

predominate; quartzite and sandy limestone are also present. One thin but persistent sandy limestone unit divides the section into a lower sequence of dominantly argillaceous rocks, cropping out to the west, and a chert and quartzite rich upper unit to the east. The limestone bed dips and thickens easterly and may correlate with skarn present in the deep subsurface. Along the southeast side of the Mount Hope complex, the basal limestone unit of the Permian Garden Valley Formation has been preserved in a small asymmetrical syncline and overlies Vinini Formation in unconformable or possibly thrust contact. Hydrothermal alteration and mineralization affect nearly all of the Mount Hope complex and a wide area of adjacent Paleozoic sedimentary rocks. Drilling to a depth of 2,888 feet in the vicinity of the Mount Hope complex has failed to intercept lower plate carbonate rocks, which could potentially contain fossils. Patterns of alteration and metal zoning are well developed and nearly all of the original textures in both the volcanic and sedimentary rocks have been destroyed. Mapping and petrographic study allow correlation of alteration effects in igneous rocks with those in the Vinini Formation which have been metamorphosed. Any fossil presence would have been destroyed in this process. These units would be considered as Class 1 - Very Low.

The TSF constructed south of Mount Hope would be constructed in soils that overlie lacustrine and basin fill sediments. Exploration drilling southwest of Mount Hope has identified thick sequences of lacustrine deposits adjacent to the mountain front. Data from deep oil and gas exploration wells indicate that Tertiary and early Quaternary basin fill deposits are fine grained and contain considerable amounts of clay. The thickness of Tertiary deposits ranges from tens of feet to thousands of feet. Quaternary sediments in the Project Area are typically coarse grained fluvial sediments derived from the adjacent mountain blocks, fine and coarse grained alluvial fan deposits, and fine grained playa deposits. The potential exists for fossils to occur within the lacustrine lake beds; however, these fossils would be buried to an unknown depth. There is also the possibility that vertebrate fossils could be found in lake bed and spring related sediments or paleo-channel material such as the mammoth tusk that was found in Crescent Valley near the Cortez mine (BLM 2008a). Sporadic and unremarkable mammoth remains are known from many locations in Quaternary lake bed and spring related sediments throughout Nevada (BLM 1996a). These units would be considered as Class 2 - Low and 3b - Unknown.

No paleontological resources of critical scientific or educational value are known to occur within the Project Area. The nearest important fossil locality is located in the Roberts Mountains region where significant vertebrate microfossils have been recovered from the same base strata that the Mount Hope igneous complex possibly intruded. Turner and Murphy (1988) report the discovery of Siluro-Devonian vertebrate microfossils within the Roberts Mountains and Burrow (2003) describes the remains of an upper Silurian acanthodian, *Poracanthodes punctatus*, which extends the known geographic range of the taxon outside of the circum-Arctic.

Paleontological resources have been discovered in the Roberts Mountains, especially Vinini Creek, Pete Hanson Creek, and Cottonwood Canyon, and are significant for their invertebrate fossil resources because they have yielded numerous new species. Johnson (1962) reports a previously unrecorded species of brachiopod, leading to the designation of a new Middle Devonian zone from rocks in the Roberts Mountains. Ausich (1978) reports a new species of *Pisocrinus* from the Roberts Mountains which expanded the known range for this type of Silurian crinoid. Stone and Berdan (1984), based on investigations of the Late Silurian strata of the Roberts Mountains, identified three new genera and 18 new species of ostracodes. Finney et al. (2007) state, "A continuous trench exposure within the uppermost type Vinini Formation at Vinini Creek, Roberts Mountains, Nevada, provides an unparalleled opportunity to examine the

fate of graptolites, prominent Paleozoic zooplankton, during most of the Hirnantian mass extinction event”.

3.5.3 Environmental Consequences and Mitigation Measures

3.5.3.1 Significance Criteria

The Proposed Action or an alternative would have a significant effect on the environment if there were sensitive paleontological resources within the Project Area that would be affected by the Project’s activities.

3.5.3.2 Assessment Methodology

Impacts of the Proposed Action and Project Alternatives were assessed based on review of geologic maps and reports that have been completed in the Project Area. The significance of the impacts was evaluated based on the significance criteria listed above and through analysis based on IM Nos. 2008-009 and 2009-011.

3.5.3.3 Proposed Action

Project components associated with the open pit, WRDFs, and the processing facilities would be located in an area of geologic units that are identified as Class 1. Thus these components would have essentially no potential to impact significant paleontological resources. The TSFs and the water production field would be located in areas with Tertiary lacustrine and Quaternary basin fill sediments that could contain paleontological resources of critical scientific or educational value, and these geologic units are identified as either Class 2 or 3b. BLM review of paleontological resources found no known vertebrate or invertebrate fossils in the Project Area.

Since fossils are usually buried, their locations cannot be confirmed unless excavation occurs in those geologic units. The TSFs would be constructed on the lower portion of the soil horizons in those areas and thus would not excavate those underlying geologic units. Activities within the water production area would also occur within the soil horizons or as drilling through the geologic units. These types of activities would have no impacts to these geologic units with questionable importance for paleontological resources; therefore, the Proposed Action would not impact paleontological resources of critical scientific or educational value.

3.5.3.4 No Action Alternative

As a result of the No Action Alternative, there would be no impacts to paleontological resources since the permitted activities consist of drilling and soil excavations, which would not affect the underlying geologic formations.

3.5.3.5 Partial Backfill Alternative

Project components associated with the open pit, WRDFs, and the processing facilities under this alternative would be located in an area of geologic units that are identified as Class 1. Thus these components would have essentially no potential to impact significant paleontological resources. The TSFs and the water production field would be located in areas with Tertiary lacustrine and Quaternary basin fill sediments that could contain paleontological resources of critical scientific

or educational value, and these geologic units are identified as either Class 2 or 3b. BLM review of paleontological resources found no known vertebrate or invertebrate fossils in the Project Area.

Since fossils are usually buried, their locations cannot be confirmed unless excavation occurs in those geologic units. The TSFs would be constructed on the lower portion of the soil horizons in those areas and thus would not excavate those underlying geologic units. Activities within the water production area would also occur within the soil horizons or as drilling through the geologic units. These types of activities would have no impacts to these geologic units with questionable importance for paleontological resources; therefore, the Partial Backfill Alternative would not impact paleontological resources of critical scientific or educational value.

3.5.3.6 Off-Site Transfer of Ore Concentrate for Processing Alternative

Project components associated with the open pit, WRDFs, and the processing facilities under this alternative would be located in an area of geologic units that are identified as Class 1. Thus these components would have essentially no potential to impact significant paleontological resources. The TSFs and the water production field would be located in areas with Tertiary lacustrine and Quaternary basin fill sediments that could contain paleontological resources of critical scientific or educational value, and these geologic units are identified as either Class 2 or 3b. BLM review of paleontological resources found no known vertebrate or invertebrate fossils in the Project Area.

Since fossils are usually buried, their locations cannot be confirmed unless excavation occurs in those geologic units. The TSFs would be constructed on the lower portion of the soil horizons in those areas and thus would not excavate those underlying geologic units. Activities within the water production area would also occur within the soil horizons or as drilling through the geologic units. These types of activities would have no impacts to these geologic units with questionable importance for paleontological resources; therefore, the Off-Site Transfer of Ore Concentrate for Processing Alternative would not impact paleontological resources of critical scientific or educational value.

3.5.3.7 Slower, Longer Project Alternative

Project components associated with the open pit, WRDFs, and the processing facilities would be located in an area of geologic units that are identified as Class 1. Thus these components would have essentially no potential to impact significant paleontological resources. The TSFs and the water production field would be located in areas with Tertiary lacustrine and Quaternary basin-fill sediments that could contain paleontological resources of critical scientific or educational value, and these geologic units are identified as either Class 2 or 3b. BLM review of paleontological resources found no known vertebrate or invertebrate fossils in the Project Area.

Since fossils are usually buried, their locations cannot be confirmed unless excavation occurs in those geologic units. The TSFs would be constructed on the lower portion of the soil horizons in those areas and thus would not excavate those underlying geologic units. Activities within the water production area would also occur within the soil horizons or as drilling through the geologic units. These types of activities would have no impact to these geologic units with questionable importance for paleontological resources; therefore, the Slower, Longer Project Alternative would not impact paleontological resources of critical scientific or educational value.

3.6 Air and Atmospheric Values

3.6.1 **Regulatory Framework**

Ambient air quality and the emission of air pollutants are regulated under both federal and state laws and regulations. Regulations potentially applicable to the Proposed Action and alternatives include the following: National Ambient Air Quality Standards (NAAQS); Nevada State Ambient Air Quality Standards (NSAAQS); Prevention of Significant Deterioration (PSD); New Source Performance Standards (NSPS); Federal Operating Permit Program (Title V); and State of Nevada air quality regulations (NAC 445B). The federal and state **ambient air quality standards** are presented in Table 3.6-1.

3.6.1.1 Federal Clean Air Act

The Federal CAA, and the subsequent CAA Amendments of 1990 (CAAA), require the EPA to identify NAAQS to protect the public health and welfare. The CAA and the CAAA establish NAAQS for seven pollutants, known as “criteria” pollutants because the ambient standards set for these pollutants satisfy “criteria” specified in the CAA. The criteria pollutants regulated by the CAA and their currently applicable NAAQS set by the EPA are listed in Table 3.6-1. The list of criteria pollutants is amended by the EPA as needed to protect public health and welfare. The most recent revisions include amendments to standards for the following pollutants (dates represent publication in the FR): particulate matter less than 2.5 micrometers in aerodynamic diameter (PM_{2.5}) and particulate matter less than ten micrometers in aerodynamic diameter (PM₁₀) (October 2006), ozone (O₃) (March 2008), Pb (November 2008), nitrogen dioxide (NO₂) (February 2010), and SO₂ (June 2010). The EPA recently proposed to update the 8-hour O₃ standard (see 75 FR 2938-3052) from 0.075 ppm to somewhere between 0.060-0.070 ppm; a proposed standard is expected in 2013 or later. These revised limits will not be enforceable within the State of Nevada until the Nevada State Implementation Plan (SIP) is amended by the BAPC and formally approved by the EPA. **However, this NEPA analysis must compare results to all state and federal ambient air quality standards.** The current NAAQS are listed in Table 3.6-1.

3.6.1.2 Nevada State Ambient Air Quality Standards

NAC 445B.22097 includes ambient air quality standards for the State of Nevada (Table 3.6-1). The NSAAQS are generally identical to the NAAQS, with the exception of the following: (a) the 8-hour O₃ standard revised by the EPA in 2008, (b) an additional state standard for carbon monoxide (CO) in areas with an elevation in excess of 5,000 feet amsl; (c) the recently promulgated 1-hour NAAQS standards for NO₂ and SO₂, (d) the state standard for PM₁₀ (Annual Arithmetic Mean) where the comparable NAAQS standard was revoked by the EPA in 2006; (e) the 24-hour and annual NAAQS standards for PM_{2.5} promulgated by EPA in 2006; and (f) for some pollutants, the determination of when a violation of a state standard or federal standard occurs.

3.6.1.3 Attainment and Nonattainment Areas

Pursuant to the CAA, the EPA has developed classifications for distinct geographic regions known as air quality management areas (AQMAs). Under these classifications, for each federal criteria pollutant, each air basin (or portion of an AQMA [or “planning area”]) is classified as “in

attainment” if the AQMA has "attained" compliance with (i.e., not exceeded) the adopted NAAQS for that pollutant; is classified as “non-attainment” if the levels of ambient air pollution exceed the NAAQS for that pollutant; or is classified as “maintenance” if the monitored pollutants have **improved** from non-attainment levels to attainment levels. AQMAs for which sufficient ambient monitoring data are not available are designated as “attainment-unclassifiable” for those particular pollutants until actual monitoring data support formal “attainment” or “non-attainment” classification.

In addition to the designations relative to attainment of conformance with the NAAQS, the CAA requires the EPA to place each planning area within the U.S. into one of three classes, which are designed to limit the deterioration of air quality when it is “better than” the NAAQS. “Class I” is the most restrictive air quality category and was created by Congress to prevent further deterioration of air quality in National Parks and Wilderness Areas of a given size which were in existence prior to 1977, or those additional areas that have since been designated Class I under federal regulations (40 CFR 52.21). All remaining areas outside of the designated Class I boundaries were designated Class II planning areas, which allow a relatively greater deterioration of air quality once the Minor Source Baseline Date has been set. No Class III areas have been designated. Regardless of the class of the planning area, the air quality cannot exceed the NAAQS. The nearest Class I planning area to the Project, the Jarbidge Wilderness Area, is located approximately 130 miles northeast of the Project Area. There are no Class I airsheds within 60 miles (approximately 100 kilometers) of the Project Area.

Table 3.6-1: Federal and State Ambient Air Quality Standards for Criteria Pollutants

| Criteria Pollutant | Averaging Period | Nevada Standards | Federal Standards | |
|--|---|------------------------------------|------------------------------------|---------------------------|
| | | Concentration ^a | Primary ^a | Secondary ^a |
| Ozone (O ₃) | 1-Hour ^b | 0.12 ppm (235 µg/m ³) | -- | Same as Primary Standards |
| | 8-Hour ^b | --- | 0.075 ppm (150 µg/m ³) | |
| Carbon Monoxide (CO) | 8-Hour (<5,000) ^c | 9 ppm (10.5 mg/m ³) | 9 ppm (10 mg/m ³) | --- |
| | 8-Hour (≥5,000) ^c | 6 ppm (7 mg/m ³) | 9 ppm (10 mg/m ³) | |
| | 1-Hour ^c | 35 ppm (40.5 mg/m ³) | 35 ppm (40 mg/m ³) | |
| Nitrogen Dioxide (NO ₂) | Annual (Arithmetic Average) | 53 ppb (100 µg/m ³) | 53 ppb (100 µg/m ³) | Same as Primary Standards |
| | 1-Hour ^d | --- | 100 ppb (188 µg/m ³) | |
| Sulfur Dioxide (SO ₂) | 1-Hour ^f | 75 ppb (196 µg/m ³) | 196 µg/m ³ (75 ppb) | --- |
| | Annual (Arithmetic Average) | 30 ppb (80 µg/m ³) | 80 µg/m ³ (30 ppb) | |
| | 24-Hour ^c | 140 ppb (365 µg/m ³) | 365 µg/m ³ (140 ppb) | |
| | 3-Hour ^c | 500 ppb (1,300 µg/m ³) | --- | |
| Particulate Matter (PM ₁₀) | 24-Hour ^c | 150 µg/m ³ | --- | Same as Primary Standards |
| | 24-Hour ^e (Based on Averaged Exceedances over Three Years) | --- | 150 µg/m ³ | |
| | Annual Arithmetic Mean | 50 µg/m ³ | --- | |

| Criteria Pollutant | Averaging Period | Nevada Standards | Federal Standards | |
|---|--|----------------------------|------------------------|---------------------------|
| | | Concentration ^a | Primary ^a | Secondary ^a |
| Particulate Matter (PM _{2.5}) | 24-Hour (Based on the 98 th Percentile Averaged over Three Years) | --- | 35 µg/m ³ | Same as Primary Standard |
| | Annual Arithmetic Mean Averaged Over Three Years | --- | 15.0 µg/m ³ | |
| Lead (Pb) | Rolling Three-Month Average | --- | 0.15 µg/m ³ | Same as Primary Standards |
| | Calendar Quarter | 1.5 µg/m ³ | 1.5 µg/m ³ | |

^a Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 mm Hg. Measurements of air quality are corrected to a reference temperature of 25°C and a reference pressure of 760 mm Hg (1,013.2 millibar); units of measure for the standards are ppm by volume, parts per billion (ppb - 1 part in 1,000,000,000) by volume, milligrams per cubic meter of air (mg/m³), and micrograms per cubic meter of air (µg/m³).

