4.2 AIR QUALITY

Section 4.0, Environmental Analysis, provides a description of the analytical methodology that DPR applied to each resource category, including Air Quality, from a Program perspective.

4.2.1 EXISTING CONDITIONS

4.2.1.1 Methods

Quantification of air quality emissions resulting from Program Actions implemented at Remediation Areas was conducted and assumptions documented to ensure that: (1) Project Actions at Remediation Areas were consistent with the programmatic approach; (2) identified impacts not previously considered in the programmatic analysis would be reduced to less than significant by implementing Standard and Specific Project Requirements and mitigation measures evaluated in the Program EIR; and (3) Project Requirements and all applicable mitigation measures identified in the Program EIR would be incorporated.

4.2.1.2 Climate

The Park is located in the foothills of the Sierra Nevada Mountains in western Nevada County, an area with gentle to steep topography, warm to hot and dry summers, and cool and wet winters. The area has a semi-Mediterranean climate type, with pronounced summer and winter seasonal variation in temperature and precipitation. Monthly average summer temperatures range from 54° to 85°F and monthly average winter temperatures range from 32° to 54°F. Most precipitation occurs from late October through early May with winter precipitation falling as rain or snow. Wind direction tends to be from the southwest; winds from the west can transport pollutants into the area from the Sacramento Valley and Bay Area. Surface and elevated inversions are common in the late summer and fall. These inversions can cause stagnation of airflow, allowing air pollutants to become concentrated.

Air quality is affected by both the rate and location of pollutant emissions and by meteorological conditions that influence movement, dispersal and formation of pollutants. Atmospheric conditions such as wind speed, wind direction, and air temperature gradients, along with local topography and sunlight, provide the link between air pollutant emissions and air quality.

Existing Regional Air Quality

Pursuant to the 1990 Federal Clean Air Act Amendments, the USEPA classifies air basins (or portions thereof) as "attainment" or "nonattainment" for each of the criteria air pollutants, based on whether or not the National Ambient Air Quality

Standards (NAAQS) had been achieved. Similarly, the California Air Resources Board (CARB) evaluates the attainment status of air basins based on the California Ambient Air Quality Standards (CAAQS). Table 4.2-1, Mountain Counties Air Basin Attainment Status, shows the current attainment status of the air basin that the Empire mine is located. The Mountain Counties air basin, which includes Nevada County, is in attainment or unclassified for all federal standards except the eight-hour ozone standard. The air basin is designated non-attainment for the ozone and PM_{10} CAAQS.

TABLE 4.2-1
MOUNTAIN COUNTIES AIR BASIN ATTAINMENT STATUS

Pollutant	Averaging Time	State Standard	State Standard Attainment Status	National Primary Standard	National Standard Attainment Status
Ozone	1 hour	0.09 ppm	Non-attainment	–[1]	Non-attainment
	8 hours	0.070 ppm2		0.075 ppm	
Carbon Monoxide	1 hour	20 ppm	Unclassified	35 ppm	Unclassified/ Attainment
	8 hours	9.0 ppm		9 ppm	
Nitrogen Dioxide	1 hour	0.18 ppm	Attainment	–	Unclassified/ Attainment
	Annual Avg.	0.030		0.053 ppm	
Sulfur Dioxide	1 hour	0.25 ppm	Attainment	–	Unclassified
	24 hours	0.04 ppm		0.14 ppm	
	Annual Avg.	–		0.030 ppm	
Respirable Particulate Matter (PM_{10})	24 hours	50 µg/m3	Non-attainment	150 µg/m3	Unclassified
	Annual Avg.	20 µg/m3		–	
Fine Particulate Matter ($PM_{2.5}$)	24 hours	–	Unclassified	35 µg/m3	Unclassified/ Attainment
	Annual Avg.	12 µg/m3		15 µg/m3	
Lead	30-day avg.	1.5 µg/m3	Attainment	–	Attainment
	Quarterly	–		1.5 µg/m3	
	Rolling 3-month avg.3	–		0.15 µg/m3	
Hydrogen Sulfide	1 hour	0.03 ppm	Unclassified	–	–
Sulfates	24 hour	25 µg/m3	Attainment	–	–
Visibility Reducing Particles	8 hour	Extinction of 0.23/km; visibility of 10 miles or more	Unclassified	–	–

Notes:
[1] Federal One Hour Ozone National Ambient Air Quality Standard was revoked on June 15, 2005.
[2] This concentration was approved by the Air Resources Board on April 28, 2005 and became effective May 17, 2006.
[3] Final rule signed October 15, 2008. Proposed standard not yet effected – Nevada County will be nonattainment upon effective date.

Source: California Air Resources Board, 2007b. Area Designation Maps,http://www.arb.ca.gov/desig/ad m/adm.htm, Maps current as of February, 2009.

Compliance with ambient air quality standards is determined for some pollutants with the use of a stationary monitoring network. The Northern Sierra Air Quality Management District (NSAQMD) maintains ambient air quality monitoring stations in Nevada County. The closest monitoring station is located in the City of Grass Valley (at the Litton Building), approximately 16 miles from the Park. The Grass Valley monitoring station currently monitors ozone and particulate matter with aerodynamic diameters equal to or less than 10 microns (PM_{10}) and equal to or less than 2.5 microns ($PM_{2.5}$). The most recent published data for the monitoring station are presented in Table 4.2-2, Air Quality Data Summary (2004-2008). Table 4.2-2 includes a comparison of monitored air pollutant concentrations from the Grass Valley station with state and national ambient air quality standards.

TABLE 4.2-2
AIR QUALITY DATA SUMMARY (2004-2008)

Pollutant-Monitor Location	Monitoring Data by Year						
	Standards[a]						
	National	State	2004	2005	2006	2007	2008
OZONE-GRASS VALLEY-LITTON BUILDING							
Highest 1 Hour Average (ppm)[b]	–	0.09	0.126	0.128	0.112	0.113	0.111
Days over State Standard			11	15	19	5	8
Highest 8 Hour Average (ppm)[b]	0.075	0.07	0.111	0.120	0.105	0.096	0.108
Days over National 8-hour Standard			42	42	60	36	24
Days over State 8-hour Standard			71	66	81	55	42
PARTICULATE MATTER (PM_{10})-GRASS VALLEY-LITTON BUILDING[c]							
Highest 24 Hour Average (µg/m3)[b]-National Measurement	150	50	37.8	32.7	52.1	NA	NA
Days over National Standard[d]			0	0	0	NA	NA
Annual Arithmetic Mean (µg/m3)[b]		20	NA	NA	NA	NA	NA
PARTICULATE MATTER ($PM_{2.5}$)-GRASS VALLEY-LITTON BUILDING							
Highest 24 Hour Average (µg/m3)[b]	35		17.0	10.0	32.0	22.0	102.2
Days over 24-hour National Standard			0	0	0	0	NA
National Standard Annual Average (µg/m3)[b]	15		NA	NA	6.2	4.9	NA
State Standard Annual Average (µg/m3)[b]		12	NA	NA	6.2	NA	NA

Notes:
Values in bold are in excess of at least one applicable standard. NA = Not Available.
a. Generally, State standards and national standards are not to be exceeded more than once per year.
b. ppm = parts per million; µg/m3 = micrograms per cubic meter.
c. No State measurement and exceedance data is available for PM_{10} at his monitoring station.
d. PM_{10} is not measured every day of the year. Number of estimated days over the standard is based on 365 days per year.

Source: California Air Resources Board (ARB), January 29, 2009. Summaries of Air Quality Data, 2004, 2005, 2006, 2007, 2008; http://www.arb.ca.gov/adam/cgi-bin/db2www/polltrendsb.d2w/start.

4.2.1.3 Sensitive Receptors

Sensitive receptors include individuals as well as groups relating to specific land uses; some receptors are considered more sensitive than others to air pollutants. Greater than average sensitivity results from pre-existing health problems, developmental age, proximity to emissions source, and/or duration of exposure to air pollutants. The ARB has identified the following people who are most likely to be affected by air pollution: children under 14, the elderly over 65, athletes, and people with cardiovascular and chronic respiratory diseases. These groups are classified as sensitive receptors. Locations that could contain a high concentration of these sensitive population groups include residential areas, hospitals, daycare facilities, elder care facilities, long-term care facilities, schools, and parks. For example, residential areas could be considered locations including sensitive receptors because people usually stay home for extended periods of time, with associated greater exposure to ambient air quality and some residents will be members of sensitive population groups. Another example is that recreational areas are also considered potential locations of sensitive receptors because engaging in vigorous exercise placing a higher demand on the human respiratory system.

Six houses and two mobile home pads used for DPR Park personnel housing are situated within the Park; currently three of the houses and one of the mobile home pads accommodate eight year-around residents (Clark 2008, Munson 2008a). In addition, private homes are located along Osborne Hill Road. Osborne Hill Road is a private, residential street situated to the east of Osborne Hill and the Park boundary (Wells 2008).

Two public facilities, Grass Valley Seventh Day Adventist Church on Osborne Hill Road and Calvary Bible Church of Grass Valley on SR 174, are situated within several hundred feet of the eastern Park boundary and within ½ mile of Osborne Hill. Both of these facilities include could include sensitive receptors (Superpages.com 2008).

Schools within close proximity of the Park include: Union Hill Elementary School (approximately ¼ mile from the Park), Hennessy Elementary School (approximately 1 mile from the Park), Lyman Gilmore Middle School (approximately 2 miles from the Park), and Sierra Foothills High School (approximately 1 mile from the Park) (Google Maps 2008) (see Figure 4.10-1).

4.2.1.4 Pollutants and Effects

This subsection provides a general background of typical air contaminants.

Ozone

Ground level ozone (O_3) is not emitted directly into the atmosphere, but is a secondary air pollutant produced through a complex series of photochemical reactions involving reactive organic gases (ROG) and nitrogen oxides (NO_x). Significant ozone production generally requires ozone precursors to be present in a stable atmosphere with strong sunlight for approximately 3 hours. Precursors are emitted by a number of industrial and mobile sources. Ozone is a regional air pollutant because it is not emitted directly by sources, but is formed downwind of sources of ROG and NO_x under the influence of wind and sunlight. Ozone concentrations tend to be higher in the late spring, summer, and fall, when the long sunny days create conditions conducive to the formation and accumulation of secondary photochemical compounds, like ozone.

Short-term exposure to ozone can irritate the eyes and cause constriction of the airways. Besides causing shortness of breath, both short-term and long-term exposure to ozone can aggravate existing respiratory diseases such as asthma, bronchitis, and emphysema. Long-term exposure to ozone can potentially cause damage to natural ecosystems such as forests and foothill communities and damages agricultural crops and some man-made materials, such as rubber, paint and plastics.

Because ozone is formed by secondary photochemical reactions and isn't directly emitted from any Project sources, it was not evaluated quantitatively. ROGs and NO_x were evaluated as a surrogate for ozone.

