4.3 AIR QUALITY

This section of the Draft Environmental Impact Report (EIR) analyzes the potential impacts to air quality associated with the proposed Projects. Emissions estimates were prepared to determine both short-term construction and long-term operational impacts, and calculations were made using standard industry models and federal, state, and locally approved methodologies.

The following sections discuss existing air quality for the setting in which the proposed Projects are to be located, as well as applicable air quality standards and regulations; the significance of potential air quality impacts, as determined using appropriate thresholds; and mitigation measures, as necessary, to reduce air quality impacts.

Scoping Issues Addressed

During the scoping period for the proposed Projects, two public scoping meetings were conducted and written comments were solicited from both agencies and the public. Comment letters received from the public include comments regarding air quality. Concerns were noted about particulate matter emissions; noncondensable gases, diesel particulate and hazardous air pollutant (HAP) emissions; emissions of ozone precursors; and odor nuisance from hydrogen sulfide (H_2S) emissions that could occur as a result of the construction and operation of the proposed HR-2 Project. It was requested that the Draft EIR include a description and quantification of Project construction and operational emissions. In addition, a comment was received requesting a health risk assessment be conducted to determine past, present, or future releases of hazardous airborne toxics that may pose a risk to human health or the environment.

Applicant's Reports and Survey Results

Information used in preparing this section and in the evaluation of potential impacts to air quality resources was derived from air pollutant emission estimates for construction and operational processes of the HR-2 and SmCP-2 Projects prepared by Environmental Management Associates (EMA), in March, April, and June 2012. Air quality emissions reports for construction and operation of the proposed HR-2 and SmCP-2 Projects can be found in Appendices C-1, C-2, C-3, C-4, C-5 and C-6 of this EIR. A Health Risk Assessment, prepared by EMA (April 2012) is included as Appendix M. These documents are included in Volume II of this EIR (Technical Appendix).

4.3.1 EXISTING SETTING

The proposed Projects would be located within the unincorporated area of the Imperial County in southeastern California. Imperial County encompasses the southern half of the Salton Sea Air Basin (SSAB). The proposed Projects would be situated about 2.3 miles west-southwest of the community of Niland, California.

CLIMATE

Imperial County is one of the hottest and driest parts of California, and is located in a region best described as a low latitude desert characterized by hot, dry summers and relatively mild winters. Average annual precipitation is less than 3 inches. Daily average temperature in winter ranges between 65 and 75ºF. During winter months it is not uncommon to record maximum temperatures of up to 80ºF. Summers are extremely hot with daily average temperature ranges between 104 and 115ºF, with maximum temperatures up to 120ºF (ICAPCD 2010).

During the summer, due to the presence of the Pacific high-pressure zone off the coast of California, a thermal trough develops over California's southeast desert region. The intensity and orientation of the trough varies from day to day. Although the mountainous terrain surrounding the Imperial Valley inhibits air circulation, the influence of the trough does permit some inter-basin exchange of air with coastal locations through the mountain passes. Relative humidity in the summer is very low, averaging 30 to 50 percent in the early morning and 10 to 20 percent in the afternoon. During the hottest part of the day, a relative humidity level below 10 percent is common (ICAPCD 2010). However, the effect of extensive agricultural operations in the widely-irrigated Imperial Valley tends to increase local humidity. The prevailing weather conditions promote intense heating during the day in summer, with marked cooling at night. The wind direction follows two seasonal patterns. During the fall, winter, and spring, regional winds tend to come from the northwest. These originating prevailing winds are known to be from the Los Angeles area. During the spring and summer, Imperial County experiences occasional periods of extremely high wind speeds; wind statistics indicate prevailing winds are from the west-northwest through southwest, and a secondary flow maximum from the southeast is also evident (ICAPCD 2010).

AMBIENT AIR POLLUTANTS

Criteria Air Pollutants

The U.S. Environmental Protection Agency (EPA) has established National Ambient Air Quality Standards (NAAQS) for six of the most common pollutants. These pollutants (described as "criteria air pollutants") include ground-level ozone (O_3), carbon monoxide (CO), particulate matter, both respirable (less than or equal to 10 microns in diameter) (PM_{10}) and fine (equal to or less than 2.5 microns in diameter) ($PM_{2.5}$), nitrogen dioxide (NO_2), lead (Pb), and sulfur dioxide (SO_2). Similarly, the State of California has adopted standards known as the California Ambient Air Quality Standards (CAAQS) for the six federally recognized criteria air pollutants as well as for four additional pollutants: vinyl chloride, visibility reducing particles, H_2S, and sulfates.

Under the NAAQS, standards are further classified as "primary" and "secondary." Primary ambient air quality standards define emission limits to protect public health, including the health of "sensitive populations" such as asthmatics, children, and the elderly. The secondary ambient air quality standards define limits to protect public welfare from the adverse effects of a pollutant, including protection against

decreased visibility and damage to animals, crops, vegetation, and buildings. The NAAQS and CAAQS are summarized in Table 4.3-1.

TABLE 4.3-1 SUMMARY OF AMBIENT AIR QUALITY STANDARDS

POLLUTANTS	AVERAGING TIME	CAAQS[1]	NAAQS	
			PRIMARY	SECONDARY
Ozone (O_3) [2]	1 Hour	0.09 ppm (180 µg/m^3)	--	--
	8 Hour	0.070 ppm (137 µg/m^3)	0.075 ppm	0.075 ppm
Respirable Particulate Matter (PM_{10})[3]	24 Hour	50 µg/m^3	150 µg/m^3	150 µg/m^3
	Annual	20 µg/m^3	--	--
Fine Particulate Matter ($PM_{2.5}$) [4]	24 Hour	--	35 µg/m^3	35 µg/m^3
	Annual	12 µg/m^3	15 µg/m^3	15 µg/m^3
Carbon Monoxide (CO)[5]	1 Hour	20 ppm (23 mg/m^3)	35 ppm	--
	8 Hour	9.0 ppm (10 mg/m^3)	9 ppm	--
Nitrogen Dioxide (NO_2)[6]	1 Hour	0.18 ppm (339 µg/m^3)	100 ppb	--
	Annual	0.030 ppm (57 µg/m^3)	53 ppb	53 ppb
Sulfur Dioxide (SO_2)	1 Hour	0.25 ppm (655 µg/m^3)	75 ppb	--
	3 Hour	--	--	0.5 ppm
	24 Hour	0.04 ppm (105 µg/m^3)	--	--
	Annual	--	--	--
Lead (Pb) [8]	30 Day Average	1.5 µg/m^3	--	--
	3-Month (Rolling Average)	--	0.15 µg/m^3	0.15 µg/m^3
Visibility Reducing Particles	8 Hour	See Note 9.	No Federal Standards	
Sulfates	24 Hour	25 µg/m^3		
Hydrogen Sulfide (H_2S)	1 Hour	0.03 ppm (42 µg/m^3)		
Vinyl Chloride	24 Hour	0.01 ppm (26 µg/m^3)		

Source: CARB 2012a; EPA 2011

Notes:

1 California standards for ozone, carbon monoxide, sulfur dioxide (1 and 24 hour), nitrogen dioxide, suspended particulate matter—PM_{10}, $PM_{2.5}$, and visibility reducing particles, are values that are not to be exceeded. All others are not to be equaled or exceeded.

2 The 8-hour ozone NAAQS is equal to the annual fourth-highest daily maximum 8-hr concentration, averaged over 3 years. The 1997 ozone NAAQS (0.08 ppm) and related implementation rules remain in place. In 1997, EPA revoked the 1-hour ozone NAAQS (0.12 ppm) in all areas, although some areas have continued obligations under that standard ("anti-backsliding").

3 The 24-hour PM_{10} NAAQS is not to be exceeded more than once per year on average over 3 years.

4 The 24-hour $PM_{2.5}$ NAAQS is attained when 98 percentile, averaged over three years, is equal to or less than the standard. The annual $PM_{2.5}$ NAAQS is the annual mean, averaged over 3 years.

5 The 1-hour and 8-hour CO NAAQSs are not to be exceeded more than once per year

6 For the 1-hour NO_2 NAAQS, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 100 ppb

7 The 1-hour SO_2 NAAQS is based on the 3-year average of the annual 99th percentile of 1-hour daily maximum concentrations. The 3-hour SO_2 NAAQS is not to be exceeded more than once per year. The 1971 annual and 24-hour SO2 NAAQSs were revoked in 2010. However, these NAAQSs remain in effect until one year after an area is designated for the 1-hour NAAQS, except in areas designated nonattainment for the 1971 NAAQS, where the 1971

TABLE 4.3-1 SUMMARY OF AMBIENT AIR QUALITY STANDARDS

POLLUTANTS	AVERAGING TIME	CAAQS[1]	NAAQS	
			PRIMARY	SECONDARY

NAAQSs remain in effect until implementation plans to attain or maintain the 1-hour NAAQS are approved.

[8] CARB gas identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. The Rolling 3-month average lead NAAQS is not to be exceeded. The 1978 lead NAAQS (1.5 µg/m^3 as a quarterly average) remains in effect until one year after an area is designated for the 2008 NAAQS, except that in areas designated nonattainment for the 1978, the 1978 NAAQS remains in effect until implementation plans to attain or maintain the 2008 NAAQS are approved.

[9] Extinction coefficient of 0.23 per kilometer – visibility of ten miles or more (0.07-30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent.

Key:
CAAQS = California Ambient Air Quality Standards
NAAQS = National Ambient Air Quality Standards
ppb = parts per billion
ppm = parts per million
µg/m^3 = micrograms per cubic meter

Air basins with individual criteria air pollutant levels below the NAAQS or CAAQS are designated as being in "attainment" for each pollutant. If an individual criteria air pollutant level exceeds the NAAQS or CAAQS, the air basin is designated as being in "nonattainment" for that pollutant. If not enough data on a criteria air pollutant is available, the air basin is described as being "unclassified." Under the NAAQS, the nonattainment designation can be further qualified as "marginal," "moderate," "serious," "severe," or "extreme." Also, areas previously designated as a nonattainment for one or more pollutants pursuant to the Clean Air Act (CAA) Amendments of 1990, and subsequently redesignated as an attainment area are subject to the requirement to develop a maintenance plan under section 175A of the CAA, as amended.

Table 4.3-2 shows the attainment status under both the NAAQS and the CAAQS for each criteria air pollutant in the portion of Imperial County where the proposed Projects would be located. Each criteria pollutant is described in greater detail below. In August 2004, the EPA reclassified the Imperial Valley under the CAA from a moderate to a serious PM_{10} non-attainment area (69 CFR 48792, August 11, 2004). Also in August 2004, the EPA proposed a rule to find that the Imperial Valley area (which includes the proposed Projects' site) had failed to attain the annual and 24-hour PM_{10} standards by the serious area deadline of December 31, 2001 (ICAPCD 2009). The major sources of particulate matter in Imperial County are fugitive windblown dust, with other contributions from entrained road dust, farming, and construction activities (ICAPCD 2009).

TABLE 4.3-2 AIR QUALITY STANDARD ATTAINMENT STATUS – PROJECT AREA WITHIN IMPERIAL COUNTY

POLLUTANT	CAAQS	NAAQS
Ozone (O_3)	Nonattainment	Nonattainment - Moderate
Carbon Monoxide (CO)	Attainment	Unclassified/Attainment
Respirable Particulate Matter (PM_{10})	Nonattainment	Nonattainment - Serious
Fine Particulate Matter ($PM_{2.5}$)	Unclassified	Attainment (1)
Nitrogen Dioxide (NO_2)	Attainment	Unclassified/Attainment

TABLE 4.3-2 AIR QUALITY STANDARD ATTAINMENT STATUS – PROJECT AREA WITHIN IMPERIAL COUNTY

POLLUTANT	CAAQS	NAAQS
Lead (Pb)	Attainment	Attainment
Sulfur Dioxide (SO_2)	Attainment	Attainment
Sulfates	Attainment	No Federal Standards
Vinyl Chloride	Unclassified	
Hydrogen Sulfide (H_2S)	Unclassified	
Visibility Reducing Particles	Unclassified	

Source: EPA 2012a, CARB 2011a

Notes:
(1) The proposed Projects would not be located in those portions of Imperial County designated by the EPA as nonattainment for $PM_{2.5}$.

Ozone (O_3)

Ozone is a key component of smog and is generated when "ozone precursors" such as reactive organic gases (ROG) and oxides of nitrogen (NO_x) react with sunlight in the atmosphere. Because sunlight is required to produce ozone, levels tend to increase during the summer months when days are longer. Common sources of ROGs include paint, household cleaning products, dry cleaning chemicals, and aerosols. NO_X is generally a component of automobile exhaust.

Health effects associated with ozone exposure include respiratory tract irritation, coughing, nausea, eye irritation, and decreased pulmonary function.

Carbon Monoxide (CO)

CO is an odorless, colorless gas produced by the incomplete combustion of fuel. The primary sources of CO are automobiles and other ground-based vehicles that use fossil fuels.

The health effects associated with CO exposure are related to its interaction with hemoglobin in the blood stream. At high concentrations, CO can reduce the amount of oxygen in the blood, cause heart difficulties in people with chronic heart disease, and impaired mental function.

Respirable Particulate Matter (PM_{10}) and Fine Particulate Matter ($PM_{2.5}$)

Particulate matter is a mixture of extremely small solid and liquid particles of various chemicals and other materials. Typical sources include dust from construction activities, automobile tires, automobile exhaust, factories, and wild fires.

Both PM_{10} and $PM_{2.5}$ are small enough to be inhaled into the lungs. Inhalation of particulate matter can have negative health consequences, including decreased lung function, chronic bronchitis, and aggravation of asthma symptoms.

Nitrogen Dioxide (NO_2)

NO_2 is a reddish brown, odorless gas that is one of several gases collectively known as NO_x. NO_2 is also a key component of fine particulate matter. Typical sources of NO_2 include exhaust from automobiles, as well as off-road equipment, factories, and power plants.

Health effects associated with NO_2 include nose, throat, and lung irritation, coughing, and chest pain. NO_2 can also exacerbate respiratory symptoms in people with asthma.

Lead (Pb)

Lead is a naturally occurring metal used in a variety of industrial and commercial applications. As leaded gasoline has been phased out of use, lead emissions have dropped dramatically, and current primary sources are mining, smelting, and refining activities and aircraft that use leaded aircraft fuel (EPA 2012b).