^b To attain the 8-hour NAAQS standard, the three-year average of the fourth highest daily maximum 8-hour average O₃ concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm (effective May 27, 2008). The EPA revoked the 1-hour standard in all areas, although some areas have continuing obligations under that standard ("anti-backsliding"). The 1-hour standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is less than or equal to 1.

^c A violation of the federal standard occurs on the second exceedance during a calendar year; a violation of the State of Nevada standard occurs on the first exceedance during a calendar year.

^d The 1-hour nitrogen dioxide standard is attained when the three-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area does not exceed 100 ppb (effective January 22, 2010).

^e Not to be exceeded more than once per year on average over three years.

^f To attain this standard, the three-year average of the 99th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 75 ppb. Final rule signed June 2, 2010.

3.6.1.4 Prevention of Significant Deterioration

Federal PSD applicability regulations limit the maximum allowable increase in ambient particulate matter in a Class I planning area, resulting from a major or minor stationary source to four µg/m³ (annual geometric mean) and eight µg/m³ (24-hour average). For Class II Planning areas the maximum allowable increase is 17 µg/m³ (annual geometric mean) and 30 µg/m³ (24-hour average). Increases in other criteria pollutants are similarly limited. Specific types of facilities that emit, or have the potential to emit, 100 tpy or more of PM₁₀ or other criteria air pollutants, or any facility that emits, or has the potential to emit, 250 tpy or more of PM₁₀ or other criteria air pollutants, is considered a major stationary source.

Most fugitive emissions are not counted as part of the calculation of emissions for PSD. Major stationary sources are required to notify federal land managers of Class I planning areas within 100 kilometers of the major stationary source. There are no Class I planning areas within 100 kilometers of the Project Area. As stated above, the nearest Class I planning area to the Project Area is the Jarbidge Wilderness Area. The Project air pollutant emission sources under the Proposed Action and alternatives emission sources are minor stationary sources that are not subject to PSD regulatory requirements.

3.6.1.5 New Source Performance Standards

NSPSs were established by the CAA. The standards, which are for new or modified stationary sources, require the sources to achieve the best available control technology. The NSPS apply to

specific types of processes which, in the case of the Proposed Action include certain units used to process metallic minerals. The requirements applicable to these existing units are found in 40 CFR Part 60, Subpart LL (Standards of Performance for Metallic Mineral Processing Plants).

3.6.1.6 Federal Operating Permit Program

As part of the CAA and its subsequent amendments, a facility wide permitting program was established for larger sources of pollution. This program, known as the Title V program, requires that these “major sources” of air pollutants submit a Title V permit application. To be classified as a “major source”, a facility must emit more than 100 tpy of any regulated pollutant, ten tpy of any single hazardous air pollutant (HAP), or 25 tpy or more of any combination of HAPs, from applicable sources.

3.6.1.7 Nevada Air Quality Operating Permit

The CAA delegates primary responsibility for air pollution control to state governments, which in turn often delegate this responsibility to local or regional organizations. The SIP was originally the mechanism by which a state set emission limits and allocated pollution control responsibility to meet the NAAQS. The function of a SIP broadened after passage of the 1990 CAAA and now includes the implementation of specific technology based emission standards, permitting of sources, collection of fees, coordination of air quality planning, and PSD of air quality within regional planning areas and statewide. Section 176 of the CAA, as amended, requires that federal agencies must not engage in, approve, or support in any way any action that does not conform to a SIP for the purpose of attaining ambient air quality standards.

The BAPC is the agency in the State of Nevada that has been delegated the responsibility for implementing a SIP (excluding Washoe and Clark Counties, which have their own SIPs). Included in a SIP are the State of Nevada air quality permit programs (NAC 445B.001 through 445B.3485, inclusive) and the NSAAQS (see Table 3.6-1). In addition to establishing the NSAAQS, the BAPC is responsible for permit and enforcement activities throughout the State of Nevada (except in Clark and Washoe Counties).

The Proposed Action and alternatives are located in Eureka County, Nevada. The applicable permitting authority for the county is the BAPC. Before any construction of a potential source of air pollution can occur, an air quality operating permit application must be submitted to the BAPC in order to obtain an Air Quality Operating Permit.

3.6.1.8 Nevada Mercury Control Program

The BAPC is the agency in the State of Nevada delegated the responsibility for regulating the Nevada Mercury Control Program (NMCP). The NMCP became effective in May 2006 with the purpose of achieving Hg reduction by utilizing Hg control technology through implementation of Nevada Maximum Achievable Control Technology (NvMACT). The NMCP is only applicable to control Hg emissions from operations at precious metals mining facilities. The Proposed Action and reasonable alternatives are not subject to the NMCP because none of them would be a precious metal mining facility.

3.6.1.9 Climate Change

The BLM has developed draft guidance in the form of an IM (2008-171) for the incorporation of climate change into NEPA documents. At present, there is no regulatory program that requires reductions in greenhouse gas (GHG). However, in response to a Supreme Court decision interpreting the CAA, the EPA has published an advance notice of proposed rulemaking seeking public comment on whether GHG emissions should be regulated under the CAA, and if so, by what methods. Congress is also debating legislation that would impose regulatory controls or incentives for reducing GHG emissions.

3.6.2 **Affected Environment**

3.6.2.1 Study Methods

The existing meteorological and air quality conditions in the air quality study area were obtained from the sources discussed in the following sections. No air quality data have been collected at the Project, **however, one year of hourly onsite meteorological data for the year 2010 have been collected.** Baseline air quality and meteorological conditions representative of the Project Area were assessed using data from the nearby monitoring stations of north central Nevada. In the air dispersion model, **a complete, full year (2010) of the hourly on-site meteorological data** was utilized. Meteorological data from the Ely, Nevada, airport (WBO- 262631), located 80 miles southeast of the Project, was utilized for climate characterization (Figure 3.6.1). The Ely Monitoring Station measures ambient temperature, wind speed, wind direction, and precipitation, at an elevation of approximately 6,260 feet amsl.

The majority of the Project permissible point source emissions would be located in the Diamond Valley AQMA, which includes the area bounded by the crest of the Sulphur Springs Range, Whistler Mountain, and the Mountain Boy Range on the west and north and the crest of the Diamond Mountains to the east. Fugitive emissions associated with vehicles, vehicle travel, mining, blasting, and material handling would occur in the Diamond Valley AQMA, as well as the Kobeh Valley AQMA. The Kobeh Valley AQMA includes an area bounded on the north by the Roberts Mountains, on the west by the Simpson Park Range, and on the east by Whistler Ridge. The southern boundary is topographically indistinct.

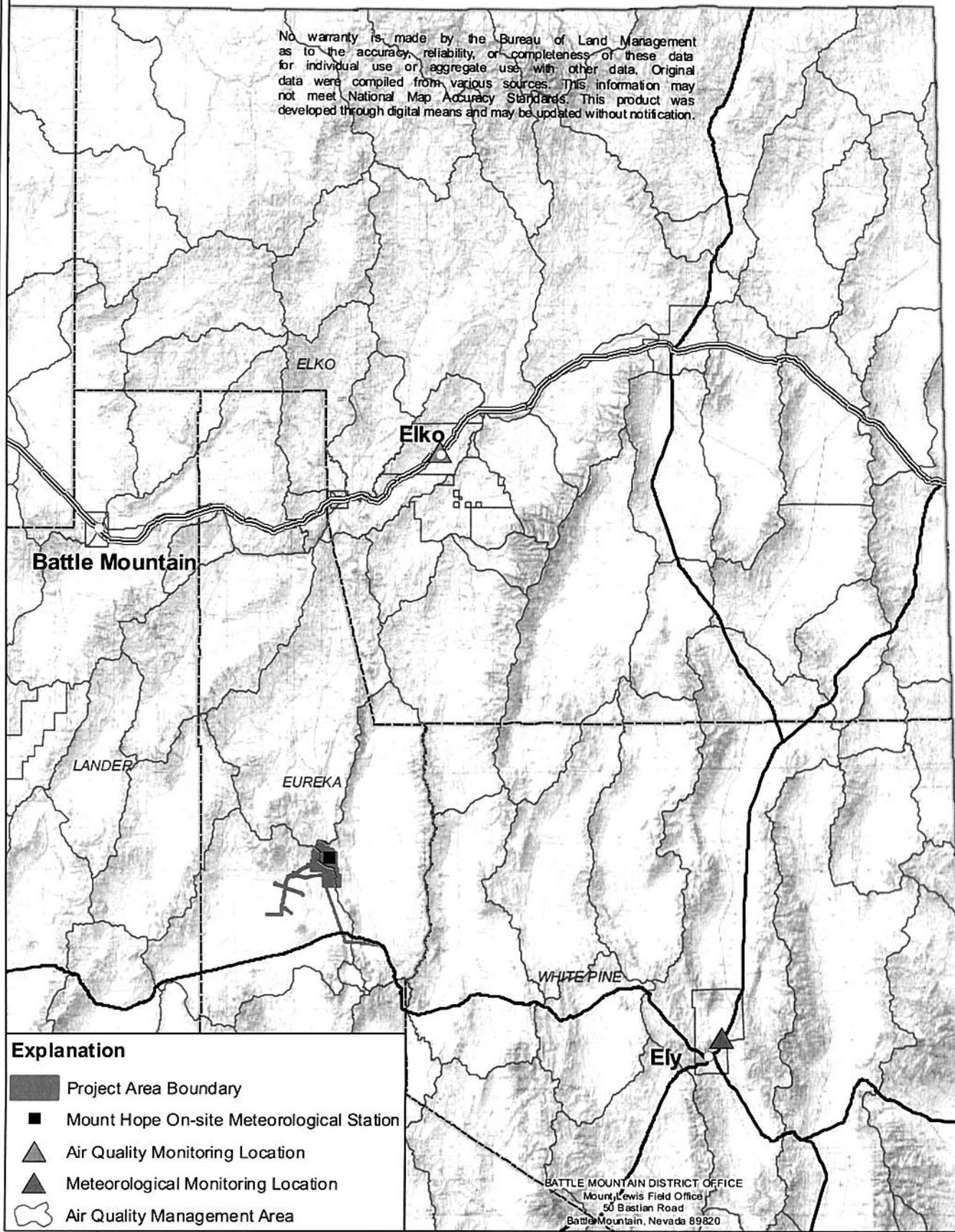
3.6.2.2 Existing Conditions

The Project is not included in any of the source categories listed in the Federal PSD Regulations, and the PSD applicable emissions from the Project are below the 250 tpy PSD threshold. Therefore, the Project is not in a PSD triggered planning area, increment is not being consumed, and the Project is not subject to PSD regulation.

3.6.2.2.1 Climate and Meteorology

The Project Area is a high desert environment characterized by arid to semiarid conditions, with bright sunshine, low annual precipitation, and large daily ranges in temperatures. The climate is controlled primarily by the rugged and varied topography to the west, in particular the Sierra Nevada Mountain Range. Prevailing westerly winds move warm moist Pacific air over the western slopes of the Sierra Nevada where the air cools, condensation takes place, and most of the moisture falls as precipitation. As the air descends the eastern slope, compressional warming takes place resulting in minimal rainfall.

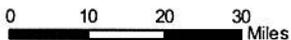
No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data. Original data were compiled from various sources. This information may not meet National Map Accuracy Standards. This product was developed through digital means and may be updated without notification.



Explanation

-  Project Area Boundary
-  Mount Hope On-site Meteorological Station
-  Air Quality Monitoring Location
-  Meteorological Monitoring Location
-  Air Quality Management Area

BATTLE MOUNTAIN DISTRICT OFFICE
 Mount Lewis Field Office
 50 Bastian Road
 Battle Mountain, Nevada 89820



BUREAU OF LAND MANAGEMENT
MOUNT HOPE PROJECT

DESIGN: EMLLC DRAWN: CVD/GSL REVIEWED: RFD
 CHECKED: APPROVED: RFD DATE: 09/06/2012
 FILE NAME: p1635_Fig3-6-1_MonitoringSites.mxd

DRAWING TITLE:
**Mount Hope On-site
 Meteorological Station,
 Elko and Ely, Nevada,
 Monitoring Sites**
 Figure 3.6.1

Climate information from the Ely airport is representative of the high desert environment. Based on the data collected from the Ely station over the period 1897 through 2006, the average temperature was 44.7°F, with temperatures ranging from 101°F to minus 30°F. Annual precipitation in the area during the same period ranged from zero to 5.52 inches. The mixture of dry desert and mountainous terrain sufficiently dries the air systems that move through the region.

A key component of accessing meteorological effects on an airshed is through atmospheric dispersion. Dispersion is influenced by several parameters, including wind speed, temperature inversions (mixing heights), and atmospheric stability. Prevailing winds in 2007 at the Ely Station were typically from the southwest, with average annual wind speeds at 6.9 miles per hour (mph). Month-to-month variations were small, with average wind speeds ranging from 4.4 to 8.4 mph. These wind speeds tend to promote atmospheric mixing and generally transport locally generated air emissions away from the area. Beneficial air movement that vents an airshed is defined as an “unstable” atmospheric condition.

