3.2 Air Quality

3.2.1 Introduction

This section describes existing air quality conditions and maximum anticipated air quality impacts from the Proposed Action and alternatives. The section is based on the air quality analysis presented in the *Air Quality Study for Proposed South Quarry Project in Lucerne Valley, California* (Yorke Engineering 2016; Appendix B-1), *MCC South Quarry Alternative Emission Calculations for Alternatives with Haul Trucks from Offsite Sources* (Yorke Engineering 2018; Appendix B-2), and *Mitsubishi Cement Corporation South Quarry Health Risk Assessment Narrative for Potential Offsite Limestone Quarries* (Yorke Engineering 2019; Appendix B-3). These studies were prepared in accordance with the methodologies provided by the Mojave Desert Air Quality Management District (MDAQMD) in its *CEQA and Federal Conformity Guidelines Handbook.*

3.2.2 Applicable Laws, Regulations, and Standards

3.2.3 Federal

Federal air quality policies are regulated through the Clean Air Act, which established nationwide air quality standards. The National Ambient Air Quality Standards (NAAQS) indicate the maximum allowable atmospheric concentrations for the seven criteria pollutants: carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), O_3, PM_{10}, fine particulate matter less than or equal to 2.5 microns in diameter ($PM_{2.5}$), and lead. Section 176(c) of the Clean Air Act (CAA), as articulated in the U.S. Environmental Protection Agency (USEPA) General Conformity Rule, states that a federal agency cannot issue a permit for or support an activity unless the agency determines that it will conform to the most recent USEPA-approved State Implementation Plan (SIP). This means that projects using federal funds or requiring federal approval must not (1) cause or contribute to any new violation of a NAAQS, (2) increase the frequency or severity of any existing violation, or (3) delay the timely attainment of any standard, interim emission reduction, or other milestone.

Class I areas are designated in 40 CFR Part 81, and are defined as areas of special national or regional value from a natural, scenic, recreational, or historic perspective. Mandatory federal Class I areas include the following areas in existence on August 7, 1977:

- International parks;
- National wilderness areas that exceed 5,000 acres in size;
- National memorial parks that exceed 5,000 acres in size; and
- National parks that exceed 6,000 acres in size.

The federal land manager responsible for the Class I area has authority under the Clean Air Act to require impact analyses if a project is thought to affect the air quality related values in a Class I area.

Many federal air quality regulations typically analyzed for development projects are not applicable to the MCC South Quarry Project because they regulate stationary sources of air emissions. There are no new or modified stationary sources proposed with this Project. See the Air Quality Study for a detailed discussion of these regulations (Yorke Engineering 2016).

3.2.3.1 State

California Air Resources Board (CARB) has oversight over air quality in the State of California. CARB has established California Ambient Air Quality Standards (CAAQS) for all of the federal criteria pollutants that are typically more stringent than the NAAQS. Additionally, CAAQS include four additional pollutants: sulfates, hydrogen sulfide, vinyl chloride, and visibility reducing particulates. Regulation of individual stationary sources has been delegated to local air pollution control agencies. CARB is responsible for developing programs designed to reduce emissions from non-stationary sources, including motor vehicles and off-road equipment.

The Air Quality Study identified the following applicable state regulations:

- California Health and Safety Code Section 41700 – prohibits discharge of quantities of air contaminants that cause injury, detriment, nuisance, or annoyance.
- California Health and Safety Code Section 41701 – prohibits the discharge of air contaminants (other than uncombined water vapor) by any source for a period of more than an aggregate of three minutes in any one hour if darker in shade than 40 percent opacity.
- California Code of Regulations, Title 13, Section 2449-2449.3 – regulates particulate matter and criteria pollutant emissions from in-use, off-road diesel-fueled vehicles greater than 25 horsepower.
- Assembly Bill 32, California Health & Safety Code, Division 25.5, Section 38500 – Greenhouse gas emissions reporting and reduction requirements. Compliance with AB 32 is discussed in Section 3.6.

3.2.3.2 Local

The Project is located in the jurisdiction of the MDAQMD. The Project is subject to specific MDAQMD prohibitory regulations listed below.

- Rule 401 – Visible Emissions. This rule is stricter than California Health and Safety Code Section 41701. Rule 401 limits the opacity of exhaust into the atmosphere darker than 20% opacity to no more than an aggregate of three minutes in any one hour.
- Rule 402 – Nuisance. This rule implements the nuisance requirements of California Health and Safety Code Section 41700. Rule 402 prohibits the discharge of air contaminants that cause injury, detriment, nuisance, or annoyance to any considerable number of people or damage to any business or property.
- Rule 403 – Fugitive Dust. Rule 403 prohibits the emissions of fugitive dust from any transport, handling, construction, or storage activity that remains visible beyond the property line of the emission source.
- Rule 403.2 – Fugitive Dust Control, Mojave Desert Planning Area. Rule 403.2 includes dust control requirements for watering of unpaved roads, minimizing trackout onto unpaved surfaces, stabilizing graded surfaces, conveyor and transfer point dust controls, and other similar dust controls for projects in the Mojave Desert Planning Area.

- Rule 431 – Sulfur Content of Fuels. Rule 431 places limits on the sulfur content of diesel and other liquid fuels to control the formation of sulfur oxides and particulates during combustion.

The MDAQMD adopted significance thresholds for criteria pollutants and toxic air contaminants in 2009. These include significant emissions thresholds, project health risk significance thresholds, and other significance thresholds. The County of San Bernardino has not adopted its own CEQA thresholds for air quality impacts.

3.2.4 Affected Environment

3.2.4.1 Climate/Meteorology

The Project area is located within the Mojave Desert Air Basin (MDAB), at a maximum elevation of approximately 6,675 feet above mean sea level (msl). The MDAB is characterized by an array of mountain ranges intermixed with long broad valleys which often contain dry lake beds. The Sierra Nevada are to the north and the San Bernardino Mountains border the Mojave Desert to the southwest. Additional mountains separate the MDAB from the coastal region of southern California and the central California regions.

During the summer, a large subtropical high pressure system off the coast of California limits cloud formation and encourages sunny conditions in the Mojave Desert. The presence of a thermal low pressure region above the Mojave Desert promotes atmospheric transport from the Los Angeles Basin. During the winter months, the Pacific high pressure area weakens, producing 20 to 30 frontal systems in the region. Some of these frontal systems are strong enough to produce rainfall. Occasionally during the late summer, moist high pressure systems from the west collide with the rising heated air from the desert producing short and intense thunderstorms that have the potential to produce high winds and flash flooding. The Project area climate is typical of high desert semi-arid regions with hot, dry summers and cool winters with limited precipitation. During the fall and winter months, dry Santa Ana winds come from the northeast causing severe temperature fluctuations.

A wind rose is shown in Figure 3.2-1, which uses 2010 through 2014 wind data from a station located at the Barstow-Daggett Airport near Daggett, California, about 25 miles north of the Project area. The Daggett station lies in an east-west orientated valley with similar topography and weather conditions to the Project location, thus wind characteristics in Daggett are expected to be similar. From the wind rose, prevailing winds are consistently out of the west with an average wind speed of about 5 meters per second (m/s).

