DOCKETED

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5.9 Public Health

This section discusses activities that could potentially affect public health as they relate to the construction and operation of the Pecho Energy Storage Center (PESC or Pecho). A Health Risk Assessment (HRA) was performed to assess potential effects and public exposure associated with airborne emissions from the PESC. Section 5.9.1 describes the affected environment. Section 5.9.2 presents an environmental analysis of the operation of the power facility and associated facilities. Section 5.9.3 discusses cumulative effects. Section 5.9.4 discusses mitigation measures. Section 5.9.5 presents applicable Laws, Ordinances, and Regulations (LORS), permit requirements, schedules, and agency contacts. Section 5.9.6 contains references cited or consulted in preparing this section. Appendices 5.9A to 5.9F contain the HRA support data.

The PESC will be a 400-megawatt (MW) Advanced Compressed Air Energy Storage (A-CAES) process that includes above-ground electric air compression and power generation equipment, an underground air storage cavern, heat exchangers, and two diesel fuel-fired internal combustion engines driving emergency generators with an approximate output of up to 5MW each. The Facility will be restricted to the public with security fencing surrounding the perimeter. A detailed description of the PESC is presented in Section 2, Project Description.

Air will be the dominant pathway for public exposure to chemical substances released by Pecho. Emissions to the air will consist primarily of combustion by-products produced by two internal combustion engines driving emergency generators. As these units are for emergencies purposes only the use of these units is anticipated to be minimal. Potential health risks from combustion emissions will occur almost entirely by direct inhalation. To be conservative, additional pathways were included in the health risk modeling. The HRA was conducted following the guidelines established by the California Office of Environmental Health Hazard Assessment (OEHHA) and the California Air Resources Board (CARB).

Combustion byproducts with established California Ambient Air Quality Standards (CAAQS) or National Ambient Air Quality Standards (NAAQS), including nitrogen oxides (NOx), carbon monoxide (CO), and fine particulate matter (PM_{10}/$PM_{2.5}$) are addressed in Section 5.1, Air Quality. However, some discussion of the potential health risks associated with these substances is presented in this section. Human health risks associated with the potential accidental release of stored acutely hazardous materials, if applicable, are discussed in Section 5.5, Hazardous Materials.

5.9.1 Affected Environment

The PESC will be located in San Luis Obispo County within the San Luis Obispo County Air Pollution Control District (SLOCAPCD). The Pecho site is located just off of California State Highway 1 near the intersection of San Luisito Creek Road to the west of Morro Bay, California.

The Pecho site is situated in San Luis Obispo County census tract 130, which has a population value of 2,664 individuals per the 2020 census from the United States Census Bureau. Section 2, Project Description contains a detailed project description, location maps, and other related technical data.

The 2019 Annual Air Quality Report for SLOCAPCD published in November 2020 identifies the following related to air quality in the region:

- Smoke from wildfires from the San Joaquin Valley had a major impact on air quality in 2019.
- South County air quality continues to be impacted by dust blown from the Oceano Dunes State Vehicle Recreation Area.

- The 10-year ozone data shows a downward trend of the number of hours ozone exceeded 65 parts per billion (ppb). The ozone design value remained flat to a slight downward trend over the past 10 years. Particulate matter levels generally decreased across the county.

No additional public health studies related to respiratory illnesses, cancers, or related diseases within a 6-mile radius of the PESC site were identified within the last 5 years.

Receptors

For this HRA, six types of receptors were used. The receptor grid was created to cover the area of 10,000 meters (m) x 10,000 (m), centered at UTM coordinate (700,000 mE, 3,914,400 mN). The modeling domain is sufficiently large to include both the cancer risk and non-cancer risk Zone of Impact (ZOI). The ZOI for cancer risk is assumed to be all receptors within 1 in a million isopleth (70-year exposure).

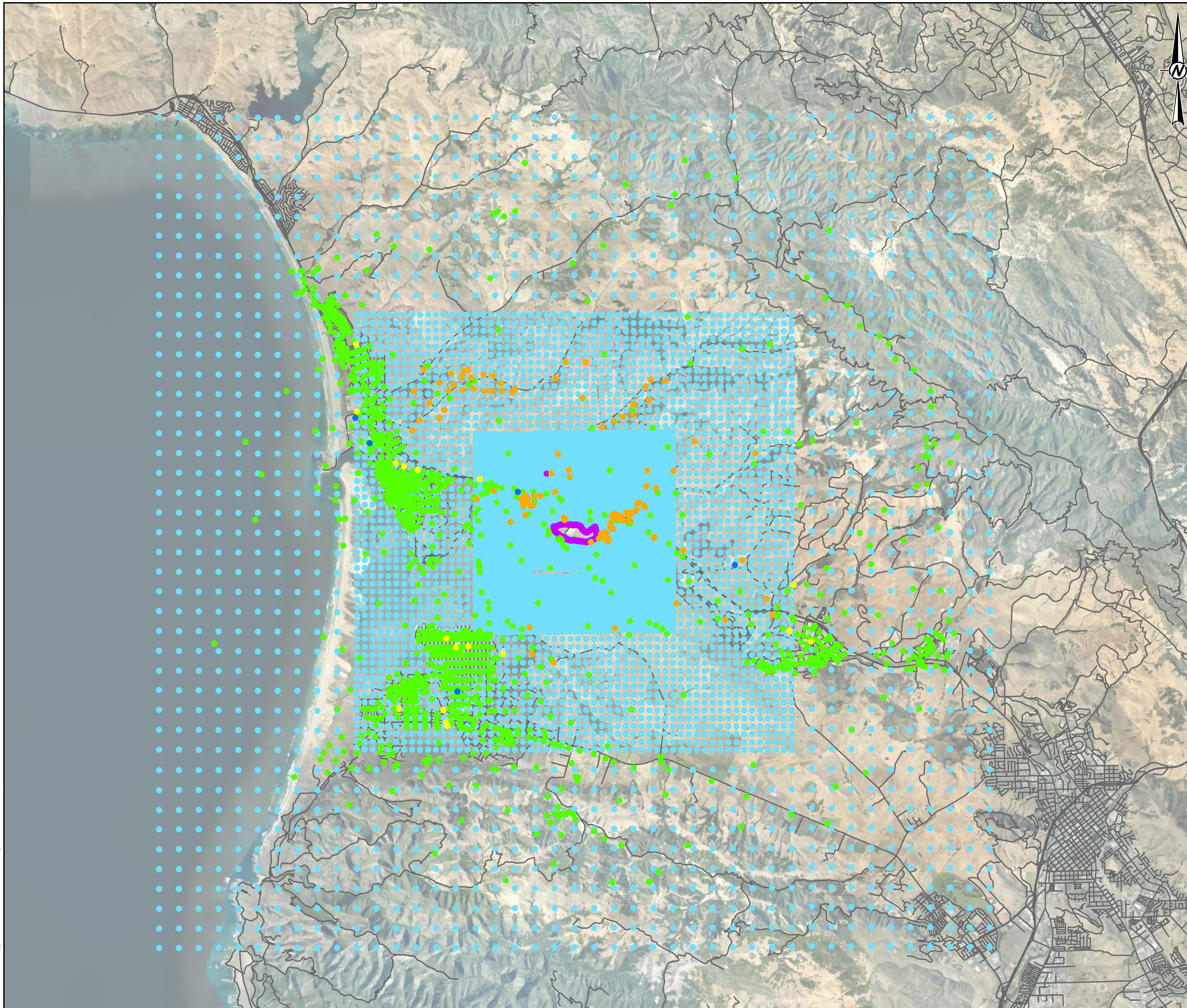
- Fenceline Receptors: Receptors are placed on the property line of the facility. The receptors were placed 10 m apart.
- Cartesian Grid receptor spacing includes:
  - 50 m spacing from fence line out to 500 m
  - 100 m spacing from 500 m to 2,000 m
  - 200 m spacing from 2,000 m to 5,000 m
  - 500 m spacing from 5,000 m to 10,000m
- Sensitive Receptors: Sensitive receptors were placed where the population is potentially more susceptible to adverse effects from emitted pollutants. Based on (OEHH/CARB 2015) sensitive receptor locations include schools [kindergarten through grade 12 (K-12)], daycare centers, nursing homes, retirement homes, health clinics, hospitals, playgrounds, and athletic facilities. Seventeen (17) sensitive receptors were identified within 10 kilometers (km) of the PESC.
- Residential Receptors: Discrete receptors were located at the nearest residences to the Pecho site. Google Maps was used to identify the locations of residential receptors.
- Worker Receptors: Discrete receptors were located at the buildings of industries, companies, where workers would likely be present. Google Maps was used to identify the locations of worker receptors.
- Population (census) Receptors: These receptors were placed to represent population centroids. The Hotspots Analysis and Reporting Program (HARP) has a database that can export population centroid receptors and their corresponding populations to a csv file. Population receptors within 10 km of the PESC were exported from HARP and imported into the American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD) as discrete receptors.