In “stable” atmospheric conditions, inversions would restrict vertical movement of the air in the lower atmosphere. Atmospheric pollutants are prevented from mixing with the air above the inversion layer. The resulting lower mixing heights produce higher pollutant concentrations since the volume of air with which the pollutants can mix is limited. In cold night/hot day weather patterns, mixing heights can be quite high in the afternoon versus low mixing heights at night and in the early morning due to nighttime cooling.

Mixing heights in the Project Area are estimated to be highest during the afternoon of summer months at 5,900 feet (annual average), which is conducive for good air dispersion. In the late afternoon, unstable atmospheric conditions that vent and disperse the air are favorable. Adequate mixing of air is needed during summer months when temperatures are higher and pollutants are more reactive on a local scale. During the winter months the opposite occurs. Mixing heights are much lower, approximately 250 feet (annual average), resulting in poor air dispersion. Cooler temperatures, however, effectively slow pollutant reactivity.

3.6.2.2.2 Air Quality

Air quality in the Project Area is governed by both factors of pollutant emissions and meteorological conditions. As discussed above, wind speeds, mixing heights, and stability all affect the circulation and dilution of emissions in the area.

The Project Area is located within an AQMA that is currently in “attainment-unclassifiable” for all pollutants having an air quality standard (40 CFR 81.329). No NO₂, SO₂, or Pb non-attainment areas are located within the State of Nevada. Washoe County, Nevada (within which the city of Reno is located) is the PM₁₀, CO, and O₃ non-attainment area located closest to the Project Area, although it is located more than 100 miles to the west.

At present, the BAPC does not conduct ambient air quality monitoring in the vicinity of the Project. The closest station is located in Elko, Nevada, which is approximately 75 miles northeast (Figure 3.6.1). The site is a State and Local Air Monitoring Site (SLAMS) for continuous monitoring of PM₁₀ only. The latest Bureau of Air Quality Planning (BAQP) Trend Report for 1998-2009 reported the highest 24-hour ambient PM₁₀ concentration to be 150 µg/m³.

The mean concentration measured for a 24-hour period for PM₁₀ during 2009 was only 25 µg/m³ (Table 3.6-2) (<http://ndep.nv.gov/baqp/monitoring/docs/trend.pdf>).

Table 3.6-2: Ambient PM₁₀ Monitoring Data from the Elko Site

| Year | 24-Hour Average PM ₁₀ Concentration (µg/m ³) | | |
|---------|---|----------------------|-----------------|
| | 1 st High | 2 nd High | Arithmetic Mean |
| 1998 | 100 | 70 | 22 |
| 1999 | 80 | 80 | 25 |
| 2000 | 90 | 80 | 25 |
| 2001 | 100 | 70 | 25 |
| 2002 | 150 | 90 | 22 |
| 2003 | 110 | 80 | 19 |
| 2004 | 80 | 70 | 21 |
| 2005 | 90 | 70 | 21 |
| 2006 | 130 | 130 | 26 |
| 2007 | 90 | 90 | 26 |
| 2008 | 40 | 40 | 15 |
| 2009 | 140 | 130 | 25 |
| Average | 100.0 | 83.3 | 22.7 |

3.6.2.2.3 Climate Change

Ongoing scientific research has identified the potential impacts of anthropogenic (man-made) GHG emissions and changes in biological C sequestration due to land management activities on global climate. Through complex interactions on a regional and global scale, these GHG emissions and net losses of biological C sinks cause a net warming effect of the atmosphere, primarily by decreasing the amount of heat energy radiated by the earth back into space. Although GHG levels have varied for millennia, recent industrialization and burning of fossil C sources have caused carbon dioxide equivalent (CO₂(e)) concentrations to increase dramatically, and are likely to contribute to overall global climatic changes. The Intergovernmental Panel on Climate Change (IPCC) in 2007 concluded that “warming of the climate system is unequivocal” and “most of the observed increase in globally average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations” (IPCC 2007a).

Global mean surface temperatures have increased nearly 1.8°F from 1890 to 2006. Models indicate that average temperature changes are likely to be greater in the Northern Hemisphere. Northern latitudes (above 24°N) have exhibited temperature increases of nearly 2.1 °F since 1900, with nearly a 1.8°F increase since 1970 alone. Without additional meteorological monitoring systems, it is difficult to determine the spatial and temporal variability and change of climatic conditions, but increasing concentrations of GHGs are likely to accelerate the rate of climate change.

In 2001, the IPCC indicated that by the year 2100, global average surface temperatures would increase 2.5 to 10.4°F above 1990 levels. The National Academy of Sciences has confirmed these findings, but also has indicated there are uncertainties regarding how climate change may

affect different regions. Computer model predictions indicate that increases in temperature would not be equally distributed, but are likely to be accentuated at higher latitudes. Warming during the winter months is expected to be greater than during the summer, and increases in daily minimum temperatures is more likely than increases in daily maximum temperatures. Increases in temperatures would increase water vapor in the atmosphere, and reduce soil moisture, increasing generalized drought conditions, while at the same time enhancing heavy storm events. Although large-scale spatial shifts in precipitation distribution may occur, these changes are more uncertain and difficult to predict. "As with any field of scientific study, there are uncertainties associated with the science of climate change. This does not imply that scientists do not have confidence in many aspects of climate change science. Some aspects of the science are known with virtual certainty, because they are based on well-known physical laws and documents trends" (EPA 2008a).

Several activities contribute to the phenomena of climate change, including emissions of GHGs (especially CO₂ and methane) from fossil fuel development, large wildfires and activities using combustion engines; changes to the natural C cycle; and changes to radiative forces and reflectivity (albedo). It is important to note that GHGs would have a sustained climatic impact over different temporal scales. For example, recent emissions of CO₂ can influence climate for 100 years.

It may be difficult to discern whether global climate change is already affecting resources, let alone the area of the Proposed Action. In most cases there is more information about potential or projected effects of global climate change on resources. It is important to note that projected changes are likely to occur over several decades to a century. Therefore, many of the projected changes associated with climate change may not be measurably discernible within the reasonably foreseeable future.

3.6.3 Environmental Consequences and Mitigation Measures

The Project would require an Air Quality Operating Permit from the BAPC. The main impact related to air quality would be the result of increased pollutant concentrations. The Project would increase emissions of regulated pollutants from PSD applicable sources and sources applicable to the NSPS regulations. The Project would not result in emissions of any regulated pollutant above 250 tpy; **therefore, the Project is not subject** to PSD regulations or Title V application requirements.

3.6.3.1 Significance Criteria

The Proposed Action would have a significant effect on the environment if any of the following would occur:

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

3.6.3.2 Assessment Methodology

In order to evaluate the impacts of the Project, an assessment of the significance of the impacts was made based on the significance criteria listed above. The air quality analyses quantified the emissions of the applicable criteria pollutants from the mining and processing of ore from the Project.

An air dispersion modeling analysis was utilized to characterize the Project. The air pollution sources at the Project that were modeled in the air dispersion modeling analysis include the following source categories:

- Process emission points (material handling, crushing, conveying, leaching, drying, roasting, etc.);
- Auxiliary sources (emergency generators, etc.); and
- Fugitive emission sources (drilling, blasting, loading, unloading, hauling, wind erosion, mobile machinery tailpipes, etc.).

Air emission estimates were calculated based on the maximum material throughput for each applicable time period, using EPA approved AP-42 emission factors for the Project and information provided by EML. Table 3.6-3 shows the emissions, in tpy, that were used in the model **for this EIS analysis**.

3.6.3.2.1 Model Selection and Options

The most recent version (11353) of the AERMOD modeling system was used for the air quality impact analyses. AERMOD was run using regulatory default options (Air Sciences Inc. 2012a; EML 2008b).

Process and insignificant sources with exhaust stacks such as generators, boilers, dryer, roasters, baghouse/dust collector equipped dust sources (crusher, apron feeder, etc.), and process fugitive sources such as truck dump and conveyors are modeled as point sources. All fugitive source activities such as the pit, the primary crusher stockpile, the waste storage sites, the coarse and low-grade ore storage sites, and the tailings storage facility are modeled as volume sources. Each haul road section is characterized by a series of volume sources with length not exceeding twice the road width (Air Sciences Inc. 2012a).

Table 3.6-3: Modeled Emission Rates

| Model and Source Category | Annual Emissions (tons/year) | | | | | |
|------------------------------------|------------------------------|-------------------|-----------------|-----------------|---------|------------------|
| | PM ₁₀ | PM _{2.5} | NO ₂ | SO ₂ | CO | VOC ¹ |
| Point and Process Fugitive Sources | 98.1 | 86.6 | 61.2 | 98.1 | 22.2 | 49.2 |
| Fugitive and Tailpipe Sources | 876.9 | 111.3 | 881.7 | 64.2 | 1,326.5 | 263.0 |
| Total | 975.0 | 197.9 | 942.9 | 162.4 | 1,348.7 | 312.2 |

¹(VOC) volatile organic compound.

The effects of building induced downwash were incorporated into the air quality modeling analyses. Building downwash parameters were calculated using the most recent version of the

Building Profile Input Program (BPIP) with Plume Rise Model Enhancement (PRIME) algorithm (BPIP-PRIME version 04274) and the August 28, 2008, version of the buildings layout (Air Sciences Inc. 2012a).

3.6.3.2.2 Receptors

The receptor data were utilized in the modeling analyses to assess ground level impacts from the Project facility emissions. **Discrete receptors located at 100-meter spacing out to two kilometers in each direction from the facility boundary were included. Receptors within the fenced boundary were not modeled since these receptors inside the boundary would not be considered ambient.**

Receptors placed at a 25-meter spacing along the facility public exclusion boundary line are also included in the models. Receptors within the facility public exclusion boundary were not modeled.

A group of sensitive receptors has been evaluated in the air dispersion modeling analysis. This group includes receptors placed at nearby ranches, permanent dwellings, designated campgrounds, and the Town of Eureka. These sensitive receptors are provided in the Table 3.6-4.

Table 3.6-4: Sensitive Receptors and Universal Transverse Mercator Coordinates

| Receptor | Universal Transverse Mercator (UTM) Coordinates | |
|------------------------------|---|--------------|
| | Easting (meters [m]) | Northing (m) |
| Bailey North Ranch | 580,043 | 4,419,188 |
| Bailey South Ranch | 581,599 | 4,396,519 |
| Benson | 584,817 | 4,396,554 |
| Eureka County High School | 588,204 | 4,374,062 |
| Eureka Elementary School | 589,341 | 4,373,756 |
| Eureka County Medical Clinic | 589,358 | 4,374,008 |
| Alpha Ranch | 568,465 | 4,428,941 |
| Roberts Creek Ranch | 560,933 | 4,400,378 |
| Tonkin Reservoir | 550,030 | 4,418,098 |

In addition, 100 receptors each along the boundaries of the Jarbidge Wilderness Area (a designated federal Class I area) and the Great Basin National Park that were closest to the Project Area were also modeled.

All the receptors are processed with the AERMOD Terrain preprocessor AERMAP to generate receptor terrain elevations and hill height values using the 30-meter resolution USGS 7.5-minute

Digital Elevation Model (DEM) Files (Air Sciences, Inc. 2012a). The modeled sources, fence line, and receptor grid locations are shown in Figure 3.6.2.

3.6.3.2.3 Meteorological Data

A complete full year (2010) hourly on-site meteorological data were utilized. Missing data were substituted with the upper-air (soundings) and cloud cover data from the Elko station and surface data from the Eureka Airport station. The most recent version (11059) of the AERMOD meteorological preprocessor AERMET was used to process these data and generate AERMOD input-ready meteorological data files (Air Sciences, Inc. 2012a). A wind frequency distribution of the meteorological data is illustrated on Figure 3.6.3.

3.6.3.2.4 Modeled Pollutants and Assumptions

The air quality impact analyses include modeling for the following air pollutants and averaging periods. These data are presented in Table 3.6-5.

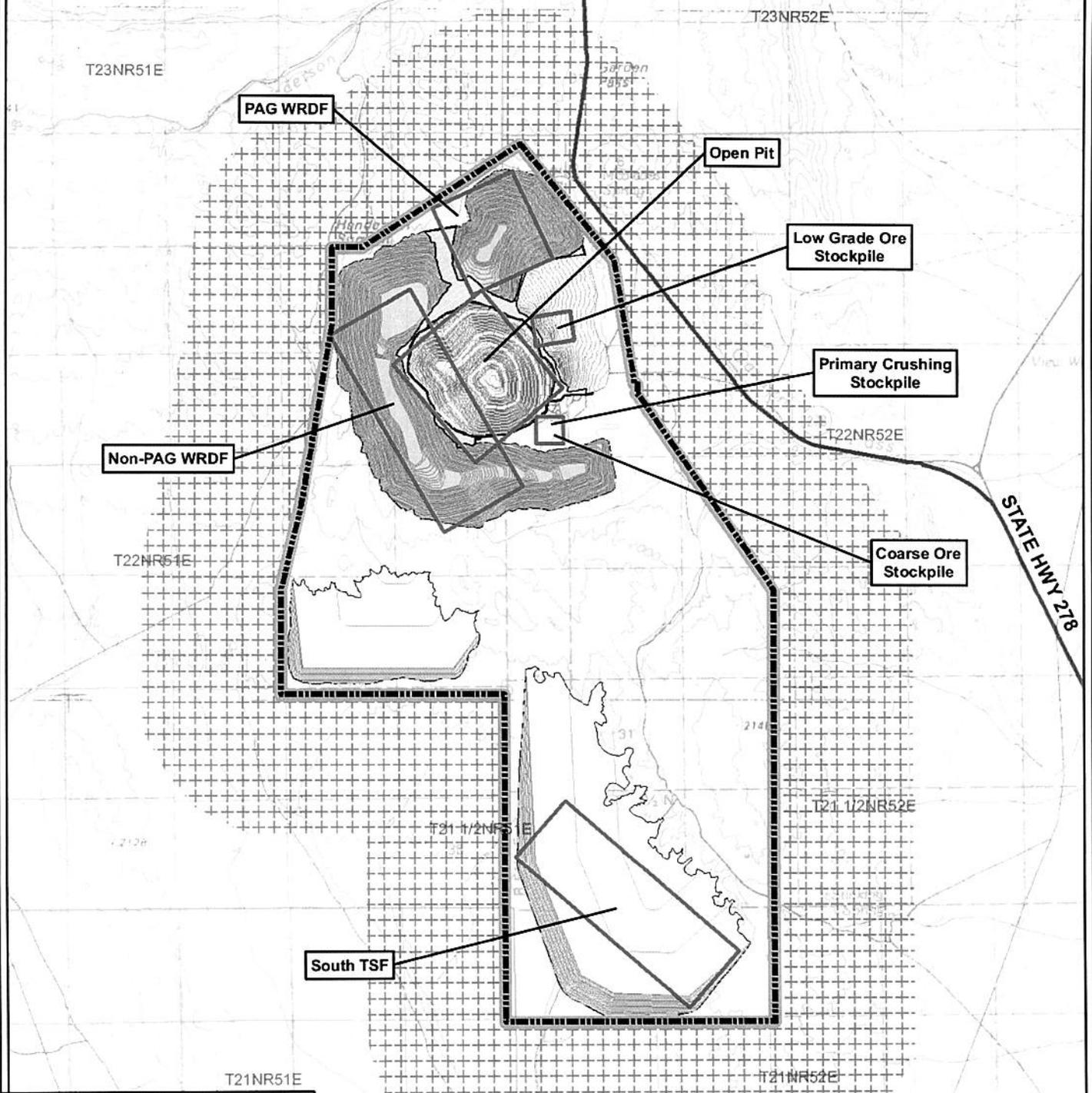
Table 3.6-5: Air Pollutants and Applicable Averaging Times for the Air Quality Modeling

| Pollutant | Averaging Time ^a |
|-------------------|-----------------------------|
| PM ₁₀ | 24-Hour |
| | Annual |
| PM _{2.5} | 24-Hour |
| | Annual |
| Pb | Quarterly |
| CO | 1-Hour |
| | 8-Hour |
| NO ₂ | 1-Hour |
| | Annual |
| SO ₂ | 1-Hour |
| | 3-Hour |
| | 24-Hour |
| | Annual |

^a All concentrations are applicable at any point of public access.

