777 12th Street, Ste. 300 SACRAMENTO METROPOLITAN Sacramento, CA 95814
AIR QUALITY
MANAGEMENT DISTRICT

AUTHORITY TO CONSTRUCT EVALUATION

APPLICATION NO.: 27780, 27781, 27782, 27783, 27784, 27785

REVIEW STARTINGDATE: February 5, 2024

ISSUING ENGINEER: Jeff Weiss

I. PROJECT DESCRIPTION:

FACILITY NAME: Sacramento Area Sewer District

LOCATION: 8521 Laguna Station Road, Elk Grove, CA 95758

PROPOSAL: Authorities to Construct and Permits to Operate a 2.8 MW Fuel Cell, four 3,681 HP spark-ignited prime power engines driving electric generators, and a 19.95 MMBtu/hr boiler.

INTRODUCTION: Sacramento Area Sewer District is a public utility that operates the sewer network, pump stations, and waste water treatment plant for Sacramento County. Sacramento Area Sewer District (SacSewer) is seeking Authorities to Construct and Permits to Operate for a 2.8 MW Carbonate Fuel Cell, four 3,681 HP prime power engines, and a 19.95 MMBtu/hr boiler at their wastewater treatment plant located at 8521 Laguna Station Road, Elk Grove. The primary objective of the cogeneration project is to utilize biogas that is produced by SacSewer's anaerobic digesters to generate electrical power and heat.

The treatment process starts with sewage that enters the wastewater treatment plant from various parts of the County. This sewage is treated using a variety of mechanical and biological processes at the plant. Near the end of the treatment chain, the remaining wastewater sludge is sent to the anaerobic digesters (P/O 24424) for further decomposition. The process of anaerobic digestion produces a voluminous amount of digester gas (3,000 scfm) at the plant. Because the gas is comprised primarily of methane (CH_4) and smaller amounts of hydrogen sulfide (H_2S), it must be destroyed rather than released into the environment.

Historically, SacSewer has sent the gas to SMUD which burns it in their gas turbines to generate electricity at one of their power plants. However, the wastewater treatment plant's 30 year contract with SMUD will end in 2025. As a result, SacSewer has decided to destroy the gas at the plant and produce electricity and hot water/steam as biproducts. For this purpose, the facility is proposing to construct a 2.8 MW carbonate fuel cell and four 3,681 HP spark-ignited prime power IC engine driving 2.7 MW electric generators to destroy the gas and produce electricity and hot water. The electricity will be used on-site with the remainder being provided to the electrical power grid. Some of the heat generated from the fuel cell and the engines will be diverted to the anaerobic digesters. This heat is necessary for the anaerobic digesters to optimally process the wastewater sludge. A 19.95 MMBtu/hr boiler will serve as back-up equipment to provide the necessary heat in case any of the primary equipment is taken off-line.

The digester gas will be routed first to the fuel cell with the remaining gas being sent to the engines. The engines will consume the remainder of the gas. However, if an engine or the fuel cell is taken offline for maintenance, repair, or failure, any remaining gas will be consumed by a

19.95 MMBtu/hr hot water boiler. The boiler will not generate electricity, but it can generate the heat necessary for the anaerobic digesters. If the boiler is unable to handle the volume of gas, the remaining gas will be sent to the ground flares (P/O 25901) and/or the above ground flares (P/O 12526) for destruction.

The digester gas will be treated by a gas conditioning system before being sent to the equipment. The system will remove hydrogen sulfide, siloxane, moisture, and particulate from the gas stream. This conditioning is necessary to prevent fouling of the equipment. If the digester gas conditioning system is taken offline for any reason, the fuel cell, boiler, and engines will not be able to operate on digester gas. Consequently, the boiler will then be needed to operate exclusively on natural gas to provide heat to the digesters until the digester gas conditioning system is brought back online.

The fuel cell and the IC engines will be supplemented with pipeline quality natural gas as needed to maintain proper operation. The boiler will operate on either digester gas or natural gas but never both together. The boiler will only use natural gas as a back-up fuel if heat can not be provided to the digesters using digester gas. Upon completion of the project, SacSewer will remove the three existing 38 MMBtu/hr boilers from the facility (P/Os 19868, 19869, and 19870).

EQUIPMENT DESCRIPTION:

A/C 27780	Fuel Cell	
	Make:	Fuel Cell Energy
	Model:	SureSource 3000
	Serial No.:	To be determined
	Rating:	2.8 MW
	Type:	Carbonate

A/C 27781	Boiler	
	Make:	Superior
	Model:	Lakota HTHWG
	Serial No.:	To be determined
	Rating:	19.95 MMBtu/hr
	Fuel:	Digester Gas
	Standby Fuel:	Natural Gas
	Type:	Non-Atmospheric

A/C 27782	IC Engine (Prime Power)	
	Make:	Jenbacher
	Model:	JMS 616 J325_J09
	Serial No.:	To be determined
	Rating:	3,681 HP at 1800 rpm
	Fuel Type:	Digester Gas
	Displacemnt.:	6090 cubic inches
	Model Year:	2024
	Controls:	SCR and Oxidation Catalyst
	Gen-Set Rtg:	2.7 MW

A/C 27783	IC Engine (Prime Power)	
	Make:	Jenbacher
	Model:	JMS 616 J325_J09
	Serial No.:	To be determined
	Rating:	3,681 HP at 1800 rpm
	Fuel Type:	Digester Gas
	Displacemnt:	6090 cubic inches
	Model Year:	2024
	Controls:	SCR and Oxidation Cat
	Gen-Set Rtg:	2.7 MW

A/C 27784	IC Engine (Prime Power)	
	Make:	Jenbacher
	Model:	JMS 616 J325_J09
	Serial No.:	To be determined
	Rating:	3,681 HP at 1800 rpm
	Fuel Type:	Digester Gas
	Displacemnt.:	6090 cubic inches
	Model Year:	2024
	Controls:	SCR and Oxidation Catalyst
	Gen-Set Rtg:	2.7 MW

A/C 27785	IC Engine (Prime Power)	
	Make:	Jenbacher
	Model:	JMS 616 J325_J09
	Serial No.:	To be determined
	Rating:	3,681 HP at 1800 rpm
	Fuel Type:	Digester Gas
	Displacemnt:	6090 cubic inches
	Model Year:	2024
	Controls:	SCR and Oxidation Cat
	Gen-Set Rtg:	2.7 MW

PROCESS FLOW DIAGRAM: Refer to Appendix A

FUEL USAGE:

A/C 27780 (Fuel Cell)

Equipment	Natural Gas Fuel Usage (A)			
	MMcf/hour	MMcf/day	MMcf/quarter	MMcf/year
Fuel Cell (2.8 MW)	0.0327	0.7844	72.168	286.320

(A) Based on the maximum natural gas flow rate from manufacturer's data, a digester gas HHV of 662 Btu/scf, 24 hours/day, 92 days/quarter, and 365 days/year.

A/C 27781 (Boiler)

Equipment	Gas Fuel Usage (A)			
	MMcf/hour	MMcf/day	MMcf/qtr	MMcf/year
Boiler (19.95 MMBtu/hr) – Digester Gas (A)	0.0301	0.7233	66.540	263.991
Boiler (19.95 MMBtu/hr) – Natural Gas (B)	0.0200	0.4788	44.050	174.762

(A) Based on firing at maximum capacity, 24 hours/day, 92 days/quarter, 365 days/year, and a digester gas HHV of 662 Btu/scf.
(B) Based on firing at maximum capacity, 24 hours/day, 92 days/quarter, 365 days/year, and a natural gas HHV of 1,000 Btu/scf.

A/C 27782, 27783, 27784, 27785 (Each Engine)

Equipment	Digester Gas Fuel Usage (A)			
	MMcf/hour	MMcf/day	MMcf/quarter	MMcf/year
IC Engine (3,691 HP)	0.03524	0.84564	77.7989	308.6586

(A) Based on firing at maximum capacity from manufacturer's data, 24 hours/day, 92 days/quarter, and 365 days/year.

OPERATING SCHEDULE: Digester gas will be continuously produced in the anaerobic digesters (P/O 24424). Therefore, the fuel cell, boiler, and four engines will be allowed to operate 24 hours/day, 92 days/quarter, and 365 days/year to destroy the continuous flow of gas.

CONTROL EQUIPMENT EVALUATION:

Fuel Cell: The fuel cell will be controlled to emit no more than 0.02 lb/MW-hr of VOC and 0.07 lb/MW-hr of NOx.

Boiler: The boiler will be controlled with a burner that will emit no more than 9 ppm NOx at 3% oxygen when fired with digester gas or with natural gas back-up fuel.

IC Engines: Each engine will be equipped with Johnson Matthey controls that employ both an oxidation catalyst and Selective Catalytic Reduction (SCR). Urea usage is expected to not exceed 3.0 gallons/hour with an ammonia slip of 10 ppmv at 15% oxygen. The SCR system will monitor NOx emissions and adjust urea injection to minimize NOx and ammonia emissions. Johnson Matthey has guaranteed emissions to not exceed the following:

Pollutant	Inlet (g/hp-hr)	Outlet (ppmvd at 15% oxygen)	Reduction (percent)
VOC	0.40	30	44
NOx	1.1	11	89
CO	2.5	69.9	81

Biogas Conditioning System: The project will utilize a digester gas conditioning systems to clean the digester gas before being used in the fuel cell, boiler, and engines. The fuel cell will be equipped with a second digester gas conditioning system to further clean the gas. The first conditioning system will remove hydrogen sulfide (H_2S), siloxane, moisture, and particulate. Hydrogen sulfide will be removed using three granular iron oxide vessels in series. Only one vessel is expected to be necessary to achieve the 40 ppm H_2S target, but two more vessels will be used to prevent breakthrough. Each vessel is expected to last six months. Siloxane will be removed using activated carbon vessels. Moisture will be removed using heat exchangers and glycol chillers. Particulate will be removed using filtration media. This second system for the fuel cell is necessary because of its sensitivity to contamination. Natural gas will not require pretreatment.

II. EMISSIONS CALCULATIONS:

1. **HISTORIC POTENTIAL EMISSIONS:** The fuel cell, boiler, and four engines are being evaluated as new emission units. The historic potential emissions are zero for any pollutant per Rule 202, Section 225.

2. **PROPOSED POTENTIAL TO EMIT:** The fuel cell, prime power engines, and the boiler will have a maximum potential to operate of 24 hours per day; 90 days (2,160 hours) for the first calendar quarter, 91 days (2,184 hours) for the second calendar quarter, and 92 days (2,208 hours) for the third and fourth calendar quarter; and 365 days (8,760 hours) per year. Therefore, the potential to emit will be calculated assuming the equipment operates (i) 24 hours per day; (ii) 2,160 hours for the first quarter, 2,184 hours for the second quarter, 2,208 hours for the third and fourth quarter, and (iii) 8,760 hours per year.

   A. Fuel Cell

   Emissions for the fuel cell are calculated using the following equation:

   PTE = EF x Cell Rating x Hours

   Where:

   PTE = Potential to Emit (lb/day, lb/quarter, lb/year)
   EF = Emission Factor (lb/MW-hr)
   Cell Rating = Maximum rating for the fuel cell (MW)
   Hours = Max. hours of operation (hours/day, hours/quarter, hours/year)

A/C 27780 – Fuel Cell

Pollutant	Emission Factors (lb/MW-hr) (A)	Potential to Emit (B)					
		(lb/day)	1st Qtr (lb/qtr)	2nd Qtr (lb/qtr)	3rd Qtr (lb/qtr)	4th Qtr (lb/qtr)	(lb/year)
VOC	0.02	1.3	121	122	124	124	491
NOx	0.07	4.7	423	428	433	433	1,717
SOx	0.00011	0.0	1	1	1	1	3
PM10	0.000020	0.0	0	0	0	0	0
PM2.5	0.000020	0.0	0	0	0	0	0
CO	0.10	6.7	605	612	618	618	2,453
GHG	680	22.8 tons/day	2056 tons/qtr	2079 tons/qtr	2,102 tons/qtr	2,102 tons/qtr	8,340 tons/yr
Lead	N/A	N/A	N/A	N/A	N/A	N/A	N/A

(A) Emission factors for VOC, NOx, and CO are from CARB Executive Order DG-057 and are BACT. Emission factors for SOx, PM10, and GHG are from manufacturer's data. The PM10 and PM2.5 emission factors are the same factor since all PM is expected to be smaller than 2.5 microns in diameter.

(B) Emissions are based on the fuel cell operating at a maximum capacity of 2.8 MW; 24 hours/day; 90 days, 91 days, 92 days, and 92 days for each sequential quarter; 365 days/year; and the emission factors in this table. GHG emissions are expressed as tons in English units.

B. Boiler

Emissions for the boiler are calculated using the following equation:

$$PTE = \frac{EF \times \text{Boiler Rating} \times \text{Hours}}{U_{CF}}$$

Where:

PTE = Potential to Emit (lb/day, lb/quarter, lb/year)
EF = Emission Factor (lb/MMcf)
Boiler Rating = Maximum rating for the boiler (MMBtu/hr)
Hours = Max. hours of operation (hours/day, hours/quarter, hours/year)
U_{CF} = Unit conversion factor (662 MMBtu/MMcf) for Digester Gas and 1000 MMBtu/MMcf for Natural Gas

A/C 27781 – Boiler Fired with Digester Gas

Pollutant	Emission Factors (lb/MMcf) (A)	Potential to Emit (B)					
		(lb/day)	1st Qtr (lb/qtr)	2nd Qtr (lb/qtr)	3rd Qtr (lb/qtr)	4th Qtr (lb/qtr)	(lb/year)
VOC	3.6	2.6	232	235	238	238	942
NOx	7.2	5.2	471	476	481	481	1,910
SOx	9.1	6.6	590	597	603	603	2,393
PM10	4.9	3.6	321	325	328	328	1,302
PM2.5	4.9	3.6	321	325	328	328	1,302

Pollutant	Emission Factors (lb/MMcf) (A)	Potential to Emit (B)					
		(lb/day)	1st Qtr (lb/qtr)	2nd Qtr (lb/qtr)	3rd Qtr (lb/qtr)	4th Qtr (lb/qtr)	(lb/year)
CO	195.6	141.5	12,734	12,875	13,017	13,017	51,642
GHG	76,400	27.6 tons/day	2,487 tons/qtr	2,514 tons/qtr	2,542 tons/qtr	2,542 tons/qtr	10,084 tons/yr
Lead	0.0005	0.0	0	0	0	0	0

(A) Emission factors for VOC, PM, and lead are from AP-42, Table 1.4-2 (7/98) and have been adjusted to a HHV of 662 Btu/scf. Emission factor for NOx is based on 9 ppm at 3% oxygen and a HHV of 662 Btu/scf. Emission factor for SOx is from AP-42, Table 1.4-2 (7/98) and has been adjusted to a sulfur content of 40 ppm S in the fuel and a HHV of 662 Btu/scf. Emission factors for PM10 and PM2.5 are the PM factor since all particulate is expected to be less than 1.0 micrometer in diameter. Emission factor for CO is BACT and is based on 400 ppm at 3% oxygen and a HHV of 662 Btu/scf. GHG emission factor is expressed as CO_2e and is from EPA's Mandatory Reporting of Greenhouse Gases Rule (78 FR 71948, Nov. 29, 2013), Tables C-1 and C-2. The GHG factor is for landfill gas and has been adjusted to a HHV of 662 Btu/scf.

(B) Emissions are based on 19.95 MMBtu/hr; 24 hours/day; 90 days, 91 days, 92 days, and 92 days for each sequential quarter; and 365 days/year. GHG emissions are given as tons in English units.

A/C 27781 – Boiler Fired with Natural Gas

Pollutant	Emission Factors (lb/MMcf) (A)	Potential to Emit (B)					
		(lb/day)	1st Qtr (lb/qtr)	2nd Qtr (lb/qtr)	3rd Qtr (lb/qtr)	4th Qtr (lb/qtr)	(lb/year)
VOC	5.4	2.6	232	235	238	238	942
NOx	10.9	5.2	471	476	481	481	1,910
SOx	0.6	0.3	25	26	26	26	103
PM10	7.5	3.6	321	325	328	328	1,302
PM2.5	7.5	3.6	321	325	328	328	1,302
CO	295.5	141.5	12,734	12,875	13,017	13,017	51,642
GHG	117,098	28.0 tons/day	2,523 tons/qtr	2,551 tons/qtr	2,579 tons/qtr	2,579 tons/qtr	10,232 tons/yr
Lead	0.0005	0.0	0	0	0	0	0

(A) Emission factors for VOC, SOx, PM, and lead are from AP-42, Table 1.4-2 (07/98) and have been adjusted to a natural gas HHV of 1,000 Btu/scf. Emission factors for PM10 and PM2.5 are the PM factor since all particulate is expected to be less than 1.0 micrometer in diameter. Emission factor for NOx is based on 9 ppmvd at 3% oxygen and is BACT. Emission factor for CO is based on 400 ppmvd at 3% oxygen. GHG emission factor is expressed as CO_2e and is from EPA's Mandatory Reporting of Greenhouse Gases Rule (78 FR 71948, Nov. 29, 2013), Tables C-1 and C-2.

(B) Emissions are based on 19.95 MMBtu/hr; 24 hours/day; 90 days, 91 days, 92 days, and 92 days for each sequential quarter; and 365 days/year. GHG emissions are given as tons in English units.

A/C 27781 – Boiler Worst Case Scenario of Firing on Digester Gas or Natural Gas

Pollutant	Maximum Potential to Emit (lb/quarter) (B)		
	Digester Gas (A)	Natural Gas (B)	Worst Case (C)
VOC	238	238	238
NOx	481	481	481

Pollutant	Maximum Potential to Emit (lb/quarter) (B)		
	Digester Gas (A)	Natural Gas (B)	Worst Case (C)
SOx	603	26	603
PM10	328	328	328
PM2.5	328	328	328
CO	13,017	13,017	13,017
Lead	0.0	0.0	0.0
GHG	2,542 ton/day	2,579 ton/qtr	2,579 ton/year

(A) Emissions are based on 92 days/quarter of digester gas usage.
(B) Emissions are based on 92 days/quarter of natural gas usage.
(C) Emissions are the worst case scenario of operating on digester gas or natural gas.

C. IC Engines

Emission factors that are given in parts per million are calculated as grams per horsepower-hour using the following equation:

$$EF = \frac{PPM \times F \times EAC \times BSFC \times MW \times U1_{CF}}{MV}$$

Where:
- PPM = Parts per Million Dry Volume in the Exhaust at 15% O_2 (ppm)
- F = F-Factor exhaust volume (8710 dscf/MMBtu)
- EAC = Excess Air Correction to 0% O_2 ((20.9 – 0%)/(20.9 – 15%))
- BSFC = Brake-Specific Fuel Consumption (5542 Btu/BHP-hr)
- MW = Molecular Weight of Pollutant
- MV = Molar Volume (385.3 scf/lb-mol)
- $U1_{CF}$ = Unit conversion factor (453.59 grams/lb)

$$EF = \frac{PPM \times MR \times MW \times BSFC \times U1_{CF}}{MV \times HHV}$$

Where:
- PPM = Parts per Million in the Fuel (ppm)
- MR = Mole Ratio of H_2S to SO_2
- MW = Molecular Weight of Pollutant (64.066 lb/mol)
- BSFC = Brake-Specific Fuel Consumption (5542 Btu/BHP-hr)
- $U1_{CF}$ = Unit conversion factor (453.59 grams/lb)
- MV = Molar Volume (385.3 scf/lb-mol)
- HHV = Higher Heating Value (662 Btu/scf)

Emissions for the IC engines are calculated using the following equation:

$$PTE = \frac{EF \times HP \times Hours}{U_{CF}}$$

Where:
- PTE = Potential to Emit (lb/day, lb/quarter, lb/year)
- EF = Emission Factor (g/hp-hr)
- HP = Horsepower of engine
- Hours = Maximum hours of operation (hours/day, hours/quarter, hours/year)
- U_{CF} = Unit conversion factor (453.59 g/lb)

A/C 27782, 27783, 27784, 27785 (Each Engine)

Pollutant	Emission Factors (g/hp-hr) (A)	Potential to Emit (B)					
		(lb/day)	1st Qtr (lb/qtr)	2nd Qtr (lb/qtr)	3rd Qtr (lb/qtr)	4th Qtr (lb/qtr)	(lb/year)
VOC	0.10	19.5	1,753	1,772	1,792	1,792	7,109
NOx	0.10	19.5	1,753	1,772	1,792	1,792	7,109
SOx	0.025	4.9	438	443	448	448	1,777
PM10	0.07	13.6	1,227	1,241	1,254	1,254	4,976
PM2.5	0.07	13.6	1,227	1,241	1,254	1,254	4,976
CO	0.65	126.6	11,394	11,520	11,647	11,647	46,208
Ammonia	0.034	6.6	596	603	609	609	2,417
GHG	290.04	28.2 tons/day	2,542 tons/qtr	2,570 tons/qtr	2,599 tons/qtr	2,599 tons/qtr	10,309 tons/yr
Lead	N/A	N/A	N/A	N/A	N/A	N/A	N/A

(A) Emission factors for VOC and NOx are based on 30 ppm at 15% O_2 and 11 ppm at 15% O_2 respectively and are BACT. Emission factor for SOx is based on 40 ppm H_2S in the fuel and is BACT. Emission factors for PM10 and PM2.5 are BACT. Emission factor for CO was requested by the applicant. Emission factor for ammonia is based on 10 ppm at 15% O_2 from manufacturer's data. Emission factor for GHG is expressed as CO_2e for landfill gas and is from EPA's Mandatory Reporting of Greenhouse Gases Rule (78 FR 71948, 11/13), Tables C-1 and C-2 using a specific fuel consumption of 5,542 Btu/hp-hr.

(B) Emissions are based on 3,681 hp; 24 hours/day; 90 days, 91 days, 92 days, and 92 days for each sequential quarter; 365 days/year; and the emission factors in this table. GHG emissions are expressed as tons in English units

III. COMPLIANCE WITH RULES AND REGULATIONS:

1. **HEALTH AND SAFETY CODE § 42301.6 (AB 3205) COMPLIANCE:** The fuel cell, boiler, and engines are not located within 1,000 feet from the outer boundary of a school site. Therefore, the school public noticing requirements of Health and Safety Code § 42301.6 do not apply.

2. **NSR COMPLIANCE:**

Rule 202 - New Source Review

Section 301 - Best Available Control Technology:

BACT is triggered for any pollutant for which the emission increase ($BACT_{EI}$) calculated pursuant to Rule 202, Section 411.1 exceeds the levels specified below. For purposes of this calculation, $BACT_{EI}$ is calculated using emissions that have been rounded to the nearest tenth with the result being rounded to the nearest integer using standard rounding convention (i.e. round up if greater than or equal to 0.5):

BACT is triggered if:

$BACT_{EI} > BACT_{TL}$

Where:

$BACT_{EI}$= Emissions Increase = (DPE − DHPE)
DPE = Daily Potential Emissions (from Section II.2)
DHPE = Daily Historic Potential Emissions (from Section II.1)

$BACT_{TL}$ =

Pollutant	$BACT_{TL}$
VOC	0 lb/day
NOx	0 lb/day
SOx	0 lb/day
CO	550 lb/day
PM10	0 lb/day
PM2.5	0 lb/day
Lead	3.3 lb/day

Determination of BACT Applicability:

A/C 27780 (Fuel Cell)

Pollutant	DPE (lb/day)	DHPE (lb/day)	$BACT_{EI}$ (lb/day)	$BACT_{TL}$ (lb/day)	Is BACT Required?
VOC	1.3	0	1	>0	Yes
NOx	4.7	0	5	>0	Yes
SOx	0.0	0	0	>0	No
PM10	0.0	0	0	>0	No
PM2.5	0.0	0	0	>0	No
CO	6.7	0	7	>550	No
Lead	N/A	0	N/A	>3.3	No

A/C 27781 (Boiler Fired with Digester Gas)

Pollutant	DPE (lb/day)	DHPE (lb/day)	$BACT_{EI}$ (lb/day)	$BACT_{TL}$ (lb/day)	Is BACT Required?
VOC	2.6	0	3	>0	Yes
NOx	5.2	0	5	>0	Yes
SOx	6.6	0	7	>0	Yes
PM10	3.6	0	4	>0	Yes
PM2.5	3.6	0	4	>0	Yes
CO	141.5	0	142	>550	No
Lead	0	0	0	>3.3	No

A/C 27781 (Boiler Fired with Natural Gas)

Pollutant	DPE (lb/day)	DHPE (lb/day)	$BACT_{EI}$ (lb/day)	$BACT_{TL}$ (lb/day)	Is BACT Required?
VOC	2.6	0	3	>0	Yes
NOx	5.2	0	5	>0	Yes
SOx	0.3	0	0	>0	No
PM10	3.6	0	4	>0	Yes
PM2.5	3.6	0	4	>0	Yes
CO	141.5	0	142	>550	No
Lead	0	0	0	>3.3	No

A/C 27782, 27783, 27784, and 27785 (Each IC Engine)

Pollutant	DPE (lb/day)	DHPE (lb/day)	$BACT_{EI}$ (lb/day)	$BACT_{TL}$ (lb/day)	Is BACT Required?
VOC	19.5	0	20	>0	Yes
NOx	19.5	0	20	>0	Yes
SOx	4.9	0	5	>0	Yes
PM10	13.6	0	14	>0	Yes
PM2.5	13.6	0	14	>0	Yes
CO	126.6	0	127	>550	No
Lead	0	0	0	>3.3	No

A/C 27780 (Fuel Cell)

The proposed VOC and NOx emissions exceed the BACT trigger levels specified in this section and are subject to BACT.

SMAQMD's BACT Determination for fuel cells operating on waste gas or natural gas (BACT No. 358) was last reviewed on **2/15/2024**. Since less than two years have passed since its last review and the SMAQMD is not aware of any significant changes to BACT requirements for fuel cells, this BACT determination will be considered current and valid for this permit application.

Determination of Compliance with BACT Requirements:

BACT Compliance for Fuel Cells Operating on Waste Gas or Natural Gas		
Pollutant	District BACT Standard BACT No. 358	Compliance Determination (A)
VOC	0.02 lb/MW-hr	0.02 lb/MW-hr
NOx	0.07 lb/MW-hr	0.07 lb/MW-hr
SOx	No Standard	Not Applicable – BACT not triggered

BACT Compliance for Fuel Cells Operating on Waste Gas or Natural Gas		
Pollutant	District BACT Standard BACT No. 358	Compliance Determination (A)
PM10	No Standard	Not Applicable – BACT not triggered
PM2.5	No Standard	Not Applicable – BACT not triggered
CO	0.10 lb/MW-hr	BACT not triggered – 0.10 lb/MW-hr
Lead	No standard	Not Applicable – BACT not triggered

(A) Based on CARB Executive Order DG-057 for the SureSource 3000 fuel cell when operating on digester gas and CARB Executive Order DG-33 for the SureSource 3000 fuel cell when operating on natural gas.

The proposed emissions for VOC and NOx comply with BACT. The emissions for CO comply with BACT but do not trigger BACT. The other criteria pollutants do not trigger BACT.

A/C 27781 (Boiler)

The proposed VOC, NOx, SOx, PM10, and PM2.5 emissions for the boiler when fired on digester gas exceed the BACT trigger levels specified in this section and are subject to BACT.

SMAQMD's BACT Determination for digester gas-fired boilers rated ≥ 5 MMBtu/hr to ≤ 20 MMBtu/hr (BACT No. 359) was last reviewed on **7/23/2024**. Since less than two years have passed since its last review and the SMAQMD is not aware of any significant changes to BACT requirements for digester boilers in this size category, this BACT determination will be considered current and valid for this permit application.

Determination of Compliance with BACT Requirements:

BACT Compliance for Digester gas-fired Boilers ≥ 5 MMBtu/hr to ≤ 20 MMBtu/hr		
Pollutant	District BACT Standard BACT No. 359	Compliance Determination (A)
VOC	No standard	Not Applicable – No Standard
NOx	9 ppm at 3% O_2 or 0.11 lb/MMBtu	9 ppm at 3% O_2
SOx	No standard	Not Applicable – No Standard
PM10	0.1 grain/scf at 12% CO_2	4.9 lb/MMcf (equates to 0.0051 gr/dscf at 12% CO_2)
PM2.5	0.1 grain/scf at 12% CO_2	4.9 lb/MMcf (equates to 0.0051 gr/dscf at 12% CO_2)
CO	100 ppm at 3% O_2	Not Applicable – BACT not triggered
Lead	No standard	Not Applicable – BACT not triggered

(A) NOx emissions are based on the manufacturer's guarantee. PM10 and PM2.5 emission factors are from AP-42 and are far below the BACT standard.

The proposed emissions for VOC, NOx, SOx, PM10, and PM2.5 meet BACT requirements when fired with digester gas. The boiler will also be allowed to be fired with pipeline quality natural gas when the digester gas conditioning system is not operating.

For natural gas use, the boiler triggers BACT for VOC, NOx, PM10, and PM2.5. The boiler will be required to comply with BACT 359 when fired with natural gas for back-up purposes. Since the boilers emissions are the same for VOC, NOx, PM10, and PM2.5 when fired on both natural gas and digester gas, the boiler will comply with BACT. Conditions will be placed on the permit to stipulate the conditions under which the boiler may be fired with natural gas.

A/C 27782, 27783, 27784, 27785 (Each Engine)

The proposed VOC, NOx, SOx, PM10, and PM2.5 emissions exceed the BACT trigger levels specified in this section and are subject to BACT.

SMAQMD's BACT Determination for spark-ignited, prime power IC engines rated at 3681 bhp (BACT No. 363) was last reviewed on **7/16/2024**. Since less than two years have passed since its last review and the SMAQMD is not aware of any significant changes to BACT requirements for engines in this size category, this BACT determination will be considered current and valid for this permit application.

Determination of Compliance with BACT Requirements:

BACT Compliance for Spark Ignited Prime Power IC Engines Rated 3681 HP		
Pollutant	District BACT Standard BACT No. 363	Compliance Determination (A)
VOC	30 ppmvd at 15% O_2 (0.10 g/hp-hr)	30 ppmvd at 15% O_2 (0.10 g/hp-hr)
NOx	11 ppmvd at 15% O_2 (0.10 g/hp-hr)	11 ppmvd at 15% O_2 (0.10 g/hp-hr)
SOx	40 ppmvd in the fuel daily average or 40 ppmvd monthly average and 500 ppmvd 15-minute average	40 ppmvd daily average (0.025 g/hp-hr)
PM10	0.07 g/hp-hr	0.07 g/hp-hr
PM2.5	0.07 g/hp-hr	0.07 g/hp-hr
CO	250 ppmvd at 15% O_2 (1.41 g/hp-hr)	Not Applicable – BACT not triggered
Lead	No standard	Not Applicable – BACT not triggered

(A) Emission factors for VOC, NOx, PM10, and PM2.5 are based on the manufacturer's guarantee. Emission factor for SOx is based on 40 ppm H_2S in the biogas which will be controlled by the digester gas conditioning system and enforced by permit conditions.

The proposed emissions for VOC, NOx, SOx, PM10, and PM2.5 meet BACT requirements. Although BACT for CO is not triggered, the engines meet BACT for this pollutant.

Section 302 – Offsets Offsets are required for any project where the stationary source potential to emit, calculated pursuant to Rule 202, Section 411.3, exceeds the following levels.