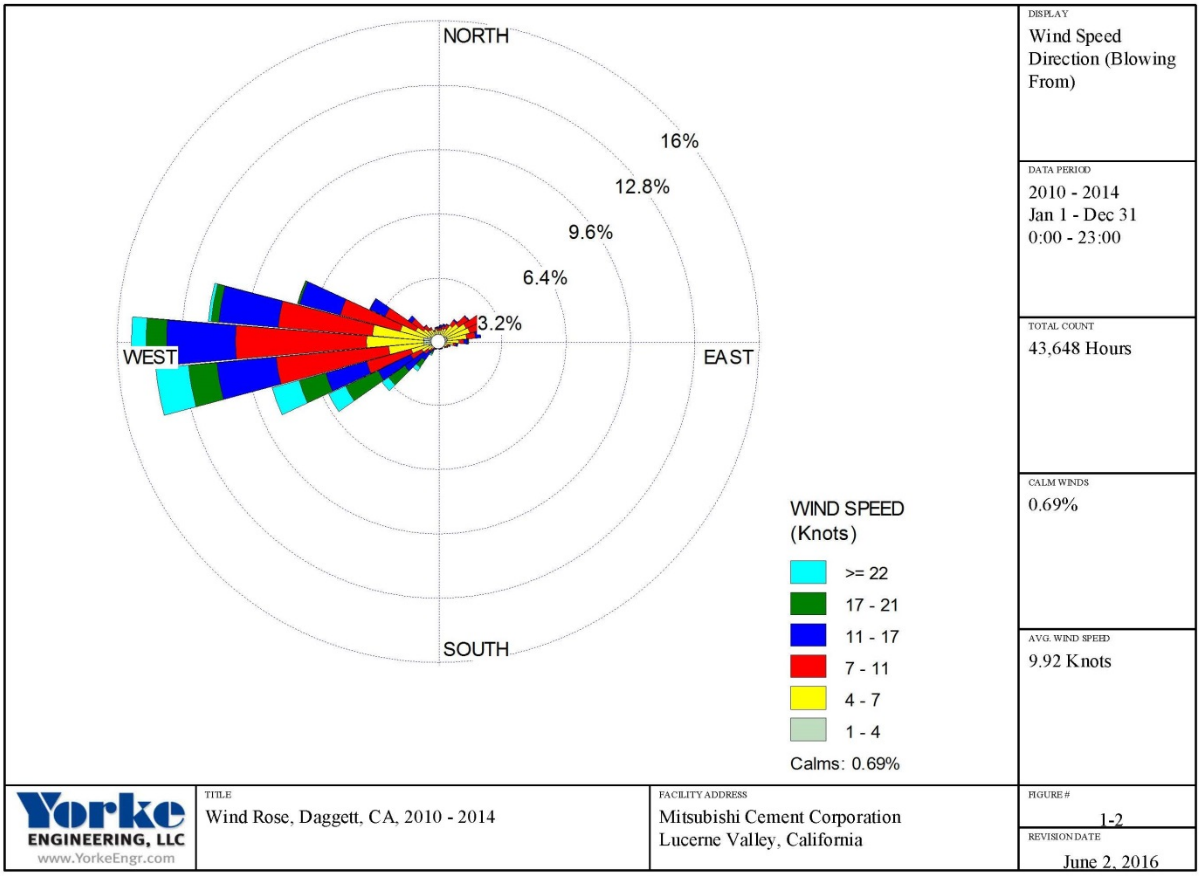

Figure 3.2-1 Wind Rose, Daggett, CA

3.2.4.2 Criteria Pollutants

Air quality is defined by ambient air concentrations of specific pollutants determined by the USEPA to be of concern with respect to the health and welfare of the general public. Seven major pollutants of concern, called criteria pollutants, are CO, SO_2, NO_2, O_3, PM_{10}, $PM_{2.5}$, and lead. The USEPA has established NAAQS for these pollutants. Areas that violate a federal air quality standard are designated as non-attainment areas.

Ambient air quality refers to the atmospheric concentration of a specific compound (amount of pollutants in a specified volume of air) that occurs at a particular geographic location. The ambient air quality levels measured at a particular location are determined by the interactions of emissions, meteorology, and chemistry. Emission considerations include the types, amounts, and locations of pollutants emitted into the atmosphere. Meteorological considerations include wind and precipitation patterns affecting the distribution, dilution, and removal of pollutant emissions. Chemical reactions can transform pollutant emissions into other chemical substances. Ambient air quality data are generally reported as a mass per unit volume (e.g., micrograms per cubic meter [$\mu g/m^3$] of air) or as a volume fraction (e.g., parts per million [ppm] by volume).

Pollutant emissions typically refer to the amount of pollutants or pollutant precursors introduced into the atmosphere by a source or group of sources. Pollutant emissions contribute to the ambient air concentrations of criteria pollutants, either by directly affecting the pollutant concentrations measured in the ambient air or by interacting in the atmosphere to form criteria pollutants. Primary pollutants, such as CO, SO_2, lead, and some particulates, are emitted directly into the atmosphere from emission sources.

Secondary pollutants, such as O_3, NO_2, and some particulates, are formed through atmospheric chemical reactions that are influenced by meteorology, ultraviolet light, and other atmospheric processes. PM_{10} and $PM_{2.5}$ are generated as primary pollutants by various mechanical processes (for example, abrasion, erosion, mixing, or atomization) or combustion processes. However, PM_{10} and $PM_{2.5}$ can also be formed as secondary pollutants through chemical reactions or by gaseous pollutants condensing into fine aerosols. In general, emissions that are considered precursors to secondary pollutants in the atmosphere (such as reactive organic gases [ROG] and oxides of nitrogen [NOx], which are considered precursors for O_3), are the pollutants for which emissions are evaluated to control the level of O_3 in the ambient air.

Both the State of California and the Federal government have established health-based ambient air quality standards for several air pollutants. These pollutants include O_3, CO, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and lead. The State has also set standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. The standards are designed to protect the health and welfare of the population with a reasonable margin of safety.

3.2.4.3 Toxic Air Contaminants

Toxic air contaminants (TACs) are substances that have the potential to be emitted into the ambient air that have been determined to present some level of acute or chronic health risk (cancer or non-cancer) to the general public. These pollutants may be emitted in trace amounts from various types of sources, including combustion sources.

3.2.4.4 Greenhouse Gas Emissions

Greenhouse gases (GHGs) are gases that trap heat in the atmosphere. These emissions occur from natural processes as well as human activities. The accumulation of GHGs in the atmosphere regulates the earth's temperature. Scientific evidence indicates a trend of increasing global temperature over the past century, which a number of scientists attribute to an increase in GHG emissions from human activities. The climate change associated with this global warming is predicted to produce negative economic and social consequences across the globe. Impacts from GHG emissions are discussed in Section 3.6 of this document.

3.2.4.5 Existing Ambient Air Quality

A geographic area that does not meet the NAAQS or the California Ambient Air Quality Standards (CAAQS) for a particular criteria pollutant is classified as a non-attainment area for that pollutant. The NAAQS and CAAQS are shown in Table 3.2-1.

Table 3.2-1
Ambient Air Quality Standards

Pollutant	Average Time	California Standards		National Standards		
		Concentration	Measurement Method	Primary	Secondary	Measurement Method
Ozone (O_3)	1 hour	0.09 ppm (180 µg/m^3)	Ultraviolet Photometry	--	--	Ethylene Chemiluminescence
	8 hour	0.070 ppm (137 µg/m^3)		0.070 ppm (137 µg/m^3)	0.070 ppm (137 µg/m^3)	
Carbon Monoxide (CO)	8 hours	9.0 ppm (10 mg/m^3)	Non-Dispersive Infrared Spectroscopy (NDIR)	9 ppm (10 mg/m^3)	None	Non-Dispersive Infrared Spectroscopy (NDIR)
	1 hour	20 ppm (23 mg/m^3)		35 ppm (40 mg/m^3)		
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	0.030 ppm (57 µg/m^3)	Gas Phase Chemi-luminescence	0.053 ppm (100 µg/m^3)	0.053 ppm (100 µg/m^3)	Gas Phase Chemiluminescence
	1 hour	0.18 ppm (339 µg/m^3)		100 ppb (188 µg/m^3)	--	
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	--	Ultraviolet Fluorescence	0.300ppm (for certain areas)	--	Ultraviolet Fluorescence; Spectrophotometry (Pararosaniline Method)
	24 hours	0.04 ppm (105 µg/m^3)		0.14 ppm (for certain areas)	--	
	3 hours	--		--	0.5 ppm (1300 µg/m^3)	
	1 hour	0.25 ppm (655 µg/m^3)		0.075 ppm (196 µg/m^3)	--	
Respirable Particulate Matter (PM_{10})	24 hours	50 µg/m^3	Gravimetric or Beta Attenuation	150 µg/m^3	150 µg/m^3	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m^3		--	--	
Fine Particulate Matter ($PM_{2.5}$)	Annual Arithmetic Mean	12 µg/m^3	Gravimetric or Beta Attenuation	12 µg/m^3	15 µg/m^3	Inertial Separation and Gravimetric Analysis
	24 hours	--		35 µg/m^3	35 µg/m^3	
Sulfates	24 hours	25 µg/m^3	Ion Chromatography	--	--	--
Lead (Pb)	30-day Average	1.5 µg/m^3	Atomic Absorption	--	--	Atomic Absorption
	Calendar Quarter	--		1.5 µg/m^3	1.5 µg/m^3	
	3-month Rolling Average	--		0.15 µg/m^3	0.15 µg/m^3	

Pollutant	Average Time	California Standards		National Standards		
		Concentration	Measurement Method	Primary	Secondary	Measurement Method
Visibility Reducing Particles	8 hour	See footnote	Beta Attenuation and Transmittance through Filter Tape	--	--	--
Hydrogen Sulfide (H_2S)	1 hour	0.03 ppm (42 μg/m^3)	Ultraviolet Fluorescence	--	--	--
Vinyl Chloride	24 hours	0.010 ppm (26 μg/m^3)	Gas Chromatography	--	--	--

Notes: ppm= parts per million
ppb = parts per billion
μg/m^3 = micrograms per cubic meter
mg/m^3 = milligrams per cubic meter
-- = no standard
In 1989, the California Air Resources Board converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.
Source: Yorke Engineering 2016

Table 3.2-2 summarizes the attainment status of the Mojave Desert Air Basin for the NAAQS and CAAQS.

Table 3.2-2
Ambient Status – Mojave Desert Air Basin

Pollutant	Attainment Status	
	NAAQS	CAAQS
O_3	Non-attainment (severe)	Non-attainment
CO	Unclassifiable/Attainment	Attainment
NO_2	Unclassifiable/Attainment	Attainment
SO_2	Unclassifiable/Attainment	Attainment
PM_{10}	Non-attainment (moderate)	Non-attainment
$PM_{2.5}$	Unclassifiable/Attainment	Non-attainment
Lead	Unclassifiable/Attainment	Attainment
Visibility Reducing Particles	No Standard	Unclassified
Sulfates	No Standard	Attainment
Hydrogen Sulfide	No Standard	Unclassified
Vinyl Chloride	No Standard	Not Available*

Notes: *Attainment status is not provided by the ARB.

Source: Yorke Engineering 2016

Several ambient air quality monitoring stations within San Bernardino County and surrounding counties measure criteria pollutants. The Big Bear City monitoring station is the closest to the Project site, approximately six miles away, but only provides $PM_{2.5}$ data. The closest monitoring station to the Project site providing data for all pollutants is the Victorville monitoring station, located approximately 30 miles northwest of the Project site. Table 3.2-3 summarizes the monitoring data from the Victorville and Big Bear City monitoring stations for the years 2012 through 2014. Please note that data for CO and SO_2 is only available for 2010 through 2012 and 2011through 2013, respectively.