Pb emissions were calculated by multiplying the Pb constituent with PM emissions, which are calculated based on PM₁₀/PM ratio of 0.35. The Pb NAAQS is based on a three-month rolling averaging period. A monthly averaging period was used to model Pb emissions because the AERMOD does not have an option for modeling a three-month averaging period. The maximum monthly concentrations are higher than the three-month rolling average concentrations, therefore, comparison of the maximum monthly concentrations to the

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EXPLANATION

- BLM Wire Fence
- Modeling Sources
- Boundary Line Receptors
25-meter spacing
- Discrete Receptors
100-meter spacing
- Pit (50' Contours)
- Interpit Area
- Low Grade Ore Stockpile (25' Contours)
- Tailing Storage Facilities (20' Contours)
- Waste Rock Disposal Facilities (20' Contours)



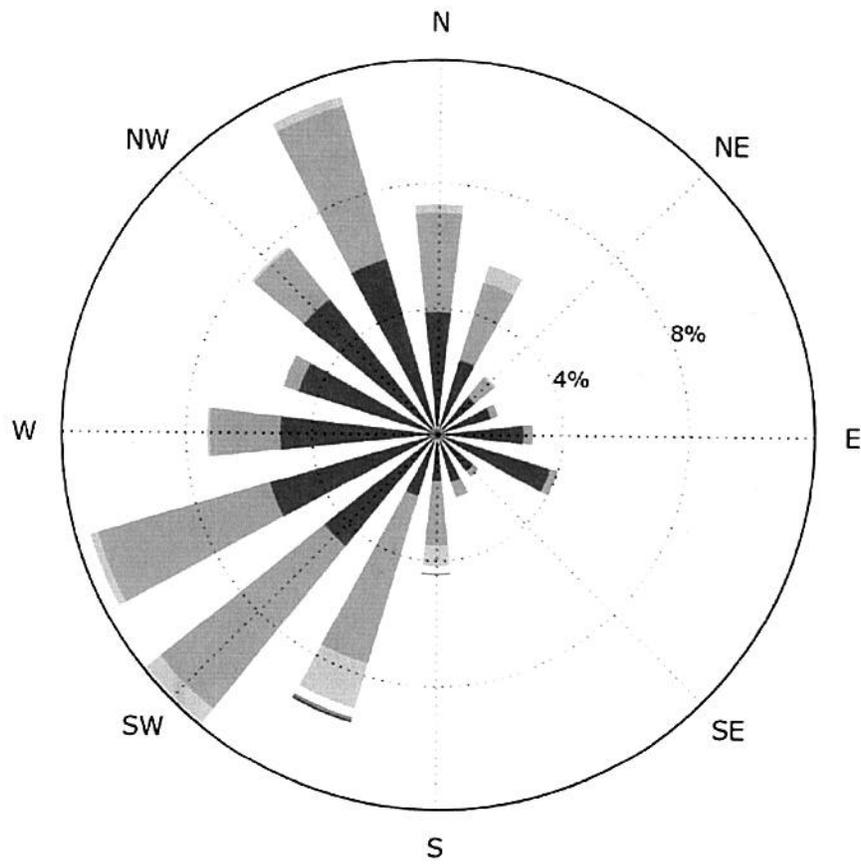
BATTLE MOUNTAIN DISTRICT OFFICE
 Mount Lewis Field Office
 50 Bastian Road
 Battle Mountain, Nevada 89820

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| 0 0.5 1 1.5 Miles | | | |
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BUREAU OF LAND MANAGEMENT
MOUNT HOPE PROJECT

DRAWING TITLE:
**Model Sources, Fenceline,
 and Receptor Locations**

Figure 3.6.2



Calms: 2.9%

- >= 11.75 m/s
- 9.50 - 11.75 m/s
- 7.25 - 9.50 m/s
- 5.00 - 7.25 m/s
- 2.75 - 5.00 m/s
- 0.50 - 2.75 m/s

Note: The wind direction in the figure is the direction from which the wind is blowing.

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BUREAU OF LAND MANAGEMENT
MOUNT HOPE PROJECT

DRAWING TITLE:
**Mount Hope 2010 On-site
 Meteorology - Wind Frequency
 Distribution Diagram**
 Figure 3.6.3

three-month rolling average concentrations is conservative approach to estimating the concentration (Air Sciences Inc. 2012a).

The maximum design rates are used to estimate the emissions from stacks and process fugitive sources, and the fugitive emissions are based on the mine year production rates (Air Sciences Inc. 2012a).

In order to conduct the **NEPA modeling** analysis efficiently and without generating and analyzing cumbersome data, **a screening modeling analysis was conducted for all 32 years of active mine life.** The results of the screening model showed that the highest impacts were driven by either of the two WRDFs or the LGO Stockpile. Based upon these findings, the mine production years representing the highest emissions in the PAG storage area and LGO stockpile, along with all other sources, were selected for each pollutant and modeled with one year of on-site meteorological data. Regulatory default options in AERMOD were used to estimate the ground-level concentrations for all the pollutants and averaging period except for NO₂. The non-default option of the Plume Volume Molar Ratio Method (PVMRM), a Tier 3 method from 40 CFR 51, Appendix W, was used to estimate the NO₂ concentrations. (Air Sciences Inc. 2012a).

The mine production years chosen for the NEPA modeling and the selection criteria are presented in Table 3.6-6. The sensitive receptors along the Jarbidge Wilderness Area and the Great Basin National Park were modeled separately from the boundary and grid receptors. The highest emissions for mine production Years 1, 6, 16, 20, 24, 27 and 32 for all pollutants **except annual PM₁₀ and old SO₂ standards (24-hour and annual)**, was modeled with one year of on-site meteorological data set. **The modeling of the annual PM₁₀ and old SO₂ standards is from the modeling information presented in the Draft EIS.**

Table 3.6-6: Modeled Mine Production Years and Selection Criteria

| Pollutant | Mine Production Year | Selection Criteria |
|---|----------------------|--|
| All | Year 24 | Highest cumulative and individual emissions for all pollutants |
| | Year 6 | Year of highest impact in screen model runs |
| CO | Year 1 | Highest emissions in PAG |
| | Year 27 | Highest emissions in Non-PAG |
| | Year 16 | Highest emissions in LGO Stockpile |
| NO ₂ | Year 24 | Highest emissions in PAG |
| | Year 27 | Highest emissions in Non-PAG |
| | Year 16 | Highest emissions in LGO Stockpile |
| PM ₁₀ , PM _{2.5} , and Pb | Year 1 | Highest emissions in PAG |
| | Year 20 | Highest emissions in Non-PAG |
| | Year 16 | Highest emissions in LGO Stockpile |
| SO ₂ | Year 1 | Highest emissions in PAG |
| | Year 27 | Highest emissions in Non-PAG |
| | Year 32 | Highest emissions in LGO stockpile |

3.6.3.2.5 Applicable Air Quality Standards

The background concentrations are added to the modeled impact to estimate the total pollutant concentrations, which were compared with the NAAQS for compliance demonstrations. The NAAQS are presented in Table 3.6-1.

3.6.3.2.6 Background Concentrations

To assess the impact of the Project on the ambient air quality, it was necessary to account for existing, or background, levels for each pollutant. No monitoring has been performed within the Project Area for ambient concentrations of CO, NO₂, O₃, or SO₂, nor does the BAPC specify background concentrations for these pollutants. However, background values are necessary for the purpose of comparing modeled results to the NAAQS and NSAAQS. **The BAPC was contacted to obtain representative background concentrations for the modeling analysis. The BAPC recommended background concentrations are presented in Table 3.6-7.**

Table 3.6-7: Background Values for Criteria Pollutants

| Pollutant | Averaging Period | Monitor Location | Year | Background Concentration (µg/m ³) | Reference |
|-------------------|----------------------|---------------------------------------|-----------|---|-------------------|
| PM ₁₀ | 24-Hour | NV Rural Area Default, Great Basin NP | N/A | 10.2 | BAPC |
| | Annual | NV Rural Area Default | N/A | 9.0 | BAPC |
| PM _{2.5} | 24-Hour ³ | Great Basin NP | 2005-2007 | 7.0 | BAPC ¹ |
| | Annual ⁴ | Great Basin NP | 2005-2007 | 2.4 | BAPC |
| CO | 1-Hour | N/A | N/A | 0 | BAPC ² |
| | 8-Hour | N/A | N/A | 0 | BAPC ² |
| NO ₂ | 1-Hour | N/A | N/A | 0 | BAPC ² |
| | Annual | N/A | N/A | 0 | BAPC ² |
| SO ₂ | 1-Hour | N/A | N/A | 0 | BAPC ² |
| | 3-Hour | N/A | N/A | 0 | BAPC ² |
| | 24-Hour | Boulder City, Clark Co., NV | 2001-2003 | 13.1 | EPA Air Data* |
| | Annual | Boulder City, Clark Co., NV | 2001-2003 | 2.6 | EPA Air Data* |
| Pb | Quarterly | N/A | N/A | 0 | BAPC |

<http://www.epa.gov/air/data/index.html>

¹ Randy Philips, BAPC, March 19, 2008

² Greg Remer, BAPC, March 19, 2007

³ 3-year average of the 98th percentile of 24-hour measurements

⁴ 3-year average of the weighted annual mean measurements

The PM₁₀ background concentrations are the default Nevada values recommended by the BAPC for unmonitored rural areas like the Project Area. For the PM_{2.5} background, monitoring aerosol data from Great Basin National Park were used. **The BAPC recommends assuming zero background for CO, NO₂, and SO₂ for unmonitored rural areas similar to the Project Area (Air Sciences Inc. 2012a).**

3.6.3.3 Proposed Action

The Proposed Action consists of many activities and actions, each of which may have the potential to emit air pollutants. NAC 445B.187 defines “stationary source” as “...any building, structure, facility, or installation, including temporary sources which emits or may emit any regulated air pollutant that is regulated under ... NAC445B.001 to NAC445B.3485.” NAC 445B.059 further defines “emission unit” as, “... a part of a stationary source that emits or has the potential to emit any regulated air pollutant.” A comprehensive list of the sources of air pollutant emissions, resulting either directly from the Proposed Action or from indirectly related facilities used to process ore from the Proposed Action are presented in Table 3.6-8.

Table 3.6-8: List of Sources Analyzed for the Mount Hope Project

| Emission Unit Description | Pollutants* |
|--|--|
| Primary Crusher (PC) Dump Pocket | PM ₁₀ , PM _{2.5} , Pb, HAPs |
| Primary Crusher & Apron Feeder Discharge | PM ₁₀ , PM _{2.5} , Pb, HAPs |
| Transfer to Coarse Ore Conveyor | PM ₁₀ , PM _{2.5} , Pb, HAPs |
| Transfer to Course Ore Stockpile | PM ₁₀ , HAPs |
| Reclaim Apron Feeder Transfer | PM ₁₀ , HAPs |
| Conveyor Transfer to SAG Mill | PM ₁₀ , HAPs |
| Pebble Crusher and Discharge | PM ₁₀ , HAPs |
| Sodium Metasilicate Silo Loading | PM ₁₀ , HAPs |
| Sodium Metasilicate Silo Unloading | PM ₁₀ , HAPs |
| Boiler for Dryer | CO, NO ₂ , PM ₁₀ , PM _{2.5} , Pb, SO ₂ , VOC, HAPs |
| Concentrate Dryer | CO, NO ₂ , PM ₁₀ , PM _{2.5} , Pb, SO ₂ , VOC, HAPs |
| Concentrate Transfer to Roasters via Conveyors, Bins, and Bucket Elevators | PM ₁₀ , PM _{2.5} , Pb, HAPs |
| Concentrate Roasters (1 and 2) | CO, NO ₂ , PM ₁₀ , PM _{2.5} , Pb, SO ₂ , VOC, HAPs |
| Primary and Secondary Screening | PM ₁₀ , PM _{2.5} , Pb, HAPs |
| TMO/ Rock Breaker- Roaster Building | PM ₁₀ , PM _{2.5} , Pb, HAPs |
| TMO Transfer to Packaging via Conveyors, Bins, and Bucket Elevators | PM ₁₀ , PM _{2.5} , Pb, HAPs |
| Lime Silo 1 Loading | PM ₁₀ , PM _{2.5} , HAPs |
| Lime Silo 1 Discharge | PM ₁₀ , PM _{2.5} , HAPs |
| Lime Silo 2 Loading | PM ₁₀ , PM _{2.5} , HAPs |
| Lime Silo 2 Discharge | PM ₁₀ , PM _{2.5} , HAPs |
| FeMo Plant- Batch Reactor | PM ₁₀ , PM _{2.5} , Pb, HAPs |
| FeMo Mixer | PM ₁₀ , PM _{2.5} , Pb, HAPs |
| FeMo Jaw Crusher | PM ₁₀ , PM _{2.5} , Pb, HAPs |
| FeMo Transfer to Packaging via Conveyors, Bins, and Bucket Elevators | PM ₁₀ , PM _{2.5} , Pb, HAPs |
| TMO Transfers, Handling, and Packaging | PM ₁₀ , PM _{2.5} , Pb, HAPs |
| FeMo Transfers, Handling, and Packaging | PM ₁₀ , PM _{2.5} , Pb, HAPs |
| Emergency Generator – Portable | CO, NO ₂ , PM ₁₀ , PM _{2.5} , SO ₂ , VOC, HAPs |
| Emergency Generator - Truck Shop | CO, NO ₂ , PM ₁₀ , PM _{2.5} , SO ₂ , VOC, HAPs |

