5.9 Public Health

This section describes and evaluates the public health effects of the Huntington Beach Energy Project (HBEP). Section 5.9.2 discusses the affected environment. Section 5.9.3 presents the analysis of the public health effects of the HBEP project. Section 5.9.4 evaluates any potential cumulative effects to public health, and Section 5.9.5 addresses proposed mitigation measures that would avoid or minimize any adverse impacts. Section 5.9.6 describes the laws, ordinances, regulations and standards (LORS) that apply to the project. Section 5.9.7 presents agency contacts, and Section 5.9.8 identifies the permits and permit schedule related to public health. Section 5.9.9 provides the references used to prepare this section.

5.9.1 Setting

The HBEP site is located in an industrial area of Huntington Beach at 21730 Newland Street, just north of the intersection of the Pacific Coast Highway (Highway 1) and Newland Street. The project is located on the site of the existing Huntington Beach Generating Station, an operating power plant. The HBEP site is bounded on the west by a manufactured home/recreational vehicle park, on the north by a tank farm, on the north and east by the Huntington Beach Channel and residential areas, on the southeast by the Huntington Beach Wetland Preserve / Magnolia Marsh wetlands, and to the south and southwest by the Huntington Beach State Park and the Pacific Ocean. The site is located on a gently sloping coastal plain.

HBEP is a 939-megawatt combined-cycle power plant, consisting of two power blocks. Each power block is composed of three combustion turbines with supplemental fired heat recovery steam generators (HRSG), a steam turbine generator, an air-cooled condenser, and ancillary facilities. HBEP will reuse existing onsite potable water, natural gas, stormwater, process wastewater, and sanitary pipelines and electrical transmission facilities. No offsite linear developments are proposed as part of the project.

The project will use potable water, provided by the City of Huntington Beach, for construction and operational process and sanitary uses. During operation, stormwater and process wastewater will be discharged to a retention basin and then ultimately to the Pacific Ocean via an existing outfall. Sanitary wastewater will be conveyed to the Orange County Sanitation District via the existing City of Huntington Beach sewer connection. Two 230-kilovolt (kV) transmission interconnections will connect HBEP Power Blocks 1 and 2 to the existing onsite Southern California Edison 230-kV switchyard.

HBEP construction will require the removal of the existing Huntington Beach Generating Station Units 1, 2, and 5. Demolition of Unit 5, scheduled to occur between the fourth quarter of 2014 and the end of 2015, will provide the space for the construction of HBEP Block 1. Construction of Blocks 1 and 2 are each expected to take approximately 42 and 30 months, respectively, with Block 1 construction scheduled to occur from the first quarter of 2015 through the second quarter of 2018, and Block 2 construction scheduled to occur from the first quarter of 2018 through the second quarter of 2020. Removal/demolition of existing Huntington Beach Generating Station Units 1 and 2 is scheduled to occur from the fourth quarter of 2020 through the third quarter of 2022.

Existing Huntington Beach Generating Station Units 3 and 4 were licensed through the California Energy Commission (CEC) (00-AFC-13C) and demolition of these units is authorized under that license and will proceed irrespective of the HBEP. Therefore, demolition of existing Huntington Beach Generating Station Units 3 and 4 is not part of the HBEP project definition. However, to ensure a comprehensive review of potential project impacts, the demolition of existing Huntington Beach Generating Station Units 3 and 4 is included in the cumulative impact assessment. Removal/demolition of existing Huntington Beach Generating Station Units 3 and 4 will be in advance of the construction of HBEP Block 2.

HBEP construction will require both onsite and offsite laydown and construction parking areas. Approximately 22 acres of construction laydown will be required, with approximately 6 acres at the Huntington Beach Generating Station used for a combination of laydown and construction parking, and 16 acres at the AES Alamitos Generating Station (AGS) used for construction laydown (component storage only/no assembly of components at AGS). During HBEP construction, the large components will be hauled from the construction laydown area at the AGS site to the HBEP site as they are ready for installation.

Construction worker parking for HBEP and the demolition of the existing units at the Huntington Beach Generating Station will be provided by a combination of onsite and offsite parking. A maximum of 330 parking spaces will be required during construction and demolition activities. As shown on Figure 2.3-3 in Section 2.0, Project Description, construction/demolition worker parking will be provided at the following locations:

- Approximately 1.5 acres onsite at the Huntington Beach Generating Station (approximately 130 parking stalls)
- Approximately 3 acres of existing paved/graveled parking located adjacent to HBEP across Newland Street (approximately 300 parking stalls)
- Approximately 2.5 acres of existing paved parking located at the corner of Pacific Coast Highway and Beach Boulevard (approximately 215 parking stalls)
- 225 parking stalls at the City of Huntington Beach shore parking west of the project site.
- Approximately 1.9 acres at the Plains All American Tank Farm located on Magnolia Street (approximately 170 parking stalls)

5.9.1.1 Project Overview as it Relates to Public Health

HBEP will consist of two three-on-one combined-cycle power blocks with a net capacity of 939 megawatts. Each power block will consist of three Mitsubishi Power Systems Americas 501DA combustion turbine generators (CTG), one steam turbine, and an air-cooled condenser. Each CTG will be equipped with an HRSG and will employ supplemental natural gas firing (duct firing). The turbines will use dry low NO_x (oxides of nitrogen) burners and selective catalytic reduction to limit NO_x emissions to 2 parts per million by volume (ppmv). Emissions of carbon monoxide will be limited to 2 ppmv and volatile organic compounds to 1 ppmv through the use of the best combustion practices and the use of an oxidation catalyst. Best combustion practices and burning pipeline-quality natural gas will minimize emissions of the remaining pollutants.

