the number of people using the service, and a population increase could be accommodated with no hardship (JBR 1999c). Another home health agency, Home Health Services of Nevada, has locations in Battle Mountain, Winnemucca, and Elko. It is a Nevada-licensed and Medicare-certified home health agency.

The Battle Mountain Medical Clinic, located in the hospital's former patient wing, has a family practice doctor, an internal medicine doctor, a licensed practical nurse, a medical assistant, and support staff. Services include family practice, internal medicine, and some minor surgery. Serious injuries are taken to the hospital. A further increase in population will require re-evaluation of the clinic's capacity (JBR 1999c).

Mental health services are provided for Battle Mountain by Winnemucca Mental Health Center. A marriage and family counselor from its staff is in Battle Mountain to see patients 2 days a week. For more serious cases, the counselor refers patients to a psychiatrist or psychologist in the Winnemucca office. The Winnemucca Mental

Health Clinic opened a small office in Battle Mountain with a full-time clinician on staff to handle everything from depression to child/family counseling to case management for those with more serious mental illness. The center has been able to meet the demands of the community thus far. An increase in population, and therefore in cases (especially emergency cases) may, however, cause a decrease in response time. Waiting lists have already been implemented in Winnemucca (JBR 1996a).

3.12.2 Environmental Consequences

This section describes potential impacts to population, income, employment, public finance, schools, housing, and other public services, which include water and sewer, waste management, fire protection, and medical services.

The Proposed Action and No Action alternative were evaluated for issues relating to the social, cultural, and economic well-being and health of minorities and low income groups. Such issues are termed environmental justice issues, and none were identified for the Phoenix Project. Social and economic impacts of the Proposed Action and No Action alternative would not affect minority or low income groups disproportionately. Potential effects to Native Americans are presented in Section 3.8, Cultural Resources.

Due to the fluctuating populations in surrounding communities and the variability in gold process, which could affect regional population levels in the future, the following assumptions have been developed to provide a basis for the socioeconomic impact assessment.

Analysis Assumptions

Work Force Assumptions

No Action alternative assumptions for temporary resumption of mining are listed below:

- The current BMG work force of 20 workers would continue through the 5-year closure and reclamation period. An additional 80 workers would be hired for a 6-month period to resume mining and complete production of the ore available under existing permits.
- The work force is assumed to be 60 percent local; 40 percent of the construction work force would enter the area from non-local origins.

- 100 percent of the new mining work force would seek temporary (i.e., rental or RV site) housing in Lander County.
- The indirect construction employment (secondary or induced employment) is assumed to mimic a construction scenario so an employment multiplier of 1.2 is employed.
- Based on previous EISs prepared for similar gold mining projects in northern Nevada, it is assumed that 70 percent of the indirect labor force would be second persons in a direct labor household or current residents of the Battle Mountain area.
- Based on the assumption that the temporary mining work force would resemble a construction scenario, the work force composition is estimated to be 80 percent single (including married without family present) and 20 percent married with families. The population estimates are based on 1 person per single household and an average of 2.77 persons per married household (based on average household size in Lander County).

Proposed Action assumptions for construction and operations are as follows:

- 300 to 350 employees would be required over the 12- to 18-month construction period.
- 230 to 250 new employees would be needed in addition to the current BMG work force of 20 for a total of 250 to 270 employees during the projected 28-year life of the project.

Construction Phase Assumptions

- The construction work force is assumed to be 25 percent local; 75 percent of the construction work force would enter the area from non-local origins.
- 100 percent of the new construction work force would seek temporary (i.e., rental or RV site) housing in Lander County.
- The indirect construction employment (secondary or induced employment) is calculated using a construction employment multiplier of 1.2 (Dobra 1989).
- Based on previous EISs prepared for similar gold mining projects in northern Nevada, it is assumed that 70 percent of the indirect labor

force would be second persons in a direct labor household or current residents of the Battle Mountain area.

- Based on previous EISs prepared for similar gold mining projects in northern Nevada, the construction work force composition is estimated to be 80 percent single (including married without family present) and 20 percent married with families. The population estimates are based on 1 person per single household and an average of 2.77 persons per married household (based on average household size in Lander County).

Operations Phase Assumptions

The operations phase assumptions were developed primarily from previous EISs prepared for similar gold mining projects in northern Nevada and on an employee survey conducted by BMG during August 1993. The survey was completed by 101 respondents, representing 110 employees (including households with more than one BMG employee), or approximately 83 percent of the work force. BMG Although the size and composition of the BMG work force has changed since 1993, the survey continues to provide guidance in estimating the effects of the proposed Phoenix Project. The survey revealed the following employee characteristics:

Employment and Residency

- 70 percent of employees had been employed by BMG for over 10 years; the average BMG employment was 14.5 years.
- 99 percent of employees lived in Lander County; 77 percent lived within the Battle Mountain township limits.
- The average length of residency in Lander County was 17.4 years.

Demographics

- The 101 households contained 301 persons for an average household size of 2.98, which extrapolates to a total of 355 project-related residents in Lander County.
- 78 percent of the employees were male; 22 percent were female.
- 76 percent of the employees were married.

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- The 101 households had a total of 78 school-age children for an average of 0.77 school-age children per household, which extrapolates to a total of 92 project-related students.

Housing

- 93 percent of the employees owned their own homes.
- 60 percent of the employees lived in mobile homes; 39 percent lived in single-family homes.
- Average monthly housing cost for mobile homes was \$551; for single-family homes it was \$593.
- 9 percent of total households contained more than one employee.

Household Spending

The average household spent \$228 per week, or \$988 per month, on household purchases in Battle Mountain.

Comparing the results of the employee survey with the general population of Lander County at the same time revealed the following demographic differences: 1) BMG employees were more likely to own their homes (93 percent of employees compared to 70 percent of Lander County); 2) BMG employees were more likely to be married (78 percent of employees compared to 62 percent of Lander County); 3) BMG employee household size was larger (2.98 for employees compared to 2.77 for Lander County); and 4) more BMG employees lived in the county for over 5 years (93 percent of employees compared to 54 percent of Lander County).

Based on the results of the BMG employee survey and on previous EISs prepared for similar gold mining projects in northern Nevada, the following operations phase assumptions were used to conduct the socioeconomic impact assessment:

- The new operations work force is assumed to be 40 percent local; 60 percent non-local.
- 100 percent of the new operations work force would reside in Lander County; 77 percent of these workers would reside within the Battle Mountain township limits.

- The indirect operations employment (secondary or induced employment) is calculated using an operations employment multiplier of 1.74 (Dobra 1989).

- It is assumed that 70 percent of the indirect labor force would be second persons in a direct labor household or current residents of the Battle Mountain area.

- The new operations work force composition is estimated to be 75 percent married with families and 25 single parent or married with absent families.

- The population estimates are based on 1 person per single household and an average of 2.98 persons per married household, including an average of 0.77 school-age children.

- 93 percent of the new operations work force would want to purchase a residence (60 percent mobile homes; 40 percent single-family homes).

Significance Criteria

Socioeconomic impacts are considered significant if the following criteria are met or exceeded. Both beneficial and adverse impacts were evaluated and are disclosed.

- Changes in local population, employment, or earnings associated with operations is 5 percent or more.
- Demand for temporary or permanent housing exceed the expected supply of available housing during the scheduled construction and operations periods.
- Long-term demands on public services and infrastructure consume capacities in these systems, either triggering the need for capital expansion or resulting in a discernable reduction in the level of service provided.
- The project's effects on public sector fiscal conditions result in a 5 percent or greater change in revenues or expenditures, or the underlying fiscal conditions are affected beyond the life of the project.
- The project substantially affects a number of residences or businesses by displacement or

other use of the property without fair and reasonable compensation.

- Changes induced in the social or business community are likely to cause important changes in organizational structures, local government, or traditional lifestyles of the community.

In addition to the general social and economic criteria of significance, the following significance criterion specifically addresses considerations of Environmental Justice:

- The project disproportionately affects minority or low-income populations, including human health or environmental effects.

3.12.2.1 Proposed Action

Construction of the proposed facilities is anticipated to take approximately 12 to 18 months. During that time, the construction work force would grow to a peak of 300 to 350 workers. Current employees are expected to continue working through the construction phase and transition into the new facilities and operations as permitted. The operations work force would continue to grow to a peak of 250 to 270 employees (20 existing and 230 to 250 new employees). It is expected that the life of the project would be up to 28 years.

Population

Anticipated minimum and maximum population increases resulting from construction of the Proposed Action are presented in **Tables 3.12-14** and **Table 3.12-15**, respectively. Anticipated minimum and maximum population increases resulting from project operations are presented in **Tables 3.12-16** and **3.12-17**, respectively. The tables also include anticipated indirect or secondary employment.

Construction. In-migrating construction workers and their families would number approximately 328 to 385 persons (**Tables 3.12-14** and **3.12-15**). This would represent a 4.7 to 5.5 percent increase over the 1998 Lander County population of 7,040 (**Table 3.12-1**). These numbers represent the Proposed Action peak construction work force, which would be on-site for only part of the construction phase. Typical construction would involve fluctuating work forces as special crews may only be employed for certain projects lasting only several weeks. The population increases would be temporary (18 months or less).

Operations. In-migrating operations workers and their families would number approximately 416 to 453 persons (**Tables 3.12-16** and **3.12-17**). This increase would represent a 5.9 to 6.4 percent increase over the 1998 Lander County population of 7,040 (**Table 3.12-1**). It is assumed that approximately 77 percent (320 to 349 persons) would seek to reside within the Battle Mountain township limits. This would represent a 5.9 to 6.5 percent increase over the 1998 Battle Mountain Division population of 5,360 (**Table 3.12-1**). These population increases would be considered significant as they are above the 5 percent significant impact threshold.

The practical effect of the estimated population increases is not known, despite the fact that they would exceed the significance threshold, because data are not readily available on the actual current population of Battle Mountain and Lander County. There have been numerous layoffs in the mining industry since the 1998 population estimates were prepared; however, data are not available on how many of the workers may have moved their families out of the Battle Mountain area to find new employment. (Total county employment was down by almost 460 workers, however, from 2,730 in 1995 to 2,270 in 1999.) Realistically, it is likely that a substantial portion of the estimated “new” population for the Phoenix Project would be replacing population lost in recent years as a result of the layoffs.

Income and Employment

Construction. The construction work force would grow to a peak of 300 to 350 workers. Indirect employment generated by the construction activity is projected at 60 to 70 additional jobs, raising the temporary construction impact to 360 to 420 (**Tables 3.12-14** and **3.12-15**). Local labor is expected to meet 25 percent of the direct project jobs and 70 percent of the indirect jobs during construction, leaving a demand for 243 to 284 workers from outside the local area. The employment impact during construction represents a 9.3 to 10.8 percent increase over Lander County’s 1990 employment when reported on a place-of-work basis, and a 8.9 to 10.4 percent increase compared to the 1995 employed work force of 2,730. This increase in employment during the construction period would be temporary (12 months or less).

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**Table 3.12-14
New Construction-related Employment, Households,
and Population Projections - Minimum**

New Construction-related Employment¹								
Direct²			Indirect³			Total		
Local	Non-Local	Total	Local	Non-Local	Total	Local	Non-Local	Total
75	225	300	42	18	60	117	243	360
New Construction-related Households								
			Direct⁴	Indirect⁵	Total New Households			
New Non-Local Workers			225	18	0			
Single			180	7	187			
Married – 1 Worker			41	5	46			
Married – 2 Workers			2	3	5			
New Households			223	15	238			
New Construction-related Population								
		Population⁶						
		Households	Adults	Children⁷		Total		
				School-Age	Other			
Single Households		187	187	0	0	187		
Married Households		51	102	31	8	141		
Total		238	289	31	8	328		

¹Construction-related employment would range from 300 to 350.

²Construction work force is assumed to be 25 percent local, 75 percent non-local.

³Construction-generated indirect employment is calculated using an employment multiplier of 1.2; the indirect work force is assumed to be 70 percent local and 30 percent non-local.

⁴The direct construction work force is assumed to be 80 percent single, or married without families present; 10 percent of the married households are assumed to be two-worker families.

⁵The indirect work force is assumed to be 40 percent single, or married without families present; half of the married households are assumed to be two-worker families.

⁶Population estimates are based on one person per single household and 2.77 persons per married household.

⁷Eighty percent of the children are assumed to be of school age.

**Table 3.12-15
New Construction-related Employment, Households,
and Population Projections - Maximum**

New Construction-related Employment ¹								
Direct ²			Indirect ³			Total		
Local	Non-Local	Total	Local	Non-Local	Total	Local	Non-Local	Total
88	263	350	49	21	70	137	284	420
New Construction-related Households								
			Direct ⁴	Indirect ⁵	Total New Households			
New Non-Local Workers			263	21				
Single			210	8	219			
Married – 1 Worker			47	6	54			
Married – 2 Workers			3	3	6			
New Households			260	18	278			
New Construction-related Population								
		Population ⁶						Total
		Households	Adults	Children ⁷				
				School-Age	Other			
Single Households		219	219	0	0			219
Married Households		60	120	37	9			166
Total		279	339	37	9			385

¹Construction-related employment would range from 300 to 350.

²Construction work force is assumed to be 25 percent local, 75 percent non-local.

³Construction-generated indirect employment is calculated using an employment multiplier of 1.2; the indirect work force is assumed to be 70 percent local and 30 percent non-local.

⁴The direct construction work force is assumed to be 80 percent single, or married without families present; 10 percent of the married households are assumed to be two-worker families.

⁵The indirect work force is assumed to be 40 percent single, or married without families present; half of the married households are assumed to be two-worker families.

⁶Population estimates are based on one person per single household and 2.77 persons per married household.