| Emission Unit Description | Pollutants* |
|--|--|
| Emergency Generator - Mill Building | CO, NO ₂ , PM ₁₀ , PM _{2.5} , SO ₂ , VOC, HAPs |
| Emergency Generator - Tailings Pump House | CO, NO ₂ , PM ₁₀ , PM _{2.5} , SO ₂ , VOC, HAPs |
| Boiler - Mill Maintenance - General Heating | CO, NO ₂ , PM ₁₀ , PM _{2.5} , SO ₂ , VOC, HAPs |
| Boiler - Mine Maintenance - General Heating | CO, NO ₂ , PM ₁₀ , PM _{2.5} , SO ₂ , VOC, HAPs |
| Boiler - Filter/Packaging - General Heating | CO, NO ₂ , PM ₁₀ , PM _{2.5} , SO ₂ , VOC, HAPs |
| Boiler - FeMo Plant - General Heating | CO, NO ₂ , PM ₁₀ , PM _{2.5} , SO ₂ , VOC, HAPs |
| 100,000 Gallon #2 Fuel Oil Tank | VOC, HAPs |
| Diesel Storage Tank | VOC, HAPs |
| Diesel Storage Tank | VOC, HAPs |
| Diesel Storage Tank | VOC, HAPs |
| Boiler - Mill Maintenance - Office Heating | CO, NO ₂ , PM ₁₀ , PM _{2.5} , SO ₂ , VOC, HAPs |
| Boiler - Mill Maintenance - Shower Boiler | CO, NO ₂ , PM ₁₀ , PM _{2.5} , SO ₂ , VOC, HAPs |
| Boiler - Mine Maintenance - Office Heating | CO, NO ₂ , PM ₁₀ , PM _{2.5} , SO ₂ , VOC, HAPs |
| Boiler - Mine Maintenance - Shower Boiler | CO, NO ₂ , PM ₁₀ , PM _{2.5} , SO ₂ , VOC, HAPs |
| Boiler - Truck Wash - General Heating | CO, NO ₂ , PM ₁₀ , PM _{2.5} , SO ₂ , VOC, HAPs |
| Boiler - Truck Wash - Wash Steamer | CO, NO ₂ , PM ₁₀ , PM _{2.5} , SO ₂ , VOC, HAPs |
| Boiler - Administration | CO, NO ₂ , PM ₁₀ , PM _{2.5} , SO ₂ , VOC, HAPs |
| Boiler - Administration | CO, NO ₂ , PM ₁₀ , PM _{2.5} , SO ₂ , VOC, HAPs |
| Boiler - Laboratory - General Heating | CO, NO ₂ , PM ₁₀ , PM _{2.5} , SO ₂ , VOC, HAPs |
| Boiler - Laboratory - Water Heater | CO, NO ₂ , PM ₁₀ , PM _{2.5} , SO ₂ , VOC, HAPs |
| Boiler - Health and Safety - General Heating | CO, NO ₂ , PM ₁₀ , PM _{2.5} , SO ₂ , VOC, HAPs |
| Boiler - Health and Safety - Water Heater | CO, NO ₂ , PM ₁₀ , PM _{2.5} , SO ₂ , VOC, HAPs |
| Boiler - Truck Shop - General Heating | CO, NO ₂ , PM ₁₀ , PM _{2.5} , SO ₂ , VOC, HAPs |
| Antifreeze Storage Tank | VOC, HAPs |
| Used Antifreeze Storage Tank | VOC, HAPs |
| Used Oil Storage Tank | VOC, HAPs |
| Truck Maintenance Fluid Storage Tank | VOC, HAPs |
| ATF Storage Tank | VOC, HAPs |
| Engine Oil Storage Tank | VOC, HAPs |
| Gear Oil Storage Tank | VOC, HAPs |
| Hydraulic Fluid Storage Tank | VOC, HAPs |
| Engine Oil Storage Tank | VOC, HAPs |
| Used Antifreeze Storage Tank | VOC, HAPs |
| Used Oil Storage Tank | VOC, HAPs |
| Gasoline Storage Tank | VOC, HAPs |
| Highway Diesel Storage Tank | VOC, HAPs |
| Fuel Oil #2/ MIBC Blend Storage Tank | VOC, HAPs |
| MIBC Storage Tank | VOC, HAPs |
| Pine Oil Storage Tank | VOC, HAPs |
| Fuel Oil #2 Storage Tank | VOC, HAPs |
| Fuel Oil Storage Tank | VOC, HAPs |

| Emission Unit Description | Pollutants* |
|---|--|
| Hydrochloric Acid Storage Tank | VOC, HAPs |
| Drilling | PM ₁₀ , PM _{2.5} , Pb, HAPs |
| Blasting | CO, NO ₂ , PM ₁₀ , PM _{2.5} , Pb, SO ₂ , HAPs |
| HG Ore - In-Pit Loading | PM ₁₀ , PM _{2.5} , Pb, HAPs |
| HG Ore - Stockpile Unloading | PM ₁₀ , PM _{2.5} , Pb, HAPs |
| HG Ore - Stockpile Loading | PM ₁₀ , PM _{2.5} , Pb, HAPs |
| LGO In-Pit Loading | PM ₁₀ , PM _{2.5} , Pb, HAPs |
| LGO Stockpile Unloading | PM ₁₀ , PM _{2.5} , Pb, HAPs |
| Waste - In-Pit Loading | PM ₁₀ , PM _{2.5} , Pb, HAPs |
| Waste - PAG Unloading | PM ₁₀ , PM _{2.5} , Pb, HAPs |
| Waste - Non-PAG Unloading | PM ₁₀ , PM _{2.5} , Pb, HAPs |
| LGO Stockpile Loading | HAPs |
| Wind Erosion - PC Stockpile | PM ₁₀ , PM _{2.5} , Pb, HAPs |
| Wind Erosion - LG Stockpile | PM ₁₀ , PM _{2.5} , Pb, HAPs |
| Wind Erosion - PAG | PM ₁₀ , PM _{2.5} , Pb, HAPs |
| Wind Erosion - Non-PAG | PM ₁₀ , PM _{2.5} , Pb, HAPs |
| Wind Erosion - Course HG Stockpile | PM ₁₀ , PM _{2.5} , Pb, HAPs |
| Wind Erosion - Pit to PC Haul Road | PM ₁₀ , PM _{2.5} , Pb, HAPs |
| Wind Erosion - Pit to Low-Grade Ore Stockpile Haul Road | PM ₁₀ , PM _{2.5} , Pb, HAPs |
| Wind Erosion - Pit to PAG Haul Road | PM ₁₀ , PM _{2.5} , Pb, HAPs |
| Wind Erosion - Pit to Non-PAG Haul Road | PM ₁₀ , PM _{2.5} , Pb, HAPs |
| Wind Erosion - Tailings Storage Facility | PM ₁₀ , PM _{2.5} , Pb, HAPs |
| Haul - HG Ore to PC & Stockpile | PM ₁₀ , PM _{2.5} , Pb, HAPs |
| Haul - LG Ore to Stockpile | PM ₁₀ , PM _{2.5} , Pb, HAPs |
| Haul - Waste to PAG | PM ₁₀ , PM _{2.5} , Pb, HAPs |
| Haul - Waste to Non-PAG | PM ₁₀ , PM _{2.5} , Pb, HAPs |
| Haul - LG Stockpile to PC | PM ₁₀ , PM _{2.5} , Pb, HAPs |
| Tailpipe - Loaders | CO, NO ₂ , PM ₁₀ , PM _{2.5} , SO ₂ , VOC, HAPs |
| Tailpipe - Haul Trucks | CO, NO ₂ , PM ₁₀ , PM _{2.5} , SO ₂ , VOC, HAPs |
| Tailpipe - Dozers | CO, NO ₂ , PM ₁₀ , PM _{2.5} , SO ₂ , VOC, HAPs |
| Tailpipe - Graders | CO, NO ₂ , PM ₁₀ , PM _{2.5} , SO ₂ , VOC, HAPs |
| Tailpipe - Water Trucks | CO, NO ₂ , PM ₁₀ , PM _{2.5} , SO ₂ , VOC, HAPs |
| Tailpipe - Excavators | CO, NO ₂ , PM ₁₀ , PM _{2.5} , SO ₂ , VOC, HAPs |
| Tailpipe - Blasthole Drills | CO, NO ₂ , PM ₁₀ , PM _{2.5} , SO ₂ , VOC, HAPs |
| Tailpipe - Hydraulic Shovel | CO, NO ₂ , PM ₁₀ , PM _{2.5} , SO ₂ , VOC, HAPs |
| Paved Road Travel - Commuter Buses | PM ₁₀ , PM _{2.5} , HAPs |
| Tailpipe - Commuter Buses | CO, NO ₂ , PM ₁₀ , PM _{2.5} , SO ₂ , VOC, HAPs |

* - Hazardous air pollutant (HAP) emissions could occur from any or all sources.

3.6.3.3.1 PM₁₀, PM_{2.5}, and Pb Emissions and Modeled Concentrations

PM₁₀ emissions are generated by almost all sources in Table 3.6-8. The major sources of PM₁₀ and PM_{2.5} emissions include resuspension of unpaved road dust from haul trucks, wind erosion of the WRDFs and the ore storage stockpiles, as well as processing material using crushers, screens, and conveyors, and emissions from blasting operations. Emission controls such as watersprays help minimize emissions from the material process equipment (i.e., crushers, screens, conveyors, etc.) (AirSciences Inc. 2010; 2011a; 2011b; 2012a).

The PM₁₀/PM_{2.5} emissions from the bus transportation of the employees on public roads to and from the Project Area would total 2.86 tpy (AirSciences Inc. 2011c). These emissions would be from engine exhaust, tire and brake wear, and fugitive dust generated from bus travel on paved roads. These emissions would have an incremental impact on the air quality in the vicinity of the transportation route.

The potential for indirect fugitive dust emissions from the ground water production exists as a result of the Proposed Action. As discussed under Section 3.2, the ground water pumping in Kobeh Valley would result in the lowering of the water table in Kobeh Valley. As discussed in Section 3.9, a phreatophytic vegetation community exists in Kobeh Valley where the current water table is near the ground surface. Should the water table be lowered a sufficient distance, the current vegetation community in this area may shift to another community, have a lower population density (less individual plants per given area), or there may be an area without any vegetation. Should this occur and there are sufficient activities in that area to keep the soil surface from crusting, then the wind would result in the creation of wind-blown fugitive dust. These emissions would have an incremental impact on the air quality in the vicinity of the Kobeh Valley.

The maximum modeled ambient PM₁₀ concentration in the NEPA modeling analysis, including background concentrations, for modeled years of highest impact (Years 1, 6, 16, 20, 24, 27, and 32) at any point of public access is 58.6 µg/ m³ per 24-hour time period with 2010 on-site meteorological data, and 20.8 µg/m³, annual arithmetic average with 1988 meteorological data (Table 3.6-9). The maximum modeled ambient PM_{2.5} concentration in the NEPA modeling analysis, including background concentrations, for modeled years of highest impact (Years 1, 6, 16, 20, 24, 27, and 32) at any point of public access are 23.0 µg/ m³ per 24-hour time period and 6.5 µg/ m³, annual arithmetic average with 2010 on-site meteorological data (Table 3.6-9). The modeled high concentration for Pb is substantially below the NSAAQS and NAAQS standards.

Table 3.6-9: Highest Modeled Air Pollutant Concentrations from the Proposed Action at Receptor Points Accessible to the Public

| Pollutant | Averaging Time | Met. Data Year | Highest Modeled Receptor Point | | | Lowest Applicable Ambient Standard (µg/m ³) |
|-------------------|----------------|----------------|--------------------------------|------------------|---|---|
| | | | Receptor Location ¹ | | Dispersion Modeling Results (µg/m ³) ² | |
| | | | UTM Easting (m) | UTM Northing (m) | | |
| PM ₁₀ | 24-Hour | 2010 | 572,288 | 4,405,086 | 58.6 | 150 |
| | Annual | 1988 | 569,680 | 4,407,572 | 20.7 | 50 |
| PM _{2.5} | 24-Hour | 2010 | 572,317 | 4,404,913 | 23.0 | 35 |

| Pollutant | Averaging Time | Met. Data Year | Highest Modeled Receptor Point | | | Lowest Applicable Ambient Standard ($\mu\text{g}/\text{m}^3$) |
|-----------------|-------------------------|----------------|--------------------------------|------------------|---|---|
| | | | Receptor Location ¹ | | Dispersion Modeling Results ($\mu\text{g}/\text{m}^3$) ² | |
| | | | UTM Easting (m) | UTM Northing (m) | | |
| | Annual | 2010 | 572,400 | 4,404,700 | 6.5 | 15 |
| SO ₂ | 1-Hour | 2010 | 572,400 | 4,404,600 | 62.3 | 196 |
| | 3-Hour | 2010 | 572,449 | 4,404,521 | 32.9 | 1,300 |
| | 24-Hour | 1991 | 567,700 | 4,405,600 | 29.3 | 365 |
| | Annual | 1992 | 572,386 | 4,404,696 | 4.3 | 80 |
| CO | 1-Hour | 2010 | 569,825 | 4,407,667 | 324.5 | 40,000 |
| | 8-Hour (< 5,000') | 2010 | 572,400 | 4,404,700 | 110.0 | 10,000 |
| | 8-Hour (\geq 5,000') | 2010 | 572,400 | 4,404,700 | 110.0 | 6,667 |
| Pb | 1-Month | 2010 | 572,308 | 4,404,962 | 0.007 | 0.15 |
| NO ₂ | 1-Hour | 2010 | 572,284 | 4,405,111 | 162.1 | 188 |
| | Annual | 2010 | 572,400 | 4,404,700 | 14.1 | 100 |

¹ All coordinates in UTM projection, North American Datum 1983.

² Background values, as listed in Table 3.6-7 are included.

The modeled high concentration receptor locations for the NEPA modeling analysis is shown in Figure 3.6.4.