Pollutant	(lb/quarter)
VOC	5,000
NOx	5,000
SOx	13,650
PM10	7,300
PM2.5	15 ton/year
CO	49,500

Calculation of Offset Trigger for VOC and NOx (Equal Quarters)

Permit No.	Emissions Unit	Stationary Source Potential to Emit (lb/quarter)	
		VOC	NOx
P/O 11187	Scrubbers	0	0
P/O 19868	Boiler (38 MMBtu/hr)	Replaced by A/C 27781	
P/O 19869	Boiler (38 MMBtu/hr)	Replaced by A/C 27781	
P/O 19870	Boiler (38 MMBtu/hr)	Replaced by A/C 27781	
P/O 24222	Gasoline Dispensing Facility	61	0
P/O 24421	Sewage Treatment Process Mod.	2,501	0
P/O 24422	Odor Removal System (Primary Bldg)	0	0
P/O 24423	Odor Removal System (Portable)	0	0
P/O 24424	Anaerobic Digesters	45	0
P/O 24425	Odor Removal System (I/E Bldg.)	0	0
P/O 24426	Lime Silos	0	0
P/O 24427	Odor Removal System (Biofilter)	0	0
P/O 24500	Biological Nutrient Removal Basins	2,539	0
P/O 24682	Paint Spray Booth	2,944	0
P/O 25022	APC Dust Collector	0	0
P/O 25403	Abrasive Blasting Booth	0	0
P/O 12526	Above Ground Flares (6) (B)	7,481 (D)	17,322 (D)
P/O 25901	Ground Flares (3) (C)		
P/O 26025	Gravity Belt Thickeners	(A)	0
P/O 26464	IC Engine, Prime (250 hp)	58	124
P/O 26465	IC Engine, Prime (250 hp)	58	124
P/O 26896	Sodium Bisulfite Storage System	0	0
A/C 27780	Fuel Cell (2.8 MW)	124	433
A/C 27781	Boiler (19.95 MMBtu/hr)	238	481
A/C 27782	IC Engine, Prime (3,681 hp)	1,792	1,792
A/C 27783	IC Engine, Prime (3,681 hp)	1,792	1,792
A/C 27784	IC Engine, Prime (3,681 hp)	1,792	1,792
A/C 27785	IC Engine, Prime (3,681 hp)	1,792	1,792
Total		23,217	25,652
Offset Trigger Levels		5,000	5,000
Are Offsets Triggered?		Yes	Yes
Facility-wide Annual Limits (ton/year)		24.4	24.4

(A) VOC emissions from this process are included in P/O 24421.
(B) VOC and NOx emission from the above ground flares (P/O 12526) are based on a digester gas HHV of 662 Btu/scf, a digester gas firing rate at full capacity (2.85 MMscf/day), and 92 days/quarter (262.16 MMscf/quarter).
(C) The quarterly VOC potential to emit for the ground flares (P/O 25901) is based on the permitted limit of 376.7 MMcf/quarter process rate of digester gas flared through the three ground flares combined and a digester gas HHV of 662 Btu/scf.
(D) P/O 12526 (above ground flares) and P/O 25901 (ground flares) share a quarterly limit of 376.7 MMscf/quarter. Limit represents the worst case scenario of the two flare permits.

Emissions are over the offset thresholds for VOC and NOx. ERCs will be provided for the new equipment that are being added to the facility: A/C 27780 (fuel cell), A/C 27781 (boiler), and A/Cs 27782, 27783, 27784, 27785 (IC engines).

The facility currently maintains a VOC facility cap for P/Os 24421, 12526, 19868, 19869, 19870, 25901, 24222, 24682, 26464, and 26465. The removal of the three boilers (P/Os 19868, 19869, 19870) requires that this existing cap be reduced by the Historic Actual Emissions (HAE) of the three boilers per district policy "Policy Establishing Offset Calculation Procedures for Facilities Operating Under an Emission Cap" (8/15).

The HAE for the three boilers was calculated according to Rule 202, Section 224. According to the rule, the two most recent consecutive years of actual emissions are used in the calculation unless these two years are not representative of normal operation. In the first quarter of 2022, digester gas usage in the boilers was twice as high as digester gas usage in any quarter of the most recent five year period. Since this quarter coincides with a rehabilitation and improvement project that the Gas Management System underwent in 2022, the 2022/2023 time period was thrown out as not being representative. Therefore, the next two consecutive years 2020 and 2021 were chosen as representative of normal operation. The revised VOC facility cap is given in the following table.

Quarter	Existing Facility Cap (lb/quarter)	HAE for 3 Boilers (A) (lb/quarter)	Revised Facility Cap (lb/quarter)
1	7,348	13	7,335
2	7,364	19	7,345
3	7,371	3	7,368
4	7,367	13	7,354

(A) Historic emissions are from District inspection records for 2020 and 2021 (P/Os 19868, 19869, 19870).

Calculation of Offset Trigger for SOx, PM10, PM2.5, & CO (Equal Quarters)

Permit No.	Emissions Unit	Stationary Source Potential to Emit Since 1/1/1977			
		(ton/year)	(lb/quarter)		
		PM2.5 (A)	SOx	PM10	CO
P/O 11187	Scrubbers	0	0	0	0
P/O 19868	Boiler (38 MMBtu/hr)	Replaced by A/C 27781			
P/O 19869	Boiler (38 MMBtu/hr)	Replaced by A/C 27781			
P/O 19870	Boiler (38 MMBtu/hr)	Replaced by A/C 27781			

Permit No.	Emissions Unit	Stationary Source Potential to Emit Since 1/1/1977			
		(ton/year)	(lb/quarter)		
		PM2.5 (A)	SOx	PM10	CO
P/O 24222	Gasoline Dispensing Facility	0	0	0	0
P/O 24421	Sewage Treatment Process Mod.	0	0	0	0
P/O 24422	Odor Removal System (Primary Bl)	0	0	0	0
P/O 24423	Odor Removal System (Portable)	0	0	0	0
P/O 24424	Anaerobic Digesters	0	0	0	0
P/O 24425	Odor Removal System (I/E Bldg.)	0	0	0	0
P/O 24426	Lime Silos	0.02	0	10	0
P/O 24427	Odor Removal System (Biofilter)	0	0	0	0
P/O 24500	Biological Nutrient Removal Bsn.	0	0	0	0
P/O 24682	Paint Spray Booth	0.005	0	9	0
P/O 25022	APC Dust Collector	0	0	0	0
P/O 25403	Abrasive Blasting Booth	0.0001	0	1	0
P/O 12526	Above Ground Flares (6) (B)	6.83 (D)	8,123 (D)	3,416 (D)	92,269 (D)
P/O 25901	Ground Flares (3) (C)				
P/O 26025	Gravity Belt Thickeners	0	0	0	0
P/O 26464	IC Engine, Prime (250 hp)	0.007	2	7	1,075
P/O 26465	IC Engine, Prime (250 hp)	0.007	2	7	1,075
P/O 26896	Sodium Bisulfite Storage System	0	2	0	0
A/C 27780	Fuel Cell (2.8 MW)	0.00	1	0	618
A/C 27781	Boiler (19.95 MMBtu/hr)	0.65	603	328	13,017
A/C 27782	IC Engine, Prime (3,681 hp)	2.49	448	1,254	11,647
A/C 27783	IC Engine, Prime (3,681 hp)	2.49	448	1,254	11,647
A/C 27784	IC Engine, Prime (3,681 hp)	2.49	448	1,254	11,647
A/C 27785	IC Engine, Prime (3,681 hp)	2.49	448	1,254	11,647
Total		17.48	10,525	8,794	154,642
Facility Cap		14.4	---	7,299	---
Offset Trigger Levels		15	13,650	7,300	49,500
Are Offsets Triggered?		Yes	No	Yes	Yes
Facility-wide Annual Limits (ton/year)		N/A	N/A	N/A	99.4

(A) With the exception of P/O 24426, emissions for PM2.5 were calculated assuming that all PM10 emissions from the equipment are PM2.5.

(B) PM10, SOx, and CO emission from the Above Ground Flares (P/O 12526) are based on a digester gas HHV of 662 Btu/scf, a daily digester gas firing rate at full capacity (2.85 MMscf/day), and 92 days/quarter (262.16 MMscf/quarter).

(C) The quarterly potential to emit for the ground flares (P/O 25901) is based on the permitted limit of 376.7 MMcf/quarter process rate of digester gas flared through the three ground flares combined and a digester gas HHV of 662 btu/scf.
(D) P/O 12526 (above ground flares) and 25901 (ground flares) share a quarterly limit of 376.7 MMscf/quarter). Limit represents the worst case scenario of the two flare permits.

Emissions exceed the offset thresholds for PM10, PM2.5, and CO. In regard to CO, Rule 202, Section 302.7 does not require ERCs to be provided if the project emits an offsite, ground level, 8 hour average CO concentration that does not exceed 500 µg/m^3. The emission model was run using Aermod (v.11.2.0) for the CO emissions from the project. Modeling results indicate that the maximum offsite CO concentration is 45.51 µg/m^3. Since 46 µg/m^3 is less than 500 µg/m^3, CO ERCs will not be required per Section 302.7. The facility will retain its CO facility limit of 99.4 tons/year to remain under the major source threshold for CO. The results of the model run are located in Appendix B.

For PM10, the facility has elected to take a PM10 facility cap of 7,299 lb/quarter to remain under the PM10 offset threshold. Likewise, the facility has elected to take a PM2.5 facility cap of 14.4 tons/year to remain under the PM2.5 offset threshold. Because the facility will continue to remain under the offset thresholds for PM10 and PM2.5, ERCs will not be required for PM10 and PM2.5 SOx emissions continue to remain under the offset threshold.

Section 303 – Emission Reduction Credits

To meet offset requirements for the fuel cell (A/C 27780), boiler (A/C 27781), and four engines (A/C 27782, 27783, 27784, 27785), the applicant has requested to lease Emission Reduction Credits (ERCs) for VOC and NOx from the Community Bank and from the Essential Public Services Account of the Priority Reserve Bank. The use of ERCs for offsetting purposes is specified in Rule 202 (New Source Review), Sections 302 and 303, and these requirements are discussed below.

Section 302/303 – Offsets: For the boiler, ERCs will be obtained from the SMAQMD Essential Public Services Account. SacSewer is eligible to use this account because it is an essential public service per Rule 205, Section 205.1 For the engines, the facility will surrender all of the VOC ERCs that they currently hold from SMAQMD ERC Certificate Nos. 1210, 1215, and 1246. The balance of the necessary ERCs for the fuel cell and the IC engines will be obtained from the SMAQMD Community Bank. The fuel cell and the engines are not eligible to use the Essential Public Services Account per Section 102.1 because the equipment is involved in on-site power generation.

Equipment	VOC Emissions Required to be Offset (lb/quarter)			
	QTR 1 (lb/qtr)	QTR 2 (lb/qtr)	QTR 3 (lb/qtr)	QTR 4 (lb/qtr)
Fuel Cell (A/C 27780)	121	122	124	124
Boiler (A/C 27781)	232	235	238	238
IC Engine (A/C 27782)	1,753	1,772	1,792	1,792
IC Engine (A/C 27783)	1,753	1,772	1,792	1,792
IC Engine (A/C 27784)	1,753	1,772	1,792	1,792
IC Engine (A/C 27785)	1,753	1,772	1,792	1,792
Emissions required to be Offset	7,365	7,445	7,530	7,530

Equipment	NOx Emissions Required to be Offset (lb/quarter)			
	QTR 1 (lb/qtr)	QTR 2 (lb/qtr)	QTR 3 (lb/qtr)	QTR 4 (lb/qtr)
Fuel Cell (A/C 27780)	423	428	433	433
Boiler (A/C 27781)	471	476	481	481
IC Engine (A/C 27782)	1,753	1,772	1,792	1,792
IC Engine (A/C 27783)	1,753	1,772	1,792	1,792
IC Engine (A/C 27784)	1,753	1,772	1,792	1,792
IC Engine (A/C 27785)	1,753	1,772	1,792	1,792
Emissions required to be Offset	7,906	7,992	8,082	8,082

The applicant will surrender ERCs from SMAQMD Certificate Nos. 1210, 1215, and 1246 to partially offset the required emissions. These ERCs will need to be adjusted by an offset ratio per Section 303.1 According to the following table, the offset ratio will be 1.2 to 1.0 for the ERCs that originated from 2100 Q Street, Sacramento.

Location of Emission Offset	Emission Offset Ratio			
	Volatile organic compounds or Nitrogen oxides	PM2.5 or ammonia if determined to be PM2.5 precursor by Section 239	Other Nonattainment pollutants	Attainment Pollutants
Within 15-mile radius and within Sacramento Valley Air Basin	1.2 to 1.0 (A)	1.2 to 1.0	1.2 to 1.0	1.1 to 1.0

(A) This ratio is used if credits are for a non-major stationary source or a non-major modification at a major source where emissions calculated per Section 411.3 are 7,500 lb/quarter or greater. Other ratios apply for other scenarios.

The following are the emission credits given on the ERC certificates that are held by the applicant.

VOC ERCs from Certificates (lb/quarter)				
SMAQMD Certificate No.	QTR 1 (lb/qtr)	QTR 2 (lb/qtr)	QTR 3 (lb/qtr)	QTR 4 (lb/qtr)
1210	2,219	2,244	2,268	2,269
1215	2,165	2,190	2,214	2,215
1246	568	337	228	291
Total	4,952	4,771	4,710	4,775

VOC ERCs Distribution (lb/quarter)				
	QTR 1 (lb/qtr)	QTR 2 (lb/qtr)	QTR 3 (lb/qtr)	QTR 4 (lb/qtr)
ERCs Held by Applicant	4,952.0	4,771.0	4,710.0	4,775.0
ERCs Applied to A/C 27782 (A)	2,103.6	2,126.4	2,150.4	2,150.4
ERCs held by Applicant (Balance)	2,848.4	2,644.6	2,559.6	2,624.6
ERCs Applied to A/C 27783 (A)	2,103.6	2,126.4	2,150.4	2,150.4
ERCs held by Applicant (Balance)	744.8	518.2	409.2	474.2
ERCs Required for A/C 27784 (A)	2,103.6	2,126.4	2,150.4	2,150.4
ERCs Applied to A/C 27784	744.8	518.2	409.2	474.2
Emissions Remaining for A/C 27784	1,132.3	1,340.2	1,451.0	1,396.8

(A) An offset ratio of 1.0 to 1.0 has been applied to the emissions.

SacSewer has petitioned for the remainder of the project to be offset from ERCs from the Community Bank and the Essential Public Services Account of the SMAQMD Priority Reserve Bank. Pursuant to Rule 202, Section 303.2, the applicable offset ratio for a non-major source is 1.0 to 1.0. Because SacSewer has accepted limits to remain a synthetic minor source (Ref: Rule 207 Section below), the source is a non-major stationary source and the offset ratio is 1.0 to 1.0 according to the rule.

Emission Offsets Obtained from the Community Bank and Priority Reserve Bank	
Source Type/Pollutant	Offset Ratio
For use by non-major stationary sources or non-major modifications for all pollutants if the non-major modification has an increase in emissions calculated pursuant to Section 411.3 of 250 lbs/day or less of VOC, NOx, and SOx, and 80 lbs/day or less of PM10.	1.0 to 1.0
If the non-major modification has an increase in emissions calculated pursuant to Section 411.3 that is greater than 250 lbs/day of VOC, NOx, and SOx, or greater than 80 lbs/day of PM10.	1.2 to 1.0

Emissions Remaining to be Offset					
Pollutant	Permit No.	QTR 1 (lb/qtr)	QTR 2 (lb/qtr)	QTR 3 (lb/qtr)	QTR 4 (lb/qtr)
VOC	27780	121	122	124	124
	27781	232	235	238	238
	27782	0	0	0	0
	27783	0	0	0	0
	27784	1,132.3	1,340.2	1,451	1,396.8
	27785	1,753	1,772	1,792	1,792
	Total	3,238.3	3,469.2	3,605	3,550.8

Emissions Remaining to be Offset					
Pollutant	Permit No.	QTR 1 (lb/qtr)	QTR 2 (lb/qtr)	QTR 3 (lb/qtr)	QTR 4 (lb/qtr)
NOx	27780	423	428	433	433
	27781	471	476	481	481
	27782	1,753	1,772	1,792	1,792
	27783	1,753	1,772	1,792	1,792
	27784	1,753	1,772	1,792	1,792
	27785	1,753	1,772	1,792	1,792
	Total	7,906	7,992	8,082	8,082

For the boiler, the following table indicates the ERCs that need to be borrowed from the Essential Public Services Account. The emissions have been adjusted by an offset ratio of 1.0 to 1.0.

ERCs to be Leased from the Essential Public Services Account					
Permit No.	Pollutant	QTR 1 (lb/qtr)	QTR 2 (lb/qtr)	QTR 3 (lb/qtr)	QTR 4 (lb/qtr)
27781	VOC	232	235	238	238
	NOx	471	476	481	481

The Essential Public Services Account has sufficient ERCs for the loan amounts. The following table indicates the ERCs that will need to be borrowed from the Community Bank. The emissions have been adjusted by an offset ratio of 1.0 to 1.0.

ERCs to be Leased from the Community Bank					
Permit No.	Pollutant	QTR 1 (lb/qtr)	QTR 2 (lb/qtr)	QTR 3 (lb/qtr)	QTR 4 (lb/qtr)
27780	VOC	121	122	124	124
	NOx	423	428	433	433
27782	VOC	0	0	0	0
	NOx	1,753	1,772	1,792	1,792
27783	VOC	0	0	0	0
	NOx	1,753	1,772	1,792	1,792
27784	VOC	1,132.3	1,340.2	1,451.0	1,396.8
	NOx	1,753	1,772	1,792	1,792
27785	VOC	1,753	1,772	1,792	1,792
	NOx	1,753	1,772	1,792	1,792

The Community Bank has sufficient ERCs for the loan amounts. The facility has identified sufficient ERCs to meet offsetting requirements. Therefore, the facility will be able to comply with the offsetting requirements specified in this rule.

Section 308 – CEQA This section requires that projects that do not comply with CEQA be denied. The California Environmental Quality Act (CEQA) is a statute that requires state and local agencies to identify the significant adverse environmental impacts of their actions and to avoid or mitigate those impacts to the extent feasible. An Environmental Impact Report (EIR) was prepared as part of the CEQA process with the Sacramento Regional County Sanitation District (a.k.a. SacSewer) as the lead agency. The District participated in the review as a commenting agency and the Environmental Impact Report was approved by the Sacramento Regional County Sanitation District on September 27, 2023. A copy of the approval documents is located in Appendix D. No further CEQA review is necessary.

Section 406 – Submittal of BACT Determinations: This permit action relied on existing BACT determinations already published in SMAQMD's BACT Clearinghouse. Therefore, this section does not apply.

Rule 203 – Prevention of Significant Deterioration

A source or modification triggers PSD if:

- Its potential to emit any one pollutant is greater than or equal to 100 tons/year if it is one of the 28 selected industrial categories in 42 U.S.C. Section 7479 (1) or greater than or equal to 250 tons/year for all other categories; or
- It is part of a major stationary source and the project's net emissions increase for any pollutant will be greater than the significance levels listed below:

Pollutant	Level of Significance (tons/year)
CO	100
NOx	40
SOx	40
PM	25
PM10	15
PM2.5	10 PM2.5 or 40 SO_2 or 40 NO
Ozone	40 NOx or 40 VOC
Lead	0.6
Fluorides	3
Sulfuric acid mist	7
H_2S	10
Total reduced sulfur (including H_2S)	10
Reduced sulfur compounds (incl. H_2S)	10
Greenhouse Gases (CO_2e)	75,000

There are no emissions sources at the facility that appear to have the potential to emit over 100 or 250 tons per year and, as demonstrated in Section II.2, the emissions from the project will not cause the facility to exceed the threshold when analyzed cumulatively. Since this is not a major source, it is not necessary to consider the major modification significance levels. Section II.2 also demonstrates that the facility is below these levels.

Rule 205 – Community Bank and Priority Reserve Bank

This rule governs the banking and disbursement of Emission Reduction Credit (ERC) loans for the Community Bank and the Priority Reserve Bank. According to the rule, the Priority Reserve Bank is comprised of two accounts: the Essential Public Services Account (EPSA) and the Military Base Account. The EPSA is an ERC account that can be used as offsets pursuant to Rule 202 for specific categories of essential public services. Publicly owned sewage treatment operations are allowed to use this account per Section 205.1 The rule states that the applicant's access to the EPSA may only occur if a stationary source does not have ERCs to surrender for the pollutant that's being requested. The applicant is eligible to obtain an EPSA loan for the boiler (A/C 27781) because SacSewer is an essential public service per Section 205.1, and it will first surrender its available privately held ERCs for VOC. ERCs for the fuel cell (A/C 27780) and the IC engines (A/Cs 27782, 27783, 27784, 27785) are not eligible for a loan from this account per Section 102.1 because they will generate on-site power. However, the applicant is eligible to obtain a Community Bank loan for these pieces of equipment because they will previously exhaust their available privately held ERCs for VOC. The issuance of the loans will comply with the rule.

Rule 207 –Title V – Federal Operating Permit Programs

The facility is a synthetic minor source that has operated under facility caps for NOx, CO, and Hazardous Air Pollutants (HAPs) to remain under the Title V major source thresholds. For VOC, the maximum potential to emit before the addition of the Biogen project is 19.9 tons/year. However, the facility's maximum VOC potential to emit after the project will be 34.9 tons/year which is above the major source threshold. Since the facility has requested a limit to remain under the VOC major source threshold of 25 tons/year, a facility limit of 24.4 tons/year will be added to the permits. The facility's quarterly potential to emit for SOx, PM10, and PM2.5 are below their offset thresholds which guarantees that their annual potential to emit will remain under the major source threshold for these pollutants (100 tons/year). Therefore, the facility will continue to remain under major source thresholds and is not a major source. Except for SOx, the following are the limits that will be placed on the permits:

Emissions	VOC	NOx	SOx	PM10	PM2.5	CO	Single HAP	Total HAPs
Annual (tons/year)	24.4 (A)	24.4 (A)	10.3	14.6 (B)	14.4 (B)	99.4 (A)	9.4 (A)	24.4 (A)
Major Source Threshold (tons/yr)	25	25	100	100	100	100	10	25

(A) Facility has accepted an annual emissions cap to remain below the major source thresholds.
(B) Facility has accepted a PM10 facility cap of 7,299 lb/quarter and a PM2.5 facility cap of 14.4 tons/year which maintains the facility well below the major source thresholds.

A synthetic minor source that has a potential to emit that is within 80% of a major source threshold is classified by the EPA as a SM-80 synthetic minor source. The following is the SM-80 calculation for the facility.

Permit No.	Emissions Unit	Stationary Source Potential to Emit (tons/year)						
		VOC	NOx	SOx	PM10	PM2.5	CO	HAP (C)
11187	Scrubbers	0	0	0	0	0	0	0
12526	Above Ground Flares	14.725 (A)	34.644 (B)	6.284 (B)	6.832 (B)	6.832 (B)	184.54 (B)	0.200 (B)
25901	Ground Flares							
24421	Sewage Treatment		0	0	0	0	0	5.164
24222	Gasoline Dispensing		0	0	0	0	0	0.005
24682	Paint Spray Booth		0	0	0.008	0.008	0	0
26464	IC Engine, Prime		0.124	0.002	0.007	0.007	1.075	0.007
26465	IC Engine, Prime		0.124	0.002	0.007	0.007	1.075	0.007
24422	Odor Removal (Prim Bld)	0	0	0	0	0	0	0
24423	Odor Removal (Portable)	0	0	0	0	0	0	0
24424	Anaerobic Digesters	0.09	0	0	0	0	0	2.445
24425	Odor Removal (I/E Bldg)	0	0	0	0	0	0	0
24426	Lime Silos	0	0	0	0.019	0.019	0	0
24427	Odor Removal (Biofilter)	0	0	0	0	0	0	0.065
24500	Biological Nutr. Removal	3.313	0	0	0	0	0	0
25022	APC Dust Collector	0	0	0	0	0	0	0
25403	Abrasive Blasting Booth	0	0	0	0.002	0.000	0	0
26025	Gravity Belt Thickeners	(D)	0	0	0	0	0	0
26896	Sodium Bisulfite Storage	0	0	0.005	0	0	0	0
27780	Fuel Cell	0.246	0.859	0.002	0	0	1.227	0
27781	Boiler	0.475	0.951	0.475	0.647	0.647	25.819	0.610
27782	IC Engine, Prime	3.55	3.555	0.889	2.488	2.488	23.104	2.780
27783	IC Engine, Prime	3.55	3.555	0.889	2.488	2.488	23.104	2.780
27784	IC Engine, Prime	3.55	3.555	0.889	2.488	2.488	23.104	2.780
27785	IC Engine, Prime	3.55	3.555	0.889	2.488	2.488	23.104	2.780
Total		33.07	50.92	10.33	17.47	17.47	306.15	19.62
Enforceable Facility Limit		24.4	24.4	---	14.6	14.9	99.4	24.4
Major Source & Title V Threshold		25	25	100	100	100	100	25
SM-80		Yes	Yes	No	No	No	Yes	No

(A) This equipment share a quarterly VOC emission cap.
(B) P/O 12526 (above ground flares) and P/O25901 (ground flares) share a quarterly limit of 376.7 MMscf/quarter). Limit represents the worst case scenario of the two flares.
(C) This column is for multiple HAPs. The maximum single HAP emissions are 7.08 tons/year of hydrogen sulfide. This is less than 80% of the 10 tons/year of single HAP under Title V.
(D) VOC emissions from this process are included in P/O 24421.

The facility has a potential to emit that is within 80% of the major source thresholds for NOx, VOC, and CO. Therefore, the facility is a SM-80 synthetic minor source.

Rule 214 – Federal New Source Review

This rule does not apply because this permit action is not for a new major stationary source or a modification at an existing major stationary source.

Rule 217 – Public Notice Requirements for Permits

Sections 401-402 – CARB, EPA, and Public Notification: The public noticing requirements of Rule 217 do not apply if:

- Offsets are not required under Rule 202, Section 302.
- A visibility analysis is not required under Rule 214, Section 413.
- The increase in potential to emit for the project, calculated under Section 403 of Rule 217, is below the following limits:

Pollutant	(lb/quarter)
VOC	5,000
NOx	5,000
SOx	9,200
PM10	7,300
PM2.5	10 tons/year
CO	49,500

Analysis:

- As determined in Section III.2, offsets are required for this project.
- This permit action is not subject to Rule 214. Therefore, the visibility analysis required by Section 413 of Rule 214 is inapplicable.
- As shown below, the increase in potential to emit does not exceed the notification exemption thresholds.

A/Cs 27780, 27781, 27782, 27783, 27784, & 27785 – Increase in Potential to Emit

Pollutant	Potential to Emit for the Project		Increase in PTE	Notification Threshold	Notification Required?
	Pre-Application	Post-Application			
VOC (lb/qtr)	0	23,217	23,217	≥ 5,000	Yes
NOx (lb/qtr)	0	25,652	25,652	≥ 5,000	Yes
SOx (lb/qtr)	0	10,525	10,525	≥ 9,200	Yes
PM10 (lb/qtr)	0	8,794	8,794	≥ 7,300	Yes
PM2.5 (ton/yr)	0	14.40	14.40	≥ 10	Yes
CO (lb/qtr)	0	154,642	154,642	≥ 49,500	Yes

A public notice per Section 401 of this rule is required because emissions from the equipment require offsetting and because the increase in the potential to emit for VOC, NOx, SOx, PM10, PM2.5, and CO exceed the notification thresholds. A notice declaring a 30 day public review period concerning the District's preliminary decision to issue the Authorities to Construct will be sent to the EPA, CARB, and published in the Sacramento Bee. A subsequent notice will

be sent to the EPA, CARB, the applicant, and will be published on the District's website indicating the District's final action on the applications.

3. PROHIBITORY RULE COMPLIANCE:

Rule 401 – Ringelmann Chart

The permit will include conditions requiring that the equipment comply with the Ringelmann No. 1 or 20% opacity standard and, in the District's experience, properly operated fuel cells, engines, and boilers are able to meet this requirement. The equipment will be inspected prior to the issuance of the permit to operate and on a regular basis thereafter to help ensure continuous compliance.

Rule 402 – Nuisance

The District regulates emissions of toxics substances under Rule 402, SMAQMD's guidance document, Health Risk Management Programs For Existing, Modified and New Stationary Sources (March 24, 2016). The District's health risk action levels and results are summarized below.

Health Risk Assessment Summary				
Type of Health Risk	Permitting Thresholds (A)		Project HRA Results	
	T-BACT	Maximum	Residential	Worker
Cancer Risk (Chances per Million)	≥ 1.0	10.0	5.1	0.3
Acute Non-Cancer (Hazard Index)	≥ 1.0	1.0	0.0	0.1
Chronic Non-Cancer (Hazard Index)	≥ 1.0	1.0	0.0	0.0

(A) In certain circumstances, the District may allow a health risk in excess of the levels specified here. For more information, see SMAQMD's guidance document, Health Risk Management Programs for Existing, Modified and New Stationary Sources (2016).

A health risk assessment was completed for the project, and the reports and locations of the health risk impacts is included in Appendix C. The project's emissions were modeled using an EPA approved air dispersion model to determine the concentrations of toxic pollutants at residential and non-residential receptors surrounding the project. The Aermod software used for this analysis was Lakes Environmental's AERMOD View, Version 11.2.0 The following parameters were used in the model runs:

Source Type:	Point Sources (IC Engines)
Stack Coordinates:	Stack 7 (Engine 1), UTM 10: 634075 E, 4257122 N
	Stack 8 (Engine 2), UTM 10: 634075 E, 4257129 N
	Stack 9 (Engine 3), UTM 10: 634075 E, 4257136 N
	Stack 10 (Engine 4), UTM 10: 634075 E, 4257142 N
Release Height:	44 feet
Gas Exit Temperature:	685 °F
Stack Diameter:	25 inches
Gas Exit Flow Rate:	6,949 acfm
Emission Rate (Aermod Input):	1.0 g/s

Source Type:	Point Source (Boiler)
Source Coordinates:	Stack 11 (Boiler), UTM 10: 634047 E, 4257158 N
Release Height:	44 feet
Gas Exit Temperature:	230 °F
Stack Diameter:	24 inches
Gas Exit Flow Rate:	7,322 acfm
Emission Rate (Aermod Input):	1.0 g/s

The fuel cell was not modelled because toxic emissions from this type of equipment is considered to be negligible. In addition, toxic emission factors for fuel cells operating on natural gas or digester gas could not be found.

Emission factors for sewage-based digester gas could not be located and were not available. As a substitute, emission factors for natural gas combustion from AP-42, Table 3.2-2 for uncontrolled, 4-stroke, lean-burn engines were used for the engines and AP-42, Table 1.4-3 for uncontrolled boilers were used for the boiler. In addition, emission factors from the San Joaquin Valley APCD for digester gas-fired internal combustion engines (digester gas from farm waste) and digester gas-fired external combustion boilers (digester gas from farm waste) were added to the EPA natural gas factors to more closely approximate the actual health risk impacts. If there was a conflict between emission factors, the worst case emission factor was used. The engine emission factors were adjusted for a control of 75% for hydrocarbon based toxics. The emissions for each stack are given below.

Emissions (Each IC Engine)

Pollutant	Pollutant ID	Emission Factor (A) (lb/MMBtu)	Emissions (D)	
			(lb/hour)	(lb/year)
1,2,4TriMeBenze	95636	7.11E-05	3.63E-04	3.1766
1,3-Butadiene	106990	2.67E-04	1.36E-03	11.9291
2,2,4TriMePentn	540841	2.50E-04	1.28E-03	11.1695
2MeNaphthalene	91576	3.32E-05	1.69E-04	1.4833
Acenaphthene	83329	1.25E-06	6.38E-06	0.0558
Acenaphthylene	208968	5.53E-06	2.82E-05	0.2471
Acetaldehyde	75070	8.36E-03	4.26E-02	373.5097
Acrolein	107028	2.15E-05 (B)	1.10E-04	0.9606
Ammonia	7664417	10 ppm at 15% O_2 (C)	2.77E-01	2423.5290
Benzene	71432	2.56E-03 (B)	1.31E-02	114.3762
B[b]fluoranthen	205992	1.66E-07	8.47E-07	0.0074
B[e]pyrene	192972	4.15E-07	2.12E-06	0.0185
B[g,h,i]perylen	191242	4.14E-07	2.11E-06	0.0185
Biphenyl	92524	2.12E-04	1.08E-03	9.4718
Chrysene	218019	6.93E-07	3.53E-06	0.0310
Ethyl Benzene	100414	3.97E-05	2.02E-04	1.7737
Ethyl Chloride	75003	1.87E-06	9.54E-06	0.0835

Pollutant	Pollutant ID	Emission Factor (A) (lb/MMBtu)	Emissions (D)	
			(lb/hour)	(lb/year)
Fluoranthene	206440	1.11E-06	5.66E-06	0.0496
Fluorene	86737	5.67E-06	2.89E-05	0.2533
Formaldehyde	50000	5.28E-02	2.69E-01	2359.0084
Hexane	110543	1.11E-03	5.66E-03	49.5928
Isobutyraldehyde	78842	1.01E-04	5.15E-04	4.5125
Methanol	67561	2.50E-03	1.28E-02	111.6955
Methylene Chlor	75092	1.32E-04 (B)	6.73E-04	5.8975
Naphthalene	91203	7.44E-05	3.79E-04	3.3241
PAHs-w/o	1151	2.69E-05	1.37E-04	1.2018
Phenanthrene	85018	1.04E-05	5.30E-05	0.4647
Phenol	108952	2.40E-05	1.22E-04	1.0723
Pyrene	129000	1.36E-06	6.94E-06	0.0608
Toluene	108883	1.12E-03 (B)	5.71E-03	50.0396
TCE	79016	1.32E-05 (B)	6.73E-05	0.5898
Vinyl Chloride	75014	1.72E-05 (B)	8.77E-05	0.7685
Xylenes	1330207	2.42E-04 (B)	1.23E-03	10.8121
1,4-Dioxane	123911	1.31E-05 (B)	6.68E-05	0.5853
CCl4	56235	6.71E-06 (B)	3.42E-05	0.2998
Chloroform	67663	1.33E-05 (B)	6.78E-05	0.5942
EDC	107062	6.67E-06 (B)	3.40E-05	0.2980
1,1,1-TCA	71556	1.34E-05 (B)	6.83E-05	0.5987
p-DiClBenzene	106467	6.47E-05 (B)	3.30E-04	2.8907
Perc	127184	1.36E-05 (B)	6.94E-05	0.6076
Styrene	100425	5.00E-05 (B)	2.55E-04	2.2339
Vinylid Chloride	75354	6.81E-06 (B)	3.47E-05	0.3043

(A) Emission factors are from AP-42, Table 3.2-2 for uncontrolled, 4-stroke, lean-burn engines (7/00) except as noted.
(B) Emission factors are from San Joaquin Valley APCD for digester gas-fired internal combustion engines. Digester gas was generated from food waste.
(C) Emission factor is ammonia slip from the engines.
(D) Emissions are based on a maximum capacity of 20.401 MMBtu/hr, 8,760 hours/year, a VOC control efficiency of 75%, and the emission factors in this table.