⁷Eighty percent of the children are assumed to be of school age.

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**Table 3.12-16
New Operations-related Employment, Households,
and Population Projections - Minimum**

New Operations-related Employment¹								
Direct²			Indirect³			Total		
Local	Non-Local	Total	Local	Non-Local	Total	Local	Non-Local	Total
92	138	230	119	51	170	211	189	400
New Operations-related Households								
			Direct⁴	Indirect⁵	Total New Households			
New Non-Local Workers			138	51	0			
Single			35	20	55			
Married – 1 Worker			93	15	108			
Married – 2 Workers			5	8	13			
New Households			133	43	176			
New Operations-related Population								
		Population⁶						
		Households	Adults	Children⁷		Total		
				School-Age	Other			
Single Households		55	55	0	0	55		
Married Households		121	242	90	29	361		
Total		176	297	90	29	416		

¹New operations-related employment would range from 230 to 250.

²Operations work force is assumed to be 40 percent local, 60 percent non-local.

³Operations-generated indirect employment is calculated using an employment multiplier of 1.74 (Dobra 1989); the indirect work force is assumed to be 70 percent local and 30 percent non-local.

⁴The direct operations work force is assumed to be 25 percent single, or married without families present; 10 percent of the married households are assumed to be two-worker families.

⁵The indirect work force is assumed to be 40 percent single, or married without families present; half of the married households are assumed to be two-worker families.

⁶Population estimates are based on one person per single household and 2.98 persons per married household.

⁷Seventy-five percent of the children are assume to be of school age.

**Table 3.12-17
New Operations-related Employment, Households,
and Population Projections - Maximum**

New Operations-related Employment ¹								
Direct ²			Indirect ³			Total		
Local	Non-Local	Total	Local	Non-Local	Total	Local	Non-Local	Total
100	150	250	130	56	185	230	206	435
New Operations-related Households								
			Direct ⁴		Indirect ⁵		Total New Households	
New Non-Local Workers			150		56		0	
Single			38		22		60	
Married – 1 Worker			101		17		118	
Married – 2 Workers			6		8		14	
New Households			144		48		192	
New Operations-related Population								
		Population ⁶						
		Households	Adults	Children ⁷		Total		
				School-Age	Other			
Single Households		60	60	0	0	60		
Married Households		132	264	98	32	393		
Total		192	324	98	32	453		

¹New operations-related employment would range from 230 to 250.

²Operations work force is assumed to be 40 percent local, 60 percent non-local.

³Operations-generated indirect employment is calculated using an employment multiplier of 1.74 (Dobra 1989); the indirect work force is assumed to be 70 percent local and 30 percent non-local.

⁴The direct operations work force is assumed to be 25 percent single, or married without families present; 10 percent of the married households are assumed to be two-worker families.

⁵The indirect work force is assumed to be 40 percent single, or married without families present; half of the married households are assumed to be two-worker families.

⁶Population estimates are based on one person per single household and 2.98 persons per married household.

⁷Seventy-five percent of the children are assume to be of school age.

3.0 AFFECTED ENVIRONMENT/ENVIRONMENTAL CONSEQUENCES

Direct payroll to construction workers, including the value of benefits, is projected to be approximately \$13 million to \$15 million on an annual basis. Much of this would be spent locally for items such as food, clothing, fuel, and rent, stimulating the local economy.

Operations. The existing BMG operations work force would increase substantially with an additional 230 to 250 workers for the Phoenix Project. Indirect employment generated by the operations activity is projected at 170 to 185 additional jobs, raising the total operations-related employment to 400 to 435 (**Tables 3.12-16** and **3.12-17**). Local labor is expected to meet 40 percent of the direct project jobs and 70 percent of the indirect jobs during operation of the Phoenix Project, leaving a demand for 189 to 206 workers from outside the local area. The employment impact during operations represents a 7.2 to 7.7 percent increase over Lander County's 1990 employment when reported on a place-of-work basis (**Tables 3.12-4**), and a 6.9 to 7.6 percent increase compared to the 1995 employed work force of 2,730. This increase in employment during the operations period would be a substantial economic benefit to individuals and to the economy, and would be considered significant (i.e., over the 5 percent threshold).

An estimated annual payroll for the total BMG operation, including benefits, would be \$12.7 million, or \$1.1 million per month. Each \$1.00 in local earnings would indirectly generate \$0.37 in earnings to other workers in the local economy (U.S. Bureau of Economic Analysis 1992; Dobra 1989). Consequently, the annual indirect impact on earnings would be \$4.7 million (\$391,600 monthly), yielding a combined indirect impact of \$17.4 million (\$1.5 million per month). The increase in income earnings would be a substantial economic benefit accruing from the project to the local economy.

Public Finance

Construction. During the construction phase, the principal revenue change for Lander County would result from an increase in sales and use tax revenues. According to BMG, it is estimated that annual state and local capital expenditures by the mine would amount to \$82.3 million. BMG estimates this would generate approximately \$2.4 million per year in sales and use tax revenue for the state and Lander County for the 12 to 18 months affected by construction. Approximately \$1.7 million of the total would accrue to Lander

County. This would constitute a 32.3 percent increase over the county's fiscal year 1997-98 general fund revenue. It would be more than six times the 5 percent significance threshold, resulting in a significant beneficial economic impact.

Operations. BMG estimates the state and local taxes generated by the Phoenix Project during operations would average \$2.4 million per year (in year 2000 dollars). Lander County would benefit from approximately \$887,000, or 37 percent of the total, annually. The Lander County portion would constitute a 17.1 percent increase over the county's fiscal year 1997-98 general fund revenue total, and would exceed the 5 percent significance threshold by more than three times, resulting in a significant beneficial economic impact.

Public Education

Construction. Enrollments in the Battle Mountain area schools would temporarily increase by approximately 31 to 37 students during the construction phase (**Table 3.12-14** and **3.12-15**). An influx of 31 to 37 children would increase total enrollment in Battle Mountain schools by approximately 2 percent over 1998-99 levels (**Table 3.12-11**). Additionally, the school district has lost from 300 to 500 students since the beginning of the 1998-99 school year due to job losses and families departing the area (Campbell 2000; Duvall 2000). Consequently the effect of the construction-related enrollment increase would be temporary, lasting one or two school years, and could be accommodated within existing capacity so it would not be considered significant.

Operations. Enrollments in the Battle Mountain area schools would increase by approximately 90 to 98 project-related students during the operations phase of the Phoenix Project (**Tables 3.12-16** and **3.12-17**). This influx of school-age children would increase total enrollment in Battle Mountain schools by approximately 6 percent over 1998-99 enrollment levels (**Table 3.12-11**). This could be accommodated within existing capacity and would not be a significant impact, particularly considering the post-1998-99 enrollment losses noted above.

Housing

Construction. Construction-related demand for housing is estimated at from 238 to 278 units during the highest construction activity periods (**Tables 3.12-14** and **3.12-15**). Although data are

not available to accurately determine the current availability of housing in the Battle Mountain area, 1990 census data and 1998 population estimates (**Table 3.12-1**) suggest there are approximately 2,600 dwelling units in Lander County, perhaps 2,100 of which are in or very near Battle Mountain. These estimates do not include the over 386 motel/hotel rooms and an unknown number of RV spaces. A demand for up to 278 units would constitute 13.3 percent of the permanent housing units at Battle Mountain, or 10.7 percent of the Lander County units (**Table 3.12-13**). With perhaps 400 to 500 families having left town in recent years (Hinze 2000), current estimates, though admittedly not supported by data, place the vacancy rate at 15 to 20 percent (Campbell 2000). This would indicate over 315 units are available in Battle Mountain, alone. In combination with hotel/motel rooms and RV sites, which many construction workers prefer, this should provide an ample amount of housing for the anticipated construction work force.

Operations. Operation of the proposed Phoenix Project would generate demand for an estimated 176 to 192 housing units for the life of the project (**Tables 3.12-16** and **3.12-17**). As noted above, the current soft housing market indicates there would be more than enough housing available to accommodate this level of demand. Given the approximately 50 foreclosures in the past 30 months (Duvall 2000), it would be expected that an increase in housing demand would benefit the community at this time.

Other Public Services

Construction. Generally, existing utilities and emergency response services have indicated there should be few, if any problems accommodating the estimated maximum of 385 new people the Phoenix Project would bring to Lander County and the Battle Mountain community. Some reservations were expressed about the capacity of the Battle Mountain Medical Clinic and of mental health services. However, the loss in recent years of an estimated 400 to 500 families from the community (Hinze 2000) indicates earlier capacity concerns would have been reduced, if not eliminated, since they were first expressed. It is expected, therefore, that project construction would have only minor and insignificant effects on public services and facilities in the Battle Mountain area.

Operations. The operations phase of the Phoenix Project would generate an estimated influx of 416

to 453 people to the Battle Mountain/Lander County community. Although greater than the construction population, 416 to 453 additional people would not be expected to create demand for public services and facilities in excess of available capacity. A loss of 400 to 500 families (Hinze 2000), as noted above, would have resulted in a loss of 1,000 to 1,500 people, indicating the community facilities and services accommodated two to three times the number of expected new workers in the recent past. As a result, no significant adverse effects are anticipated.

Displacement and Social Organization

The proposed Phoenix Project would not displace any existing residences or businesses. It would temporarily use rangeland for mining purposes, but the incremental acreages are minor in the context of the total grazing allotment and would not be considered significant (see Sections 3.6.2 and 3.10.2).

The proposed project is not expected to cause changes in the social structure or traditional lifestyles of the Battle Mountain or Lander County communities. There has been, and is currently, a very substantial mining presence in the county, despite recent industry declines. The proposed Phoenix Project would bolster that presence, but would not alter the county's overall balance of mining, ranching, and tourism to a significant degree. No project-related effects on governmental structure have been identified.

3.12.2.2 No Action Alternative

The No Action alternative would allow for the currently permitted activities to continue as planned. Mining would resume for a period of about 6 months, followed by closure and reclamation operations, which would continue for approximately 5 years. Without further expansion plans and related permits, BMG operations would then cease. The No Action analysis is based on the assumption that the current 20 employees would remain employed at the mine until the cessation of all operations in about 2006. An additional 80 workers would be employed for the 6-month mining resumption period only.

Population

Resumption of mining, as permitted under the No Action alternative, would result in a temporary, 6-month increase to the area population of about

3.0 AFFECTED ENVIRONMENT/ENVIRONMENTAL CONSEQUENCES

53 people (**Table 3.12-18**). Because of the short duration of mining under this alternative, it is assumed that the employment and population "bubble" would behave more like a construction effect than like a mining operation effect. That means fewer non-local workers would be likely to relocate their families for a 6-month job assignment, so a higher percentage would show up as "single or married without families present." Upon completion of the brief mining period, the area population would return to current levels and stabilize for the 5-year period of closure and reclamation.

At the time the project is closed, the regional economy should be able to assimilate the relatively small number of current workers (20) that would be laid off, either in Lander County or in neighboring counties thereby maintaining the current population at or near its existing level. However, determining the exact extent of assimilation and out-migration is not possible at this time as the assimilative potential of the region is dependent on prevailing economic conditions and the timing of the layoffs.

Income and Employment

Resumption of mining would raise the BMG project-generated income and employment for a brief 6-month period. Employment would increase by 80 workers to a total of 100. Average monthly payroll would increase by \$3.5 million to almost \$4.4 million. After mining is completed, both employment and income generated by BMG would return to current levels.

The local income and employment conditions, as currently affected by BMG operations, would persist until final closure in approximately 5 years. The project would continue to account for 20 mining employees, or approximately 2.0 percent of the county mining and construction sectors (using 1999 average sector employment levels). This is currently a modest contribution to county employment, although overall county mining employment continues to decline (Duvall 2000).

The existing average monthly payroll at the mine is approximately \$56,000 (\$672,000 annually), including benefits. This approximate level is expected to continue until mine closure. Using an assumption that approximately 70 percent of the payroll is disposable income (based on an average income tax rate of 30 percent), then approximately \$39,200 in 1997 dollars would be available monthly (\$470,400 annually) for local

expenditures and savings. Based on the results of the BMG employee survey, BMG households purchase approximately 75 percent of their household purchases within Lander County. This amounts to approximately \$29,400 spent monthly (\$352,800 annually) by BMG employees in the Lander County economy. These expenditures would cease with the shutdown of the mine.

Public Finance

Resumption of mining under the No Action alternative would increase payroll taxes, sales taxes, and net proceeds taxes to local, state, and federal taxing jurisdictions for approximately 6 months. Tax contributions to local agencies would be approximately \$130,000, primarily for property taxes and sales taxes. Net proceeds taxes would be negligible because the project has been in a loss posture in recent years that would carry forward for tax purposes. The \$130,000 amount would be approximately 2.5 percent of total annual county general fund revenue, although the BMG contribution for the resumed mining period would continue for only 6 months. After the 6-month mining period, the No Action alternative would revert to a gradual phase-down of processing of previously mined ore for approximately 5 years while the project returned primarily to closure and reclamation activities.

After the brief mining resumption period is completed, BMG would continue to pay property taxes, payroll taxes, and sales taxes to local, state, and federal taxing entities, but at approximately the reduced levels currently being paid. BMG is currently not required to pay net proceeds taxes because of the loss posture of the project.

As the phase down of operations continued, tax contributions by the mine would decrease, lagging project activity by 1 year in most cases. The year following shutdown would be the last year of tax contribution, resulting in a cessation of most tax payments, except for property taxes on the private land portion of the project, which would be based primarily on agricultural use rates.