Lead exposure has been associated with learning disabilities and behavioral problems in children, kidney damage, and negative effects on the nervous and cardiovascular systems.

Sulfur Dioxide (SO_2)

SO_2 is one of several highly reactive gasses known as oxides of sulfur (SO_x) and is formed by burning fuel containing sulfur. Typical sources include emissions from burning coal or oil at power plants and factories. Typical health effects associated with exposure to sulfur dioxide include respiratory illness and exacerbation of respiratory symptoms in people with asthma.

Sulfates

Sulfates are the fully oxidized ionic form of sulfur produced when sulfur dioxide is fully oxidized in the atmosphere. Sulfates are produced by emissions from automobiles, power plants, and industrial activity, and contribute to general atmospheric haziness. Typical health effects associated with exposure to sulfates include respiratory illness and an increased risk of cardio-pulmonary disease.

Vinyl Chloride

Vinyl chloride is an artificially created colorless gas with a mild, slightly sweet odor. The gas is used in the manufacture of vinyl products, including polyvinyl chloride (PVC) plastic. Vinyl chloride emissions are produced from the vinyl manufacturing process as well as from the breakdown of vinyl products in landfills and hazardous waste sites.

The health effects associated with vinyl chloride include dizziness, headaches, and drowsiness from short-term exposure, and liver damage and cancer resulting from long-term exposure.

Hydrogen Sulfide (H_2S)

H_2S is a naturally occurring, colorless gas that at low concentrations produces a distinctive rotten egg odor. At higher concentrations, olfactory fatigue prevents detection of odor. The gas is produced through the bacteriological breakdown of organic materials as well as during oil and gas production and geothermal power generation. Health effects associated with H_2S include exposure to a disagreeable odor, coughing, irritation to eyes, and impairment of the respiratory system.

Visibility Reducing Particles

Visibility reducing particles are particulate matter composed of many different substances that are suspended in the atmosphere and contribute to haze and diminished visibility.

Table 4.3-3 provides a summary of the common sources and health effects of each criteria air pollutant.

TABLE 4.3-3 SUMMARY OF COMMON SOURCES AND EFFECTS OF CRITERIA POLLUTANTS

CRITERIA AIR POLLUTANT	COMMON SOURCES	EFFECTS
Ozone (O_3)	Paints, aerosols, secondary formation in the atmosphere	Respiratory tract irritation, coughing, nausea, eye irritation, decreased pulmonary function
Carbon Monoxide (CO)	Automobiles and ground-based vehicles	Reduction in oxygen in the blood, cardiovascular difficulties, impaired mental function
Respirable Particulate Matter (PM_{10})	Construction activities, automobile tires, automobile exhaust, factories, and wild fires	Decreased lung function, chronic bronchitis, aggravated asthma symptoms
Fine Particulate Matter ($PM_{2.5}$)	Construction activities, automobile tires, automobile exhaust, factories, and wild fires	Decreased lung function, chronic bronchitis, aggravated asthma symptoms
Nitrogen Dioxide (NO_2)	Automobiles, off-road equipment, factories, and power plants	Nose, throat, and lung irritation, coughing, chest pain, aggravated asthma symptoms
Lead (Pb)	Mining, smelting and refining, leaded aircraft fuel	Learning disabilities, behavioral problems in children, kidney damage, nervous and cardiovascular system problems
Sulfur Dioxide (SO_2)	Power plants, factories burning fossil fuels (e.g., coal and oil)	Respiratory illness, aggravated asthma symptoms
Sulfates	Automobiles, power plants, industrial activity	Respiratory illness, cardio-pulmonary disease
Vinyl Chloride	Manufacturing, breakdown of vinyl products in landfills and hazardous waste sites	Dizziness, headaches, drowsiness, liver damage, cancer
Hydrogen Sulfide (H_2S)	Bacteriological breakdown of organic materials, geothermal activity	Coughing, irritation to eyes, respiratory system impairment
Visibility Reducing Particles	Construction activities, automobile tires, automobile exhaust, factories, and wild fires	Decreased lung function, chronic bronchitis, aggravated asthma symptoms

Sources: CARB 2009

Toxic Air Contaminants/Hazardous Air Pollutants

Toxic air contaminants (TACs) are designated in the State of California as a wide range of pollutants that may cause or contribute to an increase in deaths or in serious illness, or which may pose a present or potential hazard to human health (CARB 2010a). Health effects associated with TACs, including cancer, are typically the result of acute or repeated exposure to these pollutants. On a federal level, the EPA has designated a list of hazardous air pollutants (HAPs) that "may reasonably be anticipated to result in an increase in mortality or an increase in serious irreversible or incapacitating reversible illness." (EPA 2010).Currently, both the EPA and the State of California have recognized nearly 200 different contaminants as TACs and/or HAPs. CARB has identified ten specific pollutants as posing the greatest risk to human health based on ambient background levels in the state. The potential TACs and/or HAPs of most concern associated with the proposed Projects are benzene, hydrochloric acid (HCl) vapors, and diesel particulate matter (DPM).

Benzene

Benzene is a colorless, flammable liquid with a pleasant, sweet odor that evaporates quickly when exposed to air. Benzene is produced naturally through geothermal processes, as a component of petroleum and natural gas, and as a byproduct of burning wood and other plant matter. Anthropomorphic sources of benzene include use as an ingredient in solvents and as an additive to gasoline.

Hydrochloric Acid (HCl)

HCl is a colorless liquid with a pungent odor, or a colorless to slightly yellow gas, commonly used in the chemical, mining, water treatment, waste management, and food industries, among others. HCl is one of the most corrosive of the non-oxidizing acids in contact with copper alloys, and is handled in dilute solutions. It is soluble in benzene, alcohol, and ether; it is insoluble in hydrocarbons, and incompatible or reactive with metals, hydroxides, amines, and alkalis. HCl fumes have an acid, penetrating odor. Inhalation of the spray mist may produce severe irritation of the respiratory tract, characterized by coughing, choking, or shortness of breath. Severe over-exposure can result in death. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering (Sciencelab 2010).

Diesel Particulate Matter (DPM)

DPM is produced by the combustion of diesel fuel and is composed of a mixture of various gases and fine particulate matter (i.e., soot). The California Air Resources Board (CARB) recognized the particulate matter in DPM as a TAC in 1998 based on its potential to cause cancer and contribute to other adverse health effects (CARB 2011b).

Other Substances of Concern

Ammonia

Ammonia is another substance of concern for the proposed Projects. Ammonia is listed neither as a criteria air pollutant, TAC, or HAP[1]. Ammonia is a widely-used strongly alkaline chemical which can be volatile. The proposed Projects would produce ammonia from the geothermal reservoir by operation of the geothermal wells and subsequent use of geothermal brine. No storage of ammonia would be involved as a result of the Projects' operations. Ammonia vapors cause irritation of the eyes and the respiratory tract. Higher concentrations cause conjunctivitis, laryngitis, and pulmonary edema, possibly accompanied by a feeling of suffocation (Cal/EPA 1999).

Ammonia also is responsible for neutralizing a large fraction of acidic gases promoting the formation of atmospheric particles. The EPA recommends monitoring of ammonia gas for identifying when $PM_{2.5}$ formation in an area that is limited by ammonia or nitric acid (EPA 2007). However, under ICAPCD Rule 101, ammonia is not listed as a precursor or a secondary pollutant. Further, similar geothermal projects analyzed in Southern California have recognized that although these reactions could occur, there is not sufficient evidence to demonstrate that the concurrence of all conditions necessary for particulate formation from geothermal wells operations is supported by meteorological and other data (CEC 2003).

ODORS

Odors are generally considered a nuisance rather than a health hazard and can lead to discomfort and distress among the general public. Investigations involving nuisance odors are governed by the perception of the receptor. A person's perception of odor is related to the human olfactory system, which can vary from person to person; therefore, the ability to identify and qualify odors is a complex and subjective issue. In addition, regular exposure to odor may cause desensitization, resulting in "odor fatigue," whereby once recognized odors go unnoticed unless there is a change in the odor's intensity.

Odors produced as a result of geothermal energy production can include the sulfurous, rotten egg smell characteristic of H_2S emissions. Similarly, the combustion of diesel fuel to power construction or operations of combustion equipment can produce odors due to the sulfur content of diesel fuel. Additionally, the geothermal brine would also contain ammonia, which is a colorless gas with a characteristic pungent odor.

BACKGROUND CONCENTRATIONS

The Imperial County Air Pollution Control District (ICAPCD) and CARB maintain a network of seven ambient air quality monitoring stations in Imperial County. Five of these stations (Niland, Brawley, Westmorland, El Centro, and Calexico-Grant Street) are operated by the ICAPCD and two stations

[1] CARB has listed ammonia as Category IIb, or "Substance not identified as Toxic Air Contaminant known to be emitted in California, with one or more health values under development by the Office of Environmental Health Hazard Assessment for review by the Scientific Review Panel" (CARB 2010b).

(Calexico-Ethel Street and Calexico-East) are operated by CARB. The purpose of the monitoring network is to measure air pollutant levels in air. As indicated previously, the air basin is currently designated as being in nonattainment for ozone and PM_{10} with respect to NAAQS and CAAQS. In addition, certain areas within the SSAB (but not the area where the proposed Projects are to be located) are designated as being in nonattainment for $PM_{2.5}$ with respect to NAAQS.

The closest monitoring station to the proposed Project site is located at 7711 English Road in the Town of Niland, approximately 0.57 miles north of the boundary of the Projects' site. While both ozone and PM_{10} are measured at the Niland air monitoring station; none of the other criteria pollutants are monitored at this station. The Brawley monitoring station, located at 220 Main Street, approximately 26 miles south of the proposed Project site, monitors $PM_{2.5}$ in addition to ozone and PM_{10}. Table 4.3-4 shows a summary of the monitoring data for these pollutants for years 2006 through 2010.

4.3.2 REGULATORY SETTING

FEDERAL AND STATE

Federal Clean Air Act and California Clean Air Act

The Clean Air Act of 1970 (CAA) (42 United States Code [U.S.C.] §§7401-7641) (last amended by the Clean Air Act Amendments of 1990 [104 Stat. 2468, P.L. 101-549]), defines the EPA's role in managing air quality in the United States. Under the CAA, the EPA promulgated the NAAQS (40 CFR Part 50), setting limits on the acceptable ambient air concentrations for each of the federally identified criteria air pollutants.

Similar to the CAA, the California Clean Air Act of 1988 (CCAA) (Stats. 1988, Ch. 1568) requires all air quality planning regions to achieve and maintain the CAAQS by the earliest date practicable. The CCAA also requires that air quality regions that have failed to meet the CAAQS work with the CARB to prepare State Implementation Plans (SIPs) demonstrating when and how the CAAQS will be met.

California Air Resources Board (CARB)

The CARB, a part of the California Environmental Protection Agency (Cal/EPA), is responsible for interpreting and implementing state statutes that manage air pollution. CARB gathers air quality data for the State of California, ensures the quality of these data, designs and implements air models, sets ambient air quality standards for the state, compiles the state's emissions inventories, and performs air quality and emissions inventory special studies. CARB is responsible for monitoring the regulatory activity of California's 35 local and regional air pollution control districts. These districts regulate stationary emissions sources (i.e., industrial pollution sources), issue air quality permits, develop local air quality plans, and ensure that industries under their jurisdiction adhere to air quality mandates.

TABLE 4.3-4 BACKGROUND AIR QUALITY DATA

MONITORING STATION	POLLUTANT	MONITORING YEAR				
		2006	2007	2008	2009	2010
Niland (English Road)	**OZONE (O3)**					
	Maximum Concentration – 1-Hr. Period (ppm)	0.091	0.091	0.090	0.091	0.089
	Maximum Concentration – 8-Hr. Period (ppm)	0.080	0.082	0.085	0.083	0.075
	Number of Days National Standard Exceeded (8-Hr. Period) [2]	6	7	3	5	0
	Number of Days State Standard Exceeded (8-Hr. Period) [2]	3	15	11	16	5
	RESPIRABLE PARTICULATE MATTER (PM10)[1]					
	Maximum Concentration –24-Hr. Period (μg/m³) Based on method to compare with National Standard	116.0	162.0	121.6	202.1	58.1
	Number of Days National Standard Exceeded (24-Hr. Period) [2]	0	4	0	6	0
	Maximum Concentration –24-Hr. Period (μg/m³) Based on method to compare with State Standard	113.0	160.0	129.7	192.9	113.4
	Number of Days State Standard Exceeded (24-Hr. Period) [2]	31	83	62	74	44
Brawley (Main Street)	**OZONE (O3)**					
	Maximum Concentration – 1-Hr. Period (ppm)	0.063	0.082	0.065	NA	NA
	Maximum Concentration – 8-Hr. Period (ppm)	0.049	0.069	0.060	NA	NA
	Number of Days National Standard Exceeded (8-Hr. Period) [2]	0	0	0	NA	NA
	Number of Days State Standard Exceeded (8-Hr. Period) [2]	0	0	0	NA	NA
	RESPIRABLE PARTICULATE MATTER (PM10)[1]					
	Maximum Concentration – 24-Hr. Period (μg/m³) Based on method to compare with National Standard	127.0	291.0	137.0	196.4	61.6
	Number of Days National Standard Exceeded (24-Hr. Period) [2]	0	13	0	19	0
	Maximum Concentration – 24-Hr. Period (μg/m³) Based on method to compare with State Standard	123.0	296.0	138.0	196.4	105.9
	Number of Days State Standard Exceeded (24-Hr. Period) [2]	100	159	61	90	48
	FINE PARTICULATE MATTER ($PM_{2.5}$)					
	Maximum Concentration – 24-Hr. Period (μg/m3)	30.4	19.5	32.7	26.6	16.2
	Number of Days National Standard Exceeded (24-Hr. Period) [2]	*	*	0	*	*

Source: CARB 2012b

Notes:

[1] National maximum concentrations calculated for standard conditions and state maximum concentrations calculated for local conditions. Standard conditions are corrected for local temperature and atmospheric pressure.

[2] Fractional number of days of National and State Standard Exceedance, as reported by CARB, have been rounded to next highest whole number.