Table 3.2-3
Ambient Background Concentration

Ozone				
Averaging Time	**2012**	**2013**	**2014**	**Monitoring Station**
8 hour[1]	95	97	97	Victorville
No. of Exceedance Days – NAAQS	28	31	18	
No. of Exceedance Days - CAAQS	58	60	40	
1 hour[1]	111	120	122	
No. of Exceedance Days - CAAQS	6	9	3	
PM_{10}				
Averaging Time	**2012**	**2013**	**2014**	**Monitoring Station**
Annual[2]	n/a	n/a	n/a	Victorville
High 24 hour average National[2]	45.0	77.9	246.2	
High 24 hour average State[2]	40.0	70.6	n/a	
No. of Exceedance Days – NAAQS	0	n/a	1	
No. of Exceedance Days - CAAQS	n/a	n/a	n/a	
$PM_{2.5}$				
Averaging Time	**2012**	**2013**	**2014**	**Monitoring Station**
Annual Average - National[2]	n/a	9.6	n/a	Big Bear
Annual Average – State[2]	n/a	6.9	n/a	
24 hour[2]	36.4	35.5	24.2	
No. of Exceedance Days – NAAQS	n/a	5.8	n/a	
NO_2				
Averaging Time	**2012**	**2013**	**2014**	**Monitoring Station**
1 hour[1]	0.07	0.06	0.06	Victorville
No. of Exceedance Days – CAAQS	0	0	0	
CO				
Averaging Time	**2010**	**2011**	**2012**	**Monitoring Station**
1 hour[3]	15.9	1.9	1.9	Victorville
8 hour[3]	5.17	1.51	1.83	
No. of Exceedance Days - NAAQS	0	0	0	
No. of Exceedance Days – CAAQS	0	0	0	
SO_2				
Averaging Time	**2011**	**2012**	**2013**	**Monitoring Station**
Maximum 1 hour[3]	0.007	0.003	0.002	Victorville
No. of Exceedance Days - CAAQS	0	0	0	

Source: Yorke Engineering 2016
Notes:

n/a = data not available or were insufficient to determine the value
[1] units are ppb
[2] units are µg/m3
[3]units are ppm

3.2.4.6 Class I Areas

The nearest Class I area to the Project area is the San Gorgonio Wilderness, located approximately 21 kilometers (13 miles) south of the Project area in the SBNF (Figure 3.2-2).

Joshua Tree National Park is located approximately 48 kilometers (30 miles) southeast of the Project area. Other Class I areas within 100 kilometers of the Project area include the San Gabriel Wilderness, Cucamonga Wilderness, San Jacinto Wilderness, and Agua Tibia Wilderness. All of these Class I areas are under Forest Service management except for Joshua Tree National Park, which is under the management of the National Parks Service.

3.2.4.7 Sensitive Receptors

The MDAQMD defines residences, schools, daycare centers, playgrounds and medical facilities as sensitive receptor land uses. The nearest residences and businesses to the South Quarry are located approximately one-half mile from the property boundary. The nearest receptors of the other sensitive categories are located over are over three miles from the South Quarry property boundary (Figure 3.2-3). Figure 3.2-3 identifies the locations of the Maximum Exposed Individual Worker (MEIW) and the as Maximum Exposed Individual Residence (MEIR).

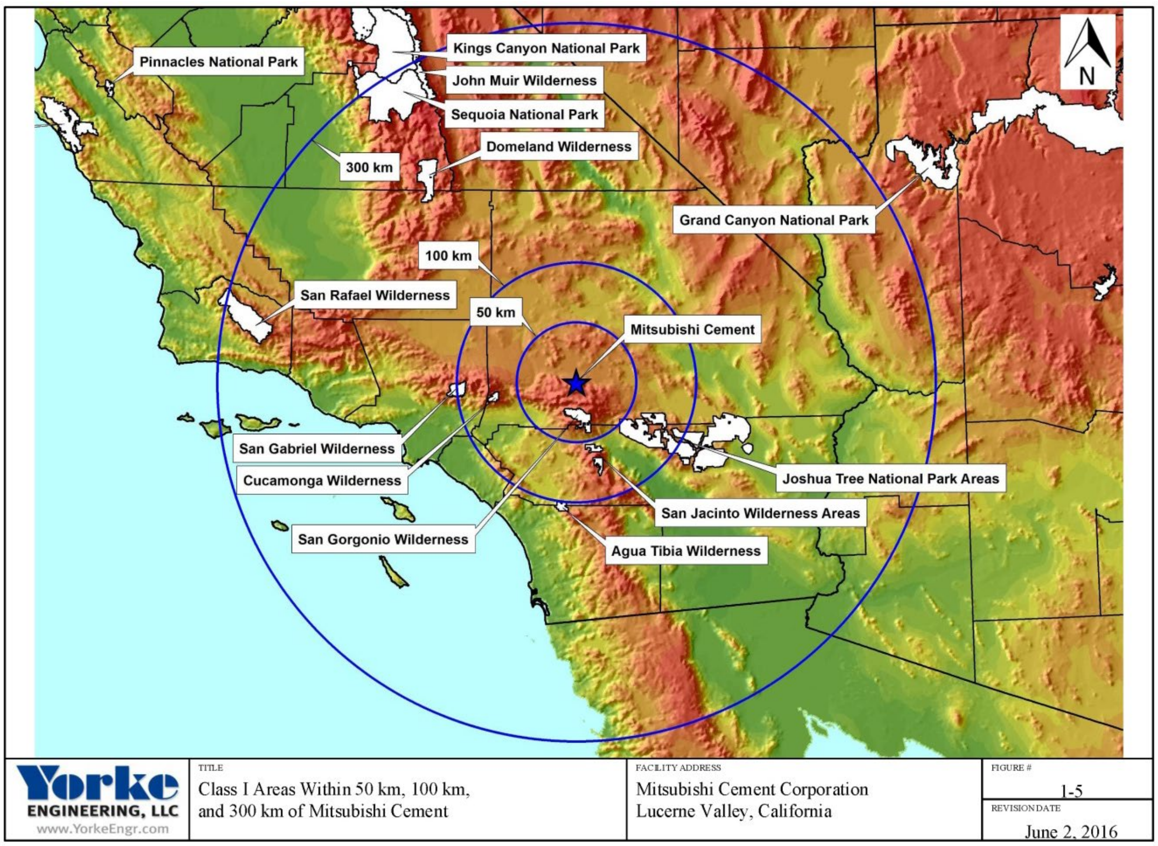

Figure 3.2-2. Class I Areas

3.2.5 Environmental Consequences

Emissions associated with the operation of the Proposed Action and alternatives are associated with (1) excavation of overburden and limestone rock; (2) hauling of excavation material; (3) wind erosion from disturbed roads or excavation areas; and (4) employee traffic and deliveries. For each of the construction and operational phases, the emissions consist of the difference between the baseline and with-Project emissions.

For the construction phase, the baseline consists of operation in the East and West pits, and the with-Project condition consists of the ongoing operation in the East and West pits, which are unchanged, plus the construction associated with the South Quarry. The construction phase emissions for the South Quarry are the calculated difference between baseline and with-Project conditions.

For the operational phase, the baseline consists of operation in the East and West pits, and the with-Project condition consists of the ongoing, reduced operation in the East and West pits, plus the operation associated with the South Quarry. The Project emissions for the operational phase consist of the difference between the emissions in the baseline and with-Project operational scenarios. For both the construction and operational phases, the worst-case year was chosen for the Project emissions (year with largest difference between baseline and with-Project conditions).