Public Education

Resumption of mining under the No Action alternative would increase local school enrollment by an estimated five students for a brief period (**Table 3.12-18**). After the brief mining period, enrollment would return to current levels, which are well below capacity and an estimated 500

**Table 3.12-18
New No Action Operations-related Employment, Households, and Population Projections**

New No Action Operations-related Employment ¹								
Direct ²			Indirect ³			Total		
Local	Non-Local	Total	Local	Non-Local	Total	Local	Non-Local	Total
48	32	80	11	5	16	59	37	96
New No Action Operations-related Households								
			Direct ⁴	Indirect ⁵	Total New Households			
New Non-Local Workers			32	5	0			
Single			26	2	28			
Married – 1 worker			6	2	8			
Married – 2 Workers			0	1	1			
New Households			32	5	37			
New No Action Operations-related Population								
		Population ⁶						
		Households	Adults	Children ⁷		Total		
				School-Age	Other			
Single Households		28	28	0	0	28		
Married Households		9	18	5	2	25		
Total		37	46	5	2	53		

¹New, temporary operations-related employment is estimated at 80.
²Operations work force is assumed to be 60 percent local, 40 percent non-local.
³Operations-generated indirect employment is calculated using an employment multiplier of 1.2; the indirect work force is assumed to be 70 percent local and 30 percent non-local.
⁴The direct operations work force is assumed to be 80 percent single, or married without families present; 10 percent of the married households are assumed to be two-worker families.
⁵The indirect work force is assumed to be 40 percent single, or married without families present; half of the married households are assumed to be two-worker families.
⁶Population estimates are based on one person per single household and 2.77 persons per married household.
⁷Seventy-five percent of the children are assume to be of school age.

students below peak enrollment levels in 1998 (Duvall 2000). They would remain at this level through closure and reclamation in approximately 5 years. Subsequently, there could be a decrease in students unless the current workers obtain jobs within commuting distance of their current homes.

Housing

The temporary resumption of mining under the No Action alternative would generate an estimated 37 new households in the Battle Mountain area (**Table 3.12-18**). The short, 6-month duration of mining, however, suggests that all of the demand for housing would be temporary, also. Households of singles, or single equivalents, would likely seek rentals ranging from motel rooms and RV sites to rental homes. Family households would more likely prefer rental homes or, perhaps, RV sites with quality amenities. At the completion of mining, housing demand would revert to the current level, where it would remain for approximately 5 years.

Subsequently, there could be a decrease in housing demand unless the current workers obtain jobs within commuting distance of their current homes.

Other Public Services

The temporary resumption of mining would increase demand for local public facilities and services by a small amount, roughly equivalent to the percentage increase in population. The demand would be temporary, and total demand would remain below levels experienced when the local population peaked in 1999. Capacities should be ample to accommodate the change. At the completion of mining, service demands associated with the No Action alternative would revert to current levels, where they would remain for approximately 5 years. After closure and reclamation are complete, there could be a decrease in the demand for public facilities and most services unless the current workers obtain

jobs within commuting distance of their current homes.

3.12.2.3 *Environmental Justice*

Executive Order No. 12898 of February 1994 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."

EPA guidelines (CEQ 1998) for evaluating potential adverse environmental effects of projects require specific identification of minority populations 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 population than of the population of some other appropriate geographic unit, as a whole. Neither of these circumstances was found to exist in the vicinity of the proposed Phoenix Project.

The proposed Phoenix Project would be an expansion of existing mining activities in an unpopulated, rural area. ***The No Action alternative would comprise the completion, closure, and reclamation of the currently authorized mining operations at the Battle Mountain Complex. Neither of these actions*** would have discernible effects on human health in area communities, minority and low-income or otherwise. The project would not discriminate against minority or low-income communities in hiring or any other matter.

Despite the fact that no particularly vulnerable minority or low-income population was identified near the project site, an extensive effort was made to provide all interested parties in the project vicinity with access to public information and opportunities to participate in the review process for the project. An informational letter was sent to individuals, organizations, and state and local agencies describing the proposed project and requesting comments. Similar notices were published in newspapers in the area. See Sections 4.1 and 4.2 for additional information on the public notification process.

In addition to the general public consultation process, a supplementary communication and

coordination effort was conducted with the Native American community in the area, including a site visit for interested Native American participants. Every effort was made in the public consultation process to ensure that access to information was available to all interested parties in a non-discriminatory manner.

The project analyses in this EIS have not identified any adverse effects impacting low-income or minority populations differently from the general population. The EIS will be made available to all interested parties for review and comment to ensure that the analyses and conclusions regarding environmental justice and all other issues are comprehensive and reasonable.

3.12.3 Cumulative Impacts

The social and economic cumulative effects area for the Phoenix Project encompasses the impacted communities in Lander County, Nevada, with the focus being the town of Battle Mountain. The social and economic effects of past and present activities are largely reflected in the affected environment data presented in Section 3.12.1. Consequently, potential cumulative effects are addressed in the discussion of environmental consequences (Section 3.12.2).

The proposed expansion of the Marigold Mine would add approximately 13 people to the work force at that location in approximately the same timeframe as the proposed Phoenix Project. Considering the apparent availability of housing and public facilities and services in the Battle Mountain area, this level of increased employment is unlikely to cause cumulative adverse social or economic effects in the analysis area.

There is potential for modest, cumulative aggravating effects of the No Action alternative in concert with the anticipated closure of the Trenton Canyon Mine in 2005 and the Lone Tree Mine in 2006. The No Action alternative would release the last of the 20 current BMG workers in approximately 6 years, near the same time Trenton Canyon would be releasing 130 workers and the release of 350 Lone Tree workers. The combined effect would adversely affect the economy and community life of the Lander County/Battle Mountain area, reducing economic activity, depressing the housing market, and reducing public tax revenues.

3.12.4 Monitoring and Mitigation Measures

The BLM can and does encourage local, county, and state governments or agencies to initiate discussions with the project proponent on the basis of the analysis presented in the EIS. The establishment of a dialogue based on mutual advantage and understanding, and a commitment to a shared responsibility for resolution of the potential impacts associated with project development, could lead to the preparation and implementation of mitigation measures that are advantageous to all parties. In particular, the volatility of the mining economy in the Lander County area suggests that predicted social and economic effects could change if employment opportunities in the industry change. It is recommended that BMG work with local governments to monitor the effects of the proposed project to ensure that they are consistent with the projections discussed in this EIS. Consistent monitoring will facilitate adjustments in local planning efforts if major deviations from the projections should occur.

3.12.5 Residual Adverse Effects

There would be no residual adverse effects associated with social and economic issues as a result of the Proposed Action.

3.13 Visual Resources

3.13.1 Affected Environment

The study area lies in the Great Basin Section of the Basin and Range Province, according to the Physical Divisions of the United States classification of Nevin M. Fenneman (1946). This area is typified by generally wide, flat to gently sloping basins bounded by widely scattered, isolated mountain ranges. These mountain ranges are highly variable in size, extent, and character and typically rise 3,000 to over 5,000 feet above the surrounding basins.

While most of the mountains tend to be elongated ranges consisting of a spine of interconnected mountain peaks, the proposed Phoenix Project is located in a relatively small, conical formation known simply as Battle Mountain. Battle Mountain is located along the south side of the Humboldt River valley, just south of Interstate 80 near the town of Battle Mountain, Nevada.

A series of deeply incised drainages radiate out from Antler Peak in the central portion of the mountain, which creates a somewhat complex pattern of internal ridges and canyons. The proposed project is located primarily in the Copper Canyon drainage in the southern portion of the mountain range but includes the ridges and canyons of other minor drainages to the southeast, including Philadelphia and Iron canyons. Portions of the project are therefore located on elevated, exposed ridgetops, while other portions are located in lower, more concealed canyons.

The proposed Phoenix Project is located in an area that has been mined historically, and large-scale mining operations continue. Both historic and recent mining operations also are present in the northern and eastern portions of the mountain range.

As with many of the mountain ranges in this region, vegetation consists of a low, relatively sparse shrub community. As a result, the color and texture are primarily determined by the geology of the landform. For this reason, past and current mining operations on Battle Mountain are visually evident because of the resulting unnatural color and texture contrasts within the surrounding darker, undisturbed rock. Other visual modifications exist but are much less extensive and noticeable. These include some areas of

recent mineral exploration, some historic small-scale mining operations, and jeep roads.

The project area is visible from Interstate 80, portions of the town of Battle Mountain, and State Highway 305, which runs southwest from town past portions of the project area. It also is visible from a number of homes and ranches south of town. In addition, the Buffalo Valley Road and Willow Creek Road, which carry primarily recreation-oriented traffic, pass near the southern end of the proposed project.

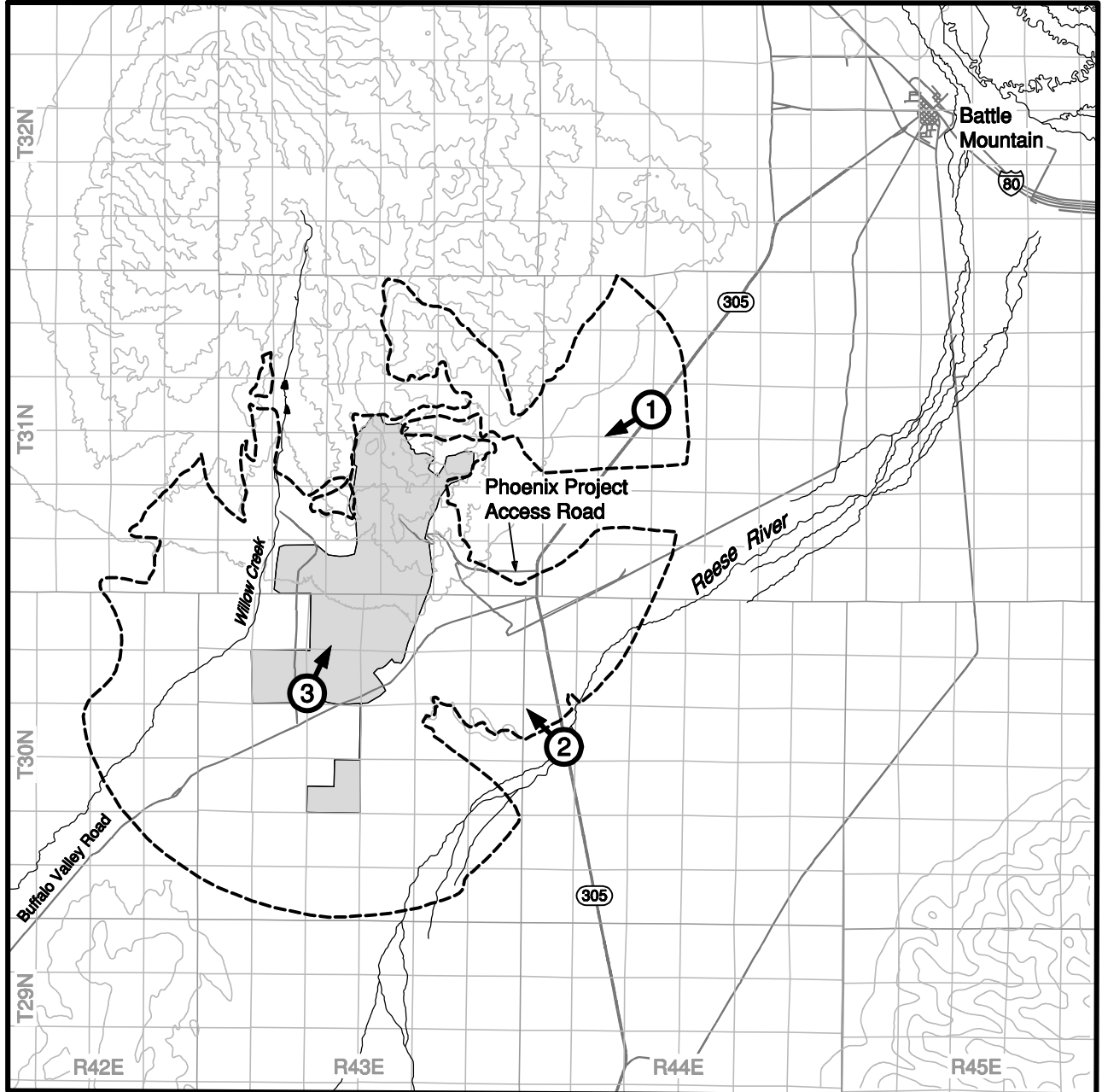
The project area has been inventoried for visual resources using BLM's Visual Resource Management program. This area has a visual resource management designation of Class IV. The management guidelines for this classification are as follows:

The objective of this class 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 attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic [landscape] elements (BLM 1986c).

3.13.2 Environmental Consequences

The study area for visual resources is the viewshed within 5 miles of the proposed Phoenix Project (**Figure 3.13-1**). Areas of disturbance from previous operations are currently visible from a number of viewpoints, as noted. The primary issues related to visual resources, therefore, would include 1) an increase in the number of sensitive viewpoints impacted by the project, 2) significant increases in the extent or scale of visible mining disturbances, and 3) the ultimate appearance of the project at full reclamation versus current and interim stages of active mining.

The process used to assess visual impacts is the standard BLM Contrast Rating process, as outlined in BLM Technical Manual 8432, "Visual Contrast Rating." In simplified terms, this process consists of assessing the degree of visual contrast between the existing landscape character and condition with the character and condition that would occur following project development. The



Explanation

- Road
- Drainage
- - - 5-Mile Viewshed Boundary
- Project Facility Boundary
- ① Key Observation Points:
 - 1 - State Highway 305 Southbound View
 - 2 - State Highway 305 Northbound View
 - 3 - Willow Creek Road View



Phoenix Project

Figure 3.13-1

5-Mile Viewshed

level of visual contrast is then compared to the visual management guidelines for that area, as determined by its visual resource management class designation to determine compatibility with the guidelines for that class designation.