HBEP will retain the use of the two existing 275-horsepower diesel-fired emergency fire water pumps, which were installed during the existing Huntington Beach Generating Station's Units 3 and 4 retooling project in 2001. Because the existing fire pumps are already permitted by the South Coast Air Quality Management District (SCAQMD) and are considered part of the existing background conditions, they were not included in the public health analysis for HBEP.

This section presents the methodology and results of the human health risk assessment (HRA) that was conducted to assess the potential public health impacts and exposure associated with airborne emissions from the proposed routine operation of the HBEP. The quantities of hazardous materials proposed to be stored onsite, a description of their uses, and the potential concerns regarding these materials are presented in Section 5.5, Hazardous Materials Handling. A discussion of the potential concerns associated with electromagnetic field exposure is presented in Section 3.0, Transmission System Engineering.

5.9.2 Affected Environment

Based on the Environmental Data Resources (EDR) *Offsite Receptor Report* (EDR, 2012), approximately 353,173 residents live within a 6-mile radius of HBEP. Per California Energy Commission (CEC) siting regulation Appendix B (g)(9)(E)(i), sensitive receptors include infants and children, the elderly, the chronically ill, and any other member of the general population who is more susceptible to the effects of exposure than the population at large. Therefore, schools (public and private), daycare facilities, convalescent homes, and hospitals are of particular concern. Sensitive receptors within a 6-mile radius of the project site include:

- 275 preschool/daycare centers
- 12 nursing homes
- 81 schools
- 579 hospitals, clinics, and/or pharmacies
- 7 colleges

The EDR *Offsite Receptor Report* includes a figure and list of the sensitive receptors located within a 6-mile radius of the project site is presented in Appendix 5.9A. The nearest sensitive receptor is a daycare facility located

0.3 mile east of the project site. The nearest school is the Edison High School, located approximately 0.5 mile to the northeast of the project site. The nearest resident is approximately 250 feet west-northwest of the facility along Newland Street. The nearest businesses are located along Edison Drive, just north of the project site.

Per CEC siting regulation Appendix B (g)(9)(c), a search of available health studies concerning the potentially affected populations within a 6-mile radius is required. In October 1997, the MATES II study was initiated as part of the Environmental Justice Initiatives adopted by the SCAQMD Governing Board. It consisted of a comprehensive monitoring program, an updated emissions inventory, and a modeling effort to characterize health risks associated with human exposures to ambient concentrations of toxic air contaminants (TAC) in the Southern California Air Basin (SCAB). The results of the MATES II study estimated that the excess lifetime carcinogenic risk from exposures to airborne TACs in the SCAB averages about 1,400 in 1 million (1.4×10^{-3}), meaning that an individual exposed over a 70-year lifetime would have about a 0.14 percent additional chance of contracting cancer. Estimated carcinogenic risk was found to be rather uniform across the basin. For example, risk ranged from about 1,120 in 1 million to about 1,740 in 1 million for the sites monitored.

The MATES II study showed that mobile sources (for example, cars, trucks, trains, ships, and aircraft) represent the greatest contributors to the estimated risks. About 70 percent of all carcinogenic risk is attributed to diesel particulate matter emissions; about 20 percent is attributed to other toxics associated with mobile sources (including benzene, butadiene, and formaldehyde); and about 10 percent of all risk is attributed to emissions from stationary sources (which include industries and other businesses, such as dry cleaners and chrome plating operations). Updating the findings of MATES II, SCAQMD completed the MATES III study by issuing a final report in September 2008. Similar to the earlier MATES II study, the MATES III study found that mobile sources continued to dominate cancer risk in the SCAB by accounting for an estimated 94 percent of the overall cancer risk. Diesel emissions, alone, account for 84 percent of the cancer risk. Overall, the general trend in risk exposure has been decreasing with the estimated cancer risk from exposure to airborne toxics reduced to 1,200 in 1 million. The MATES III study found that non-diesel risk has been lowered from the MATES II estimates by 50 percent.

5.9.3 Environmental Analysis

5.9.3.1 Air Toxics Exposure Assessment (Operation Impacts)

Human health risks potentially associated with hazardous substance emissions, from the proposed operation of HBEP, which includes compounds on the list of Office of Environmental Health Hazard Assessment (OEHHA) TACs and U.S. Environmental Protection Agency (EPA) hazardous air pollutants (HAP), were evaluated. The HRA was conducted in accordance with SCAQMD Rules 212 and 1401 and the following guidance:

- *Air Toxics Hot Spots Program Risk Assessment Guidelines* (OEHHA, 2003)
- Supplemental Guidelines for Preparing Risk Assessments for the Air Toxics “Hot Spots” Information and Assessment Act (AB2588) (SCAQMD, 2011a)
- California Air Resources Board (ARB) *Recommended Interim Risk Management Policy for Inhalation-based Residential Cancer Risk* (ARB, 2003)
- *Guideline on Air Quality Models* (EPA, 2005)
- Huntington Beach Energy Project Dispersion Modeling Protocol (CH2M HILL, 2012)

The HRA modeling was conducted using the ARB *Hotspots Analysis Reporting Program* (HARP, Version 1.4f), along with the ARB HARP On-ramp program (Version 1.0). The HARP On-ramp tool was used to import the American Meteorological Society/EPA Regulatory Model (AERMOD) air dispersion modeling results into the HARP Risk Module.

