Encina Wastewater Authority

6200 Avenida Encinas
Carlsbad, CA 92011

SDAPCD Emissions ID 5985

August 2024

Risk Reduction Audit and Plan for Reporting Year 2021

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List of Acronyms and Abbreviations

AB	Assembly Bill
bhp	Brake Horsepower
CO	Carbon Monoxide
ERA	Energy Resiliency Assessment
EWPCF	Encina Water Pollution Control Facility
HHI	Health Hazard Index
HRA	Health Risk Assessment
kW	Kilowatt
MEIR	Maximally Exposed Individual Resident
MEIW	Maximally Exposed Individual Worker
MGD	Million Gallons per Day
MMBtu/hr	Million British Thermal Units per hour
ppm	Parts Per Million
ORF	Odor Reduction Facilities
PTE	Potential to Emit
RNG	Renewable Natural Gas
RTO	Regenerative Thermal Oxidizer
SDAPCD	San Diego County Air Pollution Control District
TAC	Toxic Air Contaminant
U.S. EPA	United States Environmental Protection Agency
UTM	Universal Transverse Mercator
VOC	Volatile Organic Compound

Encina Wastewater Authority Risk Reduction Audit and Plan for Reporting Year 2021

1.0 INTRODUCTION

The Encina Wastewater Authority (Encina) operates the Encina Water Pollution Control Facility (EWPCF) located at 6200 Avenida Encinas in Carlsbad, CA. The EWPCF is regulated by the California Air Toxics "Hot Spots" Program under Assembly Bill 2588 (AB 2588), which is administered by the San Diego County Air Pollution Control District (SDAPCD). As part of this program, a health risk assessment (HRA) based on 2021 facility emissions was conducted by Encina with assistance from Yorke Engineering, LLC (Yorke). The HRA predicted the residential cancer risk and the non-cancer acute Health Hazard Index (HHI) exceeded the SDAPCD Rule 1210 risk reduction levels.

In accordance with SDAPCD Rule 1210 (effective November 4, 2021), Yorke has prepared this risk reduction audit and plan on behalf of Encina. The plan outlines the procedures that Encina will use to reduce facility risks below the risk reduction levels applicable to the 2021 HRA.

1.1 Facility Information

The EWPCF is an essential public service treating up to 36 million gallons per day (MGD) (dry weather flow) of sewage wastewater from over 379,000 residents and businesses throughout a 125-square-mile service area. Encina is owned by six public agencies and governed by a Joint Powers Authority that includes the cities of Carlsbad, Vista, and Encinitas, as well as Buena Sanitation, Vallecitos Water, and Leucadia Wastewater Districts. The facility houses complex processes and equipment that protect the local ocean environment, preserve public health, and provide valuable water resources for the region. It also has extensive systems for neighborhood odor control, electricity generation from treatment process gas (cogeneration), and biosolids processing that produces a high-quality fertilizer product.

The SDAPCD permit ID for Encina is APCD1984-SITE-03370, and the emissions inventory facility ID is 5985. The facility address is as follows:

Encina Wastewater Authority
6200 Avenida Encinas
Carlsbad, CA 92011

The facility's equipment includes the following:

- 36 MGD wastewater treatment consisting of headworks, primary sedimentation basins, secondary treatment, and odor control systems;
- Four lean-burn cogeneration engines fired on digester gas or natural gas, rated 1,306 and 1,085 brake horsepower (bhp), respectively, driving a 750-kilowatt (kW) generator each;
- Varec Biogas 244 Series flare equipped with an enclosed burner and autopilot ignition system;

- Biosolids processing operation consisting of a 15 million British thermal units per hour (MMBtu/hr) digester gas/natural gas-fired sludge dryer with the following control systems: a 1.3-MMBtu/hr natural gas regenerative thermal oxidizer (RTO), dual throat wet scrubber, baghouse, and odor control systems; and
- One 1,528-bhp diesel emergency standby engine.

All sources can operate at any time of day.

The team responsible for preparation and implementation of the risk reduction audit and plan are listed in Table 1-1.

Table 1-1: Plan Contacts

Alicia Appel		**Julie Mitchell**
Encina Wastewater Authority		**Yorke Engineering, LLC**
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1.2 Permit Action

The permit application accompanying this plan is only for risk reduction actions as required per Rule 1210. The General Permit or Registration Application Form is provided in Appendix A. This application was provided in June 2024 with the previous version of the RRAP, along with the application fee to SDAPCD.

2.0 RISK REDUCTION

2.1 Risk Reduction Evaluation

The HRA modeling predicted that the residential excess cancer risk and the non-cancer acute HHI exceeded the Rule 1210 risk reduction thresholds.

The risk evaluation examines the cancer and acute risks separately to determine the sources and pollutants that cause a significant portion of each risk and assesses potential reduction measures.

2.1.1 HRA Results – Acute Health Hazard Index

The acute HHI was calculated for an exposure duration of 1 hour. The SDAPCD acute HHI analysis used maximum simultaneous hourly emission rates from all sources.

The modeling predicted that the acute HHI isopleth extended off-site to the north and west of the facility in locations where people might work. As shown in Figure 2-1, there are 26 businesses within the business park north of the facility, although not all are within the isopleth. Figure 2-1 also shows the acute HHI isopleth of 1.0 near the only affected resident occurred on the property line in the landscaping.

The maximum acute HHI at an actual receptor occurred at the Maximally Exposed Individual Worker (MEIW), receptor 131. The acute HHI at the MEIW, receptor 131 [Universal Transverse Mercator (UTM) coordinates 469,985, 3,664,349], was mainly due to formaldehyde emissions from the cogeneration engines (98%), targeting the eyes, as shown in Tables 2-1 and 2-2 below. The source/pollutant profile is very similar for the other receptors over the risk reduction threshold.

Table 2-1: Acute HHI Results Per Source from All Pollutants Targeting the Eyes at MEIW

Source	Description	MEIW	
		Acute HHI	Contribution (%)
ALL	All Sources	1.17E+00	100%
542	Cogen Engine	2.49E-01	21.23%
543	Cogen Engine	4.32E-01	36.83%
544	Cogen Engine	4.75E-01	40.47%
545	Cogen Engine	0.00E+00	0.00%
1004	Flare	9.68E-03	0.82%
982044	Emergency Diesel ICE	4.19E-03	0.36%
144602	Activated Sludge ORF3	1.51E-03	0.13%
1016_RTO	Biosolids RTO	1.15E-03	0.10%
144601	Headworks ORF1	5.78E-04	0.05%

Table 2-2: Acute HHI Results Per Pollutant from All Sources at MEIW

Pollutant	CAS No.	Target Organs											
		Alimentary	Bone	Cardiovascular	Central Nervous	Endocrine	Eye	Hematologic	Immune	Kidney	Reproductive/ Development	Respiratory	Skin
Formaldehyde	50000	0	0	0	0	0	1.1555	0	0	0	0	0	0
Acrolein	107028	0	0	0	0	0	0.0096	0	0	0	0	0.0096	0
Acetaldehyde	75070	0	0	0	0	0	0.0046	0	0	0	0	0.0046	0
1,4-Dioxane	123911	0	0	0	0	0	0.0015	0	0	0	0	0.0015	0
Hydrochloric Acid	7647010	0	0	0	0	0	0.0011	0	0	0	0	0.0011	0
Ammonia	7664417	0	0	0	0	0	0.0008	0	0	0	0	0.0008	0
Toluene	108883	0	0	0	0.0001	0	0.0001	0	0	0	0	0.0001	0
Perchloroethylene	127184	0	0	0	0.0001	0	0.0001	0	0	0	0	0.0001	0
Xylenes	1330207	0	0	0	8E-06	0	8E-06	0	0	0	0	8E-06	0
Phenol	108952	0	0	0	0	0	8E-07	0	0	0	0	8E-07	0
Methyl ethyl ketone	78933	0	0	0	0	0	3E-08	0	0	0	0	3E-08	0
Styrene	100425	0	0	0	0	0	3E-11	0	0	0	3E-11	3E-11	0
Hydrogen Sulfide	7783064	0	0	0	0.0681	0	0	0	0	0	0	0	0
Chloroform	67663	0	0	0	0.0291	0	0	0	0	0	0.0291	0.0291	0
Benzene	71432	0	0	0	0	0	0	0.0234	0.0234	0	0.0234	0	0
Arsenic	7440382	0	0	0.0071	0.0071	0	0	0	0	0	0.0071	0	0
Nickel	7440020	0	0	0	0	0	0	0	0.0043	0	0	0	0
Mercury	7439976	0	0	0	0.0004	0	0	0	0	0	0.0004	0	0
Methylene Chloride	75092	0	0	0.0003	0.0003	0	0	0	0	0	0	0	0
Carbon Disulfide	75150	0	0	0	0.0003	0	0	0	0	0	0.0003	0	0

Pollutant	CAS No.	Target Organs											
		Alimentary	Bone	Cardiovascular	Central Nervous	Endocrine	Eye	Hematologic	Immune	Kidney	Reproductive/ Development	Respiratory	Skin
1,3-Butadiene	106990	0	0	0	0	0	0	0	0	0	0.0001	0	0
Copper	7440508	0	0	0	0	0	0	0	0	0	0	1E-04	0
Methanol	67561	0	0	0	2E-05	0	0	0	0	0	0	0	0
1,1,1-TCA	71556	0	0	0	1E-05	0	0	0	0	0	0	0	0
Total Acute HHI		**0**	**0**	**0.007**	**0.106**	**0**	**1.173**	**0.023**	**0.028**	**0**	**0.061**	**0.047**	**0**

Figure 2-1: 2021 Acute HHI Isopleth

2.1.2 HRA Results – Cancer Risk

Cancer risk is the estimated probability of a maximally exposed individual potentially contracting cancer as a result of exposure to toxic air contaminants (TACs) over an extended period of time. Per SDAPCD HRA guidance, this HRA estimated cancer risk over a 30-year period for residential locations. The analysis assumes that a resident lives in the same location and is exposed to the same level of emissions for 30 years.

The 2021 HRA modeling predicted excess residential cancer risk would exceed the risk reduction threshold of 10 in one million at a number of residential locations. The HRA predicted the Maximally Exposed Individual Resident (MEIR) cancer risk to be 15.96 in a million. Figure 2-2 shows the locations of the 30-year cancer risk isopleth.

The cancer risk at the MEIR was mainly due to formaldehyde emissions from the cogeneration engines (73%). The MEIR was receptor 1443 from the modeling located at UTM coordinates 469,829, 3,664,229. The predicted cancer risk at the MEIR broken down by source is presented in Table 2-3 and by pollutant is presented in Table 2-4.

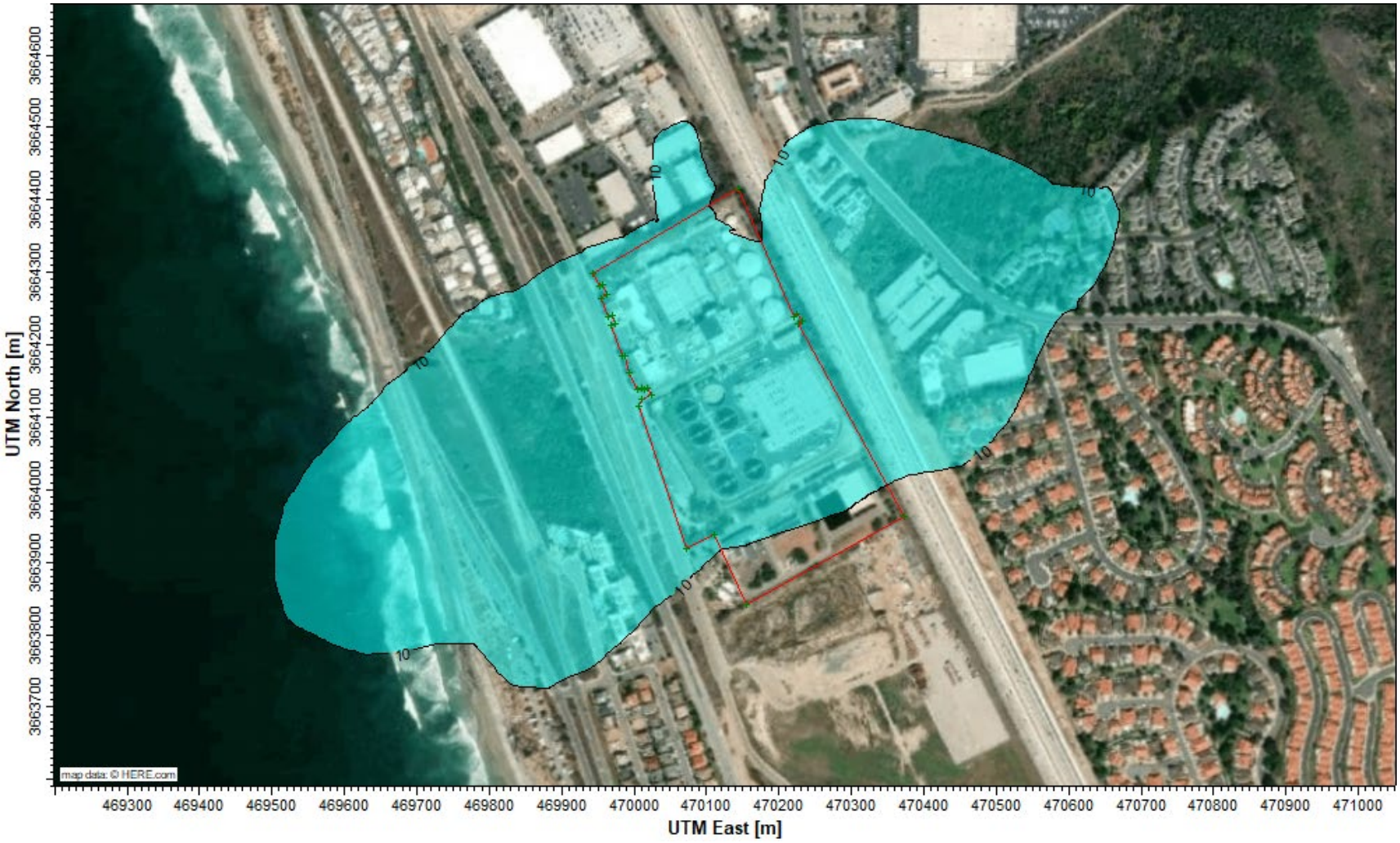
Table 2-3: Cancer Risk Results Per Source from All Pollutants at MEIR