Key:

* = Insufficient data available

LOCAL

Imperial County Air Pollution Control District (ICAPCD)

The ICAPCD is the local air pollution control agency for Imperial County, which includes the southern half of the SSAB. The ICAPCD has primary responsibility for ensuring that state and federal air quality standards are attained and maintained within the ICAPCD's jurisdiction. To that end, the ICAPCD is responsible for preparing clean air plans, issuing construction and operation permits, monitoring ambient air quality, and promulgating rules and regulations governing air quality within Imperial County. The ICAPCD has also produced California Environmental Quality Act (CEQA) guidelines that include significance thresholds for determining potential impacts to air quality from operational and construction related gas emissions. Rules and regulations promulgated by the ICAPCD applicable to the proposed Projects include the following:

- ICAPCD Rule 207.C.1, New and Modified Stationary Source Review (best available control technologies [BACT]), requires that any new or modified emissions unit that has a potential to emit 25 pounds per day or more of any nonattainment pollutant or its precursors, or 55 pounds per day of H_2S, must include best available control technology (BACT) as a part of the Projects.

- ICAPCD Rule 207.C.2, New and Modified Stationary Source Review (Offsets), requires the purchase of offsets for facility emissions of criteria air pollutants in excess of 137 pounds a day.

- ICAPCD Rule 400, Nuisances, forbids the emission of air contaminants or other materials that would cause a nuisance to the public, including non-agricultural related odors.

- ICAPCD Regulation VIII, Rule 801 (Construction and Earthmoving Activities) requires the implementation of a dust management control plan for all non-residential projects of five acres or more.

- ICAPCD Rule 900, Major Stationary Source Permits, Rule 900 implements the requirements of Title V of the federal CAA as amended in 1990 for permits to operate. Title V provides for the establishment of operating permit programs for sources which emit regulated air pollutants, including attainment and nonattainment pollutants.

Imperial County 2009 PM10 State Implementation Plan

Based on the fact that six Imperial County monitoring stations were in violation of the PM_{10} 24-hour standard during 1999-2001, in December, 2007, the EPA issued a final rule action requiring the state to submit an air quality plan demonstrating that Imperial County will attain the PM_{10} standard as expeditiously as practicable. In August, 2009, the ICAPCD Board adopted the Imperial County 2009 PM_{10} State Implementation Plan (SIP). Efforts coordinated by Imperial County also include the 2005 amendments of the District's Regulation VIII Best Available Control Methods (BACM), adopted in advance of the PM_{10} SIP for the purposes of accelerating BACM implementation and of meeting the requirements and schedule of the County's Natural Event Action Plan.

The 2009 Imperial County PM_{10} SIP addresses the following elements, required under the CAA of areas classified to be in serious nonattainment of the NAAQS:

- Best available emission inventories;
- A plan that enables attainment of the PM_{10} federal air quality standards;
- Annual reductions in PM_{10} or PM_{10} precursor emissions that are not less than 5 percent from the date of SIP submission until attainment;
- Best available control measures and best available control technologies for significant sources and major stationary sources[2] of PM_{10}, to be implemented no later than 4 years after reclassification of the area as serious;
- Transportation conformity and quantitative milestones; and
- Contingency measures to be implemented (without the need for additional rulemaking actions) in the event that the control measure regulations incorporated in the plan cannot be successfully implemented or fail to give the expected emissions reductions.

Imperial County 2009 "1997 8-Hour Ozone Modified Air Quality Management Plan"

In December, 2009, the EPA promulgated a clean data finding for Imperial County, indicating that the County's air quality now complies with the 1997 8-hour ozone ambient air quality standard. This action suspended certain CAA requirements that Imperial County would have had to address as a moderate ozone nonattainment area. In July, 2010, the ICAPCD adopted the 2009 Ozone Air Quality Attainment Plan (AQAP) and the 2009 Reasonably Available Control Technology (RACT) SIP to fulfill CAA requirements that were not suspended by the clean data finding and to fulfill RACT requirements for moderate nonattainment areas.

County of Imperial General Plan

The County of Imperial General Plan consists of nine elements including Land Use, Housing, Circulation and Scenic Highways, Noise, Seismic and Public Safety, Agricultural, Conservation and Open Space, Geothermal and Transmission, and Water. The Land Use, Conservation and Open Space, and Geothermal and Transmission elements include policies for protecting air quality that are applicable to the proposed Projects. Table 4.3-5 includes an analysis of the proposed Projects' consistency with the applicable policies.

[2] A major stationary source is defined in a serious nonattainment area for PM_{10} as any source that has the potential to emit ≥ 70 tons per year of PM_{10} or PM_{10} precursors.

TABLE 4.3-5 HR-2 AND SMCP-2 PROJECTS' CONSISTENCY WITH APPLICABLE GENERAL PLAN AIR QUALITY GOALS AND OBJECTIVES

GENERAL PLAN POLICIES	CONSISTENCY	ANALYSIS
LAND USE ELEMENT (LUE)		
LUE Objective 9.6: Incorporate the strategies of the Imperial County Air Quality Attainment Plan (AQAP) in land use planning decisions and as amended.	Yes	The AQAP includes the rules and regulations promulgated by the ICAPCD that are applicable to land use projects in Imperial County. The proposed Projects will each require an Authority to Construct and a Permit to Operate issued by the ICAPCD. Accordingly, the proposed Projects must comply with applicable ICAPCD rules and regulations, either through project design or inclusion of mitigation, to qualify for the necessary permits to implement construction and operation.
LU Objective 9.7: Implement a review procedure for land use planning and discretionary project review which includes the Imperial County Air Pollution Control District.	Yes	As the air pollution control district for the County, the ICAPCD must review all projects subject to environmental documentation. This review may entail the required inclusion of mitigation or other measures to reduce project emissions to levels acceptable per ICAPCD rules and regulations. The ICAPCD will review the proposed Projects as part of the CEQA process.
CONSERVATION AND OPEN SPACE ELEMENT (COSE)		
COSE Goal 9: The County shall actively seek to improve and maintain the quality of air in the region.	Yes	The ICAPCD seeks to improve and maintain the quality of air in Imperial County through issuance of air quality management plans, rules, and regulations that reflect both state and federal requirements for meeting air quality objectives. The proposed Projects must comply with the requirements of these plans, rules, and regulations to gain approval from the County.
COSE Objective 9.1: Ensure that all facilities shall comply with current federal and state requirements for attainment of air quality objectives.	Yes	The proposed Projects will obtain Authorities to Construct and Permits to Operate from the ICAPCD. Issuance of these permits will be evidence of compliance with current federal and state requirements for attainment of air quality objectives.
COSE Objective 9.2: Cooperate with all federal and state agencies in the effort to attain air quality objectives.	Yes	The ICAPCD seeks to improve and maintain the quality of air in Imperial County through issuance of air quality management plans, rules, and regulations that reflect both state and federal requirements for meeting air quality objectives. The proposed Projects must comply with the requirements of these plans, rules, and regulations to gain approval from the County.

TABLE 4.3-5 HR-2 AND SMCP-2 PROJECTS' CONSISTENCY WITH APPLICABLE GENERAL PLAN AIR QUALITY GOALS AND OBJECTIVES

GENERAL PLAN POLICIES	CONSISTENCY	ANALYSIS
Geothermal and Transmission Element (GTE)		
Objective 9.7: Assure that geothermal and transmission line development complies with Imperial County Air Pollution Control District's regulations and mitigation measures.	Yes	As the air pollution control district for the County, the ICAPCD must review all projects subject to environmental documentation. This review may entail the required inclusion of mitigation or other measures to reduce each project's emissions to levels acceptable per ICAPCD rules and regulations. Furthermore, the ICAPCD is responsible for issuing permits for construction and operation of the proposed Projects. Accordingly, the proposed Projects must comply with applicable ICAPCD rules and regulations, either through Projects design or inclusion of mitigation, to qualify for the necessary permits to implement construction and operation.

Source: County of Imperial 1993, 2006, and 2008.

4.3.3 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

The impact analysis provided below is based on the following State CEQA Guidelines Appendix G. An impact is considered significant if the project would:

1. Conflict with or obstruct implementation of the applicable air quality plan.
2. Violate any air quality standard or contribute substantially to an existing or projected air quality violation.
3. 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 releasing emissions which exceed quantitative thresholds for ozone precursors).
4. Expose sensitive receptors to substantial pollutant concentrations.
5. Create objectionable odors affecting a substantial number of people.

ICAPCD THRESHOLDS OF SIGNIFICANCE

While final determination of whether or not a project is significant relies on the responsibility of the lead agency pursuant to Section 15064(b) of the State CEQA Guidelines, the ICAPCD recommends the use of air pollution thresholds as guidance in determining whether a project could result in a significant air quality impact (Table 4.3-6). If the lead agency finds that a project has the potential to exceed these air pollution thresholds, the project's impact would be considered significant.

TABLE 4.3-6 ICAPCD RECOMMENDED THRESHOLDS OF SIGNIFICANCE

CRITERIA POLLUTANT	OPERATIONS (POUNDS/DAY)	CONSTRUCTION (POUNDS/DAY)
NOx	55	100
ROG	55	75
PM_{10}	150	150
SOx	150	--
CO	550	550

Source: ICAPCD 2007.

For construction emissions, the ICAPCD CEQA Handbook (2007) recommends conducting initial analyses based on a qualitative approach and the implementation of effective and comprehensive mitigation measures. Projects exceeding the construction thresholds are required to submit a detailed emissions analysis, and implement standard, discretionary, and enhanced mitigation measures for construction equipment and fugitive PM_{10}. In addition, a health risk assessment is recommended if a project would have the potential to emit pollutants and is located in close proximity to sensitive receptors.

Because the operational phase of a project has the potential of creating long term impacts on air quality, the ICAPCD recommends that projects whose operational emissions are expected to exceed the thresholds of significance be deemed to have a potentially significant adverse impact on air quality.

For industrial development, the ICAPCD recommends operational thresholds (as listed in Table 4.3-6) be used only to determine significance of the impact from mobile source emissions attracted to the stationary source. Thresholds in Table 4.3-6 would not be used to determine significance for the air emissions associated with the stationary source, including off-road mobile emissions produced within the stationary source; since those sources are already subject to mitigation according to ICAPCD Rules 207 and 201. However, the ICAPCD CEQA Guidance also states that "the Lead Agency has the authority to request a comprehensive air quality analysis or an EIR to address the impact of all sources regardless of the recommended operational thresholds."

For the purposes of this analysis, air pollutant emissions from stationary sources associated with the proposed Projects' operations are compared with the ICAPCD Rule 207 Standards, as defined in Subsection C.1, and Offset Requirements, as defined in Subsection C.2 (refer to Section 4.3.2, Regulatory Setting, for emission limits). These standards are applicable as threshold of significance for operational stationary sources only.

The ICAPCD has not adopted a specific threshold of significance for TACs, but ICAPCD recommends it be consulted on any project with the potential to emit toxic or hazardous air pollutants. A health risk assessment may be also required to determine the potential level of risk associated with the operation and if emissions would exceed a certain magnitude, especially those located in close proximity to already existing industrial type operations and/or have the potential to emit TACs.

Consistent with the California Air Pollution Control Officers Association (CAPCOA) guidance for performing analysis and risk assessments related to TACs (CAPCOA 2009), for acute (short-term), non-cancerous health effects and chronic (long-term) non-cancerous health effects, impacts are considered significant if the proposed Projects would result in emissions that pose an acute or chronic health risk with a health hazard index (HHI) of 1 or greater. The acute HHI is the ratio of the average short term ambient concentration of an acutely toxic substance or substances, divided by the acute reference response level set by the California Office of Health Hazard Assessment (OEHHA). Similarly, the chronic HHI is the ratio of the average annual ambient concentration of a chronic toxic substance divided by the chronic reference exposure level set by the OEHHA (CAPCOA 2009).

For potentially carcinogenic effects associated with TAC emissions, impacts are considered significant if the Projects would pose a lifetime cancer risk of greater than one in one million (Cal/EPA 2003).

ENVIRONMENTAL PROTECTION MEASURES

Chapter 3 provides a complete list and description of Environmental Protection Measures (EPMs) that Hudson Ranch Power II, LLC and Simbol, Inc. have incorporated into their respective projects to avoid or minimize impacts on all resources.

The HR-2 EPMs that are proposed to minimize or avoid impacts to air quality resources are as follows:

HR-2 Construction Environmental Protection Measures

- EPM AQ-1: Fugitive Dust Suppression Plan. This plan will provide a detailed list of control measures to reduce fugitive emissions from construction and operational activities, including, but not limited to, watering of unpaved roads, vehicle speed limits, windbreaks, transport container covers, and cleaning and sweeping procedures.

- EPM AQ-2: Well Drilling Compliance Program. This program will require contractors to obtain Imperial County Air Pollution Control District permits to minimize air emissions.

- EPM AQ-3: Exhaust Emissions Control Program. This plan will provide a detailed list of control measures to minimize exhaust emissions during project construction, including, but not limited to, fuel use, engine maintenance, and procedures.

- EPM AQ-4: Well Flow Testing Program. This program uses design features such as well test units to minimize the release of particulate matter and metals. This program includes flow rate and duration limits.

- EPM AQ-9: Air Quality Protection. Fugitive dust generation during construction and use of on-site plant roads and the well sites will be minimized by watering, as necessary. To further reduce fugitive dust emissions, vehicle traffic on plant roads and well sites will be kept below 15 miles per hour.

HR-2 Plant Operations Environmental Protection Measures

- EPM AQ-5: Cooling Tower Emission Program. This program incorporates the Biox® hydrogen sulfide abatement program to minimize hydrogen sulfide emissions from both the vent gas and the portion of condenser condensate being used as cooling tower makeup.

- EPM AQ-6: Dilution Water Heater Emission Program. This program uses design measures to control and minimize dilution water heater emissions.

- EPM AQ-7: Filter Cake Fugitive Emissions Control Plan. This plan incorporates handling procedures to control the potential fugitive emissions of particulate matter, including direct loading and tarping.

- EPM AQ-8: Operating and Maintenance Equipment Emission Control Program. This program will control air pollutant emissions from operating and maintenance equipment by meeting any applicable road or non-road emissions standards and maintaining the equipment with manufacturers' recommended procedures.

- EPM AQ-9: Air Quality Protection. Fugitive dust generation during construction and use of on-site plant roads and the well sites will be minimized by watering, as necessary. To further reduce fugitive dust emissions, vehicle traffic on plant roads and well sites will be kept below 15 miles per hour.