Emissions (Boiler)

Pollutant	Pollutant ID	Emission Factor (A) (lb/MMscf)	Emissions (C)	
			(lb/hour)	(lb/year)
Benzene	71432	2.1E-03	6.32E-05	0.5537
p-DiClBenzene	106467	1.2E-03	3.61E-05	0.3164
Fluoranthene	206440	3.0E-06	9.03E-08	0.0008
Fluorene	86737	2.8E-06	8.43E-08	0.0007
Formaldehyde	50000	1.46E-00 (B)	4.40E-02	385.4254
Hexane	110543	1.8E-00	5.42E-02	474.6168
Naphthalene	91203	6.1E-04	1.84E-05	0.1608
Phenanthrene	85018	1.7E-05	5.12E-07	0.0045
Pyrene	129000	5.0E-06	1.51E-07	0.0013
Toluene	108883	9.59E-03 (B)	2.89E-04	2.5317
Ammonia	7664417	1.12E-04 (B)	1.12E-04	0.9820
Ethyl Benzene	100414	2.61E-02 (B)	7.87E-04	6.8901
H_2S	7783064	1.17E-00 (B)	3.53E-02	308.8683
Methyl Chloroform	71556	4.19E-03 (B)	1.26E-04	1.1061
Methylene Chloride	75092	8.67E-02 (B)	2.61E-03	22.8879
Perchloroethylene	127184	2.43E-03 (B)	7.32E-05	0.6415
Vinyl Chloride	75014	1.32E-03 (B)	3.98E-05	0.3485
Vinylid Chloride	75354	3.08E-04 (B)	9.28E-06	0.0813
Xylenes	1330207	5.57E-02 (B)	1.68E-03	14.7042

(A) Emission factors are from AP-42, Table 1.4-3 for uncontrolled boilers (7/98) except as noted.
(B) Emission factors are from San Joaquin Valley APCD for digester gas-fired external combustion. Digester gas was generated from food waste.
(C) Emissions are based on a maximum capacity of 0.0301 MMscf/hr, a digester gas HHV of 662 Btu/scf, 8,760 hours/year, and the emission factors in this table.

SMAQMD utilizes the California Air Resources Board's Hotspots Analysis and Reporting Program (HARP2), Version 22118 model which incorporates the health risk assessment methodologies from the "Risk Assessment Guidelines - Guidance Manual for Preparation of Health Risk Assessments" (February 2015).

CANCER RISK ASSESSMENT:

From equation 5.4.1.1 and 8.2.4 A:

Riskair = Cair * (BR/BW) * A * EF * CPF * ED/AT * (1E-06) * (GLC) * ASF * FAH

Where:

Riskair = Cancer risk from inhalation exposure
Cair = Concentration (µg/m3)
(BR/BW) = Breathing Rate/Body Weight

	=	361 (l/kg-day) 95%, 3rd Trimester
	=	1090 (l/kg-day) 95%, 0<2 yrs
	=	631 (l/kg-day) 80%, 2<9 yrs
	=	572 (l/kg-day) 80%, 2<16 yrs
	=	261 (l/kg-day) 80%, 16<30 yrs
	=	233 (l/kg-day) 80%, 16<70 yrs
	=	230 (l/kg-day) 8 hr worker rate
A	=	Inhalation Absorption Factor (default = 1)
EF	=	Exposure Frequency
	=	350 days for Res
	=	250 days for Non-Res
CPF	=	Cancer Potency Factor (kg-day/mg)
ED	=	Exposure Duration, 30 years Res, 25 years Non-Res
AT	=	Averaging Time, 25,550 days
ASF	=	Age sensitivity factor for a specified age group
FAH	=	Fraction of time spent at home (use 1 for children under 16 when a school is within a 1 in a million cancer risk isopleth)
	=	0.85, 3rd Trimester
	=	0.85, 0<2 yrs
	=	0.72, 2<9 yrs
	=	0.72, 2<16 yrs
	=	0.73, 16<30 yrs
	=	0.73, 16<70 yrs
(1E-06)	=	(mg/1000 µg)*(m3/1000 l)
GLC	=	Ground Level Adjustment Factor
	=	1.0 for resident
	=	1.0 for worker for equipment that runs continuously

NON-CANCER RISK ASSESSMENT: The chronic non-cancer health risk is determined for a given pollutant by dividing the pollutant's annual average ambient air concentration (µg/m^3) by the chronic reference exposure level of that pollutant in order to obtain the chronic hazard index (HI). The acute non-cancer health risk is determined by dividing the pollutant's maximum hourly ambient air concentration (µg/m^3) by the acute reference exposure level in order to obtain the acute hazard index (HI). In addition, each contaminant can affect different organs of the body and several compounds may affect common organs. Therefore, when there are multiple toxic compounds involved, the effects are additive for the common organs.

A list of chronic or acutely hazardous air contaminants may be found at the OEHHA website www.oehha.ca.gov. The method of calculating the HI numbers (Risk Assessment Guidelines) is also found at this website.

SUMMARY:

Type of Health Risk	Project HRA Results (A)	
	Residential	Worker
Cancer Risk (Chances per Million)	5.0876	0.3117
Acute Non-Cancer (Hazard Index)	0.0478	0.1088
Chronic Non-Cancer (Hazard Index)	0.0129	0.0114

HRA CONCLUSION: The health risk for this project is considered acceptable to the SMAQMD because:

- The evaluated cancer risk for a maximum exposed individual resident (MEIR) is 5.1 in one million. This is below the significant risk threshold. Since the cancer risk is over 1 chance per million, T-BACT will be required.
- The evaluated cancer risk for a maximum exposed individual worker (MEIW) is 0.3 in one million. This is below the significant risk threshold.
- The evaluated noncancer Acute Hazard Index is less than one for the maximum exposed individual resident (MEIR) and the maximum exposed individual worker (MEIW).
- The evaluated noncancer Chronic Hazard Index is less than one for the maximum exposed individual resident (MEIR) and the maximum exposed individual worker (MEIW).

T-BACT will be required because the cancer risk is over 1 chance per million. T-BACT for the IC engines is specified by BACT #363 and is use of an oxidation catalyst with a formaldehyde control of at least 50%. Johnson-Matthey has guaranteed a formaldehyde control of at least 70%. The engines' emissions will be tested for formaldehyde to verify compliance. T-BACT for the boiler is specified by BACT #359 and is compliance with BACT #359 for VOC and PM. As specified above in Section III.2, the boiler will be in compliance with BACT #359 for VOC and PM. The fuel cell is certified to CARB's Distributive Generation standards for VOC, and the District is not aware of any T-BACT standards for fuel cells. The digester gas will be conditioned to remove sulfur to a concentration that does not exceed 40 ppm hydrogen sulfide. Therefore, the project complies with T-BACT and is in compliance with the rule.

Rule 406 – Specific Contaminants

The proposed equipment is not expected to exceed the emissions limit of 0.2% by volume sulfur compound as SO_2 and 0.1 gr/dscf for combustion contaminants calculated to 12% CO_2.

Fuel Cell

Specific Fuel Consumption	=	7,260 Btu/kW-hr
Exhaust Flow Rate	=	10,200 cfm
Digester Gas Flow Rate	=	364 scfm
Digester Gas HHV	=	662 Btu/scf
Exhaust Mass Flow Rate	=	36,600 lb/hr
Molar Volume	=	385.3 ft^3/mol
Fuel Density	=	23.8 cf/lb
Fuel Energy Density	=	63.469 lb fuel/MMBtu
Conversion Factor	=	7,000 gr/lb
PM10 Emission Factor	=	0.000020 lb/MW-hr
SO_2 Emission Factor	=	0.00011 lb/MW-hr
Weight % C in Digester Gas	=	60% or 0.60 lb C/lb fuel
C to CO_2 Conversion Efficiency	=	0.995

PM10 Concentration (combustion contaminants):

= (0.000020 lb/MW-hr) × (kW-hr/7260 Btu) × (MW/1000 kW) × (7,000 gr/lb) × (MMBtu/63.469 lb fuel) × (1,000,000 Btu/MMBtu) × (0.12 mol CO_2/mol exhaust) × (lb fuel/0.60 lb C) × (12.0 lb C/mol C) × (mol C/mol CO_2) × 1/(0.995) × (mol exhaust/385.3 dscf)

= 0.000001902 gr/dscf corrected to 12% CO_2

SO_2 Concentration (% SO_2 by volume):

The following calculation is at 0% excess air which represents worst case.

= (0.00011 lb/MW-hr) × (kW-hr/7260 Btu) × (MW/1000 kW) × (364 scf/min) × (662 Btu/scf) x (min/10,200 scf) × (mol SO_2/64 lb SO_2) × (385.3 dscf/mol exhaust)
= 0.00000000215 mol SO_2/mol exhaust or 0.000000215% SO_2

Boiler

Natural Gas F-Factor	=	8,710 dscf/MMBtu
Molar Volume	=	385.3 ft^3/mol
Digester Gas HHV	=	662 Btu/scf
Fuel Density	=	23.8 lb/scf (AP-42)
Fuel Energy Density	=	63.469 lb fuel/MMBtu
Conversion Factor	=	7,000 gr/lb
PM10 Emission Factor	=	4.9 lb/MMcf
SO_2 Emission Factor	=	9.1 lb/MMcf
Weight % C in Natural Gas	=	60 % or 0.60 lb C/lb fuel
C to CO_2 Conversion Efficiency	=	0.995

PM10 Concentration (combustion contaminants):

= (4.9 lb/MMcf) × (scf/662 Btu) × (7000 gr/lb) × (0.12 mol CO_2/mol exhaust) × (lb fuel/0.60 lb C) × (12.0 lb C/mol C) x (mol C/mol CO_2) × (MMBtu/63.469 lb fuel) ×1/(0.995) x (mol exhaust/385.3 dscf)
= 0.0051105 gr/dscf corrected to 12% CO_2

SO_2 Concentration (% SO_2 by volume):

The following calculation is at 0% excess air which represents worst case.

= (9.1 lb/MMcf) × (scf/662 Btu) × (MMBtu/8,710 dscf) × (mol SO_2/64 lb SO_2) × (385.3 dscf/mol exhaust)
= 0.000009501 mol SO_2/mol exhaust or 0.0009501% SO_2

IC Engines

BSFC	=	5,542 Btu/hp-hr
Natural Gas F-Factor	=	8,710 dscf/MMBtu
Molar Volume	=	385.3 ft^3/mol
Digester Gas HHV	=	662 Btu/scf
Fuel Density	=	23.8 lb/scf (AP-42)
Fuel Energy Density	=	63.469 lb fuel/MMBtu
Conversion Factor	=	7,000 gr/lb
PM10 Emission Factor	=	0.07 g/hp-hr
SO_2 Emission Factor	=	0.025 g/hp-hr
Weight % C in Digester Gas	=	60% or 0.60 lb C/lb fuel
C to CO_2 Conversion Efficiency	=	0.995

PM10 Concentration (combustion contaminants):

= (0.07 g/hp-hr) × (hp-hr/5542 Btu) × (lb/453.59 g) × (1,000,000 Btu/MMBtu) × (7,000 gr/lb) × (0.12 mol CO_2/mol exhaust) × (lb fuel/0.60 lb C) × (12.0 lb C/mol C) × (mol C/mol CO_2) × (MMBtu/63.469 lb fuel) × 1/(0.995) × (mol exhaust/385.3 dscf)
= 0.019226 gr/dscf corrected to 12% CO_2

SO_2 Concentration (% SO_2 by volume):

The following calculation is at 0% excess air which represents worst case.

= (0.025 g/hp-hr) × (hp-hr/5542 Btu) × (lb/453.59 g) × (1,000,000 Btu/MMBtu) × (MMBtu/8,710 dscf) × (mol SO_2/64 lb SO_2) × (385.3 dscf/mol exhaust)
= 0.000006874 mol SO_2/mol exhaust or 0.0006874% SO_2

The equipment emits below the rule emission limit of SO_2 and PM of 0.2% SO_2 by volume and 0.1 grains/ft^3 at 12% CO_2 respectively. Therefore, the emissions from the fuel cell, boiler, and IC engines comply with Rule 406.

Rule 411 – NOx from Boilers, Process Heaters, and Steam Generators.

This rule limits NOx emissions from boilers. The boiler is subject to this rule since the products of combustion do not come in direct contact with the material being heated and the boiler is rated more than 1 MMBtu/hr.

The boiler is rated at 19.95 MMBtu/hr and is required to emit no more than 15 ppm NOx at 3% oxygen and 400 ppm CO at 3% oxygen. The applicant has submitted information from the manufacturer that the boiler will not exceed an emission limit of 9 ppm NOx at 3% oxygen and 400 ppm CO at 3% oxygen. To verify compliance, the boiler will be tested initially within 60 days of start-up and biennially thereafter to comply with rule's testing requirements. The boiler is expected to comply with the rule.

Rule 419 – NOx from Miscellaneous Combustion Units

This rule applies to any miscellaneous combustion unit with a total rated heat input capacity of 2 MMBtu per hour or greater located at a major stationary source of NOx or with a total rated heat input capacity of 5 MMBtu per hour or greater located at any area source of NOx. Since the boiler is subject to Rule 411, it is exempt from Rule 419 per Section 110. The engines are exempt from the rule per Section 114. The fuel cell is not governed by the rule because it is not a combustion unit. This rule does not apply to the equipment.

Rule 420 – Sulfur Content of Fuels

This rule limits the sulfur content of all gaseous fuels to less than 50 grains per 100 cubic foot, calculated as hydrogen sulfide (H_2S). The fuel cell, IC engines, and the boiler will utilize both digester gas and pipeline quality natural gas.

All digester gas burned in the equipment will be pretreated by the digester gas conditioning system. The conditioning system is expected to reduce H_2S emissions to a maximum concentration of 40 ppm using a granular iron oxide media. This equates to 2.5 grains per 100 cubic foot H_2S which complies with the rule. If the gas conditioning system is taken off-line for any reason, the digester gas will not be considered suitable for use in the equipment and will be routed to the flares or elsewhere for destruction. Pipeline quality natural gas in

Sacramento County has a sulfur content of 0.22 grains per 100 cubic foot and also complies with the rule. Therefore, the fuels used in the equipment will comply with the rule.

4. **NSPS COMPLIANCE:** The list of all adopted New Source Performance Standards were reviewed to determine if the proposed project is subject to one or more of these regulations. The following potentially applicable provisions was identified. (https://www.epa.gov/stationary-sources-air-pollution/new-source-performance-standards)

   40 CFR 60, SUBPART Dc - Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units. This regulation applies to steam generating units with a heat input rate of greater than or equal to 10 MMBtu/hr but less than or equal to 100 MMBtu/hr. The regulation applies to the proposed boiler because it is rated at 19.95 MMBtu/hr. There are no emissions standards for natural gas or digester gas fired boilers in this rule. Records are required to be kept for natural gas and digester gas usage but only if these fuels are used with regulated fuels (e.g. coal, wood, oil) to demonstrate compliance with the SO_2 standards. Therefore, since natural gas and digester gas are not used with these other fuels, the recordkeeping standards of the regulation do not apply to the boiler.

   40 CFR 60, SUBPART JJJJ – Standards of Performance for Stationary Spark Ignition Internal Combustion Engines: This regulation is applicable to any of the following:
   1. Manufacturers of engines rated less than or equal to 25 HP and are manufactured on or after July 1, 2008.
   2. Manufacturers of engines rated greater than 25 HP that are gasoline fueled or that are rich burn engines fueled by liquefied petroleum gas (LPG), and where the date of manufacture is on or after July 1, 2008, or on or after January 1, 2009 for emergency engines.
   3. Manufacturers of engines rated greater than 25 HP that are not gasoline fueled and are not rich burn engines fueled by LPG, where the manufacturer participates in the voluntary manufacturer certification program and where the manufacture date is:
      (i) on or after July 1, 2007 for engines rated greater than or equal to 500 HP (except lean burn engines rated greater than 500 HP and less than 1,350 HP);
      (ii) on or after January 1, 2008 for lean burn engines rated greater than 500 HP and less than 1,350 HP;
      (iii) on or after July 1, 2008 for engines rated less than 500 HP; or
      (iv) on or after January 1, 2009 for emergency engines.
   4. Owners or operators of engines that commence construction after June 12, 2006 where the engine is manufactured:
      (i) on or after July 1, 2007 for engines rated greater than or equal to 500 HP (except lean burn engines rated greater than or equal to 500 HP and less than 1,350 HP);
      (ii) on or after January 1, 2008 for lean burn engines rated greater than or equal to 500 HP and less than 1,350 HP;
      (iii) on or after July 1, 2008 for engines rated less than 500 HP; or
      (iv) on or after January 1, 2009 for emergency engines rated greater than 25 HP
   5. Owners and operators of engines that modify or reconstruct their engine after June 12, 2006.

   Each proposed engine is a digester gas-fired, lean burn spark ignited non-emergency engine rated at 3,681 bhp where construction commenced after June 12, 2006. To comply with the regulation, each engine must meet the following emission standards given in Table 1 in accordance with 40 CFR §60.4233(e):

Pollutant	Emission Standards g/hp-hr (ppmv at 15% O_2)	Proposed Emissions (A) (ppmv at 15% O_2)
NOx	2.0 (150)	11
CO	5.0 (610)	70
VOC	1.0 (80)	30

(A) Emissions are from Johnson Matthey for the proposed Jenbachers engines equipped with an oxidation catalyst and SCR unit.

Each engine is new and non-certified. As a non-certified engine, the owner or operator must do the following to demonstrate compliance with per 40 CFR §60.4243(b):

1. The owner/operator must keep a maintenance plan and records of conducted maintenance and must, to the extent practicable,
2. Maintain and operate the engine in a manner consistent with good air pollution control practice for minimizing emissions, and
3. Conduct an initial performance test and conduct subsequent performance testing every 8,760 hours or 3 years, whichever comes first, thereafter to demonstrate compliance. Testing must be conducted in accordance with 40 CFR §60.4244:
   (i) Performance test must be conducted within 10% of 100% peak (or the highest achievable) load.
   (ii) Performance test must not be conducted during periods of startup, shutdown, or malfunction.
   (iii) Performance test must consist of three test runs with each test run lasting at least one hour.

The facility is allowed to choose whether it will meet the standard given in units of g/hp-hr or ppmvd at 15% oxygen. The Authorities to Construct will require that the engines are tested in accordance with this NSPS to verify that the standards are met.

4. NESHAP COMPLIANCE:

NESHAPs under 40 CFR 61: The list of all adopted National Emission Standards for Hazardous Air Pollutants were reviewed to determine if the proposed project is subject to one or more of these regulations. There are no 40 CFR, Part 61 NESHAPs applicable to these source categories. (https://www.epa.gov/stationary-sources-air-pollution/national-emission-standards-hazardous-air-pollutants-neshap-8)

NESHAPs under 40 CFR 63: The District has not requested nor obtained delegation of Part 63 NESHAPs. However, these NESHAPS are being enforced as state Air Toxic Control Measures (ATCMs) pursuant to Health and Safety Code, Sections 39658(b) and 39666(d). The list of all adopted National Emission Standards for Hazardous Air Pollutants were reviewed to determine if the proposed project is subject to one or more of these regulations. Two potentially applicable provisions were identified: (https://www.epa.gov/stationary-sources-air-pollution/national-emission-standards-hazardous-air-pollutants-neshap-8)

For reference purposes, 40 CFR 63, SUBPART JJJJJJ – National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers at Area Sources will be discussed here. This rule applies if you own or operate a boiler combusting solid fossil fuels, biomass, or liquid fuels located at an area source except for emergencies, gas curtailment, or periodic testing. Periodic testing of liquid fuel shall not exceed a combined total of 48 hours during any calendar year. Gas-fired boilers are not covered under this subpart

per Section 63.11195. Gas-fired boilers are further defined in this subpart as any boiler that burns gaseous fuels that are not combined with any solid fuels and only burns liquid fuels under certain circumstances. Gaseous fuels are further defined as including natural gas, landfill gas, and biogas. Since the boiler will only be fired with gaseous fuels (e.g. digester gas and natural gas), this regulation does not apply.

40 CFR 63, SUBPART ZZZZ – National Emission Standard for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines establishes national emission limitations and operating limitations for Hazardous Air Pollutants (HAP) emitted from stationary reciprocating internal combustion engines (RICE) located at both major and area sources of HAP emissions.

The engines are subject to this subpart because they are existing, new, or reconstructed stationary RICEs at an area source or major source of HAP emissions. In accordance with Section 63.6590(c), each engine will comply with this subpart by being in compliance with Subpart JJJJ. Therefore, the engines are in compliance with this regulation.

5. **ATCM COMPLIANCE:** The list of all adopted Airborne Toxic Control Measures was reviewed to determine if the proposed project is subject to one or more of these regulations. There are currently no ATCMs applicable to this source category. (https://ww2.arb.ca.gov/resources/documents/airborne-toxic-control-measures)

IV. RECOMMENDATION: The fuel cell, boiler, and IC engines should comply with all applicable District rules and regulations. Authorities to construct the equipment should be issued to Sacramento Area Sewer District with the following conditions.

Refer to conditions in Authority to Construct No. 27780, 27781, 27782, 27783, 27784, 27785

REVIEWED BY: Ali Othman **DATE:** 7-23-2024

APPROVED BY: Brian F Krebs **DATE:** 07-25-2024

A/C Evaluation
27780, 27781, 27782, 27783, 27784, 27785

Appendix A

Process Flow Diagram

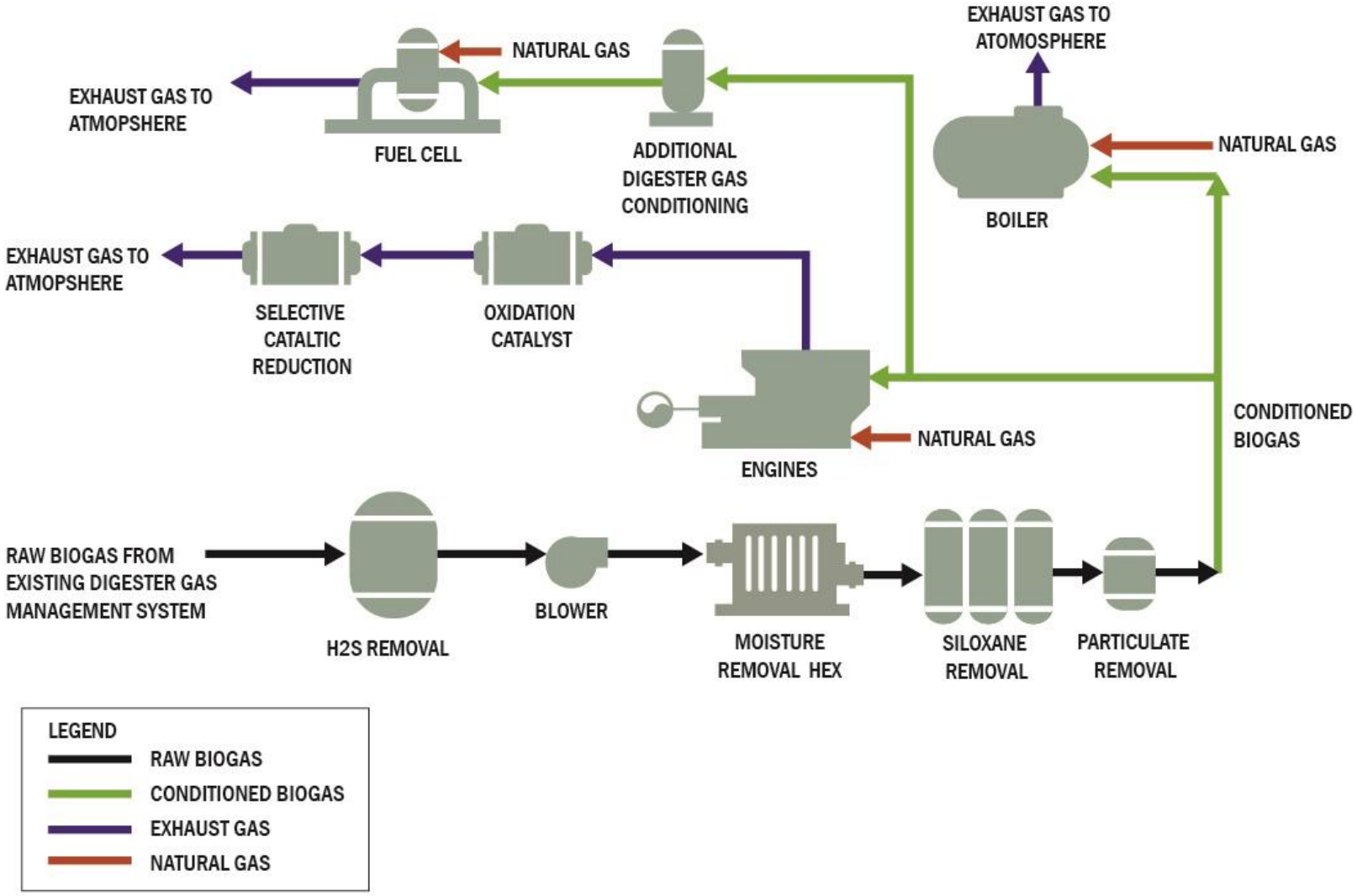


Figure 2-1. Simplified process flow diagram of proposed project

A/C Evaluation
27780, 27781, 27782, 27783, 27784, 27785

Appendix B

Carbon Monoxide Modeling

Rule 202, Section 302.7 Modeling Parameters and Results

Carbon Monoxide Emissions

A/C No.	Equipment	Carbon Monoxide Emissions (A)	
		(lb/day)	(grams/second)
27780	Fuel Cell	6.72	0.03528
27781	Boiler	141.47	0.74270
27782	Engine 1	126.60	0.66464
27783	Engine 2	126.60	0.66464
27784	Engine 3	126.60	0.66464
27785	Engine 4	126.60	0.66464

(A) Emissions are based on continuous operation for 24 hours per day.

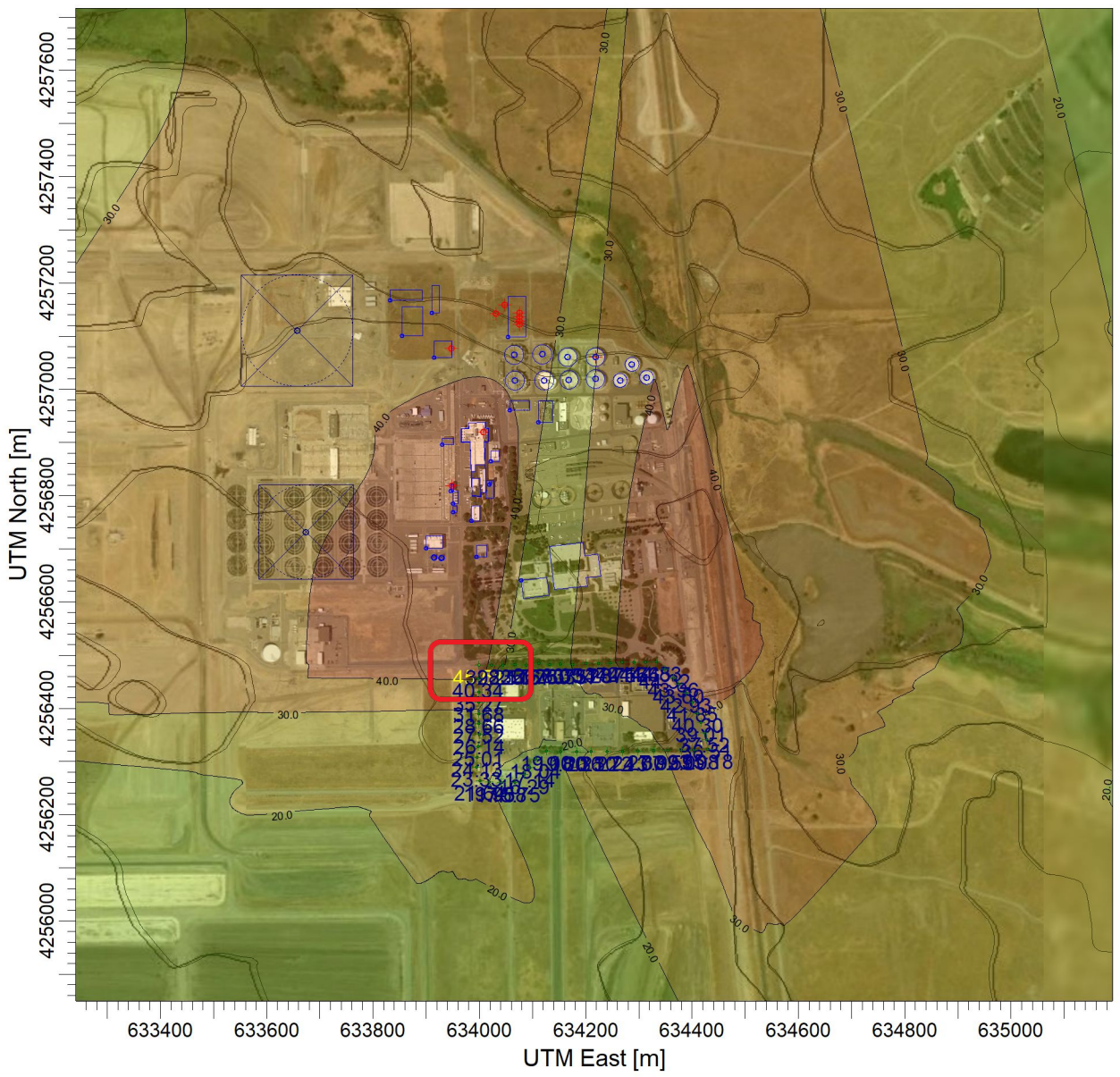
Model Results

The project's highest offsite, ground level, 8 hour average CO concentration is 45.51 $\mu g/m^3$

Rule 202, Section 302.7 Limit is 500 $\mu g/m^3$. ERCs are required if the project's CO concentration is higher than this limit.