Source	Description	MEIR	
		Cancer Risk (in a million)	Contribution (%)
ALL	All Sources	15.96	100%
542	Cogen Engine	3.23	20.24%
543	Cogen Engine	4.20	26.32%
544	Cogen Engine	2.79	17.48%
545	Cogen Engine	3.01	18.85%
144601	Headworks ORF1	2.25	14.11%
144602	Activated Sludge ORF3	0.28	1.72%
1016_RTO	Biosolids RTO	0.11	0.68%
1004	Flare	0.10	0.60%
982044	Emergency Diesel ICE	0.002	0.02%

Table 2-4: Cancer Risk Results Per Pollutant from All Sources at MEIR

Pollutant	CAS No.	MEIR	
		Cancer Risk (in a million)	Contribution (%)
ALL	-	15.96	100%
Formaldehyde	50000	11.58	72.54%
Ethylene dichloride (EDC)	107062	1.61	10.07%
PAHs-w/o	1151	0.98	6.16%
Arsenic	7440382	0.41	2.58%
1,4-Dioxane	123911	0.34	2.15%
Benzene	71432	0.31	1.94%
Chloroform	67663	0.13	0.81%
1,3-Butadiene	106990	0.13	0.80%
Perchloroethylene	127184	0.12	0.76%
p-DiClBenzene	106467	0.12	0.75%
Trichloroethylene (TCE)	79016	0.094	0.59%
Acetaldehyde	75070	0.067	0.42%
Methylene Chloride	75092	0.045	0.28%
Cadmium	7440439	0.009	0.06%
Naphthalene	91203	0.008	0.05%
Hexavalent Chromium	18540299	0.005	0.03%
Diesel Particulate Matter (DPM)	9901	0.002	0.02%
Nickel	7440020	0.002	0.01%
Lead	7439921	6.71E-04	0.00%
Ethyl Benzene	100414	4.02E-04	0.00%
Methyl tert-butyl ether (MTBE)	1634044	8.30E-09	0.00%

Figure 2-2: 2021 30-Year Cancer Risk Isopleth



3.0 RISK REDUCTION MEASURES PROPOSED

3.1 Process Description

Wastewater is treated in a number of steps involving multiple basins and processes to clarify the water for in-plant use, recycled water use, or release to the ocean. Foul air from the wastewater and biosolids processing is treated in one of three Odor Reduction Facilities (ORF). Grit and larger wastes are separated and sent to a landfill; sludge from the wastewater process enters the digesters, and the residual biosolids are dried and turned into pellets for use as fertilizer. A byproduct of anaerobic digestion, methane-rich biogas is either captured to power the cogeneration engines and the dryer or sent to the flare. The cogeneration engines are fired primarily on digester gas and secondarily with natural gas to produce most of the facility's electricity and heat needs and provide heat to the digesters.

3.2 Risk Reduction Measures

The HRA modeling for 2021 predicted that the formaldehyde emissions from the cogeneration engines were the main contributors to the elevated acute HHI and cancer risk. Thus, the risk reduction evaluation focuses on reductions associated with the formaldehyde emissions from the cogeneration engines.

Encina has an ongoing Capital Improvement Program and maintenance programs in which Encina continues to evaluate, upgrade, and replace equipment to protect air quality and treat odors from the facility. Encina's Member Agencies fund such efforts through the collection of wastewater service charges throughout the service area.

Encina has undertaken a rigorous Energy Resiliency Assessment (ERA) to determine the best approach to meet EWPCF's power and heat needs while reducing TAC emissions to meet SDAPCD Rule 1210 and AB 2588 HRA requirements.

The ERA has examined alternatives to the use of the existing cogeneration engines to meet the facility's power and heat requirements. All of these alternatives would require major facility infrastructural and operational modifications.

Alternatives have included options such as elimination of the cogeneration engines, which would necessitate a different source to meet the power and heat requirements of the facility and would require significant facility redesign and and/or a massive increase in electricity costs.

If the digester gas is not used for on-site power generation, it would need to be flared or processed for off-site use as renewable natural gas (RNG) or sent to a third party for power generation. All of these options would cause EWA to need to purchase electricity from the grid and find an alternative heat source. These options would shift TAC emissions from EWPCF to other sources.

Replacement of the cogeneration engines with different power generation technology would come with a significant cost, which would have to be passed on to the citizens of the cities served by the EWPCF.

Although the ERA is ongoing and other options continue to be explored, this Risk Reduction Plan proposes the following measures:

- Installation of gas conditioning and oxidation catalysts on all four existing cogeneration engines;

- Conducting source testing to determine more representative TACs emission factors for each of the ORFs.; and
- Continued evaluation of alternative power generation technologies.

These reductions will be real, permanent, quantifiable, and enforceable through the modifications to the permits for the cogeneration engines (Permits APCD2010-PTO-000542, APCD2010-PTO-000543, APCD2010-PTO-000544, and APCD2010-PTO-000545).

3.3 Emissions with Selected Risk Reduction Measures

The emissions from all sources were evaluated to include any foreseeable new or increased emissions of TACs from the stationary source per Rule 1210.

Per the SDAPCD's interpretation of foreseeable new or increased emissions, they have requested all sources be modeled at full potential to emit (PTE) levels. This is an unrealistic emission profile for many of the sources, especially the wastewater treatment sources, as these sources are limited by population growth and those projections are well documented.

The emission profile developed for this Risk Reduction Plan is based on PTE, even though this will overestimate reasonably foreseeable emissions. The PTE was based on permit limited fuel usage, wastewater throughput, or hours of operation. Calculation methods were the same as those used for the 2021 HRA emissions with the exception of the cogeneration engines, ORF1 and ORF3, which are described below.

3.3.1 Cogeneration Engine Emissions

To account for the emission reductions from the oxidation catalyst added to the cogeneration engines, it was conservatively assumed that a control efficiency of 90% for the volatile TACs would occur. This is the control efficiency presented for oxidation catalysts by the United States Environmental Protection Agency (U.S. EPA) in AP-42 Section 3.2.4.1 and the SDAPCD for emission factor A01-E17 - Engines, Natural Gas Fired, 4 Stroke, Lean Burn, with Catalytic Oxidation.

The TAC emissions from combustion of digester gas are based on the default SDAPCD emission factors A01-E09 – Engine, Digester Gas Fired with a 90% control efficiency applied to the volatile TACs. The uncontrolled formaldehyde emission factor is based on the on-site source test results from March 1, 2022. Arsenic emissions are based on the Encina specific emission factor from the SDAPCD.

The TAC emissions from combustion of natural gas are based on the default SDAPCD emission factors A01-E17 - Engines, Natural Gas Fired, 4 Stroke, Lean Burn, with Catalytic Oxidation.

3.3.2 Odor Reduction Facility Emissions

As shown in Table 2-3, approximately 10% of the cancer risk at the MEIR was attributable to ethylene dichloride (EDC). The SDAPCD provided inventory shows the majority of the EDC being emitted from ORF1 and ORF3.

The SDAPCD emissions factors for these sources are based on data from tests conducted in the 1990s at EWPCF. Both ORF1 and ORF3 have been modified since those tests.

EWA is proposing to conduct source testing to determine site-specific emission factors for EDC and other TACs. Until source testing of the ORFs is complete Encina; EWA is proposing to use emission factors for EDC from CATEF. EWA will use the SDAPCD emissions factors for the remaining TACs.

For ORF1 which services the headworks, the EDC emissions are based on the CATEF factor of 0.247 ppbv for 'Aeration Basin & PST, Wastewater' plus the application of an 80% control efficiency to account for the biological reduction tower and carbon adsorption system. The flow rate is based on the maximum design rating for the system.

For ORF3 which services the activated sludge area the EDC emissions are based on the CATEF factor of 0.247 ppbv for 'Aeration Basin & PST, Wastewater' plus the application of an 80% control efficiency to account for the carbon adsorption system. The flow rate is based on the maximum design rating for the system.

Detailed emission calculations used in the risk reduction HRA are provided in Appendix B and electronically to the SDAPCD with changes highlighted in green.

3.4 HRA Results with Risk Reduction Measures

To demonstrate that the installation of gas conditioning and oxidation catalysts on all four cogeneration engines, and reduction in EDC in the ORFs will be sufficient to reduce the acute HHI and cancer risk below the significance thresholds, an updated HRA was conducted.

The risk reduction HRA modeling was conducted using the emissions discussed in Section 3.3. This HRA only examined the cancer risk and acute non-cancer health impacts, as these were the only health risk above the risk reduction thresholds. The HRA was conducted in the same manner as the previously submitted assessment, following the SDAPCD HRA guidelines (SDAPCD 2022), which are based on the Office of Environmental Health Hazard Assessment (OEHHA 2015) Tier 1 technique and guidance from SDAPCD HRA staff.

3.4.1 Risk Reduction HRA Results – Acute Health Hazard Index

The acute HHI was calculated for an exposure duration of 1 hour. The risk reduction acute HHI analysis used maximum hourly emission rates from all sources, even though all sources do not operate simultaneously or continuously; for example only three of the four cogeneration engines operate simultaneously, but since there are not permit conditions limiting operation, all four were included in the HRA modeling.

The risk reduction HRA calculated that the acute HHI was below the threshold of 1.0 at all receptors. Figure 3-1 shows the locations of the point of maximum impact (PMI), MEIR, sensitive, and MEIW. No isopleth is shown as the acute HHI was predicted to be just slightly above 0.5 at a value of 0.51 at the PMI and MEIW. Table 3-1 presents the HIA at the PMI, MEIR, MEIW and maximum sensitive receptor, plus the coordinates of each receptor.

Table 3-1: Risk Reduction Acute Hazard Index Results

Receptor	Exposure Duration	Acute Hazard Index	UTM Easting (m)	UTM Northing (m)	Receptor Number
PMI	1-Hour	0.51	470,374	3,664,195	94

Receptor	Exposure Duration	Acute Hazard Index	UTM Easting (m)	UTM Northing (m)	Receptor Number
MEIR		0.21	470,576	3,664,312	222
Sensitive		0.20	470,400	3,664,134	97
MEIW		0.51	470,374	3,664,195	94

The HIA was predicted to be less than 1.0 at all receptors.

The MEIR was predicted to occur approximately 1,100 feet to the east of the facility in a residential neighborhood off Tide Court. The location of the peak sensitive receptor was predicted to occur at Medical Offices located to the east of the facility across the I-5 freeway. The MEIW was predicted to occur east of the facility across the I-5 freeway at U-Haul Moving and Storage.