Carbon Monoxide

Ambient carbon monoxide (CO) concentrations normally are considered a local effect and typically correspond closely to the spatial and temporal distributions of vehicular traffic. Wind speed and atmospheric mixing also influences CO concentrations. Under inversion conditions, CO concentrations could be distributed more uniformly over an area that could extend some distance from vehicular sources. When inhaled at high concentrations, CO combines with hemoglobin in the blood and reduces the oxygen-carrying capacity of the blood resulting in reduced oxygen reaching the brain, heart, and other body tissues. This condition is especially critical for people with cardiovascular disease, chronic lung disease, or anemia, as well as for fetuses. Even healthy people exposed to high CO concentrations can experience headaches, dizziness, fatigue, unconsciousness, and even death. The health threat from lower levels of CO is most serious for those who suffer from heart disease, like angina, clogged arteries, or congestive heart failure. For a person with heart disease, a single exposure to CO at low levels could cause chest pain and reduce that person's

ability to exercise; repeated exposures could contribute to other cardiovascular effects.

Carbon monoxide concentrations have declined dramatically in California due to existing controls and programs. Most areas of the state including the Project region have no problem meeting the state and federal carbon monoxide standards. Carbon monoxide concentrations are expected to continue declining due to the ongoing retirement of older, pollution-prone vehicles from the mix of vehicles on the road network.

Nitrogen Dioxide

Nitrogen dioxide (NO_2) is a reddish brown gas that is a by-product of combustion processes; automobiles and industrial operations are the main sources of NO_2. NO_2 could be visible as a coloring component of a brown cloud on high pollution days, especially in conjunction with high ozone levels.

NO_2 is an air quality concern because it acts as a respiratory irritant and is a precursor of ozone. NO_2 is a major component of the group of gaseous nitrogen compounds commonly referred to as nitrogen oxides (NO_x). NO_x are produced by fuel combustion in motor vehicles, industrial stationary sources (such as industrial activities), ships, aircraft, and rail transit. Typically, NO_x emitted from fuel combustion are in the form of nitric oxide (NO) and NO_2. NO is often converted to NO_2 when it reacts with ozone or undergoes photochemical reactions in the atmosphere. Therefore, emissions of NO_2 from combustion sources are typically evaluated based on the amount of NO_x emitted from the source. Additionally, besides contributing to tropospheric ozone, NO_2 also contributes to the formation of PM_{10} and $PM_{2.5}$, both of which contribute to respiratory disease and visibility degradation.

Respirable Particulate Matter

Respirable particulate matter consists of particulate matter that is 10 microns (a micron is one-millionth of a meter) or less (PM_{10}) in aerodynamic diameter and 2.5 microns or less ($PM_{2.5}$) in aerodynamic diameter, respectively. PM_{10} and $PM_{2.5}$ represent fractions of particulate matter that can be inhaled into the air passages and the lungs and can cause adverse health effects. Some sources of particulate matter (such as wood burning in fireplaces, demolition, and construction activities) are more local in nature, while others, such as vehicular traffic, have a more regional effect. Very small particles of certain substances (e.g., sulfates and nitrates) can cause lung damage directly, or can contain adsorbed gases (e.g., chlorides or ammonium) that could be injurious to health. Large dust particles (diameter greater than 10 microns) settle out rapidly and are easily filtered by human breathing passages. This large dust is of more concern

as a soiling nuisance rather than a health hazard. The remaining fraction, PM_{10} and $PM_{2.5}$, are a health concern particularly at levels above the federal and state ambient air quality standards. $PM_{2.5}$ (including diesel exhaust particles) is thought to have greater effects on health, because these particles are so small and thus, are able to penetrate to the deepest parts of the lungs.

Scientific studies have suggested links between respirable particulate matter and numerous health problems including asthma, bronchitis, acute and chronic respiratory symptoms such as shortness of breath and painful breathing. Recent studies have shown an association between morbidity and mortality and daily concentrations of particulate matter in the air. Children are more susceptible to the health risks of PM_{10} and $PM_{2.5}$ because their immune and respiratory systems are still developing.

Despite important gaps in scientific knowledge and continued skepticism, a comprehensive evaluation of the research findings provides persuasive evidence that exposure to fine particulate air pollution has adverse effects on cardiopulmonary health (Dockery and Pope 2006). The California Air Resources Board (ARB) has estimated that achieving the ambient air quality standards for PM_{10} could reduce premature mortality rates by 6,500 cases per year (ARB 2002).

As the discussion above illustrates, the main regulatory focus for controlling PM_{10} and $PM_{2.5}$ is to reduce potential health risks; however, particulates can also damage materials and reduce visibility.

Sulfur Dioxide

Sulfur dioxide (SO_2) is a combustion product of sulfur or sulfur-containing fuels such as coal, fuel oil, and diesel. SO_2 is also a precursor to the formation of atmospheric sulfate, particulate matter and contributes to potential atmospheric sulfuric acid formation that could precipitate downwind as acid rain.

SO_2 also contributes to the atmospheric formation of suspended particulate in the PM_{10} and $PM_{2.5}$ size fractions. Ambient SO_2 concentrations have been reduced in recent years due to restriction on the sulfur content in fuel.

Lead

Lead is a criteria pollutant for which there are federal and state ambient air quality standards, as well as a TAC. In the Project area, ambient lead concentrations currently meet state standards, which are more stringent than federal standards. Lead has a range of adverse neurotoxin health effects, and was formerly released into the atmosphere primarily via leaded gasoline

products. The phase-out of leaded gasoline in California resulted in decreasing levels of atmospheric lead. However, due to lead concentrations in some soils at the Park that were above the U.S. EPA Region 9 PRG, lead was evaluated as a possible soil PCOC for this assessment.

Odors

Though offensive odors from stationary sources rarely cause any physical harm, they are unpleasant and can lead to public distress. The frequency and severity of the odor impacts depend on the nature, frequency and intensity of the source; wind speed and direction; and the sensitivity of receptors. The CEQA Guidelines recommend that odor impacts be considered for any proposed new odor sources located near existing receptors, as well as any new sensitive receptors located near existing odor sources. Generally, increasing the distance between the receptor and the source will mitigate odor impacts.

Greenhouse Gases

Some gases in the atmosphere affect the Earth's heat balance by absorbing infrared radiation. These gases can prevent the escape of heat in much the same way as glass in a greenhouse. This is often referred to as the "greenhouse effect," and it is responsible for maintaining a habitable climate. On Earth, the gases believed to be most responsible for global warming are water vapor, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). Enhancement of the greenhouse effect occurs when concentrations of these gases exceed the natural concentrations in the atmosphere. Of these greenhouse gases (GHG), CO_2 and methane are emitted in the greatest quantities from human activities. Emissions of CO_2 are largely by-products of fossil fuel combustion, whereas methane primarily results from off-gassing associated with agricultural practices and landfills and from the natural decay of materials in the environment. SF_6 is a GHG commonly used in the utility industry as an insulating gas in transformers and other electronic equipment. SF_6, while comprising a small fraction of the total GHGs emitted annually world-wide, is a much more potent GHG with 23,900 times the global warming potential as CO_2. Global warming potential is the potential of a gas or aerosol to trap heat in the atmosphere. CO2 is assigned a global warming potential of 1. There is widespread international scientific agreement that human-caused increases in GHGs has and will continue to contribute to global warming, although there is much uncertainty concerning the magnitude and rate of the warming.

Globally, climate change has the potential to impact numerous environmental resources through potential, though uncertain, impacts related to future air temperatures and precipitation patterns. In California the effects of global

warming could include loss in snow pack, sea level rise, more extreme heat days per year, more high ozone days, more large forest fires, and more drought years (ARB 2007f). The projected effects of global warming on weather and climate are likely to vary regionally; however, these are expected to include the following direct effects (IPCC 2001):

- Higher maximum temperatures and more hot days over nearly all land areas;
- Higher minimum temperatures, fewer cold days and frost days over nearly all land areas;
- Reduced diurnal temperature range over most land areas;
- Increase of heat index over land areas; and
- Increased intensity of precipitation events.

Also, there are many secondary effects that are projected to result from global warming, including global rise in sea level, impacts to agriculture, changes in disease vectors, and changes in habitat and biodiversity. Because the possible outcomes and the feedback mechanisms involved are not fully understood, more research is required, and the potential for substantial environmental, social, and economic consequences over the long term could be great.

Toxic Air Contaminants

Non-criteria air pollutants, or TACs, are airborne substances that are capable of causing short-term (acute) and/or long-term (chronic or carcinogenic, i.e., cancer-causing) adverse human health effects (i.e., injury or illness). TACs include both organic and inorganic chemical substances. They could be emitted from a variety of common sources including gasoline stations, automobiles, dry cleaners, industrial operations, and painting operations. The current California list of TACs includes approximately 200 compounds, including particulate emissions from diesel-fueled engines.

Diesel Particulate Matter (DPM)

In 2001, the ARB assessed the statewide health risks from exposure to diesel exhaust and to other toxic air contaminants. It is difficult to distinguish the health risks of diesel emissions from the other air toxics, since diesel exhaust contains about 40 different TACs. The ARB study (ARB 2000) detected diesel exhaust by using ambient air carbon soot measurements as a surrogate for diesel emissions. The Study reported that in 2000, the statewide cancer risk from exposure to diesel exhaust was about 540 cancer cases per million people as compared to a total risk for exposure to all ambient air toxics of 760 cancer cases per million. This

estimate of risk from diesel exhaust, which accounts for about 70 percent of the total risk from TACs, included both urban and rural areas in the State. It can be considered a plausible worst-case for the State, since it assumes constant exposure to outdoor concentrations of diesel exhaust and does not account for expected lower concentrations indoors, where people spend most of their time.

The California Office of Environmental Health Hazard Assessment (OEHHA) has determined that chronic exposure to DPM can cause carcinogenic and non-carcinogenic health effects. OEHHA has specified an acceptable exposure level (AEL) of DPM as a non-carcinogen of 5 µg/m3 (micrograms per cubic meter) (annual average). OEHHA has also established a unit risk value for DPM, which is the increased probability of contracting cancer if exposed to an average concentration of 1 µg/m3 for 70 years. The unit risk value established for DPM is 300 in a million per microgram per cubic meter.

TAC Metals (Arsenic/Lead/Cadmium)

Project areas containing contaminants in soil are potential sources of air quality impacts. From 2006 to 2008, MFG measured metal concentrations in soils and mine waste rock materials at various Park locations. MFG analyzed the materials for the following metals and their concentrations at the Park: antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, molybdenum, nickel, selenium, silver, thallium, vanadium, zinc, and mercury. Of these seventeen metals, arsenic, lead, and cadmium were found to be PCOCs within the Park and Remediation Areas when compared with the commercial/industrial CHHSLs or, in the case of lead, the U.S. EPA PRG.