- Impact 3.6.3.3-1:** Emissions of PM₁₀, PM_{2.5}, and Pb would be generated by numerous processes as a result of the Proposed Action, including the resuspension of road dust, wind erosion of exposed dirt surfaces, and activities related to the processing of ore materials. These activities are inherent to the mining process and would be ongoing throughout the life of the Proposed Action. The modeled PM₁₀, PM_{2.5}, and Pb concentrations show levels below the NSAAQS and NAAQS, even with the addition of the background values.

Significance of the Impact: This impact is not considered significant.

No mitigation is proposed for this impact; see Section 3.1.1 for a general discussion of significance and the development of mitigation measures.

3.6.3.3.2 Combustion Emissions and Modeled Concentrations

Combustion of diesel in the haul trucks and mobile equipment, such as loaders, dozers, etc., the combustion of propane in processing units such as the boilers, and the combustion of fuel oil or diesel in units such as the roaster, can produce elevated ambient levels of CO, NO₂, SO₂, PM₁₀, PM_{2.5}, and O₃ (from VOC emissions). In most cases, combustion emissions are generally uncontrolled for the emissions units. Despite the lack of tailpipe emissions control technology for combustion sources throughout the Project Area, the maximum modeled CO, NO₂, and SO₂ concentrations from the modeling analysis is well below either the NSAAQS or the NAAQS.

The modeled results, including background concentrations, for each pollutant for each applicable averaging time are shown in Table 3.6-9.

The CO, NO₂, SO₂, and VOC emissions from the bus transportation of the employees on public roads, to and from the Project Area total 2.32, 4.97, 0.01, and 0.25 tpy, **respectively** (Air Sciences Inc 2011c). These emissions would be from engine exhaust. These emissions would have an incremental impact on the air quality in the vicinity of the transportation route.

- **Impact 3.6.3.3-2:** Combustion emissions of CO, NO₂, SO₂, PM₁₀, PM_{2.5}, and VOC would be generated by numerous processes as a result of the Proposed Action, including combustion emissions from diesel engines and burning propane, fuel oil, or diesel in various process equipments. The modeled CO, NO₂, SO₂, PM₁₀, PM_{2.5}, and VOC show levels below the NSAAQS and NAAQS.

Significance of the Impact: This impact is not considered significant.

No mitigation is proposed for this impact; see Section 3.1.1 for a general discussion of significance and the development of mitigation measures.

3.6.3.3.3 HAPs Emissions

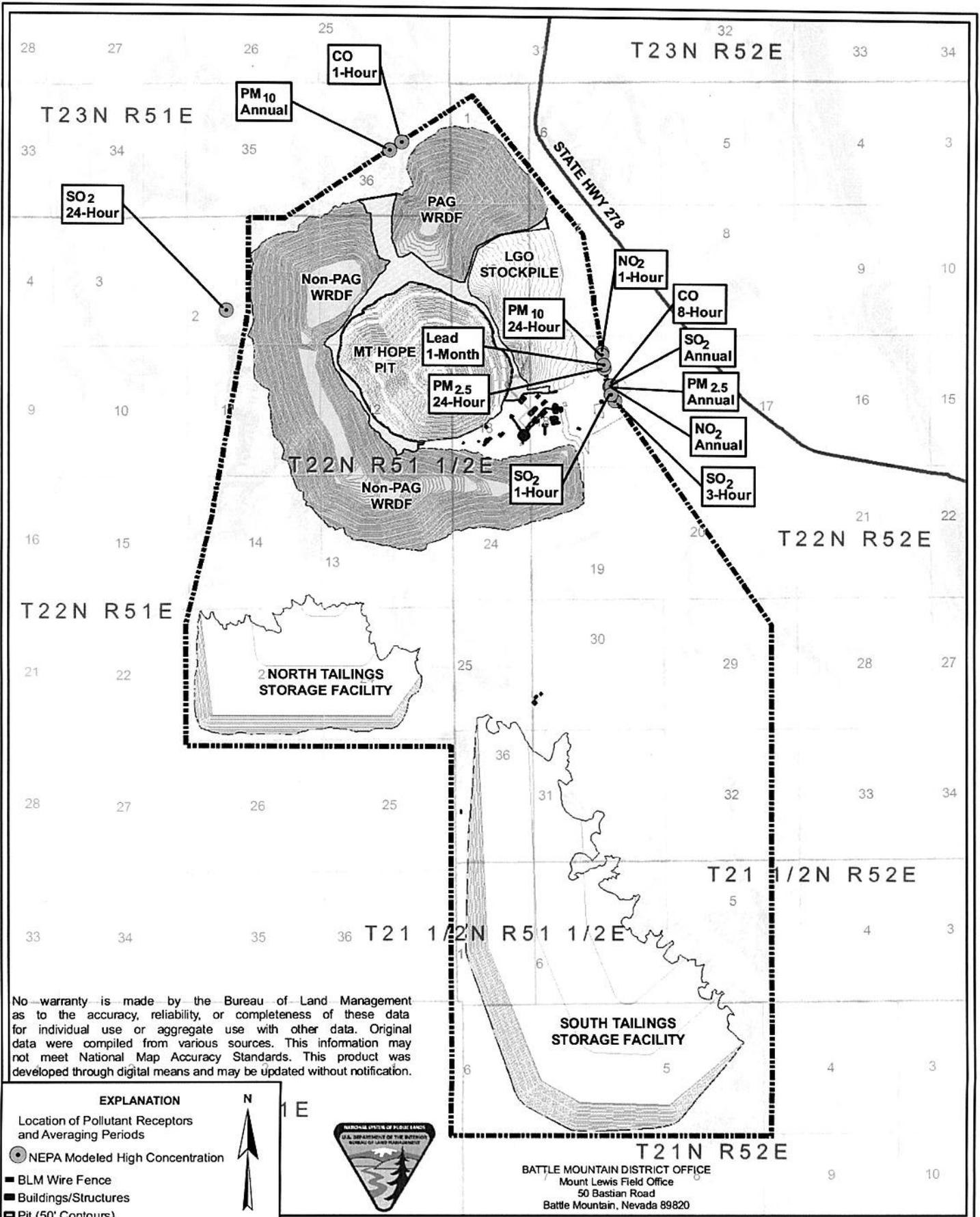
HAPs emissions from the Proposed Action would result from the handling of earthen materials, the combustion of the hydrocarbon fuels, and the handling and use of various chemicals. A summary of the total HAPs emissions that would be emitted from the Proposed Action is presented in Table 3.6-10 (Air Sciences Inc. 2012b). The facility-wide HAPs emissions would be **4.53 tpy** and Mn would be the highest emitted single HAP at 1.16 tpy. These estimated emissions include both fugitive and process sources. EPA thresholds for any single HAP, or for all HAPs combined, are ten and 25 tpy, respectively. With the exception of Pb, there are no ambient air quality standards for HAPs and these emissions would have an incremental impact on the air quality in the vicinity of the Project Area. Pb is a criteria pollutant, as mentioned previously in the text.

3.6.3.3.4 Sensitive Receptors Effects

Dispersion modeling was also performed to determine the impacts on the “sensitive” receptors listed in Section 3.6.3.2.2 for the NEPA analysis. The highest 24-hour PM₁₀ impact from the Proposed Action on the defined sensitive receptors was found to be **14.3 µg/ m³** at the Roberts Creek Ranch. The highest annual PM₁₀ impact from the Proposed Action on the defined sensitive receptors was found to be 1.091 µg/ m³, also at the Roberts Creek Ranch (Table 3.6-11).

The NEPA modeling analysis was also performed to determine the impacts of the gaseous pollutants from the Proposed Action on the defined sensitive receptors, including the Jarbidge Wilderness, for each applicable averaging time shown in Table 3.6-11. In all instances, the concentrations are a small fraction of the ambient standards, and in the case of the Jarbidge Wilderness, much less than the PSD Class I increments.

The highest 24-hour and annual PM₁₀ concentrations modeled from the Proposed Action emissions at the Jarbidge Wilderness Area are 0.1 µg/m³ and 0.008 µg/m³, respectively. Although the Project is not subject to limitations by the PSD Class I increments (8 µg/m³ and



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- EXPLANATION**
- Location of Pollutant Receptors and Averaging Periods
 - NEPA Modeled High Concentration
 - BLM Wire Fence
 - Buildings/Structures
 - Pit (50' Contours)
 - Interpit Area
 - Low Grade Ore Stockpile (25' Contours)
 - Tailing Storage Facilities (20' Contours)
 - Waste Rock Disposal Facilities (20' Contours)
 - Yard



BATTLE MOUNTAIN DISTRICT OFFICE
 Mount Lewis Field Office
 50 Bastian Road
 Battle Mountain, Nevada 89820

| | | | |
|--------------------------|---|----------|------------|
| 0 2,000 4,000 6,000 Feet | | | |
| DESIGN | EMLLC | DRAWN | CVD/GSL |
| CHECKED | | APPROVED | RFD |
| DATE | 08/02/2012 | DATE | 08/02/2012 |
| FILE NAME | p1635_Fig3-6-4_ModeledHighPollutants_v3.mxd | | |

BUREAU OF LAND MANAGEMENT
MOUNT HOPE PROJECT

Modeled Highest Pollutant Concentrations for the Proposed Action
 Figure 3.6.4

4 g/m³, 24-hour and annual averaging times, respectively), the ambient concentration increases modeled from Proposed Action emissions values are far below these PSD Class I increments and the EPA's modeling significance level of 1 µg/m³.

Table 3.6-10: HAPs Emissions for the Mount Hope Project

| HAPs | Facility Total (tpy) | Fugitive Sources (tpy) | Process Sources (tpy) |
|--------------------|----------------------|------------------------|-----------------------|
| Formaldehyde | 0.074 | 0.056 | 0.018 |
| Benzene | 0.553 | 0.550 | 0.003 |
| Acetaldehyde | 0.018 | 0.018 | 0.0003 |
| Naphthalene | 0.093 | 0.092 | 0.001 |
| 1,3-Butadiene | 0.00001 | -- | 0.00001 |
| Acrolein | 0.006 | 0.006 | 0.00005 |
| Toluene | 0.201 | 0.199 | 0.002 |
| Hexane | 0.415 | -- | 0.415 |
| Phosphorus as P2O5 | 0.810 | 0.770 | 0.040 |
| Phosphorus | 0.011 | -- | 0.011 |
| Xylenes | 0.137 | 0.137 | 0.001 |
| Lead | 0.265 | 0.243 | 0.022 |
| Manganese | 1.159 | 1.142 | 0.018 |
| Mercury | 0.001 | 0.001 | 0.0002 |
| Nickel | 0.038 | 0.037 | 0.001 |
| Antimony | 0.015 | 0.015 | 0.000 |
| Arsenic | 0.184 | 0.159 | 0.025 |
| Beryllium | 0.004 | 0.003 | 0.000 |
| Cadmium | 0.025 | 0.025 | 0.000 |
| Chromium | 0.267 | 0.262 | 0.005 |
| Cobalt | 0.010 | 0.010 | 0.000 |
| Hydrochloric Acid | 0.241 | -- | 0.241 |
| Selenium | 0.004 | 0.003 | 0.001 |
| Total HAPs | 4.53 | 3.73 | 0.80 |

Table 3.6-11: Highest Modeled Air Pollutant Concentration Impacts from the Proposed Action at the Defined Sensitive Receptors

| Pollutant | Averaging Time | Met Year | Receptor Location | | Dispersion Modeling Results (µg/m ³) | Lowest Applicable Ambient Standard (µg/m ³) |
|---------------------------------|-------------------|----------|-------------------|------------------|--|---|
| | | | UTM Easting (m) | UTM Northing (m) | | |
| Jarbidge Wilderness Area | | | | | | |
| PM _{2.5} | 24-Hour | 2010 | 634,545 | 4,608,201 | 0.0 | 35 |
| | Annual | 2010 | 632,947 | 4,608,167 | 0.0 | 15 |
| PM ₁₀ | 24-Hour | 2010 | 628,352 | 4,608,069 | 0.1 | 4 |
| | Annual | 1991 | 628,652 | 4,608,076 | 0.008 | 8 |
| CO | 1-Hour | 2010 | 627,543 | 4,610,542 | 0.8 | 40,000 |
| | 8-Hour (< 5,000') | 2010 | 627,543 | 4,610,542 | 0.2 | 10,000 |
| | 8-Hour (≥ 5,000') | 2010 | 627,543 | 4,610,542 | 0.2 | 6,670 |

| Pollutant | Averaging Time | Met Year | Receptor Location | | Dispersion Modeling Results ($\mu\text{g}/\text{m}^3$) | Lowest Applicable Ambient Standard ($\mu\text{g}/\text{m}^3$) |
|----------------------------------|-------------------------|----------|-------------------|------------------|--|---|
| | | | UTM Easting (m) | UTM Northing (m) | | |
| Pb | 1-Month | 2010 | 628,352 | 4,608,069 | 0.0000 | 1.5 |
| NO ₂ | 1-Hour | 2010 | 632,347 | 4,608,154 | 0.4 | 188 |
| | Annual | 2010 | 628,321 | 4,608,164 | 0.0 | 2.5 |
| SO ₂ | 1-Hour | 2010 | 630,150 | 4,608,108 | 0.1 | 196 |
| | 3-Hour | 2010 | 627,540 | 4,610,936 | 0.1 | 25 |
| | 24-Hour | 1991 | 628,652 | 4,608,076 | 0.076 | 5 |
| | Annual | 1991 | 628,652 | 4,608,076 | 0.001 | 2 |
| Great Basin National Park | | | | | | |
| PM _{2.5} | 24-Hour | 2010 | 732,016 | 4,327,169 | 7.0 | 35 |
| | Annual | 2010 | 732,114 | 4,327,174 | 2.4 | 15 |
| PM ₁₀ | 24-Hour | 2010 | 732,213 | 4,327,179 | 10.3 | 150 |
| | Annual | 1991 | 732,016 | 4,327,170 | 0.007 | 50 |
| CO | 1-Hour | 2010 | 732,213 | 4,327,179 | 2.6 | 40,000 |
| | 8-Hour (< 5,000') | 2010 | 732,213 | 4,327,179 | 0.4 | 10,000 |
| | 8-Hour (\geq 5,000') | 2010 | 732,213 | 4,327,179 | 0.4 | 6,670 |
| Pb | 1-Month | 2010 | 731,031 | 4,327,122 | 0.000 | 1.5 |
| NO ₂ | 1-Hour | 2010 | 732,016 | 4,327,169 | 0.8 | 188 |
| | Annual | 2010 | 732,016 | 4,327,169 | 0.0 | 100 |
| SO ₂ | 1-Hour | 2010 | 731,622 | 4,327,150 | 0.1 | 196 |
| | 3-Hour | 2010 | 732,311 | 4,327,183 | 0.1 | 1,300 |
| | 24-Hour | 1988 | 728,953 | 4,320,711 | 0.042 | 365 |
| | Annual | 1991 | 732,016 | 4,327,170 | 0.001 | 80 |
| Bailey North Ranch* | | | | | | |
| PM _{2.5} | 24-Hour | 2010 | 580,043 | 4,419,188 | 7.3 | 35 |
| | Annual | 2010 | 580,043 | 4,419,188 | 2.45 | 15 |
| PM ₁₀ | 24-Hour | 2010 | 580,043 | 4,419,188 | 12.0 | 150 |
| CO | 1-Hour | 2010 | 580,043 | 4,419,188 | 37.9 | 40,000 |
| | 8-Hour (<5,000') | 2010 | 580,043 | 4,419,188 | 6.9 | 10,000 |
| | 8-Hour (>5,000') | 2010 | 580,043 | 4,419,188 | 6.9 | 6,670 |
| Pb | 1-Month | 2010 | 580,043 | 4,419,188 | 0.000 | 1.5 |