The HRA process requires four general steps to estimate health impacts: (1) identify and quantify project-generated emissions; (2) evaluate pollutant transport (air dispersion modeling) to estimate ground-level TAC concentrations at each receptor location; (3) assess human exposure; and (4) use a risk characterization model to estimate the potential health risk at each receptor location. The following sections describe in detail the methods used in this HRA.

5.9.3.1.1 Air Toxics Emission Calculations

Air toxics (TAC and HAP) emissions associated with the project will consist primarily of combustion byproducts produced by the six natural-gas-fired CTGs and HRSGs. TACs are compounds, designated by OEHHA as pollutants that may pose a significant health hazard. HAPs are compounds designated by EPA as pollutants that are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects.

Air toxics emission factors for the gas turbines were obtained from the ARB California Air Toxics Emission Factors (CATEF) emission database (ARB, 2012), with the exception of polyaromatic hydrocarbons (PAH) and formaldehyde. The PAH emission factor was based on two separate source tests (2002 and 2004) at the Delta Energy Center in Pittsburg, California (Avogadro Group, 2002 and 2004). The allowable formaldehyde emission rate was based on the maximum allowable concentration identified in New Source Performance Standards (NSPS) Part 60, Subpart KKKK for natural-gas-fired turbines.

The HRA was conducted assuming the combustion turbines would be operated 5,000 hours per turbine per year at base load without duct burner firing, 1,200 hours at base load per turbine per year with duct burner firing, and 624 startups and shutdowns (estimated 465 hours) per turbine per year. A summary of the air toxics emissions included in the HRA is presented in Table 5.9-1. The detailed emission calculations for the air toxics are provided in Appendix 5.1B.

TABLE 5.9-1
Air Toxic Emission Rates Modeled for HBEP

Pollutant[a]	Chemical Abstracts Service Registry Number	CTG/HRSG (per turbine)	
		lb/hr[b]	lb/yr[b]
Ammonia[c]	7664417	1.32E+01	8.40E+04
Acetaldehyde	75070	2.69E-01	1.34E+03
Acrolein	107028	3.72E-02	1.85E+02
Benzene	71432	2.61E-02	1.30E+02
1,3-Butadiene	106990	2.50E-04	1.24E+00
Ethyl Benzene	100414	3.52E-02	1.75E+02
Formaldehyde[d]	50000	4.32E-01	2.15E+03
Hexane	110543	5.09E-01	2.53E+03
Naphthalene	91203	3.26E-03	1.62E+01
PAHs[e]	1151	2.75E-05	1.37E-01
Propylene	115071	1.52E+00	7.53E+03
Propylene oxide	75569	9.40E-02	4.67E+02
Toluene	108883	1.40E-01	6.93E+02
Xylenes	1330207	5.13E-02	2.55E+02

[a] Emission rates based on the California Air Toxics Emission Factors (CATEF) database, unless otherwise noted (ARB, 2012).
[b] Hourly emission rates are based on a maximum turbine heat input with duct burner firing of 2,005 MMBtu/hr (high heat value). The annual emission rates are based on 5,465 hours of turbine operation with an average annual heat input of 1,403 MMBtu/hr and 1,200 hours of turbine operation with duct burner firing and an average annual heat input of 1,910 MMBtu/hr. (See Appendix 5.1B for detailed emission estimates.)
[c] Based on the operating exhaust ammonia limit of 5 ppmv @ 15% oxygen and an F-factor of 8710.
[d] Emission factor is based on the NSPS Subpart YYYY emission limit of 91 ppbv for formaldehyde.
[e] Carcinogenic PAHs only; naphthalene considered separately. Emission Factor based on two separate source tests (2002 and 2004) from the Delta Energy Center located in Pittsburg, CA (Avogadro Group, 2002; 2004).

5.9.3.1.2 Dispersion Modeling

The AERMOD dispersion model (Version 12060) was used to predict ground-level concentrations of air toxic emissions associated with HBEP. The AERMOD settings, source parameters, meteorological data, and source definition for the risk assessment were the same as the air quality impact analysis methodology (Section 5.1). A unit emission rate (1 gram/second) was used to model each source, as outlined in the HARP On-ramp program manual.

The maximum hourly impacts were predicted for the 100 degrees Fahrenheit (°F), 70 percent load case, which represents the turbine exhaust parameters associated with the maximum predicted 1-hour impact in Section 5.1. The annual impacts were predicted for the 65.8°F, 70 percent load case, which represents the average annual temperature and load scenario. Detailed modeling source parameters for HBEP are presented in Appendix 5.1C.

The discrete receptor grid spacing out to 50 kilometers was similar to the air quality impact analysis modeling methodology. In addition to the discrete receptor grid, the census block receptor locations and sensitive receptors within 6 miles of the HBEP site were also included in the HRA.

5.9.3.1.3 Risk Characterization

The results of the dispersion modeling analysis represent an intermediate product in the HRA process. The HARP On-ramp program was used to convert the AERMOD output files to a format compatible with the HARP model. The HARP model was subsequently used to determine cancer, chronic, and acute health risks.