The SmCP-2 EPMs that are proposed to minimize or avoid impacts to air quality resources are included as follows:

SmCP-2 Construction Environmental Protection Measures

- EPM AQ -1: Air Quality Protection. An application would be submitted to the ICAPCD for an Authority to Construct permit for the site construction activities and any operational equipment or emission sources requiring a permit. The Plan specifies a detailed list of control measures to reduce fugitive emissions from operational and maintenance activities, including but not limited to watering of unpaved roads, vehicle speed limits, windbreaks, transport container covers, cleaning and sweeping procedures. The Project would comply with the ICAPCD permit conditions of approval to limit emissions from the Project activities.

- EPM AQ-9: Fugitive Dust Suppression Plan. Specifies detailed list of control measures to reduce fugitive emissions from operational and maintenance activities included but not limited to watering of unpaved roads, vehicle speed limits, windbreaks, transport container covers, cleaning and sweeping procedures.

SmCP-2 Plant Operations Environmental Protection Measures

- EPM AQ-2: Exhaust Emissions Control Program. SmCP-2 Specifies detailed list of control measures to minimize exhaust emissions during operation of the project, including but not limited to fuel use, engine maintenance, and procedures.

- EPM AQ–3: Cooling Tower Emission Program. Maintain low total dissolved solids content of the circulating cooling tower, and utilize high efficiency drift eliminators to minimize particulate emissions.

- EPM AQ–4: Process Equipment Emission Control. Process equipment emission control includes:

  – Mist eliminators for water vapor during venting

  – Filter press operations will be conducted in enclosures to control particulates

  – Off-gas vapor scrubbers from the HCl production process

  – Baghouse dust collectors or the equivalent will be used to minimize these emissions from dry reagent transfer and making systems

  – The Lithium Production and Packaging Buildings' air will be filtered and a negative pressure will be maintained to prevent fugitive dust emissions.

- EPM AQ–5: Filter Cake Storage Fugitive Emissions Control. Incorporates handling procedures to control the potential fugitive emissions of particulate matter, including direct loading into storage containers, and tarping.

- EPM AQ–6: Emergency Generators/Fire Pump Emission Control Program. Emergency generators will meet all current regulatory emission standards. The sulfur content of fuel used will meet the current California Air Resources Board (CARB) standards. Maintenance and testing operation of each emergency generator will not exceed 50 hours per year.

- EPM AQ–7: Operating & Maintenance Equipment Emission Control Program. Would control this equipment by meeting any applicable road or non-road 2001 emissions standards, as amended, and maintaining the equipment with manufacture's recommended procedures.

- EPM AQ–8: Potential Emissions Control Program. Would control potential temporary emissions by limiting the operation of temporary sources. Changes to process operations will undergo review for their environmental impact before adoption.

ADDITIONAL AIR QUALITY MODELING ASSUMPTIONS

In addition to the EPMs, the following practices were included as assumptions of the air pollutant emissions estimations described in Appendix C.

HR-2 Project construction:

- Dust Control during Asphalt Paving. The unpaved portion of McDonald Road between Highway 111 and English Road will be coated with an asphaltic dust palliative (ARAM or equivalent) at the beginning of the HR-2 Project construction. This coating has been determined by the ICAPCD to be an equivalent fugitive dust control measure to actual asphalt paving.

- Diesel Engines with Certified NOx Emissions. The HR-2 Project will require the grading contractor to use construction equipment using diesel engines with certified NOx emissions rated as Tier 3 or better.

- Reduction of Fugitive Dust Emissions. During grading, the HR-2 Project would be watering actively disturbed onsite areas at least three times a day as necessary to reduce fugitive dust emissions.

HR-2 Project Operations:

- Power during Operations. During operations, the HR-2 power plant would generate power to service its own electrical load and would not need to purchase electrical energy.

- Non-Condensable Gas Removal and Emission Abatement Systems. The Turbine Generator Facility (TGF) would include non-condensable gas removal and emission abatement systems. The abatement system is expected to remove at least 95 percent of the hydrogen sulfide (H_2S) in the non-condensable gases. Additionally, particle emissions from the cooling towers would be minimized by using high efficiency drift eliminators.

- Generators That Meet Pollutant Emission Limits. The two proposed standby/"black start" diesel engine generators, one emergency generator and one emergency fire pump engine would each meet the applicable EPA and CARB air pollutant emission limits. Each engine would be tested for less than 50 hours per year.

- Exhaust Emissions Control Program. Specifies detailed list of control measures to minimize exhaust emissions during operation of the Project, including but not limited to fuel use, engine maintenance, and procedures.

SmCP-2 Project construction:

- Diesel Engines with Certified NOx Emissions. The SmCP-2 applicant will require the grading contractor to use construction equipment using diesel engines with certified NOx emissions rated as Tier 3 or better.

- Reduction of Fugitive Dust Emissions. During grading, the SmCP-2 Project would be watering actively disturbed onsite areas at least three times a day as necessary to reduce fugitive dust emissions.

METHODOLOGY

Air pollutant emissions for both construction and operations of the proposed Projects were estimated using a combination of methods. For some of the Projects' sources, construction and operational emissions for both the HR-2 and SmCP-2 were estimated using the California Emission Estimator Model (CalEEMod) (version 2011.1), which can be used to estimate air pollutant emissions for various land uses, area sources, construction and operational activities, and vehicle travel. Additionally, the CalEEMod emission factors were used for estimating operational emissions associated with annual electrical energy use and water consumption.

For other Projects' operations and construction activities, air pollutant emissions were calculated using the U.S. EPA AP-42 Compilation of Air Pollutant Emission Factors, the CARB area-wide source methodologies (for land preparation emissions), and the GHG emission factors provided in the California Climate Action Registry General Reporting Protocol (version 3.0). In order to best utilize the capabilities of the CalEEMod and the other emission factor methodologies used, the applicants calculated emissions from both Projects' activities in multiple CalEEMod models and separate calculations using applicable emission factors. Given that the version of CalEEMod used for estimating construction emissions had incorrect emission factors for NOx, ROG and TOG emissions for Tier 2 and Tier 3 engines, the applicants generated corrected Tier 3 mitigated emissions for construction equipment as part of each of the air emissions reports (Appendix C).

Furthermore, the applicants conducted an assessment of the potential health risks from air toxics which may be emitted by the proposed Projects. This assessment has been prepared consistent with the methodology described in the OEHHA "Air Toxics Hot Spots Program Guidance for Preparation of Health Risk Assessments" (Cal/EPA 2003). Results from this assessment have been compared with recommended limits established by OEHHA for maximum acute hazard and risk, the maximum chronic non-cancer risk, and Cal/EPA for the maximum cancer risk.

Because the SmCP-2 plant would be dependent on the geothermal brine produced by the HR-2 geothermal flash plant, it would not be constructed or could not operate without the HR-2 geothermal operations. However, the HR-2 Project could operate without SmCP-2. Therefore, the air quality and air toxics health risk analyses presented as follows considered (a) construction and operations of HR-2 only; and (b) the combined construction and operation impacts of HR-2 and SmCP-2.

OVERVIEW OF CONSTRUCTION AND OPERATIONAL EMISSIONS

HR-2 Construction Emissions

The HR-2 Project construction would take approximately 28 months to complete (i.e., from July 2013 until June 2015). Construction activities would initiate with application of an asphaltic dust palliative (ARAM or equivalent) on an unpaved portion of McDonald Road that provides access into the proposed HR-2 plant site[3], then following with the site preparation, grading, foundation construction, building erection, architectural coating, onsite paving, well site grading, drill rig assembly, well drilling and testing. Emissions from the proposed construction activities would include combustion emissions from onsite heavy-duty diesel and gasoline powered equipment and offsite vehicle use, ROG from coating, and fugitive dust from earthmoving and offsite traffic in paved and unpaved roads[4]. Additionally, construction of the HR-2 Project would also involve the release of hydrogen sulfide (H_2S) during well drilling and testing operations. H_2S

[3] During construction, the HR-2 Project would apply the ARAM dust palliative. Paving of McDonald Road in full would be an activity covered by the Simbol Calipatria Plant I (SmCP-1) Project. However, in the event the SmCP-1 would not be approved; it has been assumed that the HR-2 project will include paving emissions as part of the air quality analysis.

[4] Concrete and/or asphaltic paving would be applied on the HR-2 Project onsite roads.

emissions during drilling and flow testing would occur on a short term basis at each well location and would be conducted under a permit from the ICAPCD.

Table 4.3-7 presents a summary of the estimated daily emissions for each year of construction, based on the anticipated construction schedule, phasing of the proposed activities, and implementation of the proposed EPMs. It is anticipated that certain construction activities, such as building erection, would overlap for at least one month with the well pad site grading, drill rig assembly, well drilling and testing. Detailed emissions estimates are included in Appendix C.

TABLE 4.3-7 SUMMARY OF HR-2 DAILY CONSTRUCTION AIR POLLUTANT EMISSIONS

YEAR	EMISSIONS/THRESHOLD	MAXIMUM DAILY EMISSIONS (LB/DAY)					
		ROG	NOX	CO	SO_2	PM_{10}	$PM_{2.5}$
2013	Construction Emissions	6	97	93	0.17	118	17
	ICAPCD Threshold	75	100	550	NA	150	NA
	Exceeds Threshold?	No	No	No	NA	No	NA
2014	Construction and Well Drilling Emissions	21	93	215	0.38	10	5
	ICAPCD Threshold	75	100	550	NA	150	NA
	Exceeds Threshold?	No	No	No	NA	No	NA
2015	Construction and Well Drilling Emissions	18	88	181	0.36	13	5
	ICAPCD Threshold	75	100	550	NA	150	NA
	Exceeds Threshold?	No	No	No	NA	No	NA

Source: EMA 2012a

Note: Geothermal well drilling would occur in years 2014 and 2015 and emissions sources associated with this activity would include drill rig; off-road equipment used during well assembly, drill and well testing; and worker and vendor vehicle use.

HR-2 Operational Emissions

Operations of the proposed HR-2 geothermal power plant would involve stationary and mobile emission sources associated with the proposed Brine Processing Facility (BPF), the Turbine-Generator Facility (TGF), common and ancillary facilities, a new overhead interconnection line, a water conveyance system, and worker and vendor vehicle use. Operational emissions associated with the HR-2 facility would include combustion emissions from onsite equipment and offsite traffic; noncondensable gases (NCG) from the geothermal brine containing H_2S, ROG, benzene, ammonia, and traces of other substances (methane, nitrogen, hydrogen, and argon); HCl vapors from storage tanks; particulate emissions from the cooling tower operations and traffic on unpaved roads; and the use of architectural coating and consumer products during maintenance.

Benzene, H_2S, and ammonia, contained in naturally occurring gases produced with the geothermal fluids, would be emitted from the geothermal plant. HCl, used to chemically stabilize the geothermal brine once the steam and NCG are removed, would be emitted during the filling of the HCl storage tank. DPM would be emitted during testing, maintenance, and operation of standby/"black start" and emergency diesel

engines. During plant startup and outages, produced steam would be diverted to a rock muffler for venting of the steam, H_2S, benzene, and other NCGs to the atmosphere.

All NCGs produced by the geothermal production wells which are not retained in the geothermal brine and injected into the geothermal reservoir would be delivered to the cooling tower, either from the condenser (dissolved in the condensate used as the cooling tower makeup water), or from the condenser NCG removal system (which would be pressurized and vented to the cooling tower H_2S abatement system). The applicant would abate the produced H_2S by using oxidizing process also known as Biox® process, which is expected to remove at least 95 percent of the H_2S in the condenser off-gas and at least 98 percent in the portion of the condensate used as cooling tower makeup water. The produced benzene would be emitted through the cooling tower unabated, while an estimated of 95 percent of the ammonia in the brine would remain dissolved in the cooling tower water and be injected into the geothermal reservoir.

Operations of the cooling tower would require the use of cooling makeup water, which during the cooler months would consist entirely of steam condensate with a low total dissolved solids (TDS) concentration. The TDS concentration is expected to increase during higher temperature summer months, due to the use of canal water from the IID "O" Lateral as supplemental cooling tower makeup water. The applicant would use high efficiency cooling tower drift eliminators to limit the emission of water droplets ("drift") which lead to aerosols that form when the emitted cooling tower liquid drift evaporates as particulates.

Summaries of emissions of criteria air pollutants, TACs and HAPs, and other gases from operations of the HR-2 geothermal power plant are provided in Tables 4.3-8 and 4.3-9. The HR-2 operational summary presents emissions during normal operations of the BPF and the TGF at the maximum operating rate (with abatement of H_2S emissions in the cooling tower); emissions from testing of emergency and standby diesel engines; and emissions during startup and outages.