Significance of visual impacts would be judged as follows:

- **Significant** – Predicted visual contrast that exceeds the visual resource management class guidelines.
- **Moderate** – Predicted visual contrast levels that are fully at the level of change allowed, but that do not exceed the management guidelines.
- **Low** – Predicted visual contrast levels that are clearly below the management class allowable thresholds for visual change.

3.13.2.1 Proposed Action

Viewpoints affected by the proposed project include portions of Interstate 80, portions of the town of Battle Mountain (south and east of the town proper), State Highway 305, ranches south of the project, and the Buffalo Valley and Willow Creek roads. Of these, State Highway 305 and the Willow Creek Road were identified as the most critical viewpoints, due to their close proximity to the mine in addition to the volume (State Highway 305) and sensitivity of the users (Willow Creek Road).

The assessment of potential visual effects under the Proposed Action has been supplemented by photosimulations of the project at reclamation, as seen from three sensitive and commonly used public viewpoints referred to as key observation points. The location map insert on the photosimulations (**Figures 3.13-2, 3.13-3, and 3.13-4**) shows the location of the three key observation points, including northbound and southbound views from State Highway 305 and Willow Creek Road in relation to the Phoenix Project. **Figures 3.13-2 through 3.13-4** show the photosimulations and existing condition photographs from each of these viewpoints. The results of the analysis of impacts to these three viewpoints are discussed below.

State Highway 305 Southbound

Figure 3.13-2 shows the existing conditions view and photosimulations of postreclamation

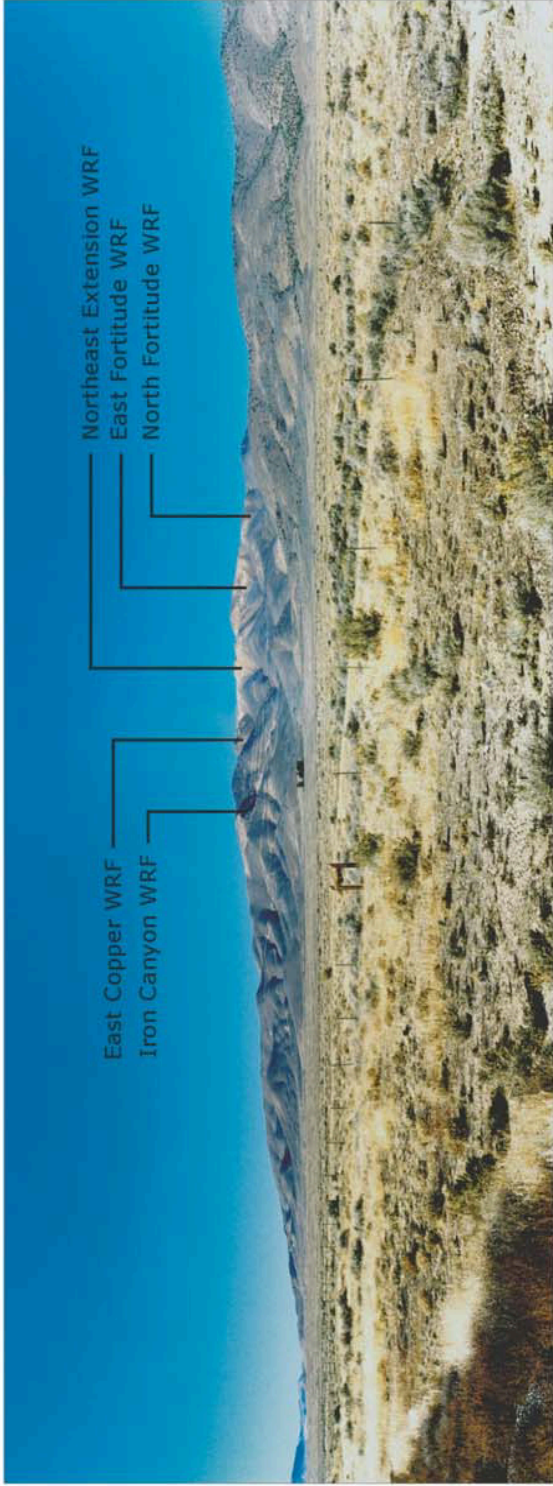
conditions looking southwest toward the project area from southbound Highway 305. As this figure illustrates, disturbance from previous mining activities is visible from the highway. This includes bright-colored waste rock slopes, exposed pit walls, and light colored horizontal banding from exploration roads. Because of the color, form, and line contrasts of these modifications against the surrounding undisturbed landscape, they are readily evident to the southbound highway traveler.

The bottom image is the photosimulation showing the site as it would appear following successful reclamation. As this image shows, the waste rock slopes would be enlarged; however, the effect would be somewhat softened due to the revegetation that would occur. The light-colored, conical-shaped rock peaks on the ridgeline would be removed and the contrast eliminated. A portion of the Iron Canyon Pit would be seen in the location of the current exploration roads. The remainder of the exploration road disturbances would be reclaimed and revegetated.

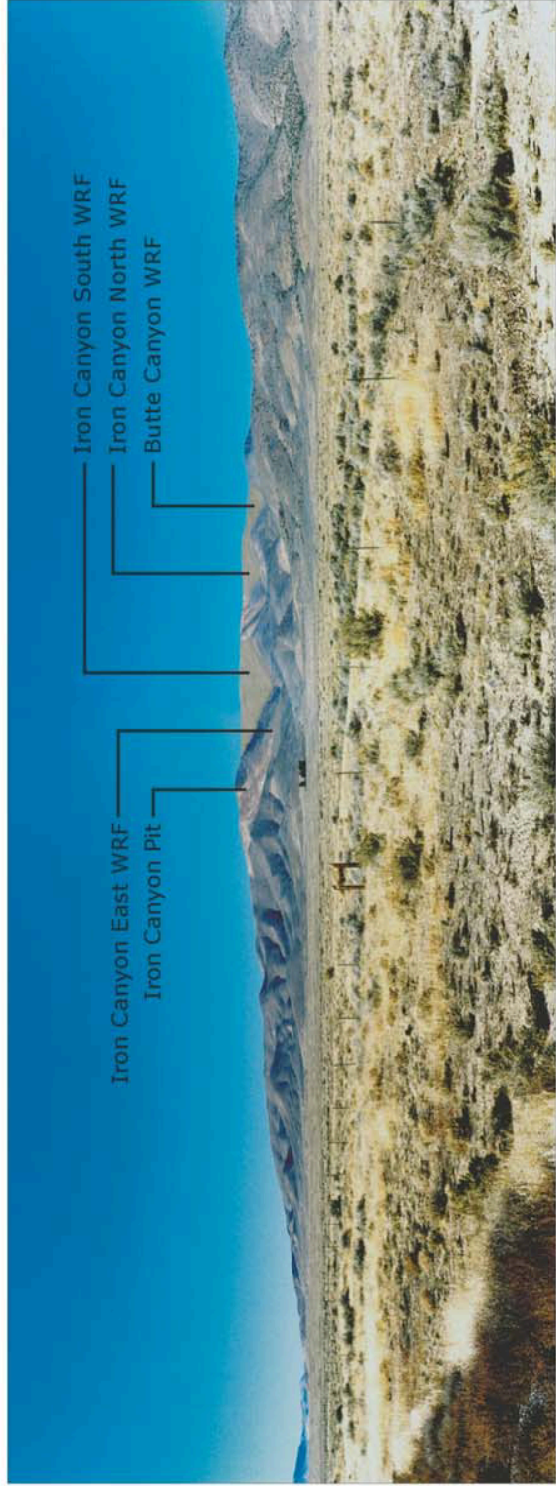
The results of the contrast rating assessment indicate that unnatural forms, lines, and colors would remain; however, important changes would have taken place. While the extent of waste rock facilities would increase, the visibility of the facilities would be reduced following successful revegetation. The amount of exposed rock face also would be expanded; however, unlike the waste rock facilities, it would not be muted by vegetation and would remain highly visible due to a combination of unnatural form and color.

During operation it is probable that night lighting, both stationary (at the Iron Canyon Pit) and vehicular (at the Butte Canyon and Iron Canyon waste rock facilities), would be visible from this viewpoint. Vehicular lighting would be intermittent and only periodically noticeable, while stationary lighting would be continuous throughout the nighttime hours. Due to the orientation of the Iron Canyon Pit, it is likely that any stationary lights in this area would be directed toward the working pit wall and away from highway viewers.

Overall, the extent of area with a high degree of visual contrast would be reduced and consolidated. Therefore, the degree of visual contrast would be considered a net improvement, and the significance of the visual impact would be low. The changes, as described, would conform with the area's Class IV visual resource management designation.