Cancer risks were evaluated based on the annual air toxics ground-level concentrations, inhalation cancer potency, oral slope factor, frequency and duration of exposure at the receptor, and breathing rate of the exposed persons. Cancer risks were estimated using the required conservative assumption of 70-year continuous exposure duration for residential and sensitive receptors and a 40-year, 5-day week, 8-hours-per-day exposure duration for commercial/industrial receptors. In addition, for predicted cancer risks, where the inhalation pathway is the dominant pathway of cancer risks, the Derived (Adjusted) Method was used for the cancer risk evaluation, based on the *Recommended Interim Risk Management Policy for Inhalation-Based Residential Cancer Risk* (ARB, 2003).

If a predicted Derived Adjusted cancer risk is greater than one in 1 million, the cancer burden is calculated for each census block receptor. Cancer burden is defined as the estimated increase in the occurrence of cancer cases in a population resulting from exposure to carcinogenic air contaminants. The population data for census block receptors within 6 miles of the HBEP site are based on the population information within the HARP database.

Chronic toxicity is defined as adverse health effects from prolonged chemical exposure caused by chemicals accumulating in the body. Per CEC Siting Regulations, “a chronic exposure is one which is greater than twelve (12) percent of a lifetime of seventy (70) years.”[1] Acute toxicity is defined as adverse health effects caused by a brief chemical exposure of no more than 24 hours. Per CEC Siting Regulations, “An acute exposure is one which occurs over a time period of less than or equal to one (1) hour.”[2] To assess chronic and acute non-cancer exposures, annual and 1-hour air toxics ground-level concentrations are compared with the Reference Exposure Levels (REL) developed by OEHHA to obtain a chronic or acute hazard index. The REL is a concentration in ambient air at or below which no adverse health effects are anticipated.

OEHHA/ARB Cancer and Non-Cancer RELs. The HRA included potential health impacts from home-grown produce, dermal absorption, soil ingestion, and mother’s milk, as required by OEHHA guidelines (OEHHA, 2003). The inhalation cancer potency, oral slope factor values, and RELs used to characterize health risks associated with the modeled impacts were obtained from the *Consolidated Table of OEHHA/ARB Approved Risk Assessment Health Values* (OEHHA and ARB, 2012), and are shown in Table 5.9-2.

[1] Data Adequacy Checklist, Appendix B (g)(9)(E)(iii)

[2] Data Adequacy Checklist, Appendix B (g)(9)(E)(ii)

TABLE 5.9-2
Risk Assessment Health Values for Air Toxic Sustances

Compound	Inhalation Cancer Potency (mg/kg-day) $^{-1}$	Oral Cancer Slope Factor (mg/kg-day) $^{-1}$	Chronic Inhalation Reference Exposure Level (µg/m^3)	Chronic Oral Reference Exposure Level (mg/kg-day)	Acute Inhalation Reference Exposure Level (µg/m^3)
PAHs	3.90E+00	1.20E+01	—	—	—
Xylenes	—	—	7.00E+02	—	2.20E+04
Formaldehyde	2.10E-02	—	9.00E+00	—	5.50E+01
Benzene	1.00E-01	—	6.00E+01	—	1.30E+03
Acetaldehyde	1.00E-02	—	1.40E+02	—	4.70E+02
Propylene oxide	1.30E-02	—	3.00E+01	—	3.10E+03
Naphthalene	1.20E-01	—	9.00E+00	—	—
Ethyl Benzene	8.70E-03	—	2.00E+03	—	—
1,3-Butadiene	6.00E-01	—	2.00E+01	—	—
Acrolein	—	—	3.50E-01	—	2.50E+00
Toluene	—	—	3.00E+02	—	3.70E+04
Hexane	—	—	7.00E+03	—	—
Propylene	—	—	3.00E+03	—	—
NH_3	—	—	2.00E+02	—	3.20E+03

Notes:
µg/m^3 = microgram(s) per cubic meter
mg/kg-day = milligram(s) per kilogram per day
Source: OEHHA/ARB, 2012

Significance Criteria

Cancer Risk. Cancer risk is the probability or chance of contracting cancer over a human life span (assumed to be 70 years). Carcinogens are not assumed to have a threshold below which there is no human health impact. In other words, any exposure to a carcinogen is assumed to have some probability of causing cancer; the lower the exposure (time or mass), the lower the cancer risk (that is, a linear, no-threshold model). State and local regulations in California use an excess (that is, an incremental increase from the project) cancer risk greater than 10 in 1 million as the significant impact level for public health impact assessments. For example, the 10-in-1-million risk level is used by the Air Toxics Hot Spots (AB 2588) program and California's Proposition 65 as the public notification level for air toxic emissions from existing sources. An excess cancer risk below one in 1 million for a project is typically considered the de minimus impact level, meaning an excess cancer risk for a project less than one in 1 million would be less than significant.

Based on SCAQMD Rule 1401 and the SCAQMD California Environmental Quality Act (CEQA) significance thresholds (SCAQMD, 2011b), a source with a maximum individual cancer risk (MICR) less than one in 1 million individuals and a project increment less than 10 in 1 million individuals would be less than significant. Individual sources with a MICR between 1 and 10 in 1 million would be required to install best available control technology for toxics (T-BACT). Therefore, the predicted health risk values for each individual source will be compared to the incremental increase in cancer risk of one in 1 million individuals per source (that is, each of the six CTGs/HRSGs) and the predicted incremental increase in cancer risk for the project will be compared to the 10 in 1 million individuals threshold.

Based on SCAQMD Rule 1401 and the SCAQMD CEQA significance thresholds (SCAQMD, 2011b), a cancer burden greater than 0.5 excess cancer cases in areas with an incremental increase greater than one in 1 million individuals is considered significant.