PROJECT TITLE:

Rule 202, Section 302.7 Emission Modeling
Overview Map



COMMENTS:

SOURCES:
14

RECEPTORS:
2192

OUTPUT TYPE:
Concentration

MAX:
45.5 ug/m^3

COMPANY NAME:

MODELER:

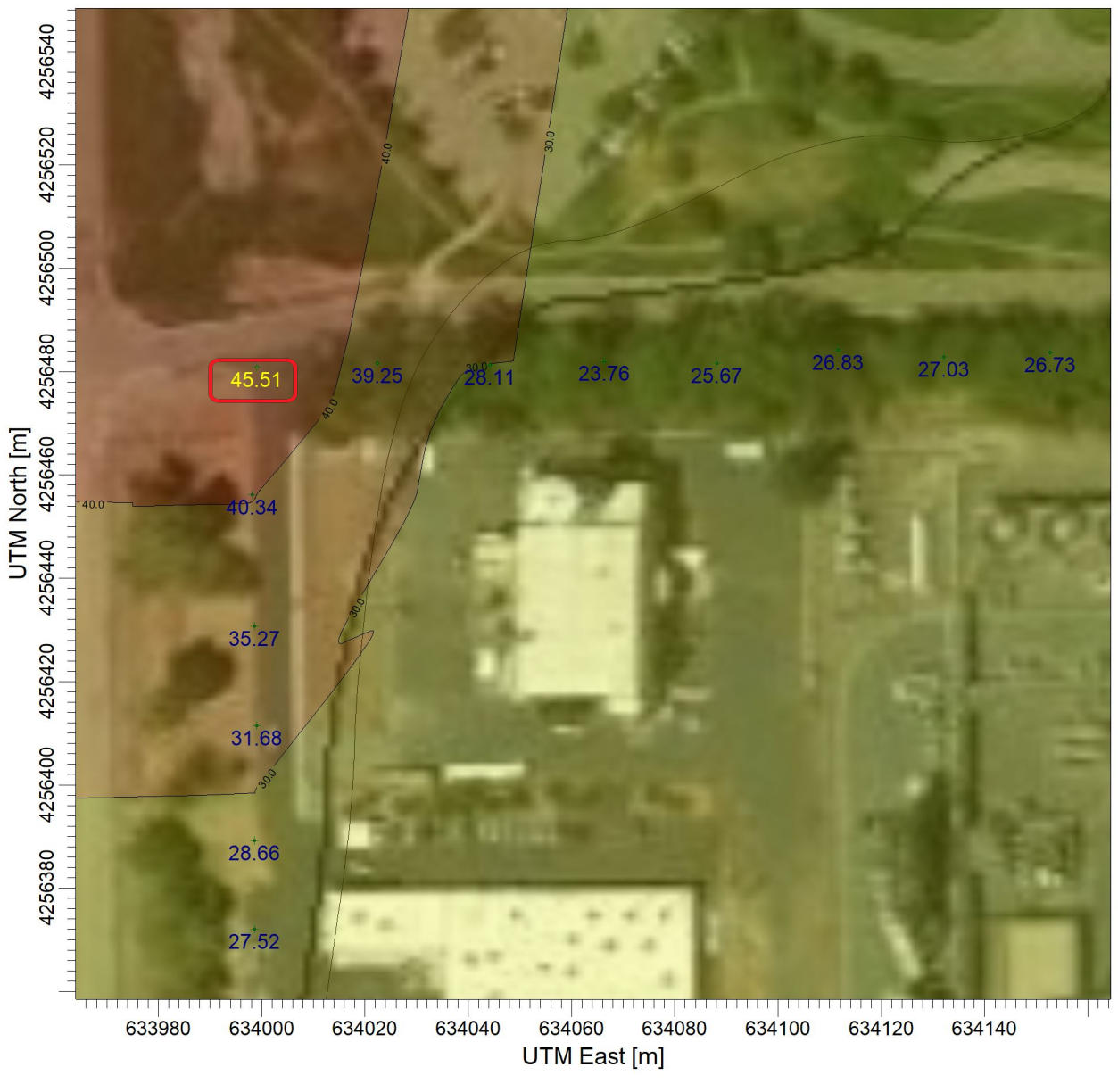
DATE:
6/12/2024

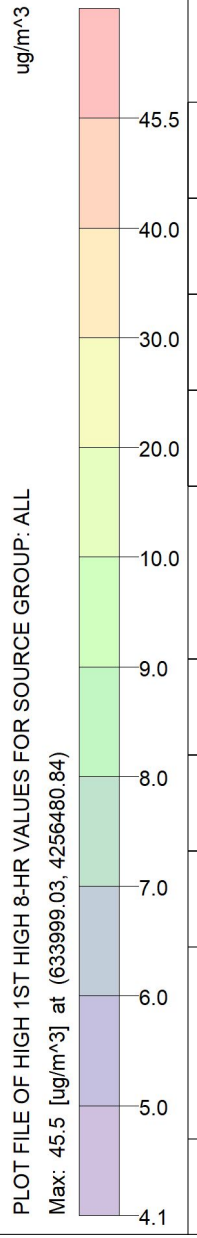
SCALE: 1:12,716
0 0.4 km

PROJECT NO.:

PROJECT TITLE:

Rule 202, Section 302.7 Emission Modeling
Highest 8 Hour Average CO Concentration = 45.51 micrograms/m3





COMMENTS:

SOURCES:
14

RECEPTORS:
2192

OUTPUT TYPE:
Concentration

MAX:
45.5 ug/m^3

COMPANY NAME:

MODELER:

DATE:
6/12/2024

SCALE: 1:1,307
0 0.03 km

PROJECT NO.:

```
** RECEPTOR CONCENTRATIONS AND ELEVATIONS DELETED FOR BREVITY **
**
****************************************
**
** AERMOD Input Produced by:
** AERMOD View Ver. 11.2.0
** Lakes Environmental Software Inc.
** Date: 6/12/2024
** File: C:\Users\jeffw\OneDrive - SMAQMD\Desktop\27780 27781 27782 27783 27784 27785 CO\27780 27781 27782 27783 27784
27785.ADI
**
****************************************
**
**
 **********************************
 *** SETUP Finishes Successfully ***
 **********************************

  *** AERMOD - VERSION 22112  ***   *** C:\Users\jeffw\Desktop\24421 et al\24421 et al.isc                   ***
06/12/24
 *** AERMET - VERSION  19191 ***   ***                                                                       ***
10:30:02
                                                                                                                              PAGE
1
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  RURAL  ADJ_U*

                                            ***     MODEL SETUP OPTIONS SUMMARY       ***
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
-

 ** Model Options Selected:
      * Model Uses Regulatory DEFAULT Options
      * Model Is Setup For Calculation of Average CONCentration Values.
      * NO GAS DEPOSITION Data Provided.
      * NO PARTICLE DEPOSITION Data Provided.
      * Model Uses NO DRY DEPLETION. DDPLETE  =  F
      * Model Uses NO WET DEPLETION. WETDPLT  =  F
      * Stack-tip Downwash.
      * Model Accounts for ELEVated Terrain Effects.
      * Use Calms Processing Routine.
      * Use Missing Data Processing Routine.
      * No Exponential Decay.
      * Model Uses RURAL Dispersion Only.
      * ADJ_U*   - Use ADJ_U* option for SBL in AERMET
      * CCVR_Sub - Meteorological data includes CCVR substitutions
      * TEMP_Sub - Meteorological data includes TEMP substitutions
      * Model Assumes No FLAGPOLE Receptor Heights.
      * The User Specified a Pollutant Type of: CO

 **Model Calculates  1 Short Term Average(s) of:   8-HR

 **This Run Includes:     14 Source(s);      15 Source Group(s); and    2192 Receptor(s)

                with:     10 POINT(s), including
                           0 POINTCAP(s) and      0 POINTHOR(s)
                 and:      4 VOLUME source(s)
                 and:      0 AREA type source(s)
                 and:      0 LINE source(s)
                 and:      0 RLINE/RLINEXT source(s)
                 and:      0 OPENPIT source(s)
                 and:      0 BUOYANT LINE source(s) with a total of     0 line(s)
                 and:      0 SWPOINT source(s)


 **Model Set To Continue RUNning After the Setup Testing.

 **The AERMET Input Meteorological Data Version Date:  19191

 **Output Options Selected:
          Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
          Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
          Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

 **NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                 m for Missing Hours
                                                                 b for Both Calm and Missing Hours

 **Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =     6.00 ;  Decay Coef. =    0.000     ;  Rot. Angle =     0.0
```

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BLDG EXISTS	URBAN SOURCE	CAP/ HOR VARY BY	EMIS RATE SCALAR
STCK1	0	0.00000E+00	634007.3	4256920.0	3.7	33.53	293.00	1801.71	1.37	YES	NO	NO	
STCK3	0	0.00000E+00	633948.6	4256818.1	3.7	18.29	293.00	1008.86	1.40	YES	NO	NO	
STCK5	0	0.00000E+00	634218.1	4257061.1	3.2	12.80	293.15	574.44	0.30	YES	NO	NO	
STCK6	0	0.00000E+00	633947.3	4257076.8	3.3	3.05	293.00	18.29	7.69	YES	NO	NO	
STCK7	0	0.66464E+00	634075.1	4257122.0	2.1	13.41	635.93	10.19	0.64	YES	NO	NO	
STCK8	0	0.66464E+00	634075.1	4257129.1	1.9	13.41	635.93	10.19	0.64	YES	NO	NO	
STCK9	0	0.66464E+00	634075.1	4257136.1	1.8	13.41	635.93	10.19	0.64	YES	NO	NO	
STCK10	0	0.66464E+00	634075.1	4257143.2	1.8	13.41	635.93	10.19	0.64	YES	NO	NO	
STCK11	0	0.74270E+00	634047.2	4257158.4	1.9	13.41	383.15	11.84	0.61	YES	NO	NO	
STCK12	0	0.35279E-01	634031.7	4257143.1	2.2	7.01	369.26	12.12	0.71	YES	NO	NO	

*** VOLUME SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	RELEASE HEIGHT (METERS)	INIT. SY (METERS)	INIT. SZ (METERS)	URBAN SOURCE	EMISSION RATE SCALAR VARY BY
VOL1	0	0.00000E+00	633657.1	4257110.3	3.0	2.13	48.68	1.00	NO	
VOL2	0	0.00000E+00	633674.0	4256731.6	4.3	0.00	41.14	0.00	NO	
VOL3	0	0.00000E+00	632870.5	4256736.9	2.2	3.70	89.96	1.50	NO	
VOL4	0	0.00000E+00	632709.1	4255502.8	3.2	3.70	134.97	1.50	NO	

*** SOURCE IDs DEFINING SOURCE GROUPS ***

SRCGROUP ID	SOURCE IDs							
STCK1	STCK1 ,							
STCK3	STCK3 ,							
STCK5	STCK5 ,							
STCK6	STCK6 ,							
VOL1	VOL1 ,							
VOL2	VOL2 ,							
VOL3	VOL3 ,							
VOL4	VOL4 ,							
STCK10	STCK10 ,							
STCK11	STCK11 ,							
STCK12	STCK12 ,							
STCK7	STCK7 ,							
STCK8	STCK8 ,							
STCK9	STCK9 ,							
ALL	STCK1 ,	STCK3 ,	STCK5 ,	STCK6 ,	VOL1 ,	VOL2 ,	VOL3 ,	VOL4 ,
	STCK7 ,	STCK8 ,	STCK9 ,	STCK10 ,	STCK11 ,	STCK12 ,		

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
(1=YES; 0=NO)

```
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1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
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1 1 1 1 1 1 1 1 1 1  1 1 1 1 1
```

NOTE: METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: N:\PERMITTING\Modeling\AermodMet 19191\Exec\14-18.SFC Met Version: 19191
Profile file: N:\PERMITTING\Modeling\AermodMet 19191\Exec\14-18.PFL
Surface format: FREE
Profile format: FREE
Surface station no.: 23232 Upper air station no.: 23230
Name: SACRAMENTO/EXECUTIVE_ARPT Name: OAKLAND/WSO_AP
Year: 2014 Year: 2014

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
14	01	01	1	01	-1.4	0.061	-9.000	-9.000	-999.	36.	14.2	0.04	0.93	1.00	0.62	152.	10.1	274.9	2.0
14	01	01	1	02	-4.9	0.096	-9.000	-9.000	-999.	72.	16.7	0.16	0.93	1.00	1.08	107.	10.1	274.2	2.0
14	01	01	1	03	-5.3	0.100	-9.000	-9.000	-999.	76.	17.3	0.16	0.93	1.00	1.13	95.	10.1	274.2	2.0
14	01	01	1	04	-2.4	0.075	-9.000	-9.000	-999.	49.	15.4	0.16	0.93	1.00	0.70	117.	10.1	273.8	2.0
14	01	01	1	05	-3.8	0.084	-9.000	-9.000	-999.	59.	14.5	0.11	0.93	1.00	1.03	120.	10.1	273.1	2.0
14	01	01	1	06	-2.3	0.072	-9.000	-9.000	-999.	46.	14.5	0.11	0.93	1.00	0.74	128.	10.1	273.1	2.0
14	01	01	1	07	-1.3	0.061	-9.000	-9.000	-999.	36.	16.0	0.05	0.93	1.00	0.53	232.	10.1	273.1	2.0
14	01	01	1	08	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.08	0.93	0.76	0.00	0.	10.1	273.1	2.0
14	01	01	1	09	-1.5	0.085	-9.000	-9.000	-999.	60.	38.3	0.11	0.93	0.40	1.03	133.	10.1	278.1	2.0
14	01	01	1	10	40.2	0.170	0.461	0.019	88.	168.	-11.2	0.11	0.93	0.28	1.50	122.	10.1	281.4	2.0
14	01	01	1	11	74.7	0.195	0.704	0.017	170.	206.	-9.0	0.11	0.93	0.23	1.67	140.	10.1	283.8	2.0
14	01	01	1	12	94.4	0.181	0.832	0.016	222.	184.	-5.7	0.04	0.93	0.22	1.88	157.	10.1	286.4	2.0
14	01	01	1	13	97.3	0.170	0.891	0.014	265.	168.	-4.6	0.04	0.93	0.22	1.71	173.	10.1	287.5	2.0
14	01	01	1	14	84.1	0.178	0.894	0.013	309.	181.	-6.1	0.04	0.93	0.23	1.81	202.	10.1	289.2	2.0
14	01	01	1	15	54.8	0.119	0.824	0.012	371.	99.	-2.8	0.04	0.93	0.26	1.08	189.	10.1	289.9	2.0
14	01	01	1	16	12.2	0.060	0.506	0.012	384.	36.	-1.6	0.04	0.93	0.35	0.52	169.	10.1	288.8	2.0
14	01	01	1	17	-2.3	0.067	-9.000	-9.000	-999.	42.	11.9	0.04	0.93	0.60	0.96	173.	10.1	286.4	2.0
14	01	01	1	18	-1.7	0.066	-9.000	-9.000	-999.	40.	15.2	0.09	0.93	1.00	0.62	252.	10.1	283.8	2.0
14	01	01	1	19	-1.7	0.069	-9.000	-9.000	-999.	43.	17.0	0.15	0.93	1.00	0.55	79.	10.1	281.4	2.0
14	01	01	1	20	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.08	0.93	1.00	0.00	0.	10.1	280.4	2.0
14	01	01	1	21	-1.7	0.062	-9.000	-9.000	-999.	37.	13.4	0.04	0.93	1.00	0.69	7.	10.1	279.2	2.0
14	01	01	1	22	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.08	0.93	1.00	0.00	0.	10.1	278.1	2.0
14	01	01	1	23	-1.3	0.060	-9.000	-9.000	-999.	35.	14.8	0.04	0.93	1.00	0.58	28.	10.1	277.5	2.0
14	01	01	1	24	-2.2	0.067	-9.000	-9.000	-999.	42.	12.2	0.04	0.93	1.00	0.87	24.	10.1	277.5	2.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
14	01	01	01	10.1	1	152.	0.62	274.9	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

*** AERMOD - VERSION 22112 *** *** C:\Users\jeffw\Desktop\24421 et al\24421 et al.isc ***
06/12/24
*** AERMET - VERSION 19191 *** *** ***
10:30:02

*** MODELOPTs: RegDFAULT CONC ELEV RURAL ADJ_U*

*** THE 1ST HIGHEST 8-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: ALL ***
INCLUDING SOURCE(S): STCK1 , STCK3 , STCK5 , STCK6 , VOL1
,
VOL2 , VOL3 , VOL4 , STCK7 , STCK8 , STCK9 , STCK10 , STCK11
,
STCK12 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF CO IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	(YYMMDDHH)	X-COORD (M)	Y-COORD (M)	CONC	(YYMMDDHH)
634410.16	4256390.90	40.29652	(14122524)	634417.15	4256373.23	39.00573	(14122524)
634422.90	4256354.75	37.51748	(14122524)	634427.41	4256340.79	36.51094	(14122524)

634429.88	4256322.72	35.17913	(14122524)	634402.77	4256321.48	33.08263	(18012724)
634379.77	4256321.07	32.09421	(18012724)	634354.72	4256321.07	30.58893	(14122608)
634327.61	4256320.66	27.98773	(14122608)	634298.45	4256319.84	24.07399	(14102324)
634269.70	4256318.61	22.12585	(18101424)	634240.12	4256318.61	21.71554	(18101424)
634210.14	4256318.61	20.30322	(18101424)	634183.44	4256318.20	18.36420	(15022224)
634153.05	4256319.02	18.99570	(15022224)	634126.35	4256319.43	18.99910	(15022224)
634105.00	4256304.23	18.04367	(15022224)	634094.73	4256288.21	17.13843	(15022224)
634083.64	4256275.07	16.29166	(15022224)	634066.80	4256260.29	15.74685	(16043024)
634041.33	4256260.29	17.57932	(14031208)	634000.67	4256263.57	21.63701	(14031208)
634018.74	4256261.93	19.97802	(14031208)	633998.21	4256456.20	40.34474	(18020708)
633998.62	4256430.74	35.26547	(18020708)	633999.03	4256411.43	31.68137	(18020708)
633998.62	4256389.25	28.65666	(14031208)	633998.62	4256372.00	27.52409	(14031208)
633999.85	4256351.06	26.14412	(14031208)	633998.21	4256328.05	25.01209	(14031208)
633995.74	4256307.52	24.13118	(14031208)	633994.51	4256289.45	23.32860	(14031208)

*** MODELOPTs: RegDFAULT CONC ELEV RURAL ADJ_U*

*** THE SUMMARY OF HIGHEST 8-HR RESULTS ***

** CONC OF CO IN MICROGRAMS/M**3 **

NETWORK GROUP ID / GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)					OF TYPE
STCK1	HIGH	1ST HIGH VALUE IS	0.00000	ON 00000000:	AT (0.00,	0.00,	0.00,	0.00,	0.00)	
STCK3	HIGH	1ST HIGH VALUE IS	0.00000	ON 00000000:	AT (0.00,	0.00,	0.00,	0.00,	0.00)	
STCK5	HIGH	1ST HIGH VALUE IS	0.00000	ON 00000000:	AT (0.00,	0.00,	0.00,	0.00,	0.00)	
STCK6	HIGH	1ST HIGH VALUE IS	0.00000	ON 00000000:	AT (0.00,	0.00,	0.00,	0.00,	0.00)	
VOL1	HIGH	1ST HIGH VALUE IS	0.00000	ON 00000000:	AT (0.00,	0.00,	0.00,	0.00,	0.00)	
VOL2	HIGH	1ST HIGH VALUE IS	0.00000	ON 00000000:	AT (0.00,	0.00,	0.00,	0.00,	0.00)	
VOL3	HIGH	1ST HIGH VALUE IS	0.00000	ON 00000000:	AT (0.00,	0.00,	0.00,	0.00,	0.00)	
VOL4	HIGH	1ST HIGH VALUE IS	0.00000	ON 00000000:	AT (0.00,	0.00,	0.00,	0.00,	0.00)	
STCK10	HIGH	1ST HIGH VALUE IS	9.48803	ON 18020708:	AT (633999.03,	4256480.84,	3.57,	3.57,	0.00)	DC
STCK11	HIGH	1ST HIGH VALUE IS	13.18862	ON 16011008:	AT (634290.64,	4256486.18,	4.57,	4.57,	0.00)	DC
STCK12	HIGH	1ST HIGH VALUE IS	0.98309c	ON 15021608:	AT (634349.38,	4256474.27,	4.57,	4.57,	0.00)	DC
STCK7	HIGH	1ST HIGH VALUE IS	8.72433	ON 14122608:	AT (634332.95,	4256487.83,	4.57,	4.57,	0.00)	DC
STCK8	HIGH	1ST HIGH VALUE IS	8.68713	ON 14122608:	AT (634332.95,	4256487.83,	4.57,	4.57,	0.00)	DC

STCK9   HIGH   1ST HIGH VALUE IS   9.20019 ON 18020708: AT (633999.03, 4256480.84,   3.57,   3.57,   0.00) DC

ALL   HIGH   1ST HIGH VALUE IS   45.50698 ON 18020708: AT (633999.03, 4256480.84,   3.57,   3.57,   0.00) DC

 *** RECEPTOR TYPES: GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
  *** AERMOD - VERSION 22112 ***   *** C:\Users\jeffw\Desktop\24421 et al\24421 et al.isc   ***
06/12/24
 *** AERMET - VERSION 19191 ***   ***   ***
10:30:02
                                                                                                                PAGE
456
 *** MODELOPTs: RegDFAULT CONC ELEV RURAL ADJ_U*

 *** Message Summary : AERMOD Model Execution ***

  --------- Summary of Total Messages --------

 A Total of   0 Fatal Error Message(s)
 A Total of   14 Warning Message(s)
 A Total of   1576 Informational Message(s)

 A Total of   43680 Hours Were Processed

 A Total of   643 Calm Hours Identified

 A Total of   933 Missing Hours Identified (2.14 Percent)

    ******** FATAL ERROR MESSAGES ********
               *** NONE ***

    ********   WARNING MESSAGES   ********
 SO W320   64   PPARM: Input Parameter May Be Out-of-Range for Parameter   QS
 SO W320   64   PPARM: Input Parameter May Be Out-of-Range for Parameter   VS
 SO W320   65   PPARM: Input Parameter May Be Out-of-Range for Parameter   QS
 SO W320   65   PPARM: Input Parameter May Be Out-of-Range for Parameter   VS
 SO W320   66   PPARM: Input Parameter May Be Out-of-Range for Parameter   QS
 SO W320   66   PPARM: Input Parameter May Be Out-of-Range for Parameter   VS
 SO W320   67   PPARM: Input Parameter May Be Out-of-Range for Parameter   QS
 SO W320   68   VPARM: Input Parameter May Be Out-of-Range for Parameter   QS
 SO W320   69   VPARM: Input Parameter May Be Out-of-Range for Parameter   QS
 SO W320   69   VPARM: Input Parameter May Be Out-of-Range for Parameter   SZINIT
 SO W320   70   VPARM: Input Parameter May Be Out-of-Range for Parameter   QS
 SO W320   71   VPARM: Input Parameter May Be Out-of-Range for Parameter   QS
 ME W186   467   MEOPEN: THRESH_1MIN 1-min ASOS wind speed threshold used   0.50
 ME W187   467   MEOPEN: ADJ_U* Option for Stable Low Winds used in AERMET

    ****
    *** AERMOD Finishes Successfully ***
    ****

A/C Evaluation
27780, 27781, 27782, 27783, 27784, 27785

Appendix C

Health Risk Assessment

POINTS OF MAXIMUM IMPACT

HARP POINT OF MAXIMUM IMPACT REPORT FOR RESIDENT CANCER RISK 6/5/2024 3:21:28 PM
RISK SCENARIO: NCAcute

LINE	REC	TYPE	X	Y	CANCER RISK
1	1204	ALL	634336	4258201	5.0876000e-06
2	1205	ALL	634355	4258205	5.0754000e-06
3	1203	ALL	634316	4258198	5.0714000e-06
4	1206	ALL	634374	4258209	5.0489000e-06
5	1207	ALL	634393	4258212	5.0126000e-06
6	1208	ALL	634412	4258216	4.9664000e-06
7	1217	ALL	634350	4258230	4.9649000e-06
8	1216	ALL	634331	4258226	4.9638000e-06
9	1218	ALL	634369	4258233	4.9488000e-06
10	1215	ALL	634312	4258222	4.9442000e-06

HARP POINT OF MAXIMUM IMPACT FOR RESIDENT CHRONIC RISK 6/5/2024 3:22:19 PM

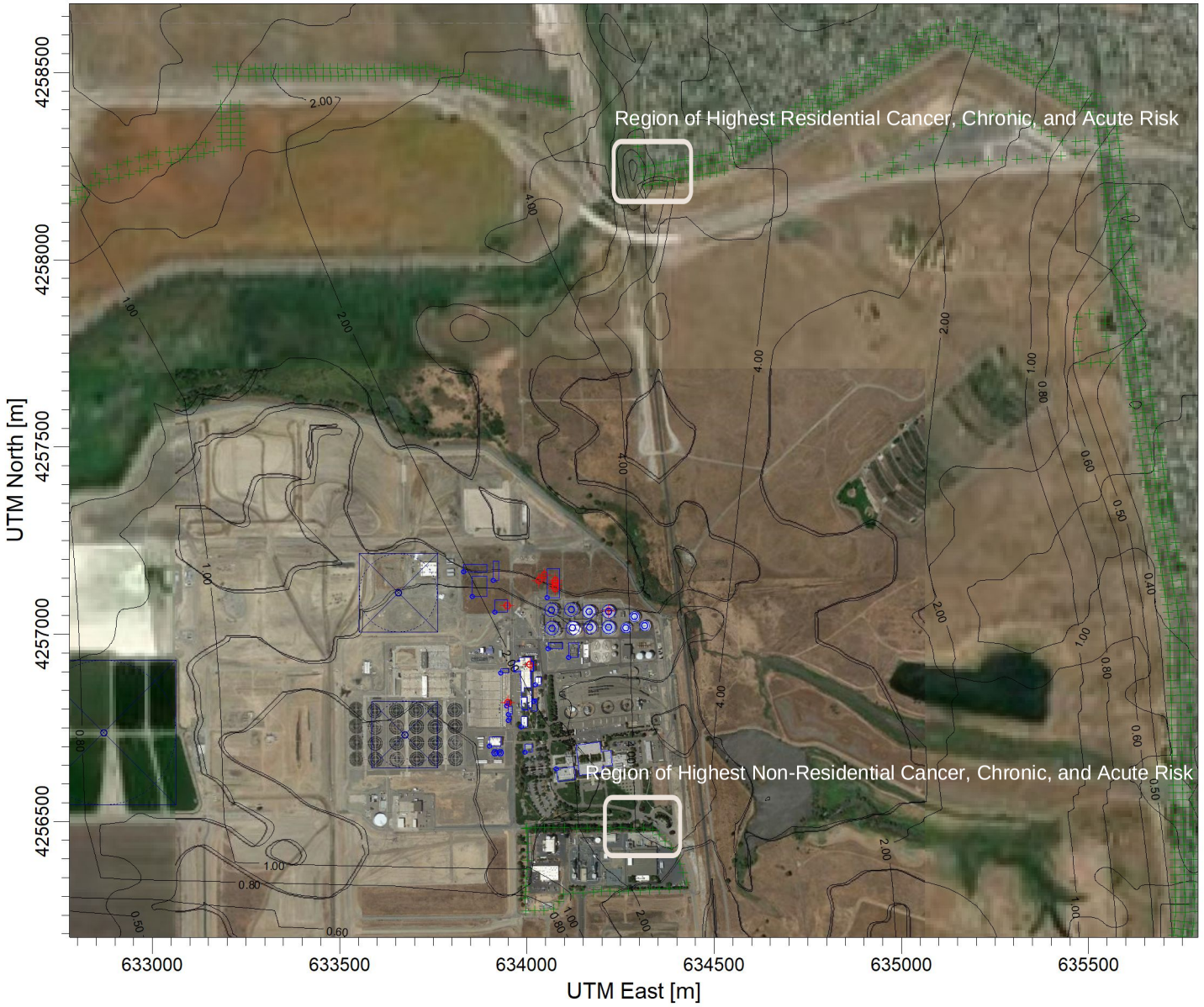
LINE	REC	TYPE	X	Y	CHRONIC RISK
1	1204	ALL	634336	4258201	1.2925000e-02
2	1203	ALL	634316	4258198	1.2895000e-02
3	1205	ALL	634355	4258205	1.2884000e-02
4	1206	ALL	634374	4258209	1.2807000e-02
5	1207	ALL	634393	4258212	1.2706000e-02
6	1216	ALL	634331	4258226	1.2611000e-02
7	1217	ALL	634350	4258230	1.2604000e-02
8	1208	ALL	634412	4258216	1.2580000e-02
9	1215	ALL	634312	4258222	1.2573000e-02
10	1218	ALL	634369	4258233	1.2553000e-02

HARP POINT OF MAXIMUM IMPACT FOR WORKER ACUTE RISK 6/5/2024 3:23:01 PM

LINE	REC	TYPE	X	Y	ACUTE RISK
1	2188	ALL	634278	4256481	1.0881000e-01
2	2189	ALL	634251	4256483	1.0729000e-01
3	2186	ALL	634336	4256480	1.0680000e-01
4	2227	ALL	634353	4256465	1.0627000e-01
5	2199	ALL	633999	4256483	1.0564000e-01
6	2228	ALL	634369	4256448	1.0482000e-01
7	2187	ALL	634312	4256482	1.0445000e-01
8	2198	ALL	633997	4256480	1.0431000e-01
9	2229	ALL	634385	4256430	1.0200000e-01
10	2197	ALL	634023	4256484	1.0072000e-01

PROJECT TITLE:

SacSewer Biogen Project
Overview Map



COMMENTS:

SOURCES:
14

RECEPTORS:
2233

OUTPUT TYPE:
Concentration

MAX:
5.09 ug/m^3

COMPANY NAME:

MODELER:

DATE:
6/6/2024

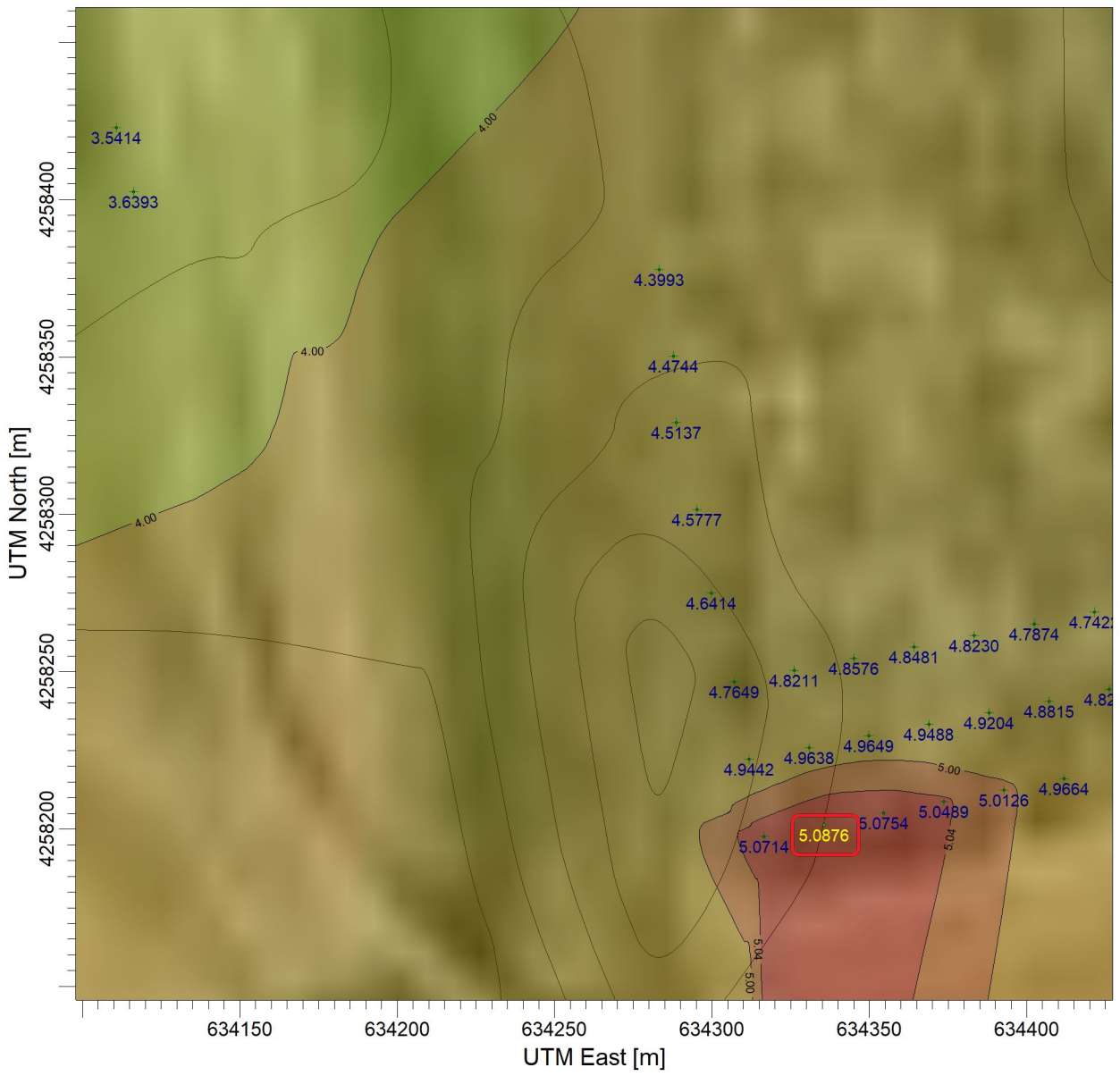
SCALE: 1:16,977
0 0.5 km

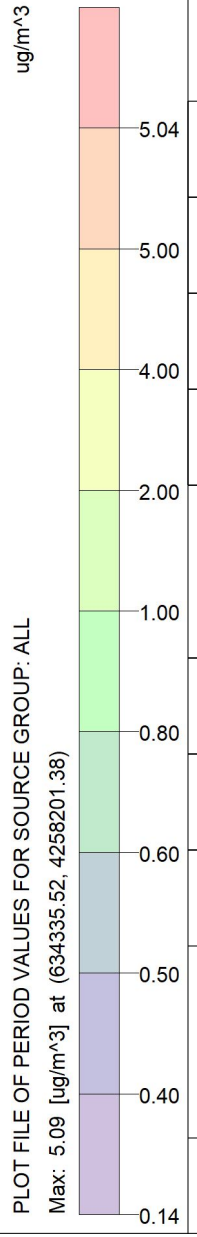
PROJECT NO.:

PROJECT TITLE:

SacSewer Biogen Project

Highest Resident Cancer Risk is 5.0876 Chances per Million





COMMENTS:

SOURCES:

14

RECEPTORS:

2233

OUTPUT TYPE:

Concentration

MAX:

5.09 ug/m^3

COMPANY NAME:

MODELER:

DATE:

6/5/2024

SCALE: 1:2,148

0 0.05 km

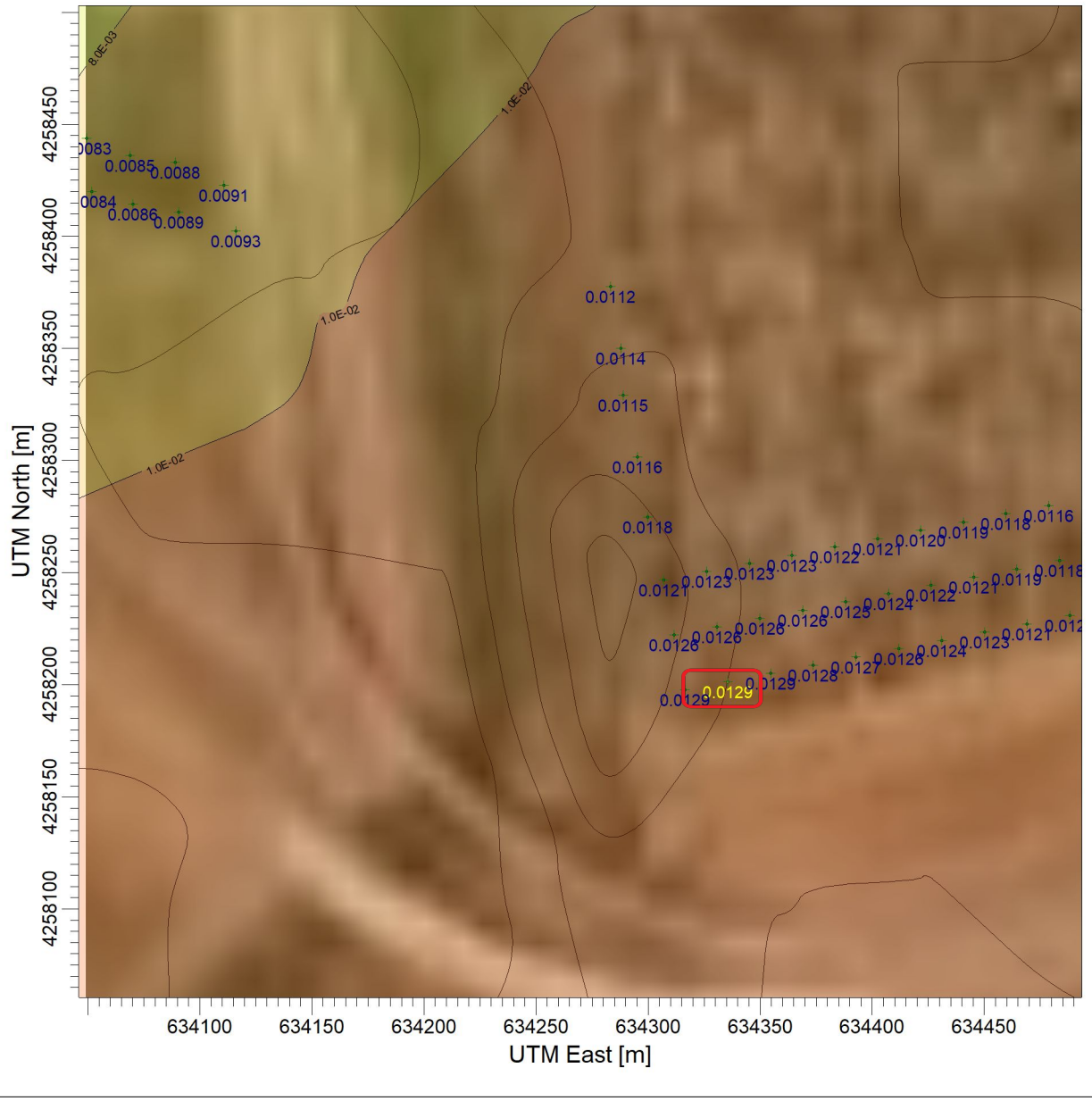
PROJECT NO.:

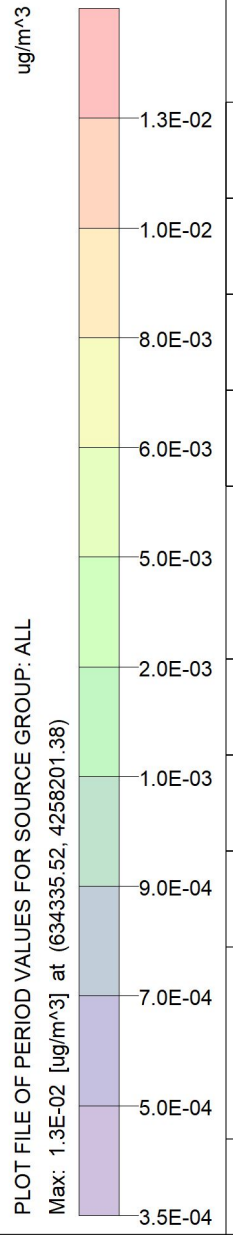
7781, 27782, 27783, 2

PROJECT TITLE:

SacSewer Biogen Project

Highest Resident Chronic Risk is a Hazard Index of 0.0129





COMMENTS:

SOURCES:

14

RECEPTORS:

2233

OUTPUT TYPE:

Concentration

MAX:

1.3E-02 ug/m^3

COMPANY NAME:

MODELER:

DATE:

6/5/2024

SCALE: 1:3,013

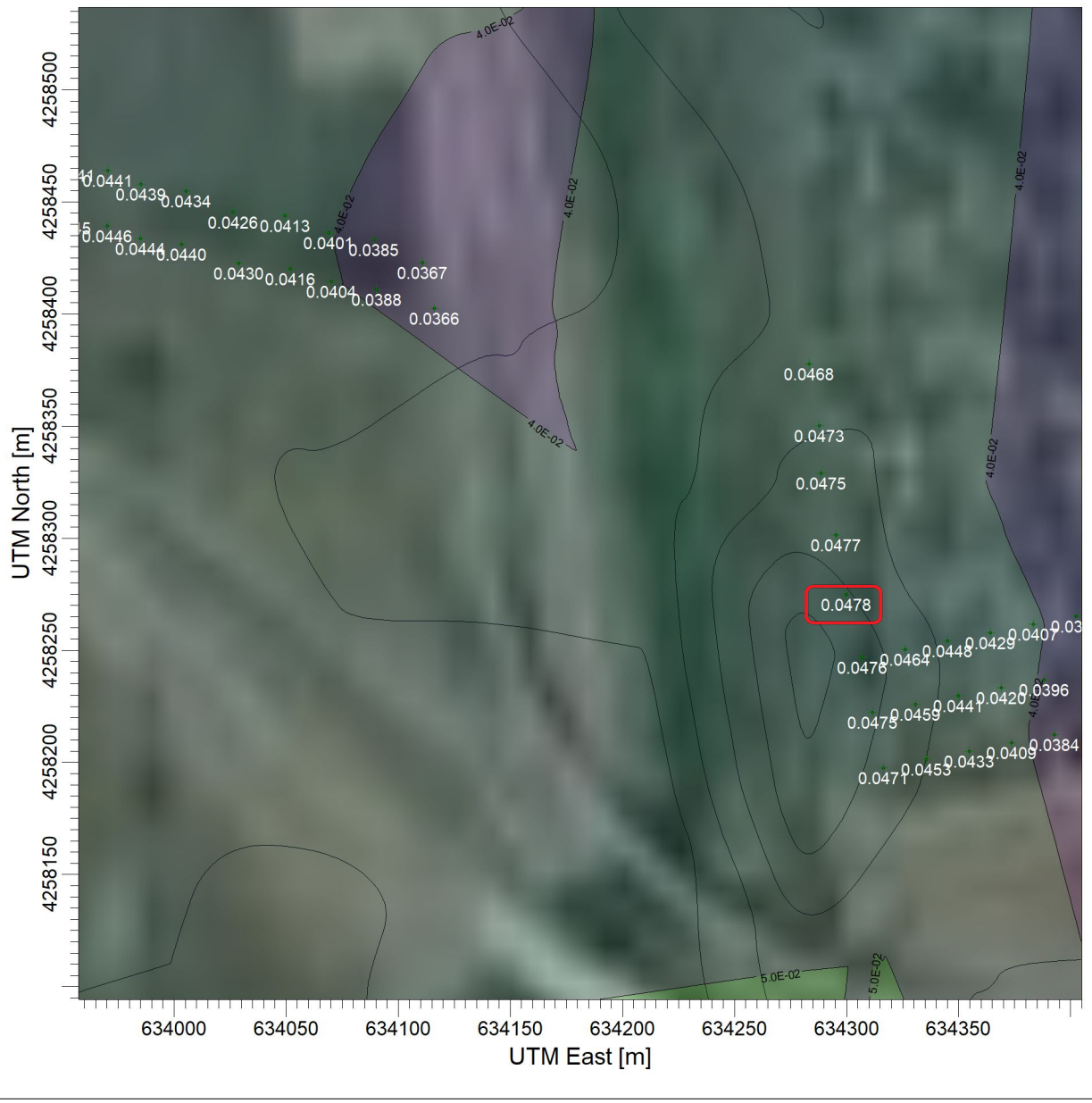
0 0.05 km

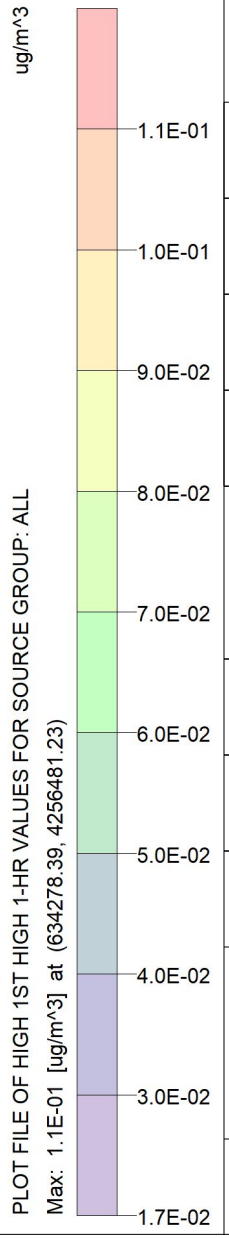
PROJECT NO.:

7781, 27782, 27783, 2

PROJECT TITLE:

SacSewer Biogen Project
Highest Resident Acute Risk is a Hazard Index of 0.0478





COMMENTS:

SOURCES:
14

RECEPTORS:
2233

OUTPUT TYPE:
Concentration

MAX:
1.1E-01 ug/m^3

COMPANY NAME:

MODELER:

DATE:
6/5/2024

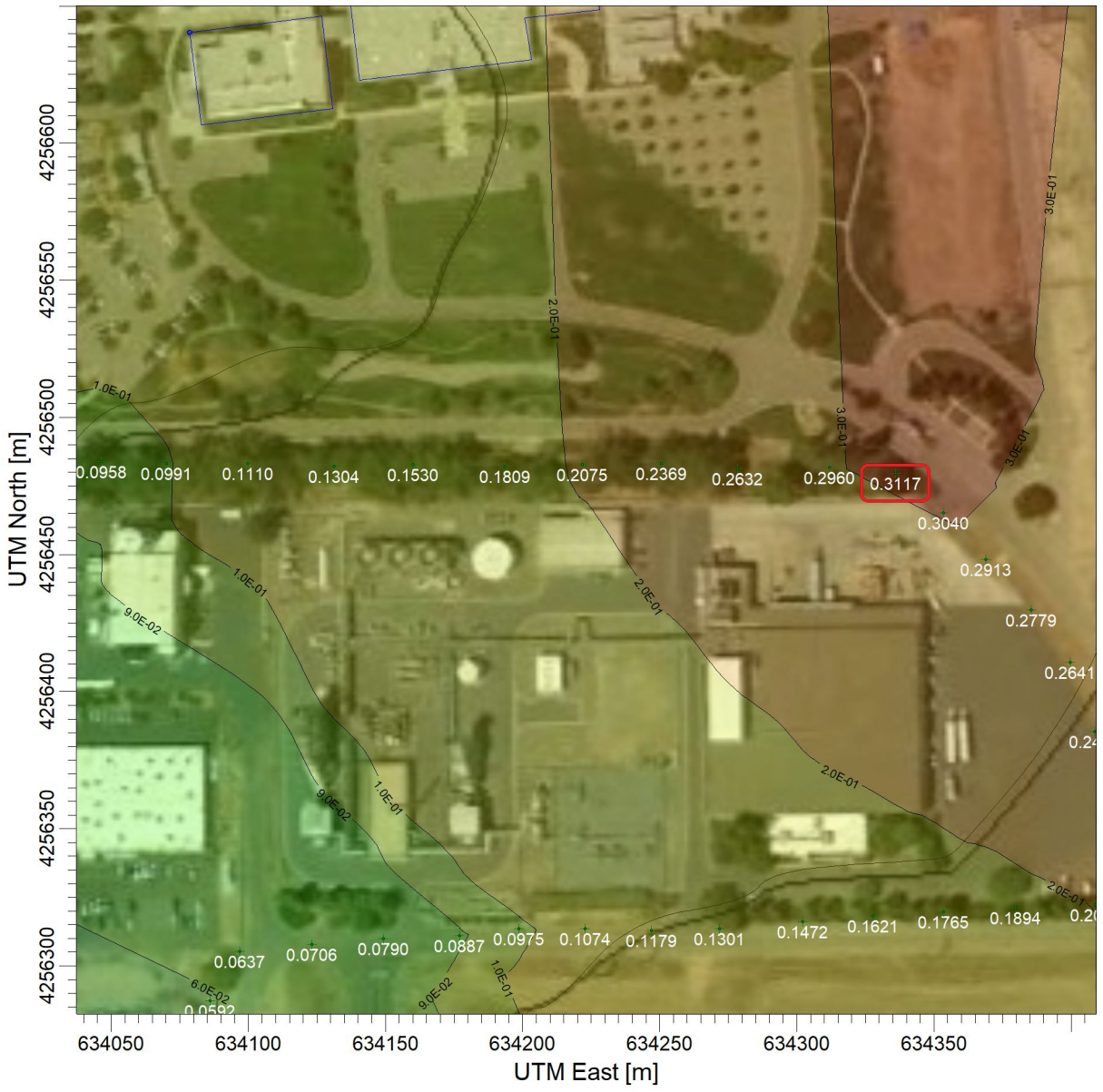
SCALE: 1:3,013
0 0.05 km

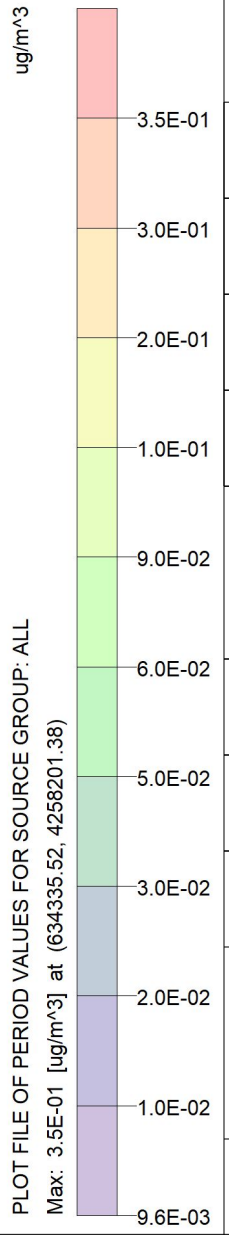
PROJECT NO.:
7781, 27782, 27783, 2

PROJECT TITLE:

SacSewer Biogen Project

Highest Worker Cancer Risk is 0.3117 Chances per Million





COMMENTS:

SOURCES:

14

RECEPTORS:

2233

OUTPUT TYPE:

Concentration

MAX:

3.5E-01 ug/m^3

COMPANY NAME:

MODELER:

DATE:

6/5/2024

SCALE: 1:2,503

0 0.05 km

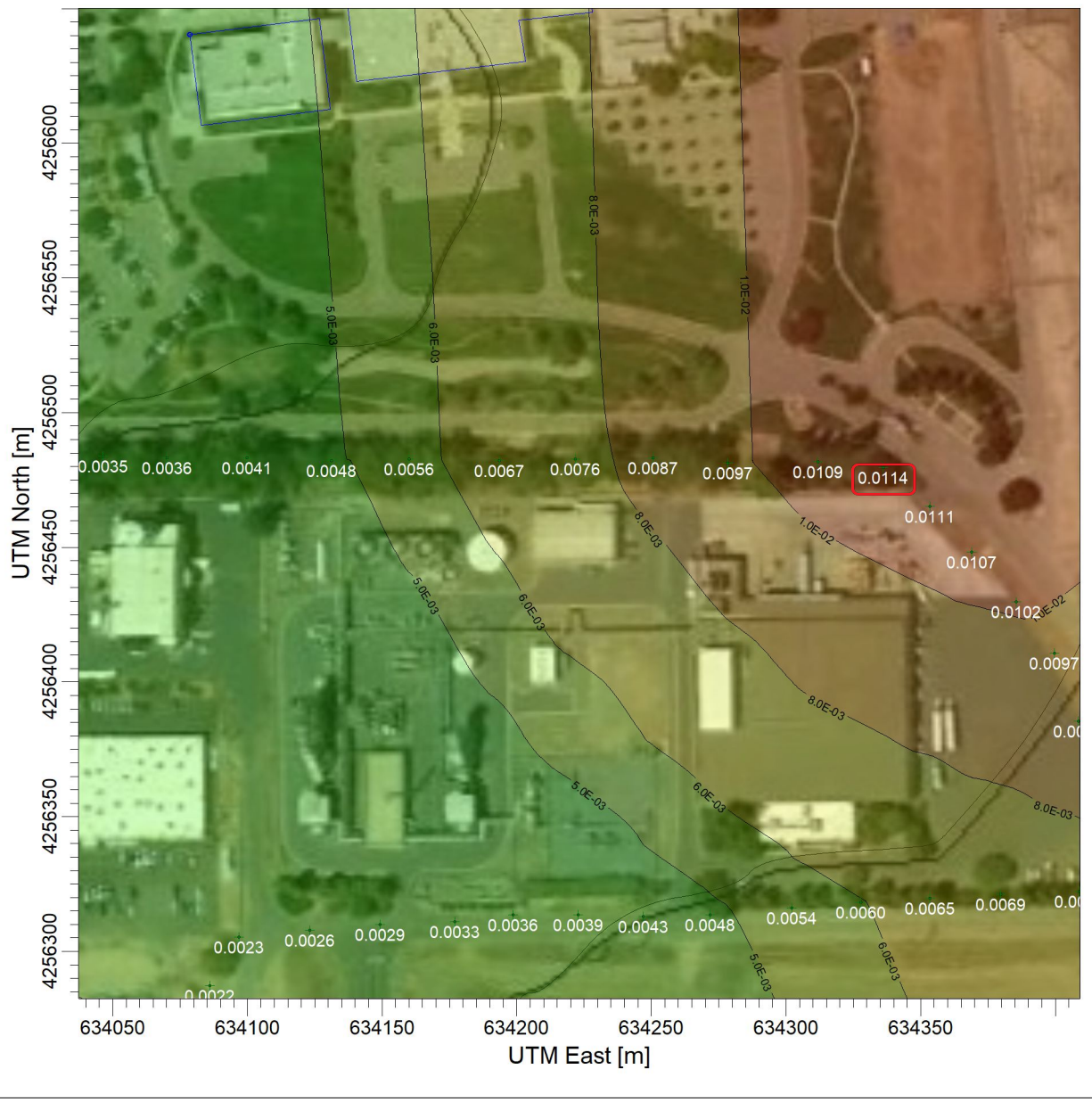
PROJECT NO.:

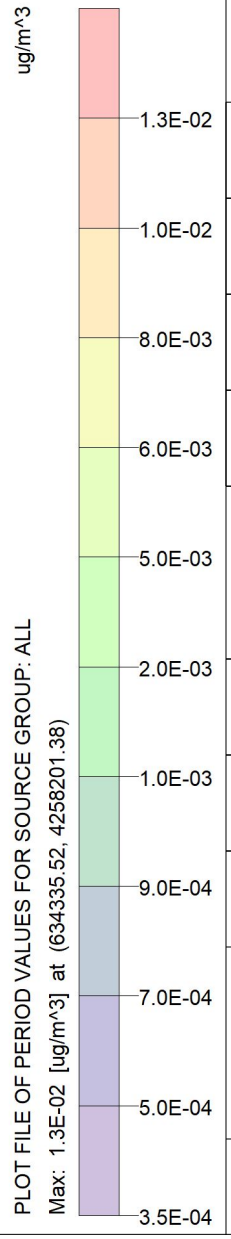
7781, 27782, 27783, 2

PROJECT TITLE:

SacSewer Biogen Project

Highest Worker Chronic Risk is a Hazard Index of 0.0114





COMMENTS:

SOURCES:

14

RECEPTORS:

2233

OUTPUT TYPE:

Concentration

MAX:

1.3E-02 ug/m^3

COMPANY NAME:

MODELER:

DATE:

6/5/2024

SCALE: 1:2,503

0 0.05 km

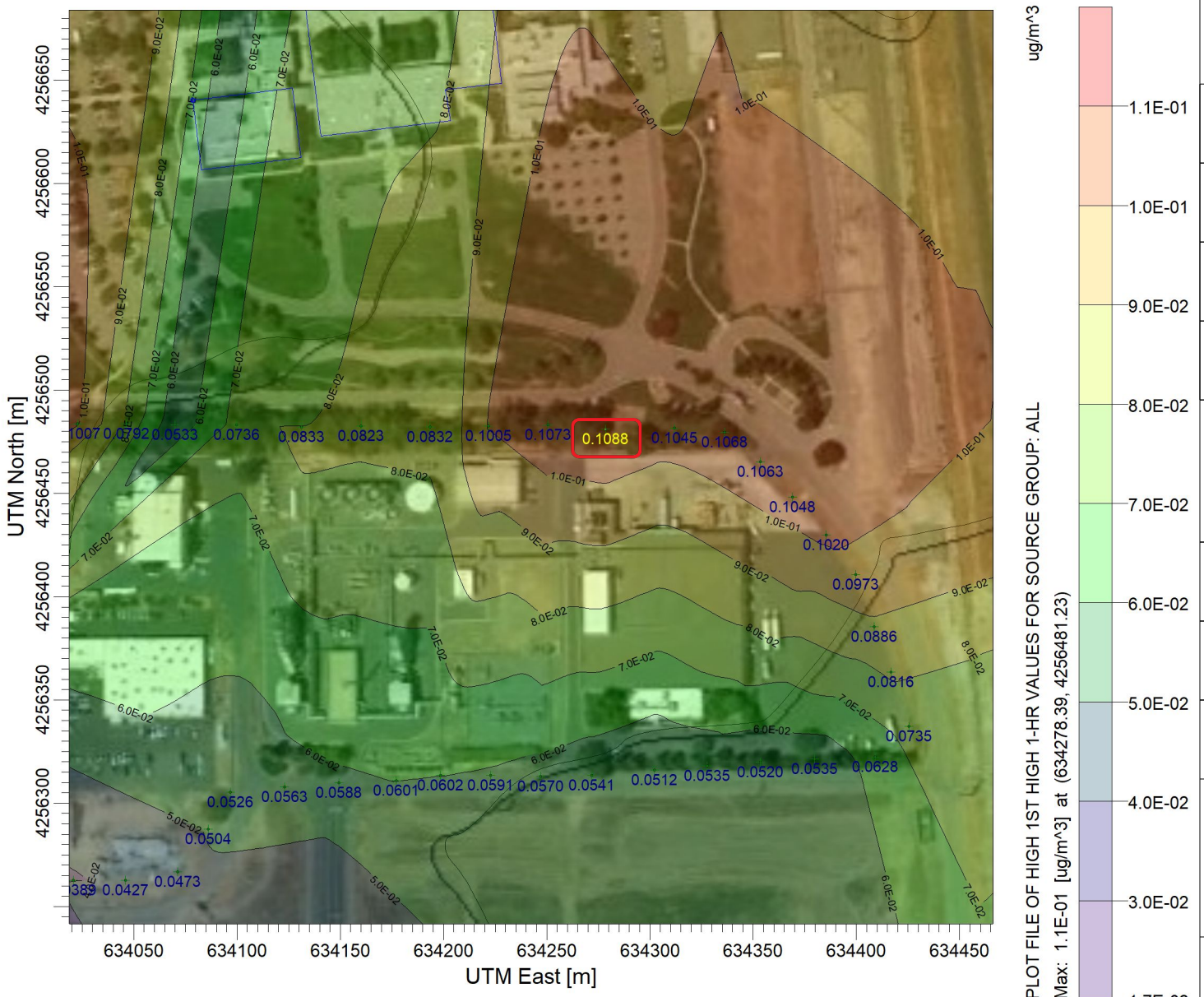
PROJECT NO.:

7781, 27782, 27783, 2

PROJECT TITLE:

SacSewer Biogen Project

Highest Worker Acute Risk is a Hazard Index of 0.1088



COMMENTS:

SOURCES:
14

RECEPTORS:
2233

OUTPUT TYPE:
Concentration

MAX:
1.1E-01 ug/m^3

COMPANY NAME:

MODELER:

DATE:
6/5/2024

SCALE: 1:3,013

0 0.05 km

PROJECT NO.:
7781, 27782, 27783, 2

Aermod Report

```
** RECEPTOR CONCENTRATIONS AND ELEVATIONS DELETED FOR BREVITY **
**
**************************************
**
** AERMOD Input Produced by:
** AERMOD View Ver. 11.2.0
** Lakes Environmental Software Inc.
** Date: 6/5/2024
** File: C:\Users\jeffw\OneDrive - SMAQMD\Desktop\27780 27781 27782 27783 27784 27785\27780 27781 27782 27783 27784 27785.ADI
**
**************************************
**
**
**************************************
** AERMOD Control Pathway
**************************************
**
**
CO STARTING
   TITLEONE C:\Users\jeffw\Desktop\24421 et al\24421 et al.isc
   MODELOPT DFAULT CONC
   AVERTIME 1 PERIOD
   POLLUTID OTHER
   RUNORNOT RUN
   ERRORFIL "24421 et al.err"
CO FINISHED
**
**************************************
** AERMOD Source Pathway
**************************************
**
**
SO STARTING
** Source Location **
** Source ID - Type - X Coord. - Y Coord. **
   LOCATION STCK1        POINT      634007.320  4256919.980        3.660
** DESCRSRC IE ORT
   LOCATION STCK3        POINT      633948.562  4256818.059        3.660
** DESCRSRC PE ORT
   LOCATION STCK5        POINT      634218.100  4257061.090        3.160
** DESCRSRC DIGESTER GAS
   LOCATION STCK6        POINT      633947.260  4257076.810        3.330
** DESCRSRC BIOFILTER
   LOCATION VOL1         VOLUME     633657.060  4257110.300        3.050
** DESCRSRC BNR
   LOCATION VOL2         VOLUME     633674.020  4256731.640        4.270
** DESCRSRC SST
   LOCATION VOL3         VOLUME     632870.460  4256736.930        2.210
** DESCRSRC SSB1
   LOCATION VOL4         VOLUME     632709.060  4255502.770        3.170
** DESCRSRC SSB2
   LOCATION STCK7        POINT      634075.070  4257121.970        2.090
** DESCRSRC BIOGEN ENGINE 1
   LOCATION STCK8        POINT      634075.070  4257129.060        1.950
** DESCRSRC BIOGEN ENGINE 2
   LOCATION STCK9        POINT      634075.070  4257136.150        1.820
** DESCRSRC BIOGEN ENGINE 3
   LOCATION STCK10       POINT      634075.070  4257143.240        1.750
** DESCRSRC BIOGEN ENGINE 4
   LOCATION STCK11       POINT      634047.230  4257158.430        1.860
** DESCRSRC BIOGEN BOILER
   LOCATION STCK12       POINT      634031.730  4257143.100        2.200
** DESCRSRC BIOGEN FUEL CELL
** Source Parameters **
   SRCPARAM STCK1             0.0    33.528   293.000 1801.71171243471    1.3716
   SRCPARAM STCK3             0.0    18.288   293.000 1008.85674482371   1.40208
   SRCPARAM STCK5             0.0    12.802   293.150 574.43936193264    0.3048
   SRCPARAM STCK6             0.0     3.048   293.000 18.2923385004706  7.690104
   SRCPARAM VOL1              0.0     2.130    48.684     1.000
   SRCPARAM VOL2              0.0     0.000    41.144     0.000
   SRCPARAM VOL3              0.0     3.700    89.963     1.500
   SRCPARAM VOL4              0.0     3.700   134.970     1.500
   SRCPARAM STCK7             1.0    13.411   635.928 10.1919467017119   0.64008
   SRCPARAM STCK8             1.0    13.411   635.928 10.1919467017119   0.64008
   SRCPARAM STCK9             1.0    13.411   635.928 10.1919467017119   0.64008
   SRCPARAM STCK10            1.0    13.411   635.928 10.1919467017119   0.64008
   SRCPARAM STCK11            1.0    13.411   383.150 11.839766975004    0.6096
```

```
   SRCPARAM STCK12            0.0     7.010   369.261 12.1211580981684 0.7110984

** Building Downwash **
   BUILDHGT STCK1          13.72    13.72    13.72    13.72    13.72    13.72
   BUILDHGT STCK1          13.72    13.72    13.72    13.72    13.72    13.72
   BUILDHGT STCK1          13.72    13.72    13.72    13.72    13.72    13.72
   BUILDHGT STCK1          13.72    13.72    13.72    13.72    13.72    13.72
   BUILDHGT STCK1          13.72    13.72    13.72    13.72    13.72    13.72
   BUILDHGT STCK1          13.72    13.72    13.72    13.72    13.72    13.72

   BUILDHGT STCK3          13.72    13.72    13.72    13.72    13.72    13.72
   BUILDHGT STCK3          12.19    12.19    13.72    13.72    13.72    13.72
   BUILDHGT STCK3          12.19    12.19    12.19    12.19    12.19    12.19
   BUILDHGT STCK3          13.72    13.72    13.72    13.72    13.72    13.72
   BUILDHGT STCK3          13.72    13.72    13.72    13.72    13.72    13.72
   BUILDHGT STCK3          12.19    12.19    12.19    12.19    12.19    12.19

   BUILDHGT STCK5          12.19    12.19    12.19    12.19    12.19    12.19
   BUILDHGT STCK5          12.19    12.19    12.19    12.19    12.19    12.19
   BUILDHGT STCK5          12.19    12.19    12.19    12.19    12.19    12.19
   BUILDHGT STCK5          12.19    12.19    12.19    12.19    12.19    12.19
   BUILDHGT STCK5          12.19    12.19    12.19    12.19    12.19    12.19
   BUILDHGT STCK5          12.19    12.19    12.19    12.19    12.19    12.19

   BUILDHGT STCK6           1.52     1.52     1.52     1.52     1.52     1.52
   BUILDHGT STCK6           1.52     1.52     1.52     1.52     1.52     1.52
   BUILDHGT STCK6           1.52     1.52     1.52     1.52     1.52     1.52
   BUILDHGT STCK6           1.52     1.52     1.52     1.52     1.52     1.52
   BUILDHGT STCK6           1.52     1.52     1.52     1.52     1.52     1.52
   BUILDHGT STCK6           1.52     1.52     1.52     1.52     1.52     1.52

   BUILDHGT STCK7          12.19    12.19    12.19     9.14     9.14     9.14
   BUILDHGT STCK7           9.14     9.14     9.14     9.14     9.14     9.14
   BUILDHGT STCK7           9.14     9.14     9.14     9.14     9.14     9.14
   BUILDHGT STCK7           9.14     9.14     9.14     9.14     9.14     9.14
   BUILDHGT STCK7           9.14     9.14     9.14     9.14     9.14     9.14
   BUILDHGT STCK7          12.19    12.19    12.19    12.19    12.19    12.19

   BUILDHGT STCK8          12.19    12.19     9.14     9.14     9.14     9.14
   BUILDHGT STCK8           9.14     9.14     9.14     9.14     9.14     9.14
   BUILDHGT STCK8           9.14     9.14     9.14     9.14     9.14     9.14
   BUILDHGT STCK8           9.14     9.14     9.14     9.14     9.14     9.14
   BUILDHGT STCK8           9.14     9.14     9.14     9.14     9.14     9.14
   BUILDHGT STCK8          12.19    12.19    12.19    12.19    12.19    12.19

   BUILDHGT STCK9          12.19    12.19     9.14     9.14     9.14     9.14
   BUILDHGT STCK9           9.14     9.14     9.14     9.14     9.14     9.14
   BUILDHGT STCK9           9.14     9.14     9.14     9.14     9.14     9.14
   BUILDHGT STCK9           9.14     9.14     9.14     9.14     9.14     9.14
   BUILDHGT STCK9           9.14     9.14     9.14     9.14     9.14     9.14
   BUILDHGT STCK9           9.14     9.14     9.14     9.14    12.19    12.19

   BUILDHGT STCK10          9.14     9.14     9.14     9.14     9.14     9.14
   BUILDHGT STCK10          9.14     9.14     9.14     9.14     9.14     9.14
   BUILDHGT STCK10          9.14     9.14     9.14     9.14     9.14     9.14
   BUILDHGT STCK10          9.14     9.14     9.14     9.14     9.14     9.14
   BUILDHGT STCK10          9.14     9.14     9.14     9.14     9.14     9.14
   BUILDHGT STCK10          9.14     9.14     9.14     9.14     9.14     9.14

   BUILDHGT STCK11          9.14     9.14     9.14     9.14     9.14     9.14
   BUILDHGT STCK11          9.14     9.14     9.14     9.14     9.14     9.14
   BUILDHGT STCK11          9.14     9.14     9.14     9.14     9.14     0.00
   BUILDHGT STCK11          9.14     9.14     9.14     9.14     9.14     9.14
   BUILDHGT STCK11          9.14     9.14     9.14     9.14     9.14     9.14
   BUILDHGT STCK11          9.14     9.14     9.14     9.14     9.14     0.00

   BUILDHGT STCK12          0.00     0.00     9.14     9.14     9.14     9.14
   BUILDHGT STCK12          9.14     9.14     0.00     9.14     9.14     9.14
   BUILDHGT STCK12          9.14     9.14     9.14     0.00     0.00     0.00
   BUILDHGT STCK12          0.00     0.00     9.14     9.14     9.14     9.14
   BUILDHGT STCK12          9.14     9.14     9.14     9.14     9.14     9.14
   BUILDHGT STCK12          9.14     9.14     9.14     0.00     0.00     0.00

   BUILDWID STCK1          66.54    84.95   100.77   113.53   122.83   132.48
   BUILDWID STCK1         139.01   141.32   140.10   141.21   139.18   132.92
   BUILDWID STCK1         122.63   108.60    91.28    73.24    55.91    52.08
   BUILDWID STCK1          66.54    84.95   100.77   113.53   122.83   132.48
   BUILDWID STCK1         139.01   141.32   140.10   141.21   139.18   132.92
```