A total of 9,166 receptors were included in one combined AERMOD run and HARP run. Table 5.9-1 shows the distribution of the six types of receptors mentioned above.

Table 5.9-1: HRA Receptors

Receptor #	ID	Type of Receptor	Number of Receptors
1 to 298	FC-PECH-01 to FC-PECH-298	Fenceline Receptors	298
299 to 315	SR-PECH-01 to SR-PECH-17	Sensitive	17
316 to 444	RD-PECH-01 to RD-PECH-129	Residential	129
445 to 450	WR-PECH-1 to WR-PECH-06	Worker	6
451 to 7939	GR-PECH-01 to GR-PECH-7489	Grid Receptors	7489
7940 to 9166	CS-PECH-01 to CS-PEACH-1227	Population Receptors	1,227

The nearest residential receptor is RD-PECH-16 approximately 40 m southeast of the PESC ambient boundary. The closest residential receptor to the proposed emergency generators is RD-PECH-33 located approximately 180 meters to the northeast of the stacks. The nearest worker receptor WR-PECH-05 (Stoners Auto) is approximately 0.8 km east of the PESC ambient boundary. The nearest sensitive receptor SR-PECH-13 (Bayside Care Center) is approximately 2.2 km northwest from the PESC ambient boundary. Figure 5.9-1 shows the location of the fence line, grid, sensitive, residential, worker, and population receptors within a 10 km radius of the site. All receptors included in this analysis are presented in Appendix 5.9A.



Legend

- SENSITIVE RECEPTORS
- RESIDENTIAL RECEPTORS
- WORKER RECEPTORS
- POPULATION (CENSUS) RECEPTORS
- FENCELINE RECEPTORS
- GRID RECEPTORS
- ROAD
- PECHO SITE

NOTES

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0 5,000 10,000 Feet

REFERENCE

COORDINATE SYSTEM: NAD 1983 UTM ZONE 10N

CLIENT
HYDROSTOR, INC.

PROJECT
PECHO ENERGY STORAGE CENTER

TITLE
LOCATION OF RECEPTORS FOR HEALTH RISK ASSESSMENT

CONSULTANT

GOLDER MEMBER OF WSP

YYYY-MM-DD	2021-10-05
PREPARED	MR
DESIGN	MR
REVIEW	DH
APPROVED	DH

PROJECT No.	CONTROL	Rev.	FIGURE
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5.9.2 Environmental Analysis

The environmental effects on public health from the construction and operation of PESC are presented in the following sections.

5.9.2.1 Significant Criteria

Significant criteria for cancer and non-cancer risk are described in the sections below.

5.9.2.1.1 Cancer Risk

Cancer risk is the probability or chance of contracting cancer over a human lifetime. Any exposure to a carcinogen is assumed to have some probability of causing cancer; the lower the exposure, the lower the cancer risk (i.e., a linear, no-threshold model). Under various state and local regulations, an incremental cancer risk greater than
10 per million due to a project's emission can have a significant effect on public health. For example, the 10 per million risk level is used by the Air Toxics Hot Spots (AB 2588) program and Proposition 65 as the public notification level for air toxic emissions from existing sources. When evaluating cancer risks from a single facility it is important to note that the overall lifetime risk of developing cancer for the average male in the United States is approximately 1 in 2 or 500,000 per million, and about 1 in 3, or 333,333 per million for the average female1.

In California, from 2013-2017 the cancer incidence rates were 4,329 per million for males and 3,876 per million for females[2]. The cancer death rates in California from 2014-2018 were 1,649 per million for males and 1,225 per million for females[3].

5.9.2.1.2 Non-Cancer Risk

Non-cancer health effects can be classified as either chronic or acute. In determining the potential health risks of non-cancerous air toxics, it is assumed there is a dose of the chemical of concern below which there would be no effect on human health. The air concentration corresponding to this dose is called the Reference Exposure Level (REL). 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 indices for each organ system. A hazard index of less than 1.0 is generally an insignificant health risk. RELs used in the hazard index calculations were those published in the Consolidated Table of OEHHA/ARB Approved Risk Assessment Health Values dated October 2, 2020.

Chronic toxicity is defined as adverse health effects from prolonged chemical exposure, caused by chemicals accumulating in the body. Because chemical accumulation to toxic levels typically occurs slowly, symptoms of chronic effects usually do not appear until long after exposure commences. The lowest no-effect chronic exposure level for a non-carcinogenic air toxic is the chronic REL. Below this threshold, the body can eliminate or detoxify the chemical rapidly enough to prevent its accumulation. The chronic hazard index was calculated using the hazard quotients calculated with annual concentrations.

Acute toxicity is defined as adverse health effects caused by brief chemical exposure of no more than 24 hours. For most chemicals, the air concentration required to produce acute effects is higher than the level required to produce chronic effects because the exposure duration is shorter. Because acute toxicity is predominantly

[1] https://www.cancer.org/cancer/cancer-basics/lifetime-probability-of-developing-or-dying-from-cancer.html, Accessed August 21, 2021.

[2] https://cancerstatisticscenter.cancer.org/#!/data-analysis/IncRate, Accessed August 21, 2021.

[3] https://cancerstatisticscenter.cancer.org/#!/data-analysis/DeathRate, Accessed August 21, 2021.

manifested in the upper respiratory system at threshold exposures, all hazard quotients are typically summed to calculate the acute hazard index. One-hour average concentrations are divided by the acute RELs to obtain a hazard index for health effects caused by relatively high, short-term exposures to air toxics.

5.9.2.2 Construction and Commissioning Phase Effects

The construction phase of the PESC is expected to take approximately 54 months (followed by several months of startup and commissioning). Strict construction practices that incorporate safety and compliance with applicable LORS will be followed (see Section 5.9.5). Additionally, mitigation measures to reduce air emissions from construction effects will be implemented as described in Section 5.1, Air Quality. Temporary emissions from construction-related activities are discussed in Appendix 5.9B. Construction-related emissions are temporary and localized, resulting in no long-term effects to the public.

Small quantities of hazardous waste may be generated during the construction phase of the PESC. Hazardous waste management plans will be in place so the potential for public exposure will be minimal (see Section 5.14, Waste Management). No acutely hazardous materials will be used or stored on-site during construction (see Section 5.5, Hazardous Materials). To ensure worker safety during construction, safe work practices will be followed (see Section 5.16, Worker Health and Safety).

A screening health risk assessment was conducted for the construction period due to emissions of diesel particulate matter. Although estimated cancer risks at the property line are elevated due to proximity to emission points, the cancer risk decreases significantly with distance and is based on a cancer burden estimate, no significant public health effects are expected during the construction phase. The results of this analysis show no significant impact on public health and are presented in Appendix 5.9B.