Non-Cancer Risk. Non-cancer health effects can be either chronic or acute. In determining potential non-cancer health risks (chronic and acute) from air toxics, it is assumed there is a dose of the air toxic substance below which there would be no impact on human health. The air concentration corresponding to this dose is called the Reference Exposure Level. Non-cancer health risks are measured in terms of a hazard quotient, which is the calculated exposure of each contaminant divided by its REL. Hazard quotients for pollutants affecting the same target organ are typically summed with the resulting totals expressed as hazard indexes for each organ system. Based on SCAQMD Rule 1401 and the SCAQMD CEQA significance thresholds (SCAQMD, 2011b), a chronic or acute hazard index of less than 1.0 for each source and the project increment, respectively, is considered to be a less-than-significant health risk.

5.9.3.1.4 Summary of Air Toxic Exposure Assessment Results

A summary of the MICR, chronic health index, and acute health index at the point of maximum impact (PMI) locations, as well as the maximum predicted public health impacts for worker, residential, and sensitive receptors, have been included in Table 5.9-3 and Table 5.9-4. In accordance with SCAQMD Rule 1401, the results in Table 5.9-3 represent the predicted risk for each individual emission unit while the results in Table 5.9-4 represent a comparison of the total predicted HBEP impact to the SCAQMD CEQA significance thresholds. The receptor grid used to evaluate the predicted impacts is included in Appendix 5.1C. Additionally, the HARP report files were also prepared and submitted to the CEC on compact disc.

As presented in Table 5.9.3, the predicted MICR at the PMI for each individual turbine is approximately 0.066 in 1 million.[3] The maximum impact is located approximately 300 meters northeast of the project boundary. The predicted MICR for the maximum exposed individual resident (MEIR), which is approximately 500 meters northeast of the project boundary, is predicted to be 0.052 in 1 million (Derived Adjusted) and the predicted MICR for the maximum exposed individual worker (MEIW), which is located approximately 300 meters northeast of the project boundary, is predicted to be 0.010 in 1 million for the individual units. The predicted MICR at the maximum exposed sensitive receptor is predicted to be 0.0045 in 1 million. Overall, the predicted MICR for the MEIR, MEIW, and the sensitive receptors are well below the individual source significance threshold of one in 1 million. Therefore, based on SCAQMD Rule 1401, the predicted incremental increase in cancer risk from each individual unit will be less than significant and T-BACT would not be required. However, while not required, the emission control technologies included in this project are considered to be T-BACT.

The maximum chronic hazard index for an individual source at the PMI is predicted to be 0.0023, which is located approximately 300 meters northeast of the project boundary. The maximum acute hazard index for an individual source at the PMI is predicted to be 0.026, which is located on the north side of the facility fence line. The predicted chronic and acute indices are well below the SCAQMD individual source significance threshold of 1.0. Therefore, the predicted impact from each individual unit will be less than significant and T-BACT will not be required. However, as previously noted, the emission control technologies included in this project are considered to be T-BACT.

[3] All cancer risk values presented represent the 70-year OEHHA Derived methodology, unless noted.

TABLE 5.9-3
Health Risk Assessment Summary: Individual Units[a]

Risk[b]	Turbine 1	Turbine 2	Turbine 3	Turbine 4	Turbine 5	Turbine 6
Derived Cancer Risk at the PMI[c] (per million)	0.066	0.066	0.066	0.065	0.065	0.065
Derived Adjusted Cancer Risk at the PMI[d] (per million)	0.052	0.052	0.052	0.052	0.052	0.052
Derived Adjusted Cancer Risk at the MEIR[d] (per million)	0.050	0.050	0.051	0.052	0.052	0.052
Derived Adjusted Highest Cancer Risk at a Sensitive Receptor [d] (per million)	0.045	0.045	0.045	0.043	0.044	0.044
Derived Cancer Risk at the MEIW (per million)	0.010	0.010	0.010	0.010	0.010	0.010
Chronic Hazard Index at the PMI	0.0023	0.0023	0.0023	0.0022	0.0022	0.0022
Resident Chronic Hazard Index	0.0021	0.0022	0.0022	0.0022	0.0022	0.0022
Worker Chronic Hazard Index	0.0023	0.0023	0.0023	0.0022	0.0022	0.0022
Chronic Hazard Index at Sensitive Receptor	0.0020	0.0019	0.0019	0.0019	0.0019	0.0019
Acute Hazard Index at the PMI	0.014	0.026	0.024	0.0047	0.0046	0.0070
Resident Acute Hazard Index	0.0082	0.016	0.0064	0.0035	0.0035	0.0057
Worker Acute Hazard Index	0.014	0.026	0.024	0.0047	0.0046	0.0070
Acute Hazard Index at Sensitive Receptor	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025

[a] The results in Table 5.9-3 represent the predicted risk for each individual emission unit in accordance with SCAQMD Rule 1401.
[b] A source with a MICR less than one in 1 million individuals is considered to be less than significant. A chronic or acute hazard index less than 1.0 for each source is considered to be a less-than-significant health risk.
[c] Cancer risk values are based on the OEHHA Derived Methodology.
[d] Risk values are based on the Derived Adjusted Methodology.

A risk analysis was also performed to evaluate the potential facility-wide impacts. The potential health impacts at the PMI, the MEIR, the MEIW, and sensitive receptors resulting from HBEP operation are summarized in Table 5.9-4.