BUILDWID STCK1	122.63	108.60	91.28	73.24	55.91	52.08
BUILDWID STCK3	66.54	84.95	100.77	113.53	122.83	132.48
BUILDWID STCK3	14.04	13.62	140.10	141.21	139.18	132.92
BUILDWID STCK3	13.60	12.75	11.51	9.93	8.04	5.91
BUILDWID STCK3	66.54	84.95	100.77	113.53	122.83	132.48
BUILDWID STCK3	139.01	141.32	140.10	141.21	139.18	132.92
BUILDWID STCK3	13.60	12.75	11.51	9.93	8.04	5.91
BUILDWID STCK5	34.47	32.89	33.81	61.32	66.39	69.45
BUILDWID STCK5	71.56	74.99	76.15	74.99	71.56	69.45
BUILDWID STCK5	66.39	61.32	33.81	32.89	34.47	35.00
BUILDWID STCK5	34.47	32.89	33.81	61.32	66.39	69.45
BUILDWID STCK5	71.56	74.99	76.15	74.99	71.56	69.45
BUILDWID STCK5	66.39	61.32	33.81	32.89	34.47	35.00
BUILDWID STCK6	38.18	42.10	44.73	46.00	45.88	44.36
BUILDWID STCK6	41.50	37.37	32.11	37.37	41.50	44.36
BUILDWID STCK6	45.88	46.00	44.73	42.10	38.18	33.11
BUILDWID STCK6	38.18	42.10	44.73	46.00	45.88	44.36
BUILDWID STCK6	41.50	37.37	32.11	37.37	41.50	44.36
BUILDWID STCK6	45.88	46.00	44.73	42.10	38.18	33.11
BUILDWID STCK7	35.45	33.83	34.78	75.02	80.40	83.34
BUILDWID STCK7	83.75	81.61	76.99	81.61	83.75	83.34
BUILDWID STCK7	80.40	75.02	67.36	57.65	46.19	33.33
BUILDWID STCK7	46.19	57.65	67.36	75.02	80.40	83.34
BUILDWID STCK7	83.75	81.61	76.99	81.61	83.75	83.34
BUILDWID STCK7	35.86	35.86	34.77	33.83	35.45	36.00
BUILDWID STCK8	35.45	33.83	67.36	75.02	80.40	83.34
BUILDWID STCK8	83.75	81.61	76.99	81.61	83.75	83.34
BUILDWID STCK8	80.40	75.02	67.36	57.65	46.19	33.33
BUILDWID STCK8	46.19	57.65	67.36	75.02	80.40	83.34
BUILDWID STCK8	83.75	81.61	76.99	81.61	83.75	83.34
BUILDWID STCK8	35.86	35.86	34.77	33.83	35.45	36.00
BUILDWID STCK9	35.45	33.83	67.36	75.02	80.40	83.34
BUILDWID STCK9	83.75	81.61	76.99	81.61	83.75	83.34
BUILDWID STCK9	80.40	75.02	67.36	57.65	46.19	33.33
BUILDWID STCK9	46.19	57.65	67.36	75.02	80.40	83.34
BUILDWID STCK9	83.75	81.61	76.99	81.61	83.75	83.34
BUILDWID STCK9	80.40	75.02	67.36	57.65	35.45	36.00
BUILDWID STCK10	46.19	57.65	67.36	75.02	80.40	83.34
BUILDWID STCK10	83.75	81.61	76.99	81.61	83.75	83.34
BUILDWID STCK10	80.40	75.02	67.36	57.65	46.19	33.33
BUILDWID STCK10	46.19	57.65	67.36	75.02	80.40	83.34
BUILDWID STCK10	83.75	81.61	76.99	81.61	83.75	83.34
BUILDWID STCK10	80.40	75.02	67.36	57.65	46.19	33.33
BUILDWID STCK11	46.19	57.65	67.36	75.02	80.40	83.34
BUILDWID STCK11	83.75	81.61	76.99	81.61	83.75	83.34
BUILDWID STCK11	80.40	75.02	67.36	57.65	46.19	0.00
BUILDWID STCK11	46.19	57.65	67.36	75.02	80.40	83.34
BUILDWID STCK11	83.75	81.61	76.99	81.61	83.75	83.34
BUILDWID STCK11	80.40	75.02	67.36	57.65	46.19	0.00
BUILDWID STCK12	0.00	0.00	67.36	75.02	80.40	83.34
BUILDWID STCK12	83.75	81.61	0.00	81.61	83.75	83.34
BUILDWID STCK12	80.40	75.02	67.36	0.00	0.00	0.00
BUILDWID STCK12	0.00	0.00	67.36	75.02	80.40	83.34
BUILDWID STCK12	83.75	81.61	76.99	81.61	83.75	83.34
BUILDWID STCK12	80.40	75.02	67.36	0.00	0.00	0.00
BUILDLEN STCK1	141.21	139.18	132.92	122.63	108.60	91.28
BUILDLEN STCK1	73.24	55.91	52.08	66.54	84.95	100.77
BUILDLEN STCK1	113.53	122.83	132.48	139.01	141.32	140.10
BUILDLEN STCK1	141.21	139.18	132.92	122.63	108.60	91.28
BUILDLEN STCK1	73.24	55.91	52.08	66.54	84.95	100.77
BUILDLEN STCK1	113.53	122.83	132.48	139.01	141.32	140.10
BUILDLEN STCK3	141.21	139.18	132.92	122.63	108.60	91.28
BUILDLEN STCK3	9.93	8.04	52.08	66.54	84.95	100.77
BUILDLEN STCK3	12.75	13.60	14.03	14.04	13.62	12.79
BUILDLEN STCK3	141.21	139.18	132.92	122.63	108.60	91.28
BUILDLEN STCK3	73.24	55.91	52.08	66.54	84.95	100.77
BUILDLEN STCK3	12.75	13.60	14.03	14.04	13.62	12.79

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BUILDLEN STCK5          34.47    32.89    33.81    66.39    61.32    54.38
BUILDLEN STCK5          46.96    41.61    35.00    41.61    46.96    54.38
BUILDLEN STCK5          61.32    66.39    33.81    32.89    34.47    35.00
BUILDLEN STCK5          34.47    32.89    33.81    66.39    61.32    54.38
BUILDLEN STCK5          46.96    41.61    35.00    41.61    46.96    54.38
BUILDLEN STCK5          61.32    66.39    33.81    32.89    34.47    35.00

BUILDLEN STCK6          37.37    41.50    44.36    45.88    46.00    44.73
BUILDLEN STCK6          42.10    38.18    33.11    38.18    42.10    44.73
BUILDLEN STCK6          46.00    45.88    44.36    41.50    37.37    32.11
BUILDLEN STCK6          37.37    41.50    44.36    45.88    46.00    44.73
BUILDLEN STCK6          42.10    38.18    33.11    38.18    42.10    44.73
BUILDLEN STCK6          46.00    45.88    44.36    41.50    37.37    32.11

BUILDLEN STCK7          35.45    33.83    34.78    80.40    75.02    67.36
BUILDLEN STCK7          57.65    46.19    33.33    46.19    57.65    67.36
BUILDLEN STCK7          75.02    80.40    83.34    83.75    81.61    76.99
BUILDLEN STCK7          81.61    83.75    83.34    80.40    75.02    67.36
BUILDLEN STCK7          57.65    46.19    33.33    46.19    57.65    67.36
BUILDLEN STCK7          35.86    35.86    34.77    33.83    35.45    36.00

BUILDLEN STCK8          35.45    33.83    83.34    80.40    75.02    67.36
BUILDLEN STCK8          57.65    46.19    33.33    46.19    57.65    67.36
BUILDLEN STCK8          75.02    80.40    83.34    83.75    81.61    76.99
BUILDLEN STCK8          81.61    83.75    83.34    80.40    75.02    67.36
BUILDLEN STCK8          57.65    46.19    33.33    46.19    57.65    67.36
BUILDLEN STCK8          35.86    35.86    34.77    33.83    35.45    36.00

BUILDLEN STCK9          35.45    33.83    83.34    80.40    75.02    67.36
BUILDLEN STCK9          57.65    46.19    33.33    46.19    57.65    67.36
BUILDLEN STCK9          75.02    80.40    83.34    83.75    81.61    76.99
BUILDLEN STCK9          81.61    83.75    83.34    80.40    75.02    67.36
BUILDLEN STCK9          57.65    46.19    33.33    46.19    57.65    67.36
BUILDLEN STCK9          75.02    80.40    83.34    83.75    35.45    36.00

BUILDLEN STCK10         81.61    83.75    83.34    80.40    75.02    67.36
BUILDLEN STCK10         57.65    46.19    33.33    46.19    57.65    67.36
BUILDLEN STCK10         75.02    80.40    83.34    83.75    81.61    76.99
BUILDLEN STCK10         81.61    83.75    83.34    80.40    75.02    67.36
BUILDLEN STCK10         57.65    46.19    33.33    46.19    57.65    67.36
BUILDLEN STCK10         75.02    80.40    83.34    83.75    81.61    76.99

BUILDLEN STCK11         81.61    83.75    83.34    80.40    75.02    67.36
BUILDLEN STCK11         57.65    46.19    33.33    46.19    57.65    67.36
BUILDLEN STCK11         75.02    80.40    83.34    83.75    81.61     0.00
BUILDLEN STCK11         81.61    83.75    83.34    80.40    75.02    67.36
BUILDLEN STCK11         57.65    46.19    33.33    46.19    57.65    67.36
BUILDLEN STCK11         75.02    80.40    83.34    83.75    81.61     0.00

BUILDLEN STCK12          0.00     0.00    83.34    80.40    75.02    67.36
BUILDLEN STCK12         57.65    46.19     0.00    46.19    57.65    67.36
BUILDLEN STCK12         75.02    80.40    83.34     0.00     0.00     0.00
BUILDLEN STCK12          0.00     0.00    83.34    80.40    75.02    67.36
BUILDLEN STCK12         57.65    46.19    33.33    46.19    57.65    67.36
BUILDLEN STCK12         75.02    80.40    83.34     0.00     0.00     0.00

XBADJ    STCK1        -122.74  -120.83  -115.26  -106.19   -93.88   -78.73
XBADJ    STCK1         -61.18   -44.69   -41.85   -42.19   -41.44   -39.43
XBADJ    STCK1         -36.22   -31.91   -29.06   -25.88   -21.91   -18.04
XBADJ    STCK1         -18.47   -18.35   -17.66   -16.44   -14.72   -12.55
XBADJ    STCK1         -12.05   -11.22   -10.23   -24.35   -43.51   -61.34
XBADJ    STCK1         -77.31   -90.92  -103.42  -113.14  -119.41  -122.06

XBADJ    STCK3         -12.16    -4.96     2.38     9.66    16.64    23.12
XBADJ    STCK3          -5.43    -4.06    16.91    -2.02   -21.08   -39.50
XBADJ    STCK3          -4.52    -4.69    -4.72    -4.61    -4.36    -3.97
XBADJ    STCK3        -129.05  -134.22  -135.31  -132.29  -125.25  -114.40
XBADJ    STCK3        -102.13   -86.78   -68.99   -64.52   -63.86   -61.27
XBADJ    STCK3          -8.23    -8.90    -9.31    -9.43    -9.27    -8.82

XBADJ    STCK5         -58.31   -55.64   -53.03   -49.39   -44.24   -37.76
XBADJ    STCK5         -30.70   -24.47   -17.49   -17.13   -16.24   -16.62
XBADJ    STCK5         -17.07   -17.00    19.22    22.75    23.84    24.21
XBADJ    STCK5          23.84    22.75    19.22   -17.00   -17.07   -16.63
XBADJ    STCK5         -16.26   -17.15   -17.51   -24.49   -30.72   -37.77
XBADJ    STCK5         -44.25   -49.39   -53.03   -55.64   -58.31   -59.21
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XBADJ	STCK6	-22.88	-27.56	-31.39	-34.28	-36.12	-36.87
XBADJ	STCK6	-36.49	-35.01	-32.46	-34.50	-35.50	-35.41
XBADJ	STCK6	-34.25	-32.05	-28.87	-24.82	-20.01	-14.60
XBADJ	STCK6	-14.49	-13.94	-12.97	-11.60	-9.88	-7.86
XBADJ	STCK6	-5.60	-3.18	-0.65	-3.68	-6.60	-9.32
XBADJ	STCK6	-11.75	-13.83	-15.49	-16.68	-17.36	-17.51
XBADJ	STCK7	-75.68	-73.95	-71.78	-32.01	-31.68	-30.39
XBADJ	STCK7	-28.18	-25.10	-21.27	-30.16	-38.13	-44.95
XBADJ	STCK7	-50.39	-54.31	-56.58	-57.13	-55.94	-53.05
XBADJ	STCK7	-54.34	-53.98	-51.97	-48.39	-43.34	-36.97
XBADJ	STCK7	-29.48	-21.09	-12.06	-16.03	-19.52	-22.41
XBADJ	STCK7	-87.01	-88.64	-87.58	-84.47	-72.26	-75.11
XBADJ	STCK8	-82.66	-80.62	-37.51	-37.44	-36.24	-33.94
XBADJ	STCK8	-30.60	-26.34	-21.27	-28.93	-35.71	-41.40
XBADJ	STCK8	-45.84	-48.88	-50.44	-50.46	-48.96	-45.96
XBADJ	STCK8	-47.36	-47.31	-45.83	-42.96	-38.78	-33.42
XBADJ	STCK8	-27.05	-19.86	-12.06	-17.27	-21.95	-25.96
XBADJ	STCK8	-91.57	-94.08	-93.72	-91.13	-79.24	-82.20
XBADJ	STCK9	-89.65	-87.28	-43.65	-42.87	-40.80	-37.48
XBADJ	STCK9	-33.03	-27.57	-21.27	-27.70	-33.28	-37.86
XBADJ	STCK9	-41.28	-43.45	-44.30	-43.80	-41.97	-38.87
XBADJ	STCK9	-40.37	-40.65	-39.69	-37.53	-34.22	-29.88
XBADJ	STCK9	-24.63	-18.63	-12.06	-18.50	-24.37	-29.50
XBADJ	STCK9	-33.74	-36.95	-39.04	-39.95	-86.22	-89.29
XBADJ	STCK10	-48.22	-49.76	-49.79	-48.30	-45.35	-41.03
XBADJ	STCK10	-35.45	-28.80	-21.27	-26.47	-30.86	-34.31
XBADJ	STCK10	-36.72	-38.02	-38.16	-37.14	-34.99	-31.78
XBADJ	STCK10	-33.39	-33.99	-33.55	-32.10	-29.67	-26.33
XBADJ	STCK10	-22.20	-17.40	-12.06	-19.73	-26.80	-33.05
XBADJ	STCK10	-38.30	-42.38	-45.18	-46.61	-46.62	-45.21
XBADJ	STCK11	-58.34	-54.51	-49.02	-42.05	-33.79	-24.51
XBADJ	STCK11	-14.48	-4.02	6.57	3.59	0.50	-2.61
XBADJ	STCK11	-5.63	-8.49	-11.08	-13.34	-15.20	0.00
XBADJ	STCK11	-23.27	-29.24	-34.32	-38.36	-41.23	-42.85
XBADJ	STCK11	-43.17	-42.17	-39.90	-49.78	-58.15	-64.75
XBADJ	STCK11	-69.39	-71.92	-72.26	-70.40	-66.41	0.00
XBADJ	STCK12	0.00	0.00	-28.00	-20.34	-12.06	-3.42
XBADJ	STCK12	5.32	13.91	0.00	16.19	9.82	3.15
XBADJ	STCK12	-3.61	-10.27	-16.61	0.00	0.00	0.00
XBADJ	STCK12	0.00	0.00	-55.34	-60.06	-62.96	-63.94
XBADJ	STCK12	-62.98	-60.10	-55.40	-62.38	-67.47	-70.51
XBADJ	STCK12	-71.41	-70.14	-66.73	0.00	0.00	0.00
YBADJ	STCK1	8.92	-1.03	-10.95	-20.54	-29.51	-37.18
YBADJ	STCK1	-43.63	-48.75	-52.01	-52.13	-51.24	-48.80
YBADJ	STCK1	-44.87	-39.58	-33.09	-24.56	-16.74	-15.81
YBADJ	STCK1	-8.92	1.03	10.95	20.54	29.51	37.18
YBADJ	STCK1	43.63	48.75	52.01	52.13	51.24	48.80
YBADJ	STCK1	44.87	39.58	33.09	24.56	16.74	15.81
YBADJ	STCK3	-31.25	-21.39	-10.88	-0.04	10.80	21.70
YBADJ	STCK3	-2.41	-2.46	49.91	58.44	64.63	68.85
YBADJ	STCK3	-1.61	-1.26	-0.88	-0.47	-0.04	0.39
YBADJ	STCK3	31.25	21.39	10.88	0.04	-10.80	-21.70
YBADJ	STCK3	-32.05	-41.42	-49.91	-58.44	-64.63	-68.85
YBADJ	STCK3	1.61	1.26	0.88	0.47	0.04	-0.39
YBADJ	STCK5	-7.25	-14.28	-20.86	-13.59	-16.20	-18.31
YBADJ	STCK5	-19.86	-20.82	-21.13	-20.81	-19.86	-18.31
YBADJ	STCK5	-16.19	-13.58	-20.85	-14.26	-7.23	0.01
YBADJ	STCK5	7.25	14.28	20.86	13.59	16.20	18.31
YBADJ	STCK5	19.86	20.82	21.14	20.81	19.86	18.31
YBADJ	STCK5	16.19	13.58	20.85	14.26	7.23	-0.01
YBADJ	STCK6	15.41	14.45	13.05	11.25	9.11	6.69
YBADJ	STCK6	4.07	1.33	-1.46	-4.19	-6.81	-9.21
YBADJ	STCK6	-11.34	-13.12	-14.50	-15.44	-15.92	-15.90
YBADJ	STCK6	-15.41	-14.45	-13.05	-11.25	-9.11	-6.69
YBADJ	STCK6	-4.07	-1.33	1.46	4.19	6.81	9.21
YBADJ	STCK6	11.34	13.12	14.50	15.44	15.92	15.90
YBADJ	STCK7	-0.21	-10.27	-20.02	12.88	14.11	14.91

```
   YBADJ    STCK7          15.25    15.13    14.56    13.53    12.10    10.30
   YBADJ    STCK7           8.19     5.83     3.29     0.65    -2.01    -4.61
   YBADJ    STCK7          -7.06    -9.31   -11.27   -12.88   -14.11   -14.91
   YBADJ    STCK7         -15.25   -15.13   -14.56   -13.53   -12.10   -10.30
   YBADJ    STCK7          15.46     3.23    -9.10   -21.15    19.63     9.86

   YBADJ    STCK8          -1.44   -12.69     7.72     8.33     8.68     8.77
   YBADJ    STCK8           8.59     8.15     7.47     6.55     5.44     4.16
   YBADJ    STCK8           2.76     1.27    -0.26    -1.77    -3.24    -4.61
   YBADJ    STCK8          -5.83    -6.88    -7.72    -8.33    -8.68    -8.77
   YBADJ    STCK8          -8.59    -8.15    -7.47    -6.55    -5.44    -4.16
   YBADJ    STCK8          20.89     7.79    -5.55   -18.72    20.86     9.86

   YBADJ    STCK9          -2.67   -15.12     4.18     3.77     3.25     2.63
   YBADJ    STCK9           1.93     1.17     0.38    -0.43    -1.22    -1.98
   YBADJ    STCK9          -2.67    -3.29    -3.80    -4.20    -4.47    -4.61
   YBADJ    STCK9          -4.60    -4.46    -4.18    -3.77    -3.25    -2.63
   YBADJ    STCK9          -1.93    -1.17    -0.38     0.43     1.22     1.98
   YBADJ    STCK9           2.67     3.29     3.80     4.20    22.09     9.86

   YBADJ    STCK10          3.37     2.03     0.63    -0.79    -2.18    -3.51
   YBADJ    STCK10         -4.74    -5.81    -6.71    -7.41    -7.89    -8.12
   YBADJ    STCK10         -8.10    -7.84    -7.35    -6.62    -5.70    -4.60
   YBADJ    STCK10         -3.37    -2.03    -0.63     0.79     2.18     3.51
   YBADJ    STCK10          4.74     5.81     6.71     7.41     7.89     8.12
   YBADJ    STCK10          8.10     7.84     7.35     6.62     5.70     4.60

   YBADJ    STCK11        -26.69   -29.33   -31.07   -31.88   -31.72   -30.59
   YBADJ    STCK11        -28.53   -25.61   -21.90   -17.54   -12.64    -7.35
   YBADJ    STCK11         -1.85     3.72     9.17    14.34    19.08     0.00
   YBADJ    STCK11         26.69    29.33    31.07    31.88    31.72    30.59
   YBADJ    STCK11         28.53    25.61    21.90    17.54    12.64     7.35
   YBADJ    STCK11          1.85    -3.72    -9.17   -14.34   -19.08     0.00

   YBADJ    STCK12          0.00     0.00   -36.83   -33.90   -29.94   -25.06
   YBADJ    STCK12        -19.43   -13.20     0.00     0.25     7.07    13.67
   YBADJ    STCK12         19.86    25.45    30.26     0.00     0.00     0.00
   YBADJ    STCK12          0.00     0.00    36.83    33.90    29.94    25.06
   YBADJ    STCK12         19.43    13.20     6.57    -0.25    -7.07   -13.67
   YBADJ    STCK12        -19.86   -25.45   -30.26     0.00     0.00     0.00

   SRCGROUP STCK1    STCK1
   SRCGROUP STCK3    STCK3
   SRCGROUP STCK5    STCK5
   SRCGROUP STCK6    STCK6
   SRCGROUP VOL1     VOL1
   SRCGROUP VOL2     VOL2
   SRCGROUP VOL3     VOL3
   SRCGROUP VOL4     VOL4
   SRCGROUP STCK10   STCK10
   SRCGROUP STCK11   STCK11
   SRCGROUP STCK12   STCK12
   SRCGROUP STCK7    STCK7
   SRCGROUP STCK8    STCK8
   SRCGROUP STCK9    STCK9
SO FINISHED
**
**************************************
** AERMOD Receptor Pathway
**************************************
**
**
RE STARTING
   INCLUDED "27780 27781 27782 27783 27784 27785.rou"
RE FINISHED
**
**************************************
** AERMOD Meteorology Pathway
**************************************
**
**
ME STARTING
   SURFFILE "N:\PERMITTING\Modeling\AermodMet 19191\Exec\14-18.SFC"
   PROFFILE "N:\PERMITTING\Modeling\AermodMet 19191\Exec\14-18.PFL"
   SURFDATA 23232 2014 SACRAMENTO/EXECUTIVE_ARPT
   UAIRDATA 23230 2014 OAKLAND/WSO_AP
   PROFBASE 6.0 METERS
ME FINISHED
```

```
**
**************************************
** AERMOD Output Pathway
**************************************
**
**
OU STARTING
   RECTABLE ALLAVE 1ST
   RECTABLE 1 1ST
** Auto-Generated Plotfiles
   PLOTFILE 1 STCK1 1ST "24421 et al.AD\01H1G001.PLT" 31
   PLOTFILE 1 STCK3 1ST "24421 et al.AD\01H1G002.PLT" 32
   PLOTFILE 1 STCK5 1ST "24421 et al.AD\01H1G003.PLT" 33
   PLOTFILE 1 STCK6 1ST "24421 et al.AD\01H1G004.PLT" 34
   PLOTFILE 1 VOL1 1ST "24421 et al.AD\01H1G005.PLT" 35
   PLOTFILE 1 VOL2 1ST "24421 et al.AD\01H1G006.PLT" 36
   PLOTFILE 1 VOL3 1ST "24421 et al.AD\01H1G007.PLT" 37
   PLOTFILE 1 VOL4 1ST "24421 et al.AD\01H1G008.PLT" 38
   PLOTFILE 1 STCK10 1ST "24421 et al.AD\01H1G009.PLT" 39
   PLOTFILE 1 STCK11 1ST "24421 et al.AD\01H1G010.PLT" 40
   PLOTFILE 1 STCK12 1ST "24421 et al.AD\01H1G011.PLT" 41
   PLOTFILE 1 STCK7 1ST "24421 et al.AD\01H1G012.PLT" 42
   PLOTFILE 1 STCK8 1ST "24421 et al.AD\01H1G013.PLT" 43
   PLOTFILE 1 STCK9 1ST "24421 et al.AD\01H1G014.PLT" 44
   PLOTFILE PERIOD STCK1 "24421 et al.AD\PE00G001.PLT" 45
   PLOTFILE PERIOD STCK3 "24421 et al.AD\PE00G002.PLT" 46
   PLOTFILE PERIOD STCK5 "24421 et al.AD\PE00G003.PLT" 47
   PLOTFILE PERIOD STCK6 "24421 et al.AD\PE00G004.PLT" 48
   PLOTFILE PERIOD VOL1 "24421 et al.AD\PE00G005.PLT" 49
   PLOTFILE PERIOD VOL2 "24421 et al.AD\PE00G006.PLT" 50
   PLOTFILE PERIOD VOL3 "24421 et al.AD\PE00G007.PLT" 51
   PLOTFILE PERIOD VOL4 "24421 et al.AD\PE00G008.PLT" 52
   PLOTFILE PERIOD STCK10 "24421 et al.AD\PE00G009.PLT" 53
   PLOTFILE PERIOD STCK11 "24421 et al.AD\PE00G010.PLT" 54
   PLOTFILE PERIOD STCK12 "24421 et al.AD\PE00G011.PLT" 55
   PLOTFILE PERIOD STCK7 "24421 et al.AD\PE00G012.PLT" 56
   PLOTFILE PERIOD STCK8 "24421 et al.AD\PE00G013.PLT" 57
   PLOTFILE PERIOD STCK9 "24421 et al.AD\PE00G014.PLT" 58
   SUMMFILE "24421 et al.sum"
OU FINISHED


  *** Message Summary For AERMOD Model Setup ***

  --------- Summary of Total Messages --------

 A Total of            0 Fatal Error Message(s)
 A Total of           15 Warning Message(s)
 A Total of            0 Informational Message(s)


    ******** FATAL ERROR MESSAGES ********
               ***  NONE  ***


    ********   WARNING MESSAGES   ********
 SO W320      64        PPARM: Input Parameter May Be Out-of-Range for Parameter            QS
 SO W320      64        PPARM: Input Parameter May Be Out-of-Range for Parameter            VS
 SO W320      65        PPARM: Input Parameter May Be Out-of-Range for Parameter            QS
 SO W320      65        PPARM: Input Parameter May Be Out-of-Range for Parameter            VS
 SO W320      66        PPARM: Input Parameter May Be Out-of-Range for Parameter            QS
 SO W320      66        PPARM: Input Parameter May Be Out-of-Range for Parameter            VS
 SO W320      67        PPARM: Input Parameter May Be Out-of-Range for Parameter            QS
 SO W320      68        VPARM: Input Parameter May Be Out-of-Range for Parameter            QS
 SO W320      69        VPARM: Input Parameter May Be Out-of-Range for Parameter            QS
 SO W320      69        VPARM: Input Parameter May Be Out-of-Range for Parameter        SZINIT
 SO W320      70        VPARM: Input Parameter May Be Out-of-Range for Parameter            QS
 SO W320      71        VPARM: Input Parameter May Be Out-of-Range for Parameter            QS
 SO W320      77        PPARM: Input Parameter May Be Out-of-Range for Parameter            QS
 ME W186     466       MEOPEN: THRESH_1MIN 1-min ASOS wind speed threshold used           0.50
 ME W187     466       MEOPEN: ADJ_U* Option for Stable Low Winds used in AERMET

 *********************************
 *** SETUP Finishes Successfully ***
 *********************************

  *** AERMOD - VERSION 22112  ***   *** C:\Users\jeffw\Desktop\24421 et al\24421 et al.isc                  ***
06/05/24
```

*** MODELOPTs: RegDFAULT CONC ELEV RURAL ADJ_U*

*** MODEL SETUP OPTIONS SUMMARY ***

- -

** Model Options Selected:
* Model Uses Regulatory DEFAULT Options
* Model Is Setup For Calculation of Average CONCentration Values.
* NO GAS DEPOSITION Data Provided.
* NO PARTICLE DEPOSITION Data Provided.
* Model Uses NO DRY DEPLETION. DDPLETE = F
* Model Uses NO WET DEPLETION. WETDPLT = F
* Stack-tip Downwash.
* Model Accounts for ELEVated Terrain Effects.
* Use Calms Processing Routine.
* Use Missing Data Processing Routine.
* No Exponential Decay.
* Model Uses RURAL Dispersion Only.
* ADJ_U* - Use ADJ_U* option for SBL in AERMET
* CCVR_Sub - Meteorological data includes CCVR substitutions
* TEMP_Sub - Meteorological data includes TEMP substitutions
* Model Assumes No FLAGPOLE Receptor Heights.
* The User Specified a Pollutant Type of: OTHER

**Model Calculates 1 Short Term Average(s) of: 1-HR
and Calculates PERIOD Averages

**This Run Includes: 14 Source(s); 14 Source Group(s); and 2233 Receptor(s)

with: 10 POINT(s), including
0 POINTCAP(s) and 0 POINTHOR(s)
and: 4 VOLUME source(s)
and: 0 AREA type source(s)
and: 0 LINE source(s)
and: 0 RLINE/RLINEXT source(s)
and: 0 OPENPIT source(s)
and: 0 BUOYANT LINE source(s) with a total of 0 line(s)
and: 0 SWPOINT source(s)