Average metal concentrations that are below the commercial/industrial CHHSL/PRG values are generally expected to be below thresholds for risk to human health; therefore, the remaining metals are not considered PCOC (see screening analysis in Appendix D, Air Quality Assessment Calculations and Results). The use of the industrial/commercial CHHSL values are considered conservative for construction activities that would occur over relatively short periods of time. Commercial/industrial CHHSLs were developed using an exposure scenario of 250 days per year for 20 years. Although park workers could be on-site for such exposure periods, remediation activities would likely not occur for such a continuous, extended period.

Arsenic (As) is a metallic element with three allotropic forms, yellow, black, and gray, of which the brittle, crystalline gray is the most common. Arsenic

exists as both organic and inorganic compounds. Inorganic and organic arsenic occur naturally in the environment with inorganic forms being more abundant. Inorganic arsenic is associated with other metals in igneous and sedimentary rocks, and it also occurs in combination with other elements, especially oxygen, chlorine and sulfur. Organic arsenic contains carbon and hydrogen and is usually less harmful than inorganic arsenic; therefore, inorganic arsenic is the only PCOC at the Park. The majority of atmospheric arsenic is inorganic arsenic. Through ingestion, inhalation and skin permeation, arsenic can cause minor to serious health effects. California has stated under Assembly Bill 1807 and Proposition 65 that inorganic arsenic compounds are cancer-causing compounds. Non-cancer effects from arsenic exposure include irritation of the eyes, nose and bronchi, vascular disorders (hemolysis), neurological disturbances, adverse reproductive effects, and liver or kidney damage.

Lead (Pb) is a bluish gray metal that occurs naturally in various mineral forms in the earth's crust. It has been widely used for hundreds of years because it is readily shaped and molded, and is resistant to corrosion. California considers lead to be a cancer-causing metal. Non-cancer effects from lead are regulated through the ambient air quality standard for lead (discussed in the criteria pollutant section for lead above).

Cadmium (Cd) is a soft, bluish-white metal that occurs naturally at low concentrations in various mineral forms. Materials more concentrated in cadmium can result from refinement and processing. California considers cadmium to be a cancer-causing metal. Target organs for non-cancer effects include the kidneys and the respiratory system.

Asbestos

Asbestos refers to several naturally-occurring fibrous minerals that can be found throughout California. Asbestos is most commonly found in ultrabasic rock that has undergone partial or complete alteration to serpentine rock, which often contains chrysotile asbestos. Asbestos fibers are released when ultrabasic or serpentine rock is abraded, broken, or crushed. The largest concern regarding asbestos is from breathing the fibers which can stay airborne for very long periods once disturbed. If inhaled or swallowed, asbestos fibers can cause cancer and other diseases by remaining and accumulating in the lungs or digestive tract.

The Grass Valley Gold Mining District contains areas of ultrabasic rocks. However, no serpentine or serpentinite soils have been identified within the Park at Project sites (Breedy and Brussard 2002). Therefore, asbestos is not considered a COC in subsequent air analyses.

Potential Constituents of Concern at the Park

Air pollutant emissions include mobile sources such as construction equipment and fugitive dust from surface disturbances. Mobile sources would result in tailpipe emissions containing criteria pollutants (ozone, carbon monoxide, nitrogen dioxide, PM_{10}, $PM_{2.5}$, and lead) and TACs. For construction equipment tailpipe emissions, diesel particulate matter contains many TACs and is a primary concern.

Fugitive dust from surface disturbances would consist of particulate matter containing historically placed Potential Constituents of Concern (PCOC). PCOC are substances that could potentially exceed regulatory screening levels and become Constituent of Concern (COC). COC are identified for each Remediation Area when the concentrations of PCOC exceed screening levels for protection of human health or water quality objectives. Residential CHHSLs have been used to identify COC in soil for the Mine Yard and Stamp Mill, Historic Grounds, and Residences and Residences' Yards, while the commercial/industrial CHHSLs or industrial PRG for lead and cyanide have been used for the other Remediation Areas. EPA storm water benchmarks or Basin Plan water quality objectives have been used to identify COC for waters. COC could potentially be discharged to waters of the state and cause, or threaten to cause, pollution or a nuisance, including impacts to beneficial uses of waters of the state. Release of COC could pose unacceptable risk to human health and the environment.

4.2.2 REGULATORY SETTING

Air quality within the region is addressed through the efforts of various federal, state, regional, and local government agencies. These agencies work jointly, as well as individually, to improve air quality through legislation, regulations, planning, policy-making, education, and a variety of programs. The air pollutants of concern and agencies primarily responsible for improving the air quality and the pertinent regulations are discussed below.

4.2.2.1 Federal

The Federal Clean Air Act (FCAA) requires the U.S. EPA to identify National Ambient Air Quality Standards (NAAQS or national standards) to protect public health and welfare. National standards have been established for ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, PM_{10}, $PM_{2.5}$, and lead.
The FCAA has provisions that require each state to prepare an air quality control plan referred to as the State Implementation Plan (SIP) and requires that states containing areas that violate the NAAQS revise their SIP to incorporate additional control measures to reduce air pollution. The SIP is periodically modified to reflect the latest

emissions inventories, planning documents, and rules and regulations of air basins as reported by the agencies with jurisdiction over them. The U.S. EPA reviews all state SIPs to determine if they conform to the mandates of the FCAA and will achieve air quality goals when implemented. If the U.S. EPA determines a SIP to be inadequate, it can prepare a Federal Implementation Plan (FIP) for the non-attainment area and can impose additional control measures. Failure to submit an approvable SIP or to implement the plan within mandated timeframes can result in sanctions being applied to transportation funding and stationary air pollution sources in the air basin.

4.2.2.2 State

The ARB manages air quality, regulates mobile emissions sources, and oversees the activities of County Air Pollution Control Districts and Regional Air Quality Management Districts. ARB establishes state ambient air quality standards and vehicle emissions standards.

California has adopted some ambient standards that are more stringent than the federal standards for the criteria air pollutants. These are shown in Table 4.2-1. Under the California Clean Air Act (CCAA) patterned after the FCAA, areas have been designated as attainment or nonattainment with respect to the state standards. Table 4.2-1 summarizes the attainment status with California standards in the Project area. Nevada County, in the Mountain Counties air basin, is in attainment or unclassified for all state standards except the one-hour ozone standard and the PM_{10} standard.

Toxic Air Contaminants

The California Health and Safety Code defines TACs as air pollutants which could cause or contribute to an increase in mortality or in serious illness, or which could pose a present or potential hazard to human health. The State Air Toxics Program was established in 1983 under Assembly Bill (AB) 1807 (Tanner). A total of 243 substances have been designated TACs under California law; they include the 189 (federal) hazardous air pollutants (HAPs) adopted in accordance with AB 2728. The Air Toxics "Hot Spots" Information and Assessment Act of 1987 (AB 2588) seeks to identify and evaluate risk from air toxics sources; however, AB 2588 does not regulate air toxics emissions. Toxic air contaminant emissions from individual facilities are quantified and prioritized. "High-priority" facilities perform a health risk assessment and, if specific thresholds are violated, are required to communicate the results to the public in the form of notices and public meetings. NSAQMD implements AB 2588, and is responsible for prioritizing facilities that emit air toxics.

In August 1998, ARB identified particulate emissions from diesel-fueled engines (DPM) as TACs because of their ability to cause cancer. ARB subsequently developed the Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles (ARB 2000). The document represents

proposals to reduce diesel particulate emissions, with the goal of reducing emissions and associated health risks by 75 percent in 2010 and by 85 percent in 2020. The program aims to require the use of state-of-the-art catalyzed diesel particulate filters and ultra low sulfur diesel fuel on diesel-fueled engines. ARB regulations and programs that have been implemented to achieve these goals and that would apply to the project include the following (ARB 2004):

- Cleaner Diesel Fuel: In 2003, the ARB adopted a new regulation lowering the sulfur content of diesel fuel to enable the use of advanced emission control technologies for diesel engines.
- Standards for New On-Road Diesel Engines: In 2001, ARB adopted new PM and NO_x emission standards to clean up large diesel engines that power big-rig trucks, trash trucks, delivery vans and other large vehicles. These standards took effect in 2007 and as the new trucks meeting these standards replace older trucks, the newer trucks will have dramatically reduced diesel PM emissions compared to the average on-road engines currently used in California.
- Standards for New Off-Road Diesel Engines: U.S. EPA has proposed new standards that would reduce the emission from off-road engines to levels similar to the on-road engines discussed above by 2010-2012. These standards will dramatically reduce diesel PM emission compared to the off-road engines currently sold in California. In addition, ARB adopted a new regulation effective May 16, 2008 to reduce emissions from existing off-road diesel vehicles used in California construction, mining and other industries. The regulation is expected to significantly reduce emissions of NO_x and PM. In total, the regulation is expected to reduce 187,000 tons of NO_x emissions and 33,000 tons of PM emissions between 2009 and 2030. The regulation is expected to achieve the 2020 goal of reducing PM 85 percent from 2000 baseline levels set forth in ARB's 2000 Diesel Risk Reduction Plan. It is also projected to reduce PM emissions 37 percent from the 2000 baseline by 2010, and 92 percent by 2020. NO_x is expected to be about 13 percent lower in 2015 as a result of the regulation, and by 2020, NO_x emissions would be 32 percent lower than would occur in the absence of the regulation.
- New Regulations for In-Use Diesel Engines:
  - Stationary Engines Standards (Adopted 2004): Most stationary diesel-fueled engines in California are used as emergency backup in the event of a power failure. Others are used to pump water in some areas, to run compressors, and other equipment. ARB standards for these engines will bring an approximate 80 percent PM reduction by 2020 through stricter standards for new engines and requirements to retrofit existing engines.

- Portable Engines Standards (Adopted 2004): Most portable diesel engines in California are used to power pumps, airport ground support equipment, oil drilling rigs, generators, and a variety of other equipment. ARB's rule requires four stepped reductions in emissions from portable engines, reaching a 95 percent reduction in PM emissions in 2020 with concurrent significant cuts in smog-forming emissions.

Air Quality and Land Use Handbook

ARB recently published the Air Quality and Land Use Handbook: A Community Health Perspective (ARB 2005). The primary goal in developing the handbook was to provide information that will help keep California's children and other vulnerable populations out of harm's way with respect to nearby sources of air pollution. The handbook highlights recent studies that have shown that public exposure to air pollution can be substantially elevated near freeways and certain other facilities. However, the health risk is greatly reduced with distance. For that reason, ARB provided some general recommendations aimed at keeping appropriate distances between sources of air pollution and sensitive land uses, such as residences.

Climate Change and Greenhouse Gases

In 2005, in recognition of California's vulnerability to the effects of climate change, Governor Schwarzenegger established Executive Order S-3-05, which sets forth a series of target dates by which statewide emission of greenhouse gas would be progressively reduced, as follows:

- By 2010, reduce greenhouse gas emissions to 2000 levels;
- By 2020, reduce greenhouse gas emissions to 1990 levels; and
- By 2050, reduce greenhouse gas emissions to 80 percent below 1990 levels.