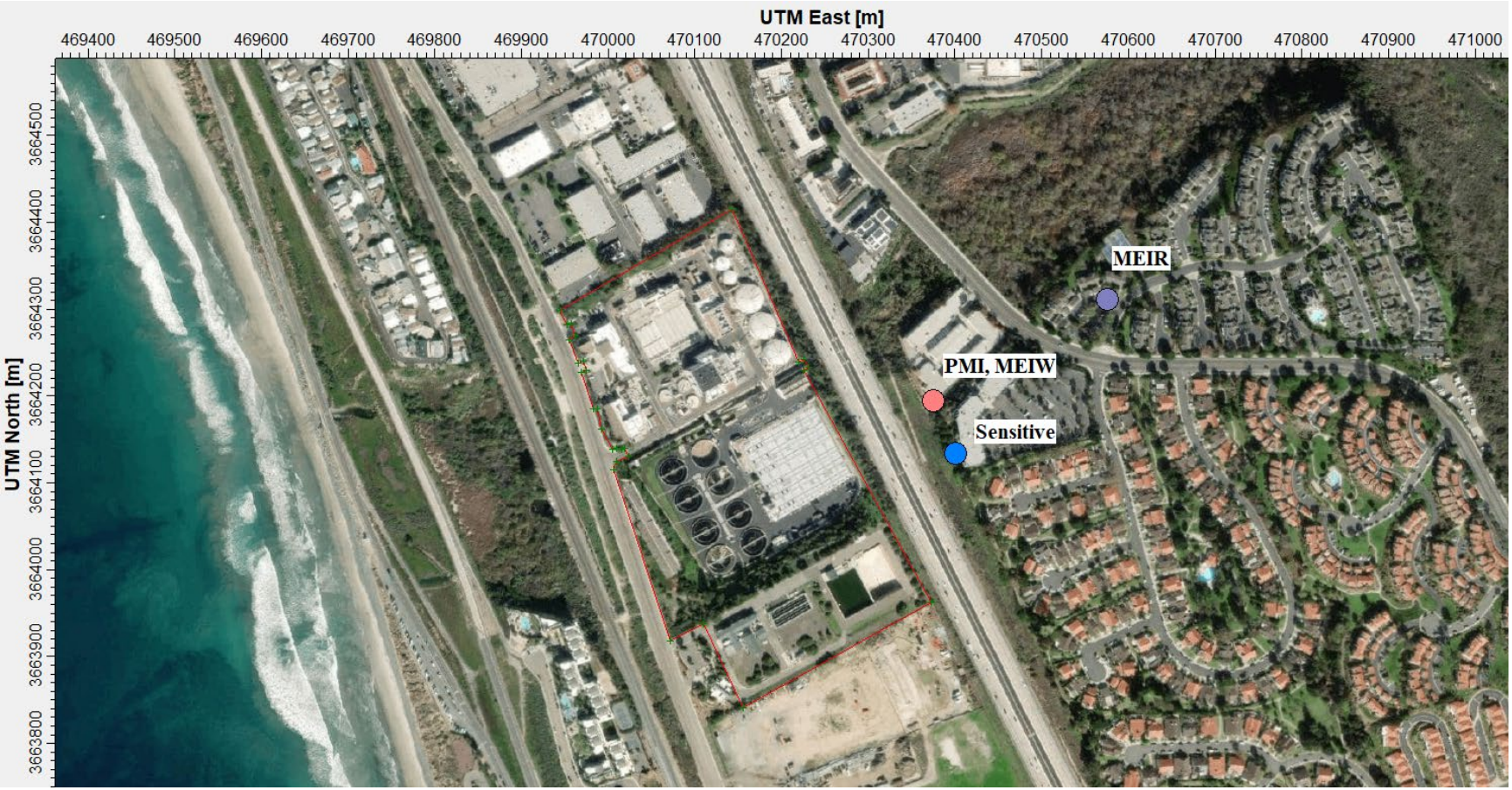
ORF3 contributed to more than 64% of the risk at all receptor types. The pollutant of interest at the PMI, MEIR and MEIW is hydrogen sulfide (>61%) targeting the central nervous system. At the peak sensitive receptor, the pollutant of interest is formaldehyde (> 93%) targeting the ophthalmic system.

Appendix C presents detailed tables summarizing the risk reduction HRA results at each receptor type, broken down by pollutant and source.

This HRA demonstrates that the installation of gas conditioning and oxidation catalysts on all four cogeneration engines reduces the acute HHI below the risk reduction threshold at all actual receptors.

Air dispersion modeling and risk calculation files will be provided electronically to the SDAPCD.

Figure 3-1: Risk Reduction Acute HHI Locations of PMI, MEIR, MEIW, and Maximum Sensitive Receptor



3.4.2 Risk Reduction HRA Results – Cancer Risk

Cancer risk is the estimated probability of a maximally exposed individual potentially contracting cancer as a result of exposure to TACs over an extended period of time. Per SDAPCD HRA guidance (SDAPCD 2022), this HRA estimated cancer risk over a 30-year period for residential, sensitive, and PMI grid receptor locations and 25 years for off-site worker receptor locations.

The risk reduction cancer risk analysis used PTE emission rates from all sources as outlined in Section 3.3. The modeling was conservatively conducted with PTE emissions although the facility operations are significantly lower.

The HRA predicted that the cancer risk was below the threshold of 10 in one million at all actual receptors. Figure 3-2 shows the 30-year cancer risk isopleths and the locations of the PMI, MEIR, and maximum sensitive receptor. Figure 3-3 shows the 25-year worker cancer risk isopleth and the location of the MEIW. Table 3-2 presents the 30-year cancer risk at the PMI, MEIR, and maximum sensitive receptor, and the 25-year cancer risk at the MEIW, plus the coordinates of each receptor.

Table 3-2: Risk Reduction Cancer Risk Results

Receptor	Exposure Duration	Cancer Risk (in one million)	UTM Easting (m)	UTM Northing (m)	Receptor Number
PMI	30-Year	15.74	470,311	3,664,075	5,864
MEIR		8.30	470,436	3,664,104	1
Sensitive		9.33	470,400	3,664,134	97
MEIW	25-Year	1.91	470,409	3,664,119	98

The MEIR was predicted to occur approximately 400 feet to the east of the facility across the I-5 freeway in a residential neighborhood off Caminito Del Reposo. The location of the peak sensitive receptor and MEIW was predicted to occur at Medical Offices located to the east of the facility across the I-5 freeway.

ORF3 contributed greater than 40% followed by the emergency diesel engine contributing greater than 15% of the cancer risk at all receptor types. The pollutant contributing most to the risk at all receptors was diesel particulate matter (>15%). From ORF3, 1,4-dioxane and chloroform combined for greater than 27% of the risk at all receptor types.

Appendix C presents detailed tables summarizing the risk reduction HRA results for each health risk, at each receptor type, broken down by pollutant and source.

This HRA demonstrates that the installation of gas conditioning and oxidation catalysts on all four cogeneration engines, plus the reduction of EDC in the ORFs, reduces the cancer risk below the risk reduction threshold at all actual receptors.

Air dispersion modeling and risk calculation files will be provided electronically to the SDAPCD.

Figure 3-2: Risk Reduction 30-Year Cancer Risk Isopleth and Locations of PMI, MEIR, and Maximum Sensitive Receptor

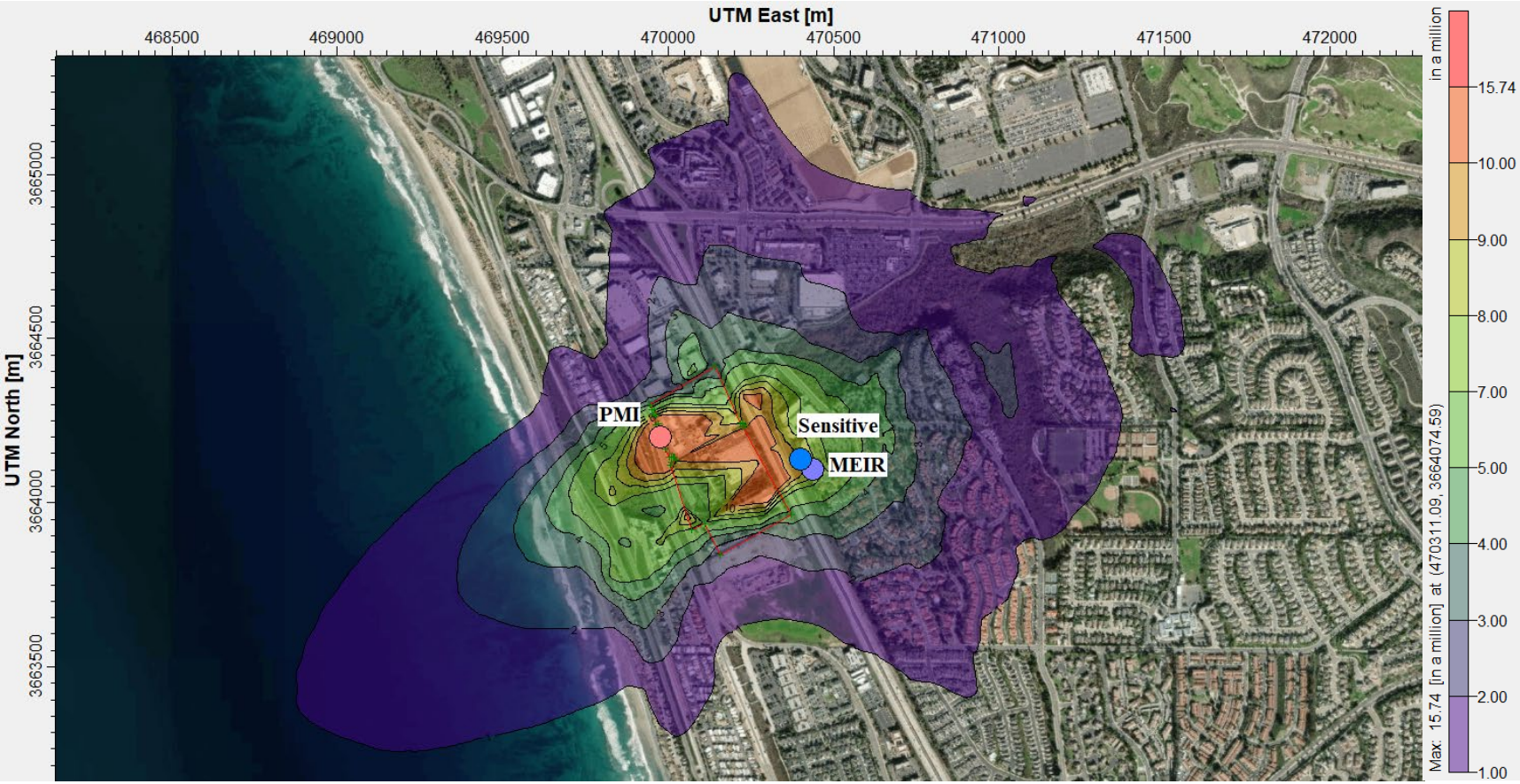
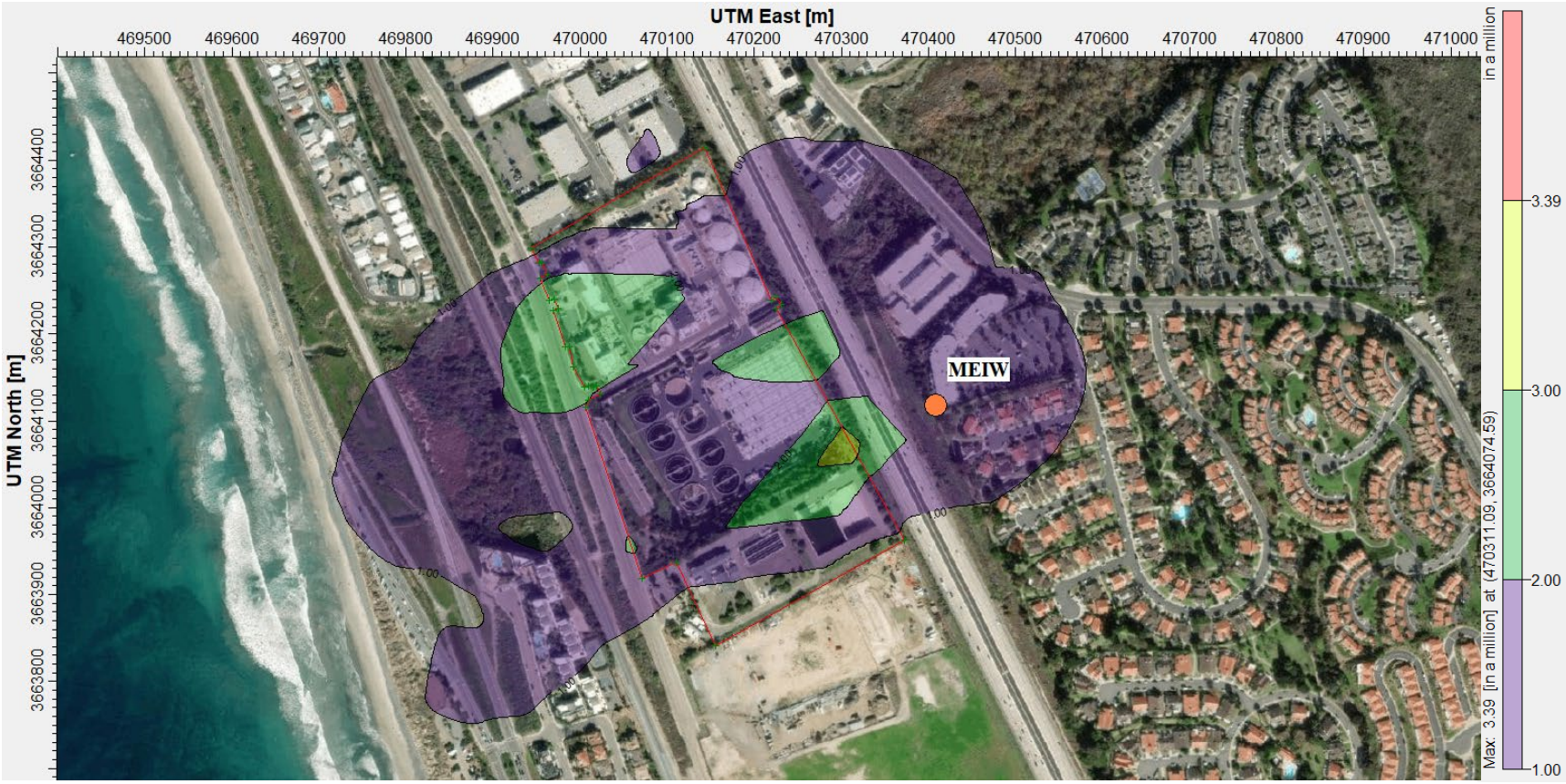


Figure 3-3: Risk Reduction 25-Year Cancer Risk Isopleth and Location of MEIW



3.5 Risk Reduction Schedule

Encina will work with a design engineering firm to develop plans for implementation of the gas conditioning and oxidation catalysts on the cogeneration engines. Encina EWA will work with SDAPCD staff to modify the cogeneration engines permits to include gas conditioning and oxidation catalysts. A complete permit modification package will be submitted to the SDAPCD once the control system's design is complete for the cogeneration engines (Permits APCD2010-PTO-000542, APCD2010-PTO-000543, APCD2010-PTO-000544, and APCD2010-PTO-000545).