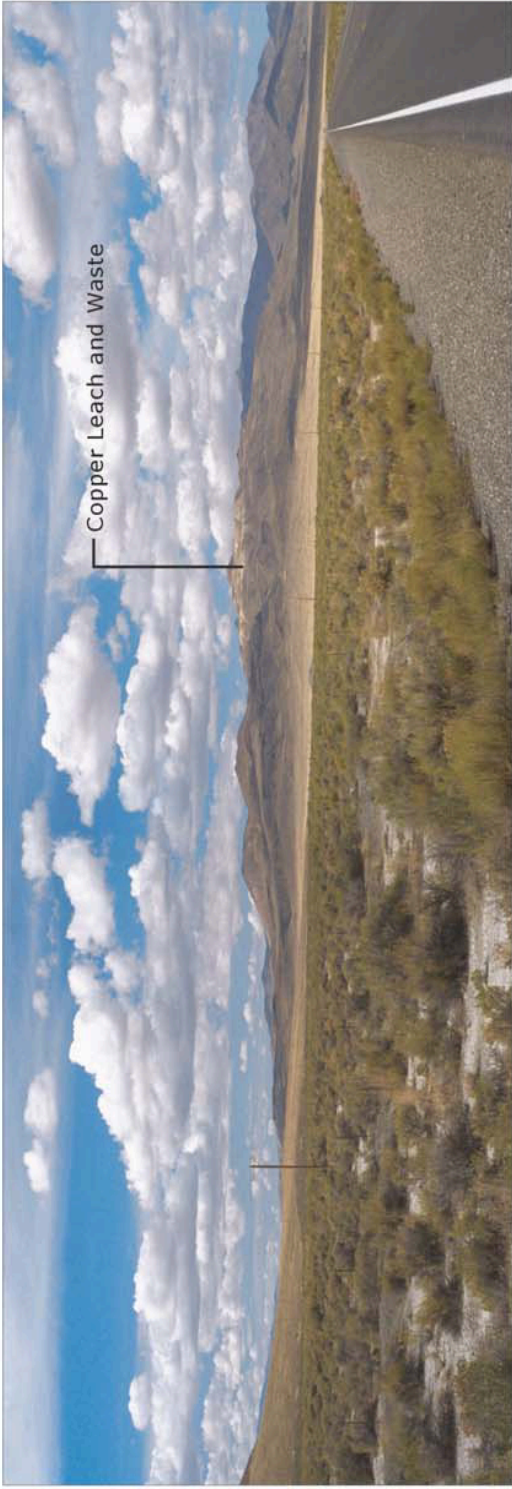


Existing Conditions Photograph

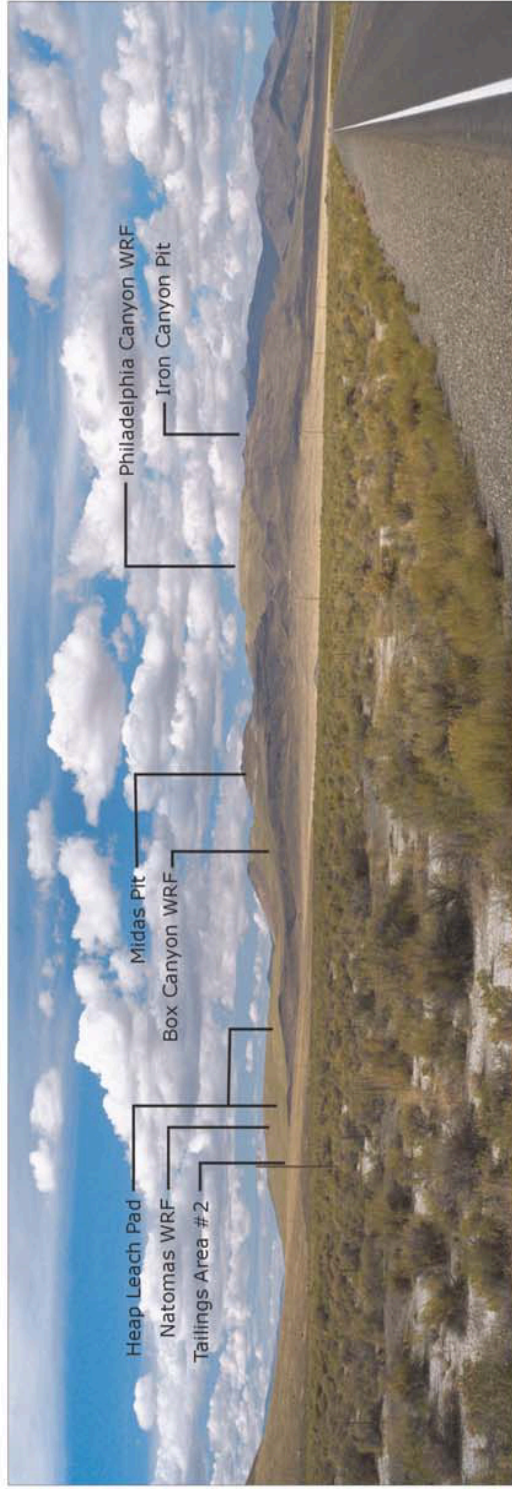


Simulation of Postreclamation Conditions

**Figure 3.13-2: Simulation of Postreclamation Conditions
Hwy. 305, Southbound View**

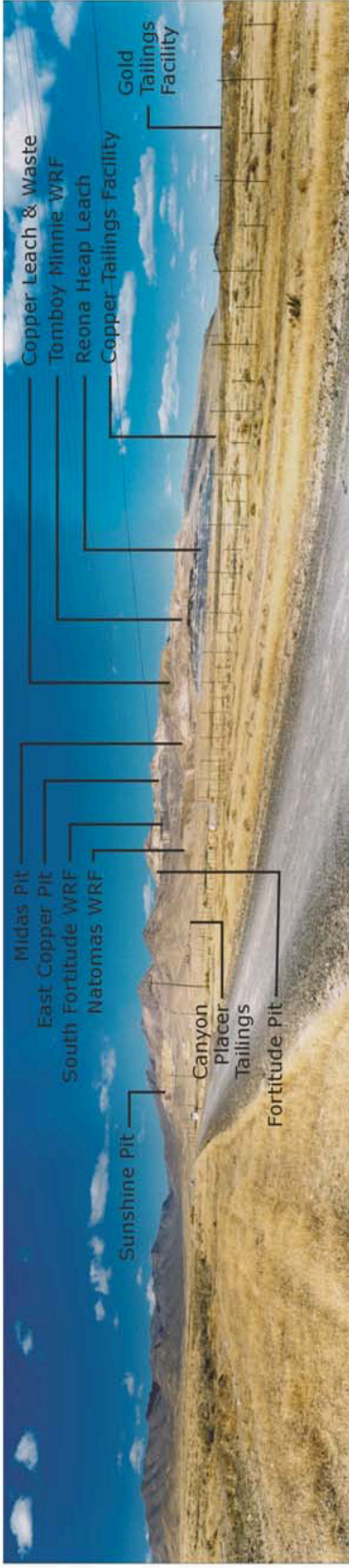


Existing Conditions Photograph

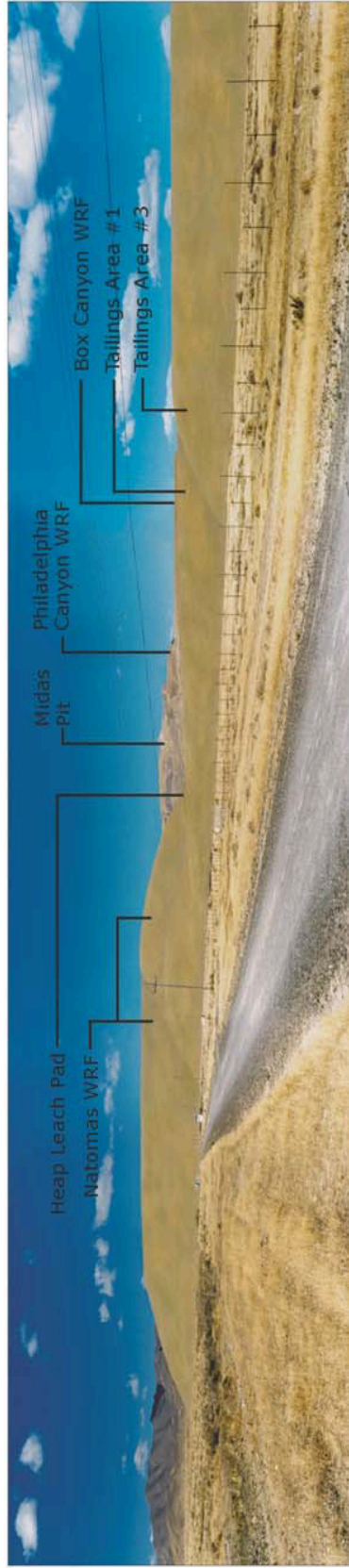


Simulation of Postreclamation Conditions

**Figure 3.13-3: Simulation of Postreclamation Conditions
Hwy. 305, Northbound View**



Existing Conditions Photograph



Simulation of Postreclamation Conditions

**Figure 3.13-4: Simulation of Postreclamation Conditions
Willow Creek Road View**

State Highway 305 Northbound

As illustrated in the existing condition photo on **Figure 3.13-3**, visible portions of the mine are largely limited to waste rock facility slopes and two ridgetop, cone-shaped rock remnants. To a lesser extent, some exploration roads currently are visible.

A substantial increase in the extent of visible mine features would occur following development of the proposed Phoenix Project. The existing talus slopes near the Iron Canyon Pit would be covered by the proposed Philadelphia Canyon waste rock facility. As a result, the visible rock slopes would be expanded and extended. However, the degree of color contrast would be noticeably reduced following successful revegetation of the waste rock slopes. The bright conical peaks on the ridgetop would be eliminated. To the right, a portion of the high wall of the Iron Canyon Pit would break through the ridge and become visible from this location.

The greatest change would come from new facilities south of Philadelphia Canyon. These would include the Box Canyon waste rock facility, the expanded heap leach pad, and Tailings Area #2. Most importantly, the Natomas waste rock facility would become a prominent new landform in what is currently an open valley. While these tailings, heap leach and waste rock facilities would be rounded slightly and revegetated, the scale of their unnatural forms would result in a strong degree of visual contrast.

Most of the major project features, which extend from a portion of the Iron Canyon Pit wall on the north to the southern end of the Natomas waste rock facility, would remain readily visible from this viewpoint. Under the Proposed Action, the extent of visible project features would expand significantly. The degree of visual contrast would be strong, primarily as a result of the large-scale, unnatural landforms. The form and color contrasts of portions of the Iron Canyon and Midas pits also would contribute to the visual contrast, but to a lesser degree. In this visual resource management Class IV area, the significance of the visual impacts would be moderate but would conform with the management guidelines for the area.

During operation, night lighting would be periodically visible from mine vehicles. An undetermined amount of stationary night lighting also would be visible at different locations as mining progresses. It is probable that the

stationary lighting would be focused on working sites, such as the pit walls, and not oriented toward the highway. However, if unshielded or directed to the east, glare and spill would affect the nighttime sky.

Willow Creek Road

Figure 3.13-4 shows the existing condition view and postmining photosimulation as seen from the Willow Creek Road. Similar views would exist from Buffalo Valley Road and the ranches to the south. From this location, extensive pastmining modifications are readily visible. They include pit walls, waste rock facilities, heap leach facilities, tailings disposal areas, and other mining features that (from this viewpoint) appear to be randomly distributed across a wide area. Unnatural colors, textures, forms, and lines of landforms and vegetation appear together. It is clearly a mining landscape on a large scale and, as such, it has visual interest.

As shown in the postmining photosimulation, the extent and scale of mining would substantially increase under the Proposed Action. Dominating this view would be the Natomas waste rock facility, which would overshadow both the natural peaks behind it as well as most other mine features around it. From this viewpoint, Tailings Area #1 and #3 also would be strong new features. Like the Natomas waste rock facility, they would have rounded but strongly geometric forms. From this viewpoint, the angle of view over Tailings Area #1 would screen all but a small corner of the heap leach pad. Portions of the Box Canyon and Philadelphia Canyon waste rock facilities and a small portion of the Midas Pit wall would be visible farther up the hill. As in other views, the largest of the conical rock forms at the top of the ridge would generally be eliminated.

The fact that little exposed rock face would remain visible and that the remainder would be revegetated will provide a much needed, unifying element to the scene. To this extent, the changes envisioned would be considered a net improvement. However, the sheer scale and extent of the resulting landforms would dominate the scene and result in a strong degree of visual contrast as seen from this viewpoint.

The significance of the visual impact is judged to be moderate due to the visual resource management Class IV designation, with which it would conform, and the extent of existing disturbance.

Other Viewpoints

The rural residential areas south and east of the main town of Battle Mountain would have a view most similar to that of southbound State Highway 305. They are considerably farther away, however. Here the significance of visual impact would be low due to the somewhat offsetting effects of reduced waste rock contrasts and increased amount of visible pit wall. This view would be essentially the same from westbound Interstate 80. However, the distance would be even greater and duration and sensitivity would be less. Visual impacts would, therefore, be negligible. From Buffalo Valley Road, views would be similar to the views from Willow Creek Road but at a greater distance. The increased distance would result in greater visibility of the disturbance behind the Natomas waste rock facility and Tailings Areas #1 and #2.

The proposed 120 kV transmission line along Buffalo Valley Road would create an extension of an existing line that crosses Buffalo Valley Road to the southwest of the mine. This extension would occur in an open valley setting that is already influenced by the existing transmission line and the existing mine facilities. Visual contrast would therefore be low to moderate depending upon the specific viewpoint from which it is seen. This area has a visual resource management Class IV designation, and a moderate level of visual contrast would result in a low visual impact.

3.13.2.2 No Action Alternative

State Highway 305 Southbound

Under the No Action alternative, no additional disturbance would be visible beyond that shown in the existing condition photograph in **Figure 3.13-2**. The existing waste rock facilities and exploration roads would be reclaimed similar to that shown in the simulation of the postreclamation conditions in **Figure 3.13-2** for the Proposed Action.

The long-term, postreclamation visual impact of the No Action alternative would differ from the Proposed Action in two basic ways. First, no additional mining would take place in the Iron Canyon Pit, and the amount of exposed pit wall currently visible would not increase. Second, the waste rock facilities would remain at their current size rather than be expanded as under the Proposed Action. Also, the ridgeline would remain somewhat more irregular and natural in appearance. The primary visual impact that would

remain following successful reclamation of the property under the No Action alternative would be the amount of exposed pit wall that currently is visible.

The degree of visual contrast would be improved; therefore, it would not be an adverse visual impact.

State Highway 305 Northbound

Under the No Action alternative, little additional disturbance would be visible from this viewpoint. The existing disturbance, shown in the existing condition photograph in **Figure 3.13-3**, would be reclaimed. The forms and lines that would remain generally would appear natural and similar in scale to the surrounding undisturbed terrain. Color and texture contrasts would be reduced with time as the reestablished vegetation matures.

Visual contrasts and visual impacts would be low and in conformance with this visual resource management Class IV area.

Willow Creek Road

Under the No Action alternative, little additional disturbance would be visible from the Willow Creek Road, Buffalo Valley Road, and the ranches to the south of the project area. Essentially all of the existing visible mining disturbances shown in the existing condition photograph in **Figure 3.13-4** would be revegetated. This would differ significantly from the Proposed Action, which would create large new landforms very near to the road. Following reclamation, the degree of visual contrast would be reduced from that seen currently, and as a result, there would be no additional visual impacts.

During operation, it is anticipated that there would be nighttime lighting visible from this viewpoint due to the number of individual mine features that could be seen in relatively close proximity. These would include a number of vehicular as well as stationary lighting sources. While generally directed at specific work areas, the overall effect on the night sky would be noticeable.

Following reclamation, the visual impact from other viewpoints, including Interstate 80 and rural residential homes south and east of Battle Mountain would all be improved from the current level of visual contrast. The remaining level of visual contrast would be low, resulting in low visual

impacts in conformance with this visual resource management Class IV area.

3.13.3 Cumulative Impacts

The cumulative effects area for visual resources comprises the viewshed of the proposed Phoenix Project and any reasonably foreseeable future actions associated with the Battle Mountain Complex.

The Phoenix Project would be an expansion of a long-established, existing mine. While it represents a substantial expansion as seen from some viewpoints, it would be seen as an expansion rather than a new regional, visual impact. Of most visual significance in the cumulative effects area would be new large-scale projects located in a viewshed without similar evident visual modifications. This is not the case with the Phoenix Project, since it is an expansion of an existing mine in the same viewshed as the McCoy/Cove Mine to the south and the M-I Drilling Fluids plant to the southeast. The cumulative visual impact is judged to be low.

3.13.4 Monitoring and Mitigation Measures

Assuming successful revegetation of all disturbed landforms (except for the exposed pit walls), color and texture contrasts would be reduced to below a level of significance.

It is recommended that new disturbance be limited only to that needed for the safe operation of the facility to reduce the acreage that would need to be reclaimed. The long-term reclamation objective should be to achieve a self-sustaining, native vegetative community so that the colors and textures of the landscape (except for the pit highwalls), in time, would appear no different than that of the surrounding undisturbed landscape. The following measures are recommended to address the creation of large landforms and night lighting.

VR-1: Landforms. Wherever possible the following measures **would** be incorporated into the operation and reclamation of the mine: 1) visually reduce the creation of linear and angular landforms; 2) vary final lifts of waste rock disposal areas and leach pads to create intermediate hummocks and hills; 3) vary interbench heights to reduce linear, equally spaced, terrace-like impacts; and 4) flatten final slopes to 3 horizontal:1 vertical, where possible.

VR-2: Night Lighting. Night lighting **would** be shielded and down directed to avoid light spill and glare as seen from the identified key observation points.

3.13.5 Residual Adverse Effects

The large-scale, unnatural forms and lines of the landforms would remain highly visible from the Willow Creek Road and some ranches to the south. They also would remain readily visible from northbound State Highway 305. These changes would result in long-term visual impacts.

A small portion of the Iron Canyon Pit wall would remain readily visible, particularly in morning light, from southbound State Highway 305. This would result in a low long-term visual impact.

3.14 Noise

3.14.1 Affected Environment

The area of potential influence for noise effects from the proposed Phoenix Project would likely be localized to within 3 to 5 miles of the project site. Describing the existing environment potentially affected by noise from the proposed project involves identifying noise-sensitive receptors and existing noise sources in the vicinity, characterizing terrain features that may affect noise transmission, and determining existing noise levels.