In 2006, California passed the California Global Warming Solutions Act of 2006 (Assembly Bill No. 32; California Health and Safety Code Division 25.5, Sections 38500, et seq., or AB 32), which requires the ARB to design and implement emission limits, regulations, and other measures, such that feasible and cost-effective statewide greenhouse gas emissions are reduced to 1990 levels by 2020 (representing an approximate 25 percent reduction in emissions).
In June 2007, ARB directed staff to pursue 37 early actions for reducing greenhouse gas emissions under the California Global Warming Solutions Act of 2006 (AB 32). The broad spectrum of strategies to be developed (including a Low Carbon Fuel Standard, regulations for refrigerants with high global warming potentials, guidance and protocols for local governments to facilitate greenhouse

gas reductions, and green ports) reflects that the serious threat of climate change requires action as soon as possible (ARB 2007c).

In addition to approving the 37 greenhouse gas reduction strategies, ARB directed staff to further evaluate early action recommendations made at the June 2007 meeting, and to report back to ARB within six months. The general sentiment of ARB suggested a desire to try to pursue greater greenhouse gas emissions reductions in California in the near-term. Since the June 2007 ARB hearing, ARB staff has evaluated all 48 recommendations submitted by several stakeholder and several internally-generated staff ideas and published the Expanded List of Early Action Measures to Reduce Greenhouse Gas Emissions In California Recommended For Board Consideration in October 2007 (ARB 2007d). Based on its additional analysis, ARB staff is recommending the expansion of the early action list to a total of 44 measures.

The 2020 target reductions are currently estimated to be 169 million metric tons/year of CO_2 equivalent (CO_2e) (ARB 2008b). In total, the 44 recommended early actions have the potential to reduce greenhouse gas emissions by at least 42 million metric tons/year CO_2e emissions by 2020, representing about 25 percent of the estimated reductions needed by 2020. ARB staff is working on 1990 and 2020 greenhouse gas emission inventories in order to refine the projected reductions needed by 2020. The 44 measures are in the sectors of fuels, transportation, forestry, agriculture, education, energy efficiency, commercial, solid waste, cement, oil and gas, electricity, and fire suppression. The Program Actions evaluated in this Draft PEIR do not fit into any of these sectors.

In addition to identifying early actions to reduce greenhouse gases, ARB is also developing mandatory greenhouse gas reporting regulations pursuant to requirements of AB 32. The regulations are expected to require reporting for certain types of facilities that make up the bulk of the stationary source emissions in California. Currently, the draft regulation language identifies major facilities as those that generate more than 25,000 metric tons/year of CO_2e. Cement plants, oil refineries, electric-generating facilities/providers, cogeneration facilities, and hydrogen plants and other stationary combustion sources that emit more than 25,000 metric tons/year CO_2e, make up 94 percent of the point source CO_2e emissions in California (ARB 2007e).

In January 2008, the California Air Pollution Control Officers Association (CAPCOA) issued a "white paper" on evaluating greenhouse gas emissions under CEQA (CAPCOA 2008). The CAPCOA white paper strategies are not guidelines and have not been adopted by any regulatory agency; rather, the paper is offered as a resource to assist lead agencies in considering climate change in environmental documents.

The ARB published a Climate Change Draft Scoping Plan (ARB 2008b) that outlines reduction measures to lower the state's greenhouse gas emissions to meet the 2020 limit. The Draft Scoping Plan "proposes a comprehensive set of actions designed to reduce overall carbon emissions in California, improve our environment, reduce our dependence on oil, diversify our energy sources, save energy, and enhance public health while creating new jobs and enhancing the growth in California's economy." ARB will release a Proposed Scoping Plan in early October to the Board for consideration at its meeting in November 2009. Measures included in the Scoping Plan will be developed over the next three years and be in place by 2012.

4.2.2.3 Regional

As a state agency, DPR is exempt from local regulations, including general plans, specific plans, and zoning ordinances, to the extent that such requirements conflict with DPR's own General Plan for the Park (California Constitution Article XI Section 7). However, DPR must comply with the Park's General Plan, as well as applicable state and federal rules and regulations governing historic buildings, structures, and districts and any local regulations applicable to impacts located outside the Park boundaries.

Northern Sierra Air Quality Management District

The Project is under jurisdiction of the NSAQMD, which regulates air quality according to the standards established in the Clean Air Acts and amendments to those acts. The NSAQMD regulates air quality through its permitting authority and through air quality related planning and review activities over most types of stationary emission sources.

The NSAQMD is comprised of three contiguous, mountainous, rural counties in northeastern California (Nevada, Sierra, and Plumas counties). The NSAQMD is part of the Mountain Counties Air Basin. The NSAQMD enforces controls on stationary sources of air pollutants through its permit and inspection programs and regulates open burning. Through its permitting authority, the NSAQMD enforces limitations of criteria and toxic air contaminant emissions. Other NSAQMD responsibilities include monitoring air quality, preparing of implementation plans, and responding to citizen air quality complaints.

The NSAQMD reviews development proposals to ensure that air quality impacts are adequately assessed and mitigated in accordance with attainment planning efforts. Planning efforts are focused on preventing air quality degradation and violations of the California and national ambient air quality standards. Additional responsibility includes acting as a lead or commenting agency on CEQA evaluations. For this purpose, the NSAQMD has prepared the "Guidelines for Assessing and Mitigating Air Quality Impacts of Land Use Projects." These

Guidelines explain that the NSAQMD has adopted District Rule 226 which requires dust control plans that are vital in limiting fugitive emissions from surface-disturbing activities.

4.2.2.4 Local

Nevada County General Plan

The overall air quality in Nevada County is very good. However, there are several pollutants that do not meet state and federal AAQS. The Nevada County General Plan includes an Air Quality element (Nevada County 1996) that contains a number of guiding goals, and objectives that would apply to the proposed Project. The County has adopted the following applicable goals, objectives, and policies in the Air Quality element.

Goal 14.1: Attain, maintain and ensure high air quality.

Objective 14.2: Implement standards that minimize impacts on and/or restore air quality.

Policy 14.4: Encourage and cooperate with the NSAQMD, or any successor agency, to:

a. Adopt control measures to reduce pollutant emissions from open burning;
b. Develop a program to regulate and control fugitive dust emissions from construction projects; and
c. Identify and establish visibility standards for air quality in the County.

Policy 14.5: Encourage and cooperate with the NSAQMD, or any successor agency, to develop and implement a long-term monitoring program to quantify air quality in the County. The County shall work with the District to identify areas for monitoring and to develop an implementation program to begin on-site monitoring upon project application where a proposal will result in an increase of more than 25 tons per year of non-attainment pollutants (or precursors). The County will also cooperate with the District in developing a monitoring program for CO emissions at key intersections as a basis for consideration of short- to long-term air quality in the preparation of the County Road Improvement Program.

4.2.3 THRESHOLDS OF SIGNIFICANCE

The following thresholds have been prepared based on the State CEQA Guidelines (Appendix G) and Section 15065 of the State CEQA Guidelines. The Project would have a significant impact on air quality if it will:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is a non-attainment zone under an applicable federal or State ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors);
- Expose sensitive receptors to substantial pollutant concentrations; and
- Create objectionable odors affecting a substantial number of people.

With respect to Greenhouse Gases (GHG) Emissions (OPR 2009) the Project would have a significant air quality impact based on:

- The extent to which the Project could help or hinder attainment of the state's goals of reducing greenhouse gas emissions to 1990 levels by the year 2020 as stated in the Global Warming Solutions Act of 2006;
- The extent to which the Project could result in increased energy efficiency of and a reduction in overall greenhouse gas emissions from an existing facility;
- The extent to which the Project impacts or emissions exceed any threshold of significance that applies to the Project; and
- The extent to which the Project could increase the consumption of fuels or other energy resources, especially fossil fuels that contribute to greenhouse gas emissions when consumed.

Thresholds of significance illustrate the extent of an impact and are a basis from which to apply mitigation measures. In January 2009, the state of California, through the OPH/SCH, published its Interim Greenhouse Gas thresholds (see Table 4.2-3, CARB's Interim GHG Significance Threshold).

The NSAQMD has developed a tiered approach to significance levels for criteria pollutants. A project with emissions qualifying it for Level A thresholds would require the most basic mitigations. Projects that qualify for Level B would require more extensive mitigations, and subsequently, those projects that qualify for Level C would require the most extensive application of mitigation measures. The tiered thresholds for Level A, B and C are given in Table 4.2-4, NSAQMD Emission Significance Thresholds,

for a project's estimated emissions of criteria pollutants in pounds per day. These tiered thresholds will be compared to Program Actions per NSAQMD guidelines.

TABLE 4.2-3
CARB'S INTERIM GHG SIGNIFICANCE THRESHOLD

	CARB
Policy Objective	Capture 90 percent of statewide stationary project emissions.
Exemption	Apply applicable exemption.
Regional GHG Reduction Plan	N/A.
Thresholds	Project < 7,000 $MTCO_2eq/yr$ & meets construction & transportation performance standards.
Performance Standards	See above.
Offsets	Off-site substitution allowed.
Determination	GHG emissions significant, EIR is prepared, if meeting none of the above.

TABLE 4.2-4
NSAQMD EMISSION SIGNIFICANCE THRESHOLDS

Threshold Level	NOx (lbs/day)	ROG (lbs/day)	PM10 (lbs/day)
Level A Thresholds	< 24	< 24	< 79
Level B Thresholds	24-136	24-136	79-136
Level C Thresholds	> 136	> 136	> 136

Source: NSAQMD, 2007.

If emissions for NO_x, ROG and/or PM_{10} exceed 136 pounds per day (Level C), then there is a significant impact; below Level C the impact would be potentially significant. The NSAQMD guidelines suggest that projects with higher emissions (Level C Thresholds) should automatically mitigate more emissions, quantitatively, than would a lower impact project (Level A). Also according to the guidelines, if a new project is unable to provide adequate on-site mitigation of their long-term air quality impacts, an off-site mitigation program could be necessary.

For TACs, the Project's emissions are significant if they result in either of the following:

- A lifetime excess cancer risk greater than 10-in-a-million, or
- An acute or chronic hazard index greater than 1.0.

These thresholds are typical for CEQA air quality assessments throughout California.

In a risk assessment, cancer risk for an individual is expressed as the probability of developing cancer over a 70-year lifetime. The predicted concentrations and health impacts (e.g., cancer risk) presented in a site-specific health risk assessment are assumed to exist in excess of background concentrations or resulting health risks. Cancer risks are typically expressed as “chances per million”.