| Pollutant | Averaging Time | Met Year | Receptor Location | | Dispersion Modeling Results ($\mu\text{g}/\text{m}^3$) | Lowest Applicable Ambient Standard ($\mu\text{g}/\text{m}^3$) |
|----------------------------------|------------------|----------|-------------------|------------------|--|---|
| | | | UTM Easting (m) | UTM Northing (m) | | |
| NO ₂ | 1-Hour | 2010 | 580,043 | 4,419,188 | 18.3 | 188 |
| | Annual | 2010 | 580,043 | 4,419,188 | 0.3 | 100 |
| SO ₂ | 1-Hour | 2010 | 580,043 | 4,419,188 | 1.6 | 196 |
| | 3-Hour | 2010 | 580,043 | 4,419,188 | 1.0 | 1,300 |
| Bailey South Ranch* | | | | | | |
| PM _{2.5} | 24-Hour | 2010 | 581,599 | 4,396,519 | 7.4 | 35 |
| | Annual | 2010 | 581,599 | 4,396,519 | 2.45 | 15 |
| PM ₁₀ | 24-Hour | 2010 | 581,599 | 4,396,519 | 12.3 | 150 |
| CO | 1-Hour | 2010 | 581,599 | 4,396,519 | 37.5 | 40,000 |
| | 8-Hour (<5,000') | 2010 | 581,599 | 4,396,519 | 7.2 | 10,000 |
| | 8-Hour (>5,000') | 2010 | 581,599 | 4,396,519 | 7.2 | 6,670 |
| Pb | 1-Month | 2010 | 581,599 | 4,396,519 | 0.0000 | 1.5 |
| NO ₂ | 1-Hour | 2010 | 581,599 | 4,396,519 | 21.7 | 188 |
| | Annual | 2010 | 581,599 | 4,396,519 | 0.4 | 100 |
| SO ₂ | 1-Hour | 2010 | 581,599 | 4,396,519 | 2.4 | 196 |
| | 3-Hour | 2010 | 581,599 | 4,396,519 | 1.5 | 1,300 |
| Benson Ranch* | | | | | | |
| PM _{2.5} | 24-Hour | 2010 | 584,817 | 4,396,554 | 7.3 | 35 |
| | Annual | 2010 | 584,817 | 4,396,554 | 2.45 | 15 |
| PM ₁₀ | 24-Hour | 2010 | 584,817 | 4,396,554 | 11.7 | 150 |
| CO | 1-Hour | 2010 | 584,817 | 4,396,554 | 27.1 | 40,000 |
| | 8-Hour (<5,000') | 2010 | 584,817 | 4,396,554 | 5.8 | 10,000 |
| | 8-Hour (>5,000') | 2010 | 584,817 | 4,396,554 | 5.8 | 6,670 |
| Pb | 1-Month | 2010 | 584,817 | 4,396,554 | 0.000 | 1.5 |
| NO ₂ | 1-Hour | 2010 | 584,817 | 4,396,554 | 15.8 | 188 |
| | Annual | 2010 | 584,817 | 4,396,554 | 0.3 | 100 |
| SO ₂ | 1-Hour | 2010 | 584,817 | 4,396,554 | 1.5 | 196 |
| | 3-Hour | 2010 | 584,817 | 4,396,554 | 0.7 | 1,300 |
| Eureka County High School | | | | | | |
| PM _{2.5} | 24-Hour | 2010 | 588,204 | 4,374,062 | 7.2 | 35 |

| Pollutant | Averaging Time | Met Year | Receptor Location | | Dispersion Modeling Results (µg/m³) | Lowest Applicable Ambient Standard (µg/m³) |
|-------------------------------------|-------------------|----------|-------------------|------------------|-------------------------------------|--|
| | | | UTM Easting (m) | UTM Northing (m) | | |
| PM ₁₀ | Annual | 2010 | 588,204 | 4,374,062 | 2.4 | 15 |
| | 24-Hour | 2010 | 588,204 | 4,374,062 | 10.8 | 150 |
| | Annual | 1990 | 588,204 | 4,374,062 | 0.073 | 50 |
| CO | 1-Hour | 2010 | 588,204 | 4,374,062 | 11.2 | 40,000 |
| | 8-Hour (< 5,000') | 2010 | 588,204 | 4,374,062 | 1.9 | 10,000 |
| | 8-Hour (≥ 5,000') | 2010 | 588,204 | 4,374,062 | 1.9 | 6,670 |
| Pb | 1-Month | 2010 | 588,204 | 4,374,062 | 0.000 | 1.5 |
| NO ₂ | 1-Hour | 2010 | 588,204 | 4,374,062 | 6.3 | 188 |
| | Annual | 2010 | 588,204 | 4,374,062 | 0.1 | 100 |
| SO ₂ | 1-Hour | 2010 | 588,204 | 4,374,062 | 1.0 | 196 |
| | 3-Hour | 2010 | 588,204 | 4,374,062 | 0.5 | 1,300 |
| | 24-Hour | 1992 | 588,204 | 4,374,062 | 0.216 | 365 |
| | Annual | 1990 | 588,204 | 4,374,062 | 0.010 | 80 |
| Eureka Elementary School | | | | | | |
| PM _{2.5} | 24-Hour | 2010 | 589,341 | 4,373,756 | 7.2 | 35 |
| | Annual | 2010 | 589,341 | 4,373,756 | 2.4 | 15 |
| PM ₁₀ | 24-Hour | 2010 | 589,341 | 4,373,756 | 10.9 | 150 |
| | Annual | 2010 | 589,341 | 4,373,756 | 0.075 | 50 |
| CO | 1-Hour | 2010 | 589,341 | 4,373,756 | 9.2 | 40,000 |
| | 8-Hour (< 5,000') | 2010 | 589,341 | 4,373,756 | 1.7 | 10,000 |
| | 8-Hour (≥ 5,000') | 2010 | 589,341 | 4,373,756 | 1.7 | 6,670 |
| Pb | 1-Month | 2010 | 589,341 | 4,373,756 | 0.000 | 1.5 |
| NO ₂ | 1-Hour | 2010 | 589,341 | 4,373,756 | 6.6 | 188 |
| | Annual | 2010 | 589,341 | 4,373,756 | 0.1 | 100 |
| SO ₂ | 1-Hour | 2010 | 589,341 | 4,373,756 | 0.7 | 196 |
| | 3-Hour | 2010 | 589,341 | 4,373,756 | 0.4 | 1,300 |
| | 24-Hour | 1992 | 589,341 | 4,373,756 | 0.174 | 365 |
| | Annual | 1990 | 589,341 | 4,373,756 | 0.010 | 80 |
| Eureka County Medical Clinic | | | | | | |
| PM _{2.5} | 24-Hour | 2010 | 589,358 | 4,374,008 | 7.2 | 35 |

| Pollutant | Averaging Time | Met Year | Receptor Location | | Dispersion Modeling Results ($\mu\text{g}/\text{m}^3$) | Lowest Applicable Ambient Standard ($\mu\text{g}/\text{m}^3$) |
|----------------------------|--------------------------|----------|-------------------|------------------|--|---|
| | | | UTM Easting (m) | UTM Northing (m) | | |
| PM ₁₀ | Annual | 2010 | 589,358 | 4,374,008 | 2.4 | 15 |
| | 24-Hour | 2010 | 589,358 | 4,374,008 | 10.9 | 150 |
| | Annual | 1990 | 589,358 | 4,374,008 | .076 | 50 |
| CO | 1-Hour | 2010 | 589,358 | 4,374,008 | 9.1 | 40,000 |
| | 8-Hour (< 5,000') | 2010 | 589,358 | 4,374,008 | 1.7 | 10,000 |
| | 8-Hour ($\geq 5,000'$) | 2010 | 589,358 | 4,374,008 | 1.7 | 6,670 |
| Pb | 1-Month | 2010 | 589,358 | 4,374,008 | 0.000 | 1.5 |
| NO ₂ | 1-Hour | 2010 | 589,358 | 4,374,008 | 6.7 | 188 |
| | Annual | 2010 | 589,358 | 4,374,008 | 0.1 | 10 |
| SO ₂ | 1-Hour | 2010 | 589,358 | 4,374,008 | 0.7 | 196 |
| | 3-Hour | 2010 | 589,358 | 4,374,008 | 0.4 | 1,300 |
| | 24-Hour | 1991 | 589,358 | 4,374,008 | 0.182 | 365 |
| | Annual | 1990 | 589,358 | 4,374,008 | 0.011 | 80 |
| Alpha Ranch | | | | | | |
| PM _{2.5} | 24-Hour | 2010 | 568,465 | 4,428,941 | 7.4 | 35 |
| | Annual | 2010 | 568,465 | 4,428,941 | 2.4 | 15 |
| PM ₁₀ | 24-Hour | 2010 | 568,465 | 4,428,941 | 12.0 | 150 |
| | Annual | 1991 | 568,465 | 4,428,941 | .110 | 50 |
| CO | 1-Hour | 2010 | 568,465 | 4,428,941 | 44.8 | 40,000 |
| | 8-Hour (< 5,000') | 2010 | 568,465 | 4,428,941 | 6.1 | 10,000 |
| | 8-Hour ($\geq 5,000'$) | 2010 | 568,465 | 4,428,941 | 6.1 | 6,670 |
| Pb | 1-Month | 2010 | 568,465 | 4,428,941 | 0.000 | 1.5 |
| NO ₂ | 1-Hour | 2010 | 568,465 | 4,428,941 | 21.1 | 188 |
| | Annual | 2010 | 568,465 | 4,428,941 | 0.2 | 100 |
| SO ₂ | 1-Hour | 2010 | 568,465 | 4,428,941 | 2.4 | 196 |
| | 3-Hour | 2010 | 568,465 | 4,428,941 | 1.2 | 1,300 |
| | 24-Hour | 1989 | 568,465 | 4,428,941 | 0.445 | 365 |
| | Annual | 1991 | 568,465 | 4,428,941 | 0.013 | 80 |
| Roberts Creek Ranch | | | | | | |
| PM _{2.5} | 24-Hour | 2010 | 560,933 | 4,400,379 | 7.9 | 35 |

| Pollutant | Averaging Time | Met Year | Receptor Location | | Dispersion Modeling Results ($\mu\text{g}/\text{m}^3$) | Lowest Applicable Ambient Standard ($\mu\text{g}/\text{m}^3$) |
|-------------------------|--------------------------|----------|-------------------|------------------|--|---|
| | | | UTM Easting (m) | UTM Northing (m) | | |
| PM ₁₀ | Annual | 2010 | 560,933 | 4,400,379 | 2.5 | 15 |
| | 24-Hour | 2010 | 560,933 | 4,400,379 | 14.3 | 150 |
| | Annual | 1991 | 560,933 | 4,400,388 | 1.091 | 50 |
| CO | 1-Hour | 2010 | 560,933 | 4,400,379 | 60.9 | 40,000 |
| | 8-Hour (< 5,000') | 2010 | 560,933 | 4,400,379 | 11.0 | 10,000 |
| | 8-Hour ($\geq 5,000'$) | 2010 | 560,933 | 4,400,379 | 1.0 | 6,670 |
| Pb | 1-Month | 2010 | 560,933 | 4,400,379 | 0.000 | 1.5 |
| NO ₂ | 1-Hour | 2010 | 560,933 | 4,400,379 | 37.1 | 188 |
| | Annual | 2010 | 560,933 | 4,400,379 | 0.5 | 100 |
| SO ₂ | 1-Hour | 2010 | 560,933 | 4,400,379 | 3.9 | 196 |
| | 3-Hour | 2010 | 560,933 | 4,400,379 | 1.7 | 1,300 |
| | 24-Hour | 1991 | 560,933 | 4,400,379 | 0.942 | 365 |
| | Annual | 1991 | 560,933 | 4,400,379 | 0.112 | 80 |
| Tonkin Reservoir | | | | | | |
| PM _{2.5} | 24-Hour | 2010 | 550,030 | 4,418,098 | 7.5 | 35 |
| | Annual | 2010 | 550,030 | 4,418,098 | 2.4 | 15 |
| PM ₁₀ | 24-Hour | 2010 | 550,030 | 4,418,098 | 12.3 | 150 |
| | Annual | 1988 | 550,030 | 4,418,098 | 0.236 | 50 |
| CO | 1-Hour | 2010 | 550,030 | 4,419,098 | 28.4 | 40,000 |
| | 8-Hour (< 5,000') | 2010 | 550,030 | 4,419,098 | 6.5 | 10,000 |
| | 8-Hour ($\geq 5,000'$) | 2010 | 550,030 | 4,419,098 | 6.5 | 6,670 |
| Pb | 1-Month | 2010 | 550,030 | 4,419,098 | 0.000 | 1.5 |
| NO ₂ | 1-Hour | 2010 | 550,030 | 4,419,098 | 14.8 | 188 |
| | Annual | 2010 | 550,030 | 4,419,098 | 0.2 | 100 |
| SO ₂ | 1-Hour | 2010 | 550,030 | 4,419,098 | 1.9 | 196 |
| | 3-Hour | 2010 | 550,030 | 4,419,098 | 1.1 | 1,300 |
| | 24-Hour | 1989 | 550,030 | 4,419,098 | 0.443 | 365 |
| | Annual | 1988 | 550,030 | 4,419,098 | 0.031 | 80 |

* New Sensitive Receptors

¹ All coordinates in UTM projection, North American Datum 1983.