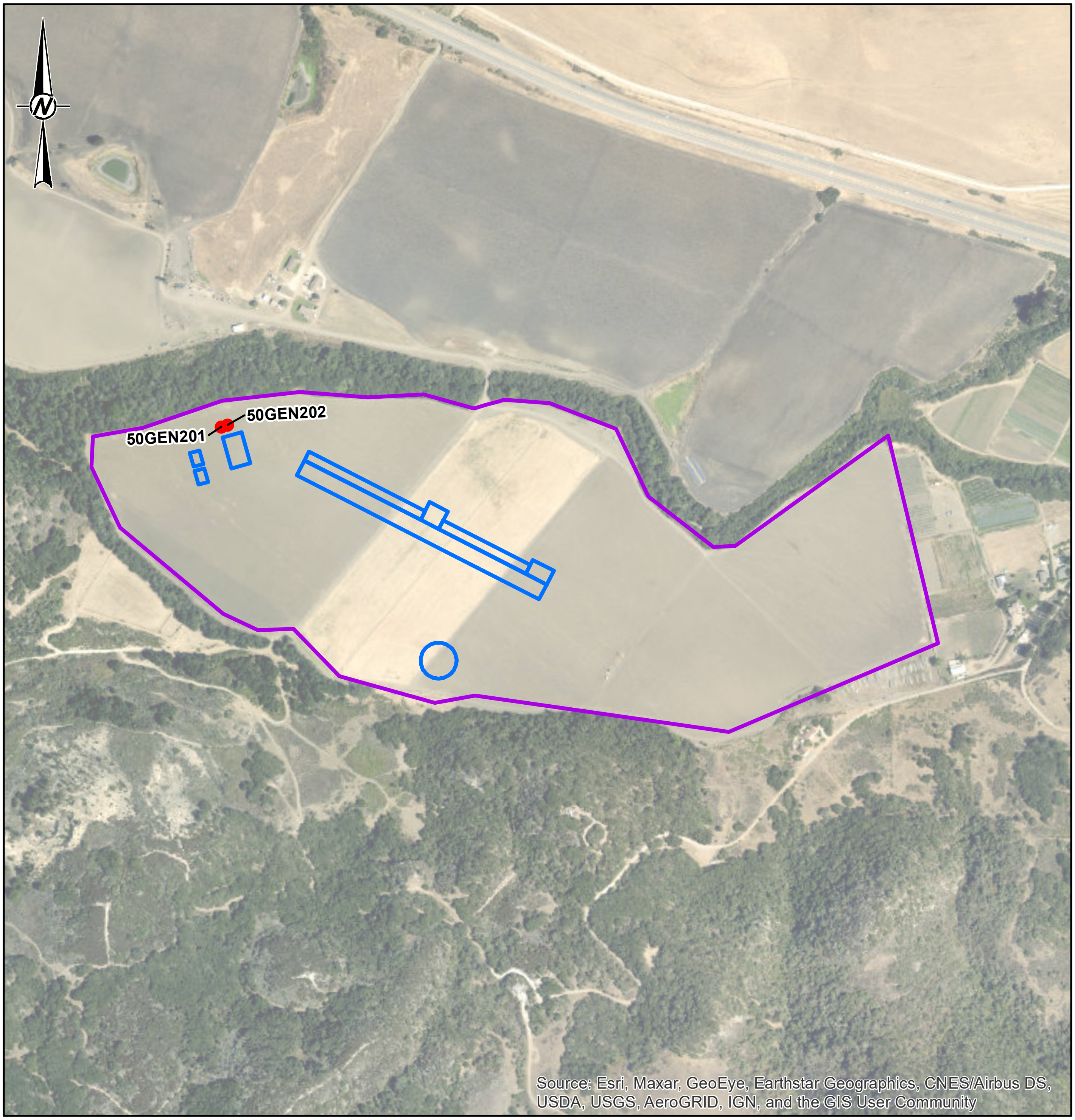
5.9.2.3 Operational Phase Effects

During the operational phase, two, diesel generators will supply emergency power for critical loads. The capacity for the final design is not known but be no more than 5 MW each; we have assumed 5 MW units for this analysis. These generators are the only stationary sources that will combust fossil fuel and are anticipated to operate for up to 50 hours (each) per year for testing, maintenance, and emergency service. SLOCAPCD will likely require permitted operation for maintenance and readiness testing to be 30 hours (each) per year or less depending on the risk prioritization score. SLOCAPCD does not specify permit limits for emergency use, but this analysis assumes the engines will be limited to 200 hours per year each in an air permit. This HRA includes emissions from the operation of the two emergency diesel generators. Table 5.9-2 provides the location and source characteristics for each generator stack. Figure 5.9-2 shows the site property boundary and location of the two emission sources that are evaluated for this HRA.

Table 5.9-2: Pecho Emission Sources for Operation Phase

Source ID	Description	UTM Easting Coordinate (m)	UTM Northing Coordinate (m)	Stack Height from grade (ft)	Stack Inside Diameter (ft)	Stack Elevation (m)	Exhaust Gas Temperature (°F)	Exhaust Gas Flowrate (actual cfm)	Stack Velocity (m/s)
50GEN201	Emergency Diesel Generator	382,048.8	3,861,827.2	13.05	1.5	799.6	718.5	42,896.7	123.3
50GEN202	Emergency Diesel Generator	382,048.4	3,861,817.5	13.05	1.5	799.5	718.5	42,896.7	123.3

Source: TWD (August 2021), and CAT Technical Specifications for a diesel generator set Stand By 5320 ekW 6650 Kva.
Coordinate datum = UTM Zone 10, NAD83.



LEGEND

- POINT SOURCE
- STRUCTURE
  ONLY STRUCTURES THAT CAN INFLUENCE AIR DISPERSION FROM POINT SOURCES WERE INCLUDED IN THE MODEL
- PECHO SITE - PROPERTY BOUNDARY

0 500 1,000
Feet

CLIENT
HYDROSTOR INC.

REFERENCE(S)
COORDINATE SYSTEM: NAD 1983 UTM ZONE 10N

PROJECT
PECHO ENERGY STORAGE CENTER

CONSULTANT

GOLDER
MEMBER OF WSP

YYYY-MM-DD	10/5/2021
DESIGNED	MR
PREPARED	MR
REVIEWED	MS
APPROVED	DS

TITLE
LOCATION OF PECHO EMISSION SOURCES DURING OPERATION PHASE

PROJECT NO.	CONTROL	REV.	FIGURE
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Environmental consequences potentially associated with the operation of the PESC are human exposure to chemical substances emitted into the air. The human health risks potentially associated with these chemical substances were evaluated in an HRA. The chemical substances potentially emitted to the air from the PESC emission units are listed in Table 5.9-3.

Table 5.9-3: Chemical Substances Potentially Emitted to the Air from the PESC

Criteria Pollutants	Greenhouse Gasses	Toxic Air Pollutants	
Particulate Matter (PM)	Carbon Dioxide (CO_2)	Acenaphthene Acenaphthylene Acetaldehyde Acrolein Anthracene Benzo(a)anthracene Benzene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(g,h,l)perylene Benzo(k)fluoranthene Chrysene	Dibenz(a,h)anthracene Fluoranthene Fluorene Formaldehyde Indeno(1,2,3-cd)pyrene Naphthalene Phenanthrene Propylene Pyrene Toluene Xylene
PM less than 10 microns (PM10)	Methane (CH_4)		
PM less than 2.5 microns (PM2.5)	Nitrous Oxide (N_2O)		
Carbon Monoxide (CO)			
Nitrogen Oxides (NOx)			
Volatile Organic Compounds (VOC)			

Source: Section 5.1, Air Quality and Section 5.9, Public Health, Appendix 5.9C.

Estimated toxic pollutant emissions from PECS processes for the operation phase are provided in Table 5.9-4. Appendix 5.9C shows detailed emission calculations.

Table 5.9-4: Toxic Pollutant Emissions Estimates for Operation Phase

CAS	Pollutant	Pecho Emission (2 generators) pounds per hour (lb/hr)	Pecho Emission (2 generators) (tons/yr)
83329	Acenaphthene	4.45E-04	4.45E-05
208968	Acenaphthylene	8.77E-04	8.77E-05
75070	Acetaldehyde	2.39E-03	2.39E-04
107028	Acrolein	7.49E-04	7.49E-05
120127	Anthracene	1.17E-04	1.17E-05
56553	Benzo(a)anthracene	5.91E-05	5.91E-06
71432	Benzene	7.37E-02	7.37E-03
50328	Benzo(a)pyrene	2.44E-05	2.44E-06
205992	Benzo(b)fluoranthene	1.05E-04	1.05E-05
191242	Benzo(g,h,l)perylene	5.28E-05	5.28E-06
207089	Benzo(k)fluoranthene	2.07E-05	2.07E-06
218019	Chrysene	1.45E-04	1.45E-05
53703	Dibenz(a,h)anthracene	3.29E-05	3.29E-06

CAS	Pollutant	Pecho Emission (2 generators) pounds per hour (lb/hr)	Pecho Emission (2 generators) (tons/yr)
206440	Fluoranthene	3.83E-04	3.83E-05
86737	Fluorene	1.22E-03	1.22E-04
50000	Formaldehyde	7.49E-03	7.49E-04
193395	Indeno(1,2,3-cd) pyrene	3.93E-05	3.93E-06
91203	Naphthalene	1.23E-02	1.23E-03
85018	Phenanthrene	3.88E-03	3.88E-04
115071	Propylene	2.65E-01	2.65E-02
129000	Pyrene	3.52E-04	3.52E-05
108883	Toluene	2.67E-02	2.67E-03
1330207	Xylene	1.83E-02	1.83E-03

Source: Section 5.9, Public Health, Appendix 5.9C

Ambient air concentrations due to emissions of criteria pollutants will adhere to NAAQS and CAAQS (see Section 5.1, Air Quality). Offsets will not be required because the PESC project will not be a major source under New Source Review (NSR). Air dispersion modeling results (see Section 5.1, Air Quality) show that emissions will not result in ambient concentrations of criteria pollutants that exceed ambient air quality standards (NAAQS or CAAQS). These standards are intended to protect the general public. Therefore, the Pecho project is not anticipated to have a significant effect on public health from emissions of criteria pollutants.