The Phoenix Project area is located in a fairly remote region with little development. The only two occupied ranches in the area are the Filippini Chiara Ranch approximately 3.7 miles southeast of the existing tailings area (proposed tailings area #3) and the D. Filippini Badger Ranch approximately 5 miles south-southeast of the same point. The nearest possible noise-sensitive receptor is the undeveloped Willow Creek recreation area, which is owned by BMG. After these sites, the closest occupied residences are near the town of Battle Mountain, approximately 10 miles northeast of the project site.

The principal sources of noise near the proposed project site are industrial-type heavy equipment noise from the existing mining activities and natural sounds including wind, insects, and birds. Ranching, recreation, and other mining activities in the area generate occasional vehicular noise, although the traffic is generally light.

Terrain in the study area is irregular. The existing mine site and proposed Phoenix Project rest against the south flank of the Battle Mountain range. Terrain to the north and northwest is a complex pattern of irregular mountain ridges and canyons. To the east, south, and southwest, the terrain drops off into the Reese River and Buffalo valleys. Elevations range up to 8,232 feet amsl at Antler Peak, slightly less than 3 miles north of the northern project boundary. The low point in the area is approximately 4,500 feet amsl in the river bottom near the town of Battle Mountain.

A noise study of the existing mine, adjacent property, and points within the town of Battle Mountain was conducted for BMG to identify representative noise baseline conditions and to determine natural ambient environmental noise sources (e.g., wind) (JBR 1996c). Representative

noise monitoring sites were located to measure 1) noise emitted from existing mining operations, 2) noise at outlying residences and recreational areas, 3) noise between the mine and sensitive wildlife areas, 4) noise at selected locations surrounding the mining operations, 5) vehicle noise, and 6) in-town noise. The locations of these sites are described in **Table 3.14-1**. The sites were monitored approximately 24 hours a day for 9 days.

The noise levels at the 24 sites monitored were substantially influenced by the wind. However, between midnight and noon each day, the wind velocity was low enough that it did not adversely influence the noise levels at these sites. Measurements from this period were used to establish baseline noise levels for the 24 sites. It was possible to group the individual monitoring sites based on location and to develop baseline levels for each group. These baselines were then used for comparison with estimated project-related noise levels. These groups consist of 1) in-town sites, 2) State Highway 305 sites, 3) remote residential sites, 4) lower elevation sites south and southwest of the existing mine, 5) higher elevation sites at the existing mine, and 6) recreational sites west and northwest of the existing mine. Based upon this grouping of sites, the noise levels in **Table 3.14-2** were used as the baseline developed from the noise monitoring study (JBR 1996c).

Based upon the midnight to noon period when the wind had the least influence, certain observations are apparent from this study. First, noise from the existing mine does not traverse considerable distances beyond the mine. Second, the noise levels in town were equal to or exceeded noise levels on State Highway 305, at the existing mine, and at the recreational areas northwest of the mine, which indicates the sources of existing noise in town were not from the mine. Third, noise levels at the remote residential areas were not caused by the existing mining operations. Monitoring sites surrounding the mine had low noise levels when the residential areas were elevated.

3.14.2 Environmental Consequences

Noise impacts are commonly judged according to two general criteria: the extent to which a project would exceed federal, state, or local noise regulations and the estimated degree of disturbance to people.

3.0 AFFECTED ENVIRONMENT/ENVIRONMENTAL CONSEQUENCES

**Table 3.14-1
Locations of Noise Monitoring Sites**

Site Number	Description of Site Locations
Site 1	Alley between Mountain and Humboldt Street
Site 2	255 6 th Street
Site 3	On west fence along Highway 305, north of Cottonwood Canyon Road
Site 4	On west fence corner of Zumwalt property
Site 5	On west fence along Highway 305, south of Buffalo Valley Road
Site 6	On west fence along Highway 305, north of turn for barite operation
Site 7	On west fence along Highway 305, north of McCoy Mine Road
Site 8	North of house area near corral fencing, D. Filippini Badger Ranch
Site 9	North of house area near corral fencing, Filippini Chiara Ranch
Site 10	On west fence along Highway 305, south of McCoy Mine Road
Site 11	South ridge by tailings
Site 12	South of Buffalo Valley Road and tailings near power line
Site 13	South of Buffalo Valley Road and adjacent to Nevada Bell building
Site 14	Southwest of Natomas Well and slightly off north side of Buffalo Valley Road
Site 15	Near Natomas Well and beside monitoring well 19
Site 16	North of Natomas Well and west of road to Willow Creek reservoirs
Site 17	West of Willow Creek Road and between picnic area and site 16
Site 18	On fence just east of Willow Creek picnic area
Site 19	On low ridge immediately east of Willow Creek reservoirs
Site 20	North of upper road, east of saddle, and west of site 22
Site 21	Waste rock dump in saddle area
Site 22	Ridge above Philadelphia Canyon, north of road and near white marker
Site 23	Ridge south of office complex
Site 24	Glory Hole

**Table 3.14-2
Baseline Noise Levels**

Monitoring Locations (noise monitoring site no.)	Baseline Hourly L_{eq} (dBA)¹	Average Daily L_{eq} (dBA)²
Battle Mountain town (1,2)	45-55	50-55
Highway 305 (3,5,6,7,10)	35-55	56-63
Vacant ranch residence near mine (4)	38-55	50
Occupied ranch residences (8,9)	30-45	50-56
South and southwest valley floor (11-16)	30-40	49-64
West and northwest recreation areas (17-19)	30-55 ³	48-63 ³
Mine area (20-24)	30-45	57-72

Source: Adapted from JBR 1996c.

¹Predominant range of values with minimal wind influence; lower levels typically represent ambient baseline conditions.

²Range of values among monitoring sites, substantially wind influenced; full day data sets only.

³Site 19 near Willow Creek reservoirs demonstrated unexpectedly high noise levels during nighttime and early morning hours with low wind velocities. No field observations were made to identify a source for the noise, but speculation centers on moving water and/or cattle and wildlife accessing the water source.

dBA = The sound pressure levels in decibels measured with a frequency-weighting network corresponding to the A-scale on a standard sound level meter.

There are no specific federal, state, or local noise regulations that would apply to the Phoenix Project site. Neither the State of Nevada nor Lander County have noise regulations governing mining operations. The U.S. Department of Housing and Urban Development has developed standards for use in evaluating activities under its jurisdiction. Though not applicable to the Phoenix Project, the HUD standard for "acceptable" noise levels in residential areas (65 dBA [Ldn]) is instructive as a guide to human disturbance (U.S. Department of Housing and Urban Development 1984).

Without legislative guidance, the degree of disturbance becomes the key factor in evaluating noise effects, with, in this case, a focus on residents of two ranches south of the project area with some concern also for people using undeveloped recreation areas west of the project site and for residents of Battle Mountain. The concept of human disturbance is known to vary with a number of interrelated factors, including changes in noise levels; the presence of other, non-project related noise sources in the vicinity; peoples' attitudes toward the project; the number of people exposed; and the type of human activity affected, for example sleep or quiet conversation as compared to physical work or active recreation. Consequently, it is helpful to refer to the HUD standard as a quantitative measure of likely disturbance.

Noise impacts would be significant if the Proposed Action or No Action alternative result in the following:

- Project-related noise levels at sensitive receptors exceed the U.S. Department of Housing and Urban Development's 65 dBA "acceptable" day-night average noise level guideline for residential areas.

For purposes of comparison, **Table 3.14-3** illustrates noise levels of some common noise sources.

3.14.2.1 Proposed Action

Major sources of noise from mining and processing operations associated with the Proposed Action would include rock drilling, blasting, loading of rock and ore, truck hauling, ore crushing, crushed ore handling and distribution, and waste rock placement. Project construction also would include some road building. A list of equipment that would be used for the Proposed Action is presented in **Table 3.14-4**. Noise

generation estimates were developed from published EPA data (EPA 1971) and from file data for comparable mining projects in Nevada and other western states.

The proposed project would be located over an area approximately 5.5 miles north to south and 3 to 4 miles east to west. There would be several focal points of activity within that area generating noise. Main noise centers would include the Phoenix, Mida, Reona, and Iron Canyon pits; Philadelphia Canyon, Natomas, North Fortitude, Battle Canyon, Box Canyon, and Iron Canyon (north, south, and east) waste rock areas; mill area; heap leach pad; and tailings areas.

Conservatively assuming attenuation of the noise as it travels over distance, the noise level experienced at the occupied Filippini Chiara and Badger ranch buildings would be below 51 dBA. This level would be noticeable during very quiet periods, but would not be discernable compared to the average daily L_{eq} levels of 50 to 56 measured at the ranches. It is well below the HUD standard. Also, as noted, the projected mine noise levels are conservative, taking no account for topographic barrier effects of, for example, work below the top of the pit rims. As the project proceeds, pit noise reaching the ranch areas would decline because the pit wall would form its own noise barrier, becoming more effective as the pit is deepened. The noise levels estimated at the ranches would be higher than existing levels or levels normally experienced in an undeveloped rural environment. However, they would be less than the 65 dBA level that is generally considered acceptable for exterior noise at a residential area (24 CFR 51).

Noise modeling indicates that other noise-sensitive receptors several miles farther away at the town of Battle Mountain likely would not experience perceptible changes in ambient noise levels from development and operation of the proposed project. At worst, they may perceive activities as a very low level "hum" at times of extremely low background noise, when there is no wind and little or no traffic noise. Even under these uncommon conditions, the projected mine noise level would be near the measured background noise level in the community, and topographic barriers for several of the noise source points would further reduce the noise energy reaching the town.

Mine noise at the Willow Creek picnic recreation area is estimated in the mid-50s dBA, but that is without the benefit of topographic barriers, which

3.0 AFFECTED ENVIRONMENT/ENVIRONMENTAL CONSEQUENCES

**Table 3.14-3
Typical Values of Sound Level of Common Noise Sources**

Sound Pressure Level (dBA)	Common Indoor Noise Levels	Common Outdoor Noise Levels
110	Rock band	--
105	--	Jet flyover at 1,000 feet
100	Inside New York subway train	--
95	--	Gas lawn mower at 3 feet
90	Food blender at 3 feet	--
80	Garbage disposal at 3 feet, or shouting at 3 feet	Noisy urban daytime
70	Vacuum cleaner at 10 feet	Gas lawn mower at 100 feet
65	Normal speech at 3 feet	Commerical area, heavy traffic at 300 feet
60	Large business office	--
50	Dishwasher in next room	Quiet urban daytime
40	Small theater, large conference room	Quiet urban nighttime
35	--	Quiet suburban nighttime
33	Library	--
28	Bedroom at night	--
25	Concert hall (background)	Quiet rural nighttime
15	Broadcast and recording studio	--
5	Threshold of hearing	--

Source: BLM 1999a.

**Table 3.14-4
Phoenix Project Equipment and Associated Noise Emission Levels**

Equipment Type	Number of Units	dBA	Reference Distance ¹ (feet)
Haul trucks (150-ton class)	19	77-80	50
Haul trucks (85-100-ton class)	8	77-80	50
Hydraulic shovels (~23 cu. yd.)	2	85	50
Wheel loaders	4	85	50
Bulldozers (tracked & rubber tired)	9	81-88	50
Motor graders	3	82	50
Water trucks	3	70-75	50
Ingersol Rand DM45 drills	6	75	50
Fuel trucks	4	70-7	50
Lube trucks	4	70-75	50
Support trucks	4	70-75	50
Crushers, chutes, feeders, etc.	NA	90-105	50

¹Distance at which noise emissions were measured for each type of equipment.

would offer protection from several noise centers at the mine through much of the mine life. In particular, a ridge over 300 feet high would largely screen the mill and crusher operations, which are some of the loudest project facilities. Consequently, it is expected that mine noise levels at this location, despite its relatively close proximity to some of the mine operations, would be closer to 50 dBA.

Blasting noise is not included in the noise level estimates noted above, mainly because mine blasting is typically an extremely brief event occurring once per day. With modern blasting techniques, the blasting would be experienced by people at the ranches and, perhaps, in Battle Mountain, as a very brief, muted clap of thunder preceded by a warning whistle or siren. Public acceptance is generally improved by scheduling

blasting at the same time every day to further reduce the startle factor.

In summary, mining activities associated with the Proposed Action would generate high noise levels on the site; however, there are no sensitive receptors near enough to experience significant adverse noise effects. The mine-related noise would not exceed the significance threshold at any of the identified sensitive receptors.

3.14.2.2 No Action Alternative

The No Action alternative would include the continuation (for approximately 6 months) of mining, heap leaching, and ore processing in association with currently permitted facilities followed by closure and reclamation activities for an additional 5 years. From a noise perspective, these activities would include continued use of heavy equipment similar to the mining operation that was ongoing when the baseline noise study discussed in Section 3.14.1 was conducted. Activity would be somewhat less intense after mining has been completed; however, reclamation plans call for recontouring of waste rock facilities, so heavy equipment use would continue.

Overall noise emissions from the mine site would likely be slightly lower than at the time of the baseline study, tapering off further as closure and reclamation activities are completed. No measurable effects on noise at sensitive receptor locations are expected to occur, however, because the baseline noise study did not demonstrate any apparent cause-and-effect relationship between mine noise levels and noise levels (57 to 72 dBA) measured at the sensitive receptors (Filippini Ranch sites, Willow Creek Recreation Area, Battle Mountain), which ranged from 48 to 63 dBA. Based on this data, anticipated noise levels at sensitive receptors as a result of the No Action alternative would not be significant.

3.14.3 Cumulative Impacts

The cumulative effects area for noise includes an area within a 10-mile radius of the Phoenix Project in addition to the town of Battle Mountain. Present activities in the noise cumulative effects area are included in the background noise discussed in Section 3.14.1. Potential interactive noise effects with these other projects or activities are included in the environmental consequences analysis in Section 3.14.2. None of the potentially interrelated project activities (Section 2.6, Past, Present, and Reasonably Foreseeable Future Actions) is near

enough to the Phoenix Project or well enough defined to raise concerns about noise interactions.