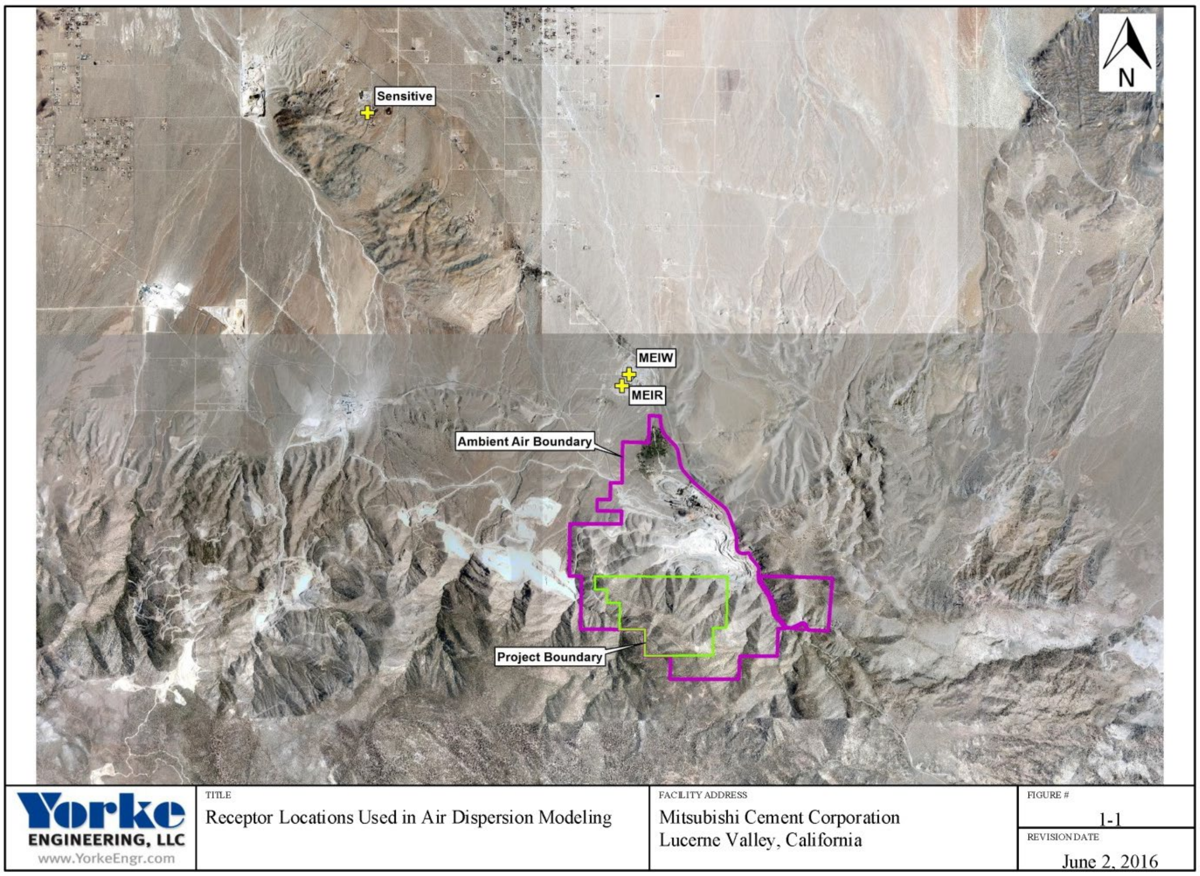

Figure 3.2-3. Location of Sensitive Receptors

3.2.5.1 Impact Analysis Approach

For purposes of both the CEQA and NEPA evaluation of air quality impacts, both action alternatives are defined as the shifting of a portion of the production from the West Pit to the South Quarry. As described in Section 2.3.2.2, the Project does not involve an increase in overall mine throughput (sum of throughputs from the West Pit and South Quarry). Because the air emissions impacts of construction and operation of the West Pit were fully analyzed in the EIR certified in 2004, the air quality analysis (Yorke Engineering 2016) compares the impacts of the Project to the impacts previously evaluated for the West Pit in the 2004 EIR.

CEQA Significance Criteria

Appendix G of the State CEQA Guidelines suggest that lead agencies evaluate the potential significance of air quality impacts of a project by considering whether the project would:

- Conflict with or obstruct the implementation of the applicable air quality plan;
- Cause a violation of 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 non-attainment under an applicable federal or state ambient air quality standard (including release emissions which exceed quantitative thresholds for ozone precursors).
- Expose sensitive receptors to substantial pollutant concentrations; or
- Create objectionable odors affecting a substantial number of people.

The Air Quality Study (Yorke Engineering 2016) provided an evaluation of the potential of the Project to create objectionable odors affecting a substantial number of people. The study concluded that neither action alternative would affect a substantial number of people under this threshold; therefore, no further analysis was necessary.

The Air Quality Study used the MDAQMD's thresholds of significance to evaluate air quality impacts associated with the Project because San Bernardino County has not developed County thresholds for criterial pollutants (greenhouse gases are discussed separately in Section 3.6). The MDAQMD's thresholds are described below and in Table 3.2-4.

Any project is significant if it:

1. Generates total emissions (direct and indirect) in excess of the thresholds given in the table below and/or,
2. Generates a violation of any ambient air quality standards when added to the local background; and/or
3. Does not conform with the applicable attainment or maintenance plan(s); and/or
4. Exposes sensitive receptors to substantial pollutant concentrations, including those resulting in a cancer risk greater than or equal to 10 in a million and/or a Hazard Index (HI) (non-cancerous) greater than or equal to 1.

The MDAQMD defines residences, schools, daycare centers, playgrounds and medical facilities as sensitive receptor land uses for the purposes of threshold criteria number 4, above. The following project types proposed for sites within the specified distance to an existing or planned (zoned) sensitive receptor land use must be evaluated using significance threshold criterion number 4 (refer to the significance threshold discussion):

- Any industrial project within 1,000 feet;
- A distribution center (40 or more trucks per day) within 1,000 feet;
- A major transportation project (50,000 or more vehicles per day) within 1,000 feet;
- A dry cleaner using perchloroethylene within 500 feet; and/or
- A gasoline dispensing facility within 300 feet.

The South Quarry Project does not fall into the categories or specified distances to sensitive receptors described above; therefore, MDAQMD significance criterion number 4 is not discussed further in this analysis.

A significant project, as defined by the MDAQMD, must incorporate mitigation sufficient to reduce its impact to a level that is less than significant, where feasible. A project that cannot be mitigated to a level that is less than significant must incorporate all feasible mitigation. Note that the emission thresholds are given as a daily value and an annual value, so that a multi-phased project (such as a project with a construction phase and a separate operational phase) with phases shorter than one year can be compared to the daily value.

Table 3.2-4
MDAQMD Significance Thresholds

Criteria Pollutant	Annual Threshold (tons)	Daily Threshold (pounds)
Carbon Monoxide (CO)	100	548
Oxides of Nitrogen (NOx)	25	137
Volatile Organic Compounds (VOC)	25	137
Oxides of Sulfur (SOx)	25	137
Particulate Matter (PM_{10})	15	82
Particulate Matter ($PM_{2.5}$)	10	54
Hydrogen Sulfide (H_2S)	10	54
Lead	0.6	3

Source: Yorke Engineering 2016

NEPA Analysis Approach

A Conformity Applicability Analysis to assess whether project emissions would exceed the *de minimis* thresholds for federal non-attainment pollutants must be completed. The *de minimis* threshold for ozone precursors NO_x and VOCs is 25 tons per year, and the *de minimis* threshold for PM_{10} is 100 tons per year.

Potential effects to Class I areas were evaluated using the Federal Land Manager Air Quality Related Values Workgroup (FLAG) guidance (Yorke Engineering 2016). For Class I areas located 50 kilometers or more from the site, a screening analysis is used that states that, if the total emissions of certain pollutants divided by the distance to the Class I area in kilometers is less than 10, no further analysis is necessary. For Class I areas located within 50 km of the site, the screening method does not apply. Potential Project effects on visibility, O_3 impacts, and acid deposition were evaluated using methods in the FLAG guidance.

3.2.5.2 Alternative 1 – Proposed Action

Direct and Indirect Impacts

Alternative 1 – Proposed Action is defined as the shifting of a portion of the production from the West Pit to the South Quarry. No increase in overall mine throughput (sum of throughputs from the West Pit and South Quarry) is proposed. Because the impacts of construction and operation of the West Pit were fully analyzed in the EIR certified in 2004 (County of San Bernardino 2004), the Air Quality Study (Yorke Engineering 2016) compares the impacts of Alternative 1 –

Proposed Action to the impacts previously evaluated for the West Pit in the 2004 EIR, except as otherwise indicated, and as summarized below.

Alternative 1 – Proposed Action would consist of a construction phase (2017 and 2018), followed by an operational phase (2019 and beyond). For each of the construction and operational phases, the emissions from Alternative 1 – Proposed Action would consist of the difference between the baseline and with-Project emissions. Construction phase emissions would be the difference between baseline and with-Project condition, which would include the construction emissions associated with the South Quarry. For the operational phase, the baseline consists of operation in the East and West pits, and the with-Project condition including the ongoing, reduced operation in the East and West pits, plus the operation associated with the South Quarry. For both the construction and operational phases, the worst-case year was chosen for the Project emissions (year with largest difference between baseline and the with-Project condition) to evaluate the significance of impacts.

The following analysis is based on the MDAQMD CEQA thresholds and the federal General Conformity *de minimis* thresholds.

Alternative 1 – Proposed Action includes both construction activities and operational activities. Emissions associated with construction activities were evaluated using the CalEEMOD model (Yorke Engineering 2016).

Construction

Construction activities include the following:

- Mass site grading to create a uniform haul road surface (option identified in CalEEMod);
- Moving of rock from the cut sections to fill sections (included in mass site grading operation identified in CalEEMod);
- Hauling of cut rock that cannot be used in fill activities to limestone crushers or waste piles. However, because the total mined quantity would remain the same, and because this average haul distance is less than the maximum permitted haul distance for the West Pit, there is no emission increase associated with this activity.

Based on the above description of construction activities, the following emissions were included in the construction emission calculations:

- Fugitive PM_{10} and $PM_{2.5}$ emissions from solid material handling; and
- Diesel PM_{10} and $PM_{2.5}$, NO_x, VOC, CO, SO_x, and CO_2 emissions from mobile sources used in mass site grading, as described in CalEEMod.

For the construction phase, the baseline consists of operation in the East and West pits, and the with-Project condition consists of the ongoing operation in the East and West pits, which would be unchanged, plus the construction associated with the South Quarry. The Alternative 1 – Proposed Action emissions (difference between baseline and with-Project condition) for the construction phase consist of the construction emissions associated with the South Quarry. The analysis assumed the construction phase would occur over a two-year period. Details of the assumptions for the construction phase are provided in the Air Quality Study (Yorke Engineering 2016).

Tables 3.2-5 and 3.2-6 present Alternative 1 – Proposed Action's construction emissions summary for fugitive PM_{10} and $PM_{2.5}$ and truck exhaust with a comparison to the MDAQMD

CEQA emissions significance thresholds. As shown in Tables 3.2-5 and 3.2-6, construction emissions increases for fugitive PM_{10} and $PM_{2.5}$ and off-road vehicle exhaust (trucks and mobile equipment) are estimated to be below the MDAQMD CEQA emissions significance thresholds; therefore, Alternative 1 – Proposed Action's air quality impact for the construction phase would be less than significant.