For example, if the excess cancer risk were estimated to be 10-in-a-million as a result of emissions from a specific source, then the probability of an individual developing cancer would be expected to not exceed 10 chances in a million above the existing probability of developing cancer from other background risks. If a population (e.g., 1 million people) were exposed to the same potential cancer risk (e.g., 10 chances per million), then the statistics would predict that 10 of those million people exposed are likely to develop cancer from a lifetime of exposure (70 years) due to TAC emissions from an emitting source.

Non-cancer health risk of an air toxic is measure by the hazard quotient, the ratio of the reported concentration of an air toxic compound to an acceptable or REL. Typically, for a given set of chemicals, hazard quotients are summed for each organ system that each chemical can affect to obtain a total hazard index. For any organ system, a total hazard index exceeding 1.0 indicates a potential adverse health effect.

4.2.4 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

The Program and Project Actions are described in detail in Section 2.0 of the Draft PEIR. The discussion below lists each type of air quality impact identified and provides an analysis of potential impacts from Project Action(s), assesses the significance of each impact, and if necessary, identifies measures that would mitigate impacts to a level below significance.

The COC concentrations in fugitive dust that are considered in the air quality impact analysis are based on concentrations measured at the Project areas throughout the Park. Because it was determined that those areas with the highest pre-project COC could have a potentially significant air quality impact, a programmatic approach has been taken when evaluating each potential Remediation Area. For areas with COC above specified levels, a project-level evaluation will be completed as part of characterization before a particular remediation option is selected for a Remediation Area.

This air quality impact analysis does not evaluate the impacts following completion of the Project (such as exposure to visitors walking on trail systems), but the impacts as a result of the Project Actions that would occur during Project implementation. Fugitive dust from the Remediation Areas is assumed, for the air quality impact analysis, to contain contaminants at pre-remediation concentrations.

This baseline air quality analysis was based on maximum proposed mobile equipment use, hours of operation, and surface disturbance acreage to evaluate compliance with applicable thresholds of significance. These assumptions have been incorporated into all Standard and Specific Project Requirements to ensure that air quality impacts have been considered to the extent feasible prior to determination of whether additional mitigation measures need to be implemented during Program implementation. If Program Actions are implemented within Remediation Areas meeting certain criteria (e.g., ensuring compliance with CEQA significance thresholds) consistent with Standard and Specific Project Requirements, no additional CEQA evaluation would be necessary on an area-specific basis. For those Remediation Area exceeding the criteria specified later in this section, additional characterization and additional mitigation measures could be required.

The following sub-section provides an air quality analysis to determine the anticipated impacts of the proposed Project Actions. Implementation of particular Program Actions at specific Remediation Areas has not been finalized at this time. However, many likely Program Actions have been identified for each Remediation Area. In this resource section, air quality impacts have been analyzed for activities that would be common throughout the proposed projects, including tailpipe emissions from construction equipment and impacts from fugitive dust that would result from surface disturbance. These activities have been analyzed to determine if they could be implemented at the Park while adhering to applicable CEQA significance threshold criteria outlined in Section 4.2.3, above.

4.2.4.1 Sources of Air Quality Impacts

To evaluate the potential air quality impacts and environmental effects of the Project, it is necessary to understand the Project Actions that are likely to be sources of emissions. Program Actions are described in Section 2.6.3. The key Project Actions that could result in air pollutant emissions include:

- Operation of heavy construction equipment;
- Transportation of contaminated soils leaving the Park and importation of clean fill material entering the Park;
- Mobilization and demobilization of heavy construction equipment to the Park;
- Demolition and/or removal of any structures, including temporary facilities;
- Importation of supplies and materials that could be used for remediation activities;
- Temporary and permanent fencing installation;
- Grading activities;
- Boring activities;

- Excavation activities;
- Blasting activities;
- Scarifying activities;
- Planting and seeding activities;
- Stormwater BMP installation and maintenance activities;
- Removal of trees and other vegetation;
- Construction of ancillary structures, including utilities for either a temporary or permanent active water treatment facility;
- Construction and installation of permanent exclusion barriers;
- Construction and maintenance of access roads; and/or
- Monitoring activities.

Based on the Project Actions, the following pollutants and potential sources of air quality impacts were assessed:

1. Criteria pollutants, greenhouse gases (GHGs) and toxic air contaminants (TACs) from mobile exhaust emissions; and
2. Criteria pollutants and TACs from fugitive dust sources.

The TACs of specific concern as a result of the proposed Project Actions are diesel particulate matter (DPM) from on-site mobile construction equipment exhaust (trucks, generators), and arsenic, lead, and cadmium in the soils where the concentration is above the Commercial/Industrial California Human Health Screening Level (CHHSL), or the U.S. EPA Region 9 Preliminary Remediation Goal (PRG) in the case of lead. Asbestos-containing rock, which can be found throughout California, has not been identified within the Park (according to U.S. Geological Survey map data). Therefore, asbestos fibers are not considered a concern from historic mining activities or proposed surface disturbances.

The approach used in this Draft PEIR for the air quality assessment is to provide a analysis to determine the anticipated impacts of Project Actions. Since some of the specific details of the Project Actions have not been finalized at this time, assumptions needed to be made to complete the quantitative portions of the air impact assessment. Before actual Project Actions are carried out at individual Project Areas at the site, the specific details of the planned actions will need to be compared to the assumptions in this impact assessment to determine if the potential impacts have been adequately characterized, or if additional assessments are required (as would be the case when COC levels exceed specified levels as discussed further later in this section).

4.2.4.2 Criteria Pollutant Assessment

The assessment of criteria pollutants takes into account emissions from Project Actions as described above. The assessment also includes associated activities such as worker commute trips. The evaluation of criteria pollutants in this assessment is limited to a comparison of estimated emissions to associated thresholds of significance established by the NSAQMD.

4.2.4.3 Toxic Air Contaminant Assessment

TAC impacts are evaluated by determining if a particular chemical poses a significant risk to human health and, if so, under what circumstances. Both contaminated soil and diesel internal combustion exhaust were considered as potential sources of TAC emissions to air. DPM and metals determined to be COCs are discussed below.

Exposure Pathways

An exposure pathway describes the route a COC could take from its source to its end point and how human and ecological receptors (wildlife, aquatic life, and plants) can come into contact with (or be exposed to) the COC along the route. An exposure pathway has five parts:

1. A source of COC, such as mine and mill related materials;
2. A way for the COC to travel to the point of contact (e.g., water transporting a COC downstream, or wind blowing a COC through the air);
3. A point of exposure or contact with the constituent;
4. A route of exposure such as ingestion (eating, drinking), inhalation (breathing), or dermal contact (touching); and
5. A receptor, such as humans or sensitive wildlife, birds, and plants.

The exposure pathway is considered to be complete when all five parts are present. Conversely, if any one of these five parts is not present, the exposure pathway is considered to be incomplete.

Completed Pathways of Exposure

Completed pathways demonstrate the link between the environment and human exposure. Assumptions were made based on how receptors might come into contact with soil contamination from fugitive dust/soil at the Park. Once reasonable exposure pathways were determined, chronic daily intake was quantified in milligrams of contaminant per kilogram body weight per day. The chronic daily intake (CDI) is the quantity of a chemical which is available to the body for absorption at a membrane exchange boundary, be it via ingestion,

dermal, or inhalation exposure. It is different from the absorbed dose, which is a direct measurement of the concentration of chemical in the blood.

Constituents of Potential Concern (Arsenic/Lead/Cadmium from Soil Contaminants)

The COCs in soil chosen for the air quality assessment for Project Actions (were PCOCs in the soil with average measured concentrations above the CHHSL values, or the U.S. EPA Region 9 PRG for lead. The use of these screening thresholds is conservative in this case because the impacts being assessed are not for human receptors that would be located at the site where Project Actions are taking place, but rather to receptors located at some distance from where these activities are occurring.

PCOC concentrations used for screening purposes were determined based on either the average concentration (calculated as the 95th percentile upper confidence level of the mean), when at least 15 sample values were available, or the maximum concentration, for each potential Remediation Area.

A review of much of the available data suggested that only arsenic, lead, and cadmium concentrations would be above the CHHSL evaluation thresholds for any potential Remediation Area. For purposes of this assessment, it was assumed that the actual concentrations of other metals in soil to be disturbed would be below these thresholds.

Based on the available data, it was estimated that actual PCOC concentrations would not exceed the following values:

- Arsenic: Average concentration of 407 mg/kg; maximum concentration of 15,300 mg/kg.
- Lead: Average concentration of 904 mg/kg; maximum concentration of 5,599 mg/kg.
- Cadmium: Average concentration of 9.9 mg/kg; maximum concentration of 68.2 mg/kg.

Cancer Risks

The cancer risks from COC metals contained in fugitive dust could occur through several pathways (see Table 4.2-7). The total maximum lifetime excess cancer risk due to COC metals exposure was predicted for emissions resulting from Project Actions as well as other non-inhalation pathways.

TABLE 4.2-7
PCOC METALS EXPOSURE PATHWAY SUMMARY

Exposure Route	Pathway Quantified	Exposure Likelihood	Rationale
Inhalation	Yes	Completed pathway	Execution of Program Actions would potentially increase soils coming into contact with public receptors
Ingestion	Yes	Completed pathway	
Dermal contact	Yes	Completed pathway	

Non-Cancer Risks

PCOC metals were also evaluated based upon their known chronic and acute non-carcinogenic human health effects (where applicable). Chronic non-carcinogenic health effects were evaluated for the same exposure pathways assessed for carcinogenic effects. Acute non-carcinogenic health effects were evaluated for the inhalation pathway only, as this was expected to be the most sensitive exposure pathway for acute effects.

Diesel Particulate Matter

When evaluating health risks from diesel exhaust exposure, the potential cancer risk from inhalation exposure to DPM will outweigh the potential non-cancer health impacts. Therefore, inhalation cancer risk is the primary consideration for health effects according to OEHHA and ARB guidelines. When comparing the toxicity of diesel exhaust as a whole to the combined toxicity of the speciated components of diesel exhaust (e.g., Polycyclic Aromatic Hydrocarbon [PAHs], metals), calculated potential cancer risk from inhalation exposure to whole diesel exhaust will outweigh the calculated multipathway cancer risk from the speciated components. For this reason, an analysis of multipathway risk for DPM is not necessary (California EPA 2003). Both carcinogenic and non-carcinogenic health effects from DPM emissions are estimated in this assessment.

Toxic Air Contaminants Impact Assessment Methodology

U.S. EPA's SCREEN3 model was used to determine exposure point concentrations in air for both DPM and PCOC metals. The SCREEN3 model is an appropriate conservative model for determining estimated maximum pollutant concentrations at discrete distances from emissions sources. Emission rates used in the SCREEN3 model were based on particulate matter emissions from both fugitive dust and equipment that result from a maximum daily scenario (discussed further below). The SCREEN3 model was used to calculate

estimated maximum 1-hour concentrations. Maximum annual average concentrations were estimated by multiplying the 1-hour maximum impacts by a conversion factor of 0.1, representing the upper end of the range recommended by the U.S. EPA.