3.14.4 Monitoring and Mitigation Measures

The level and degree of noise effects projected from development of the proposed project would not be sufficient to warrant special monitoring or mitigation measures. Blasting plans should be communicated to people living and working in the project vicinity to minimize the startle factor from blasting.

3.14.5 Residual Adverse Effects

Noise emissions are inevitable from the proposed project; however, the levels anticipated would not be considered significant. Project noise would cease following the completion of project closure and reclamation. As a result, no residual adverse effects from noise emissions have been identified.

3.15 Hazardous Materials

3.15.1 Affected Environment

The affected environment for hazardous materials includes air, water, soil, and biological resources that could potentially be affected by an accidental release of hazardous materials during transportation to and from the project site and during storage and use on the project site.

The existing mining and ore processing operations at the Battle Mountain Complex require the use of the following materials classified as hazardous: 1) diesel fuel, gasoline, oils, greases, anti-freeze, and solvents used for equipment operation and maintenance; 2) sodium cyanide, sodium hydroxide, acid, flocculants, and antiscalants used in mineral extraction processes; 3) ammonium nitrate and high explosives used for blasting in the open pit; and 4) various by-products classified as hazardous waste and chemicals used in the assay laboratory.

A hazardous substance under the Comprehensive Environmental Response, Compensation, and Liability Act is defined as a substance identified in the following statutes:

- Clean Water Act, Sections 307(a) and 311
- Resource Conservation and Recovery Act, Section 3001
- Clean Air Act, Section 112
- Toxic Substances Control Act, Section 7

Pursuant to regulations promulgated under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986, release of a reportable quantity of a hazardous substance to the environment must be reported within 24 hours to the National Response Center (40 CFR Part 302). The Nevada Administrative Code (445A.347) also requires immediate reporting of a release of a reportable quantity of a hazardous substance to the Nevada Division of Emergency Management. In addition, under the State of Nevada Water Pollution Control Permit program, all releases must be reported as soon as possible, but not later than 24 hours, to the Nevada Division of

Environmental Protection, Bureau of Corrective Actions.

Incidental spills of hazardous substances have occurred during previous mining and mineral processing operations at the project site. All reported spills have been mitigated, and contaminated materials have been disposed of in accordance with federal and state regulations.

Hazardous wastes generated at the Battle Mountain Complex currently are transported by approved transporters to designated hazardous waste disposal facilities. All hazardous wastes are currently stored, packaged, and manifested in compliance with applicable federal and state regulations.

Proposed refuse disposal is discussed in Section 2.4.16.4. All non-hazardous solid waste would be disposed of in either the on-site landfill or off-site at another licensed Class III landfill.

3.15.2 Environmental Consequences

Issues related to the presence of hazardous materials are the potential impacts to the environment from an accidental release of hazardous materials during transportation to and from the project site or from the use and storage at the site.

Impacts from the transportation, storage, or use of hazardous materials would be significant if the Proposed Action or No Action alternative result in the following:

- One or more accidents during transport, resulting in the release of a reportable quantity of a hazardous material
- Release of a hazardous material on the site exceeding the storage volume of the containment structure

3.15.2.1 Proposed Action

Operation of the proposed Phoenix Project would involve the transportation, handling, storage, use, and disposal of hazardous materials. A list of hazardous substances to be used during project operation is provided in **Table 2-6**. The estimated delivery frequency and volumes and the estimated annual use of these substances are listed in **Table 3.15-1**.

**Table 3.15-1
Substance/Reagent Deliveries and Nominal Use**

Substances	Deliveries					Annual Use		
	Shipping Origin	Quantity	Units	Proposed Action	No Action Alternative	Proposed Action	No Action Alternative	Units
				Deliveries/ Month	Deliveries/ Month	Quantity	Quantity	
Aerophine 3418A	Welland, Ont.	22	tons	2.1	NA	550	NA	tons
Ammonium nitrate	Elko	20	tons	42	10.4	10,000	2,500	tons
Antifreeze	Elko	2,000	gallons	8	0.3	182,500	6,205	gallons
Antiscalent	Winnemucca	160	gallons	1.9	1.9	3,650	3,650	gallons
Carbonic methyl cellulose	Salt Lake City	1	ton	15	NA	183	NA	tons
Diesel fuel	Elko	10,000	gallons	71	13.1	8,504,500	1,569,500	gallons
Dithiophosphinate	Salt Lake City	180	gallons	53	NA	114,975	NA	gallons
Flocculent	Salt Lake City	1.1	tons	0.5	NA	6.4	NA	tons
Fluxes	Elko	1,500	lbs	2	0.5	18.3	9,125	tons
Gasoline	Elko	10,000	gallons	1.1	0.3	136,875	32,850	gallons
Granulated carbon	Elko	10	tons	3	2.3	365	274	tons
Grease	Elko	1000	lbs	16	0.4	197,100	4,380	lbs
Hydraulic oil ¹	Elko	500(a)	gallons	0.6	0.6	7,300	3,650	gallons
Hydrochloric acid	Reno	6,000	gallons	1	0.2	73,000	11,920	gallons
Lime	Salt Lake City	20	tons	137	NA	32,850	NA	tons
Methyl isobutyl carbinol	Salt Lake City	6,000	gallons	2.3	NA	162,425	NA	gallons
Motor oils	Elko	5,000	gallons	12	0.5	730,000	32,850	gallons
Nitric acid	Elko	80	gallons	3.8	1.5	3,650	1,460	gallons
Pebble lime	Reno	20	tons	84	152	20,075	36,500	tons
Potassium amyl xanthate	Salt Lake City	0.6	tons	51	NA	365	NA	tons
Sodium cyanide	Winnemucca or Elko	6,000	gallons	53	8.4	3,832,500	613,200	gallons
Sodium hydroxide	Reno	6,000	gallons	2.5	0.8	182,500	54,750	gallons
Sodium sulfite	Salt Lake City	22	tons	21	NA	5,475	NA	tons
Sulfur dioxide	Salt Lake City	20	tons	23	NA	5,475	NA	tons

Source: BMG 2000e.

¹Hydraulic oil normal delivery size is 1,000 gallons for the Proposed Action and 500 gallons for the No Action alternative.

The project would generate an estimated 60,000 gallons of used motor oil per year that would be shipped off-site for recycling. An estimated 40 tons per year of fire assay waste (cupels, crucibles, and slag) would be shipped off-site for recycling or disposal at a licensed facility.

Transportation Impacts

All hazardous substances would be transported by commercial carriers in accordance with the requirements of Title 49 of the CFR. Carriers would be licensed and inspected as required by the Nevada Department of Transportation. Tanker trucks would be inspected and have a Certificate of Compliance issued by the Nevada Motor Vehicle Division. These permits, licenses, and certificates are the responsibility of the carrier. Title 49 of the CFR requires that all shipments of hazardous substances be properly identified and placarded. Shipping papers must be accessible and include information describing the substance, immediate health hazards, fire and explosion risks, immediate precautions, fire-fighting information, procedures for handling leaks or spills, first aid measures, and emergency response telephone numbers.

As identified in **Table 3.15-1**, trucks would be used to transport a variety of hazardous substances to the project site. Shipments of hazardous substances would originate from cities such as Elko, Salt Lake City, Reno, and Winnemucca (**Table 3.15-1**) and would be transported to the town of Battle Mountain via Interstate 80. From Battle Mountain, the substances would be transported along State Route 305, a rural two-lane road to the mine access road.

Based on the quantity of the deliveries, the materials of greatest concern would be sodium cyanide solutions and diesel fuel. Sodium cyanide would be shipped as a liquid in 6,000-gallon tanker trucks; diesel fuel would be delivered in 10,000-gallon tanker trucks. The Battle Mountain Complex anticipates a delivery frequency of 53 tanker trucks of sodium cyanide and 71 diesel fuel trucks each month over the life of the Proposed Action (estimated to be 28 years of active mining and beneficiation). This would result in a total of approximately 17,900 shipments of sodium cyanide (638 shipments per year for 28 years) and 23,800 shipments of diesel fuel (850 shipments per year for 28 years). Due to the large number of deliveries, the risk of a spill during transport was evaluated for sodium cyanide and diesel fuel.

Sodium cyanide would likely be shipped from Winnemucca, located approximately 74 road miles northwest of the project, or Elko, located approximately 89 road miles northeast of the project. Diesel fuel would likely be shipped from Elko.

For this analysis, the sodium cyanide solution and the diesel fuel were assumed to be shipped from Elko. These substances would be transported approximately 68 miles along Interstate 80 from Elko to Battle Mountain, and then along approximately 21 miles of two-lane road to the project access road to the site. This route would transport these substances near the towns of Elko, Carlin, and Battle Mountain, and across both the Humboldt and Reese Rivers.

The probability of an accident resulting in a release involving deliveries of these two substances was calculated using the Federal Highway Administration truck accident statistics (Rhyne 1994), as presented in **Table 3.15-2**. According to these statistics, the average rate of truck accidents for transport along a rural interstate freeway is 0.64 per million miles traveled. For rural two-lane roads, the average truck accident rate is 2.19 accidents per million miles traveled. However, the statistics for rural two-lane roads do not differentiate between road surfaces. Considering that the transport route includes a section of improved gravel, the likelihood of an accident in this area may be higher than in the paved section, especially under wet conditions.

The probability of a release or spill was based on accident statistics for liquid tankers carrying hazardous materials (Rhyne 1994). These statistics indicate that on the average, 18.8 percent of accidents involving liquid tankers carrying hazardous materials resulted in a spill or release.

Using the accident and liquid tanker spill statistics, the probability analysis indicates that the potential for an accidental release of liquids during truck transport during the life of the Proposed Action project is less than one accident involving a spill of sodium cyanide or diesel fuel. Specifically, there is a 30 percent chance that an accident resulting in a release of sodium cyanide and a 40 percent chance that an accident resulting in a release of diesel fuel, could occur over the entire 28-year life of the project. Combining these two substances, there is a 70 percent chance that a single accident

**Table 3.15-2
Estimated Number of Spills Resulting from Truck Accidents**

Proposed Action

Truck Shipment Type	Rural Freeway						Rural Two-lane Road						Total Estimated Releases (freeway + two-lane travel)
	Total Truck Deliveries ¹	Freeway Haul Distance	Accident Rate per Million Miles Traveled ²	Calculated Number of Accidents	Probability of Release Given an Accident (%) ²	Calculated Number of Spills	Total Truck Deliveries ¹	Two-lane Haul Distance	Accident Rate per Million Miles Traveled ²	Calculated Number of Accidents	Probability of Release Given an Accident (%) ²	Calculated Number of Spills	
Diesel fuel	23,800	68	0.64	1.0140	18.8	0.1906	23,800	21	2.19	1.0946	18.8	0.2058	0.40
Sodium cyanide	17,900	68	0.64	0.7790	18.8	0.1465	17,900	21	2.19	0.8232	18.8	0.1548	0.30
TOTAL						0.34						0.36	0.70

No Action Alternative

Truck Shipment Type	Rural Freeway						Rural Two-lane Road						Total Estimated Releases (freeway + two-lane Travel)
	Total Truck Deliveries ¹	Freeway Haul Distance	Accident Rate per Million Miles Traveled ²	Calculated Number of Accidents	Probability of Release Given an Accident (%) ²	Calculated Number of Spills	Total Truck Deliveries ¹	Two-lane Haul Distance	Accident Rate per Million Miles Traveled ²	Calculated Number of Accidents	Probability of Release Given an Accident (%) ²	Calculated Number of Spills	
Diesel Fuel	79	68	0.64	0.0034	18.8	0.0006	79	21	2.19	0.0036	18.8	0.0007	0.0013
Sodium Cyanide	51	68	0.64	0.022	18.8	0.0004	51	21	2.19	0.0023	18.8	0.0004	0.0008
TOTAL						0.0004						0.0004	0.0021

Source: Rhyne 1994.

¹Total truck deliveries = estimated number of truck deliveries over the life of the project; assumed to be 28 years for the Proposed Action, and 0.5 year for the No Action Alternative.

²Accident rates are based on the average number of truck accidents occurring per million miles traveled by road type. Spill probabilities are based on statistics from accident reports that indicate the percentage of truck accidents involving liquid tankers that resulted in a spill.

involving either one of these substances could occur at some point during the project. Adding the other shipments listed in **Table 3.15-1** would incrementally increase the odds of a release of a hazardous substance during a transport accident. As previously indicated, one spill resulting from a truck accident would be considered a significant impact.

The environmental effects of a release would depend on the substance, quantity, timing, and location of the release. The event could range from a minor oil spill on the project site where cleanup equipment would be readily available, to a severe spill during transport involving a large release of cyanide solution, diesel fuel, or another hazardous substance. Some of the chemicals could have immediate adverse effects on water quality and aquatic resources if a spill were to enter a flowing stream. However, considering the anticipated transport routes, the probability of a spill into a waterway is very low. Therefore, it is unlikely that spills of these materials would impact waterways. With rapid cleanup actions, diesel contamination would not result in a long-term increase in hydrocarbons in soils, surface water, or ground water.

The effect of a sodium cyanide release would be more variable than a release of diesel fuel and would depend on the amount of the release, the location of the release (e.g., dry upland area, wet meadow area, or flowing stream), the organisms exposed, and the chemical conditions at the release location. Environmental effects of a cyanide spill or leak would be limited in the extent and time of contamination due to the rapid degradation of cyanide within the environment.