Table 3.2-5
Construction Emissions Summary for PM_{10} and $PM_{2.5}$ for 2017, Worst Case Year

Activity/Source	Uncontrolled PM_{10} Emissions, tons/year	PM_{10} Control Efficiency	Controlled PM_{10} Emissions, tons/year	Controlled $PM_{2.5}$ Emissions, tons/year
Fugitive Emissions (active disturbed area and material handling	29.93	61%	11.75	5.11
Off-road vehicle exhaust	0.41	N/A	0.41	0.38
Total	**30.3426**	**-**	**12.16**	**5.49**
		Significance Threshold:	**15**	**10**
		Above Significance Threshold	**No**	**No**

Source: Yorke Engineering 2016

Table 3.2-6
Construction Emissions Summary for Off-Road Vehicle Exhaust for 2017, Worst Case Year

Pollutant	Project Emissions (tons/year)	Significance Threshold (tons/year)	Above Significance Threshold (Yes/No)
Nitrous Oxide (NO_x)	8.70	25	No
Volatile Organic Compounds (VOCs)	0.76	25	No
Carbon Monoxide (CO)	5.85	100	No
Particulate Matter (PM_{10})[1]	0.41	15[1]	No
Particulate Matter ($PM_{2.5}$)[1, 2]	0.38	12[1]	No
Oxides of Sulfur (SOx)	0.01	25	No

Notes: [1] There is no significance threshold specific to diesel PM. Diesel PM is included in the overall Project PM_{10} to determine if PM_{10} exceeds the threshold levels.

[2] Per CalEEMod, the $PM_{2.5}/PM_{10}$ ratio used for fugitive dust and diesel exhaust is 0.44 and 0.92, respectively.

Source: Yorke Engineering 2016

Operations

Emissions. The operational phase would begin when the South Quarry is accessed for the production of limestone. The baseline mining activities were defined based on the 2004 Environmental Impact Report, and the analysis of operational impacts is based on the operational change due to the proposed South Quarry.

Emission calculations have been prepared for the period 2019 through 2022. The analysis included a transition period from 2019 to 2021, because the haul truck fleet would be transitioning from its current composition to its final composition. In the years 2022 and beyond, eight of the nine haul trucks would meet Tier 4 standards (777G) and one of the haul trucks would meet Tier 2 standards (777D). As additional trucks are added, they would meet Tier 4 standards. Therefore, the worst case scenario for the years 2022 and beyond is the case where there are eight of nine trucks that meet Tier 4.

During the period 2019 through 2021 (transition period), the haul distance would be 2.5 miles (2019), 2.7 miles (2020), and 2.9 miles (2021). The haul distance during the transition period is shorter than the worst-case distance for later years (4.0 miles).

During the transitional years (2019-2021), 33 percent of the total throughput would come from the South Quarry. In 2022, this percentage would increase to 50 percent. For the year 2022 (which is post-transition), the air quality study performed the emission calculations assuming the worst-case haul distance for any year 2022 or later (4.0 miles, which is the longest haul distance for the South Quarry). Therefore, the 2022 calculations are intended to represent worst-case conditions in any year 2022 or later.

The operational changes due to the mine expansion are summarized in Table 3.2-7. In evaluating changes to haul truck and water truck emissions, the air quality study considered the effects of the CARB off-road diesel regulation that requires various fleet changes over a 15-year period. The baseline emissions were based on an approximate off-road diesel rule compliance plan and a preliminary review of the existing fleet (the actual fleet changes planned for off-road diesel rule compliance in the baseline may be different from those shown in Table 3.2-7). The air quality study evaluated the impact of the CARB off-road diesel rule by calculating a baseline that includes the effect of the rule but not the effect of MCC's additional commitment to accelerated turnover of its fleet, and then compared the post-Project emissions to the baseline.

The analysis also assumed that Design Features AIR-1 and AIR-2 would be implemented. For the purposes of CEQA, these Design Features are also mitigation measures. For the purposes of NEPA, these Design Features are included in the required design features for the Project, listed in Section 2.3.2.14.

AIR-1: Within three years after the commencement of mining in the South Quarry, or whenever the total quarry haul truck operating horsepower-hours/year reach 6 million per year, whichever is later, the applicant shall:

(1) Add to its fleet no fewer than five quarry haul trucks meeting Tier 4 standards; and

(2) Retire all remaining Tier 0 quarry haul trucks.

"Tier 0" and "Tier 4" refer to those terms as defined by the CARB off-road diesel rule, CCR Title 13 Sections 2449-2449.3. For the purposes of this condition, "mining" shall not include the construction of the South Quarry Road.

AIR-2: Every day of active mining, the Project proponent shall apply water to unpaved roads and disturbed mine areas that are in active use on that day no less than once every 1.25 hours at a rate of no less than 0.11 gallons per square yard. Alternatively, the Project proponent shall apply chemical dust suppressants to unpaved road and disturbed mine areas in active use at a frequency and application rate in accordance with manufacturer specifications.

Table 3.2-7
Operational Changes due to Mine Expansion

Item	2004 Baseline	With-Project (Transition Period, 2019-2021)	With-Project (2022 and later)[1]	Comments
Annual mined quantity	2.9 million tons/year total (2.6 million tons/yr limestone ore 0.3 million tons/yr waste rock)	2.9 million tons/year total (2.6 million tons/yr limestone ore 0.3 million tons/yr waste rock) West Pit – 1,742,000 tons/yr limestone ore, 201,000 tons/yr waste rock South Quarry – 858,000 tons/yr limestone ore, 99,000 tons/yr waste rock	2.9 million tons/year total (2.6 million tons/yr limestone ore 0.3 million tons/yr waste rock) West Pit – 1,300,000 tons/yr limestone ore, 150,000 tons/yr waste rock South Quarry – 1,300,000 tons/yr limestone ore, 150,000 tons/yr waste rock	Proposed Project will not result in increase in quantity of rock mined at any time during the expansion. During the transition period 33% of the rock will be mined in the South Quarry. 50% will be mined in the South Quarry in 2022.
Active disturbed mine area[2]	6 acres	6 acres	6 acres	The mine expansion will not result in an increase in active disturbed mine area at any time.
Unpaved road length[3]	1.7 miles to West Pit	1.7 miles to West Pit. The South Quarry haul road will be 2.5 miles (2019), 2.7 miles (2020), and 2.9 miles (2021).	1.7 miles to West Pit with an additional 4.0 miles to the South Quarry.	Worst case scenario for PM_{10} will occur in 2022 when the maximum South Quarry haul road length will be 4.0 miles. During the transition period, the haul road length will increase gradually from 2019 to 2021. The West Pit haul road length will be unchanged.
Vehicle miles traveled – limestone ore (round trip)	3.4 miles from mine to crusher.	3.4 miles from West Pit to crusher. The South Quarry round trip haul road distance to the crusher will be 5.0 miles (2019), 5.4 miles (2020), and 5.8 miles (2021).	3.4 miles from West Pit to crusher. 8.0 miles from the South Quarry to the crusher.	Haul trucks will transport limestone ore from the West Pit and South Quarry to the same crusher.
Vehicle miles traveled – waste rock (round trip)	Not specified	3.4 miles for both the West Pit and South Quarry.	3.4 miles for both the West Pit and South Quarry.	The waste rock haul distance is the same for the transition period and for 2022 and later.

Item	2004 Baseline	With-Project (Transition Period, 2019-2021)	With-Project (2022 and later)[1]	Comments
Vehicle round trips per day – limestone ore (250 days/yr)	134 trips	126 trips for West Pit and South Quarry haul trucks carrying limestone ore.	117 trips for West Pit and South Quarry haul trucks carrying limestone ore.	Post-Project (2022 and later), the haul truck fleet will be a mix of 777B, 777D, and 777G haul trucks, which have a capacity of 77 to 105 tons/load. During the transition period, the truck capacity will vary according to the truck fleet.
Vehicle round trips per day – waste rock (250 days/yr)	Not specified	15 trips for West Pit and South Quarry haul trucks carrying waste rock.	13 trips for West Pit and South Quarry haul trucks carrying waste rock.	Post-Project (2022 and later), the haul truck fleet will be a mix of 777B, 777D, and 777G haul trucks, which have a capacity of 77 to 105 tons/load. During the transition period, the truck capacity will vary according to the truck fleet.
Haul truck operating hours – limestone ore (per week)	240 operating hours per week 2004 EIR reports total (operating hours)	266 to 280 operating hours per week for West Pit and South Quarry haul trucks carrying limestone ore.	343 operating hours per week for West Pit and South Quarry haul trucks carrying limestone ore.	Operating hours will be the highest in 2022 when the South Quarry haul road will be at its maximum distance.
Haul truck operating hours – waste rock (per week)		24 operating hours per week for West Pit and South Quarry haul trucks carrying waste rock.	22 operating hours per week for West Pit and South Quarry haul trucks carrying waste rock.	Operating hours will decrease for 202 due to the shift to higher capacity haul trucks.
Water truck operating hours (per year)	2,500 hours for the water truck fleet	3,604 to 4,919 hours	6,524 hours	The watering frequency for the South Quarry haul roads will be the same as the West Pit. Water truck operating hours are a function of haul truck operating hours and the distance of haul road requiring watering.

Notes:

[1]2022 was determined to be the worst-case year for PM10. 2019 was determined to be the worst-case year for NOx.