TABLE 4.3-8 HR-2 FACILITY OPERATIONAL CRITERIA AIR POLLUTANT EMISSIONS

	DAILY OPERATIONAL EMISSIONS (LB/DAY)					
SOURCE	**ROG**	**NOX**	**CO**	**SO2**	**PM10**	**PM2.5**
NORMAL OPERATION (MOBILE SOURCES ATTRACTED TO STATIONARY SOURCE)						
Mobile sources	0.52	3.69	3.87	0.01	0.63	0.14
ICAPCD Operational Threshold (CEQA Handbook)	55	55	550	150	150	NA
Exceeds Threshold?	No	No	No	No	No	NA
NORMAL OPERATION (STATIONARY SOURCE)						
Area sources (1)	0.16	--	--	--	--	--
Energy consumption (2)	0.01	0.06	0.05	--	--	--
Off-road equipment	2.59	14.58	11.18	0.02	0.77	0.77
Fugitive Dust	--	--	--	--	6.98	0.7
Cooling Tower	13.4	--	--	--	11.53	--
Standby/"Black Start" Diesel Engine Generator Testing	2.20	19.29	19.29	0.03	0.06	--
Emergency Standby Diesel Generator Testing	0.17	1.76	3.08	0.005	0.018	--
Emergency Standby Fire Pump Testing	0.39	2.78	2.78	0.005	0.16	--
Total	19	39	36	0.06	20	2
ICAPCD Rule 207 Standards (Section C.2)	137	137	137	137	137	NA
Exceeds Threshold?	No	No	No	No	No	NA

TABLE 4.3-8 HR-2 FACILITY OPERATIONAL CRITERIA AIR POLLUTANT EMISSIONS

SOURCE	DAILY OPERATIONAL EMISSIONS (LB/DAY)					
	ROG	NOX	CO	SO2	PM10	PM2.5
OUTAGES AND STARTUP [3]						
Standby/"Black Start" Diesel Engine Generators [4]	106	926	926	1.66	2.64	--
Rock Muffler [5]	6.7	--	--	--	--	--
Total	113	926	926	1.66	2.64	--
ICAPCD Rule 207 Offset Requirements (Section C.2.a)	137	137	137	137	137	NA
Exceeds Threshold?	No	Yes	Yes [6]	No	No	NA

Source: EMA 2012b

Key:
ROG: Reactive organic gases
NOx: Nitrogen oxides
CO: Carbon monoxide
SO2: Sulfur dioxide
PM10: Particulate matter less than 10 microns in aerodynamic diameter.
PM2.5: Respirable particulate matter less than 2.5 microns in aerodynamic diameter
NA: Not applicable

Notes:
[1] The CalEEMod model used by the applicant for estimating the HR-2 Project operational emissions defines an area source as ROG emissions from area coating reapplication.
[2] The CalEEMod model used by the applicant for estimating the HR-2 Project operational emissions defines energy consumption as the energy associated with General Heavy Industry land use (natural gas).
[3] It is anticipated that during outages and startup, emissions from mobile sources would be equivalent to those estimated for normal operations.
[4] The emission values presented in Appendix C-2 for the operation of Standby/"Black Start" Engines were reported for each engine. Corrected values are for both engines.
[5] The applicant estimates that during outages ROG and other NCGs would be emitted from the rock muffler. Benzene is also listed as a ROG.
[6] Pursuant Section C.2.g of Rule 207 and provided that the HR-2 Project would be located in an attainment area for Carbon Monoxide, the HR-2 applicant has prepared a Technical Report to demonstrate that Carbon Monoxide emission increases will not cause or contribute to a violation of the AAQS (See Appendix C-5).

TABLE 4.3-9 HR-2 NON CONDENSABLE AND OTHER GASES OPERATIONAL EMISSIONS

DESCRIPTION	OPERATIONAL EMISSIONS (LB/DAY)			
	H_2S	Benzene	NH_3	HCl
Cooling Tower NCGs (Abated)	91.2	13.4	288	--
HCl Storage Tanks (Abated)	--	--	--	0.76
Total	91.2	13.4	288	0.76
Outages and Startup Rock Muffler[1]	912	6.7	2,880	---

Source: EMA 2012b

Key:
H2S: Hydrogen Sulfide
NH3: Ammonia
HCl: Hydrochloric Acid
ROC: Reactive Organic Compounds

Notes:
[1] During startup, emissions from HCl storage tanks may occur. HCl emissions from tanks would be equivalent to those estimated for normal operations.

There is also the potential for the release of criteria air pollutants, TAC and HAPs, and other gases emissions into the atmosphere as a result of the HR-2 plant start-up and outages (e.g., during a plant trip or load rejection). During these special operational circumstances, produced steam would be diverted to a rock muffler for venting of the steam, causing the release of unabated H_2S, ROG, benzene, ammonia and other NCG into the atmosphere. If the plant outage is expected to be short, approximately one to two hours or less, the geothermal wells would be kept flowing at approximately full flow so that the plant could be quickly restored to full operation. If the plant outage is expected to last more than 24 to 48 hours, the wells would be immediately reduced to their minimum stable flow rate. If the plant outage is expected to last more than 48 hours, the wells would be shut-in as quickly as safe. The applicant has conservatively assumed that no more than four plant outages would occur during a year, each requiring continuing well flows at half rate for up to 24 hours. Table 4.3-9 provides a summary of the daily rock muffler NCG potential emissions.

Two 2,500-kW standby/"black start" diesel engine-generators would be installed to provide electrical energy to re-start power plant operations following plant trips or shutdowns. During a plant start-up, operation of both proposed standby/ "black start" diesel engine generators would be necessary to provide electrical energy to the BFP and TGF until the steam turbine-generator is capable of providing the power plant's required electrical energy. The applicant has conservatively assumed that no more than two "cold" (i.e., when the geothermal wells have been completely shut-in) and two "warm" starts would occur each year, requiring the operation of both diesel engine generators for 36 and 12 hours, respectively. Emissions from these operations of the standby/"black start" diesel engine generators are included in Table 4.3-8.

SmCP-2 Construction Emissions

The SmCP-2 Project construction would take approximately 21 months, from March 2015 until December 2016. Construction activities would initiate with site preparation and grading of the 32.4-acre site, following with the foundation construction, building erection, architectural coating, onsite paving[5], and power line construction. During March to May 2015, SmCP-2 construction activities would overlap with the proposed HR-2 building erection, coating, and onsite paving. Project paving of 200,000 square feet of McDonald Road to County standards would follow construction of the SmCP-2 plant[6]. No demolition is expected to be necessary for the SmCP-2.

Emissions from the proposed SmCP-2 construction activities would include combustion emissions from onsite heavy-duty diesel and gasoline powered equipment and offsite vehicle use, ROG from coating and paving, and fugitive dust from earthmoving and offsite traffic in paved and unpaved roads. The proposed SmCP-2 plant operations would occur simultaneously with the proposed HR-2 geothermal power plant operations.

[5] Concrete and/or asphaltic paving would occur on the SmCP-2 onsite roads.

[6] Paving of McDonald Road in full would be an activity covered by the Simbol Calipatria Plant I (SmCP-1) Project. However, in the event the SmCP-1 would not be approved; it has been assumed that the HR-2 project include paving emissions as part of the air quality analysis.

Table 4.3-10 summarizes the estimated daily emissions per year of construction, based on the anticipated construction schedule, phasing of the proposed activities, and implementation of proposed EPMs. It is anticipated that certain construction activities, such as building erection and coating, would overlap for at least one month with the proposed power line construction and onsite paving. Additionally, emissions from the SmCP-2 construction activities during the year 2015 would overlap with the proposed HR-2 building erection, coating, onsite paving and geothermal power plant operations. Construction emissions for the SmCP-2 project have been estimated by the applicant based on the methods indicated in Appendix C.

TABLE 4.3-10 SUMMARY OF SMCP- 2 DAILY CONSTRUCTION AIR POLLUTANT EMISSIONS

PERIOD	EMISSIONS/THRESHOLD	MAXIMUM DAILY EMISSIONS (LB/DAY)					
		ROG	NOx	CO	SO_2	PM_{10}	$PM_{2.5}$
2015 (March)	SmCP-2 Construction	< 0.1	< 0.1	0.4	< 0.1	60	9
	HR-2 Construction	9	72	79	0.1	8	5
	Combined	9	72	79	0.1	68	14
	ICAPCD Threshold	75	100	550	NA	150	NA
	Exceeds Threshold?	No	No	No	NA	No	NA
2015 (Apr-May)	SmCP-2 Construction	16	94	65	0.2	15	6
	HR-2 Construction	5	36	42	0.1	3	2
	Combined	21	130	107	0.3	18	8
	ICAPCD Threshold	75	100	550	NA	150	NA
	Exceeds Threshold?	No	Yes	No	NA	No	NA
2015 (Jun-Dec)	SmCP-2 Construction	21	86	107	0.2	14	6
	ICAPCD Threshold	75	100	550	NA	150	NA
	Exceeds Threshold?	No	No	No	NA	No	NA
2016	SmCP-2 Construction	21	89	109	0.2	14	6
	ICAPCD Threshold	75	100	550	NA	150	NA
	Exceeds Threshold?	No	No	No	NA	No	NA

Source: EMA 2012a, EMA 2012c

Key:
ROG: Reactive organic gases
NOx: Nitrogen oxides
CO: Carbon monoxide
SO2: Sulfur dioxide
PM10: Particulate matter less than 10 microns in aerodynamic diameter.
PM2.5: Respirable particulate matter less than 2.5 microns in aerodynamic diameter
NA: Not applicable

SmCP-2 Operational Emissions

Operations of the proposed SmCP-2 mineral extraction plant would involve stationary and mobile emission sources associated with the proposed silica management, lithium extraction and purification, lithium carbonate production, zinc and manganese extraction and production, miscellaneous processes, and worker and vendor vehicle use. Operations of the SmCP-2 plant would occur simultaneously with operations of the HR-2 Project and involve daily worker and vendor vehicle trips; haul truck trips; water

consumption for cooling towers, process water and potable water; chemical processing and packaging; and emergency standby diesel generator and fire pump engines.

Operational emissions associated with the SmCP-2 facility would include:

- Particulates emissions from drying, transfer, and packaging lithium and zinc products; loading and unloading of calcium oxide, flocculants, salt, and soda ash reagent storage and discharge systems; operations of the cooling tower; and worker/vehicle use on roads.
- HCl vapor emissions produced by the HCl synthesis process from the hydrogen and chlorine gases produced by the process of converting lithium chloride to lithium hydroxide;
- Emissions of benzene, H_2S, and ammonia from the CO_2 stream delivered from the HR-2 plant to the SmCP-2 facility;
- H_2S emitted from the gas space in the sodium hydrosulfide (NaHS) tank during the filling of the NaHS; and
- Combustion emissions, including DPM, from maintenance, testing and emergency operations of the emergency diesel engine-generator and emergency diesel fire pump engine, and worker/vendor vehicle use.

Summaries of emissions of criteria air pollutants, TAC or HAPs, and other gases from operations of the SmCP-2 mineral extraction plant are provided in Tables 4.3-11 and 4.3-12. Since the SmCP-2 Project would occur only if the HR-2 Project is approved, these tables provide the combined emissions from operations. The SmCP-2 operational emissions summary assumes normal operations of the silica, lithium, zinc and manganese units at the maximum operating rate; daily reagent deliveries equal or exceed the daily consumption of each reagent; and testing of emergency engines, all on the same day, for no more than one hour each. The applicant would implement operational EPMs, such as the use of emergency engines that meet BACT requirements for NOx emissions, and the use of low sulfur fuel in stationary combustion sources.

TABLE 4.3-11 SMCP-2 CRITERIA AIR POLLUTANT OPERATIONAL EMISSIONS

SOURCE	OPERATIONAL EMISSIONS (LB/DAY)					
	ROG	NOx	CO	SO_2	PM_{10}	$PM_{2.5}$
NORMAL OPERATIONS (MOBILE SOURCES ATTRACTED TO THE STATIONARY SOURCE)						
Mobile sources	7.83	24.80	30.57	0.05	5.38	0.99
ICAPCD Operational Threshold (CEQA Handbook)	55	55	550	150	150	NA
Exceeds Threshold?	No	No	No	No	No	NA
NORMAL OPERATIONS (STATIONARY SOURCE)						
Off-road equipment	1.41	26.63	30.09	0.05	1.87	1.87
Product Drying, Transfer, and Packaging	--	--	--	--	1.92	0.80
Reagent Storage Systems Loading and Unloading	--	--	--	--	0.12	0.03
Cooling Tower	--	--	--	--	8.73	8.73

TABLE 4.3-11 SMCP-2 CRITERIA AIR POLLUTANT OPERATIONAL EMISSIONS

SOURCE	OPERATIONAL EMISSIONS (LB/DAY)					
	ROG	NOx	CO	SO_2	PM_{10}	$PM_{2.5}$
Emergency Standby Diesel Engine-Generator #1	0.99	1.65	8.63	0.02	0.25	0.25
Emergency Standby Fire Pump Diesel Engine	0.06	0.42	0.51	0.001	0.02	0.02
Total	*3*	*29*	*39*	*0.07*	*13*	*12*
HR-2 Normal Operations *Total*	*19*	*39*	*36*	*0.06*	*20*	*2*
Combined SmCP-2 / HR-2 Operations *Total*	*22*	*68*	*75*	*0.1*	*33*	*14*
ICAPCD Rule 207 Standards (Section C.2)	137	137	137	137	137	NA
Exceeds Threshold?	No	No	No	No	No	NA

Source: EMA 2012d

Key:
ROG: Reactive organic gases
CO: Carbon monoxide
NOx: Nitrogen oxides
SO_2: Sulfur dioxide
PM10: Particulate matter less than 10 microns in aerodynamic diameter.
PM2.5: Respirable particulate matter less than 2.5 microns in aerodynamic diameter
NA: Not Applicable

TABLE 4.3-12 SMCP-2 HAZARDOUS AIR POLLUTANT AND OTHER GASES OPERATIONAL EMISSIONS

SOURCE	OPERATIONAL EMISSIONS (TONS PER YEAR)				
	DPM	Benzene	HCl	H_2S	NH_3
SmCP-2 Operations					
HCl Synthesis with Scrubber	--	--	1.21	--	--
HCl Storage Tank with Scrubber	--	--	0.21	--	--
Noncondensable Gas Emissions	--	0.35	--	1.83	15.0
Emergency Diesel Engine-Generator	0.002	--	--	--	--
Emergency Standby Fire Pump	0.00003	--	--	--	--
Total	*0.002*	*0.35*	*1.42*	*1.83*	*15.0*
HR-2 Normal Operations *Total*	*0.003*	*2.45*	*0.02*	*16.6*	*53.0*
SmCP-2 / HR-2 Combined Operations *Total*	*0.005*	*2.80*	*1.44*	*18.4*	*68.0*

Source: EMA 2012d

Key:
DPM: Diesel Particulate Matter
H_2S: Hydrogen Sulfide
HCl: Hydrochloric Acid
NH3: Ammonia

Health Risk Assessment

A health risk assessment (HRA) was conducted to determine potential effects related to the emission of TACs from the operations of the proposed HR-2 and SmCP-2 facilities. The HRA accounts for the inhalation health risks associated with fugitive emissions from stationary combustion equipment and chemical storage, transfer, and processing facilities. The risk assessment process involved: hazard identification, exposure assessment, dose-response assessment, and risk characterization.

The HRA evaluated the health risks at existing sensitive receptors sites (e.g., residences, schools, hospitals, daycare, and eldercare facilities) and other receptor sites (i.e., commercial and industrial sites) in proximity to the HR-2 and SmCP-2 plants were identified. Impacts were evaluated at residences and commercial/industrial sites within a two-mile radius from the facilities. In addition risks were evaluated at the four closest residences in the Community of Niland and three residences located along State Highway 111. No schools, hospitals, daycare, and eldercare sensitive receptors were identified within the two-mile radius. However, three schools in the Community of Niland (outside the two-mile radius) were included in the assessment. The receptor locations considered in the analysis three schools, ten residences, and six commercial/industrial sites.