The HRA was prepared using guidelines developed by OEHHA and CARB, as implemented in the latest version of the Hotspots Analysis and Reporting Program (HARP2) model (ADMRT Ver. 21081). Appendix 5.9D summarizes the HRA methodology followed, HARP2, and AERMOD model options and parameters.

5.9.2.4 Public Health Effect Study Methods

Emissions of toxic pollutants potentially associated with the PESC were estimated using emission factors approved by CARB and the Environmental Protection Agency (EPA). Unit dispersion factors for each emission source were estimated using the AERMOD dispersion modeling program. Modeling allows the estimation of both short-term and long-term average concentrations in air for use in an HRA, accounting for site-specific terrain and meteorological conditions. Unit dispersion factors and emission rates were loaded into HARP and the software calculates estimated ground level concentration (GLC) for each pollutant. HARP compares the GLCs to cancer and non-cancer benchmarks to estimate health risk. Health risks potentially associated with the estimated concentrations of pollutants in the air were characterized in terms of excess lifetime cancer risks (for carcinogenic substances), or comparison with reference exposure levels for non-cancer health effects (for non-carcinogenic substances).

Health risks were evaluated for a hypothetical maximum exposed individual resident (MEIR) located at the highest estimated concentration for a receptor where a resident could be exposed for a long period (e.g., at a house or apartment).

The highest offsite concentration location is defined as the point of maximum impact (PMI). The estimated health risks at the PMI are less than applicable health screening benchmarks.

Health risks potentially associated with concentrations of carcinogenic air pollutants were calculated as estimated excess lifetime cancer risks. The excess lifetime cancer risk for a pollutant is estimated as the product of the concentration in the air and a unit risk value. The unit risk value is defined as the estimated probability of a person contracting cancer because of constant exposure to an ambient concentration of 1 microgram per cubic meter (µg/m^3) over a 70-year lifetime. Evaluation of potential non-cancer health effects from exposure to short-term and long-term concentrations in the air was performed by comparing modeled concentrations in the air with the RELs. A REL is a concentration in the air at or below which no adverse health effects are anticipated. RELs are based on the most sensitive adverse effects reported in the medical and toxicological literature. Potential non-cancer effects were evaluated by calculating a ratio of the modeled concentration in the air and the REL. This ratio is referred to as a hazard quotient. The unit risk values and RELs used to characterize health risks associated with modeled concentrations in the air were obtained from the Consolidated Table of OEHHA/ARB Approved Risk Assessment Health Values (CARB/OEHHA 2020), are presented in Table 5.9-5.

Table 5.9-5: Toxicity Values Used to Characterize Health Risks (Inhalation)

CAS	Pollutant	Unit Risk Factor (µg/m^3)$^{-1}$	Chronic REL (µg/m^3)	Acute REL (µg/m^3)	8-hour Chronic REL (µg/m^3)
83329	Acenaphthene	-	-	-	-
208968	Acenaphthylene	-	-	-	-
75070	Acetaldehyde	2.6E-06	140	470	300
107028	Acrolein	-	0.35	2.5	0.7
120127	Anthracene	-	-	-	-
56553	Benzo(a)anthracene	1.1E-04	-	-	-
71432	Benzene	2.9E-05	3	27	3
50328	Benzo(a)pyrene	1.1E-03	-	-	-
205992	Benzo(b)fluoranthene	1.1E-04	-	-	-
191242	Benzo(g,h,l)perylene		-	-	-
207089	Benzo(k)fluoranthene	1.1E-04	-	-	-
218019	Chrysene	1.1E-05	-	-	-
53703	Dibenz(a,h)anthracene	1.2E-03	-	-	-
206440	Fluoranthene	-	-	-	-
86737	Fluorene	-	-	-	-
50000	Formaldehyde	6.0E-06	9	55	9
193395	Indeno(1,2,3-cd) pyrene	1.1E-04	-	-	-
91203	Naphthalene	3.4E-05	9	-	-
85018	Phenanthrene	-	-	-	-
115071	Propylene	-	3,000	-	-
129000	Pyrene	-	-	-	-

CAS	Pollutant	Unit Risk Factor $(\mu g/m^3)^{-1}$	Chronic REL $(\mu g/m^3)$	Acute REL $(\mu g/m^3)$	8-hour Chronic REL $(\mu g/m^3)$
108883	Toluene	-	420	5,000	830
1330207	Xylene	-	700	22,000	-

Source: CARB/OEHHA 2020

5.9.2.5 Characterization of Risks from Toxic Air Pollutants

The excess lifetime cancer risk at the PESC PMI location is estimated to be 0.09×10^{-6}. Excess lifetime cancer risks at this level are unlikely to represent significant public health effects that require additional controls of facility emissions. Cancer risks higher than 1×10^{-6} may or may not be of concern, depending upon several factors. These include the conservatism of assumptions used in risk estimation, the size of the potentially exposed population, and the toxicity of the risk-driving chemicals. Cancer risks higher than 10×10^{-6} from sources trigger public notice requirements. Non-cancer risks less than 1.0 are generally not a concern. Health effects risk thresholds are listed in Table 5.9-6, Health Effects Significant Threshold Levels for SLOCAPCD.

Table 5.9-6: Toxicity Values Used to Characterize Health Risks (Inhalation)

Risk Category	Risk Threshold
Significant Health Risk	Cancer Risk: ≥ 10×10^{-6} Chronic Risk: ≥ 1.0 Acute Risk: ≥ 1.0

Source: CEQA Air Quality Handbook SLO County APCD, April 2012

The risks predicted in the HRA are compared to the following levels (SLOCAPCD Rule 2192):

- Apply T-BACT and notify the public:
  - The cancer risk is greater than or equal to 10 in one million
  - The non-cancer chronic or acute hazard index is greater than 1.0
  - The cancer burden is greater than 1.0

HRA Results

Risks associated with pollutants potentially emitted from the PESC are presented in Table 5.9-7. Appendix 5.9E presents more detailed tables of the HARP2 modeling results for each health risk, at each receptor type, broken down by pollutant and source based on the exposure durations.

Further description of the methodology used to calculate health risks associated with emissions to the air is presented in Appendix 5.9D. If there is no significant effect associated with concentrations in air at the PMI location, it is unlikely that there would be significant effects in any other location in the vicinity of the PESC.

Table 5.9-7: Health Risk Assessment Summary

Type of Risk	Receptor Type	Exposure Duration	Risk	Receptor ID	UTM E (m)	UTM N (m)
Cancer	PMI	30-Years	0.09E-06	FC-PECH-35	699,979	3,914,194
	MEIR		0.02E-06	RD-PECH-15	700,421	3,914,141
	Sensitive		0.007E-06	SR-PECH-13	697,608	3,915,736
	MEIW	25-Years	0.0008E-06	WR-PECH-02	698,568	3,915,415
Chronic	PMI	Annual	0.0002	FC-PECH-35	699,979	3,914,194
	MEIR		0.00005	RD-PECH-15	700,421	3,914,141
	Sensitive		0.00002	SR-PECH-13	697,608	3,915,736
	MEIW		0.00003	WR-PECH-02	698,568	3,915,415
	MEIW	8-hours	0.00003	WR-PECH-02	698,568	3,915,415
Acute	PMI	1-hour	0.03	GR-PECH-309	699,350	3,914,450
	MEIR		0.01	RD-PECH-32	698,390	3,914,651
	Sensitive		0.004	SR-PECH-13	697,608	3,915,736
	MEIW		0.006	WR-PECH-02	698,568	3,915,415

Risk for cancer is expressed in risk of getting cancer where 1E-06 equals a chance of 1 per million. Risk for chronic and acute is expressed as a hazard quotient where 1.0 means the maximum pollutant is at the reference exposure level.