TABLE 5.9-4
Health Risk Assessment Summary: Facility[a]

Risk[b]	Receptor Number	Value
Derived Cancer Risk at the PMI[c]	10066	0.38 per million
Derived Adjusted Cancer Risk at the PMI[d]	10348	0.30 per million
Derived Adjusted Cancer Risk at the MEIR[d]	9337	0.30 per million
Highest Cancer Risk at a Sensitive Receptor[d]	2336	0.27 per million
Derived Cancer Risk at the MEIW	9337	0.059 per million
Chronic Hazard Index at the PMI	10348	0.013
Resident Chronic Hazard Index	10066	0.013
Worker Chronic Hazard Index	10348	0.013
Chronic Hazard Index at Sensitive Receptor	2336	0.011
Acute Hazard Index at the PMI	8988	0.049
Resident Acute Hazard Index	9254	0.038
Worker Acute Hazard Index	8988	0.049
Acute Hazard Index at Sensitive Receptor	3603	0.015

[a] The results in Table 5.9-4 represent the combined predicted risk for all six turbines operating simultaneously.
[b] A facility with an overall individual increase in cancer risk (MICR) less than 10 in 1 million individuals is considered to be less than significant. A facility chronic or acute hazard index less than 1.0 is considered to be a less-than-significant health risk.
[c] Cancer risk values represent the OEHHA Derived Methodology.
[d] Risk values represent the Derived Adjusted Methodology

It should be noted that the maximum impacts reported in Table 5.9-4 represent the maximum predicted impacts at one receptor from all sources combined. In contrast, the maximum impacts reported for each individual source in Table 5.9-3 may occur at different receptors. Therefore, the HBEP totals in Table 5.9-3 are not directly additive and should not be directly compared to the results presented in Table 5.9-4.

The predicted incremental increase in cancer risk at the PMI associated with HBEP is approximately 0.38 in 1 million[4] and is approximately 500 meters northeast of the project boundary. The predicted incremental increase in cancer risk at the MEIR is predicted to be 0.30 in 1 million (Derived Adjusted). The receptor location for the MEIR is about 500 meters northeast of the project boundary. The predicted incremental increase in cancer risk for the MEIW, which is located approximately 500 meters northeast of the project boundary, is predicted to be 0.059 in 1 million. The predicted incremental increase in cancer risk at the maximum exposed sensitive receptor is predicted to be 0.27 in 1 million. The predicted MICR for the MEIR, MEIW and the sensitive receptors are below the facility-wide significance threshold of 10 in 1 million. Therefore, based on SCAQMD CEQA significance thresholds, the predicted incremental increase in cancer risk associated with the project will be less than significant.

The maximum chronic hazard index increment at the PMI is predicted to be 0.013. The maximum predicted chronic impact is located approximately 500 meters northeast of the project boundary. The maximum acute hazard index at the PMI is predicted to be approximately 0.049. The maximum predicted acute impact is located along the north HBEP fence line. The chronic and acute index increments are below the project significance threshold of 1.0.

[4] All cancer risk values presented represent the 70-year OEHHA Derived methodology, unless noted.

The predicted chronic and acute indices are well below the SCAQMD project significance threshold of 1.0. Therefore, the predicted impact from the project will be less than significant.

5.9.3.2 Uncertainty in the Public Health Impact Assessment

Sources of uncertainty in the HRA include emissions estimates, dispersion modeling, exposure characteristics, and extrapolation of toxicity data in animals to humans. Assumptions used in HRAs are designed to provide sufficient health protection to avoid underestimation of risk to the public, which may add an additional level of conservativeness in the predicted impacts. Some sources of uncertainty and conservativeness applicable to this HRA are discussed below.

The emissions were developed assuming all equipment would operate at the same time and at the maximum heat input rate. Long-term emissions were estimated assuming the turbines would operate at maximum output for 5,000 hours per year with an additional 1,200 hours per year with supplemental duct firing, plus 465 startup and shutdown events. Under normal operating conditions, the turbines would likely operate at variable loads and would be operated less than the permitted levels on an annual basis. Consequently, the emissions used for this HRA are expected to be higher than the actual quantities during normal operation.

The models used in dispersion modeling contain assumptions that tend to over-predict ground-level concentrations. For example, the modeling performed in the HRA assumed a conservation of mass (that is, all of the pollutants emitted from the sources remained in the atmosphere while being transported downwind). During the transport of pollutants from sources to receptors, none of the material was assumed to be removed through chemical reaction or to be lost at the ground surface through reaction, gravitational settling, precipitation, or turbulent impaction. In reality, these mechanisms work to reduce the level of pollutants remaining in the atmosphere.

The long-term exposure characteristics assessed in the HRA included the assumption that residents were exposed to turbine emissions continuously at the same location for 24 hours per day, 365 days per year, for 70 years. It is extremely unlikely that any person would meet this condition. The conservative exposure assumption tends to over-predict risk estimates in the HRA process.

The toxicity data used in the HRA contain uncertainties due to the extrapolation of data from animals to humans. Typically, safety factors are applied when doing the extrapolation. Furthermore, the human population is much more diverse, both genetically and culturally, than animals used for experimental exposures and bred and housed under controlled conditions; thus, the intraspecies variability among humans is expected to be much greater than in laboratory animals. With all of the uncertainty in the assumptions used to extrapolate toxicity data, significant measures are taken to ensure that sufficient health protection is built into the available health effects data.