An estimation of how different level of exposure to a chemical can impact the likelihood and severity of health effects was performed in the HRA to evaluate potential cancer and non-cancer[7] effects. Acute (short-term) exposure levels were based on the maximum predicted downwind concentrations of TACs/HAPs emitted by each facility. For this assessment, cancer risk was expressed as the maximum number of new cases of cancer projected to occur in a population of one million people due to exposure to a TAC over a 70-year lifetime. Non-cancer risk was determined by comparing the average modeled level of exposure to a chemical to the level of exposure that is not expected to cause any adverse effects over a certain period of time. Non-cancer risk is often represented by the acute (short-term) and chronic (long term) hazard quotient[8] and hazard index[9] (Cal/EPA 2003).

The highest acute and chronic non-cancer risks, and the cancer risk estimates from HRA results were summarized. Impacts associated with the HR-2 Project only are presented in Tables 4.3-13 to 4.3-16. Impacts associated with the combined SmCP-2 and HR-2 operations are presented in Tables 4.3-13 to 4.3-19. The detailed HRA is included as Appendix M.

TABLE 4.3-13 HIGHEST ACUTE NON-CANCER RISK BY THE HR-2 PROJECT (NORMAL OPERATIONS)

RECEPTOR	AFFECTED ORGAN SYSTEM	ACUTE HAZARD QUOTIENT (1)			ACUTE HAZARD INDEX	OEHHA THRESHOLD	SIGNIFICANT EFFECT?
		H_2S	BENZENE	HCL			
Niland Head Start	Nervous	0.007	0.00001	0.00006	0.007	1.0	No
Storage Yard Workers	Nervous	0.03	0.00001	0.0005	0.03	1.0	No
Algae Farm Caretaker Residence	Nervous	0.03	0.00009	0.0001	0.03	1.0	No

[7] Non-cancer effects, such as asthma, nervous system disorders, birth defects, and developmental problems in children, typically become more severe as exposure to a chemical increases.

[8] Hazard Quotient (HQ) is defined by Cal/EPA as the estimated ground level concentration divided by the reference exposure level for a single substance and a particular end point. The Acute HQ is obtained dividing the one hour maximum concentration of a substance by the acute Reference Exposure Level for the substance. The Chronic HQ is calculated dividing the annual concentration by the chronic Reference Exposure Level for the substance.

[9] Hazard Index (HI) is defined as the sum of individual acute or chronic hazard quotients for each substance affecting a particular toxicological point.

TABLE 4.3-13 HIGHEST ACUTE NON-CANCER RISK BY THE HR-2 PROJECT (NORMAL OPERATIONS)

RECEPTOR	AFFECTED ORGAN SYSTEM	ACUTE HAZARD QUOTIENT (1)			ACUTE HAZARD INDEX	OEHHA THRESHOLD	SIGNIFICANT EFFECT?
		H_2S	BENZENE	HCL			
SW Duck Ponds Workers	Nervous	0.01	0.00003	0.0003	0.01	1.0	No

Source: EMA 2012e

Notes:

(1) Acute exposure period for Benzene is 6 hours. For H_2S and HCl the acute exposure period is 1-hour.

TABLE 4.3-14 HIGHEST ACUTE NON-CANCER RISK BY THE HR-2 PROJECT (STARTUP AND OUTAGES)

RECEPTOR	AFFECTED ORGAN SYSTEM	ACUTE HAZARD QUOTIENT			ACUTE HAZARD INDEX	OEHHA THRESHOLD	SIGNIFICANT EFFECT?
		H_2S	BENZENE	HCL			
Niland Head Start	Nervous	0.15	0.00001	<0.0001	0.15	1.0	No
Storage Yard Workers	Nervous	0.52	0.00006	<0.0001	0.52	1.0	No
Algae Farm Caretaker Residence (1)	Nervous	0.57	0.00005	<0.0001	0.57	1.0	No
SW Duck Ponds Workers	Nervous	0.28	0.00003	<0.0001	0.28	1.0	No

Source: EMA 2012e

Notes:

(1) Acute exposure period for Benzene is 6 hours. For H_2S and HCl the acute exposure period is 1-hour.

TABLE 4.3-15 HIGHEST CHRONIC NON-CANCER RISK BY THE HR-2 PROJECT (NORMAL OPERATIONS)

RECEPTOR	CHRONIC HAZARD QUOTIENT				CHRONIC HAZARD INDEX	OEHHA THRESHOLD	SIGNIFICANT EFFECT?
	H_2S	BENZENE	HCL	DIESEL PM			
Publica High School	0.0005	0.00001	<0.00001	0.000001	0.0005	1.0	No
Algae Farm Caretaker Residence	0.007	0.0002	0.00001	0.00001	0.007	1.0	No
SW Duck Ponds Workers(1)	0.002	0.00004	<0.00001	0.000003	0.002	1.0	No

Source: EMA 2012e

TABLE 4.3-16 CANCER RISK FOR THE HR-2 PROJECT (NORMAL OPERATIONS)

RECEPTOR	CANCER RISK		TOTAL CANCER RISK	OEHHA THRESHOLD	SIGNIFICANT EFFECT?
	BENZENE	DIESEL PM			
Publica High School	2.52×10^{-8}	----	2.52×10^{-8}	1×10^{-6}	No
Algae Farm Caretaker Residence	2.49×10^{-8}	3.31×10^{-7}	3.56×10^{-7}	1×10^{-6}	No
SW Duck Ponds Workers (	1.28×10^{-9}	1.94×10^{-8}	2.07×10^{-8}	1×10^{-6}	No

Source: EMA 2012e

TABLE 4.3-17 HIGHEST ACUTE NON-CANCER RISK BY THE COMBINED SMCP-2 AND HR-2 OPERATIONS (HR-2 OUTAGES)

RECEPTOR	AFFECTED ORGAN SYSTEM	ACUTE HAZARD QUOTIENT[(1)]			ACUTE HAZARD INDEX	OEHHA THRESHOLD	SIGNIFICANT EFFECT?
		H_2S	BENZENE	HCL			
Niland Head Start	Nervous	0.15	<0.001	<0.001	0.15	1.0	No
S Storage Yard	Nervous	0.52	<0.001	<0.001	0.52	1.0	No
Algae Farm Caretaker Residence	Nervous	0.57	<0.001	<0.001	0.57	1.0	No
SW Duck Ponds Workers	Nervous	0.28	<0.001	<0.001	0.2814	1.0	No

Source: EMA 2012e

Notes:

(1) Acute exposure period for Benzene is 6 hours. For H_2S and HCl the acute exposure period is 1-hour.

TABLE 4.3-18 HIGHEST CHRONIC NON-CANCER RISK BY THE COMBINED SMCP-2 AND HR-2 OPERATIONS (NORMAL CONDITIONS)

RECEPTOR	AFFECTED ORGAN SYSTEM	CHRONIC HAZARD QUOTIENT				CHRONIC HAZARD INDEX	OEHHA THRESHOLD	SIGNIFICANT EFFECT?
		H_2S	BENZENE	HCL	DIESEL PM			
Publica High School	Respiratory	0.0006	<0.0001	0.0001	0.000001	0.0006	1.0	No
Algae Farm Caretaker Residence[(1)]	Respiratory	0.009	<0.0001	0.0002	0.0002	0.011	1.0	No
SW Duck Ponds Workers	Respiratory	0.002	<0.0001	0.0003	0.003	0.003	1.0	No

Source: EMA 2012e

Notes:

(1) As of the date of publication of this DEIR, the algae farm identified in the HRA is no longer in operation.

TABLE 4.3-19 CANCER RISK FOR THE COMBINED SMCP-2 AND HR-2 OPERATIONS (NORMAL CONDITIONS)

RECEPTOR	CANCER RISK		TOTAL CANCER RISK	OEHHA THRESHOLD	SIGNIFICANT EFFECT?
	BENZENE	DIESEL PM			
Publica High School	2.92×10^{-8}	1.66×10^{-9}	3.08×10^{-8}	1×10^{-6}	No
Algae Farm Caretaker Residence[(1)]	5.10×10^{-7}	3.50×10^{-7}	8.60×10^{-7}	1×10^{-6}	No
SW Duck Ponds Workers	2.59×10^{-8}	1.09×10^{-8}	3.68×10^{-8}	1×10^{-6}	No

Source: EMA 2012e

Notes:

(1) As of the date of publication of this DEIR, the algae farm identified in the HRA is no longer in operation.

HR-2 PROJECT IMPACTS AND MITIGATION MEASURES

Impact AQ-1: The HR-2 Project would not conflict with or obstruct implementation of the applicable air quality plan.

As shown in Table 4.3-5, the HR-2 Project would be consistent with the Imperial County General Plan Air Quality Goals and Objectives. Additionally, the ICAPCD 2009 "1997 8-Hour Ozone Modified Air Quality Management Plan" (AQMP) and the 2009 Imperial County State Implementation Plan (SIP) for Particulate Matter less than 10 Microns in Aerodynamic Diameter outline long-term strategies designed to bring regional air quality into compliance with NAAQS and CAAQS.

The parameters of the Ozone AQMP and the PM10 SIP are established according to forecasted air pollution emissions within Imperial County, based on existing land uses and growth projections. Both ICAPCD plans account for the operation of industrial facilities, including geothermal power generation plants.

The emissions associated with construction and operations of the HR-2 Project would represent less than 1 percent of the regional emissions inventory included in both applicable ICAPCD air quality plans[10]. Construction of the HR-2 facilities would cover an overall period of 28 months with a temporary increase of NOx, ROG, and PM_{10} emissions; however, it is not expected that these temporary emissions would contribute a significant burden on the regional ozone or PM_{10} emissions inventories.

Although contributing to regional emissions, projected operational emissions from the HR-2 plant would also account for less than 1 percent of the total emissions inventory included in the Ozone AQMP and the PM10 SIP. Therefore, the proposed HR-2 Project would not conflict with or obstruct implementation of the applicable air quality plan, resulting in a less than significant impact under this criterion.

Mitigation Measures: None required.

Impact AQ-2: Estimated construction emissions from the proposed HR-2 Project would not violate an air quality standard and/or contribute substantially to an existing or projected air quality violation. However, the combined NOx emissions from the HR-2 and SmCP-2 Projects would exceed the ICAPCD NOx construction

[10] A comparison of the HR-2 Ozone precursors (NOx and ROG) emissions with the Imperial County Summer Planning Inventing Inventory reported in the 2009 "1997 8-Hour Ozone AQMP" results in a maximum of 0.3 percent during construction and 0.04 percent during operations. Moreover, the HR-2 PM10 emissions would account for a 0.25 percent of the projected Imperial County PM2.5 emissions inventory with the implementation of Regulation VIII.

significance threshold during April and May 2015, when construction for both projects is anticipated to overlap. Estimated HR-2 Project operational emissions would not exceed the operational significance thresholds for mobile sources or for stationary sources. However, start-up conditions would result in an exceedance of ICAPCD offset requirements for NOx and CO daily emissions.

Estimated HR-2 Project construction emissions would not exceed the construction significance thresholds. To control potential increases in emissions of ozone precursors during construction, the HR-2 applicant would implement an Exhaust Emissions Control Program (EPM AQ-3), a Well Drilling Compliance Control Program (EPM AQ-2), and the use of diesel engines with certified NOx Emissions rated as Tier 3 or better during grading (EPM AQ-11). Additionally, construction particulate matter emissions would be controlled through the implementation of a Fugitive Dust Suppression Plan (EPM AQ-1) and Air Quality Protection Measures (EPM AQ-9), in compliance with the requirements of ICAPCD Regulation VIII. The applicant would also implement a well flow testing program (EPM AQ-4) and apply a dust palliative coating to cover the unpaved portion of McDonald Road that provides access to the Project site (EPM AQ-10). Construction impacts to ambient air quality would be less than significant.

However, for approximately two months during the first year of construction of the SmCP-2 Project (2015) some of the proposed SmCP-2 Project construction activities would overlap with the late stages of construction of the HR-2 Project. As shown in Table 4.3-10, combined NOx emissions from the two Projects would exceed the ICAPCD NOx construction significance threshold during April and May 2015, based on the current SmCP-2 and HR-2 construction schedules. Therefore, impacts to ambient air quality during this overlapping construction period would be potentially significant unless mitigation is incorporated.

During normal operation, estimated HR-2 Project operational emissions would not exceed the operational significance thresholds for mobile sources or the Rule 207 C.2 offset significance thresholds for stationary sources. To limit air pollutant emissions from the HR-2 Project, each of the stationary diesel engines would meet the applicable California Air Resources Board (CARB) stationary compression ignition engine exhaust emission standards and the applicable CARB “Airborne Toxic Control Measure (ATCM) for Stationary Compression Ignition Engines” DPM standards. Particulate emissions from the cooling towers would be minimized by maintaining a low total dissolved solids (TDS) concentration in the circulating water and by controlling cooling tower drift losses to not more than 0.0006 percent of the total circulation rate using high efficiency drift eliminators. Hydrogen sulfide emissions from the cooling tower would also be minimized by using the Biox®

hydrogen sulfide abatement program (EPM AQ-5). Each of these actions would be evaluated by the ICAPCD in order to determine compliance with the District's BACT requirements. Compliance with BACT requirements during normal operations would ensure that operation of the proposed HR-2 Project sources does not interfere with the attainment of ambient air quality standards. Thus, impacts on ambient air quality from normal operations would be less than significant.

During start-up conditions associated with HR-2 Project operations, NOx and CO daily emissions would exceed the Rule 207 C.2 offset requirement limits of 137 pounds per day. The primary sources of this temporary increase of emissions would be the proposed two stand-by/"black start" diesel engine generators. Rule 207 Section C.2 requires emissions offsets for sources with non-attainment pollutant emissions that exceed 137 pounds per day. Pursuant Rule 207, Section C.2.g, Hudson Ranch II Power LLC has prepared a Carbon Monoxide Air Quality Impact Analysis (EMA 2012f), which demonstrates that the proposed HR-2 facility would not cause or contribute to a violation of the carbon monoxide AAQS (Appendix C-5). Therefore, offsets would be required for the NOx emissions in excess of 137 pounds per day but, pursuant to Rule 207 C.2.g, Rule 207 C.2 offsets for the carbon monoxide emissions would not be required. Therefore, impacts to ambient air quality during start-up operations would be potentially significant unless mitigation is incorporated.