As Encina is a Joint Powers Authority that includes the cities of Carlsbad, Vista, and Encinitas, as well as Buena Sanitation, Vallecitos Water, and Leucadia Wastewater Districts, it will take some time to develop and fund this significant facility change. This process is expected to take multiple years. The tentative schedule for the cogeneration retrofit project is outlined in Table 3-2.

Prior to conducting source testing of the ORFs, Encina will prepare a source testing protocol for approval by SDAPCD staff. Data from the sources will be used as the basis for updated emission factors for the ORFs and in future HRA modeling. Emission reductions from the source testing will be provided in the progress reports.

Progress reports on the implementation of these reduction measures will be provided annually until all measures are implemented.

Table 3-3: Risk Reduction Implementation Schedule

Action	Date
Complete Energy Resilience Assessment and Allocate Budget for FY 2026 Capital Improvement Project "Cogeneration Retrofit Project"	July 31, 2025
Issue RFP for Engineering Design for Cogeneration Retrofit Project	December 31, 2025
Complete Engineering Design of Cogeneration Retrofit Project, submit permit application to SDAPCD	December 31, 2026
After Authority to Construct is received from SDAPCD, issue Request for Bids and Select Firm for Capital Project	July 31, 2028
Complete Construction of Cogeneration Retrofit Project	August 30, 2029

APPENDIX A – GENERAL PERMIT APPLICATION

Internal Use Only	
APP ID: APCD	-APP/CER-
SITE ID: APCD	-SITE-

GENERAL PERMIT OR REGISTRATION APPLICATION FORM

San Diego County Air Pollution Control District

Submittal of this application does not grant permission to construct or to operate equipment except as specified in Rule 24(c).

REASON FOR SUBMITTAL OF APPLICATION:

- ☐ New Installation
- ☐ Amendment to Existing Authority to Construct or Application
- ☐ Change of Permit Conditions
- ☐ Registration of Portable Equipment
- ☐ Existing Unpermitted Equipment or Rule 11 Change
- ☐ Change of Equipment Location
- ☐ Change Permit to Operate Status to Inactive
- ☐ Modification of Existing Permitted Equipment
- ☐ Change of Equipment Ownership ***(please provide proof of ownership)***
- ☐ Banking Emissions
- ■ Other (Specify) Risk Reduction Plan for 2021 HRA

List affected APP/PTO Record ID(s): APCD2010-PTO-000542 APCD2010-PTO-000543 APCD2010-PTO-000544 APCD2010-PTO-000545

APPLICANT INFORMATION

Name of Business (DBA) Encina Wastewater Authority

Does this organization own or operate any other APCD permitted equipment at this or any other adjacent locations? ■ Yes ☐ No

If yes, list assigned Site Record IDs listed on your Permits APCD1984-SITE-03370

Name of Legal Owner (if different from DBA)

Equipment Owner

Name: Encina Wastewater Authority	
Mailing Address: 6200 Avenida Encinas Carlsbad, CA 92011	
City: State: Zip:	
Phone: ( )760-438-3941	
E-Mail Address: AAppel@encinajpa.com	

Authority to Construct Mailing Address

Name: Encina Wastewater Authority
Mailing Address: 6200 Avenida Encinas Carlsbad, CA 92011
City: State: Zip:
Phone: ( )760-438-3941
E-Mail Address: AAppel@encinajpa.com

Permit To Operate Mailing Address

Name: Encina Wastewater Authority
Mailing Address: 6200 Avenida Encinas Carlsbad, CA 92011
City: State: Zip:
Phone: ( )760-438-3941
E-Mail Address: AAppel@encinajpa.com

Invoice Mailing Address

Name: Encina Wastewater Authority
Mailing Address: 6200 Avenida Encinas Carlsbad, CA 92011
City: State: Zip:
Phone: ( )760-438-3941
E-Mail Address: AAppel@encinajpa.com

EQUIPMENT/PROCESS INFORMATION: Type of Equipment: ☐ Stationary ☐ Portable, *if portable please enter below the equipment storage address*. If portable, will operation exceed 12 consecutive months at the same location ☐ Yes ☐ No

Equipment Location Address 6200 Avenida Encinas Carlsbad, CA 92011 City State:

Parcel No. Zip Phone ( ) E-mail: AAppel@encinajpa.com

Site Contact Alicia Appel Phone (442) 320-7018

General Description of Equipment/Process wastewater treatment

Application Submitted by ☐ Owner ☐ Operator ☐ Contractor ■ Consultant Affiliation Yorke Engineering, LLC

EXPEDITED APPLICATION PROCESSING: ☐ I hereby request Expedited Application Processing and understand that:

a) Expedited processing will incur additional fees and permits will not be issued until the additional fees are paid in full (see Rule 40(d)(8)(iv) for details) b) Expedited processing is contingent on the availability of qualified staff c) Once engineering review has begun this request cannot be cancelled d) Expedited processing does not guarantee action by any specific date nor does it guarantee permit approval.

☐ **This application contains trade secret or confidential information** *(see reverse for instructions)*

I hereby certify that all information provided on this application is true and correct.

SIGNATURE Alicia Appel Date 5-22-2024

Print Name Alicia Appel Company Encina Wastewater Authority

Phone (442) 320-7018 E-mail Address AAppel@encinajpa.com

Internal Use Only

Date Staff Initials: Amt Rec'd $ Fee Schedule

RNP: EMF: NBF: TA: *GEN_APP_Form_Rev Date: Aug. 2017*

APPENDIX B – RISK REDUCTION HRA EMISSIONS

Yorke ENGINEERING, LLC
www.YorkeEngr.com

Encina Wastewater Authority PTE with Oxidation Catalyst
Cogeneration Engines

Fuel Usage & Engine Specs

Device	Digester Gas						Natural Gas					
	Annual (million ft^3/yr)	Daily (million ft^3/day)	Hourly (million ft^3/hr)	Hourly (scfm)	Rating (hp)	Rating (MMBtu/hr)	Annual (million ft^3/yr)	Daily (million ft^3/day)	Hourly (million ft^3/hr)	Hourly (scfm)	Rating (hp)	Rating (MMBtu/hr)
542	70	0.25	0.0152	253.72	1306	9.30	7	0.1375	0.0070	117.36	1085	7.18
543	70	0.25	0.0152	253.72	1306	9.30	7	0.1375	0.0070	117.36	1085	7.18
544	70	0.25	0.0152	253.72	1306	9.30	7	0.1375	0.0070	117.36	1085	7.18
545	70	0.25	0.0152	253.72	1306	9.30	7	0.1375	0.0070	117.36	1085	7.18
Total	**280**	**1**	**0.0609**	**1,015**			**28**	**0.55**	**0.0282**	**469**		

Daily and annual fuel usage based on permit conditions. Hourly fuel usage based on rating.

Criteria Pollutant Emissions
Digester Gas

Pollutant	CAS	Concentration (ppmv) @ 15% O2	EF ($lb/mmft^3$)	Device 542 Emissions			Device 543 Emissions			Device 544 Emissions			Device 545 Emissions			Total Emissions		
				lb/yr	lb/day	lb/hr	lb/yr	lb/day	lb/hr	lb/yr	lb/yr	lb/hr	lb/yr	lb/day	lb/hr	lb/yr	lb/day	lb/hr
Carbon Monoxide (CO)	42101	40	58.18	4,072.56	14.54	0.89	4,072.56	14.54	0.89	4,072.56	14.54	0.89	4,072.56	14.54	0.89	16,290.24	58.18	3.54
Nitrogen Oxides (NOx)	42603	47	112.27	7,858.69	28.07	1.71	7,858.69	28.07	1.71	7,858.69	28.07	1.71	7,858.69	28.07	1.71	31,434.76	112.27	6.84
Sulfur Oxides (SOx)	42401	-	2.00	140.00	0.50	0.03	140.00	0.50	0.03	140.00	0.50	0.03	140.00	0.50	0.03	560.00	2.00	0.12
Total Organic Gases (TOG)	43101	-	16.2	1,134.00	4.05	0.25	1,134.00	4.05	0.25	1,134.00	4.05	0.25	1,134.00	4.05	0.25	4,536.00	16.20	0.99
Volatile Organic Compounds (VOC)	43104	-	7.78	544.32	1.94	0.12	544.32	1.94	0.12	544.32	1.94	0.12	544.32	1.94	0.12	2,177.28	7.78	0.47
Total Particulates (TSP)	11101	-	27.6	1,932.00	6.90	0.42	1,932.00	6.90	0.42	1,932.00	6.90	0.42	1,932.00	6.90	0.42	7,728.00	27.60	1.68
Particulate Matter (PM10)	85101	-	27.6	1,932.00	6.90	0.42	1,932.00	6.90	0.42	1,932.00	6.90	0.42	1,932.00	6.90	0.42	7,728.00	27.60	1.68

Notes:
90% Control efficiency of oxidation catalyst
NOx emissions based on current permit limits
CO emissions based on permit limits with control efficiency of oxidation catalyst applied
Emissions from Digester Gas based on the default SDAPCD emission factors A01-E09 - Engine, Digester Gas Fired

General Information

Parameter	Value	Comment
$\%O_2$ Emission Guarantee Basis	15	
Fd - F-factor Digester Gas (dscf/mmBtu)	9244	Digester Gas Analysis 10/14/19
Fd - F-factor Natural Gas (dscf/mmBtu)	8710	Default
MW NO_X	46	Default
MW CO	28.01	Default
MW NH3	17	Default
Molar Gas Volume at 68F (scf/lb-mole)	385.3	Default
Digester Gas Fuel HHV (Btu/scf)	611	Digester Gas Analysis 10/14/19
Natural Gas Fuel HHV (Btu/scf)	1020	Default
Digester Gas Fuel Consumption Rate (Btu/bhp-hr)	7122	from Emissions Calcs March 2006
Natural Gas Fuel Consumption Rate (Btu/bhp-hr)	6620	from Emissions Calcs March 2006

Criteria Pollutant Emissions
Natural Gas

Pollutant	CAS	Concentration (ppmv) @ 15%	EF ($lb/mmft^3$)	Device 542 Emissions			Device 543 Emissions			Device 544 Emissions			Device 545 Emissions			Total Emissions		
				lb/yr	lb/day	lb/hr	lb/yr	lb/day	lb/hr	lb/yr	lb/day	lb/hr	lb/yr	lb/day	lb/hr	lb/yr	lb/day	lb/hr
Carbon Monoxide (CO)	42101	39	89.23	624.58	12.27	0.63	624.58	12.27	0.63	624.58	12.27	0.63	624.58	12.27	0.63	2,498.33	49.07	2.51
Nitrogen Oxides (NOx)	42603	54	202.89	1,420.24	27.90	1.43	1,420.24	27.90	1.43	1,420.24	27.90	1.43	1,420.24	27.90	1.43	5,680.98	111.59	5.71
Sulfur Oxides (SOx)	42401	-	0.6	4.20	0.08	0.00	4.20	0.08	0.00	4.20	0.08	0.00	4.20	0.08	0.00	16.80	0.33	0.02
Total Organic Gases (TOG)	43101	-	149.94	1,049.58	20.62	1.06	1,049.58	20.62	1.06	1,049.58	20.62	1.06	1,049.58	20.62	1.06	4,198.32	82.47	4.22
Volatile Organic Compounds (VOC)	43104	-	12.04	84.28	1.66	0.08	84.28	1.66	0.08	84.28	1.66	0.08	84.28	1.66	0.08	337.12	6.62	0.34
Total Particulates (TSP)	11101	-	10.19	71.33	1.40	0.07	71.33	1.40	0.07	71.33	1.40	0.07	71.33	1.40	0.07	285.32	5.60	0.29
Particulate Matter (PM10)	85101	-	10.19	71.33	1.40	0.07	71.33	1.40	0.07	71.33	1.40	0.07	71.33	1.40	0.07	285.32	5.60	0.29

Notes:
NOx emissions based on current permit limits
CO emissions based on permit limits with control efficiency of oxidation catalyst applied
Emissions from Natural Gas based on the default SDAPCD emission factors A01-E17 - Engines, Natural Gas Fired, 4 Stroke, Lean Burn, with Catalytic Oxidation