**Model Set To Continue RUNning After the Setup Testing.

**The AERMET Input Meteorological Data Version Date: 19191

**Output Options Selected:
Model Outputs Tables of PERIOD Averages by Receptor
Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE: The Following Flags May Appear Following CONC Values: c for Calm Hours
m for Missing Hours
b for Both Calm and Missing Hours

**Misc. Inputs: Base Elev. for Pot. Temp. Profile (m MSL) = 6.00 ; Decay Coef. = 0.000 ; Rot. Angle = 0.0
Emission Units = GRAMS/SEC ; Emission Rate Unit Factor = 0.10000E+07
Output Units = MICROGRAMS/M**3

**Approximate Storage Requirements of Model = 5.1 MB of RAM.

**Input Runstream File: aermod.inp

**Output Print File: aermod.out

**Detailed Error/Message File: 24421 et al.err

**File for Summary of Results: 24421 et al.sum

 *** MODELOPTs: RegDFAULT CONC ELEV RURAL ADJ_U*

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BLDG EXISTS	URBAN SOURCE	CAP/ HOR SCALAR VARY BY	EMIS RATE
STCK1	0	0.00000E+00	634007.3	4256920.0	3.7	33.53	293.00	1801.71	1.37	YES	NO	NO	
STCK3	0	0.00000E+00	633948.6	4256818.1	3.7	18.29	293.00	1008.86	1.40	YES	NO	NO	
STCK5	0	0.00000E+00	634218.1	4257061.1	3.2	12.80	293.15	574.44	0.30	YES	NO	NO	
STCK6	0	0.00000E+00	633947.3	4257076.8	3.3	3.05	293.00	18.29	7.69	YES	NO	NO	
STCK7	0	0.10000E+01	634075.1	4257122.0	2.1	13.41	635.93	10.19	0.64	YES	NO	NO	
STCK8	0	0.10000E+01	634075.1	4257129.1	1.9	13.41	635.93	10.19	0.64	YES	NO	NO	
STCK9	0	0.10000E+01	634075.1	4257136.1	1.8	13.41	635.93	10.19	0.64	YES	NO	NO	
STCK10	0	0.10000E+01	634075.1	4257143.2	1.8	13.41	635.93	10.19	0.64	YES	NO	NO	
STCK11	0	0.10000E+01	634047.2	4257158.4	1.9	13.41	383.15	11.84	0.61	YES	NO	NO	
STCK12	0	0.00000E+00	634031.7	4257143.1	2.2	7.01	369.26	12.12	0.71	YES	NO	NO	

 *** MODELOPTs: RegDFAULT CONC ELEV RURAL ADJ_U*

*** VOLUME SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	RELEASE HEIGHT (METERS)	INIT. SY (METERS)	INIT. SZ (METERS)	URBAN SOURCE	EMISSION RATE SCALAR VARY BY
VOL1	0	0.00000E+00	633657.1	4257110.3	3.0	2.13	48.68	1.00	NO	
VOL2	0	0.00000E+00	633674.0	4256731.6	4.3	0.00	41.14	0.00	NO	
VOL3	0	0.00000E+00	632870.5	4256736.9	2.2	3.70	89.96	1.50	NO	
VOL4	0	0.00000E+00	632709.1	4255502.8	3.2	3.70	134.97	1.50	NO	

 *** MODELOPTs: RegDFAULT CONC ELEV RURAL ADJ_U*

*** SOURCE IDs DEFINING SOURCE GROUPS ***

SRCGROUP ID	SOURCE IDs
STCK1	STCK1 ,
STCK3	STCK3 ,
STCK5	STCK5 ,
STCK6	STCK6 ,

VOL1 VOL1 ,

VOL2 VOL2 ,

VOL3 VOL3 ,

VOL4 VOL4 ,

STCK10 STCK10 ,

STCK11 STCK11 ,

STCK12 STCK12 ,

STCK7 STCK7 ,

STCK8 STCK8 ,

STCK9 STCK9 ,

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
(1=YES; 0=NO)

```
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1
```

NOTE: METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

*** MODELOPTs: RegDFAULT CONC ELEV RURAL ADJ_U*

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: N:\PERMITTING\Modeling\AermodMet 19191\Exec\14-18.SFC Met Version: 19191
Profile file: N:\PERMITTING\Modeling\AermodMet 19191\Exec\14-18.PFL
Surface format: FREE
Profile format: FREE
Surface station no.: 23232 Upper air station no.: 23230
Name: SACRAMENTO/EXECUTIVE_ARPT Name: OAKLAND/WSO_AP
Year: 2014 Year: 2014

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
14	01	01	1	01	-1.4	0.061	-9.000	-9.000	-999.	36.	14.2	0.04	0.93	1.00	0.62	152.	10.1	274.9	2.0
14	01	01	1	02	-4.9	0.096	-9.000	-9.000	-999.	72.	16.7	0.16	0.93	1.00	1.08	107.	10.1	274.2	2.0
14	01	01	1	03	-5.3	0.100	-9.000	-9.000	-999.	76.	17.3	0.16	0.93	1.00	1.13	95.	10.1	274.2	2.0
14	01	01	1	04	-2.4	0.075	-9.000	-9.000	-999.	49.	15.4	0.16	0.93	1.00	0.70	117.	10.1	273.8	2.0
14	01	01	1	05	-3.8	0.084	-9.000	-9.000	-999.	59.	14.5	0.11	0.93	1.00	1.03	120.	10.1	273.1	2.0
14	01	01	1	06	-2.3	0.072	-9.000	-9.000	-999.	46.	14.5	0.11	0.93	1.00	0.74	128.	10.1	273.1	2.0
14	01	01	1	07	-1.3	0.061	-9.000	-9.000	-999.	36.	16.0	0.05	0.93	1.00	0.53	232.	10.1	273.1	2.0
14	01	01	1	08	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.08	0.93	0.76	0.00	0.	10.1	273.1	2.0

```
 14 01 01   1 09   -1.5  0.085 -9.000 -9.000 -999.   60.     38.3  0.11   0.93   0.40    1.03  133.   10.1  278.1    2.0
 14 01 01   1 10   40.2  0.170  0.461  0.019   88.  168.    -11.2  0.11   0.93   0.28    1.50  122.   10.1  281.4    2.0
 14 01 01   1 11   74.7  0.195  0.704  0.017  170.  206.     -9.0  0.11   0.93   0.23    1.67  140.   10.1  283.8    2.0
 14 01 01   1 12   94.4  0.181  0.832  0.016  222.  184.     -5.7  0.04   0.93   0.22    1.88  157.   10.1  286.4    2.0
 14 01 01   1 13   97.3  0.170  0.891  0.014  265.  168.     -4.6  0.04   0.93   0.22    1.71  173.   10.1  287.5    2.0
 14 01 01   1 14   84.1  0.178  0.894  0.013  309.  181.     -6.1  0.04   0.93   0.23    1.81  202.   10.1  289.2    2.0
 14 01 01   1 15   54.8  0.119  0.824  0.012  371.   99.     -2.8  0.04   0.93   0.26    1.08  189.   10.1  289.9    2.0
 14 01 01   1 16   12.2  0.060  0.506  0.012  384.   36.     -1.6  0.04   0.93   0.35    0.52  169.   10.1  288.8    2.0
 14 01 01   1 17   -2.3  0.067 -9.000 -9.000 -999.   42.     11.9  0.04   0.93   0.60    0.96  173.   10.1  286.4    2.0
 14 01 01   1 18   -1.7  0.066 -9.000 -9.000 -999.   40.     15.2  0.09   0.93   1.00    0.62  252.   10.1  283.8    2.0
 14 01 01   1 19   -1.7  0.069 -9.000 -9.000 -999.   43.     17.0  0.15   0.93   1.00    0.55   79.   10.1  281.4    2.0
 14 01 01   1 20 -999.0 -9.000 -9.000 -9.000 -999. -999. -99999.0  0.08   0.93   1.00    0.00    0.   10.1  280.4    2.0
 14 01 01   1 21   -1.7  0.062 -9.000 -9.000 -999.   37.     13.4  0.04   0.93   1.00    0.69    7.   10.1  279.2    2.0
 14 01 01   1 22 -999.0 -9.000 -9.000 -9.000 -999. -999. -99999.0  0.08   0.93   1.00    0.00    0.   10.1  278.1    2.0
 14 01 01   1 23   -1.3  0.060 -9.000 -9.000 -999.   35.     14.8  0.04   0.93   1.00    0.58   28.   10.1  277.5    2.0
 14 01 01   1 24   -2.2  0.067 -9.000 -9.000 -999.   42.     12.2  0.04   0.93   1.00    0.87   24.   10.1  277.5    2.0


 First hour of profile data
 YR MO DY HR HEIGHT F  WDIR    WSPD AMB_TMP sigmaA  sigmaW  sigmaV
 14 01 01 01   10.1 1  152.    0.62   274.9   99.0  -99.00  -99.00

 F indicates top of profile (=1) or below (=0)

  *** AERMOD - VERSION 22112  ***   *** C:\Users\jeffw\Desktop\24421 et al\24421 et al.isc                    ***
06/05/24
 *** AERMET - VERSION  19191 ***   ***                                                                      ***
12:51:39
                                                                                                                PAGE
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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  RURAL  ADJ_U*

                                      *** THE SUMMARY OF MAXIMUM PERIOD ( 43680 HRS) RESULTS ***


                                   ** CONC OF OTHER    IN MICROGRAMS/M**3                        **

                                                                                                          NETWORK
GROUP ID                        AVERAGE CONC                RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

STCK1     1ST HIGHEST VALUE IS       0.00000 AT (       0.00,        0.00,     0.00,     0.00,    0.00)
          2ND HIGHEST VALUE IS       0.00000 AT (       0.00,        0.00,     0.00,     0.00,    0.00)
          3RD HIGHEST VALUE IS       0.00000 AT (       0.00,        0.00,     0.00,     0.00,    0.00)
          4TH HIGHEST VALUE IS       0.00000 AT (       0.00,        0.00,     0.00,     0.00,    0.00)
          5TH HIGHEST VALUE IS       0.00000 AT (       0.00,        0.00,     0.00,     0.00,    0.00)
          6TH HIGHEST VALUE IS       0.00000 AT (       0.00,        0.00,     0.00,     0.00,    0.00)
          7TH HIGHEST VALUE IS       0.00000 AT (       0.00,        0.00,     0.00,     0.00,    0.00)
          8TH HIGHEST VALUE IS       0.00000 AT (       0.00,        0.00,     0.00,     0.00,    0.00)
          9TH HIGHEST VALUE IS       0.00000 AT (       0.00,        0.00,     0.00,     0.00,    0.00)
         10TH HIGHEST VALUE IS       0.00000 AT (       0.00,        0.00,     0.00,     0.00,    0.00)

STCK3     1ST HIGHEST VALUE IS       0.00000 AT (       0.00,        0.00,     0.00,     0.00,    0.00)
          2ND HIGHEST VALUE IS       0.00000 AT (       0.00,        0.00,     0.00,     0.00,    0.00)
          3RD HIGHEST VALUE IS       0.00000 AT (       0.00,        0.00,     0.00,     0.00,    0.00)
          4TH HIGHEST VALUE IS       0.00000 AT (       0.00,        0.00,     0.00,     0.00,    0.00)
          5TH HIGHEST VALUE IS       0.00000 AT (       0.00,        0.00,     0.00,     0.00,    0.00)
          6TH HIGHEST VALUE IS       0.00000 AT (       0.00,        0.00,     0.00,     0.00,    0.00)
          7TH HIGHEST VALUE IS       0.00000 AT (       0.00,        0.00,     0.00,     0.00,    0.00)
          8TH HIGHEST VALUE IS       0.00000 AT (       0.00,        0.00,     0.00,     0.00,    0.00)
          9TH HIGHEST VALUE IS       0.00000 AT (       0.00,        0.00,     0.00,     0.00,    0.00)
         10TH HIGHEST VALUE IS       0.00000 AT (       0.00,        0.00,     0.00,     0.00,    0.00)

STCK5     1ST HIGHEST VALUE IS       0.00000 AT (       0.00,        0.00,     0.00,     0.00,    0.00)
          2ND HIGHEST VALUE IS       0.00000 AT (       0.00,        0.00,     0.00,     0.00,    0.00)
          3RD HIGHEST VALUE IS       0.00000 AT (       0.00,        0.00,     0.00,     0.00,    0.00)
          4TH HIGHEST VALUE IS       0.00000 AT (       0.00,        0.00,     0.00,     0.00,    0.00)
          5TH HIGHEST VALUE IS       0.00000 AT (       0.00,        0.00,     0.00,     0.00,    0.00)
          6TH HIGHEST VALUE IS       0.00000 AT (       0.00,        0.00,     0.00,     0.00,    0.00)
          7TH HIGHEST VALUE IS       0.00000 AT (       0.00,        0.00,     0.00,     0.00,    0.00)
          8TH HIGHEST VALUE IS       0.00000 AT (       0.00,        0.00,     0.00,     0.00,    0.00)
          9TH HIGHEST VALUE IS       0.00000 AT (       0.00,        0.00,     0.00,     0.00,    0.00)
         10TH HIGHEST VALUE IS       0.00000 AT (       0.00,        0.00,     0.00,     0.00,    0.00)

STCK6     1ST HIGHEST VALUE IS       0.00000 AT (       0.00,        0.00,     0.00,     0.00,    0.00)
          2ND HIGHEST VALUE IS       0.00000 AT (       0.00,        0.00,     0.00,     0.00,    0.00)
          3RD HIGHEST VALUE IS       0.00000 AT (       0.00,        0.00,     0.00,     0.00,    0.00)
          4TH HIGHEST VALUE IS       0.00000 AT (       0.00,        0.00,     0.00,     0.00,    0.00)
```

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
STCK10	1ST HIGHEST VALUE IS	0.73832 AT (634335.52, 4258201.38, 2.42, 2.42, 0.00)	DC		
	2ND HIGHEST VALUE IS	0.73746 AT (634354.61, 4258205.06, 2.34, 2.34, 0.00)	DC		
	3RD HIGHEST VALUE IS	0.73505 AT (634316.43, 4258197.70, 2.74, 2.74, 0.00)	DC		
	4TH HIGHEST VALUE IS	0.73387 AT (634373.70, 4258208.74, 2.37, 2.37, 0.00)	DC		
	5TH HIGHEST VALUE IS	0.72862 AT (634392.79, 4258212.42, 2.43, 2.43, 0.00)	DC		
	6TH HIGHEST VALUE IS	0.72188 AT (634411.88, 4258216.10, 2.52, 2.52, 0.00)	DC		
	7TH HIGHEST VALUE IS	0.71911 AT (634349.87, 4258229.61, 2.56, 2.56, 0.00)	DC		
	8TH HIGHEST VALUE IS	0.71859 AT (634330.78, 4258225.93, 2.74, 2.74, 0.00)	DC		
	9TH HIGHEST VALUE IS	0.71741 AT (634368.97, 4258233.29, 2.47, 2.47, 0.00)	DC		
	10TH HIGHEST VALUE IS	0.71541 AT (634311.69, 4258222.25, 3.03, 3.03, 0.00)	DC		
STCK11	1ST HIGHEST VALUE IS	1.13048 AT (634316.43, 4258197.70, 2.74, 2.74, 0.00)	DC		
	2ND HIGHEST VALUE IS	1.12176 AT (634335.52, 4258201.38, 2.42, 2.42, 0.00)	DC		
	3RD HIGHEST VALUE IS	1.10713 AT (634354.61, 4258205.06, 2.34, 2.34, 0.00)	DC		
	4TH HIGHEST VALUE IS	1.10347 AT (634311.69, 4258222.25, 3.03, 3.03, 0.00)	DC		
	5TH HIGHEST VALUE IS	1.09478 AT (634330.78, 4258225.93, 2.74, 2.74, 0.00)	DC		
	6TH HIGHEST VALUE IS	1.09015 AT (634373.70, 4258208.74, 2.37, 2.37, 0.00)	DC		
	7TH HIGHEST VALUE IS	1.08307 AT (634349.87, 4258229.61, 2.56, 2.56, 0.00)	DC		
	8TH HIGHEST VALUE IS	1.07145 AT (634392.79, 4258212.42, 2.43, 2.43, 0.00)	DC		
	9TH HIGHEST VALUE IS	1.06881 AT (634368.97, 4258233.29, 2.47, 2.47, 0.00)	DC		
	10TH HIGHEST VALUE IS	1.06441 AT (634326.05, 4258250.48, 3.43, 3.43, 0.00)	DC		
STCK12	1ST HIGHEST VALUE IS	0.00000 AT (0.00, 0.00, 0.00, 0.00, 0.00)			
	2ND HIGHEST VALUE IS	0.00000 AT (0.00, 0.00, 0.00, 0.00, 0.00)			
	3RD HIGHEST VALUE IS	0.00000 AT (0.00, 0.00, 0.00, 0.00, 0.00)			
	4TH HIGHEST VALUE IS	0.00000 AT (0.00, 0.00, 0.00, 0.00, 0.00)			
	5TH HIGHEST VALUE IS	0.00000 AT (0.00, 0.00, 0.00, 0.00, 0.00)			
	6TH HIGHEST VALUE IS	0.00000 AT (0.00, 0.00, 0.00, 0.00, 0.00)			
	7TH HIGHEST VALUE IS	0.00000 AT (0.00, 0.00, 0.00, 0.00, 0.00)			
	8TH HIGHEST VALUE IS	0.00000 AT (0.00, 0.00, 0.00, 0.00, 0.00)			
	9TH HIGHEST VALUE IS	0.00000 AT (0.00, 0.00, 0.00, 0.00, 0.00)			
	10TH HIGHEST VALUE IS	0.00000 AT (0.00, 0.00, 0.00, 0.00, 0.00)			
STCK7	1ST HIGHEST VALUE IS	0.72160 AT (634335.52, 4258201.38, 2.42, 2.42, 0.00)	DC		
	2ND HIGHEST VALUE IS	0.72050 AT (634316.43, 4258197.70, 2.74, 2.74, 0.00)	DC		
	3RD HIGHEST VALUE IS	0.71947 AT (634354.61, 4258205.06, 2.34, 2.34, 0.00)	DC		
	4TH HIGHEST VALUE IS	0.71595 AT (634373.70, 4258208.74, 2.37, 2.37, 0.00)	DC		
	5TH HIGHEST VALUE IS	0.71120 AT (634392.79, 4258212.42, 2.43, 2.43, 0.00)	DC		
	6TH HIGHEST VALUE IS	0.70583 AT (634349.87, 4258229.61, 2.56, 2.56, 0.00)	DC		
	7TH HIGHEST VALUE IS	0.70573 AT (634330.78, 4258225.93, 2.74, 2.74, 0.00)	DC		
	8TH HIGHEST VALUE IS	0.70540 AT (634411.88, 4258216.10, 2.52, 2.52, 0.00)	DC		
	9TH HIGHEST VALUE IS	0.70287 AT (634368.97, 4258233.29, 2.47, 2.47, 0.00)	DC		
	10TH HIGHEST VALUE IS	0.70274 AT (634311.69, 4258222.25, 3.03, 3.03, 0.00)	DC		

*** MODELOPTs: RegDFAULT CONC ELEV RURAL ADJ_U*

*** THE SUMMARY OF MAXIMUM PERIOD (43680 HRS) RESULTS ***

** CONC OF OTHER IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
STCK8	1ST HIGHEST VALUE IS	0.72548 AT (634335.52, 4258201.38, 2.42, 2.42, 0.00)	DC		
	2ND HIGHEST VALUE IS	0.72331 AT (634354.61, 4258205.06, 2.34, 2.34, 0.00)	DC		
	3RD HIGHEST VALUE IS	0.72282 AT (634316.43, 4258197.70, 2.74, 2.74, 0.00)	DC		
	4TH HIGHEST VALUE IS	0.71975 AT (634373.70, 4258208.74, 2.37, 2.37, 0.00)	DC		
	5TH HIGHEST VALUE IS	0.71498 AT (634392.79, 4258212.42, 2.43, 2.43, 0.00)	DC		
	6TH HIGHEST VALUE IS	0.70839 AT (634411.88, 4258216.10, 2.52, 2.52, 0.00)	DC		
	7TH HIGHEST VALUE IS	0.70831 AT (634349.87, 4258229.61, 2.56, 2.56, 0.00)	DC		
	8TH HIGHEST VALUE IS	0.70797 AT (634330.78, 4258225.93, 2.74, 2.74, 0.00)	DC		
	9TH HIGHEST VALUE IS	0.70633 AT (634368.97, 4258233.29, 2.47, 2.47, 0.00)	DC		
	10TH HIGHEST VALUE IS	0.70510 AT (634311.69, 4258222.25, 3.03, 3.03, 0.00)	DC		
STCK9	1ST HIGHEST VALUE IS	0.72825 AT (634335.52, 4258201.38, 2.42, 2.42, 0.00)	DC		
	2ND HIGHEST VALUE IS	0.72699 AT (634354.61, 4258205.06, 2.34, 2.34, 0.00)	DC		

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          3RD HIGHEST VALUE IS       0.72538 AT (  634316.43,  4258197.70,     2.74,     2.74,    0.00)  DC
          4TH HIGHEST VALUE IS       0.72303 AT (  634373.70,  4258208.74,     2.37,     2.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.71752 AT (  634392.79,  4258212.42,     2.43,     2.43,    0.00)  DC
          6TH HIGHEST VALUE IS       0.71068 AT (  634411.88,  4258216.10,     2.52,     2.52,    0.00)  DC
          7TH HIGHEST VALUE IS       0.71067 AT (  634349.87,  4258229.61,     2.56,     2.56,    0.00)  DC
          8TH HIGHEST VALUE IS       0.71041 AT (  634330.78,  4258225.93,     2.74,     2.74,    0.00)  DC
          9TH HIGHEST VALUE IS       0.70862 AT (  634368.97,  4258233.29,     2.47,     2.47,    0.00)  DC
         10TH HIGHEST VALUE IS       0.70763 AT (  634311.69,  4258222.25,     3.03,     3.03,    0.00)  DC


 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
  *** AERMOD - VERSION 22112  ***   *** C:\Users\jeffw\Desktop\24421 et al\24421 et al.isc                   ***
06/05/24
 *** AERMET - VERSION  19191 ***   ***                                                                     ***
12:51:39
                                                                                                                PAGE
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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  RURAL  ADJ_U*

                                            *** THE SUMMARY OF HIGHEST  1-HR RESULTS ***


                                    ** CONC OF OTHER    IN MICROGRAMS/M**3                          **

                                                 DATE
NETWORK
GROUP ID                           AVERAGE CONC     (YYMMDDHH)             RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)    OF TYPE
GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - -

STCK1    HIGH   1ST HIGH VALUE IS       0.00000  ON 00000000: AT (       0.00,        0.00,     0.00,     0.00,    0.00)

STCK3    HIGH   1ST HIGH VALUE IS       0.00000  ON 00000000: AT (       0.00,        0.00,     0.00,     0.00,    0.00)

STCK5    HIGH   1ST HIGH VALUE IS       0.00000  ON 00000000: AT (       0.00,        0.00,     0.00,     0.00,    0.00)

STCK6    HIGH   1ST HIGH VALUE IS       0.00000  ON 00000000: AT (       0.00,        0.00,     0.00,     0.00,    0.00)

VOL1     HIGH   1ST HIGH VALUE IS       0.00000  ON 00000000: AT (       0.00,        0.00,     0.00,     0.00,    0.00)

VOL2     HIGH   1ST HIGH VALUE IS       0.00000  ON 00000000: AT (       0.00,        0.00,     0.00,     0.00,    0.00)

VOL3     HIGH   1ST HIGH VALUE IS       0.00000  ON 00000000: AT (       0.00,        0.00,     0.00,     0.00,    0.00)

VOL4     HIGH   1ST HIGH VALUE IS       0.00000  ON 00000000: AT (       0.00,        0.00,     0.00,     0.00,    0.00)

STCK10   HIGH   1ST HIGH VALUE IS      42.43043  ON 17122321: AT (  634278.39,  4256481.23,     4.57,     4.57,    0.00)  DC

STCK11   HIGH   1ST HIGH VALUE IS      61.74178  ON 16021608: AT (  634353.48,  4256465.28,     4.57,     4.57,    0.00)  DC

STCK12   HIGH   1ST HIGH VALUE IS       0.00000  ON 00000000: AT (       0.00,        0.00,     0.00,     0.00,    0.00)

STCK7    HIGH   1ST HIGH VALUE IS      40.25888  ON 16021608: AT (  634353.48,  4256465.28,     4.57,     4.57,    0.00)  DC

STCK8    HIGH   1ST HIGH VALUE IS      40.42741  ON 16010924: AT (  634250.61,  4256483.29,     4.57,     4.57,    0.00)  DC

STCK9    HIGH   1ST HIGH VALUE IS      41.68092  ON 17122321: AT (  634278.39,  4256481.23,     4.57,     4.57,    0.00)  DC


 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
  *** AERMOD - VERSION 22112  ***   *** C:\Users\jeffw\Desktop\24421 et al\24421 et al.isc                   ***
06/05/24
 *** AERMET - VERSION  19191 ***   ***                                                                     ***
12:51:39
                                                                                                                PAGE
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*** MODELOPTs:    RegDFAULT  CONC  ELEV  RURAL  ADJ_U*

*** Message Summary : AERMOD Model Execution ***

 --------- Summary of Total Messages --------

A Total of            0 Fatal Error Message(s)
A Total of           15 Warning Message(s)
A Total of         1576 Informational Message(s)

A Total of        43680 Hours Were Processed

A Total of          643 Calm Hours Identified

A Total of          933 Missing Hours Identified (  2.14 Percent)


   ******** FATAL ERROR MESSAGES ********
              ***  NONE  ***


   ********   WARNING MESSAGES   ********
SO W320      64        PPARM: Input Parameter May Be Out-of-Range for Parameter            QS
SO W320      64        PPARM: Input Parameter May Be Out-of-Range for Parameter            VS
SO W320      65        PPARM: Input Parameter May Be Out-of-Range for Parameter            QS
SO W320      65        PPARM: Input Parameter May Be Out-of-Range for Parameter            VS
SO W320      66        PPARM: Input Parameter May Be Out-of-Range for Parameter            QS
SO W320      66        PPARM: Input Parameter May Be Out-of-Range for Parameter            VS
SO W320      67        PPARM: Input Parameter May Be Out-of-Range for Parameter            QS
SO W320      68        VPARM: Input Parameter May Be Out-of-Range for Parameter            QS
SO W320      69        VPARM: Input Parameter May Be Out-of-Range for Parameter            QS
SO W320      69        VPARM: Input Parameter May Be Out-of-Range for Parameter        SZINIT
SO W320      70        VPARM: Input Parameter May Be Out-of-Range for Parameter            QS
SO W320      71        VPARM: Input Parameter May Be Out-of-Range for Parameter            QS
SO W320      77        PPARM: Input Parameter May Be Out-of-Range for Parameter            QS
ME W186     466       MEOPEN: THRESH_1MIN 1-min ASOS wind speed threshold used          0.50
ME W187     466       MEOPEN: ADJ_U* Option for Stable Low Winds used in AERMET

   ************************************
   *** AERMOD Finishes Successfully ***
   ************************************
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HARP2 Report

HARP Project Summary Report 6/5/2024 1:47:50 PM

PROJECT INFORMATION
HARP Version: 22118
Project Name: HARP2
Project Output Directory: C:\Users\jeffw\OneDrive - SMAQMD\Desktop\27780 27781 27782 27783 27784 27785\HARP2
HARP Database: NA

FACILITY INFORMATION
Origin
X (m):0
Y (m):0
Zone:1
No. of Sources:0
No. of Buildings:0

EMISSION INVENTORY
No. of Pollutants:187
No. of Background Pollutants:0

Emissions

ScrID	StkID	ProID	PolID	PolAbbrev	Multi	Annual Ems (lbs/yr)	MaxHr Ems (lbs/hr)	MWAF
STCK7	0	0	95636	1,2,4TriMeBenze	1	3.176619309	0.000362628	1
STCK7	0	0	106990	1,3-Butadiene	1	11.92907673	0.001361767	1
STCK7	0	0	540841	2,2,4TriMePentn	1	11.1695475	0.001275063	1
STCK7	0	0	91576	2MeNaphthalene	1	1.483315908	0.000169328	1
STCK7	0	0	83329	Acenaphthene	1	0.055847738	6.37531E-06	1
STCK7	0	0	208968	Acenaphthylene	1	0.247070391	2.82044E-05	1
STCK7	0	0	75070	Acetaldehyde	1	373.5096684	0.04263809	1
STCK7	0	0	107028	Acrolein	1	0.960581085	0.000109655	1
STCK7	0	0	7664417	NH3	1	2423.52904	0.276639608	1
STCK7	0	0	71432	Benzene	1	114.3761664	0.01305664	1
STCK7	0	0	205992	B[b]fluoranthen	1	0.00741658	8.46642E-07	1
STCK7	0	0	192972	B[e]pyrene	1	0.018541449	2.1166E-06	1
STCK7	0	0	191242	B[g,h,i]perylen	1	0.018496771	2.1115E-06	1
STCK7	0	0	92524	Biphenyl	1	9.47177628	0.001081253	1
STCK7	0	0	218019	Chrysene	1	0.030961986	3.53447E-06	1
STCK7	0	0	100414	Ethyl Benzene	1	1.773724143	0.00020248	1
STCK7	0	0	75003	Ethyl Chloride	1	0.083548215	9.53747E-06	1
STCK7	0	0	206440	Fluoranthene	1	0.049592791	5.66128E-06	1
STCK7	0	0	86737	Fluorene	1	0.253325337	2.89184E-05	1
STCK7	0	0	50000	Formaldehyde	1	2359.008432	0.2692932	1
STCK7	0	0	110543	Hexane	1	49.5927909	0.005661278	1
STCK7	0	0	78842	Isobutyraldehyd	1	4.51249719	0.000515125	1
STCK7	0	0	67561	Methanol	1	111.695475	0.012750625	1
STCK7	0	0	75092	Methylene Chlor	1	5.89752108	0.000673233	1
STCK7	0	0	91203	Naphthalene	1	3.324057336	0.000379459	1
STCK7	0	0	1151	PAHs-w/o	1	1.201843311	0.000137197	1
STCK7	0	0	85018	Phenanthrene	1	0.464653176	5.30426E-05	1
STCK7	0	0	108952	Phenol	1	1.07227656	0.000122406	1
STCK7	0	0	129000	Pyrene	1	0.060762338	6.93634E-06	1
STCK7	0	0	108883	Toluene	1	50.0395728	0.00571228	1
STCK7	0	0	79016	TCE	1	0.589752108	6.73233E-05	1
STCK7	0	0	75014	Vinyl Chloride	1	0.768464868	8.77243E-05	1
STCK7	0	0	1330207	Xylenes	1	10.81212198	0.001234261	1
STCK7	0	0	123911	1,4-Dioxane	1	0.585284289	6.68133E-05	1
STCK7	0	0	56235	CCl4	1	0.299790655	3.42227E-05	1