As indicated earlier, the ICAPCD recommends the CEQA Handbook operational thresholds not be used to determine significance for the air emissions associated with the stationary source, including off-road mobile emissions produced within the stationary source; since those sources are already subject to mitigation according to ICAPCD Rules 207 and 201. Rule 201 describes the permit requirements applicable to the construction and operation of "any article, machine, Equipment, or other contrivance that emits or controls air contaminants. Thus, during air permit review, ICAPCD will determine the appropriate offset requirements applicable to the Project's stationary source NOx emissions. Mitigation Measure AQ-2.1 requires the purchase of NOx emissions, in compliance with Rule 207 C.2.

MM AQ-2.1: NOx Controls During HR-2/SmCP-2 Concurrent Construction

~~During the period of concurrent construction with the SmCP-2 Project, the HR-2 Project will undertake one or more of the following to reduce the estimated NOx emissions from the two Projects to less than 100 pounds per day:~~

The Permittee shall comply with all applicable standard mitigation measures for construction combustion equipment for the reduction of excess NOx emissions as

identified in the air quality analysis and as contained in the Imperial County CEQA Air Quality Handbook and associated regulations:

1. Utilize all Tier 3 or Tier 4 construction equipment.

2. Prohibit idling of equipment not in use; for equipment in use reduce idling time to a maximum of 5 minutes.

3. Where feasible replace fossil fuel burning equipment with electrically driven equivalents provided they are not powered via a portable generator.

4. Register all portable engines 50 horse power or greater with the ICAPCD.

Permittee shall also apply enhanced measures to assure reduced levels of NOx are maintained during the construction phase of the project.

1. Submit to the Air District prior to any earthmoving activity a complete list of all construction equipment to be utilized during the construction phase identifying Make, Model, Year, and estimated hours of usage.

2. In the event NOx emissions are calculated to exceed ICAPCD thresholds for construction, the Permittee shall provide for "off-site" mitigation or comply with Policy Number 5. Policy Number 5 allows a project to pay in-lieu impact fees utilizing the most current Carl Moyer Cost Effective methodology to reduce excess NOx emissions.

- ~~Minimize concurrent construction activities with the SmCP-2 Project construction activities;~~

- ~~Incorporate the following mitigation measures from the Imperial County Air Pollution Control District into the proposed Project's Exhaust Emission Control Program for reducing NOx emissions from construction combustion equipment.~~

  a. ~~Use of alternative fueled or catalyst-equipped diesel construction equipment, including all off-road and portable diesel-powered equipment.~~

  b. ~~Minimize idling time either by shutting equipment off when not in use or reducing the time of idling to 5 minutes as a maximum.~~

  c. ~~Limit, to the extent feasible, the hours of operation of heavy duty equipment and/or the amount of equipment in use.~~

~~d. Replace fossil fueled equipment with electrically driven equivalents (provided they are not run via portable generator set);~~

- ~~Pursuant to ICAPCD Policy Number 5, the applicant may pay an in-lieu impact fee as determined by ICAPCD using the formula provided in ICAPCD Policy No. 5 to reduce NOx emissions. Detailed emissions calculations shall be provided to ICAPCD as necessary to support calculation of the fee.~~

- ~~Require construction contractors to use Tier 4 construction equipment during site preparation and grading activities.~~

Prior to site preparation activities, the HR-2 Project will submit to the Imperial County Planning and Development Services evidence of the actions proposed to be undertaken to limit NOx emissions from the two Projects during construction to ensure that maximum daily NOx emissions resulting from the proposed combined construction activities will remain below 100 pounds per day.

Timing/Implementation: March 2015.

Enforcement/Monitoring: Imperial County Planning and Development Services/ ICAPCD.

Significance after Mitigation: Implementation of MM AQ-2.1 and adherence to ICAPCD regulations and proposed EPMs during the overlapping construction of the HR-2 Project and the SmCP-2 Project would result in levels of NOx emissions below the ICAPCD thresholds of significance for construction. Therefore, implementation of MM AQ 2.1 would reduce impacts to below the level of significance.

MM AQ-2.2: Emissions Offsets

To address potentially significant operational emissions at the HR-2 site during startup, Hudson Ranch Power II, LLC shall purchase NOx offsets for the daily NOx exceedances over the ICAPCD Rule 207 C.2.a threshold for stationary sources. The applicant shall purchase NOx offset credits for the amount required by the ICAPCD as part of the Authority to Construct conditions, and provide documentation of the purchased offsets to the ICAPCD prior to the issuance of the Permit to Operate.

Timing/Implementation: Prior the issuance of the Permit to Operate.

Enforcement/Monitoring: Imperial County Planning and Development Services/ ICAPCD.

Significance after Mitigation:

Compliance with the requirement of Rule 207 ensures that the operation of the proposed HR-2 stationary sources does not interfere with the attainment of Ambient Air Quality Standards. Through the purchase of offsets, NOx and other air pollutant emissions from the HR-2 Project are not expected to violate an air quality standard and/or contribute substantially to an existing or projected air quality violation. Therefore, this impact would be less than significant after mitigation.

Impact AQ-3:

The HR-2 Project could result in a cumulatively considerable net increase of a criteria air pollutant for which the Project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone).

During the first year of construction of the SmCP-2 Project (2015), the proposed site preparation and grading activities would overlap with the late stage of construction of the HR-2 Project. As shown in Table 4.3-10, NOx emissions would exceed the ICAPCD thresholds during April and May 2015. This would be a potentially significant impact without mitigation.

After completion of the HR-2 construction period, emissions from the development of the SmCP-2 Project would not exceed the ICAPCD thresholds of significance for construction. In order to reduce the potential to exceed the NOx significance thresholds during construction, MM AQ-2.1 requires the implementation of some combination of controls during the period of concurrent construction, such as minimizing overlapping activities, NOx controls, or the use of Tier 4 construction equipment to ensure that calculated NOx emissions are below the ICAPCD construction significance level of 100 pounds per day. With implementation of MM AQ-2.1, adherence to ICAPCD regulations and EPMs, impacts from the combined SmCP-2/HR-2 construction period would be less than significant after mitigation.

During the operational phase, the combined emissions from the normal operation of the SmCP-2 and HR-2 plants would not exceed the ICAPCD Rule 207 C.2 standards. Therefore, impacts during operations would be less than significant.

The proposed HR-2 Project would be located in a non-attainment area for ozone and PM_{10} under federal and state standards. Estimated HR-2 Project construction emissions for ozone precursors and PM10 would not exceed the construction significance thresholds.

During normal operation, estimated HR-2 Project operational emissions would not exceed the operational significance thresholds for mobile sources or the Rule 207 C.2 offset significance thresholds for stationary sources. Pursuant Rule 207

Section C.1, the HR-2 Project would apply BACT to ensure that air pollutant emissions from operation of the diesel engines and cooling tower sources would not interfere with the attainment of ozone and PM_{10} standards. Further, during plant startup conditions, NOx emissions in excess of the limits established in Rule 207 C.1 for offsets (137 pounds per day) would need to be offset through the purchase of credits in the amount determined by ICAPCD. This impact would be potentially significant unless mitigation is incorporated.

Implementation of MM AQ -2.1 ensures that the applicable provisions of Rule 207 are implemented prior initiating operations of the HR-2 Project under the Permit to Operate. Therefore, this impact is less than significant after mitigation.

More details concerning the potential cumulative impacts on air quality as a result of the implementation of the HR-2 Project are provided in Chapter 5, Cumulative analysis.

Impact AQ-4: The HR-2 Project would not expose sensitive receptors to substantial pollutant concentrations.

Sensitive receptors include residences, schools, hospitals, and other sensitive uses. Land use conflicts can arise when these receptors are located next to major sources of air pollutants. The HR-2 Project area is a rural, agricultural area. The nearest residential receptor is located approximately 0.3 miles south-east of the Project site boundary on W Shrimp Road and is an algae farm caretaker residence that could be occupied during the proposed construction and operation[11]. The next closest residence is located 0.5 miles north-east of the Project site (along English Road), which is owned by Energy Source (Hudson Ranch Power II, LLC's parent company). This residence would be vacated in fall 2012 and demolished prior to start of construction of the HR-2 Project. The next closest residence is located 1.4 miles north-west of the HR-2 Project site. The nearest population center is the Town of Niland, located 2.3 miles from the proposed Project site and at least 3.0 miles from the center of the plant site.

Other sensitive receptors located within 2.5 miles from the proposed HR-2 Project site include educational centers such as the Grace Smith Elementary School, the Publica High School, Niland Head Start, and ten residences. Other non-sensitive (commercial/industrial) receptors include six industrial or commercial areas, and

[11] The risk assessment prepared for the HR-2 Project (Appendix M) included additional an algae farm caretaker residence as part of the sensitive receptors identified for analysis. As of the date of publication of this DEIR, the algae farm was being sold and not in operation; however, the new property owner will be processing permits to allow this facility to re-open. For this reason, the caretaker residence is considered a sensitive receptor.

three "other" areas (defined as locations with the potential to attract the public for the short, but not the long, term).

Operations of the proposed HR-2 facilities would involve the potential release of NCGs containing H_2S, benzene, ammonia, and traces of other gases (methane, nitrogen, hydrogen, and argon), in addition to combustion emissions from the maintenance, testing and emergency operations of diesel-powered engines and fire pumps.

As shown in Tables 4.3-13 to 4.3-16, HRA results indicate that the cancer risks for the HR-2 operations would not exceed the OEHHA recommended threshold of one in one million. The maximum acute (short-term) and chronic (long term) hazard indices were both well below the recommended significance levels. Thus, operation of the HR-2 Project would not expose sensitive receptors to a significant health risk; therefore, this impact is less than significant.

Mitigation Measures: None required.

Impact AQ-5: The HR-2 Project would not create objectionable odors affecting a substantial number of people.

Existing population in the proposed HR-2 Project area is sparse, and does not represent a substantial number of people in the closest vicinity of the proposed facilities. The nearest residence is located south-west of the Project site boundary on W Shrimp Road and is an algae farm caretaker residence. Another residence, located 0.5 miles north-east of the Project site (along English Road) is owned by Energy Source (Hudson Ranch Power II, LLC's parent company) and the residence would be vacated in fall 2012 and demolished prior to start of construction of the HR-2 Project. The next closest residence is located 1.4 miles northwest of the HR-2 Project site. The closest population center is the Town of Niland, located 2.3 miles from the proposed Project site.

The HR-2 construction activities would include the use of diesel-fueled construction equipment, which emits a distinctive odor that may be offensive to some individuals. Odors generated by diesel exhaust would be reduced by the use of either low sulfur or ultra-low sulfur fuel, as required in California. Paving and surface coating activities during project construction would also generate odors associated with organic compounds in these materials. Additionally, construction of the HR-2 Project would also involve the release of H_2S during well drilling and testing operations, which has a distinctive odor. H_2S emissions during drilling and flow testing would be temporary at each well location and conducted under a permit from the ICAPCD.

Operations of the HR-2 plant would involve the release of NCGs containing H_2S and ammonia, in addition to combustion emissions from the maintenance, testing and emergency operations of diesel-powered engines (generator and standby fire pump). All these sources would generate distinctive odors that may be offensive to some individuals. The HR-2 Project applicant would use ultra-low sulfur fuel at all stationary combustion equipment, in addition to emission capture and control for H_2S.

Odor from H_2S emissions has been identified as major issue of public concern. The HR-2 Project applicant would be required to comply with the requirements of ICAPCD Rule 207, Section C.1.c regarding implementation of BACT during geothermal power plant operations. Additionally, H_2S monitoring would be required by the ICAPCD as part of the Conditions of Approval of the HR-2 Project Permit to Operate (Soucier 2012).

Projected 1-hour H_2S concentrations at the closest residence during HR-2 Project normal operations reported as part of the HRA resulted in a maximum value of 1.42 µg/m^3, far below the existing statewide CAAQS for H_2S of 0.03 ppm (42 µg/m^3). Concentrations at the other residences modeled were all less than 0.4 µg/m^3. The maximum modeled 1-hour concentration of 24.1 µg/m^3, at the nearby algae farm caretaker residence, would occur only during the occasional plant outages, and would also be below the CAAQS for H_2S (42 µg/m^3). The H_2S CAAQS protects against nuisance odor for the general public and the standard was adopted based on odor threshold of perception measured (CARB 2000)[12]. The HRA used an EPA-approved air dispersion model to determine ground level concentrations of H_2S using local meteorological data (Appendix M). The HRA shows that the projected H_2S concentrations would be below the nuisance odor threshold for even the closest receptors (algae farm caretaker residence) based on prevailing wind patterns.

Neither the ammonia nor DPM emissions are expected to create objectionable odors affecting a substantial number of people because the emissions are relatively small and the very low population density in the immediate vicinity of the Project In the event H_2S, ammonia or DPM odors were perceived as offensive by the public, complaints would be filed through the existing ICAPCD complaint procedure for investigation by the ICAPCD.

[12] The H_2S CAAQS was adopted based on rounding the geometric mean odor threshold of 0.029 ppm measured in adults (CARB 2000).

Since the HR-2 Project would be located in a low population density area, and Project primary odor sources (i.e., H_2S) would be controlled to result in concentrations below the odor perception threshold at closest sensitive receptors; the Project would result in a less than significant impact under this criterion.

Mitigation Measures: None required.

SMCP-2 PROJECT IMPACTS AND MITIGATION MEASURES

Impact AQ-1: The SmCP-2 Project would not conflict with or obstruct implementation of the applicable air quality plan.

As shown in Table 4.3-5, the SmCP-2 Project would be consistent with the Imperial County General Plan Air Quality Goals and Objectives. Additionally, the ICAPCD 2009 "1997 8-Hour Ozone Modified Air Quality Management Plan" (AQMP) and the 2009 Imperial County State Implementation Plan (SIP) for Particulate Matter less than 10 Microns in Aerodynamic Diameter outline long-term strategies designed to bring regional air quality into compliance with NAAQS and CAAQS.