Source: HARP2 model run by Golder Associates, September 2021

Results of the HRA indicate that cancer, chronic (non-cancer), and acute (non-cancer) risk levels associated with emissions from the two sources that will be operated during the operational phase of the PESC are below the AB2588 levels that trigger public notice or risk reduction.

Cancer Risk

The PMI for cancer risk is predicted to occur on the fence line (receptor FC-PECH-35), at the south side of the property boundary. This risk assumes 30-years of continuous exposure. Over half of the risk (50.97%) is from benzene which is a typical byproduct of combustion. The pathway for maximum exposure and contribution is Inhalation.

The MEIR for cancer risk is predicted to occur approximately 45 meters southeast of the site in the receptor RD-PECH-15. This risk assumes 30-years of continuous exposure. The pathway for maximum exposure and contribution is inhalation.

The location of the sensitive receptor with maximum cancer risk is predicted to occur at Bayside Care Center (SR-PECH-13) which is located approximately 2.3 km northwest of the PESC.

The MEIW for 25-year cancer risk is predicted to occur approximately 1.3 km northwest of the PESC at cartesian receptor WR-PECH-02 (Coast Veterinary Clinic). This receptor shows 69.44 percent of the risk from benzene followed by naphthalene with 13.96 percent of the risk.

Both generators are identical and therefore contribute approximately half of the risk for all receptors.

Table 1 and Table 2 of Appendix 5.9E present detailed information on cancer risk contribution at each receptor type, broken down by pollutant and source, respectively. Figure 5.9-3 shows the 30-year cancer risk isopleths and the locations for PMI, MEIR, and maximum sensitive receptors. Figure 5.9-4 shows the 25-year cancer risk location for the MEIW.

Chronic Hazard Index

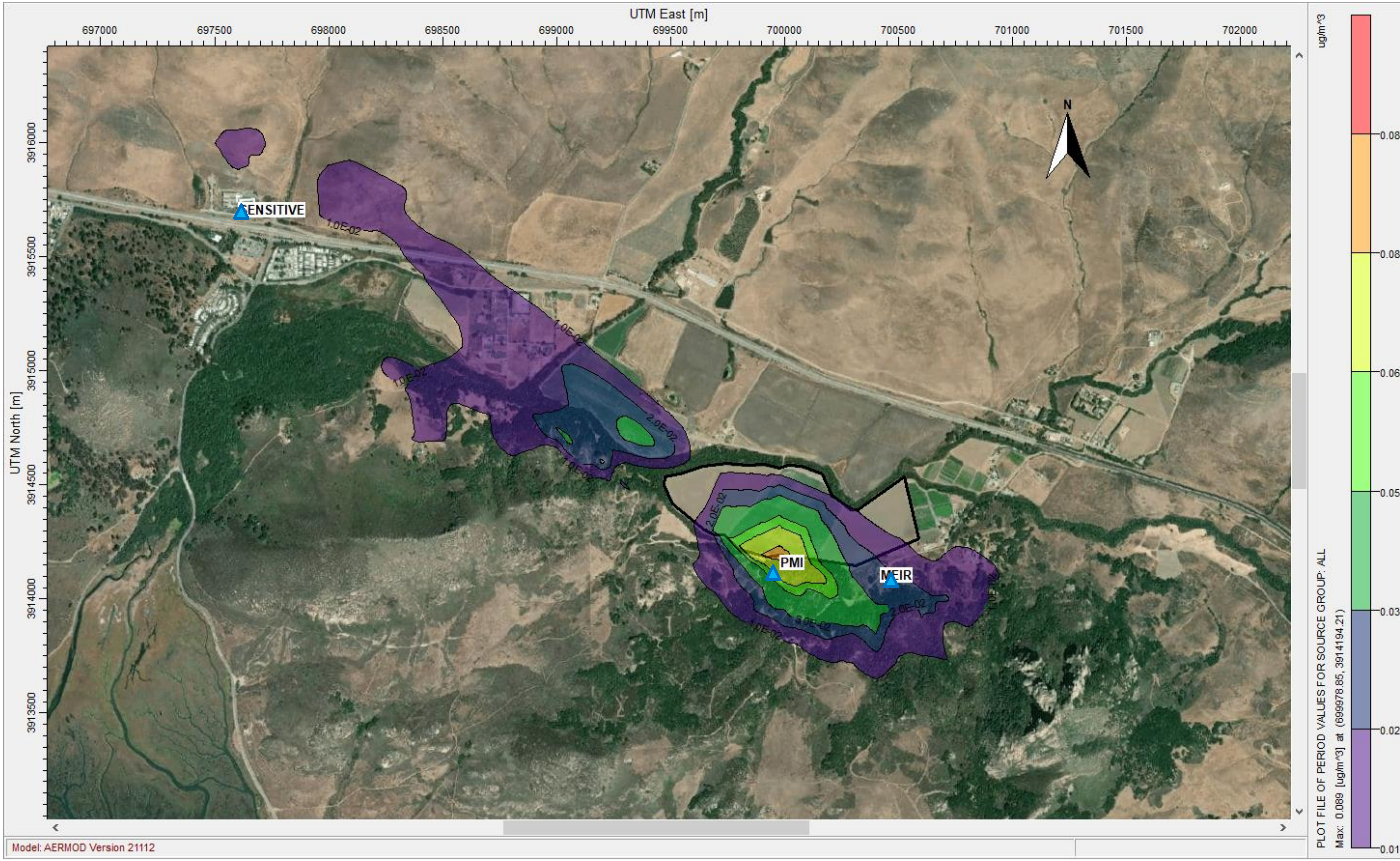
The PMI chronic, non-cancer risk is predicted to be at receptor FC-PECH-35. The pollutant contributing most significantly to predicted risk is benzene. The MEIR chronic risk is predicted to occur at receptor RD-PECH-15. The location of the sensitive receptor with the highest risk is predicted to occur at SR-PECH-13. For both receptors, the contribution of benzene is 84.40 percent to the total chronic hazard; the major pathway for this substance is Inhalation.

The maximum annual and 8-hour MEIW is predicted to occur at cartesian receptor WR-PECH-02. Benzene is estimated to contribute most of the risk at 84.40 percent and 92.67 percent or the total, respectively. Figure 5.9-5 shows the annual chronic hazard locations for the PMI, MEIR, MEIW, and maximum sensitive receptors. Table 3 and Table 4 of Appendix 5.9E present detailed information on cancer risk contribution at each receptor type, broken down by pollutant and source, respectively.

Acute Hazard Index

The PMI for acute risk is predicted to occur approximately 130 m northwest of the PESC on the west side (receptor GR-PECH-309). The MEIR acute risk is predicted to occur approximately 1.1 km west of the facility (receptor RD-PECH-32). The MEIW acute risk and the maximum sensitive receptor for acute risk are located at the same receptors identified for cancer risk and chronic hazard. The pollutant contributing most significantly for all the identified receptors was benzene, followed by acrolein comprising more than 95 percent of the acute hazard and targeting the immune system, reproductive system & developmental, and hematological system.

Figure 5.9-6 shows the locations of the acute hazard index PMI, MEIR, MEIW, and maximum sensitive receptor. Tables 5 and 6 of Appendix 5.9E presents detailed tables summarizing the cancer risk contribution ay each receptor type, broken down by pollutant and source, respectively.