DPM (from mobile equipment exhaust) and PCOC metals (contained in fugitive dust) were modeled as area sources. The area source was defined based on the estimated area that emissions might occur over as a result of Project Action activity. Concentrations at discrete distances from the area source were obtained and the maximum concentration estimated by the SCREEN3 model regardless of distance from the area source was used to determine the maximum exposure point concentration for inhalation health effects.

Health and cancer risk were determined for the maximum daily scenario. The NSAQMD has a significance threshold for health risk exposure to diesel emissions of 10 cancers per million for 70-year exposure. Accordingly, the NSAQMD Nevada County Land Use Guidelines requires that DPM from diesel engine exhaust emissions be identified or evaluated using an approved emissions model.

Cancer Risks

As discussed above, cancer risks from DPM and COC metals concentrations in air would occur through the inhalation pathway. In addition, cancer risk from COC metals was also assessed for the ingestion and dermal contact exposure pathways.

The first step in assessing potential lifetime excess cancer risk (LECR) is to use models to estimate maximum lifetime average exposure point concentrations of DPM and COC metals at locations that members of the public might be exposed. From these concentrations, exposure factors are used to estimate total average dose rates to these hypothetical individuals.

Finally, accepted dose-response factors (e.g. slope factors) are used to estimate the LECR due to potential exposures to DPM and COC metals.

The methodologies used to estimate LECR for each of these TACs and exposure pathways are provided in Appendix D, Air Quality Assessment Calculations and Results.

Non-Cancer Health Effects

As discussed above, chronic non-cancer health effects from DPM and COC metals concentrations in air would occur through the inhalation pathway. In addition, chronic non-cancer health effects from COC metals were also assessed for the ingestion and dermal contact exposure pathways. Acute non-cancer health effects were also estimated for arsenic only (none of the other TACs assessed have acute toxicity factors available for California).

The first step in assessing potential noncancer hazard is to use models to estimate maximum annual average (chronic) or hourly average (acute) exposure point concentrations of DPM and COC metals at locations that members of the public might be exposed. From these concentrations, exposure factors are used to estimate total average dose rates to these hypothetical individuals (no adjustment is made for acute exposure). Finally, accepted health threshold factors (e.g. reference exposure levels) are used to estimate the hazard quotients due to potential exposures to DPM and COC metals.

The methodologies used to estimate a hazard quotient for each of these TACs and exposure pathways are provided in Appendix D.

Exposure of Human Receptors

This assessment conservatively evaluates worst-case human health impacts to Park employees, Park users, and nearby off-Park residents and occupational workers. Due to the conservative exposure assumptions used, exposures for actual human receptors are expected to be significantly less than those estimated in this assessment.

Maximum Daily Scenarios and Impact Assessment Results

In most instances, area-specific information (referred to as a Remediation Area in Section 2.5.2 of the Draft PEIR) is not yet available on which to base assumptions for the quantification of air emissions. Hence, for the purposes of this air quality impact assessment, it is necessary to conduct an evaluation that is broader in nature to determine what level of activity related to Program Actions would result in emissions and ambient impacts that are less than significant when compared to the NSAQMD significance thresholds. This level of activity (for Program Actions) is termed the Maximum Daily Scenario (MDS) and it is an estimate of foreseeable Program Actions that could be occurring either concurrently or consecutively that are likely potential sources of emissions.

Specific Project Requirements contain provisions that will be incorporated into the MDS, which would allow Project Actions to be conducted at a specific activity level and would result in air quality impacts below NSAQMD significance thresholds. For example, the requirement to keep activity levels, daily disturbed areas, and soil hauling below specified levels, and requirements for daily watering, will ensure that the maximum actual air quality impacts will be below those specified in this assessment.

For the purposes of quantification and simplification of analysis, Project Actions were assumed to take the form of one of four construction activities. That is, any proposed interim or remediation action could be one of four "construction activities" namely; (i) Grubbing and Land Clearing, (ii) Grading and Excavation (includes soil hauling emissions), (iii) Drainage and Utilities and (iv) Paving.

Table 4.2-8, Construction Activities and Associated Equipment Usage and Quantity, and Table 4.2-9, Engine Tiers by Horsepower and Year, lists the type, quantity, and horsepower of each piece of equipment that has been evaluated in the MDS.

TABLE 4.2-8
CONSTRUCTION ACTIVITIES AND ASSOCIATED EQUIPMENT USAGE AND QUANTITY

Construction Activities (Urbemis Phase Descriptions)	Equipment Used (Quantity)	Horsepower Rating
Grubbing and Land Clearing (Mass Grading)	Rubber Tire Dozer(1)	357
	Scraper (1)	313
Grading and Excavation (Fine Grading)	Scraper(1)	313
	Excavator (1)	168
	Grader (1)	174
	Rubber Tire Loader (1)	157
Drainage Utilities (Trenching)	Scraper (1)	313
	Grader(1),	174
	Plate Compactor (1)	8
	Trencher (1)	63
Paving (Asphalt)	Pavers (1)	100
	Paving Equipment (1)	104
	Roller (1)	95

The list of equipment used to execute Project Actions is limited to the list presented in Table 4.2-9.

TABLE 4.2-9
ENGINE TIERS BY HORSEPOWER AND YEAR

Year	Horsepower Groups							
	25-49	50-74	75-99	100-174	175-299	300-599	600-750	750+
2005	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 1
2006	Tier 2	Tier 2	Tier 2	Tier 2	Tier 3	Tier 3	Tier 3	Tier 2
2007	Tier 2	Tier 2	Tier 2	Tier 3	Tier 3	Tier 3	Tier 3	Tier 2
2008	Tier 4I	Tier 4I	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 2
2009	Tier 4I	Tier 4I	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 2
2010	Tier 4I	Tier 4I	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 2
2011	Tier 4I	Tier 4I	Tier 3	Tier 3	Tier 4I	Tier 4I	Tier 4I	Tier 4I

Notes: I = Interim standard

Scenarios 1 and 2

Under Scenario 1, the only construction activity permitted is grading and excavation (includes soil hauling emissions). The types of equipment that would be assumed would be one Scraper, one Grader, one Rubber Tire Loader, and Haul Trucks that would be utilized to transport material to and from the Remediation Area.

Under Scenario 2, the types of construction activities that could occur include grubbing and land clearing, installation of drainage and utilities and paving. The types of equipment that would be assumed include one Dozer, two Scrapers, one grader, one Plate Compactor, one Trencher, on Paver, two pieces of Paving Equipment, and one Roller that would operate at the Remediation Area.

In addition to the equipment list, the MDS is correlated to the following hypothetical operating scenario:

1. The maximum disturbed acreage should be 5 acres or less;
2. The soil is assumed to be weathered rock and or soil;
3. The amount of soil imported/exported should not exceed 10,000 cubic yards over a 2-month period during scenario; and
4. The truck capacity for off-site hauling is 20 cubic yards.

Emissions were quantified using URBEMIS Version 9.2.4 for the construction activities that lead to the maximum daily scenario (MDS) and are presented in Table 4.2-10, Emissions of Scenarios that Lead to the MDS. The URBEMIS program output files are provided in Appendix D.

TABLE 4.2-10
EMISSIONS OF SCENARIOS THAT LEAD TO THE MDS (POUNDS/DAY)

Scenarios	ROG[a] (lbs/day)	CO (lbs/day)	NO_x[a] (lbs/day)	PM_{10}[a] (lbs/day)	$PM_{2.5}$ (lbs/day)	CO_2 (lbs/day)
Scenario 1	2.75	23.59	46.19	40.88	10.02	6,182.20
Scenario 2	5.67	49.79	92.46	40.86	11.69	12,183.93
NSAQMD Level A Thresholds	<24	-	<24	<79	-	-
NSAQMD Level B Thresholds	24-136	-	24-136	79-136	-	-
NSAQMD Level C Thresholds	>136	-	>136	>136	-	-

Notes:
[a] NSAQMD thresholds only exist for these pollutants.

Maximum Annual Scenario for COC Metals

COC metals at the Park could be released into the air from contaminated soils/dust and respired from either wind or other disturbances of the soil. Inhalation of soil from wind erosion could pose some risk; however, of greater concern are mechanical disturbances of the soil by remediation contractors engaging in short-term Project Actions that could produce much larger quantities of dust.

Inhalation of non-volatile COC metals adsorbed to respirable particles (generally particulate matter 10 microns in diameter or PM_{10}) was based on predicting the annual average concentration during periods of exposure from fugitive PM_{10} emissions (based on the MDS) using the SCREEN3 dispersion model.

Human exposure was based on the assumption that implementation of Program Actions would occur for six months per year, five days per week, and 8.0 hours per day for one year. Human exposure receptors were assumed to be present during all periods of Project Actions, consistent with residential exposure assumptions. Exposure parameters, such as daily breathing rates, were also conservatively based on residential exposure assumptions.

Inhalation Exposure

Based on estimated emissions of COC metals adhering to fugitive dust, human receptors subjected to Program Actions as described above for a 1-year period were estimated to have a maximum average exposure concentration of 1.47E-07 $\mu g/m^3$ for arsenic, 3.27E-03 $\mu g/m^3$ for lead, and 3.57E-05 $\mu g/m^3$ for cadmium. The resulting maximum LECR from COC metals due to the inhalation exposure pathway is estimated to be 1.58E-01 in a million (calculations are provided in Appendix D). The resulting maximum chronic HQ from COC metals due to the inhalation exposure

pathway is estimated to be 9.98E-02 (calculations are provided in Appendix D). Acute impacts from arsenic exposure are discussed separately below.

Soil Ingestion

Soils contaminated by fugitive dust resulting from Program Actions are assumed to contain up to 4.36E-02 mg/kg of arsenic, 9.71E-02 mg/kg of lead, and 1.06E-03 mg/kg of cadmium (calculated values are provided in Appendix D). Based on the assumed ingestion rates, the resulting maximum LECR from COC metals due to the ingestion exposure pathway is estimated to be 3.35E-03 in a million (calculations are provided in Appendix D). The resulting maximum chronic HQ from COC metals due to the ingestion exposure pathway is estimated to be 1.78E-02 (calculations are provided in Appendix D).

Dermal Exposure

Soils contaminated by fugitive dust resulting from Program Actions are assumed to contain up to 4.36E-02 mg/kg of arsenic, 9.71E-02 mg/kg of lead, and 1.06E-06 mg/kg of cadmium (calculated value are provided in Appendix D). Human receptors are assumed to have up to 4,700 cm2 of skin surface exposed at any one time. Based on the assumed dosing rate, the resulting maximum LECR from COC metals due to the dermal contact exposure pathway is estimated to be 2.57 E-04 in a million (calculations are provided in Appendix D). The resulting maximum chronic HQ from COC metals due to the dermal contact exposure pathway is estimated to be 6.69E-03 (calculations are provided in Appendix D).