5.9.3.3 Air Toxics Exposure Assessment (Construction and Demolition Impacts)

Air toxics emissions associated with the construction of HBEP and the demolition of the existing Huntington Beach Generating Station Units 1, 2 and 5 will consist primarily of combustion byproducts generated during movement of onsite construction/demolition equipment and onsite and offsite movement (vehicular miles traveled) of vehicles associated with the construction of the project and demolition of existing Units 1, 2 and 5. However, the construction and demolition phase is temporary and finite and an assessment of the potential health impacts from the emissions of air toxic substances is not a SCAQMD CEQA analysis requirement (SCAQMD, 1993). Therefore, an assessment of the potential health impacts from TACs from construction activities was not conducted as part of this analysis. However, the emissions of criteria pollutants from construction and demoltion have been assessed in Section 5.1 and Rule 1401 Toxic New Source Review would also apply to the any stationary equipment subject to New Source Review permitting during the construction and demolition phase. Construction impacts would be further reduced with the implementation of the additional construction mitigation measures presented in Section 5.1 and the implementation of a construction fugitive dust and diesel-fueled engine control plan. The project owner will also comply with all requirements outlined in SCAQMD Rule 1403, which requires the notification and special handling of asbestos-containing materials during demolition activities.

5.9.4 Cumulative Effects

As previously discussed, the MATES II and MATES III studies consisted of a comprehensive monitoring program, an updated emissions inventory, and a modeling effort to characterize health risks associated with human exposures to ambient concentrations of TACs in the SCAB. The estimated carcinogenic risk was found to be rather uniform across the basin ranging from about 1,120 in 1 million to about 1,740 in 1 million for the sites monitored. Updating the findings of MATES II, SCAQMD completed the MATES III study by issuing a final report in September 2008. Similar to the earlier MATES II study, the MATES III study found that mobile sources continued to dominate cancer risk in the SCAB by accounting for an estimated 94 percent of the overall cancer risk. Diesel emissions, alone, account for 84 percent of the cancer risk. Overall, the general trend in risk exposure has been decreasing with the estimated cancer risk from exposure to airborne toxics reduced to 1,200 in 1 million.

The maximum incremental increase in the cancer risk predicted at the PMI for the HBEP is 0.38 in 1 million. The maximum chronic and acute hazard indices are 0.013 and 0.049, respectively. These levels are well below the CEQA significance de minimus thresholds for cancer risk of 10 in 1 million, and/or the chronic and acute hazard index of 1.0. Furthermore, the results of the MATES III study indicate the cumulative background cancer risk from exposure to airborne toxics is approximately 1,200 in 1 million, with an estimated 94 percent of the overall cancer risk due to mobile sources. Therefore, stationary source emissions from the HBEP are expected to contribute to approximately less than 0.04 percent of the background risk in the vicinity of the project. While not required, T-BACT emission control technologies will also be installed as part of the project, which will reduce the TAC emissions to the extent technically feasible. The removal/demolition of the existing Huntington Beach Generating Station Units 1, 2, and 5, and the removal/demolition of the existing Huntington Beach Generating Station Units 3 and 4 will also offset a portion of the potential impacts from the operation of HBEP Blocks 1 and 2 relative to the existing background levels. Therefore, it is concluded that HBEP will not have a significant cumulative impact.

The HBEP construction activities and the existing Huntington Beach Generating Station's demolition activity would be finite and best available emission control techniques would be used throughout the 96-month activity period to control pollutant emissions. Impacts from the demolition of existing Huntington Beach Generating Stations's Units 1, 2, and 5, as well as the demolition of Units 3 and 4, would be further reduced with the implementation of the additional construction mitigation measures presented in Section 5.1 and the implementation of a construction fugitive dust and diesel-fueled engine control plan. Therefore, the cumulative impacts from construction and demolition are expected to be less than significant.

5.9.5 Mitigation Measures

5.9.5.1 Criteria Pollutants

The results of the air dispersion modeling presented in Section 5.1, Air Quality, concluded that HBEP emissions during operation will not cause or contribute to the violation of the ambient air quality standards (either National Ambient Air Quality Standards [NAAQS] or California Ambient Air Quality Standards) for those pollutants for which the area is designated as attainment. These standards are intended to protect the general public with a wide margin of safety. Therefore, HBEP is not expected to have a significant impact on public health from emissions of criteria pollutants. For those criteria pollutants (and their precursor pollutants) where the ambient air quality standards are categorized as non-attainment, mitigation will be provided to reduce the impacts to less-than-significant levels (see Section 5.1). HBEP will also include emission-control technologies necessary to meet the required emission standards specified for criteria pollutants under SCAQMD rules.

The construction activity would be finite and best available emission control techniques would be used throughout the 96-month construction activity period to control criteria pollutant emissions. Construction impacts would be further reduced with the implementation of the additional construction mitigation measures presented in Section 5.1 and the implementation of a construction fugitive dust and diesel-fueled engine control plan. Therefore, the public health impacts from construction are expected to be less than significant.

5.9.5.2 Air Toxic Substances

As presented in Section 5.9.3, the maximum incremental increase in the cancer risk predicted at the point of maximum impact, MEIR, and MEIW are 0.38, 0.30, and 0.059 in 1 million, respectively. The maximum chronic and acute hazard indices are 0.013 and 0.049, respectively. These levels are below the significance thresholds for cancer risk of 10 in 1 million, and/or the chronic and acute hazard index of 1.0. Therefore, mitigation measures are not required for air toxic emissions from HBEP.

5.9.6 Laws, Ordinances, Regulations, and Standards

An overview of the relevant LORS that affect public health and the conformity of the project to each of the LORS are identified in Table 5.9-5.