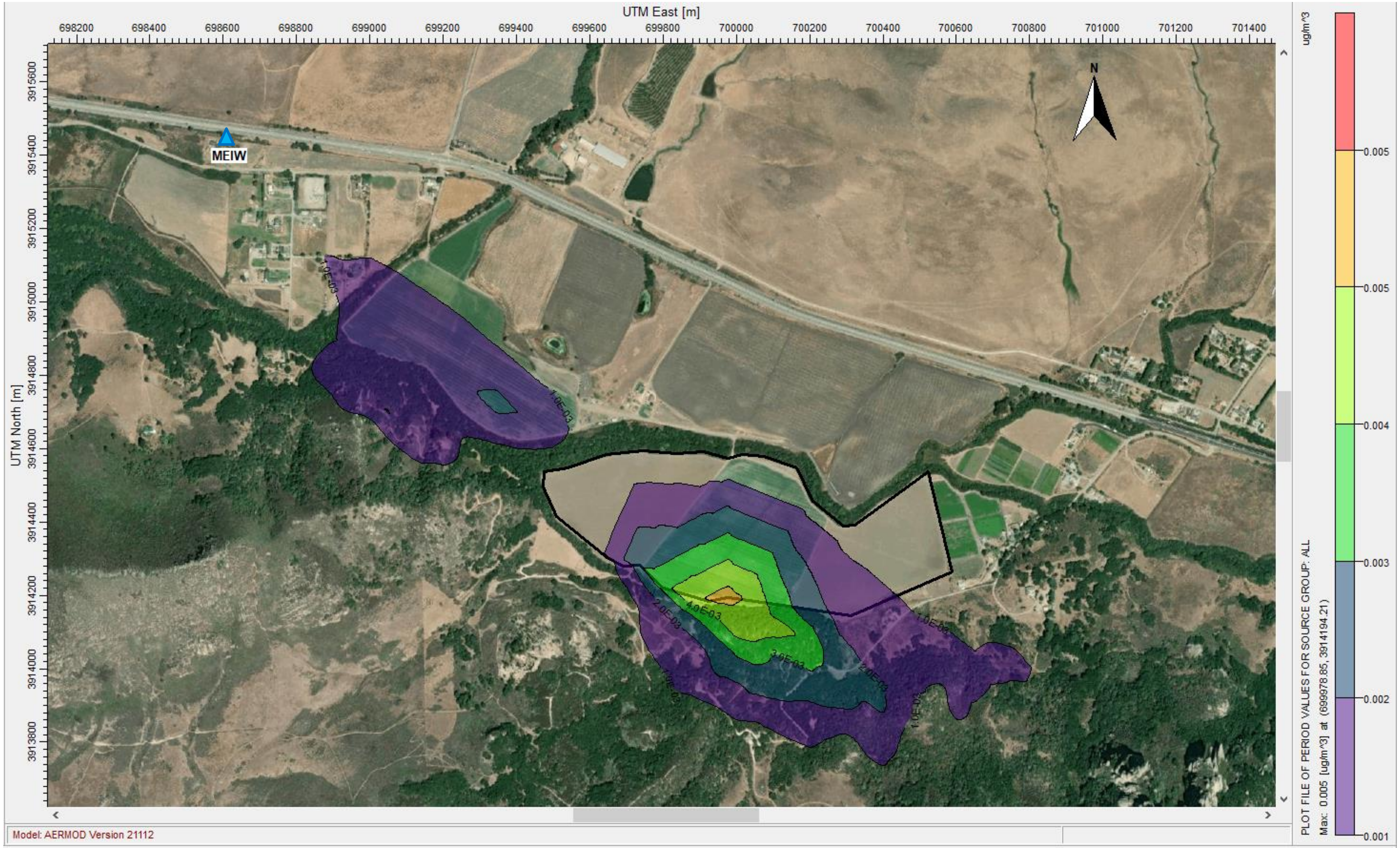


GOLDER

Figure 5.9-3 Receptors

30-Year Cancer Risk Isopleths and Locations for PMI, MEIR, and Maximum

Pecho Energy Storage Center

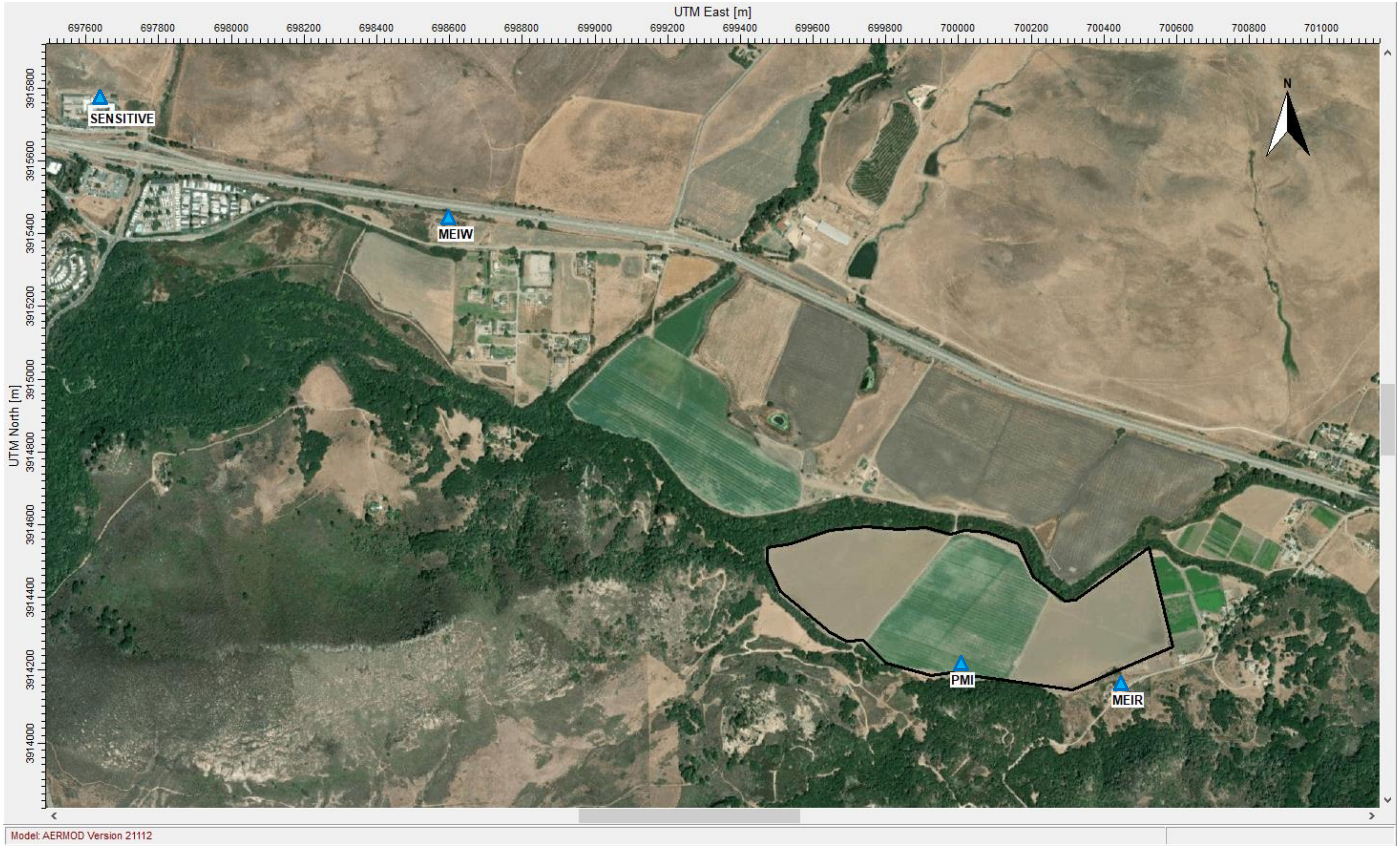


GOLDER

Figure 5.9.4

25-Year Cancer Risk Location of MEIW

Pecho Energy Storage Center



GOLDER

Figure 5.9-5

Annual Chronic Hazard Locations for PMI, MEIR, MEIW and Maximum Sensitive Receptor

Pecho Energy Storage Center

GOLDER

Figure 5.9-6

Acute Hazard Index Locations of PMI, MEIR, MEIW, and Maximum Sensitive Receptor

Pecho Energy Storage Center

The acute and chronic hazard quotients associated with concentrations in air are shown in Table 5.9-7. The acute and chronic hazard quotients for all target organs are below 1.0. As described previously, a hazard quotient less than 1.0 is unlikely to represent a significant effect on public health. Further description of the methodology used to calculate health risks associated with emissions to the air is presented in the HARP2 Users Guides (HARP 2015) and in the OEHHA 2015 Air Toxics Hot Spots Health Risk Assessment Guidance document (OEHHA/CARB 2015).

Detailed risk and hazard values are provided in the HARP output presented in Appendix 5.9F, (electronic modeling files on CD-ROM).

The estimates of excess lifetime cancer risks and non-cancer risks associated with chronic or acute exposures are below thresholds used for regulating emissions of toxic pollutants to the air. Historically, exposure to any level of a carcinogen has been considered to have a finite risk of inducing cancer. In other words, there is no threshold for carcinogenicity. Since risks at low levels of exposure cannot be quantified directly by either animal or epidemiological studies, mathematical models have estimated such risks by extrapolation from high to low doses. This modeling procedure is designed to provide a conservative estimate of cancer risks based on the most sensitive species of laboratory animal for extrapolation to humans.