[2]Active disturbed mine area reflects the total acreage of all quarries.

[3]The maximum distance over the life of the South Quarry is 4.0 miles. This distance includes the haul road from the crusher to the new haul road, the new haul road (1.82 miles), and the road traveled within the South Quarry itself.

Source: Yorke Engineering 2016

Worst case emissions for the transition period (from 2017 to 2018), and the post-transition period (after 2018) were identified, and it was determined that the worst case year for PM_{10} and $PM_{2.5}$ emissions would be 2022. For NO_x and VOCs, 2019 would be the overall worst case year. For CO and SO_x, 2022 would be the overall worst case year. Because SO_x emissions are relatively small, the air quality study did not focus on those emissions (Yorke Engineering 2016).

Tables 3.2-8, 3.2-9, and 3.2-10 present a summary of operations emissions calculated for Alternative 1 – Proposed Action for the worst case year for each pollutant, and a comparison with the MDAQMD significance thresholds. For the full analysis please see the Air Quality Study (Yorke Engineering 2016). As shown in the tables, the emissions would be below the thresholds. Impacts would be less than significant with the implementation of Design Features/Mitigation Measures AIR-1 and AIR-2.

Table 3.2-8
Operations Emissions Summary for PM_{10} and $PM_{2.5}$ for 2022 (worst-case year)

Emission Source	2022 Baseline PM_{10} Emissions (tons/year)	2022 Baseline $PM_{2.5}$ Emissions (tons/year)
Fugitive Emissions[1]	190.1	17.4
Mobile Emissions[2]	2.38	2.38
Total (All Sources)	**192.5**	**19.7**

Emissions Source	2022 With Project PM_{10} Emissions (tons/year)	2022 With Project $PM_{2.5}$ missions (tons/year)	Project PM_{10} Emissions Increase (tons/year)	Project $PM_{2.5}$ Emissions Increase (tons/year)
Fugitive Emissions[1]	205.2	19.1	15.1	1.7
Mobile Emissions[2]	1.49	1.49	-0.91	-0.88
Total (All Sources)	**206.7**	**20.5**	**14.2**	**0.78**
Significance Threshold			**15**	**10**
		Above Significance Threshold	**No**	**No**

Notes:

[1]Fugitive emissions includes: blast hole drilling; blasting; bulldozing, scraping, and grading of materials; material handling, limestone ore and waste rock; wind erosion from stockpiles; wind erosion from active disturbed mine area; wind erosion from unpaved roads; dust entrainment from unpaved roads – haul trucks; dust entrainment from unpaved roads – water trucks; and material handling, seasonal stockpile.

[2]Mobile emissions includes: other truck exhaust; haul truck exhaust; and water truck exhaust.

Source: Yorke Engineering 2016

Table 3.2-9
Project Emissions Summary for Truck Exhaust for 2019
(Worst Case Year for NOx, VOCs and CO)

Pollutant	2019 Baseline Total Emissions (tons/year)[1]	2019 With-Project Total Emissions (tons/year)[1]	Project Emissions Change (tons/ year)	Significance Threshold (tons/year)	Above Significance Thresholds (yes/no)
Nitrogen Oxides (NOx)	66.7	66.8	0.1	25	**No**
Volatile Organic Compounds (VOCs)	4.5	4.3	-0.2	25	**No**
Particulate Matter (PM_{10})	2.6	2.4	-0.2	N/A	**No**
Particulate Matter ($PM_{2.5}$)	2.5	2.3	-0.2	N/A	**No**

Notes: [1]Total emissions from mobile sources includes: other truck exhaust; haul truck exhaust; and water truck exhaust.

Source: Yorke Engineering 2016

Table 3.2-10
Project Emissions Summary for Truck Exhaust for 2022
(Worst Case Year for CO and SO_x)

Pollutant	2022 Baseline Truck Exhaust Total Emissions (tons/year)[1]	2022 With-Project Truck Exhaust Total Emissions (tons/year)[1]	Project Emissions Change (tons/year)	Significance Threshold (tons/year)	Above Significance Thresholds (yes/no)
Carbon Monoxide (CO)	21.8	29.0	7.2	100	**No**
Sulfur Oxides (SO_x)	0.5	0.5	0.02	25	**No**

Notes: [1]Total emissions from mobile sources includes: other truck exhaust; haul truck exhaust; and water truck exhaust.

Source: Yorke Engineering 2016

Conformity Analysis. As discussed in Section 3.2.4.1 NEPA Analysis Approach, Section 176(c) of the CAA, as articulated in the USEPA General Conformity Rule, states that a federal agency cannot issue a permit for or support an activity unless the agency determines that it will conform to the most recent USEPA-approved SIP. Based on the General Conformity Rule, a project must prepare a Conformity Determination if its emissions are above the federal *de minimis* thresholds.

As shown in Tables 3.2-5 through 3.2-10, emissions from both construction and operations were evaluated. Emissions of PM_{10} would be below the federal *de minimis* threshold of 100 tons per year, and emissions of O_3 precursors (NOx and VOCs) would be below the federal *de minimis* thresholds of 25 tons per year for those pollutants. Therefore, Alternative 1 – Proposed Action would not be required to prepare a Conformity Determination and no further analysis is required.

Class I Area Analysis. For Class I areas located more than 50 kilometers from the Project site, the 2010 FLAG guidance provides an initial screening method. If the total emissions of certain pollutants (in tons per year [tpy]) divided by the distance to the Class I area (in kilometers) is less than 10, no further analysis is necessary. For Alternative 1 – Proposed Action, the initial screening analysis is quantified as follows:

$$(15 \text{ tpy of } PM_{10} + 0.1 \text{ tpy of } NO_x)/50 \text{ kilometers} = 0.3 << 10$$

Because the result of the screening calculation is 0.3, which is less than 10, no further analysis is required for Class I areas located further than 50 kilometers from the Project area. This screening analysis also eliminates the requirements for ozone impacts and acid deposition impacts analysis for Class I areas beyond 50 km.

Two Class I areas are located within 50 kilometers of the Project area, the San Gorgonio Wilderness located 21 kilometers (13 miles) from the Project area and a portion of the Joshua Tree National Park, located 48 kilometers (30 miles) from the Project area. Potential effects from Alternative 1 – Proposed Action were evaluated for the San Gorgonio Wilderness, which is the closest Class I area.

The FLAG guidance calls for the use of the VISCREEN model as the first-level screening approach for visibility impairment analysis. The VISCREEN model uses worst-case meteorology to estimate plume visibility. The two parameters output by VISCREEN are Delta-E, a plume perceptibility parameter based on color differences and brightness, and plume contrast, a criterion based on a specific light spectrum wavelength. The FLAG guidance states that VISCREEN modeling results above 2.0 for Delta E value and 0.05 for plume contrast value should be further evaluated. The VISCREEN modeling results are presented in Table 3.2-11.

Table 3.2-11
Maximum Visual Impacts Inside the Class I Area

Background	Theta	Azimuth	Distance	Alpha	Delta E		Contrast	
					Standard	Plume	Standard	Plume
Sky	10	158	42	10	2	0.428	0.05	0.009
Sky	140	158	42	10	2	0.091	0.05	-0.003
Terrain	10	158	42	10	2	1.206	0.05	0.009
Terrain	140	158	42	10	2	0.085	0.05	0.001

Source: Yorke Engineering 2016

For Alternative 1 – Proposed Action, the maximum Delta E value was 1.206 and the maximum plume contrast value was 0.009, below the threshold value for further analysis. Therefore, significant effects to visibility in the Class I areas from Alternative 1 – Proposed Action are unlikely.

The FLAG guidance identifies O_3 as a pollutant of concern that may damage flora in the Class I areas. The FLAG guidance establishes an O_3 screening threshold of 45 parts per billion (ppb) for the San Gorgonio Wilderness. The air quality analysis calculated that the maximum O_3 increase from Alternative 1 – Proposed Action would be 0.0013 ppb, which is below the 45 ppb threshold. Therefore, significant effects to the flora in the Class I areas are not anticipated.

Emissions of NO_x and sulfur oxides (SO_x) may be converted into nitrates, sulfates, and sulfites in the atmosphere. When it rains, these acidic compounds in turn may be deposited onto water bodies and vegetated surfaces, damaging the plants and wildlife in the Class I area. FLAG guidance states that the threshold for acid deposition is 3.0 kilograms per hectare per year (kg/ha/year). The NO_x emissions from Alternative 1 – Proposed Action are far higher than for SO_x. SO_x emissions from Alternative 1 – Proposed Action are negligible; therefore, they would not impact acid deposition rates. The annual NO_x concentration at the northern edge of the San Gorgonio Wilderness boundary was estimated to be 0.00014 kg/ha/year. The estimated deposition is considerably less than the lowest listed air quality related values (AQRV) threshold for the San Gorgonio Wilderness (0.005 kg/ha/year). Therefore, significant effects from acid deposition in Class I areas area not anticipated.

Health Risk Assessment. The Air Quality Study provided a Health Risk Assessment to address the potential for Alternative 1 – Proposed Action to expose sensitive receptors to substantial pollutant concentrations. Emission calculations for TACs and health risk calculations for the construction phase and supporting information are presented in the Air Quality Study (Yorke Engineering 2016). TAC emission estimates are based on diesel PM_{10} and fugitive dust calculations described above and metal concentrations in fugitive dust obtained from laboratory analyses of road dust samples. Health Risk Assessment calculations use AERMOD modeling and spreadsheet based health risk calculations (derived from the Office of Environmental Health Hazard Assessment [OEHHA] guidance) (Yorke Engineering 2016).