Criteria Pollutant Emissions
Total Cogen Engine Emissions

Pollutant	CAS	Device 542 Emissions			Device 543 Emissions			Device 544 Emissions			Device 545 Emissions			Total Emissions		
		Total Annual Emissions Both Fuels (lb/yr)	Total Daily Emissions Both Fuels (lb/day)	Max Hourly Emissions Either Fuel (lb/hr)	Total Annual Emissions Both Fuels (lb/yr)	Total Daily Emissions Both Fuels (lb/day)	Max Hourly Emissions Either Fuel (lb/hr)	Total Annual Emissions Both Fuels (lb/yr)	Total Daily Emissions Both Fuels (lb/day)	Max Hourly Emissions Either Fuel (lb/hr)	Total Annual Emissions Both Fuels (lb/yr)	Total Daily Emissions Both Fuels (lb/day)	Max Hourly Emissions Either Fuel (lb/hr)	Total Annual Emissions Both Fuels (lb/yr)	Total Daily Emissions Both Fuels (lb/day)	Max Hourly Emissions Either Fuel (lb/hr)
Carbon Monoxide (CO)	42101	4.697E+03	2.681E+01	8.857E-01	4.697E+03	2.681E+01	8.857E-01	4.697E+03	2.681E+01	8.857E-01	4.697E+03	2.681E+01	8.857E-01	1.879E+04	1.073E+02	3.543E+00
Nitrogen Oxides (NOx)	42603	9.279E+03	5.596E+01	1.709E+00	9.279E+03	5.596E+01	1.709E+00	9.279E+03	5.596E+01	1.709E+00	9.279E+03	5.596E+01	1.709E+00	3.712E+04	2.239E+02	6.836E+00
Sulfur Oxides (SOx)	42401	1.442E+02	5.825E-01	3.045E-02	1.442E+02	5.825E-01	3.045E-02	1.442E+02	5.825E-01	3.045E-02	1.442E+02	5.825E-01	3.045E-02	5.768E+02	2.330E+00	1.218E-01
Total Organic Gases (TOG)	43101	2.184E+03	2.467E+01	1.056E+00	2.184E+03	2.467E+01	1.056E+00	2.184E+03	2.467E+01	1.056E+00	2.184E+03	2.467E+01	1.056E+00	8.734E+03	9.867E+01	4.223E+00
Volatile Organic Compounds (VOC)	43104	6.286E+02	3.600E+00	1.184E-01	6.286E+02	3.600E+00	1.184E-01	6.286E+02	3.600E+00	1.184E-01	6.286E+02	3.600E+00	1.184E-01	2.514E+03	1.440E+01	4.735E-01
Total Particulates (TSP)	11101	2.003E+03	8.301E+00	4.202E-01	2.003E+03	8.301E+00	4.202E-01	2.003E+03	8.301E+00	4.202E-01	2.003E+03	8.301E+00	4.202E-01	8.013E+03	3.320E+01	1.681E+00
Particulate Matter (PM10)	85101	2.003E+03	8.301E+00	4.202E-01	2.003E+03	8.301E+00	4.202E-01	2.003E+03	8.301E+00	4.202E-01	2.003E+03	8.301E+00	4.202E-01	8.013E+03	3.320E+01	1.681E+00

Notes:
Maximum hourly emissions are from engines operating on either digester gas or natural gas

TAC Emissions
Digester Gas

Pollutant	CAS	Device 542 Emissions			Device 543 Emissions			Device 544 Emissions			Device 545 Emissions			Total Emissions		Controlled by Ox Cat?	Uncontrolled EF ($lb/mmft^3$)
		EF ($lb/mmft^3$)	lb/yr	lb/hr	EF ($lb/mmft^3$)	lb/yr	lb/hr	EF ($lb/mmft^3$)	lb/yr	lb/hr	EF ($lb/mmft^3$)	lb/yr	lb/hr	lb/yr	lb/hr		
NH3	7664417	4.800E-03	3.360E-01	7.307E-05	4.800E-03	3.360E-01	7.307E-05	4.800E-03	3.360E-01	7.307E-05	4.800E-03	3.360E-01	7.307E-05	1.344E+00	2.923E-04	N	-
Acetaldehyde	75070	7.000E-05	4.900E-03	1.066E-06	7.000E-05	4.900E-03	1.066E-06	7.000E-05	4.900E-03	1.066E-06	7.000E-05	4.900E-03	1.066E-06	1.960E-02	4.262E-06	Y	7.000E-04
Benzene	71432	1.782E-02	1.247E+00	2.713E-04	1.782E-02	1.247E+00	2.713E-04	1.782E-02	1.247E+00	2.713E-04	1.782E-02	1.247E+00	2.713E-04	4.990E+00	1.085E-03	Y	1.782E-01
Chlorobenzn	108907	2.000E-05	1.400E-03	3.045E-07	2.000E-05	1.400E-03	3.045E-07	2.000E-05	1.400E-03	3.045E-07	2.000E-05	1.400E-03	3.045E-07	5.600E-03	1.218E-06	Y	2.000E-04
DiClBenzenes	25321226	1.800E-04	1.260E-02	2.740E-06	1.800E-04	1.260E-02	2.740E-06	1.800E-04	1.260E-02	2.740E-06	1.800E-04	1.260E-02	2.740E-06	5.040E-02	1.096E-05	Y	1.800E-03
Ethyl Benzene	100414	1.000E-04	7.000E-03	1.522E-06	1.000E-04	7.000E-03	1.522E-06	1.000E-04	7.000E-03	1.522E-06	1.000E-04	7.000E-03	1.522E-06	2.800E-02	6.089E-06	Y	1.000E-03
EDC	107062	1.400E-04	9.800E-03	2.131E-06	1.400E-04	9.800E-03	2.131E-06	1.400E-04	9.800E-03	2.131E-06	1.400E-04	9.800E-03	2.131E-06	3.920E-02	8.525E-06	Y	1.400E-03
Formaldehyde	50000	4.672E+00	3.270E+02	7.112E-02	4.672E+00	3.270E+02	7.112E-02	4.672E+00	3.270E+02	7.112E-02	4.672E+00	3.270E+02	7.112E-02	1.308E+03	2.845E-01	Y	4.672E+01
Hexane	110543	6.480E-03	4.536E-01	9.865E-05	6.480E-03	4.536E-01	9.865E-05	6.480E-03	4.536E-01	9.865E-05	6.480E-03	4.536E-01	9.865E-05	1.814E+00	3.946E-04	Y	6.480E-02
HCl	7647010	6.455E-02	4.519E+00	9.827E-04	6.455E-02	4.519E+00	9.827E-04	6.455E-02	4.519E+00	9.827E-04	6.455E-02	4.519E+00	9.827E-04	1.807E+01	3.931E-03	Y	6.455E-01
H2S	7783064	2.150E-02	1.505E+00	3.273E-04	2.150E-02	1.505E+00	3.273E-04	2.150E-02	1.505E+00	3.273E-04	2.150E-02	1.505E+00	3.273E-04	6.020E+00	1.309E-03	N	2.150E-02
Methylene Chlor	75092	1.000E-05	7.000E-04	1.522E-07	1.000E-05	7.000E-04	1.522E-07	1.000E-05	7.000E-04	1.522E-07	1.000E-05	7.000E-04	1.522E-07	2.800E-03	6.089E-07	Y	1.000E-04
MEK	78933	1.000E-05	7.000E-04	1.522E-07	1.000E-05	7.000E-04	1.522E-07	1.000E-05	7.000E-04	1.522E-07	1.000E-05	7.000E-04	1.522E-07	2.800E-03	6.089E-07	Y	1.000E-04
Perc	127184	5.000E-05	3.500E-03	7.612E-07	5.000E-05	3.500E-03	7.612E-07	5.000E-05	3.500E-03	7.612E-07	5.000E-05	3.500E-03	7.612E-07	1.400E-02	3.045E-06	Y	5.000E-04
Toluene	108883	6.480E-03	4.536E-01	9.865E-05	6.480E-03	4.536E-01	9.865E-05	6.480E-03	4.536E-01	9.865E-05	6.480E-03	4.536E-01	9.865E-05	1.814E+00	3.946E-04	Y	6.480E-02
1,1,1-TCA	71556	1.000E-05	7.000E-04	1.522E-07	1.000E-05	7.000E-04	1.522E-07	1.000E-05	7.000E-04	1.522E-07	1.000E-05	7.000E-04	1.522E-07	2.800E-03	6.089E-07	Y	1.000E-04
TCE	79016	3.000E-05	2.100E-03	4.567E-07	3.000E-05	2.100E-03	4.567E-07	3.000E-05	2.100E-03	4.567E-07	3.000E-05	2.100E-03	4.567E-07	8.400E-03	1.827E-06	Y	3.000E-04
Xylenes	1330207	4.500E-04	3.150E-02	6.850E-06	4.500E-04	3.150E-02	6.850E-06	4.500E-04	3.150E-02	6.850E-06	4.500E-04	3.150E-02	6.850E-06	1.260E-01	2.740E-05	Y	4.500E-03
Arsenic	7440382	2.950E-04	2.065E-02	4.491E-06	2.950E-04	2.065E-02	4.491E-06	2.950E-04	2.065E-02	4.491E-06	2.950E-04	2.065E-02	4.491E-06	8.260E-02	1.796E-05	N	2.950E-04

Notes:
Emissions from Digester Gas based on the default SDAPCD emission factors A01-E09 - Engine, Digester Gas Fired
Arsenic was included but using the Encina specific emission factor from SDAPCD (https://www.sdapcd.org/content/dam/sdc/apcd/PDF/EmissionsInventoryRequestFormsInstructions/APCD-landfill1-revised-Nov-2nd-2021.pdf)
Formaldehyde emission factors based on onsite source test results, per SDAPCD inventory 3-1-22
The emission factor for the volatile TACs are controlled 90% by the oxidation catalyst

TAC Emissions Natural Gas												
Pollutant	CAS	EF (lb/mmft^3)	Device 542 Emissions		Device 543 Emissions		Device 544 Emissions		Device 545 Emissions		Total Emissions	
			lb/yr	lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr	lb/hr
1,3-Butadiene	106990	0.03	2.100E-01	2.113E-04	2.100E-01	2.113E-04	2.100E-01	2.113E-04	2.100E-01	2.113E-04	8.400E-01	8.450E-04
Acetaldehyde	75070	0.85	5.950E+00	5.986E-03	5.950E+00	5.986E-03	5.950E+00	5.986E-03	5.950E+00	5.986E-03	2.380E+01	2.394E-02
Acrolein	107028	0.01	7.000E-02	7.042E-05	7.000E-02	7.042E-05	7.000E-02	7.042E-05	7.000E-02	7.042E-05	2.800E-01	2.817E-04
Benzene	71432	0.04	2.800E-01	2.817E-04	2.800E-01	2.817E-04	2.800E-01	2.817E-04	2.800E-01	2.817E-04	1.120E+00	1.127E-03
Ethyl Benzene	100414	0.004	2.800E-02	2.817E-05	2.800E-02	2.817E-05	2.800E-02	2.817E-05	2.800E-02	2.817E-05	1.120E-01	1.127E-04
Formaldehyde	50000	5.39	3.773E+01	3.796E-02	3.773E+01	3.796E-02	3.773E+01	3.796E-02	3.773E+01	3.796E-02	1.509E+02	1.518E-01
Hexane	110543	0.11	7.700E-01	7.746E-04	7.700E-01	7.746E-04	7.700E-01	7.746E-04	7.700E-01	7.746E-04	3.080E+00	3.098E-03
Methanol	67561	0.26	1.820E+00	1.831E-03	1.820E+00	1.831E-03	1.820E+00	1.831E-03	1.820E+00	1.831E-03	7.280E+00	7.324E-03
Methylene Chlor	75092	0.002	1.400E-02	1.408E-05	1.400E-02	1.408E-05	1.400E-02	1.408E-05	1.400E-02	1.408E-05	5.600E-02	5.633E-05
Naphthalene	91203	0.007	4.900E-02	4.929E-05	4.900E-02	4.929E-05	4.900E-02	4.929E-05	4.900E-02	4.929E-05	1.960E-01	1.972E-04
PAHs-w/o	1151	0.003	2.100E-02	2.113E-05	2.100E-02	2.113E-05	2.100E-02	2.113E-05	2.100E-02	2.113E-05	8.400E-02	8.450E-05
Phenol	108952	0.002	1.400E-02	1.408E-05	1.400E-02	1.408E-05	1.400E-02	1.408E-05	1.400E-02	1.408E-05	5.600E-02	5.633E-05
Toluene	108883	0.04	2.800E-01	2.817E-04	2.800E-01	2.817E-04	2.800E-01	2.817E-04	2.800E-01	2.817E-04	1.120E+00	1.127E-03
Xylenes	1330207	0.02	1.400E-01	1.408E-04	1.400E-01	1.408E-04	1.400E-01	1.408E-04	1.400E-01	1.408E-04	5.600E-01	5.633E-04

Notes:

Emissions based on the default SDAPCD emission factors for A01-E17 - Engines, Natural Gas Fired, 4 Stroke, Lean Burn, with Catalytic Oxidation