An excess lifetime cancer risk of 1 × 10-6 is typically used as a screening threshold of significance for potential exposure to carcinogenic substances in the air. The excess cancer risk level of 1 × 10-6, which has historically been judged to be an acceptable risk, originates from efforts by the Food and Drug Administration to use quantitative HRA for regulating carcinogens in food additives in light of the zero-tolerance provision of the Delany Amendment (Hutt 1985). The associated dose, known as a “virtually safe dose,” has become a standard used by many policymakers and the public for evaluating cancer risks. However, a study of regulatory actions about carcinogens found that an acceptable risk level can often be determined on a case-by-case basis. This analysis of 132 regulatory decisions, found that regulatory action was not taken to control estimated risks below 1×10^{-6} (one in a million), which are called de minimis risks. De minimis risks are historically considered risks of no regulatory concern. Chemical exposures with risks above 4×10^{-3} (four in ten thousand), called de manifestis risks, were consistently regulated. De manifestis risks are typical risks of regulatory concern. Risks falling between these two extremes were regulated in some cases, but not in others (Travis et al 1987).

The estimated lifetime cancer risk to the maximally exposed individual located at the PESC PMI is below the 1×10^{-6} significance level. In addition, the cancer burden (equivalent to zero) is less than the State of California recommended threshold value of 1.0. These risk estimates were calculated using assumptions that are highly health conservative. Evaluation of the risks associated with the PESC emissions should consider that the conservatism in the assumptions and methods used in risk estimation considerably overstates the risks from PESC emissions. Based on the results of this HRA, there are no significant public health effects anticipated from emissions of toxic pollutants to the air from the operation of the PESC.

Cancer Burden

To evaluate population risk, regulatory agencies have used the cancer burden as a method to account for the number of excess cancer cases that could potentially occur in a population. The cancer burden can be calculated by multiplying the cancer risk at a census block centroid, times the number of people who live in the census block and adding the estimated cancer cases across the zone of impact. A census block is defined as the smallest entity for which the Census Bureau collects and tabulates decennial census information. A centroid is defined as the central location within a specified geographic area.

The cancer burden for an operational site is calculated based on OEHHA (70 years) risks. It is independent of how many people move in or out of the vicinity of an individual facility. The number of cancer cases is considered independent of the number of people exposed, within some lower limits of exposed population size, and the length of exposure (within reason). For example, if 10,000 people are exposed to a carcinogen at a concentration with a $1x10^{-5}$ cancer risk for a lifetime, the cancer burden is 0.1, and if 100,000 people are exposed to a 1×10^{-5} risk the cancer burden is 1.

Different methods can be used as a measure of population burden. The number of individuals residing within a 1 × 10-6, 1 × 10-5, and/or 1 × 10-4 isopleth is another potential measure of population burden. The maximum cancer risk is less than 1 × 10-6 so cancer burden was not quantified in this HRA for the operation phase.

5.9.2.6 Hazardous Materials

Hazardous materials may be used and stored at the PESC site. The hazardous materials stored in significant quantities on-site and descriptions of their uses are presented in the Hazardous Materials Handling section. Use of chemicals at the PESC site will follow standard practices for storage and management of hazardous materials. The normal use of hazardous materials, therefore, will not pose significant effects on public health. While mitigation measures will be in place to prevent releases, accidental releases that migrate off-site could result in potential effects to the public.

5.9.2.7 Odors

The PESC is not expected to emit or cause to be emitted any substances that could cause nuisance odors.

5.9.2.8 Electromagnetic Field Exposure

Electromagnetic fields (EMFs) are composed of electric and magnetic fields and occur independently of one another. EMFs will exist at the PESC created by electric charges at the 60-Hz frequency used in transmission lines. Electric fields exist when these charges are not moving. Magnetic fields are created when the electric charges are moving. The magnitude of both electric and magnetic fields falls off rapidly as the distance from the source increases (proportional to the inverse of the square of distance).

Because the electric transmission lines do not typically travel through residential areas and based on findings of the National Institute of Environmental Health Sciences (NIEHS) (1999), EMF exposures are not expected to result in a significant effect on public health. The NIEHS report to the U.S. Congress found that “the probability that EMF exposure is truly a health hazard is currently small. The weak epidemiological associations and lack of any laboratory support for these associations provide only marginal scientific support that exposure to this agent is causing any degree of harm” (NIEHS 1999).

California does not currently have a regulatory level for magnetic fields. However, the values estimated for similar transmission lines proposed for the PESC are well below those established by states that do have limits. Other states have established regulations for magnetic field strengths that have limits ranging from 150 milligauss to 250 milligauss at the edge of the right-of-way, depending on voltage. The California Energy Commission (CEC) does not currently specify limits on magnetic fields for standard types and sizes of transmission lines.

5.9.2.9 Legionella

Legionella is a bacterium that is ubiquitous in natural aquatic environments and is also widely distributed in human-made water systems. It is the principal cause of legionellosis, otherwise known as Legionnaires’ disease, which is similar to pneumonia. Transmission to people results mainly from inhalation or aspiration of aerosolized contaminated water. Untreated or inadequately treated cooling systems, such as industrial cooling tower cells and building heating, ventilating, and air conditioning systems, have been correlated with outbreaks of legionellosis.

The PESC will not have a cooling tower or wet surface air cooler. As such, there is no requirement to prepare and implement a water treatment program designed to reduce the potential for Legionella.

5.9.2.10 Summary of Effects

Results from the air toxics HRA based on emissions modeling indicate that there will be no significant incremental public health risks from the construction or operation of the PESC. Results from criteria pollutant modeling for routine operations indicate that potential ambient concentrations of NO_2, CO, SO_2, and PM10 will not significantly affect air quality (Section 5.1, Air Quality). Modeled concentrations are below the federal and California standards established to protect public health, including the more sensitive members of the population.

5.9.3 Cumulative Effects

An analysis of the cumulative impacts of the PESC, per CEC practice, based on modeling studies conducted by staff, is typically only required if the proposed facility is generally within less than 0.5 miles of another existing major or large toxics emissions source. No such sources were identified within the default distance of 0.5 miles. A search of the CARB Pollution Mapping Tool shows that the closest tracked source is California Polytechnic State University located approximately 8.5 miles to the southeast of the PESC.

It is not anticipated that a cumulative impact assessment is justified based on the proposed emission units for the operation of the PESC, and the proximity to the nearest CARB-tracked air emissions source.

5.9.4 Mitigation Measures

Any mitigation measures (if applicable) are described in the sections below.

5.9.4.1 Criteria Pollutants

Emissions of criteria pollutants will be minimized by applying Best Available Control Technology (BACT) to the PESC. BACT will be to install an engine meeting Tier 4 final emission standards and will also be equivalent to toxics BACT. See Section 5.1, Air Quality for more discussion on BACT.

The PESC is not proposed to be a major source under nonattainment new source review and thus is not expected to trigger the offset requirements of SLOCAPCD Rule 204(B). Therefore, further mitigation of emissions is not required to protect public health.

5.9.4.1.1 Toxic Pollutants

Emissions of toxic pollutants to the air will be minimized using BACT/TBACT at the PESC, (i.e., the use of best management practices for the control of carbon monoxide (CO), volatile organic compounds (VOCs), and gaseous toxic constituents).

5.9.4.1.2 Legionella Mitigation Measure

The Project will not be utilizing cooling towers or wet surface air coolers (SAC); therefore, a Legionella mitigation plan is not required.

5.9.4.2 Hazardous Materials

Mitigation measures for hazardous materials are presented below and discussed in more detail in the Hazardous Materials Handling section. Potential public health effects from the use of hazardous materials are only expected to occur because of an accidental release. The facility has many safety features designed to prevent and minimize effects from the use and accidental release of hazardous materials. The PESC will include the design features listed below.

- Curbs, berms, and/or secondary containment structures will be provided where the accidental release of chemicals may occur.
- A fire-protection system will be included to detect, alarm, and in some areas suppress a fire, following applicable LORS.
- Construction of all storage systems will be following applicable construction standards, seismic standards, and LORS.

A Risk Management Plan is not required for operations.