The Health Risk Assessment identified the maximally exposed individual resident (MEIR), the maximally exposed individual worker (MEIW), and the nearest sensitive receptor, as recommended in OEHHA guidance. The Health Risk Assessment presented the results of the analysis for excess cancer risk, non-cancer chronic hazard index, and acute hazard index at these receptors for both construction and operations. The individual risks for these receptors are presented in Table 3.2-12. Risks for other receptors would be lower than the risks for the MEIR and MEIW.

Table 3.2-12
Health Risk Assessment Summary

	Cancer Risk			**Chronic Hazard Index**			**Acute Hazard Index**		
	MEIR	**MEIW**	**Sensitive**	**MEIR**	**MEIW**	**Sensitive**	**MEIR**	**MEIW**	**Sensitive**
				Construction					
Calculated Total	5.55E-08	4.25E-09	2.45E-09	1.34E-04	4.26E-05	5.89E-05	3.13E-03	1.48E-03	6.89E-04
Risk Threshold	1.00E-05	1.00E-05	1.00E-05	1	1	1	1	1	1
Exceeds Threshold (Yes/No)	No	No	No	No	No	No	No	No	No
Operations									
Calculated Total	5.37E-09	-1.27E-10	-7.79E-09	3.87E-04	1.55E-04	1.09E-04	2.72E-03	3.78E-03	1.26E-03
Risk Threshold	1.00E-05	1.00E-05	1.00E-05	1	1	1	1	1	1
Exceeds Threshold (Yes/No)	No	No	No	No	No	No	No	No	No

Source: Yorke Engineering 2016

As shown in Table 3.2-12, the cancer risks for all receptors are below the significance threshold of 10 in a million for both construction and operations. The chronic and acute hazard indices are below the significance threshold of 1.0 for both construction and operations. Therefore, Alternative 1 – Proposed Action would not expose sensitive receptors to substantial pollutant concentrations. Impacts are less than significant.

Cumulative Impacts

Alternative 1 – Proposed Action would shift a portion of the existing limestone production to the new South Quarry without an increase in overall mine throughput. The mining operation would be in compliance with all MDAQMD rules and regulations and with the permit conditions. The mining operation would be in compliance with MDAQMD prohibitory regulations designed to regulate emissions of nonattainment pollutants, including O_3 and particulate matter. The Proposed Action would therefore be consistent with the O_3 and PM_{10} Attainment Plans developed by the MDAQMD.

Projects that have been included in the cumulative impact analysis are listed in Table 3.1-1. The main potential sources of cumulative impacts would be mining projects within the vicinity of Alternative 1 – Proposed Action. Of the projects listed in Table 3.1-1, six projects involve mining operations, as listed below:

- Robertson's Revision for Mine Life Extension – existing mining operation
- Twentynine Palms Mine Life Extension – existing mining operation
- Omya Butterfield and Sentinel Quarries Expansion Plan of Operation – expansion of existing mining operation
- Omya White Knob/White Ridge Quarries Expansion – expansion of existing mining operation
- Specialties Minerals, Inc. Quarries Plan of Operation – existing mining operations at Arctic Canyon and Cushenbury, and reclamation at Marble Canyon
- Baldwin Hard Rock Prospecting Permit – 29 permits for federal hardrock mineral prospecting and three special use permits for access and road construction.

Of the projects listed above, the existing mining operations represent existing conditions, and are part of the background air quality conditions. The proposed expansion of the Omya Butterfield and Sentinel Quarries would occur approximately five miles from the proposed South Quarry site. The Omya White Knob/White Ridge Limestone Quarries Expansion is approximately nine miles from the proposed South Quarry site. Both of these operations would be subject to the requirements of the MDAQMD for the control of emissions including particulate emissions and O_3 precursors, and would be required to be consistent with the MDAQMD's Attainment Plans. The Omya mining operations would use different haul routes and different processing plants than Alternative 1 – Proposed Action. Furthermore, because Alternative 1 – Proposed Action does not result in an increase in overall mine throughput, and because the Proposed Action's air quality emissions would be below MDAQMD significance thresholds, Alternative 1 – Proposed Action would not significantly contribute to cumulative air quality impacts.

Mitigation Measures

Design Features AIR-1 and AIR-2 (see the Operations section, above, and Section 2.3.2.13) would reduce effects from haul truck operations to a less than significant level. For the purposes of CEQA, these Design Features are mitigation measures:

AIR-1: Within three years after the commencement of mining in the South Quarry, or whenever the total quarry haul truck operating horsepower-hours/year reach 6 million per year, whichever is later, the applicant shall:

(1) Add to its fleet no fewer than five quarry haul trucks meeting Tier 4 standards; and

(2) Retire all remaining Tier 0 quarry haul trucks.

"Tier 0" and "Tier 4" refer to those terms as defined by the CARB off-road diesel rule, CCR Title 13 Sections 2449-2449.3. For the purposes of this condition, "mining" shall not include the construction of the South Quarry Road.

AIR-2: Every day of active mining, the Project proponent shall apply water to unpaved roads and disturbed mine areas that are in active use on that day no less than once every 1.25 hours at a rate of no less than 0.11 gallons per square yard. Alternatively, the Project proponent shall apply chemical dust suppressants to unpaved road and disturbed mine areas in active use at a frequency and application rate in accordance with manufacturer specifications.

Residual Impacts after Mitigation

Residual impacts after mitigation would be less than significant.

3.2.5.3 Alternative 2 – Partial Implementation

Direct and Indirect Impacts

Emissions. Alternative 2 – Partial Implementation would only implement Phases 1A, 1B, and 2 of the Plan of Operations. The sequence of mining in these phases would be the same as described in Alternative 1 – Proposed Action. Mining of the north slope, which is proposed in Phases 3 and 4 of Alternative 1 – Proposed Action, would not occur, therefore, the footprint of the quarry would be approximately 20 acres smaller. Mining in the quarry would last 40 years rather than 120 years. As a result, reclamation and revegetation at the South Quarry site would be completed nearly 80 years sooner.

Daily operations at the quarry would be the same as for Alternative 1 – Proposed Action, until mining ceased in year 40. Total direct and indirect air quality impacts of Alternative 2 – Partial Implementation from mining at the South Quarry site for the peak day and the worst-case year would be identical to the impacts from Alternative 1 – Proposed Action during the 40 years of operation. However, air quality impacts from operation at the South Quarry under Alternative 2 – Partial Implementation would ultimately be greater than with Alternative - Proposed Action, as summarized further below in Table 3.2-13.

With this alternative, the existing Cushenbury Cement Plant would continue to operate after year 40. The ore reserves in the West Pit, when blended with high grade ore, are sufficient to feed the cement plant for approximately 120 years. Therefore, it is assumed that higher grade limestone would be trucked to the plant from elsewhere in the region from year 41 to year 120. Approximately 52,000 haul truck trips per year would be required, assuming import of 1.3 million tons per year of high-grade limestone using 25-ton on-road trucks (approximately 150 truck trips per day assuming deliveries 350 days per year). Three alternative sites for high-grade limestone have been identified: Omya Amboy (approximately 128 miles away), Big Maria Mountains (approximately 173 miles away) and Moapa (approximately 248 miles away). These sources are described in Table 2.3-3A and shown in Figures 2.3-12 through 2.3-15 in Chapter 2. Potential emissions were calculated from each off-site source based on the best assumed path of travel from each site to the existing Cushenbury Cement Plant. Criteria pollutant emissions would vary depending upon the distance to the offsite source. The estimated criteria pollutant emissions are summarized in Table 3.2-13 below (Yorke Engineering 2018; Appendix B-2). For Alternative 2, these emissions would commence at the conclusion of Phase 2, approximately 41 years after Project approval.

Table 3.2-13
Criteria Pollutant Emissions Associated with Transportation of High-Grade Limestone from Off-Site Sources

Pollutant	Omya Amboy 128 miles one way		Big Maria Mountains 173 miles one way		Moapa 248 miles one way		Daily Threshold	Annual Threshold
	lb/day	ton/yr	lb/day	ton/yr	lb/day	ton/yr	(lbs)	(tons)
NOx	30.63	5.36	41.40	7.24	59.35	10.39	137	25
TOG	2.94	0.52	3.98	0.70	5.70	1.00	137	25
CO	14.90	2.61	20.14	3.52	28.86	5.05	548	100
SOx	1.09	0.19	1.47	0.26	2.11	0.37	137	25
PM_{10}	61.05	10.68	386.11	67.57	35.63	6.24	82	15
$PM_{2.5}$	16.16	2.83	96.36	16.86	11.02	1.93	54	10

Source: Yorke Engineering 2018

As shown in Table 3.2-13, emissions would be greater than with Alternative 1 – Proposed Action but would still be below emissions thresholds with the exception of the Big Maria Mountains high-grade limestone source. Both daily and annual PM_{10} and PM $_{2.5}$ emissions from trucking from Big Maria Mountains would be above thresholds.

Conformity Analysis. Emissions from mining at the South Quarry location would be similar to those discussed above for Alternative 1 – Proposed Action. These emissions would be below the federal *de minimus* threshold of 100 tons per year, and emissions of O_3 precursors (NOx and VOCs) would be below the federal *de minimis* thresholds of 25 tons per year for those pollutants. After year 40, when offsite sources of high-grade limestone would be used, emissions would be below the federal *de minimis* thresholds for PM_{10} and O_3 precursors (NOx and VOCs) (Table 3.2-13). Therefore, Alternative 2 – Partial Implementation would not be required to prepare a Conformity Determination and no further analysis is required (Yorke Engineering 2019; Appendix B-3).