A large-scale release of diesel fuel, sodium cyanide, or several of the other substances delivered to the site could have implications for public health and safety. The location of the release would again be the primary factor in determining its importance. However, the probability of a release anywhere along a proposed transportation route was calculated to be low; the probability of a release within a populated area would be even lower; and the probability of a release involving an injury or fatality would be still lower. Therefore, it is not anticipated that a release involving a severe effect to human health or safety would occur during the life of the project.

In the event of a release during transport, the commercial transportation company would be

responsible for first response and cleanup. Each transportation company would be required to develop a Spill Prevention, Control, and Countermeasure Plan to address the materials they would be transporting. Local and regional law enforcement and fire protection agencies also may be involved initially to secure the site and protect public safety.

In the event of an accident involving hazardous substances, Title 49 of the CFR requires that the carrier notify local emergency response personnel, the National Response Center (for discharge of reportable quantities of hazardous substances to navigable waters), and the U.S. Department of Transportation.

Storage and Operational Impacts

The material volumes to be stored on the site are listed by facility in **Table 3.15-3**. Additionally, mobile tanker trucks would be used on the site to fuel and maintain haul trucks. The number of mobile tanker trucks to be used on the site and their combined storage volumes are also listed in **Table 3.15-3**.

Tanks and vessels would be positioned on a concrete containment surface with interior sumps to route any spilled process solutions to lined collection areas. Most of the storage tanks would be double walled. In addition, all hazardous material storage tanks would have secondary containment sufficient to hold at least 110 percent of the volume of the largest tank in the containment area.

Over the life of the project, the probability of minor spills of materials such as oils and lubricants would be relatively high. These releases could occur during operations as a result of a bad connection on an oil supply line or from equipment failure. Spills of this nature would most likely be localized, contained, and removed. Other accidents involving cyanide solutions, other process solutions, or flammable or explosive materials also could occur during mine operation. BMG has prepared an Emergency Response Plan (Terracon 2000) that establishes procedures for responding to accidental spills or releases of hazardous materials to minimize health risks and environmental effects. The plan includes procedures for evacuating personnel, maintaining safety, cleanup and neutralization activities, emergency contacts, internal and external notifications to regulatory authorities, and incident

3.0 AFFECTED ENVIRONMENT/ENVIRONMENTAL CONSEQUENCES

**Table 3.15-3
Hazardous Substances Storage**

Storage Site	Reagents	Proposed Action Maximum Storage Capacity	No Action Alternative Maximum Storage Capacity
Heap Leach	Antiscalent	100 gallons	100 gallons
	Sodium cyanide	25,000 gallons	25,000 gallons
	Sodium hydroxide	6,000 gallons	6,000 gallons
Midas Pit Area	Pebble lime	150-ton silo	150-ton silo
Mill Building	Aerophine 3418A	22 tons	NA
	Ammonium nitrate	75 ton	75 ton
	Antiscalent	100 gallons	NA
	Carbonic methyl cellulose	10 tons	NA
	Dithiophosphate	4,500 gallons	NA
	Flocculent	1.1 tons	NA
	Fluxes	3,000 pounds	3,000 pounds
	Granulated carbon	10 tons	10 tons
	Hydrochloric acid	7,000 gallons	7,000 gallons
	Lime	400 tons	NA
	Methyl isobutyl carbinol	9,000 gallons	NA
	Nitric acid	300 gallons	300 gallons
	Potassium amyl xanthate	7 tons	NA
	Sodium cyanide	8,500 gallons	8,500 gallons
	Sodium cyanide	15,000 gallons	NA
	Sodium hydroxide	10,000 gallons	10,000 gallons
	Sodium sulfite	60 tons	NA
Sulfur dioxide	100 tons	NA	
Tank Farm	Antifreeze	2,000 gallons	2,000 gallons
	Diesel fuel	50,000 gallons	50,000 gallons
	Gasoline	5,000 gallons	5,000 gallons
	Grease	550 gallons	550 gallons
	Motor oils	40,000 gallons	40,000 gallons
	Used antifreeze	2,000 gallons	2,000 gallons
	Used oil	10,000 gallons	10,000 gallons
Mine Shop	Hydraulic oil	1,000 gallons	500 gallons
Mobile Truck Storage	Number of mobile trucks	4	2
	Antifreeze	800 gallons	400 gallons
	Diesel fuel	12,000 gallons	6,000 gallons
	Grease	4,000 gallons	2,000 pounds
	Motor oils	1,000 gallons	500 gallons
	Hydraulic oil	2,000 gallons	1,000 gallons
	Used antifreeze	800 gallons	400 gallons
	Used oil	2,000 gallons	1,000 gallons

Source: BMG 2000e.

documentation. Proper implementation of the Emergency Response Plan is expected to minimize the potential for significant impacts associated with potential releases of hazardous materials.

3.15.2.1 No Action Alternative

The No Action alternative would consist of continued mining and processing for approximately 6 months under the currently permitted operations; the actual duration of the project under the No Action alternative would depend on economic conditions. Continued mining and mineral processing would involve the transportation, handling, storage, use, and disposal of hazardous material. A list of hazardous substances to be used during project operation is provided in **Table 2-6**. The estimated delivery frequency and volumes, and annual use for these substances are listed in **Table 3.15-1**.

Transportation Impacts

For comparative purposes, the potential risk of a spill during transport under the No Action alternative was estimated for sodium cyanide and diesel fuel. The general methodology used to estimate the risk of a tanker truck accident resulting in a release was the same as previously explained for the Proposed Action.

Assuming 6 months of continued operation under the No Action alternative, the Battle Mountain Complex would expect a total of approximately 51 shipments of sodium cyanide and 79 shipments of diesel fuel.

The probability analysis presented in **Table 3.15-2** indicates that the potential for an accidental release of liquids during truck transport during the 6-month operational life of the No Action alternative project is very low. This risk analysis indicates that much less than one accident involving a spill of sodium cyanide or diesel fuel is predicted over the operational life of the project. Specifically, there is a less than 1 percent chance that an accident resulting in either a release of sodium cyanide or diesel fuel could occur over the operational life of the No Action alternative. Combining these two substances, there is still a less than 1 percent chance that a single accident could occur involving either one of these substances. Due to the very low probability of an accident occurring during transport over the short life of the project, transportation impacts are not

anticipated for shipments associated with the No Action alternative.

Storage and Operational Impacts

Impacts associated with potential releases during storage and operation for the No Action alternative are similar to those discussed under Proposed Action. The potential for minor spills of materials such as oils and lubricants would be relatively high. Other accidents involving cyanide solutions, other process solutions, or flammable or explosive materials also could occur during mine operation. However, proper implementation of the Emergency Response Plan is expected to minimize the potential for significant impacts associated with potential releases of hazardous materials.

3.15.3 Cumulative Impacts

The hazardous materials cumulative effects area comprises the project area and State Highway 305 between Interstate 80 and the Phoenix Project access road (see **Figure 3.13-1**). The Proposed Action would result in an incremental increase in the amount of hazardous materials shipped along the identified transportation routes. This increase would increase the risk of release of hazardous substances resulting from truck accidents during the life of the project, as described previously. On Interstate 80 this would represent a small incremental increase over existing conditions due to the existing high truck transport volume. On State Highway 305 between the town of Battle Mountain and the Battle Mountain Complex, this increase would represent a larger incremental increase in the risk of a spill during transport since the roadway is a rural road assumed to have a relatively low truck traffic volume. However, trucks transporting hazardous materials along State Highway 305 would add to the existing hazardous materials shipments on the road since the road is used for shipments to the McCoy/Cove Mine, which is located approximately 12 miles south of the Phoenix Project. With proper implementation of the Emergency Response Plan, cumulative impacts associated with storage and use of hazardous substances at the site are not anticipated.

3.15.4 Monitoring and Mitigation Measures

No monitoring or mitigation for hazardous materials is proposed.

3.15.5 Residual Adverse Effects

Residual adverse effects during transport of a hazardous material would be the potential for a release into a populated area (e.g., Battle Mountain, Carlin, or Elko) or a sensitive environment (e.g., Reese River or Humboldt River) along the proposed transportation route. Residual adverse effects from the increased use of hazardous materials on the project site would depend on the substance, quantity, timing, location, and response involved in an accidental spill or release. Prompt cleanup of spills and releases should minimize the potential for any residual adverse effects of such events.

3.16 Relationship Between Short-term Uses of the Human Environment and the Maintenance and Enhancement of Long-term Productivity

As described in the introduction to Chapter 3.0, short-term is defined as the 28-year operational life of the project and the 5-year reclamation period; long-term is defined as the future following reclamation, i.e., beyond 33 years. This section identifies the tradeoffs between the short-term impacts to environmental resources during operation and reclamation versus long-term impacts to resource productivity that extend beyond the end of reclamation.

The short-term use of resources during the construction, operation, and reclamation of the Phoenix Project would result in beneficial impacts in the form of additional local employment and the generation of revenue. There also would be short-term beneficial impacts on the use of currently underutilized housing and public facilities and services.

The proposed project would result in various short-term adverse impacts, such as temporary loss of soil and vegetative productivity, possible wildlife dislocation or mortality, reduced livestock grazing area, dispersed recreational activity, increased fugitive dust emissions, socioeconomic impacts to the local infrastructure, increased traffic levels, and increased noise levels. These impacts are expected to end upon completion of operations and would be mitigated by reclaiming the disturbed areas.

The short-term adverse visual impacts would last a few years beyond mine closure and would gradually diminish as the vegetation becomes more established. The scale and extent of the waste rock facilities would continue to alter the local landscape and views in the long term.

Impacts to the long-term productivity of the site (i.e., following project reclamation) would depend primarily on the effectiveness of the proposed reclamation of the disturbed areas. The reclamation goal is to return the disturbed areas to livestock and wildlife grazing by establishing self-sustaining plant communities. The revegetation also is expected to stabilize the disturbed surfaces and control soil erosion from

these areas. Under typical moisture conditions at the site, it is expected that initial reclamation efforts would result in sparse stands of perennial grasses and scattered shrubs. With proper management, this initial reclamation community should evolve toward a greater abundance of grasses and shrubs. If initial reclamation of the area occurs in years with above-average precipitation, grasses and shrubs may establish more quickly, thus hastening the evolution toward a self-sustaining mixture of predominantly perennial species.

There would be long-term losses in vegetation productivity and wildlife habitat associated with the open pits (approximately 576 acres) that would not be reclaimed.

3.17 Irreversible and Irretrievable Commitment of Resources

The Proposed Action could result in the irreversible commitment of resources (e.g., the loss of future options for resource development or management, especially of nonrenewable resources, such as minerals and cultural resources) or the irretrievable commitment of resources (e.g., the lost production or use of renewable natural resources during the life of the operations). Irreversible and irretrievable impacts of the Proposed Action are summarized for each resource in **Table 3.17-1**.

**Table 3.17-1
Irreversible and Irretrievable Commitment of Resources by the Proposed Action**

Resource	Irreversible Impacts	Irretrievable Impacts	Description
Geology and Minerals	Yes	Yes	Approximately 5.2 million ounces of gold, 27 million ounces of silver, and 360 million pounds of copper would be recovered. These recovered minerals would comprise an irreversible and irretrievable commitment of these resources. No irreversible or irretrievable geologic hazard impacts are anticipated.
Water Resources and Geochemistry	No	Yes	Ground water levels affected by ground water pumping are predicted to partially recover in the long term. The total estimated volume of ground water extracted during pit dewatering, pumpage at the chloride plume mitigation well field, and operation of the clean water well field over the mine life is 66,000 acre-feet. This ground water is considered an irretrievable commitment of resources.
Soils and Reclamation	Yes	No	Suitable soils from project disturbance would be salvaged for use in reclamation. There would be an irreversible commitment (i.e., loss) of approximately 576 acres of reclaimed area associated with the open pits.
Vegetation	Yes	Yes	A total of 576 acres of vegetation would be irreversibly lost as a result of open pit development. A total of 6,497 acres would comprise an irretrievable commitment of vegetation resources during project operations; this vegetation would subsequently be reclaimed.
Wildlife and Fisheries Resources	Yes	Yes	A total of 576 acres of wildlife habitat would be irreversibly lost as a result of open pit development. A total of 6,497 acres of wildlife habitat would be removed during project operations.
Range Resources	Yes	Yes	There would be an irreversible permanent loss of 148 AUMs associated with open pits and an irretrievable annual loss of 386 AUMs during the life of the project.
Paleontological Resources	No	No	No impacts would occur to paleontological resources.
Cultural Resources	Yes	Yes	Cultural resources would be irreversibly and irretrievably lost through disturbance; however, significant cultural resources would be mitigated through avoidance or data recovery.
Air Quality	No	No	Project air emissions would not exceed federal or state ambient air quality standards. Air quality would return to existing conditions after completion of operations.

Table 3.17-1 (Continued)

Resource	Irreversible Impacts	Irretrievable Impacts	Description
Land Use and Access	Yes	Yes	There would be irreversible and irretrievable impacts to land use from the long-term commitment of 576 acres to open pits. Traffic increases would affect the roadway system, particularly State Highway 305, for the life of the project, but would be reversible and would cease at project closure.
Recreation and Wilderness	No	No	There would be a short-term loss in areas available for dispersed recreation. There would be no impacts to wilderness.
Social and Economic Values	No	Yes	There would be increased local productivity including jobs for construction and operations workers during the life of the project. Lander County and Nevada public revenues would benefit from the Proposed Action.
Visual Resources	Yes	No	Impacts to visual resources would include irreversible changes in the local landscape and views. Successful reclamation would reduce long-term color and form contrasts.
Noise	No	No	Noise effects are considered reversible because they would cease at project completion.
Hazardous Materials	No	No	No irreversible or irretrievable commitment of resources or impact is anticipated. However, if a spill or release were to affect a sensitive resource, an irretrievable impact could occur pending the recovery of the resource.