TAC Emissions
Total Cogen Engine Emissions for Modeling

Pollutant	CAS		Device 542 Emissions		Device 543 Emissions		Device 544 Emissions		Device 545 Emissions		Total Emissions	
			Total Annual Emissions both Fuels (lb/yr)	Max Hourly Emissions from Either Fuel (lb/hr)	Total Annual Emissions both Fuels (lb/yr)	Max Hourly Emissions from Either Fuel (lb/hr)	Total Annual Emissions both Fuels (lb/yr)	Max Hourly Emissions from Either Fuel (lb/hr)	Total Annual Emissions both Fuels (lb/yr)	Max Hourly Emissions from Either Fuel (lb/hr)	Total Annual Emissions both Fuels (lb/yr)	Max Hourly Emissions from Either Fuel (lb/hr)
1,3-Butadiene	106990		2.100E-01	2.113E-04	2.100E-01	2.113E-04	2.100E-01	2.113E-04	2.100E-01	2.113E-04	8.400E-01	8.450E-04
Acetaldehyde	75070		5.955E+00	5.986E-03	5.955E+00	5.986E-03	5.955E+00	5.986E-03	5.955E+00	5.986E-03	2.382E+01	2.394E-02
Acrolein	107028		7.000E-02	7.042E-05	7.000E-02	7.042E-05	7.000E-02	7.042E-05	7.000E-02	7.042E-05	2.800E-01	2.817E-04
Benzene	71432		1.527E+00	2.817E-04	1.527E+00	2.817E-04	1.527E+00	2.817E-04	1.527E+00	2.817E-04	6.110E+00	1.127E-03
Ethyl Benzene	100414		3.500E-02	2.817E-05	3.500E-02	2.817E-05	3.500E-02	2.817E-05	3.500E-02	2.817E-05	1.400E-01	1.127E-04
Formaldehyde	50000		3.648E+02	7.112E-02	3.648E+02	7.112E-02	3.648E+02	7.112E-02	3.648E+02	7.112E-02	1.459E+03	2.845E-01
Hexane	110543		1.224E+00	7.746E-04	1.224E+00	7.746E-04	1.224E+00	7.746E-04	1.224E+00	7.746E-04	4.894E+00	3.098E-03
Methanol	67561		1.820E+00	1.831E-03	1.820E+00	1.831E-03	1.820E+00	1.831E-03	1.820E+00	1.831E-03	7.280E+00	7.324E-03
Methylene Chlor	75092		1.470E-02	1.408E-05	1.470E-02	1.408E-05	1.470E-02	1.408E-05	1.470E-02	1.408E-05	5.880E-02	5.633E-05
Naphthalene	91203		4.900E-02	4.929E-05	4.900E-02	4.929E-05	4.900E-02	4.929E-05	4.900E-02	4.929E-05	1.960E-01	1.972E-04
PAHs-w/o	1151		2.100E-02	2.113E-05	2.100E-02	2.113E-05	2.100E-02	2.113E-05	2.100E-02	2.113E-05	8.400E-02	8.450E-05
Phenol	108952		1.400E-02	1.408E-05	1.400E-02	1.408E-05	1.400E-02	1.408E-05	1.400E-02	1.408E-05	5.600E-02	5.633E-05
Toluene	108883		7.336E-01	2.817E-04	7.336E-01	2.817E-04	7.336E-01	2.817E-04	7.336E-01	2.817E-04	2.934E+00	1.127E-03
Xylenes	1330207		1.715E-01	1.408E-04	1.715E-01	1.408E-04	1.715E-01	1.408E-04	1.715E-01	1.408E-04	6.860E-01	5.633E-04
NH3	7664417		3.360E-01	7.307E-05	3.360E-01	7.307E-05	3.360E-01	7.307E-05	3.360E-01	7.307E-05	1.344E+00	2.923E-04
Chlorobenzn	108907		1.400E-03	3.045E-07	1.400E-03	3.045E-07	1.400E-03	3.045E-07	1.400E-03	3.045E-07	5.600E-03	1.218E-06
DiClBenzenes	25321226		1.260E-02	2.740E-06	1.260E-02	2.740E-06	1.260E-02	2.740E-06	1.260E-02	2.740E-06	5.040E-02	1.096E-05
EDC	107062		9.800E-03	2.131E-06	9.800E-03	2.131E-06	9.800E-03	2.131E-06	9.800E-03	2.131E-06	3.920E-02	8.525E-06
HCl	7647010		4.519E+00	9.827E-04	4.519E+00	9.827E-04	4.519E+00	9.827E-04	4.519E+00	9.827E-04	1.807E+01	3.931E-03
H2S	7783064		1.505E+00	3.273E-04	1.505E+00	3.273E-04	1.505E+00	3.273E-04	1.505E+00	3.273E-04	6.020E+00	1.309E-03
MEK	78933		7.000E-04	1.522E-07	7.000E-04	1.522E-07	7.000E-04	1.522E-07	7.000E-04	1.522E-07	2.800E-03	6.089E-07
Perc	127184		3.500E-03	7.612E-07	3.500E-03	7.612E-07	3.500E-03	7.612E-07	3.500E-03	7.612E-07	1.400E-02	3.045E-06
1,1,1-TCA	71556		7.000E-04	1.522E-07	7.000E-04	1.522E-07	7.000E-04	1.522E-07	7.000E-04	1.522E-07	2.800E-03	6.089E-07
TCE	79016		2.100E-03	4.567E-07	2.100E-03	4.567E-07	2.100E-03	4.567E-07	2.100E-03	4.567E-07	8.400E-03	1.827E-06
Arsenic	7440382		2.065E-02	4.491E-06	2.065E-02	4.491E-06	2.065E-02	4.491E-06	2.065E-02	4.491E-06	8.260E-02	1.796E-05

Notes:
Maximum Hourly emissions modeled are from the max emissions from the engines operating on either digester gas or natural gas

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Encina Wastewater Authority PTE
Flares - Permit ID 1004

Fuel Usage

Device	Digester Gas Fuel Usage				Rating (MMBtu/hr)	HHV (BTU/scf)
	Annual (million ft^3/yr)	Daily (million ft^3/day)	Hourly (million ft^3/hr)	Hourly (scfm)		
Flare(s)	300	1.571	0.0655	1091	40	611

Operation (hours/day) 24

Annual fuel usage based on permit conditions. Hourly and daily fuel usage based on rating.

There are 2 flares permitted, both rated 20 MMBtu/hr, one is not yet installed. Emissions are based on both flares.

Criteria Pollutant Emissions

Pollutant	CAS	EF (lb/mmft^3)	Emissions		
			lb/yr	lb/day	lb/hr
Carbon Monoxide (CO)	42101	75.53	22,659.00	118.67	4.94
Nitrogen Oxides (NOx)	42603	34.86	10,458.00	54.77	2.28
Sulfur Oxides (SOx)	42401	2.00	600.00	3.14	0.13
Total Organic Gases (TOG)	43101	25.21	7,563.00	39.61	1.65
Volatile Organic Compounds (VOC)	43104	12.10	3,630.00	19.01	0.79
Total Particulates (TSP)	11101	12.00	3,600.00	18.85	0.79
Particulate Matter (PM10)	85101	12.00	3,600.00	18.85	0.79

Notes:

Emissions from Digester Gas based on the default SDAPCD emission factors F02 - Flares, Digester Gas Fired, Enclosed

CO & NOx from 2021 inventory. Matches average from source testing from 2011 & 2013

TAC Emissions
Digester Gas

Pollutant	CAS	EF (lb/mmft^3)	Flare Emissions	
			lb/yr	lb/hr
Acetone	67641	7.000E-04	2.100E-01	4.583E-05
Ammonia	7664417	4.800E-03	1.440E+00	3.142E-04
Arsenic	7440382	2.950E-04	8.850E-02	1.931E-05
Benzene	71432	2.770E-02	8.310E+00	1.813E-03
Chlorobenzn	108907	2.000E-04	6.000E-02	1.309E-05
DiClBenzenes	25321226	1.800E-03	5.400E-01	1.178E-04
Ethyl Benzene	100414	1.000E-03	3.000E-01	6.547E-05
EDC	107062	1.400E-03	4.200E-01	9.165E-05
Formaldehyde	50000	2.042E-01	6.126E+01	1.337E-02
Hexane	110543	1.010E-02	3.030E+00	6.612E-04
HCl	7647010	6.455E-01	1.937E+02	4.226E-02
H2S	7783064	2.150E-02	6.450E+00	1.408E-03
Methylene Chlor	75092	1.000E-04	3.000E-02	6.547E-06
MEK	78933	1.000E-04	3.000E-02	6.547E-06
Perc	127184	5.000E-04	1.500E-01	3.273E-05
Toluene	108883	1.010E-02	3.030E+00	6.612E-04
1,1,1-TCA	71556	1.000E-04	3.000E-02	6.547E-06
TCE	79016	3.000E-04	9.000E-02	1.964E-05
Xylenes	1330207	4.500E-03	1.350E+00	2.946E-04

Notes:

Emissions from Digester Gas based on the default SDAPCD emission factors F02 - Flares, Digester Gas Fired, Enclosed

Arsenic was included but using the Encina specific emission factor from SDAPCD (https://www.sdapcd.org/content/dam/sdc/apcd/PDF/EmissionsInventoryRequestFormsInstructions/APCD-landfill1-revised-Nov-2nd-2021.pdf)

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Encina Wastewater Authority PTE
Diesel ICE- Permit ID 982044

Fuel Usage

Device	Max Rating (bhp)	Annual Diesel Fuel Usage (gal/yr)	Max Daily Diesel Fuel Usage (gal/day)	Max Hourly Diesel Fuel Usage (gal/hr)	Operations (hr/yr)
Diesel ICE	1,528	3903.0	1873.4	78.06	50.00

Hourly fuel usage is calculated from the horsepower at full load

Operation (hours/day) 24

Criteria Pollutant Emissions

Pollutant	CAS	Emission Factor (g/bhp)	Emission Factor (lb/1000 gal)	Emissions		
				lb/yr	lb/day	lb/hr
Carbon Monoxide (CO)	42101	0.52	22.530	87.93	42.21	1.76
Nitrogen Oxides (NOx)	42603	5.82	251.030	979.77	470.29	19.60
Sulfur Oxides (SOx)	42401	-	0.213	0.83	0.40	0.02
Total Organic Gases (TOG)	43101	0.29	12.333	48.14	23.11	0.96
Volatile Organic Compounds (VOC)	43104	0.37	16.090	62.80	30.14	1.26
Total Particulates (TSP)	11101	0.11	4.830	18.85	9.05	0.38
Particulate Matter (PM10)	85101	0.11	4.830	18.85	9.05	0.38

EFs based on SDAPCD inventory - EMISSION FACTORS USED ARE NOX 7.8, CO 0.7, VOC 0.5, PM 0.15 G/KW-HR PER ARB E.O. U-R-035-0121.

TAC Emissions

Pollutant	CAS	EF (lb/1000 gal)	Diesel ICE Emissions	
			lb/yr	lb/hr
DieselExhPM	9901	4.83E+00	1.89E+01	-
1,3-Butadiene	106990	2.17E-01	-	1.69E-02
Acetaldehyde	75070	7.83E-01	-	6.11E-02
Acrolein	107028	3.39E-02	-	2.65E-03
Arsenic	7440382	1.60E-03	-	1.25E-04
Benzene	71432	1.86E-01	-	1.45E-02
Cadmium	7440439	1.50E-03	-	1.17E-04
Chlorobenzn	108907	2.00E-04	-	1.56E-05
Cr(VI)	18540299	1.00E-04	-	7.81E-06
Chromium	7440473	5.00E-04	-	3.90E-05
Ethyl Benzene	100414	1.09E-02	-	8.51E-04
Formaldehyde	50000	1.73E+00	-	1.35E-01
Hexane	110543	2.69E-02	-	2.10E-03
Hydrogen Chloride	7647010	1.86E-01	-	1.45E-02
Lead	7439921	8.30E-03	-	6.48E-04
Manganese	7439965	3.10E-03	-	2.42E-04
Mercury	7439976	2.00E-03	-	1.56E-04
Naphthalene	91203	1.97E-02	-	1.54E-03
Nickel	7440020	3.90E-03	-	3.04E-04
PAHs-w/o	1151	3.62E-02	-	2.83E-03
Propylene	115071	4.67E-01	-	3.65E-02
Selenium	7782492	2.20E-03	-	1.72E-04
Toluene	108883	1.05E-01	-	8.20E-03
Xylenes	1330207	4.24E-02	-	3.31E-03
Zinc	7440666	2.24E-02	-	1.75E-03
Copper	7440508	4.10E-03	-	3.20E-04

Notes:
Annual emissions reported as DPM, hourly emissions reported as speciated toxics

Heat Rate, BTU/BHP-hr	7,000.0	*SDAPCD*
Fuel HHV, BTU/gal	137,030	*SDAPCD (19,300 BTU/lb x 7.1 lb/gal)*
BSFC, gal/BHP-hr	0.05108	*calculated*
Ratio, ROG/TOG	0.88400	*SDAPCD Annual Calculations*
Conversion factor g to lb	0.002204586	

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Encina Wastewater Authority PTE
ORF1 Headworks - Permit ID 961446

Usage

Device	Usage				
	million gal/yr	million gal/day	million gal/hr	day/yr	hr/day
ORF Headworks	13,140	36.00	1.50	365	24

Permit limits to average of 36 million gallon per day

Emissions

Pollutant	CAS	EF (lb/million gal)	ORF Headworks Emissions		
			lb/yr	lb/day	lb/hr
Criteria Pollutants					
Total Organic Gases (TOG)	43101	0.188	2,470.32	6.77	2.82E-01
Volatile Organic Compounds (VC	43104	0.16	2,102.40	5.76	2.40E-01
Toxic Air Contaminants					
Pollutant	**CAS**	**EF (lb/million gal)**	**lb/yr**	**lb/hr**	
NH3	7664417	4.86E-03	63.9	7.29E-03	
Benzene	71432	9.16E-04	12.0	1.37E-03	
CS2	75150	6.31E-03	82.9	9.47E-03	
Chloroform	67663	7.73E-03	101.6	1.16E-02	
p-DiClBenzene	106467	3.97E-03	52.2	5.96E-03	
1,4-Dioxane	123911	1.69E-02	222.1	2.54E-02	
H2S	7783064	4.85E-03	63.7	7.28E-03	
Methylene Chlor	75092	1.72E-02	226.0	2.58E-02	
Perc	127184	7.63E-03	100.3	1.14E-02	
Toluene	108883	2.04E-03	26.8	3.06E-03	
1,1,1-TCA	71556	2.97E-03	39.0	4.46E-03	
TCE	79016	1.79E-02	235.2	2.69E-02	
Xylenes	1330207	4.40E-04	5.8	6.60E-04	
Methane	74828	7.38E-02	969.7	1.11E-01	
		EDC Conc (ppbv)			
EDC*	107062	0.0494	0.27	3.05E-05	