Acute Exposure to Arsenic

Arsenic is the only COC metal with a 1-hour acute reference exposure level published by the California Air Resources Board (CARB). Because of the presence of some localized pockets of materials within the Park with relatively high arsenic concentrations, the potential exists for significant impacts from fugitive emissions of soil materials containing arsenic in these areas. Therefore, the evaluation of potential acute health impacts from Program Actions was subdivided based on three levels of Remediation Areas:

1) Those Remediation Areas with maximum arsenic concentrations less than or equal to 363 mg/kg, within which only Standard and Specific Project Requirements would be necessary when Program Actions were taking place in accordance with the MDS.

2) Those Remediation Areas with maximum arsenic concentrations less than or equal to 3,500 mg/kg, but greater than 363 mg/kg, within which additional Mitigation Measures would be necessary when Program Actions were taking place, which include modifications to the MDS.
3) Those Remediation Areas with maximum arsenic concentrations greater than 3,500 mg/kg, within which a project-specific approach and MDS would need to be developed and assessed outside of this Program EIR. Project-specific requirements would then be developed to ensure that less than significant acute hazard impacts result.

Therefore, before Program Actions are commenced for a given Remediation Area, the area would be classified as described above, and the appropriate Project Requirements implemented. This will result in acute hazard impacts with a hazard index less than 1.0 for all Program Actions.

Total COC Metals Exposure

The total health effects resulting from exposure to COC metals from the exposure pathways discussed above is simply the sum of either the LECRs or the HQs. The sum of the individual HQs is referred to as the hazard index (HI). Therefore, the maximum total LECR due to potential exposure to COC metals is 1.62E-01 in a million and the maximum total chronic HI due to potential exposure to COC metals is 1.24E-01. The maximum total acute HI due to potential exposure to arsenic is less than 1.0 as described in the preceding section.

Maximum Annual Scenario for Diesel Particulate Matter

The maximum annual scenario for particulate matter is based on the summation of Scenarios 1 and 2. DPM emissions from Scenario 2 are greater than DPM emissions from Scenario 1 and are predicted to be 3.37 lb/day over a 5-acre area during the course of an 8-hour work day. The annual total DPM emissions were used to determine an area source emissions rate from which a maximum average DPM 1-hour concentration is estimated. Using the SCREEN3 model, the hourly concentration was used to determine the average annual DPM concentration by applying a factor of 0.1 to derive a concentration of 1.64E-01 $\mu g/m^3$.

The resulting maximum LECR from DPM due to the inhalation exposure pathway is estimated to be 1.56 in a million (calculations are provided in Appendix D).

The resulting maximum chronic HQ from DPM due to the inhalation exposure pathway is estimated to be 3.28E-02 (calculations are provided in Appendix D).

Impact 4.2-1: Program Actions Could Generate Criteria Pollutant Emissions at the Park

Project Action-related dust emissions would vary from day to day, depending on the level and type of activity, silt content of the soil, and the weather. Emissions of PM_{10} could potentially affect local visibility and concentrations in the air could be adversely affected; however, only on a temporary and intermittent basis during these activities.

Combustion emissions from heavy equipment and construction worker commute trips would also vary from day to day, and could contribute incrementally to regional ozone concentrations during the implementation of Project Actions.

Fugitive dust would occur both during implementation of Project Actions and as a result of wind erosion over exposed earth surfaces. Clearing and earthmoving activities generally comprise the major source of construction dust emissions; however, traffic and general disturbance of the soil also generate dust emissions.

As shown in Table 4.2-10, emissions would be below the NSAQMD Level A threshold for ROG and PM_{10} and below the Level B (potentially significant) threshold for NO_x. The NSAQMD does not have significance criteria for SO_2, CO, or $PM_{2.5}$.

To ensure that criteria pollutant emissions are less than significant, the Project Proponents will comply with all applicable NSAQMD and State Rules and Regulations (where applicable) during the execution of Project Actions. These include District Rule 226 (Dust Control), the Statewide Asbestos Airborne Toxic Control Measure for Construction, Grading, Quarrying, and Surface Mining Operations, as well as the Statewide Asbestos Airborne Toxic Control Measure for Surfacing Applications.

Standard Project Requirement AIR-1 requires that all active construction areas will be lightly sprayed with dust suppressant to reduce dust without causing runoff during dry, dusty conditions. AIR-1 further states that all trucks or light equipment hauling soil, sand, or other loose materials while implementing Program Actions on public roads will be covered or required to maintain at least two feet of free board. Additionally, AIR-1 requires that all gasoline-powered equipment will be maintained in good mechanical condition (according to manufacturer's specifications), and in compliance with all state and federal requirements.

Pursuant to AIR-1, paved streets adjacent to the Park will either be swept or washed at the end of each day, or as required, to remove excessive accumulations of silt and/or mud that could have resulted from remediation construction activities. Finally, AIR-1 requires that excavation and grading activities will be suspended when sustained winds

exceed 15 miles per hour (mph), instantaneous gusts exceed 25 mph, or when dust occurs from construction related activities where visible emissions cannot be controlled by watering or conventional dust abatement controls.

With the implementation of Standard Project Requirement AIR-1, air quality impacts from criteria pollutant emissions (including NO_x) associated with Project Actions will be less than significant.

Level of Significance Before Mitigation: Less than Significant

Mitigation Measures: None Required

Impact 4.2-2: Program Actions Would Generate TAC Emissions and Increase Exposure to TAC Emissions at Nearby Receptors

Exposure levels of TACs generated by Project Actions were estimated by conducting an analysis to determine their concentrations from TAC sources at the Park. Figure 4.2-1, Location of Potential TAC Emissions for Remediation Areas 1-4 and 6-9, shows the location of Remediation Areas that could result in potential TAC impacts.

TAC emission sources evaluated in this health risk assessment are DPM from mobile equipment exhaust and COC metals present in onsite soils that could become airborne fugitive dust (COC metals are the only soil contaminants assumed to have concentrations in soil above CHHSL levels, or the U.S. EPA Region 9 PRG in the case of lead).

The emissions from these sources were entered into the USEPA SCREEN3 model to calculate maximum ambient air concentrations at the Park. The maximum concentrations were then used to assess cancer risks and non-cancer health effects (see Appendix D).

Cancer Risk

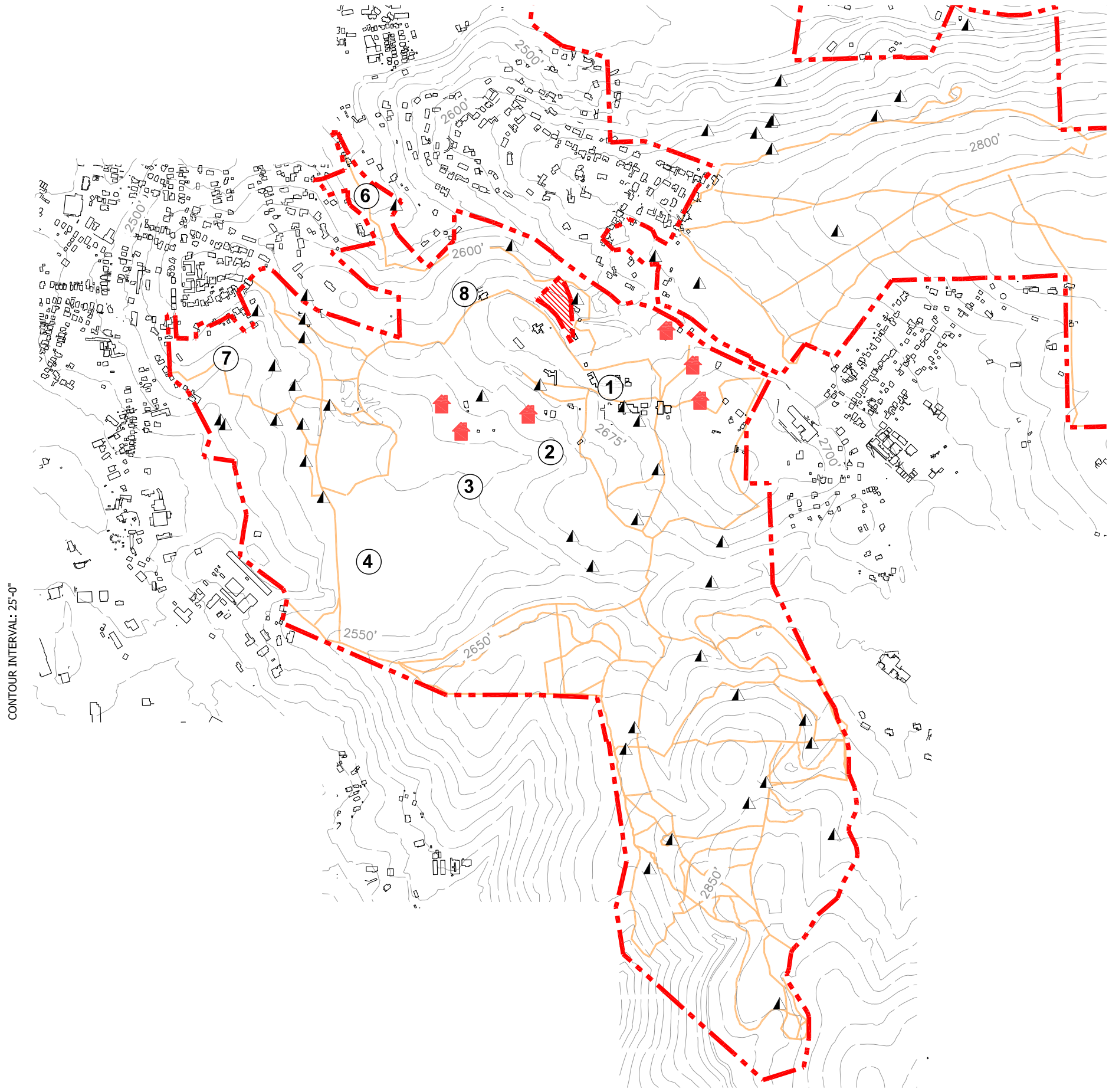
The maximally exposed individual (MEI) receptor as predicted to be 325 and 140 meters from the area sources of DPM and COC metals-containing fugitive dust respectively

The MDS is proposed to operate over a 2-year time period, for 6 months (125 working days) within each year. Assuming that the MEI receptor would be exposed to maximum annual average concentrations for 2 years over a 70-year lifetime, the LECR would be 1.56 and 1.62E-01 in a million for DPM and COC metals respectively, or a total LECR of 1.72 in a million. This is less than the associated significance threshold (10 in a million LECR) in regard to cancer risk at the MEI receptor.

It is important to note that cancer risk has been evaluated assuming that the peak daily emissions would occur over the entire span of the Project implementation to present a conservative approach. Therefore, actual impacts from the Project would likely be much lower than predicted in this assessment.