² Background values, as listed in Table 3.6-7 are included.

- **Impact 3.6.3.3-3:** The modeled PM₁₀, PM_{2.5}, Pb, CO, NO₂, SO₂, and O₃ from the Proposed Action emissions show a very small increase in these pollutants at the sensitive receptors.

Significance of the Impact: This impact is not considered significant.

No mitigation is proposed for this impact; see Section 3.1.1 for a general discussion of significance and the development of mitigation measures.

3.6.3.3.5 Climate Change Effects

The estimated fuel and electrical power consumption for the Proposed Action is provided in Table 3.6-12. In accordance with Nevada law, a portion of the electrical power consumed by EML would continue to come from renewable energy sources, increasing from 11 percent in 2009 to 15 percent in 2013 and thereafter (Nevada State Legislature 2008).

Table 3.6-12: Proposed Action and Alternatives Fuel and Power Consumption and Greenhouse Gas Emissions

| Energy Source | Years | Alternatives | | | | |
|---|------------------------|----------------------|----------------------|---|---|-----------|
| | | Proposed Action | Partial Backfill | Off-Site Transfer of Ore Concentrate for Processing | Slower, Longer Project Alternative ⁵ | No Action |
| Diesel Fuel Consumption (gallons per year) | 1 - 32 | 10,000,000 | 10,000,000 | 10,000,000 | 5,000,000 | 11,000 |
| | 33 - 44 | 1,157,750 | 9,697,750 | 1,157,750 | 578,875 | 0 |
| | 45 - 48.4 ¹ | 0 | 8,540,000 | 0 | 0 | 0 |
| Propane Consumption (gallons per year) | 1 - 32 | 1,218,100 | 1,218,100 | 505,100 | 609,050 | 0 |
| | 33 - 44 | 618,200 | 618,200 | 256,400 | 309,100 | 0 |
| | 45 - 48.4 ¹ | 0 | 0 | 0 | 0 | 0 |
| Electricity Consumption (megawatt-hours per year) | 1 - 32 | 454,500 | 454,500 | 441,600 | 227,250 | 0 |
| | 33 - 44 | 444,200 ² | 444,200 ² | 437,800 ³ | 222,100 | 0 |
| | 45 - 48.4 | 17,520 | 17,520 | 17,520 | 8,760 | 0 |
| Greenhouse Gas Emissions ⁴ (tons CO ₂ per year) | 1 - 32 | 604,251 | 604,251 | 586,069 | 302,125.5 | 124 |
| | 33 - 44 | 489,581 | 586,125 | 480,510 | 244,790.5 | 0 |
| | 45 - 48.4 ¹ | 18,641 | 115,186 | 18,641 | 9,320.5 | 0 |

Source: EML 2009b.

- 1 - From year 32 to year 49 it would take approximately 16.4 years to complete the partial backfilling of the open pit under the Partial Backfill Alternative.
- 2 - Power requirements for the mill roaster, wells, and tailings (no electric shovels or drills are required for re-mining of the LGO Stockpile and waste rock dumps).
- 3 - Power requirements for the mill, concentrate leaching and drying, wells, and tailings (excludes to roaster)
- 4 - Emissions based on EPA AP-42 (EPA 2009) and Department of Energy (DOE) (DOE 2000) data.
- 5 - Although the lower mining and processing rates are inherently less fuel efficient, on a production unit basis, the precise energy consumption amounts cannot be determined without redesigning the mining fleet and processing facility. Therefore, for the purposes of this analysis, it is assumed that the Slower, Longer Project Alternative would consume half the energy for twice the duration relative to the Proposed Action.

Recent publications in the scientific literature suggest there is a direct correlation between global warming and emissions of GHG (IPCC 2007b). Other recent publications in the scientific literature suggest the correlation is not evident (Singer and Avery 2008; Spencer 2008; Soloman 2008). GHGs include CO₂, methane, NO_x, and O₃. GHGs also include water vapor, although a dominant GHG it is generally not considered in GHG calculations. Although many of

these gases occur naturally in the atmosphere, man-made sources substantially have increased the emissions of GHGs over the past several decades. Of the man-made GHGs, the greatest contribution currently comes from CO₂ emissions.

GHG emissions associated with the proposed Project primarily would be associated with the consumption of energy for mining and ore processing over the 44-year mine life. Operations that would contribute to GHG emissions would include the following:

- Fuel consumption (vehicles and machinery);
- Electricity consumption (machinery, milling, heap leach water circulation, ground water pumping and dewatering); **and**
- Diesel fuel combustion during the roasting of the ore concentrate (diesel is used as a flotation agent and may be carried through the process).

The current national annual emissions of GHGs are approximately eight billion tons (EPA 2008b). Under the Proposed Action, the Project would emit up to approximately 604 thousand tpy of GHGs, or approximately 0.00755 percent of the national annual emissions.

Existing climate prediction models, **which use GHG emissions as input values** for the **analysis and** prediction of climate change, are global in nature; therefore, they are not at the appropriate scale to estimate potential impacts **on** climate change **as a result of** the Proposed Action.

3.6.3.3.6 Residual Effects

The residual effects of the Proposed Action include point source and fugitive PM₁₀, PM_{2.5}, and Pb emissions from vehicular traffic, blasting, and material handling and processing operations. Other impacts include combustion emissions of PM₁₀, PM_{2.5}, CO, NO₂, SO₂, and VOC generated by numerous processes as a result of the Proposed Action, including combustion emissions from diesel engines, and burning propane, fuel oil, or diesel in various process equipments. These effects would cease once the Project ceases and there are no irreversible or irretrievable effects for the Proposed Action on air resources.

3.6.3.4 No Action Alternative

Under the No Action Alternative, air quality impacts associated with the Project would not occur. EMI would not be authorized to develop the Project and mine the ore body as described in the Proposed Action. However, the currently authorized exploration in the Project Area could continue, which would result in fugitive dust emissions and combustion emissions.

3.6.3.4.1 PM₁₀, PM_{2.5}, and Pb Emissions and Modeled Concentrations

The major sources of PM₁₀, PM_{2.5}, and Pb emissions from the No Action Alternative include resuspension of unpaved road dust from trucks and emissions from drill operations. Emission controls such as road watering would help minimize these emissions.

- **Impact 3.6.3.4-1:** Emissions of PM₁₀, PM_{2.5}, and Pb would be generated by the No Action Alternative in an amount substantially less than under the Proposed Action. The modeled PM₁₀, PM_{2.5}, and Pb concentrations under the Proposed Action support the

conclusion that these concentrations under the No Action Alternative would be below the NSAAQS and NAAQS, even with the addition of the background values.

Significance of the Impact: This impact is not considered significant.

No mitigation is proposed for this impact; see Section 3.1.1 for a general discussion of significance and the development of mitigation measures.

3.6.3.4.2 Combustion Emissions

Combustion of diesel in the trucks and drilling rigs can produce elevated ambient levels of CO, NO₂, SO₂, PM₁₀, PM_{2.5}, and O₃. The amount of these emissions under the No Action Alternative would be substantially less than under the Proposed Action. Despite the lack of tailpipe emissions control technology for combustion sources throughout the Project Area, the maximum modeled CO, NO₂, SO₂, PM₁₀, PM_{2.5}, and O₃ concentrations from both models for the Proposed Action would be well below either the NSAAQS or the NAAQS, and, therefore, the concentrations under the No Action alternative would also be less than the NSAAQS and the NAAQS.

- **Impact 3.6.3.4-2:** Combustion emissions of CO, NO₂, SO₂, PM₁₀, PM_{2.5}, and VOC would be generated by the No Action Alternative in amounts that would be substantially less than under the Proposed Action. The modeled CO, NO₂, SO₂, PM₁₀, PM_{2.5}, and O₃ concentrations under the Proposed Action support the conclusion that these concentrations under the No Action Alternative would be below the NSAAQS and NAAQS, even with the addition of the background values.

Significance of the Impact: This impact is not considered significant.

No mitigation is proposed for this impact; see Section 3.1.1 for a general discussion of significance and the development of mitigation measures.

3.6.3.4.3 HAPs Emissions

The major sources of HAPs emissions from the No Action Alternative include resuspension of unpaved road dust, which contain HAP metals, from trucks and combustion emissions from drill operations. Emission controls such as road watering would help minimize these emissions.

3.6.3.4.4 Sensitive Receptors Effects

Dispersion modeling for the Proposed Action was also performed to determine the impacts on the “sensitive” receptors listed in Section 3.6.3.2.2 for the NEPA analysis. The highest 24-hour PM₁₀ impact from the Proposed Action on the defined sensitive receptors was found to be 14.3 µg/m³ at the Roberts Creek Ranch. The highest annual PM₁₀ impact from the Proposed Action on the defined sensitive receptors was found to be 1.091 µg/m³, also at the Roberts Creek Ranch; therefore, any potential impacts from the No Action Alternative would be less than those identified for the Proposed Action.

The NEPA modeling analysis was also performed for the Proposed Action to determine the impacts of the gaseous pollutants from the Proposed Action on the defined sensitive receptors,

including the Jarbidge Wilderness. In all instances, the concentrations are a small fraction of the ambient standards, and in the case of the Jarbidge Wilderness, much less than the PSD Class I increments; therefore, any potential impacts from the No Action Alternative would be less than those identified for the Proposed Action.

- **Impact 3.6.3.4-3:** The emissions of PM₁₀, PM_{2.5}, Pb, CO, NO₂, SO₂, and O₃ from the No Action Alternative emissions may show a very small increase in these pollutants at the sensitive receptors and any potential impacts would be less than those under the Proposed Action.

Significance of the Impact: This impact is not considered significant.

No mitigation is proposed for this impact; see Section 3.1.1 for a general discussion of significance and the development of mitigation measures.

3.6.3.4.5 Climate Change Effects

The estimated fuel and electrical power consumption for the No Action Alternative is provided in Table 3.6-11. GHG emissions associated with the No Action Alternative primarily would be associated with the consumption of fuel (vehicles and machinery). The current national annual emissions of GHGs are approximately eight billion tons (EPA 2008b). Under the No Action Alternative, the Project would emit up to approximately 124 tpy of GHGs, or approximately 0.000001 percent of the national annual emissions.

Existing climate prediction models, **which use GHG emissions as input values** for the **analysis and** prediction of climate change, are global in nature; therefore, they are not at the appropriate scale to estimate potential impacts **on** climate change **as a result of** the No Action Alternative.

3.6.3.4.6 Residual Effects

The residual effects of the No Action Alternative include point source and fugitive PM₁₀, PM_{2.5}, and Pb emissions from vehicular traffic and drilling operations. Other impacts include combustion emissions of PM₁₀, CO, NO₂, SO₂, PM₁₀, PM_{2.5}, and VOC generated by vehicles and drill rigs as a result of the No Action Alternative, including combustion emissions from diesel and gasoline engines. These effects would cease once the activities under the No Action Alternative ceases and there are no irreversible or irretrievable effects for the No Action Alternative on air resources. The potential impacts would be adverse, but not irreversible.

3.6.3.5 Partial Backfill Alternative

The Partial Backfill Alternative would be the same as the Proposed Action, except that at the end of the mining in the open pit, the open pit would be partially backfilled to eliminate the potential for a pit lake. Backfilling would begin in Year 32 with an approximately 17-year time frame to complete the partial backfill process. The backfilling would be completed using 1.3 billion tons of Non-PAG waste rock from the Non-PAG WRDF. Emissions related to the backfilling process would be essentially the same as those from the mining process. A quantitative analysis was not completed because the modeling analysis for the Proposed Action, which looked at time periods from one hour to annual, sufficiently encompasses the potential impacts of the Partial Backfill

Alternative. The air quality impacts would occur over a longer period of time as compared to the Proposed Action.

3.6.3.5.1 PM₁₀, PM_{2.5}, and Pb Emissions

Activities under the Partial Backfill Alternative would be the same as under the Proposed Action through the completion of the mining operation. Therefore, the analysis of the potential air quality impacts for the Proposed Action appropriately characterize the potential air quality impacts for the Partial Backfill Alternative. In Year 32 of the mine life, backfilling would begin under the Partial Backfill Alternative, and approximately 1.3 billion tons of waste rock deposited at the Non-PAG WDRF would be transferred to the open pit to complete the partial backfilling of the waste rock mined under this alternative. The emissions associated with this activity are fugitive dust and combustion emissions associated with the loader transport and dumping of the waste rock. These emissions are a subset of the type and location of emissions evaluated for the placement of the waste rock under the analysis for the Proposed Action. Since the Proposed Action did not result in an identified exceedance of the NAAQS, activities under this portion of the Partial Backfill Alternative are also not expected to result in an exceedance of the NAAQS.

The PM₁₀/PM_{2.5} emissions from the bus transportation of the employees on public roads to and from the Project Area would be similar to those of the Proposed Action, on an annual basis. However, the emissions would occur over a longer time period, due to the backfilling of the open pit. These emissions would have an incremental impact on the air quality in the vicinity of the transportation route.

The potential for indirect fugitive dust emissions from the ground water production in Kobeh Valley would be essentially the same as under the Proposed Action. These emissions would have an incremental impact on the air quality in the vicinity of the Kobeh Valley.

- **Impact 3.6.3.5-1:** The emissions of PM₁₀, PM_{2.5}, and Pb would be generated by numerous processes as a result of the Partial Backfill Alternative, including the resuspension of road dust, wind erosion of exposed dirt surfaces, and activities related to the processing of ore materials. These activities are inherent to the mining process and would be ongoing throughout the life of the Partial Backfill Alternative. Since this alternative is essentially the same as the Proposed Action, just longer in duration, the PM₁₀, PM_{2.5}, and Pb concentrations would be below the NSAAQS and NAAQS, even with the addition of the background values.

Significance of the Impact: This impact is not considered significant.

No mitigation is proposed for this impact; see Section 3.1.1 for a general discussion of significance and the development of mitigation measures.

3.6.3.5.2 Combustion Emissions

Combustion of diesel in the haul trucks and mobile equipment, such as loaders, dozers, etc., the combustion of propane in processing units such as boilers, and the combustion of fuel oil or diesel in units such as the roaster, can produce elevated ambient levels of CO, NO₂, SO₂, PM₁₀, PM_{2.5}, and O₃ (from VOC emissions). In most cases, combustion emissions are generally uncontrolled for the emissions units. Despite the lack of tailpipe emissions control technology for