Notes:
Emissions based on the default SDAPCD emission factors P15-W01 - WASTEWATER PROCESSING, ENCINA WWTP, HEADWORKS WITH CONTROLS (from site specific source test data in 1993)
* EDC emissions are based on the CATEF emission factor of 0.247 ppbv for 'Aeration Basin & PST, Wastewater' plus the application of the control efficiency

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Encina Wastewater Authority PTE
ORF3 Activated Sludge - Permit ID 961446

Usage					
Device	Usage				
	mil gal/yr	million gal/day	mil gal/hr	day/yr	hr/day
ORF Headworks	13,140	36.00	1.50	365	24

Permit limits to average of 36 million gallon per day

Emissions					
Pollutant	CAS	EF (lb/million gal)	ORF Activated Sludge Emissions		
			lb/yr	lb/day	lb/hr
Criteria Pollutants					
Total Organic Gases (TOG)	43101	0.212	2,785.68	7.63	3.18E-01
Volatile Organic Compounds (VOC)	43104	0.184	2,417.76	6.62	2.76E-01
Toxic Air Contaminants					
Pollutant	CAS	EF (lb/million gal)	lb/yr	lb/hr	
NH3	7664417	4.86E-03	63.9	7.29E-03	
Benzene	71432	9.16E-04	12.0	1.37E-03	
CS2	75150	6.31E-03	82.9	9.47E-03	
Chlorine	7782505	0.00E+00	0.0	0.00E+00	
Chloroform	67663	2.01E-02	264.1	3.02E-02	
p-DiClBenzene	106467	3.97E-03	52.2	5.96E-03	
1,4-Dioxane	123911	1.69E-02	222.1	2.54E-02	
H2S	7783064	9.75E-03	128.1	1.46E-02	
Methylene Chlor	75092	1.72E-02	226.0	2.58E-02	
Perc	127184	7.63E-03	100.3	1.14E-02	
Sodium Hydroxide	1310732	0.00E+00	0.0	0.00E+00	
Toluene	108883	2.04E-03	26.8	3.06E-03	
1,1,1-TCA	71556	2.97E-03	39.0	4.46E-03	
TCE	79016	1.79E-02	235.2	2.69E-02	
Xylenes	1330207	4.40E-04	5.8	6.60E-04	
Methane	74828	8.56E-02	1124.8	1.28E-01	
		EDC Conc (ppbv)			
EDC*	107062	0.0494	0.16	1.83E-05	

Notes:

Emissions based on the default SDAPCD emission factors P15-W02 - WASTEWATER PROCESSING, ENCINA WWTP, ACTIVATED SLUDGE AERATION WITH CONTROLS (from site specific source test data in 1993)

Chlorine & Sodium Hydroxide emissions equal zero since the caustic scrubber has been removed from the process

* EDC emissions are based on the CATEF emission factor of 0.247 ppbv for 'Solids odor processing, Sludge' plus the application of the control efficiency

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Encina Wastewater Authority PTE
Natural Gas Dryer/RTO Emissions - Permit ID 001016

Fuel Usage - Dryer/RTO

Fuel	Annual (million ft^3/yr)	Daily (million ft^3/day)	Hourly (million ft^3/hr)	Hourly (scfm)	Rating (MMBtu/hr)	HHV (BTU/scf)
Natural Gas Fuel Usage	140.0	0.38	0.0160	266	16.3	1020

Hourly fuel usage is calculated from the rating at full load

Operation (hours/day)	24
Operation (day/year)	365

Emissions
Natural Gas

Pollutant	CAS	EF (lb/mmft^3)	RTO Natural Gas Emissions		
			lb/yr	lb/day	lb/hr
Criteria Pollutants					
Carbon Monoxide (CO)	42101	84	11,760.00	32.22	1.34
Nitrogen Oxides (NOx)	42603	100	14,000.00	38.35	1.60
Sulfur Oxides (SOx)	42401	0.6	84.00	0.23	0.01
Total Organic Gases (TOG)	43101	11	1,540.00	4.22	0.18
Volatile Organic Compounds (VC	43104	5.5	770.00	2.11	0.09
Total Particulates (TSP)	11101	7.6	1,064.00	2.91	0.12
Particulate Matter (PM10)	85101	7.6	1,064.00	2.91	0.12
Toxic Air Contaminants					
Pollutant	**CAS**	**EF (lb/mmft^3)**	**lb/yr**	**lb/hr**	
Benzene	71432	2.10E-03	2.940E-01	3.356E-05	
DiClBenzenes	25321226	1.20E-03	1.680E-01	1.918E-05	
Formaldehyde	50000	7.50E-02	1.050E+01	1.199E-03	
Hexane	110543	1.80E+00	2.520E+02	2.876E-02	
Naphthalene	91203	6.10E-04	8.540E-02	9.748E-06	
Toluene	108883	3.40E-03	4.760E-01	5.433E-05	

Notes:
Emissions from Natural Gas combustion of the dryer and RTO combined based on the default SDAPCD emission factors B16 - Boiler, Natural Gas Fired, 0.3 - 100 Mmbtu/Hr, uncontrolled

Permit APCD2011-PTO-001016
Digester Gas emissions are captured in the Biosolids-RTO emissions
Emissions based on full operation on natural gas. Does not account for reduction in usage due to usage of digester gas. (i.e. Can't burn both fuels at same time at full capacity).

Device #	101602

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Encina Wastewater Authority PTE
Digester Gas Dryer & RTO Emissions - Permit ID 001016

Usage

Device	Usage			
	ton/yr	ton/day	ton/hr	hr/day
Biosolids Processing	13,176.5	36.1	1.50	24

Daily and annual usage based on permit conditions in dry ton basis.

Emissions based on Biosolids Processing including Digester Gas Combustion

Pollutant	CAS	EF (lb/ton sludge produced)	Biosolids Processing Emissions			EF Basis
			lb/yr	lb/day	lb/hr	
Criteria Pollutants						
Carbon Monoxide (CO)	42101	0.41	5,431.20	14.88	0.62	2021 inventory. Source test Mar 2009 measured 0.62 lb/hr (48.3 ppm @3%O2). Test 10/20/09 measured 43.8 ppm @3%O2
Nitrogen Oxides (NOx)	42603	1.53	20,148.00	55.20	2.30	2021 inventory. Source test Mar 2009 measured 2.3 lb/hr (109 ppm @3%O2). Test 10/20/09 measured 65.1 ppm @3%O2
Sulfur Oxides (SOx)	42401	0.28	3,635.40	9.96	0.42	2021 inventory - matches 2005 & 2009 applications
Total Organic Gases (TOG)	43101	0.45	5,939.28	16.27	0.68	Same as VOC
Volatile Organic Compounds (VOC)	43104	0.45	5,939.28	16.27	0.68	2021 inventory. [Source test Mar 2009 measured 0.17 lb/hr (12.4 ppm @3%O2)]
Total Particulates (TSP)	11101	1.21	15,899.40	43.56	1.81	2021 inventory - matches 2005 & 2009 applications
Particulate Matter (PM10)	85101	1.21	15,899.40	43.56	1.81	2021 inventory - matches 2005 & 2009 applications

Toxic Air Contaminants

Pollutant	CAS	EF (lb/ton sludge produced)	lb/yr	lb/hr
Ammonia	7664417	1.46E-01	1.93E+03	2.20E-01
Arsenic (inorganic)	7440382	2.29E-05	3.02E-01	3.45E-05
Benzene	71432	4.91E-04	6.47E+00	7.39E-04
Cadmium	7440439	1.32E-05	1.73E-01	1.98E-05
Carbon Disulfide	75150	5.08E-07	6.69E-03	7.64E-07
Chlorobenzene	108907	3.54E-06	4.67E-02	5.33E-06
Chromium, Hexavalent	18540299	1.81E-07	2.39E-03	2.73E-07
Copper	7440508	1.06E-03	1.39E+01	1.59E-03
p-Dichlorobenzene {1,4-Dichlorobenzene	106467	3.19E-05	4.20E-01	4.80E-05
Ethyl Benzene	100414	1.78E-05	2.34E-01	2.67E-05
Ethylene Dichloride	107062	2.48E-05	3.27E-01	3.73E-05
Formaldehyde	50000	3.62E-03	4.77E+01	5.45E-03
Hexane	110543	1.79E-04	2.36E+00	2.69E-04
Hydrogen Chloride	7647010	1.14E-02	1.51E+02	1.72E-02
Hydrogen Sulfide	7783064	6.65E-02	8.76E+02	1.00E-01
Lead (inorganic)	7439921	3.41E-05	4.49E-01	5.13E-05
Mercury (inorganic)	7439976	1.99E-06	2.62E-02	2.99E-06
Methyl Tert Butyl Ether	1634044	9.77E-08	1.29E-03	1.47E-07
Methylene Chloride	75092	1.78E-06	2.34E-02	2.67E-06
Methyl Ethyl Ketone	78933	1.78E-06	2.34E-02	2.67E-06
Nickel (except nickel oxide)	7440020	4.13E-05	5.44E-01	6.21E-05
Perchloroethylene	127184	8.84E-06	1.17E-01	1.33E-05
Selenium	7782492	6.71E-08	8.85E-04	1.01E-07
Styrene	100425	8.31E-08	1.10E-03	1.25E-07
Toluene	108883	1.79E-04	2.36E+00	2.69E-04
Trichloroethylene	79016	5.32E-06	7.01E-02	8.00E-06
1,1,1-Trichloroethane	71556	1.78E-06	2.34E-02	2.67E-06
Xylenes (mixed)	1330207	7.98E-05	1.05E+00	1.20E-04
Zinc	7440666	1.81E-03	2.39E+01	2.73E-03

Notes:
Per SDAPCD, the EFs are based on a combination of source testing (March 2009), previous applications, and digester gas boiler EF, using the maximum EF. The source test report not available.
Engineering evalutation APCD2005-APP-983830 May 31, 2005

> Criteria pollutant emission factors provided by the applicant, developed from testing of similar equipment, and guaranteed by the manufacturer were used. Toxic metal speciation of digester sludge was obtained from averaging EWA's digester sludge samples. The speciation was applied to the PM-10 emission factor to calculate emissions. The estimates provided by the applicant were

Engineering evalutation APCD2009-APP-000770 April 23, 2010 - listed criteria pollutant and TAC emissions which match APP-983830, and are the basis for the EFs above
EFs from 2021 inventory
Emissions are based on full operation on digester gas. Does not account for reduction in usage due to usage of natural gas.
(i.e. Can't burn both fuels at same time at full capacity).
Emissions from the combination of digester gas combustion in the RTO (CD1) and the Venturi scrubber controlling the particulate from biosolids processing (CD2)
Permit APCD2011-PTO-001016

Device #	101601

APPENDIX C – HRA RESULTS

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Acute Hazard Index by Source for All Pollutants Combined at PMI, MEIR, MEIW and Sensitive Receptor
Encina Wastewater RRP Analysis

Sources	Description	Point of Maximum Impact (PMI)		Maximally Exposed Individual Resident (MEIR)		Sensitive Receptor		Maximally Exposed Individual Worker (MEIW)	
		receptor #	94	receptor #	222	receptor #	97	receptor #	94
		UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)
		470,374.45	3,664,195.28	470,575.73	3,664,311.69	470,400.23	3,664,133.94	470,374.45	3,664,195.28
		Acute Hazard Index	Contribution (%)	Acute Hazard Index	Contribution (%)	Acute Hazard Index	Contribution (%)	Acute Hazard Index	Contribution (%)
ALL	--	5.08E-01	100%	2.06E-01	100%	2.03E-01	100%	5.08E-01	100%
144602	ORF3	4.37E-01	86.11%	1.52E-01	73.59%	1.31E-01	64.72%	4.37E-01	86.11%
1004	Flare	6.05E-02	11.91%	2.54E-02	12.33%	4.95E-02	24.42%	6.05E-02	11.91%
542	Cogen	3.83E-02	7.54%	2.60E-02	12.63%	3.58E-02	17.63%	3.83E-02	7.54%
543	Cogen	3.43E-02	6.75%	2.33E-02	11.32%	3.25E-02	16.00%	3.43E-02	6.75%
544	Cogen	3.40E-02	6.70%	2.38E-02	11.56%	3.32E-02	16.38%	3.40E-02	6.70%
545	Cogen	2.94E-02	5.79%	2.07E-02	10.05%	2.97E-02	14.63%	2.94E-02	5.79%
1016_RTO	Dryer - RTO	2.37E-02	4.66%	2.07E-02	10.05%	2.35E-02	11.59%	2.37E-02	4.66%
982044	Emergency Diesel ICE	1.20E-02	2.36%	4.61E-03	2.24%	1.73E-02	8.53%	1.20E-02	2.36%
144601	ORF1	9.76E-03	1.92%	1.74E-02	8.46%	9.00E-03	4.44%	9.76E-03	1.92%

Notes:
Individual sources are not additive because risk is based on specific target organs, which may be different per source