Class I Area Analysis. Before year 40, mining would occur at the South Quarry location and impacts would be the same as described for Alternative 1 – Proposed Action. After year 40, offsite mines would be used for high-grade limestone. Each of the three potential off-site quarry locations is more than 50 kilometers from any Class I area and is subject to the 2010 FLAG guidance initial screening. The initial screening of tons of PM_{10} /distance to Class I area for all three areas is less than the FLAG guidance threshold of 10 and shows that no further analysis is required for the offsite quarry locations. No impact to Class I areas from mining at offsite locations would occur (Yorke Engineering 2019; Appendix B-3).

For roadway segments that are more than 50 kilometers from the offsite quarry locations, the screening method indicates that no further analysis is required. However, there are roadway segments for all three offsite quarries that are within 50 kilometers of a Class I area; the closest one is Joshua Tree National Park, which is along the route from the Big Maria quarry. This road segment was analyzed for a worst-case representation of potential impacts to Class I areas from truck traffic on all routes. The analysis for Class I areas within 50 kilometers of an impact area involves three types of analyses (note that there are no SO_x emissions from this project):

- Visual impacts analysis using the VISCREEN model (based on $PM_{10}$and NO_x emissions);
- O_3 impacts analysis using the AERMOD model (based on NO_x emissions); and

- Acid deposition analysis using the AERMOD model (based on NO_x emissions).

The analysis (Yorke Engineering 2019; Appendix B-3) concluded that there were no visual, O_3, or acid deposition impacts from the roadway segment nearest Joshua Tree National Park; therefore, impacts to Class I areas at further distances would also not have these impacts.

Health Risk Assessment. The potential for mining to expose sensitive receptors to substantial pollutant concentrations through year 40 would be the same as discussed for Alternative 1 – Proposed Action. After year 40, high-grade limestone would be mined from offsite sources and trucked to the Cushenbury cement plant. The potential for mining at the alternative sites after year 40 to expose sensitive receptors to substantial pollutant concentrations was evaluated. The modeling showed that cancer risk, non-cancer chronic hazard, and acute hazard would be less than significant for mining at all three sites (Yorke Engineering 2019; Appendix B-3). For potential impacts near roadways from trucking, a representative roadway segment along the route from the Big Maria quarry near Joshua Tree National Park was selected. Health risk assessment calculations were modeled to be below applicable risk threshold. Less than significant impacts are anticipated (Yorke Engineering 2019; Appendix B-3).

Cumulative Impacts

Past, present, and foreseeable actions in the vicinity of the Project site are discussed in Section 3.1.2 and listed in Table 3.1-1. Background data, included in the air quality affected environment (Section 3.2.3), accounts for existing sources and their contribution to ambient air quality impacts. As discussed above for Alternative 1 – Proposed Action, the air quality emissions of Alternative 2 – Partial Implementation would be below MDAQMD significance thresholds during the first 40 years of mining. The contribution of emissions from Alternative 2 – Partial Implementation to cumulative air quality impacts would be less than significant. Emissions from approximately 150 on-road truck trips per day (52,000 truck trips per year) transporting higher grade ore from offsite to the Cushenbury Cement Plant after year 40 would be greater than with Alternative 1 – Proposed Action. After year 40, potentially significant cumulative impacts could occur with the use of the Big Maria Mountain limestone source.

Mitigation Measures

Design Features/Mitigation Measures AIR-1 and AIR-2 (see the Operations section, above, and Section 2.3.2.13) would reduce effects from off-road haul truck operations in years 1 to 40 to a less than significant level.

Residual Impacts after Mitigation

After implementation of Design Features/Mitigation Measures AIR-1 and AIR-2, impacts would be less than significant. However, the existing Cushenbury Cement Plant would continue to operate after year 40. Therefore, it is assumed that higher grade limestone would be trucked to the plant from elsewhere in the region from year 41 to year 120, requiring approximately 52,000 truck trips per year. Such transport would increase vehicle trips on public roadways; thereby increasing air quality impacts. If the Big Maria Mountain limestone source were used, impacts could remain significant after year 40.

3.2.5.4 Alternative 3 – No Action/No Project

Direct and Indirect Impacts

Emissions. With Alternative 3 – No Action/No Project, MCC would not develop the limestone deposit in the South Quarry under the current Plan of Operations. With this alternative, the direct and indirect air quality impacts associated with Alternative 1 – Proposed Action or Alternative 2 – Partial Implementation would not occur because the construction and operation components of the project would not occur. However, the existing Cushenbury Cement Plant would continue to operate. The ore reserves in the West Pit, when blended with high grade ore, are sufficient to feed the cement plant for approximately 120 years. Therefore, it is assumed that higher grade limestone would be trucked to the plant from elsewhere in the region during that 120-year period. Such transport would increase vehicle trips on public roadways; thereby resulting in traffic and air quality impacts related to truck traffic that would be greater than Alternative 1 – Proposed Action or Alternative 2 – Partial Implementation.

As shown in Table 3.2-13, emissions would be greater than mining in the South Quarry but would still be below emissions thresholds with the exception of the Big Maria Mountains high-grade limestone source. Both daily and annual PM_{10} and $PM_{2.5}$ emissions from trucking from Big Maria Mountains would be above thresholds.

Conformity Analysis. As shown in Table 3.2-13, for all three potential offsite sources, emissions of PM_{10} would be below the federal *de minimis* threshold of 100 tons per year, and emissions of O_3 precursors (NOx and VOCs) would be below the federal *de minimis* thresholds of 25 tons per year for those pollutants. Therefore, Alternative 3 – No Action/No Project would not be required to prepare a Conformity Determination and no further analysis is required (Yorke Engineering 2019; Appendix B-3).

As shown in Table 3.2-13, emissions would be greater than with Alternative 1 – Proposed Action but would still be below emissions thresholds with the exception of the Big Maria Mountains high-grade limestone source. Both daily and annual PM_{10} and $PM_{2.5}$ emissions from trucking from Big Maria Mountains would be above thresholds.

Class I Area Analysis. Each of the three potential off-site quarry locations is more than 50 kilometers from any Class I area and is subject to the 2010 FLAG guidance initial screening. The initial screening of tons of PM_{10} /distance to Class I area for all three areas is less than the FLAG guidance threshold of 10 and shows that no further analysis is required for the offsite quarry locations. No impact to Class I areas from mining at offsite locations would occur (Yorke Engineering 2019; Appendix B-3).

For roadway segments that are more than 50 kilometers from the offsite quarry locations, the screening method indicates that no further analysis is required. However, there are roadway segments for all three offsite quarries that are within 50 kilometers of a Class I area; the closest one is Joshua Tree National Park, which is along the route from the Big Maria quarry. This road segment was analyzed for a worst-case representation of potential impacts to Class I areas from truck traffic on all routes. The analysis for Class I areas within 50 kilometers of an impact area involves three types of analyses (note that there are no SO_x emissions from this project):

- Visual impacts analysis using the VISCREEN model (based on $PM_{10}$and NO_x emissions);
- O_3 impacts analysis using the AERMOD model (based on NO_x emissions); and
- Acid deposition analysis using the AERMOD model (based on NO_x emissions).

The analysis (Yorke Engineering 2019; Appendix B-3) concluded that there were no visual, O_3, or acid deposition impacts from the roadway segment nearest Joshua Tree National Park; therefore, impacts to Class I areas at further distances would also not have these impacts.

Health Risk Assessment. With this alternative, high-grade limestone would be mined from offsite sources and trucked to the Cushenbury cement plant. The potential for mining at the alternative sites after year 40 to expose sensitive receptors to substantial pollutant concentrations was evaluated. The modeling showed that cancer risk, non-cancer chronic hazard, and acute hazard would be less than significant for mining at all three sites (Yorke Engineering 2019; Appendix B-3). For potential impacts near roadways from trucking, a representative roadway segment along the route from the Big Maria quarry near Joshua Tree National Park was selected. Health risk assessment calculations were modeled to be below applicable risk threshold. Less than significant impacts are anticipated (Yorke Engineering 2019; Appendix B-3).

Cumulative Impacts

No direct or indirect impacts from mining on the South Quarry site would occur therefore there would be no cumulative impacts. Emissions from transporting higher grade ore from offsite to the Cushenbury Cement Plant are unknown, but are likely to be greater than with Alternative 1 – Proposed Action or Alternative 2 – Partial Implementation. Approximately 52,000 truck trips per year (150 truck trips per day) would be required to haul limestone from an off-site location. If the Big Maria Mountain location were selected, cumulative impacts could occur.

Mitigation Measures

No impacts related to mining the South Quarry site would occur therefore mitigation measures are not required.

Residual Impacts after Mitigation

With Alternative 3 – No Action/No Project, MCC would not develop the limestone deposit in the South Quarry under the current Plan of Operations. However, the existing Cushenbury Cement Plant would continue to operate. The ore reserve in the East and West Pits, when blended with high grade ore – are sufficient to feed the cement plant for approximately 120 years. Therefore, it is assumed that higher grade limestone would be trucked to the plant from elsewhere in the region during that 120-year period. Such transport would increase vehicle trips on public roadways by approximately 150 truck trips per day; thereby increasing traffic and air quality impacts. If the Big Maria Mountain limestone source were used, impacts could remain significant.

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