Non-Cancer Risk

Non-cancer adverse health effects, both for acute (short-term) and chronic (long-term) time periods, are assessed using the HQ, which is defined as the ratio of the predicted incremental exposure concentration or dose from the Project to a published threshold concentration or dose that could cause adverse health effects as established by OEHHA. The sum of the HQs for each non-carcinogenic substance that affects a certain target organ system is added to produce an overall HI for that target organ system. Overall HIs are generally calculated for each target organ system and if the overall HI for the highest-impacted target organ system is greater than one, then the impact is considered to be significant. Conservatively, however, the HQ for each individual TAC can simply be added together irrespective of the target organ system affected; this is the approach used in this health risk assessment.



Remediation Areas:

1. Mine Yard and Stamp Mill (DPM)
2. Cyanide Plant Area (DPM)
3. Conveyance Corridor and Adit Project (DPM)
4. Sand Dam Area (DPM)
- Historic Mine and Mill Sites (DPM) **(Area 5)**
6. Magenta Drain Area (DPM)
7. Stacy Lane Pond Area (DPM)
8. Historic Grounds Area (DPM)
- Residences and Residences Yards (DPM) **(Area 9)**
- Trails (DPM and As) **(Area 10)**

- Empire Mine SHP Boundary
- Buildings (Potential Receptors)
- In Holding

DPM - Diesel Particulate Matter
As - Arsenic

N

0 1000'-0"

SCALE: 1" = 1000'-0"

Figure 4.2-1
Location of Potential TAC Emissions for Remediation Areas 1-4 and 6-9

EMPIRE MINE SHP
SITE CHARACTERIZATION
AND REMEDIATION PROJECT

RESOURCE DESIGN
TECHNOLOGY, INC.

Acute Health Hazard

Acute hazard was assessed for arsenic only and only for the inhalation exposure pathway (since other COC metals and exposure pathways did not have applicable toxicity data provided by CARB). Within each Remediation Area, maximum arsenic concentrations would be classified as following levels:

1) Those Remediation Areas with maximum arsenic concentrations less than or equal to 363 mg/kg, within which only Standard and Specific Project Requirements would be necessary when Program Actions were taking place in accordance with the MDS.
2) Those Remediation Areas with maximum arsenic concentrations less than or equal to 3,500 mg/kg, but greater than 363 mg/kg, within which additional Mitigation Measures would be necessary when Program Actions were taking place, which include modifications to the MDS.
3) Those Remediation Areas with maximum arsenic concentrations greater than 3,500 mg/kg, within which a project-specific approach and MDS would need to be developed and assessed outside of this Program EIR. Project-specific requirements would then be developed to ensure that less than significant acute hazard impacts result.

For Remediation Areas in classification Level 1, the maximum HI is estimated to be less than 1.0, resulting in less than significant acute health impacts.

For Remediation Areas in classification Level 2, potential significant acute health impacts could result without implementation of additional mitigation. However, with implementation Mitigation Measure 4.2-1: Additional Dust Suppression Measures would result in less than significant impacts.

For Remediation Areas in classification Level 3, potential significant acute health impacts could result. However, an area-specific Remediation and Mitigation Plan would be developed to ensure that acute hazard from arsenic would have Hazard Index of less than 1.0. This would involve the selection of a remediation option (e.g., Placement of cover over selected areas) that would ensure that less than significant acute health impacts would result.

Chronic Health Hazard

Chronic non-carcinogenic health hazard was assessed for both DPM and COC metals. The MEI receptor for chronic health hazard was calculated to have HI's of 3.28E-02 and 1.24E-01 respectively for DPM and COC metals, for a total combined HI of 1.57E-01. Since the maximum chronic HI is less than 1.0, this impact would be less than significant.

Asbestos

Asbestos was not evaluated in this PEIR as no asbestos-containing soils were discovered at the Park and the NSAQMD requires that all projects that would disturb more than one acre submit an Asbestos Dust Mitigation Plan (which would include adopted standards for grading, excavation, blasting, and other construction or operational activities that could generate asbestos containing fugitive dust) before beginning any clearing, grading or construction activities, and implementation of an approved plan would result in impacts from asbestos that are less than significant.

Level of Significance Before Mitigation: Less than Significant for all TAC impacts except for acute health impacts from arsenic in Remediation Areas classified as Level 1. For Remediation Areas classified as Level 2 or 3, acute health impacts from arsenic could be significant; therefore, mitigation measures will be implemented.

Mitigation Measure 4.2-1 (a): Additional Dust Suppression Measures: For Project Actions within Remediation Areas classified as Level 2 (maximum arsenic concentrations less than or equal to 3,500 mg/kg, but greater than 363 mg/kg) the Project Proponents will implement the following:

- All active construction areas will be watered whenever material being disturbed is not moist. This includes areas subject to vehicle travel; material to be excavated, dozed, scraped, etc.; and material being hauled if it is not otherwise covered.
- Enclose, cover, water to maintain moist conditions, or apply (non-toxic) soil binders to exposed stockpiles containing materials with arsenic concentrations within the Level 2 classification range.
- Hydroseed or apply (non-toxic) soil stabilizers to inactive construction areas (previously graded areas inactive for 5 days or more).
- Limit the area subject to excavation, grading and other construction activity at any one time to as small as practically possible, but not to exceed 2.5 acres per day

Mitigation Measure 4.2-1 (b): Remediation and Mitigation Plan

If area-specific characterization indicates that a Remediation Area is classified as Level 3 (maximum arsenic concentrations greater than 3,500 mg/kg), the Project Proponents will develop a Remediation and Mitigation Plan that demonstrates that acute arsenic health impacts have an Hazard Index less than 1.0, and are therefore less than significant. This Plan will likely require selection of a

remediation option that reduces potential exposure to unacceptable health risks associated with arsenic (e.g., Placement of cover over selected areas).

Level of Significance After Mitigation: Less than Significant

When mitigation measures are implemented within Remediation Areas classified as Level 2 (maximum arsenic concentrations less than or equal to 3,500 mg/kg, but greater than 363 mg/kg) and when a Remediation and Mitigation Plan is developed for Remediation Areas classified as Level 3 (maximum arsenic concentrations greater than 3,500 mg/kg), the acute arsenic health impacts would have an Hazard Index less than 1.0, and would be less than significant.

Impact 4.2-3: Program Actions Would Generate Localized CO Emissions at Intersections and Roadways in the Project Vicinity due to Offsite Worker and Haul Truck Emissions

Increased traffic levels generated by the Project have the potential to affect carbon monoxide concentrations along surface streets in the Project area due to commuting by Project workers, and haul trucks bringing equipment and material to and from the Park. Such increases in traffic typically have the highest impacts at intersections, where vehicles idle in the queues formed at the intersection. These areas are often referred to as CO “hot spots.”

As noted in Section 4.11, several regulatory entities have traffic number and capacity thresholds that would trigger a specific Traffic Impact Study (TIS), the most stringent of which comes from the City of Grass Valley, with a threshold of 50 peak hour trips. Specific Project Requirements have been developed for this Project limiting peak hour truck trips and providing guidance as to when a TIS would be prepared.

For purposes of this Draft PEIR, it was assumed that carbon monoxide concentrations at locations impacted by any increases in off-site traffic would be less than significant at levels below 50 peak-hour trips (i.e. a TIS not required). If it was identified through Project Requirements that a TIS is required, a demonstration of insignificant impact (i.e. peak concentrations less than the applicable CO ambient air quality standards) would be completed. For comparison, the Bay Area AQMD considers most increases in traffic less than 100 peak hour trips to be less than significant under CEQA.

Based on implementation of the Specific Project Requirements for traffic, the impacts from localized CO emissions associated with Project Actions at intersections and roadways are less than significant.

Level of Significance Before Mitigation: Less than Significant

Mitigation Measures: None Required

Impact 4.2-4: Program Actions Could Lead to Increases in Odor Emissions

The proposed work would not result in the long-term generation of odors; however, Program Actions-related emissions could result in a short-term generation of odors, including diesel exhaust and fuel or solvent vapors. Some receptors could consider these odors objectionable. However, Program Actions would be short-term and odor emissions would be limited and dissipate rapidly in the air with increased distance from the source.

Level of Significance Before Mitigation: Less than Significant

Mitigation Measures: None Required

Impact 4.2-5: Program Actions Could Conflict with Implementation of State Goals for Reducing Greenhouse Gas (GHG) Emissions and thereby have an Adverse Effect on Global Climate Change

The geographic scope of potential cumulative greenhouse gas impacts encompasses the NSAQMD jurisdiction, statewide considerations, and contribution to attainment of State global climate change policies. ARB is required under AB 32 to develop methods to estimate and report emissions of GHG from facilities that emit GHG. This reporting will help establish a baseline from which to measure progress toward the emission reduction goals of AB 32. ARB has also been directed to develop lists of potential early actions to reduce GHG emissions statewide. In addition, SB 97 directed OPR to establish draft CEQA guidelines for the mitigation of GHG in CEQA documents by July 1, 2009, and adopt final guidelines by the beginning of 2010.

As with other individual projects (even major projects that emit more than 25,000 metric tons/year CO_2e), the project specific emissions from this Project would not individually be likely to have an impact on global climate change, but it could conflict with the State goals for reducing greenhouse gas emissions (AEP 2007) and therefore could constitute a cumulatively but minimal contribution to global climate change.

Several types of analyses are used to determine whether a project could be in conflict with the State goals for reducing greenhouse gas emissions. The analyses are reviews of:

1. The potential conflicts with the ARB 44 early action strategies;
2. The relative size of the project in comparison to the estimated greenhouse reduction goal of 174 million metric tons/year of CO_2e emissions by 2020 and in comparison to the size of major facilities that are required to report greenhouse gas emissions (25,000 metric tons/year of CO_2e);

3. The basic energy efficiency parameters of a project to determine whether its design is inherently energy efficient; and
4. Project GHG Emissions < 7,000 $MTCO_2eq/yr$.

The Project does not pose any apparent conflict with the most recent list of the ARB early action strategies (see Table 4.2-3). In addition, the Project is predicted to generate approximately 5.52 metric tons of CO_2 per day and an estimated yearly amount of 690 metric tons of CO_2 which is considerably less than the interim threshold of 7,000 metric tons of CO_2 per year as established by ARB.

Level of Significance Before Mitigation: Less than Significant

Mitigation Measures: None Required

4.2.5 EFFECTS CONSIDERED NO IMPACT OR LESS THAN SIGNIFICANT WITHOUT PROJECT REQUIREMENTS

No impacts have been identified as having no impact or having a less than significant impacts without incorporation of Project Requirements. All air quality CEQA thresholds are addressed in Impacts 4.2-1 through 4.2-4, above.

4.2.6 FINDINGS

The proposed remedial options are projected to result in less than significant air quality impacts for all Remediation Areas assuming the Project Proponents adhere to analytical assumptions (including MDS), incorporate all applicable Standard and Specific Project Requirements, and implement mitigation measures 4.2-1(a) and 4.2-1(b), as applicable.