Yorke ENGINEERING, LLC
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Maximum Acute Hazard Index by Pollutant at PMI, MEIR, MEIW and Sensitive Receptor
Encina Wastewater RRP Analysis

Pollutant CAS	Pollutant	Point of Maximum Impact (PMI)		Maximally Exposed Individual Resident (MEIR)		Sensitive Receptor		Maximally Exposed Individual Worker (MEIW)	
		receptor #	94	receptor #	222	receptor #	97	receptor #	94
		UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)
		470,374.45	3,664,195.28	470,575.73	3,664,311.69	470,400.23	3,664,133.94	470,374.45	3,664,195.28
		Acute Hazard Index	Contribution (%)	Acute Hazard Index	Contribution (%)	Acute Hazard Index	Contribution (%)	Acute Hazard Index	Contribution (%)
-	ALL	5.08E-01	100%	2.06E-01	100%	2.03E-01	100%	5.08E-01	100%
7783064	H2S	3.12E-01	61.46%	1.30E-01	63.20%	1.18E-01	57.97%	3.12E-01	61.46%
50000	Formaldehyde	2.00E-01	39.35%	1.20E-01	58.04%	1.90E-01	93.69%	2.00E-01	39.35%
67663	Chloroform	1.62E-01	31.83%	6.03E-02	29.27%	5.04E-02	24.83%	1.62E-01	31.83%
71432	Benzene	6.14E-02	12.08%	2.58E-02	12.52%	3.14E-02	15.46%	6.14E-02	12.08%
7440382	Arsenic	2.89E-02	5.70%	1.34E-02	6.50%	2.61E-02	12.87%	2.89E-02	5.70%
7440020	Nickel	9.90E-03	1.95%	5.22E-03	2.53%	1.30E-02	6.41%	9.90E-03	1.95%
123911	1,4-Dioxane	7.00E-03	1.38%	2.89E-03	1.40%	2.30E-03	1.13%	7.00E-03	1.38%
7647010	HCl	4.78E-03	0.94%	2.05E-03	1.00%	3.95E-03	1.95%	4.78E-03	0.94%
107028	Acrolein	2.87E-03	0.57%	1.98E-03	0.96%	2.77E-03	1.36%	2.87E-03	0.57%
7664417	NH3	2.55E-03	0.50%	1.35E-03	0.65%	1.27E-03	0.63%	2.55E-03	0.50%
75070	Acetaldehyde	1.90E-03	0.37%	1.13E-03	0.55%	2.12E-03	1.04%	1.90E-03	0.37%
75092	Methylene Chlor	1.53E-03	0.30%	6.30E-04	0.31%	5.02E-04	0.25%	1.53E-03	0.30%
75150	CS2	1.26E-03	0.25%	5.22E-04	0.25%	4.16E-04	0.20%	1.26E-03	0.25%
7439976	Mercury	1.25E-03	0.25%	5.03E-04	0.24%	1.78E-03	0.88%	1.25E-03	0.25%
108883	Toluene	5.51E-04	0.11%	2.29E-04	0.11%	2.08E-04	0.10%	5.51E-04	0.11%
127184	Perc	4.74E-04	0.09%	1.96E-04	0.10%	1.56E-04	0.08%	4.74E-04	0.09%
7440508	Copper	1.62E-04	0.03%	1.34E-04	0.07%	1.68E-04	0.08%	1.62E-04	0.03%
106990	1,3-Butadiene	1.51E-04	0.03%	6.82E-05	0.03%	2.03E-04	0.10%	1.51E-04	0.03%
71556	1,1,1-TCA	5.43E-05	0.01%	2.24E-05	0.01%	1.79E-05	0.01%	5.43E-05	0.01%
1330207	Xylenes	2.93E-05	0.01%	1.23E-05	0.01%	1.24E-05	0.01%	2.93E-05	0.01%
67561	Methanol	6.66E-06	0.00%	4.60E-06	0.00%	6.43E-06	0.00%	6.66E-06	0.00%
108952	Phenol	2.47E-07	0.00%	1.71E-07	0.00%	2.39E-07	0.00%	2.47E-07	0.00%
78933	MEK	1.19E-07	0.00%	5.10E-08	0.00%	9.77E-08	0.00%	1.19E-07	0.00%
100425	Styrene	5.51E-11	0.00%	4.82E-11	0.00%	5.47E-11	0.00%	5.51E-11	0.00%
100414	Ethyl Benzene	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
110543	Hexane	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
91203	Naphthalene	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
1151	PAHs-w/o	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
108907	Chlorobenzn	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
25321226	DiClBenzenes	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
107062	EDC	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
79016	TCE	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
67641	[D] Acetone	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
106467	p-DiClBenzene	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
7782505	Chlorine	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
1310732	Sodium Hydroxid	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
9901	DieselExhPM	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
7440439	Cadmium	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
18540299	Cr(VI)	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
7440473	Chromium	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
7439921	Lead	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
7439965	Manganese	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
115071	Propylene	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
7782492	Selenium	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
7440666	Zinc	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
1634044	Me t-ButylEther	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%

Notes:
Individual pollutants are not additive because risk is based on specific target organs, which may be different per pollutant.

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Cancer Risk by Source for All Pollutants Combined at PMI, MEIR, MEIW and Sensitive Receptor
Encina Wastewater RRP Analysis

Sources	Description	Point of Maximum Impact (PMI)		Maximally Exposed Individual Resident (MEIR)		Sensitive Receptor		Maximally Exposed Individual Worker (MEIW)	
		receptor #	5864	receptor #	1	receptor #	97	receptor #	98
		UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)
		470,311.09	3,664,074.59	470,435.81	3,664,103.52	470,400.23	3,664,133.94	470,408.89	3,664,118.66
		30-Year Cancer Risk	Contribution (%)	30-Year Cancer Risk	Contribution (%)	30-Year Cancer Risk	Contribution (%)	25-Year Cancer Risk	Contribution (%)
ALL	--	1.57E-05	100%	8.30E-06	100%	9.33E-06	100%	1.91E-06	100%
144602	ORF3	7.49E-06	47.61%	3.33E-06	40.14%	3.79E-06	40.61%	8.93E-07	46.86%
982044	Emergency Diesel ICE	4.47E-06	28.39%	1.61E-06	19.35%	1.42E-06	15.26%	3.90E-07	20.46%
1004	Flare	1.45E-06	9.24%	1.06E-06	12.81%	1.34E-06	14.41%	1.39E-07	7.28%
144601	ORF1	7.23E-07	4.59%	6.46E-07	7.78%	7.54E-07	8.08%	1.67E-07	8.78%
1016_RTO	Dryer - RTO	4.97E-07	3.16%	4.80E-07	5.79%	5.68E-07	6.09%	5.71E-08	3.00%
542	Cogen	2.94E-07	1.87%	3.11E-07	3.75%	3.84E-07	4.12%	6.87E-08	3.60%
544	Cogen	2.85E-07	1.81%	2.99E-07	3.61%	3.71E-07	3.98%	6.64E-08	3.48%
543	Cogen	2.74E-07	1.74%	2.90E-07	3.50%	3.58E-07	3.84%	6.42E-08	3.37%
545	Cogen	2.51E-07	1.59%	2.72E-07	3.28%	3.38E-07	3.62%	6.04E-08	3.17%

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Maximum Cancer Risk by Pollutant at PMI, MEIR, MEIW and Sensitive Receptor
Encina Wastewater RRP Analysis

Pollutant CAS	Pollutant	Point of Maximum Impact (PMI)		Maximally Exposed Individual Resident (MEIR)		Sensitive Receptor		Maximally Exposed Individual Worker (MEIW)	
		receptor #	5864	receptor #	1	receptor #	97	receptor #	98
		UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)
		470,311.09	3,664,074.59	470,435.81	3,664,103.52	470,400.23	3,664,133.94	470,408.89	3,664,118.66
		30-Year Cancer Risk	Contribution (%)	30-Year Cancer Risk	Contribution (%)	30-Year Cancer Risk	Contribution (%)	25-Year Cancer Risk	Contribution (%)
-	ALL	1.57E-05	100%	8.30E-06	100%	9.33E-06	100%	1.91E-06	100.00%
9901	DieselExhPM	4.47E-06	28.39%	1.61E-06	19.35%	1.42E-06	15.26%	3.90E-07	20.46%
123911	1,4-Dioxane	2.66E-06	16.88%	1.30E-06	15.72%	1.49E-06	15.98%	3.48E-07	18.24%
67663	Chloroform	2.08E-06	13.23%	9.65E-07	11.63%	1.10E-06	11.79%	2.58E-07	13.54%
7440382	Arsenic	1.68E-06	10.65%	1.37E-06	16.57%	1.70E-06	18.25%	1.20E-07	6.28%
50000	Formaldehyde	1.03E-06	6.52%	1.02E-06	12.29%	1.27E-06	13.56%	2.71E-07	14.24%
127184	Perc	9.34E-07	5.93%	4.58E-07	5.52%	5.24E-07	5.62%	1.22E-07	6.41%
106467	p-DiClBenzene	9.25E-07	5.88%	4.54E-07	5.47%	5.19E-07	5.57%	1.21E-07	6.35%
79016	TCE	7.30E-07	4.64%	3.58E-07	4.32%	4.09E-07	4.39%	9.54E-08	5.01%
71432	Benzene	6.92E-07	4.40%	3.86E-07	4.65%	4.55E-07	4.88%	1.03E-07	5.40%
75092	Methylene Chlor	3.51E-07	2.23%	1.72E-07	2.07%	1.97E-07	2.11%	4.59E-08	2.41%
1151	PAHs-w/o	9.21E-08	0.59%	9.78E-08	1.18%	1.21E-07	1.30%	6.39E-09	0.34%
7440439	Cadmium	4.29E-08	0.27%	4.15E-08	0.50%	4.90E-08	0.53%	1.07E-08	0.56%
18540299	Cr(VI)	2.10E-08	0.13%	2.03E-08	0.24%	2.40E-08	0.26%	5.04E-09	0.26%
106990	1,3-Butadiene	1.32E-08	0.08%	1.41E-08	0.17%	1.74E-08	0.19%	3.74E-09	0.20%
107062	EDC	1.07E-08	0.07%	6.79E-09	0.08%	8.22E-09	0.09%	1.81E-09	0.09%
7440020	Nickel	8.17E-09	0.05%	7.89E-09	0.10%	9.33E-09	0.10%	2.03E-09	0.11%
75070	Acetaldehyde	6.25E-09	0.04%	6.64E-09	0.08%	8.22E-09	0.09%	1.77E-09	0.09%
7439921	Lead	3.09E-09	0.02%	2.99E-09	0.04%	3.53E-09	0.04%	2.11E-10	0.01%
91203	Naphthalene	7.87E-10	0.00%	8.19E-10	0.01%	1.00E-09	0.01%	2.16E-10	0.01%
100414	Ethyl Benzene	4.81E-10	0.00%	3.70E-10	0.00%	4.64E-10	0.00%	9.87E-11	0.01%
1634044	Me t-ButylEther	3.82E-14	0.00%	3.70E-14	0.00%	4.37E-14	0.00%	9.50E-15	0.00%
7783064	H2S	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
107028	Acrolein	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
7664417	NH3	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
7647010	HCl	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
7440508	Copper	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
7439976	Mercury	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
75150	CS2	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
108883	Toluene	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
67561	Methanol	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
71556	1,1,1-TCA	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
1330207	Xylenes	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
108952	Phenol	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
78933	MEK	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
100425	Styrene	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
110543	Hexane	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
108907	Chlorobenzn	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
25321226	DiClBenzenes	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
67641	[D] Acetone	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
7782505	Chlorine	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
1310732	Sodium Hydroxid	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
7440473	Chromium	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
7439965	Manganese	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
115071	Propylene	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
7782492	Selenium	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
7440666	Zinc	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%

Galvez, Maria

From: Alicia Appel <aappel@encinajpa.com>
Sent: Tuesday, October 8, 2024 8:23 AM
To: Galvez, Maria; Horres, Nicholas
Cc: jmitchell@YorkeEngr.com; Nick Gysel (NGysel@YorkeEngr.com); John Furlong (JFurlong@YorkeEngr.com); Bipul Saraf (BSaraf@YorkeEngr.com)
Subject: [External] Encina- 2021 HRA Risk Reduction Plan

Nick and Maria,
Thank you for the phone call last week to discuss Encina's Risk Reduction Plan required by our Health Risk Assessment for 2021 Emissions Year. As requested, I'm providing additional information regarding the Source Testing element of our plan.

The modeled reduction in emission factors was based on an internal engineering source test in June 2024, which measured significant reduction and non-detects in Air Toxics and Sulfurous Compounds compared to SDAPCD Emission Factors. Notably, Ethylene Dichloride (EDC) was measured non-detect for both inlet and outlet emissions. EDC emissions used in the RRP modeling were based off the CATEF emission factor.

We have engaged a consultant and developed a draft source testing protocol and plan to implement it on the following schedule:

1) Submit protocol to APCD by November 27, 2024
2) After approval of protocol by APCD, complete source test within 60 days.
3) After source test, submit report to district within 60 days.

Please let me know if you have further questions or concerns about our submitted plan.
Sincerely,

Alicia Appel

ENCINA WASTEWATER AUTHORITY

Director of Environmental Compliance
Encina Wastewater Authority
Direct Line – (442) 320-7018