A safety program will be implemented and will include safety training programs for contractors and operations personnel, including instructions on the following:

- Proper use of personal protective equipment
- Safety operating procedures
- Fire safety
- Emergency response actions

The safety program will also include programs on safely operating and maintaining systems that use hazardous materials. Emergency procedures for PESC personnel include power facility evacuation, hazardous material spill cleanup, fire prevention, and emergency response.

Areas subject to potential leaks of hazardous materials will be paved and bermed. Incompatible materials will be stored in separate containment areas. Containment areas will be drained to either a collection sump or to holding or neutralization tanks. Piping and tanks exposed to potential traffic hazards will be additionally protected by traffic barriers.

5.9.5 Laws, Ordinances, Regulations, and Standards

The relevant LORS that affect public health and apply to the PESC and the conformity of the PESC to each of the LORS are presented in this section.

5.9.5.1 Federal LORS

- 40 CFR Part 50 [National Primary and Secondary Ambient Air Quality Standards]: PESC operations will comply with the NAAQS using air dispersion models.
- 40 CFR Part 63 Subpart ZZZZ [NESHAP – Reciprocating Internal Combustion Engines]: The PESC will comply with this rule by demonstrating compliance with 40 CFR Part 60 Subpart IIII (see Section 5.1, Air Quality).

5.9.5.2 State LORS

- California Health & Safety Code (CHSC) Part 6 Sections 44360 – 44366 [Air Toxics “Hot Spots” Information and Assessment]: The PESC will be subject to Part 6 because it will release substances listed in the rule from the combustion of diesel fuel from the emergency generators. Pecho will participate in the requirement to prepare an inventory and health risk analysis (as applicable). Analysis shows that emissions from the PESC will be below the significance levels for operation and that the cancer burden is reasonable for risk due to construction activities.

- CHSC Chapter 6.6 Sections 25249.5-25249.14 [Safe Drinking Water and Toxic Enforcement Act of 1986]: Pecho is not anticipated to release chemicals known to cause cancer or reproductive toxicity to a source of drinking water. Air emissions will be compliant with the air permit that must be obtained from SLOCAPCD. The results of the HRA show that air emissions do not exceed public notice thresholds.
- CHSC Sections 25500-25542 [Hazmat Inventory]: As applicable, Pecho will prepare required hazardous materials plans and inventories and submit them to the proper authorities (see Section 5.5, Hazardous Materials.)
- California Code of Regulations (CCR) Title 17 Section 70200 [California Ambient Air Quality Standards]: Emissions from Pecho operations shows compliance with the CAAQS using air dispersion models.

5.9.5.3 SLOCAPCD LORS

- SLOCAPCD Rule 202 [permits]: The reciprocating engines driving emergency generators at the PESC will require an authority to construct prior to commencing construction on, and a permit to operate to operate the air emission units. Proper permits will be obtained prior to constructing and operating these units. The process of obtaining such permits is discussed in Section 5.1, Air Quality.
- SLOCAPCD Rule 204 [requirements]:
  - Control Technology: The proposed emergency generators will emit less than 25 lb/day of all regulated pollutants except for NOx, CO and VOC. BACT will be used for NOx, CO, and VOC so the control technology requirements are met.
  - Offsets: Emissions of reactive organic gasses (ROG), NOx, SOx, and PM10 each individually will be less than 25 tons per year (tpy), and CO emissions will be less than 250 tpy, therefore offsets are not required.
- SLOCAPCD Rule 216 [part 70] & 221 [part 70 PTE limitations]: The air emission units at PESC will accept annual operating limitations such that the limited potential to emit (PTE) is less than thresholds that would classify the facility as a major source under part 70. Compliance will be enforced through the operating permit.
- SLOCAPCD Rule 218 [federal requirements for HAP]: This rule only applies to sources classified as a major source of HAP. The PESC will not be classified as a major source of HAP so this rule will not apply.
- SLOCAPCD Rule 219 [toxics new source review]: This rule only applies to facilities where the air emission sources would have emissions of air toxics that result in greater than one excess cancer per million population or the health hazard index is greater than or equal to 0.10 for acute or chronic non-cancer effects. The cancer and non-cancer risks from the operation of PESC are shown to be less than these thresholds and therefore, this rule does not apply.
- SLOCAPCD Rule 220 [PSD]: Air emissions at PESC will be limited such that the facility will not be subject to Prevention of Significant Deterioration (PSD).

- SLOCAPCD Rule 223 [power plants]: This rule applies to power plants with a gross electrical generating capacity of 50 MW or more. The air emission sources at PESC will not have the ability to generate 50 MW or more; however, the advanced air storage process will have a capacity exceeding 50 MW. It is not entirely clear if this rule will have applicability to this project, but if it does, the only requirement is that the air pollution control officer (APCO) shall consider the Application for Certification (AFC) to be equivalent to an application for Authority to Construct and that the application must meet the same requirements.
- SLOCAPCD Rule 224 [major NSR]: This rule only applies to sources that will be classified as a major source under New Source Review (NSR). Emissions at PESC will be limited so that the facility is not classified as a major source under NSR.

5.9.5.4 Permits Required and Schedule

Agency-required permits or plans related to public health include a hazardous materials management plan (HMMP) and SLOCAPCD Authority to Construct/Permits to Operate air emission units. These requirements are discussed in detail in the Hazardous Materials Handling section and Section 5.1, Air Quality, respectively.

5.9.5.5 Agencies Involved and Agency Contacts

Table 5.9-8 provides contact information for agencies involved with Public Health.

Table 5.9-8: Agency Contacts for Public Health

Public Health Concern	Regulatory Agency	Regulatory Contact
Public exposure to air pollutants	EPA Region 9	Deborah Jordan, Acting Regional Administrator EPA Region 9 75 Hawthorne St. San Francisco, CA 94105 (415) 947-8000
Public exposure to air pollutants	CARB	LinYing Li 1001 I Street, 19th Floor Sacramento, CA 95814 (916) 322 1721
Public exposure to air pollutants	SLOCAPCD	Gary Willey, Air Pollution Control Officer 3433 Roberto Court San Luis Obispo, CA 93401 (805) 781-5912
Public exposure to chemicals known to cause cancer or reproductive toxicity	OEHHA	Martha Sandy, Ph.D., Branch Chief 1001 I Street, 19th Floor Sacramento, CA 95814 (916) 324-7572
Public exposure to acutely hazardous materials	San Luis Obispo County Health Agency, Public Health Department	Penny Borenstein, Public Health Director 1055 Monterey Street San Luis Obispo, CA 93408 (805) 781-5000

5.9.6 References

Air Resources Board (ARB) and California Air Pollution Control Officers Association (CAPCOA). 2015. Risk Management Guidance Document. July. Accessed online at https://ww2.arb.ca.gov/sites/default/files/classic/toxics/rma/rmgssat.pdf.

California Air Resources Board. (CARB). 2020. Consolidated table of OEHHA/ARB approved risk assessment health values. October 2. Accessed online at https://ww3.arb.ca.gov/toxics/healthval/contable.pdf.

California Code of Regulations. Browse - California Code of Regulations (westlaw.com)

California Health and Safety Code. Codes: Codes Tree - Health and Safety Code - HSC (ca.gov)

CEQA Air Quality Handbook, SLO County APCD, April 2012

2019 Annual Air Quality Report for SLOCAPCD, November 2020.

Hotspots Analysis and Reporting Program. (HARP). 2015. User Guide, Version 2.0.3. Cal-EPA Air Resources Board, ADMRT Version 21081.

Hutt. P.B. 1985. Use of Quantitative Risk Assessment in Regulatory Decision Making Under Federal Health and Safety Statutes. Risk Quantitation and Regulatory Policy. Eds. D.G. Hoel, R.A. Merrill and F.P. Perera. Banbury Report 19, Cold Springs Laboratory.

National Cancer Institute. https://cancerstatisticscenter.cancer.org/#!/. Accessed August 23, 2021.

National Institute of Environmental Health Sciences (NIEHS). 1999. Environmental Health Institute report concludes evidence is 'weak' that EMFs cause cancer. Press release. National Institute of Environmental Health Sciences, National Institutes of Health.

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Risk Science Associates, Inc. 2008. Liberty Energy XXIII-Renewable Energy Power Plant Project, Draft EIR, Public Health Section D.11, Aspen Environmental Group, June

Travis, C.C., E.A.C. Crouch, R. Wilson, and E.D. Klema. 1987. Cancer Risk Management: A Review of 132 Federal Regulatory Cases. Environ. Sci. Technol. 21: 415-420.

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