The parameters of the Ozone AQMP and the PM_{10} SIP are established according to forecasted air pollution emissions within Imperial County, based on existing land uses and growth projections. The emissions associated with the construction and operations of the SmCP-2 Project would represent less than 1 percent of the regional emissions inventory included in both applicable ICAPCD air quality plans[13].

Construction of the SmCP-2 facilities would cover an overall period of 21 months with temporary increases of NOx, ROG, and PM_{10} emissions during construction (which would overlap with the last three months of construction of the HR-2 Project); however, it is not expected that these temporary emissions would contribute a significant burden on the regional ozone or PM_{10} emissions inventories.

Although contributing to regional emissions, projected operational emissions from the SmCP-2 plant in combined operations with the HR-2 geothermal facility would be less than 1 percent of the total emissions inventory included in the Ozone AQMP and the PM_{10} SIP. Therefore, construction and operation of the proposed

[13] A comparison of the SmCP-2 Ozone precursors (NOx and ROG) emissions with the Imperial County Summer Planning Inventing Inventory reported in the 2009 1997 8-Hour Ozone AQMP results in a maximum of 0.03 percent during construction and 0.01 percent during operations. Moreover, the SmCP-2 PM_{10} emissions would account for a 0.18 percent of the projected Imperial County $PM_{2.5}$ emissions inventory with the implementation of Regulation VIII.

SmCP-2 Project would not conflict with or obstruct implementation of the applicable air quality plans, resulting in a less than significant impact under this criterion.

Mitigation Measures: None required.

Impact AQ-2: Estimated construction emissions from the proposed SmCP-2 Project would not violate an air quality standard and/or contribute substantially to an existing or projected air quality violation. However, the combined NOx emissions from the HR-2 and SmCP-2 Projects would exceed the ICAPCD NOx construction significance threshold during April and May 2015, when construction for both projects is anticipated to overlap. Estimated HR-2 Project operational emissions, as well as combined emissions from the normal operations of the both Projects, would not exceed the operational significance thresholds for mobile sources or for stationary sources.

Estimated SmCP-2 Project construction emissions would not exceed the ICAPCD construction significance thresholds. To control potential increases in emissions of PM_{10} and ozone precursors during construction, the SmCP-2 Project would implement fugitive dust and exhaust emission controls, including an Exhaust Emissions Control Program (EPM AQ-2), a Potential Temporary Emissions Control Program to limit the operation of temporary sources (EPM AQ-8) and the use of diesel engines with certified NOx Emissions rated as Tier 3 or better during grading (EPM AQ-10). Construction particulate matter would be controlled through the implementation of a Fugitive Dust Suppression Plan (EPM AQ-1) and watering on actively disturbed areas (EPM AQ-11), in compliance with the requirements of ICAPCD Regulation VIII. Construction impacts to ambient air quality from the SmCP-2 Project alone would be less than significant.

However, during the first year of construction of the SmCP-2 Project (2015) some of the proposed SmCP-2 Project construction activities would overlap with the late stages of construction of the HR-2 Project. As shown in Table 4.3-10, combined NOx emissions from the two Projects would exceed the ICAPCD construction significance thresholds during April and May 2015, based on the current SmCP-2 and HR-2 construction schedules. Therefore, impacts to ambient air quality during this overlapping construction period would be potentially significant unless mitigation is incorporated.

During normal operation, estimated the SmCP-2 Project operational emissions would not exceed the operational significance thresholds for mobile sources or the Rule 207 C.2 offset significance thresholds for stationary sources. During the operational phase, the combined emissions from the normal operations of both the

SmCP-2 Project and the HR-2 Project would also not exceed the operational significance thresholds for mobile sources or the Rule 207 C.2 offset significance thresholds for stationary sources. To minimize air pollutant emissions during operations, the SmCP-2 Project would implement an Exhaust Emissions Control Program (EPM AQ-2); a Cooling Tower Emission Program (EPM AQ-3); a Process Equipment Emission Control Program (EPM AQ-4); a Filter Cake Storage Fugitive Emissions Control Program (EPM AQ-5); an Operating & Maintenance Equipment Emission Control Program (EPM AQ-7); and a Potential Emissions Control Program (EPM AQ-8).

MM AQ-2.1: NOx Controls During HR-2/SmCP-2 Concurrent Construction

~~During the period of concurrent construction with the SmCP-2 Project, the HR-2 Project will undertake one or more of the following to reduce the estimated NOx emissions from the two Projects to less than 100 pounds per day:~~

The Permittee shall comply with all applicable standard mitigation measures for construction combustion equipment for the reduction of excess NOx emissions as identified in the air quality analysis and as contained in the Imperial County CEQA Air Quality Handbook and associated regulations:

5. Utilize all Tier 3 or Tier 4 construction equipment.

6. Prohibit idling of equipment not in use; for equipment in use reduce idling time to a maximum of 5 minutes.

7. Where feasible replace fossil fuel burning equipment with electrically driven equivalents provided they are not powered via a portable generator.

8. Register all portable engines 50 horse power or greater with the ICAPCD.

Permittee shall also apply enhanced measures to assure reduced levels of NOx are maintained during the construction phase of the project.

3. Submit to the Air District prior to any earthmoving activity a complete list of all construction equipment to be utilized during the construction phase identifying Make, Model, Year, and estimated hours of usage.

4. In the event NOx emissions are calculated to exceed ICAPCD thresholds for construction, the Permittee shall provide for “off-site” mitigation or comply with Policy Number 5. Policy Number 5 allows a project to pay in-lieu impact fees utilizing the most current Carl Moyer Cost Effective methodology to reduce excess NOx emissions.

- ~~Minimize concurrent construction activities with the SmCP-2 Project construction activities;~~

- ~~Incorporate the following mitigation measures from the Imperial County Air Pollution Control District into the proposed Project's Exhaust Emission Control Program for reducing NOx emissions from construction combustion equipment.~~

  a. ~~Use of alternative fueled or catalyst-equipped diesel construction equipment, including all off-road and portable diesel-powered equipment.~~

  b. ~~Minimize idling time either by shutting equipment off when not in use or reducing the time of idling to 5 minutes as a maximum.~~

  c. ~~Limit, to the extent feasible, the hours of operation of heavy duty equipment and/or the amount of equipment in use.~~

  d. ~~Replace fossil fueled equipment with electrically driven equivalents (provided they are not run via portable generator set);~~

- ~~Pursuant to ICAPCD Policy Number 5, the applicant may pay an in-lieu impact fee as determined by ICAPCD using the formula provided in ICAPCD Policy No. 5 to reduce NOx emissions. Detailed emissions calculations shall be provided to ICAPCD as necessary to support calculation of the fee.~~

- ~~Require construction contractors to use Tier 4 construction equipment during site preparation and grading activities.~~

Prior to site preparation activities, the HR-2 Project will submit to the Imperial County Planning and Development Services evidence of the actions proposed to be undertaken to limit NOx emissions from the two Projects during construction to ensure that maximum daily NOx emissions resulting from the proposed combined construction activities will remain below 100 pounds per day.

Timing/Implementation: March 2015.

Enforcement/Monitoring: Imperial County Planning and Development Services/ ICAPCD.

Significance after Mitigation: Implementation of MM AQ-2.1 and adherence to ICAPCD regulations and proposed EPMs during the overlapping construction of the HR-2 Project and the SmCP-2 Project would result in levels of NOx emissions below the ICAPCD thresholds of significance for construction. Therefore, implementation of MM AQ 2.1 would reduce impacts to below the level of significance.

Impact AQ-3: The SmCP-2 Project would not 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 releasing emissions which exceed quantitative thresholds for ozone precursors).

During the first year of construction of the SmCP-2 Project (2015), the proposed site preparation and grading activities would overlap with the late stage of construction of the HR-2 Project. As shown in Table 4.3-10, NOx emissions would temporarily exceed the ICAPCD thresholds during April and May 2015. This would be a potentially significant impact without mitigation.

After completion of the HR-2 construction period, emissions from the development of the SmCP-2 Project would not exceed the ICAPCD thresholds of significance for construction. In order to reduce the potential to temporarily exceed the NOx significance thresholds during construction, MM AQ-2.1 requires the implementation of some combination of controls during the period of concurrent construction, such as minimizing overlapping activities, NOx controls, or the use of Tier 4 construction equipment to ensure that calculated NOx emissions are below the ICAPCD construction significance level of 100 pounds per day. With implementation of MM AQ-2.1 and adherence to ICAPCD regulations and EPMs, impacts from the combined SmCP-2/HR-2 construction period would be less than significant after mitigation.

During the operational phase, the combined emissions from the normal operation of the SmCP-2 and HR-2 plants would not exceed the ICAPCD Rule 207 C.2 standards. Therefore, impacts during operations would be less than significant.

Impact AQ-4: The SmCP-2 Project would not expose sensitive receptors to substantial pollutant concentrations.

Sensitive receptors include residences, schools, hospitals, and other sensitive uses. Land use conflicts can arise when these receptors are located next to major sources of air pollutants. The Project area is a rural, agricultural area. The nearest

residence is approximately 0.3 miles south-east of the Project site boundary on W Shrimp Road and is an algae farm caretaker residence[14]. Another residence is located 0.5 miles north-east of the Project site, along English Road. This residence is owned by Energy Source (Hudson Ranch Power II, LLC's parent company) and would be vacated in fall 2012 and demolished prior to start of construction of the SmCP-2 Project. The next closest residence is located 1.4 miles north-west of the Project site. The nearest population center is the Town of Niland, located 2.3 miles from the proposed Project site.

Other sensitive receptors located within 2.5 miles from the proposed SmCP-2 site include educational centers such as the Grace Smith Elementary School, the Publica High School, Niland Head Start, and ten residences. Other non-sensitive (commercial/industrial) receptors include six industrial or commercial areas, and three "other" areas (defined as locations with the potential to attract the public for the short, but not the long, term).

Combined operations of the proposed SmCP-2 and HR-2 facilities would involve the potential release of NCGs containing H_2S, benzene, ammonia, and other trace gases; DPM emissions from the maintenance, testing and emergency operations of diesel-powered engines and fire pumps; H_2S emitted from the gas space in the sodium hydrosulfide (NaHS) tank during the filling of the tank with NaHS; and HCl vapors produced by the HCl synthesis process from the hydrogen and chlorine gases produced by the process of converting lithium chloride to lithium hydroxide and HCl storage tank(s). The results of the HRA are shown in Tables 4.3-17 to 4.3-19 above. Appendix M contains additional details for this analysis. The applicant has incorporated emissions controls in the design of each facility in order to minimize combustion and process emissions during operations of the proposed mineral extraction plant.

The combined cancer risks for the combined SmCP-2 and HR-2 operations –even during outages of the HR-2 Project- would not exceed the OEHHA recommended threshold of one in one million. The maximum acute (short-term) and chronic (long-term) hazard indices were both well below the recommended significance levels. Based on the results of the HRA, construction and operation of the SmCP-2 Project in combination with the HR-2 Project would not expose sensitive receptors to a significant health risk; therefore, this impact is less than significant.

[14] The risk assessment prepared for the SmCP-2 Project (Appendix M) included additional an algae farm caretaker residence as part of the sensitive receptors identified for analysis. As of the date of publication of this DEIR, the algae farm was being sold and not in operation; however, the new property owner will be processing permits to allow this facility to re-open. For this reason, the caretaker residence is considered a sensitive receptor.

Mitigation Measures: None required.

Impact AQ-5: The SmCP-2 Project would not create objectionable odors affecting a substantial number of people.

Existing population in the proposed SmCP-2 project area is sparse, and does not represent a substantial number of people in the closest vicinity of the proposed facilities. The nearest residence is located south-west of the Project site boundary on W Shrimp Road and is an algae farm caretaker residence. Another residence, located 0.5 miles north-east of the Project site (along English Road) is owned by Energy Source (Hudson Ranch Power II, LLC's parent company) and the residence would be vacated in fall 2012 and demolished prior to start of construction of the HR-2 Project. The next closest residence is located 1.4 miles northwest of the SmCP-2 Project site. The closest population center is the Town of Niland, located 2.3 miles from the proposed Project site. .

The SmCP-2 construction activities would include the use of diesel-fueled construction equipment, which emits a distinctive odor that may be offensive to some individuals. Odors generated by diesel exhaust would be reduced by the use of either low sulfur or ultra-low sulfur fuel, as required in the state of California. Paving of McDonald Road and onsite roads, and surface coating activities during construction would also generate odors associated with organic compounds in these materials.

Combined operations of the proposed SmCP-2 and HR-2 facilities would involve the potential release of NCGs containing H_2S and ammonia; combustion emissions from the maintenance, testing and emergency operations of diesel-powered engines and fire pumps; and HCl vapors produced by the HCl synthesis process from the hydrogen and chlorine gases produced by the process of converting lithium chloride to lithium hydroxide and HCl storage tank(s). All these sources would generate distinctive odors that may be offensive to individuals. The applicant would use ultra-low sulfur fuel at all stationary combustion equipment, in addition to emission capture and control for H_2S and HCl.

Projected 1-hour H_2S concentrations for the combined SmCP-2 Project and HR-2 Project normal operations reported in the HRA resulted in a maximum value of 11.3 $\mu g/m^3$ at the closest residence, far below the existing statewide CAAQS for H_2S of 0.03 ppm (42 $\mu g/m^3$). Concentrations at the other residences modeled were all less than 0.54 $\mu g/m^3$. The maximum modeled 1-hour concentration of 24.1 $\mu g/m^3$, at the nearby algae farm caretaker residence, would occur only during the occasional HR-2 plant outages, and would also be below the CAAQS for H_2S (42 $\mu g/m^3$). The H_2S CAAQS protects against nuisance odor for the general public

(CARB 2000)[15]. Implementation of both the SmCP-2 and the HR-2 Projects would result in H_2S concentrations below the nuisance odor threshold for the closest receptors identified.

Neither the ammonia nor DPM emissions are expected to create objectionable odors affecting a substantial number of people because the emissions are relatively small and the very low population density in the immediate vicinity of the Project. In the event H_2S, ammonia or DPM odors were perceived as offensive by the public, complaints would be filed through the existing ICAPCD complaint procedure for investigation by the ICAPCD.

Since both the SmCP-2 and HR-2 Projects would be located in a low population density area and Project primary odor sources (e.g., H_2S) would be controlled to result in concentrations below the odor perception threshold at closest sensitive receptors; the Project would result in a less than significant impact under this criterion.

Mitigation Measures: None required.

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