TABLE 5.9-5
Laws, Ordinances, Regulations, and Standards for Public Health

LORS	Requirements/Applicability	Administering Agency	Analyses of Conformance
Federal			
Title 40 CFR, Part 63	Establishes national emission standards to limit emissions of hazardous air pollutants (HAPs, or air pollutants identified by EPA as causing or contributing to the adverse health effects of air pollution but for which NAAQS have not been established) from facilities in specific categories.	SCAQMD, with EPA Region IX oversight	The estimated annual HBEP HAP emissions are less than the major source thresholds for HAPs (10 tons per year for any one pollutant or 25 tons per year for all HAPs combined). Therefore, National Emissions Standards for Hazardous Air Pollutants (NESHAP) regulations do not apply.
State			
Health and Safety Code Sections 44360 to 44366 (Air Toxics "Hot Spots" Information and Assessment Act—AB 2588)	Requires preparation and biennial updating of facility emission inventory of hazardous substances; risk assessments.	SCAQMD with oversight from ARB/OEHHA	An estimate of TAC emissions and associated risk was conducted as part of this analysis. (See Conformance description for SCAQMD Rule 1401 (Permits – Toxics New Source Review)
Health and Safety Code 25249.5 et seq. (Safe Drinking Water and Toxic Enforcement Act of 1986—Proposition 65)	Provides notification of Proposition 65 chemicals.	OEHHA	The project owner will comply with all signage and notification requirements.
Local			
SCAQMD Rule 1401 (Permits – Toxics New Source Review)	The purpose of this rule is to provide for the review of new and modified sources of TAC emissions in order to evaluate potential public exposure and health risk, to mitigate potentially significant health risks resulting from these exposures, and to provide net health risk benefits by improving the level of control when existing sources are modified or replaced.	SCAQMD	T-BACT shall be applied to any new or modified source of TACs where the source risk is a cancer risk greater than 1.0 in 1 million (10^{-6}), a chronic hazard index greater than 1.0, or an acute hazard index greater than 1.0. The predicted MICR at the MEIR and MEIW cancer risks for the project are 0.30 and 0.059 in 1 million, respectively. The maximum predicted chronic and acute hazard indices are 0.013 and 0.049, respectively. The values are less than the individual source thresholds of 1.0 in 1 million (10^{-6}). The levels are also below the Permit to Construct or Permit to Operate facility thresholds for cancer risk of 10 in 1 million and the chronic and acute hazard index of 1.0. Nevertheless, the project will employ emission controls considered to be T-BACT.

TABLE 5.9-5
Laws, Ordinances, Regulations, and Standards for Public Health

LORS	Requirements/Applicability	Administering Agency	Analyses of Conformance
SCAQMD Rule 1403 (Permits – Asbestos Removal)	The purpose of this rule is to specify work practice requirements to limit asbestos emissions from building demolition and renovation activities, including the removal and associated disturbance of asbestos-containing materials.	SCAQMD	The project owner will comply with the requirements outlined in Rule 1403 prior to the removal of asbestos-containing materials.
SCAQMD Rule 212(c)(3) (Permits – Public Notice)	The purpose of this rule is to establish standards for approving permits and issuing public notice.	SCAQMD	Rule 212 (c)(3) requires public notification if the MICR, based on Rule 1401, exceeds one in 1 million (1×10^{-6}), due to a project's proposed construction, modification, or relocation for facilities with more than one permitted equipment unless the applicant can show the total facility-wide MICR is below 10 in 1 million (10×10^{-6}). The total facility-wide MICR is less than one in 1 million. Therefore, public notification is not required.
SCAQMD Rule 3008 – Title V Permits (Potential to Emit Limitations)	The purpose of this rule is to exempt low-emitting facilities with actual emissions below a specific threshold from federal Title V permit requirements by limiting the facility's potential to emit.	SCAQMD	This rule shall apply to any facility which would, if it did not comply with the limitations set forth in either paragraphs (d)(1) or (d)(2) of Rule 3008, have the potential to emit air contaminants equal to or in excess of the thresholds specified in Table 2, subdivision (b) of Rule 3001 – Applicability, or for greenhouse gasses 100,000 or more tons per year CO_2e. HBEP will exceed the Title V thresholds listed in Rule 3001. As a result, HBEP will submit a Title V application as part of the permitting process

5.9.7 Agencies and Agency Contacts

Table 5.9-6 provides contact information for agencies involved with public health.

TABLE 5.9-6
Agency Contacts for Public Health

Issue	Agency Contacted	Person Contacted
Regulatory oversight	EPA Region IX	Gerardo Rios EPA Region IX 75 Hawthorne Street San Francisco, CA 94105 (415) 947-3974
Regulatory oversight	ARB	Michael Tollstrup Project Assessment Branch California Air Resources Board 2020 L Street Sacramento, CA 95814 (916) 322-6026
Permit issuance, enforcement	SCAQMD	Andrew Lee South Coast Air Quality Management District 21865 Copley Drive Diamond Bar, CA 91765 (909) 396-2643

5.9.8 Permits and Permit Schedule

Consistent with the CEC siting regulations, SCAQMD is responsible for issuing the required operating permits related to public health. Sections 5.1-9 and 5.1-11 include a summary of the SCAQMD and EPA permits required and expected issuance schedule.

5.9.9 References

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U.S. Environmental Protection Agency (EPA). 2005. *Guideline on Air Quality Models*, 40 CFR, Part 51, Appendix W, November.