STCK7	0	0	67663	Chloroform	1	0.594219927	6.78333E-05	1
STCK7	0	0	107062	EDC	1	0.298003527	3.40187E-05	1
STCK7	0	0	71556	1,1,1-TCA	1	0.598687746	6.83434E-05	1
STCK7	0	0	106467	p-DiClBenzene	1	2.890678893	0.000329986	1
STCK7	0	0	127184	Perc	1	0.607623384	6.93634E-05	1
STCK7	0	0	100425	Styrene	1	2.2339095	0.000255013	1
STCK7	0	0	75354	Vinylid Chlorid	1	0.304258474	3.47327E-05	1
STCK8	0	0	95636	1,2,4TriMeBenze	1	3.176619309	0.000362628	1
STCK8	0	0	106990	1,3-Butadiene	1	11.92907673	0.001361767	1
STCK8	0	0	540841	2,2,4TriMePentn	1	11.1695475	0.001275063	1
STCK8	0	0	91576	2MeNaphthalene	1	1.483315908	0.000169328	1
STCK8	0	0	83329	Acenaphthene	1	0.055847738	6.37531E-06	1
STCK8	0	0	208968	Acenaphthylene	1	0.247070391	2.82044E-05	1
STCK8	0	0	75070	Acetaldehyde	1	373.5096684	0.04263809	1
STCK8	0	0	107028	Acrolein	1	0.960581085	0.000109655	1
STCK8	0	0	7664417	NH3	1	2423.52904	0.276639608	1
STCK8	0	0	71432	Benzene	1	114.3761664	0.01305664	1
STCK8	0	0	205992	B[b]fluoranthen	1	0.00741658	8.46642E-07	1
STCK8	0	0	192972	B[e]pyrene	1	0.018541449	2.1166E-06	1
STCK8	0	0	191242	B[g,h,i]perylen	1	0.018496771	2.1115E-06	1
STCK8	0	0	92524	Biphenyl	1	9.47177628	0.001081253	1
STCK8	0	0	218019	Chrysene	1	0.030961986	3.53447E-06	1
STCK8	0	0	100414	Ethyl Benzene	1	1.773724143	0.00020248	1
STCK8	0	0	75003	Ethyl Chloride	1	0.083548215	9.53747E-06	1
STCK8	0	0	206440	Fluoranthene	1	0.049592791	5.66128E-06	1
STCK8	0	0	86737	Fluorene	1	0.253325337	2.89184E-05	1
STCK8	0	0	50000	Formaldehyde	1	2359.008432	0.2692932	1
STCK8	0	0	110543	Hexane	1	49.5927909	0.005661278	1
STCK8	0	0	78842	Isobutyraldehyd	1	4.51249719	0.000515125	1
STCK8	0	0	67561	Methanol	1	111.695475	0.012750625	1
STCK8	0	0	75092	Methylene Chlor	1	5.89752108	0.000673233	1
STCK8	0	0	91203	Naphthalene	1	3.324057336	0.000379459	1
STCK8	0	0	1151	PAHs-w/o	1	1.201843311	0.000137197	1
STCK8	0	0	85018	Phenanthrene	1	0.464653176	5.30426E-05	1
STCK8	0	0	108952	Phenol	1	1.07227656	0.000122406	1
STCK8	0	0	129000	Pyrene	1	0.060762338	6.93634E-06	1
STCK8	0	0	108883	Toluene	1	50.0395728	0.00571228	1
STCK8	0	0	79016	TCE	1	0.589752108	6.73233E-05	1
STCK8	0	0	75014	Vinyl Chloride	1	0.768464868	8.77243E-05	1
STCK8	0	0	1330207	Xylenes	1	10.81212198	0.001234261	1
STCK8	0	0	123911	1,4-Dioxane	1	0.585284289	6.68133E-05	1
STCK8	0	0	56235	CCl4	1	0.299790655	3.42227E-05	1
STCK8	0	0	67663	Chloroform	1	0.594219927	6.78333E-05	1
STCK8	0	0	107062	EDC	1	0.298003527	3.40187E-05	1
STCK8	0	0	71556	1,1,1-TCA	1	0.598687746	6.83434E-05	1
STCK8	0	0	106467	p-DiClBenzene	1	2.890678893	0.000329986	1
STCK8	0	0	127184	Perc	1	0.607623384	6.93634E-05	1
STCK8	0	0	100425	Styrene	1	2.2339095	0.000255013	1
STCK8	0	0	75354	Vinylid Chlorid	1	0.304258474	3.47327E-05	1
STCK9	0	0	95636	1,2,4TriMeBenze	1	3.176619309	0.000362628	1
STCK9	0	0	106990	1,3-Butadiene	1	11.92907673	0.001361767	1
STCK9	0	0	540841	2,2,4TriMePentn	1	11.1695475	0.001275063	1
STCK9	0	0	91576	2MeNaphthalene	1	1.483315908	0.000169328	1
STCK9	0	0	83329	Acenaphthene	1	0.055847738	6.37531E-06	1
STCK9	0	0	208968	Acenaphthylene	1	0.247070391	2.82044E-05	1
STCK9	0	0	75070	Acetaldehyde	1	373.5096684	0.04263809	1
STCK9	0	0	107028	Acrolein	1	0.960581085	0.000109655	1
STCK9	0	0	7664417	NH3	1	2423.52904	0.276639608	1
STCK9	0	0	71432	Benzene	1	114.3761664	0.01305664	1

STCK9	0	0	205992	B[b]fluoranthen	1	0.00741658	8.46642E-07	1
STCK9	0	0	192972	B[e]pyrene	1	0.018541449	2.1166E-06	1
STCK9	0	0	191242	B[g,h,i]perylen	1	0.018496771	2.1115E-06	1
STCK9	0	0	92524	Biphenyl	1	9.47177628	0.001081253	1
STCK9	0	0	218019	Chrysene	1	0.030961986	3.53447E-06	1
STCK9	0	0	100414	Ethyl Benzene	1	1.773724143	0.00020248	1
STCK9	0	0	75003	Ethyl Chloride	1	0.083548215	9.53747E-06	1
STCK9	0	0	206440	Fluoranthene	1	0.049592791	5.66128E-06	1
STCK9	0	0	86737	Fluorene	1	0.253325337	2.89184E-05	1
STCK9	0	0	50000	Formaldehyde	1	2359.008432	0.2692932	1
STCK9	0	0	110543	Hexane	1	49.5927909	0.005661278	1
STCK9	0	0	78842	Isobutyraldehyd	1	4.51249719	0.000515125	1
STCK9	0	0	67561	Methanol	1	111.695475	0.012750625	1
STCK9	0	0	75092	Methylene Chlor	1	5.89752108	0.000673233	1
STCK9	0	0	91203	Naphthalene	1	3.324057336	0.000379459	1
STCK9	0	0	1151	PAHs-w/o	1	1.201843311	0.000137197	1
STCK9	0	0	85018	Phenanthrene	1	0.464653176	5.30426E-05	1
STCK9	0	0	108952	Phenol	1	1.07227656	0.000122406	1
STCK9	0	0	129000	Pyrene	1	0.060762338	6.93634E-06	1
STCK9	0	0	108883	Toluene	1	50.0395728	0.00571228	1
STCK9	0	0	79016	TCE	1	0.589752108	6.73233E-05	1
STCK9	0	0	75014	Vinyl Chloride	1	0.768464868	8.77243E-05	1
STCK9	0	0	1330207	Xylenes	1	10.81212198	0.001234261	1
STCK9	0	0	123911	1,4-Dioxane	1	0.585284289	6.68133E-05	1
STCK9	0	0	56235	CCl4	1	0.299790655	3.42227E-05	1
STCK9	0	0	67663	Chloroform	1	0.594219927	6.78333E-05	1
STCK9	0	0	107062	EDC	1	0.298003527	3.40187E-05	1
STCK9	0	0	71556	1,1,1-TCA	1	0.598687746	6.83434E-05	1
STCK9	0	0	106467	p-DiClBenzene	1	2.890678893	0.000329986	1
STCK9	0	0	127184	Perc	1	0.607623384	6.93634E-05	1
STCK9	0	0	100425	Styrene	1	2.2339095	0.000255013	1
STCK9	0	0	75354	Vinylid Chlorid	1	0.304258474	3.47327E-05	1
STCK10	0	0	95636	1,2,4TriMeBenze	1	3.176619309	0.000362628	1
STCK10	0	0	106990	1,3-Butadiene	1	11.92907673	0.001361767	1
STCK10	0	0	540841	2,2,4TriMePentn	1	11.1695475	0.001275063	1
STCK10	0	0	91576	2MeNaphthalene	1	1.483315908	0.000169328	1
STCK10	0	0	83329	Acenaphthene	1	0.055847738	6.37531E-06	1
STCK10	0	0	208968	Acenaphthylene	1	0.247070391	2.82044E-05	1
STCK10	0	0	75070	Acetaldehyde	1	373.5096684	0.04263809	1
STCK10	0	0	107028	Acrolein	1	0.960581085	0.000109655	1
STCK10	0	0	7664417	NH3	1	2423.52904	0.276639608	1
STCK10	0	0	71432	Benzene	1	114.3761664	0.01305664	1
STCK10	0	0	205992	B[b]fluoranthen	1	0.00741658	8.46642E-07	1
STCK10	0	0	192972	B[e]pyrene	1	0.018541449	2.1166E-06	1
STCK10	0	0	191242	B[g,h,i]perylen	1	0.018496771	2.1115E-06	1
STCK10	0	0	92524	Biphenyl	1	9.47177628	0.001081253	1
STCK10	0	0	218019	Chrysene	1	0.030961986	3.53447E-06	1
STCK10	0	0	100414	Ethyl Benzene	1	1.773724143	0.00020248	1
STCK10	0	0	75003	Ethyl Chloride	1	0.083548215	9.53747E-06	1
STCK10	0	0	206440	Fluoranthene	1	0.049592791	5.66128E-06	1
STCK10	0	0	86737	Fluorene	1	0.253325337	2.89184E-05	1
STCK10	0	0	50000	Formaldehyde	1	2359.008432	0.2692932	1
STCK10	0	0	110543	Hexane	1	49.5927909	0.005661278	1
STCK10	0	0	78842	Isobutyraldehyd	1	4.51249719	0.000515125	1
STCK10	0	0	67561	Methanol	1	111.695475	0.012750625	1
STCK10	0	0	75092	Methylene Chlor	1	5.89752108	0.000673233	1
STCK10	0	0	91203	Naphthalene	1	3.324057336	0.000379459	1
STCK10	0	0	1151	PAHs-w/o	1	1.201843311	0.000137197	1
STCK10	0	0	85018	Phenanthrene	1	0.464653176	5.30426E-05	1

STCK10	0	0	108952	Phenol	1	1.07227656	0.000122406	1
STCK10	0	0	129000	Pyrene	1	0.060762338	6.93634E-06	1
STCK10	0	0	108883	Toluene	1	50.0395728	0.00571228	1
STCK10	0	0	79016	TCE	1	0.589752108	6.73233E-05	1
STCK10	0	0	75014	Vinyl Chloride	1	0.768464868	8.77243E-05	1
STCK10	0	0	1330207	Xylenes	1	10.81212198	0.001234261	1
STCK10	0	0	123911	1,4-Dioxane	1	0.585284289	6.68133E-05	1
STCK10	0	0	56235	CCl4	1	0.299790655	3.42227E-05	1
STCK10	0	0	67663	Chloroform	1	0.594219927	6.78333E-05	1
STCK10	0	0	107062	EDC	1	0.298003527	3.40187E-05	1
STCK10	0	0	71556	1,1,1-TCA	1	0.598687746	6.83434E-05	1
STCK10	0	0	106467	p-DiClBenzene	1	2.890678893	0.000329986	1
STCK10	0	0	127184	Perc	1	0.607623384	6.93634E-05	1
STCK10	0	0	100425	Styrene	1	2.2339095	0.000255013	1
STCK10	0	0	75354	Vinylid Chlorid	1	0.304258474	3.47327E-05	1
STCK11	0	0	71432	Benzene	1	0.5537196	6.321E-05	1
STCK11	0	0	106467	p-DiClBenzene	1	0.3164112	3.612E-05	1
STCK11	0	0	206440	Fluoranthene	1	0.000791028	9.03E-08	1
STCK11	0	0	86737	Fluorene	1	0.000738293	8.428E-08	1
STCK11	0	0	50000	Formaldehyde	1	385.4254	0.04399856	1
STCK11	0	0	110543	Hexane	1	474.6168	0.05418	1
STCK11	0	0	91203	Naphthalene	1	0.16084236	1.8361E-05	1
STCK11	0	0	85018	Phenanthrene	1	0.004482492	5.117E-07	1
STCK11	0	0	129000	Pyrene	1	0.00131838	1.505E-07	1
STCK11	0	0	108883	Toluene	1	2.5316641	0.000289004	1
STCK11	0	0	7664417	NH3	1	0.9820428	0.000112106	1
STCK11	0	0	100414	Ethyl Benzene	1	6.890139	0.00078655	1
STCK11	0	0	7783064	H2S	1	308.8683	0.03525912	1
STCK11	0	0	71556	1,1,1-TCA	1	1.1061181	0.00012627	1
STCK11	0	0	75092	Methylene Chlor	1	22.887933	0.002612791	1
STCK11	0	0	127184	Perc	1	0.6414957	7.32E-05	1
STCK11	0	0	75014	Vinyl Chloride	1	0.3484668	3.98E-05	1
STCK11	0	0	75354	Vinylid Chlorid	1	0.08130892	9.28E-06	1
STCK11	0	0	1330207	Xylenes	1	14.704243	0.001678575	1

Background

PolID	PolAbbrev	Conc (ug/m^3)	MWAF

Ground level concentration files (\glc\)

100414MAXHR.txt
100414PER.txt
100425MAXHR.txt
100425PER.txt
106467MAXHR.txt
106467PER.txt
106990MAXHR.txt
106990PER.txt
107028MAXHR.txt
107028PER.txt
107062MAXHR.txt
107062PER.txt
108883MAXHR.txt
108883PER.txt
108952MAXHR.txt
108952PER.txt
110543MAXHR.txt
110543PER.txt

1151MAXHR.txt
1151PER.txt
123911MAXHR.txt
123911PER.txt
127184MAXHR.txt
127184PER.txt
129000MAXHR.txt
129000PER.txt
1330207MAXHR.txt
1330207PER.txt
191242MAXHR.txt
191242PER.txt
192972MAXHR.txt
192972PER.txt
205992MAXHR.txt
205992PER.txt
206440MAXHR.txt
206440PER.txt
208968MAXHR.txt
208968PER.txt
218019MAXHR.txt
218019PER.txt
50000MAXHR.txt
50000PER.txt
540841MAXHR.txt
540841PER.txt
56235MAXHR.txt
56235PER.txt
67561MAXHR.txt
67561PER.txt
67663MAXHR.txt
67663PER.txt
71432MAXHR.txt
71432PER.txt
71556MAXHR.txt
71556PER.txt
75003MAXHR.txt
75003PER.txt
75014MAXHR.txt
75014PER.txt
75070MAXHR.txt
75070PER.txt
75092MAXHR.txt
75092PER.txt
75354MAXHR.txt
75354PER.txt
7664417MAXHR.txt
7664417PER.txt
7783064MAXHR.txt
7783064PER.txt
78842MAXHR.txt
78842PER.txt
79016MAXHR.txt
79016PER.txt
83329MAXHR.txt
83329PER.txt
85018MAXHR.txt
85018PER.txt
86737MAXHR.txt

86737PER.txt
91203MAXHR.txt
91203PER.txt
91576MAXHR.txt
91576PER.txt
92524MAXHR.txt
92524PER.txt
95636MAXHR.txt
95636PER.txt

POLLUTANT HEALTH INFORMATION
Health Database: C:\HARP2\Tables\HEALTH17320.mdb
Health Table Version: HEALTH23216
Official: True

PolID	PolAbbrev	InhCancer	OralCancer	AcuteREL	InhChronicREL	OralChronicREL	InhChronic8HRREL
95636	1,2,4TriMeBenze						
106990	1,3-Butadiene	0.6		660	2		9
540841	2,2,4TriMePentn						
91576	2MeNaphthalene						
83329	Acenaphthene						
208968	Acenaphthylene						
75070	Acetaldehyde	0.01		470	140		300
107028	Acrolein			2.5	0.35		0.7
7664417	NH3			3200	200		
71432	Benzene	0.1		27	3		3
205992	B[b]fluoranthen	0.39	1.2				
192972	B[e]pyrene						
191242	B[g,h,i]perylen						
92524	Biphenyl						
218019	Chrysene	0.039	0.12				
100414	Ethyl Benzene	0.0087			2000		
75003	Ethyl Chloride				30000		
206440	Fluoranthene						
86737	Fluorene						
50000	Formaldehyde	0.021		55	9		9
110543	Hexane				7000		
78842	Isobutyraldehyd						
67561	Methanol			28000	4000		
75092	Methylene Chlor	0.0035		14000	400		
91203	Naphthalene	0.12			9		
1151	PAHs-w/o	3.9	12				
85018	Phenanthrene						
108952	Phenol			5800	200		
129000	Pyrene						
108883	Toluene			5000	420		830
79016	TCE	0.007			600		
75014	Vinyl Chloride	0.27		180000			
1330207	Xylenes			22000	700		
123911	1,4-Dioxane	0.027		3000	3000		
56235	CCl4	0.15		1900	40		
67663	Chloroform	0.019		150	300		
107062	EDC	0.072			400		
71556	1,1,1-TCA			68000	1000		
106467	p-DiClBenzene	0.04			800		
127184	Perc	0.021		20000	35		
100425	Styrene			21000	900		
75354	Vinylid Chlorid				70		

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AIR DISPERSION MODELING INFORMATION
Versions used in HARP. All executables were obtained from USEPA's Support Center for Regulatory Atmospheric Modeling website (http://www.epa.gov/scram001/)
AERMOD: 18081
AERMAP: 18081
BPIPPRM: 04274
AERPLOT: 13329

METEOROLOGICAL INFORMATION
Version:
Surface File:
Profile File:
Surface Station:
Upper Station:
On-Site Station:

LIST OF AIR DISPERSION FILES
AERMOD Input File:
AERMOD Output File:
AERMOD Error File:
Plotfile list
_____

LIST OF RISK ASSESSMENT FILES
Health risk analysis files (\hra\)
_____
ResidentCancerRisk.csv
ResidentCancerRiskSumByRec.csv
ResidentGLCList.csv
ResidentHRAInput.hra
ResidentNCAcuteRisk.csv
ResidentNCAcuteRiskSumByRec.csv
ResidentNCChronicRisk.csv
ResidentNCChronicRiskSumByRec.csv
ResidentOutput.txt
ResidentPathwayRec.csv
ResidentPolDB.csv
WorkerCancerRisk.csv
WorkerCancerRiskSumByRec.csv
WorkerGLCList.csv
WorkerHRAInput.hra
WorkerNCChronicRisk.csv
WorkerNCChronicRiskSumByRec.csv
WorkerOutput.txt
WorkerPathwayRec.csv
WorkerPolDB.csv

Spatial averaging files (\sa\)
_____

HARP2 - HRACalc (dated 22118) 6/5/2024 1:46:07 PM - Output Log

GLCs loaded successfully
Pollutants loaded successfully
Pathway receptors loaded successfully
****
RISK SCENARIO SETTINGS

Receptor Type: Resident
Scenario: Cancer
Calculation Method: Derived

****
EXPOSURE DURATION PARAMETERS FOR CANCER

Start Age: -0.25
Total Exposure Duration: 30

Exposure Duration Bin Distribution
3rd Trimester Bin: 0.25
0<2 Years Bin: 2
2<9 Years Bin: 0
2<16 Years Bin: 14
16<30 Years Bin: 14
16 to 70 Years Bin: 0

****
PATHWAYS ENABLED

NOTE: Inhalation is always enabled and used for all assessments. The remaining pathways are only used for cancer and noncancer chronic assessments.

Inhalation: True
Soil: True
Dermal: True
Mother's milk: True
Water: False
Fish: False
Homegrown crops: False
Beef: False
Dairy: False
Pig: False
Chicken: False
Egg: False

****
INHALATION

Daily breathing rate: RMP

Worker Adjustment Factors
Worker adjustment factors enabled: NO

Fraction at time at home
3rd Trimester to 16 years: OFF
16 years to 70 years: OFF

****
SOIL & DERMAL PATHWAY SETTINGS

Deposition rate (m/s): 0.05
Soil mixing depth (m): 0.01
Dermal climate: Mixed

****
TIER 2 SETTINGS
Tier2 not used.

****

Calculating cancer risk
Cancer risk breakdown by pollutant and receptor saved to: C:\Users\jeffw\OneDrive - SMAQMD\Desktop\27780 27781 27782 27783 27784 27785\HARP2\hra\ResidentCancerRisk.csv
Cancer risk total by receptor saved to: C:\Users\jeffw\OneDrive - SMAQMD\Desktop\27780 27781 27782 27783 27784 27785\HARP2\hra\ResidentCancerRiskSumByRec.csv
HRA ran successfully

HARP2 - HRACalc (dated 22118) 6/5/2024 1:46:48 PM - Output Log

GLCs loaded successfully
Pollutants loaded successfully
Pathway receptors loaded successfully
****
RISK SCENARIO SETTINGS

Receptor Type: Resident
Scenario: NCChronic
Calculation Method: Derived

****
EXPOSURE DURATION PARAMETERS FOR CANCER
Exposure duration are only adjusted for cancer assessments

****
PATHWAYS ENABLED

NOTE: Inhalation is always enabled and used for all assessments. The remaining pathways are only used for cancer and noncancer chronic assessments.

Inhalation: True
Soil: True
Dermal: True
Mother's milk: True
Water: False
Fish: False
Homegrown crops: False
Beef: False
Dairy: False
Pig: False
Chicken: False
Egg: False

****
INHALATION

Daily breathing rate: LongTerm24HR

Worker Adjustment Factors
Worker adjustment factors enabled: NO

Fraction at time at home
NOTE: Exposure duration (i.e., start age, end age, ED, & FAH) are only adjusted for cancer assessments.

****
SOIL & DERMAL PATHWAY SETTINGS

Deposition rate (m/s): 0.05
Soil mixing depth (m): 0.01
Dermal climate: Mixed

****
TIER 2 SETTINGS
Tier2 not used.

****

Calculating chronic risk
Chronic risk breakdown by pollutant and receptor saved to: C:\Users\jeffw\OneDrive - SMAQMD\Desktop\27780 27781 27782 27783 27784 27785\HARP2\hra\ResidentNCChronicRisk.csv
Chronic risk total by receptor saved to: C:\Users\jeffw\OneDrive - SMAQMD\Desktop\27780 27781 27782 27783 27784 27785\HARP2\hra\ResidentNCChronicRiskSumByRec.csv
HRA ran successfully

HARP2 - HRACalc (dated 22118) 6/5/2024 1:47:27 PM - Output Log

GLCs loaded successfully
Pollutants loaded successfully
Pathway receptors loaded successfully
****
RISK SCENARIO SETTINGS

Receptor Type: Resident
Scenario: NCAcute
Calculation Method: Derived

****
EXPOSURE DURATION PARAMETERS FOR CANCER
Exposure duration are only adjusted for cancer assessments

****
PATHWAYS ENABLED

NOTE: Inhalation is always enabled and used for all assessments. The remaining pathways are only used for cancer and noncancer chronic assessments.

Inhalation: True
Soil: False
Dermal: False
Mother's milk: False
Water: False
Fish: False
Homegrown crops: False
Beef: False
Dairy: False
Pig: False
Chicken: False
Egg: False

****
INHALATION

Daily breathing rate: LongTerm24HR

Worker Adjustment Factors
Worker adjustment factors enabled: NO

Fraction at time at home
NOTE: Exposure duration (i.e., start age, end age, ED, & FAH) are only adjusted for cancer assessments.

****
TIER 2 SETTINGS
Tier2 not used.

****

Calculating acute risk
Acute risk breakdown by pollutant and receptor saved to: C:\Users\jeffw\OneDrive - SMAQMD\Desktop\27780 27781 27782 27783 27784 27785\HARP2\hra\ResidentNCAcuteRisk.csv
Acute risk total by receptor saved to: C:\Users\jeffw\OneDrive - SMAQMD\Desktop\27780 27781 27782 27783 27784 27785\HARP2\hra\ResidentNCAcuteRiskSumByRec.csv
HRA ran successfully

HARP2 - HRACalc (dated 22118) 6/5/2024 1:41:53 PM - Output Log

GLCs loaded successfully
Pollutants loaded successfully
Pathway receptors loaded successfully
****
RISK SCENARIO SETTINGS

Receptor Type: Worker
Scenario: Cancer
Calculation Method: Derived

****
EXPOSURE DURATION PARAMETERS FOR CANCER

Start Age: 16
Total Exposure Duration: 25

Exposure Duration Bin Distribution
3rd Trimester Bin: 0
0<2 Years Bin: 0
2<9 Years Bin: 0
2<16 Years Bin: 0
16<30 Years Bin: 0
16 to 70 Years Bin: 25

****
PATHWAYS ENABLED

NOTE: Inhalation is always enabled and used for all assessments. The remaining pathways are only used for cancer and noncancer chronic assessments.

Inhalation: True
Soil: True
Dermal: True
Mother's milk: False
Water: False
Fish: False
Homegrown crops: False
Beef: False
Dairy: False
Pig: False
Chicken: False
Egg: False

****
INHALATION

Daily breathing rate: Moderate8HR

Worker Adjustment Factors
Worker adjustment factors enabled: NO

Fraction at time at home
3rd Trimester to 16 years: OFF
16 years to 70 years: OFF

****
SOIL & DERMAL PATHWAY SETTINGS

Deposition rate (m/s): 0.05
Soil mixing depth (m): 0.01
Dermal climate: Mixed

****
TIER 2 SETTINGS
Tier2 not used.

****

Calculating cancer risk
Cancer risk breakdown by pollutant and receptor saved to: C:\Users\jeffw\OneDrive - SMAQMD\Desktop\27780 27781 27782 27783 27784 27785\HARP2\hra\WorkerCancerRisk.csv
Cancer risk total by receptor saved to: C:\Users\jeffw\OneDrive - SMAQMD\Desktop\27780 27781 27782 27783 27784 27785\HARP2\hra\WorkerCancerRiskSumByRec.csv
HRA ran successfully

HARP2 - HRACalc (dated 22118) 6/5/2024 1:42:48 PM - Output Log

GLCs loaded successfully
Pollutants loaded successfully
Pathway receptors loaded successfully
****
RISK SCENARIO SETTINGS

Receptor Type: Worker
Scenario: NCChronic
Calculation Method: Derived

****
EXPOSURE DURATION PARAMETERS FOR CANCER
Exposure duration are only adjusted for cancer assessments

****
PATHWAYS ENABLED

NOTE: Inhalation is always enabled and used for all assessments. The remaining pathways are only used for cancer and noncancer chronic assessments.

Inhalation: True
Soil: True
Dermal: True
Mother's milk: False
Water: False
Fish: False
Homegrown crops: False
Beef: False
Dairy: False
Pig: False
Chicken: False
Egg: False

****
INHALATION

Daily breathing rate: Moderate8HR

Worker Adjustment Factors
Worker adjustment factors enabled: NO

Fraction at time at home
NOTE: Exposure duration (i.e., start age, end age, ED, & FAH) are only adjusted for cancer assessments.

****
SOIL & DERMAL PATHWAY SETTINGS

Deposition rate (m/s): 0.05
Soil mixing depth (m): 0.01
Dermal climate: Mixed

****
TIER 2 SETTINGS
Tier2 not used.

****

Calculating chronic risk
Chronic risk breakdown by pollutant and receptor saved to: C:\Users\jeffw\OneDrive - SMAQMD\Desktop\27780 27781 27782 27783 27784 27785\HARP2\hra\WorkerNCChronicRisk.csv
Chronic risk total by receptor saved to: C:\Users\jeffw\OneDrive - SMAQMD\Desktop\27780 27781 27782 27783 27784 27785\HARP2\hra\WorkerNCChronicRiskSumByRec.csv
HRA ran successfully

A/C Evaluation
27780, 27781, 27782, 27783, 27784, 27785

Appendix D

Environmental Impact Reports (EIR)

Draft EIR

DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE

REGIONAL SAN BIOGENERATION FACILITY PROJECT

State Clearinghouse No. 2021050080

Prepared for

REGIONALSAN

Sacramento Regional County
Sanitation District

March 2023

DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE

Regional San BioGeneration Facility Project

State Clearinghouse No. 2021050080

Prepared for:

Sacramento Regional County Sanitation District
8521 Laguna Station Road
Elk Grove, CA 95758

Contact:

Steve Nebozuk
Senior Civil Engineer
916.876.6118

Prepared by

Ascent Environmental, Inc.
455 Capitol Mall, Suite 300
Sacramento, CA 95814

Contact:

Stephanie Rasmussen
Project Manager
916.842.3173

20200089.01

March 2023

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EXECUTIVE SUMMARY

ES.1 INTRODUCTION

This summary is provided in accordance with the California Environmental Quality Act (CEQA) Guidelines Section 15123. As stated in the State CEQA Guidelines Section 15123(a), "[a]n environmental impact report (EIR) shall contain a brief summary of the proposed actions and its consequences. The language of the summary should be as clear and simple as reasonably practical." As required by the Guidelines, this chapter includes (1) a summary description of the proposed Sacramento Regional County Sanitation District (Regional San) BioGeneration Facility Project, (2) a synopsis of environmental impacts and recommended mitigation measures (Table ES-1), (3) identification of the alternatives evaluated and of the environmentally superior alternative, and (4) a discussion of the areas of controversy associated with the project.

ES.2 SUMMARY DESCRIPTION OF THE PROJECT

Regional San proposes to construct and operate a biogas cogeneration facility within the existing Sacramento Regional Wastewater Treatment Plant (SRWTP) site. The project would beneficially use biogas produced by the SRWTP's anaerobic digesters to generate heat and power.

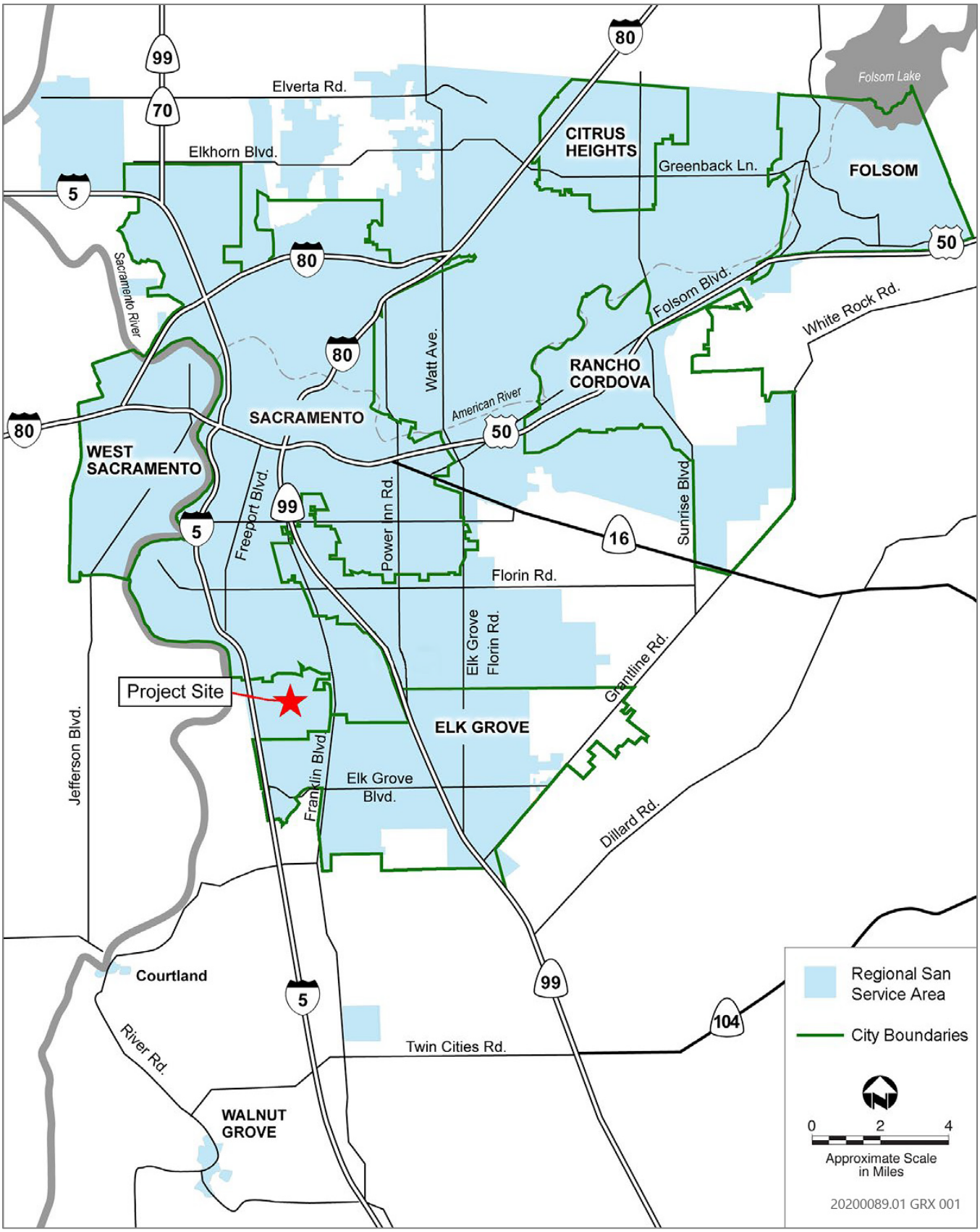
ES.2.1 Project Location

The SRWTP is located at 8521 Laguna Station Road in Elk Grove and is surrounded by approximately 2,150 acres of open space owned by Regional San and known as the Bufferlands (Figure ES-1). The entire SRWTP site and Bufferlands are located north of Laguna Boulevard and lie predominantly within the unincorporated area of Sacramento County, between Franklin Boulevard and Interstate 5 (I-5). The biogeneration project area (area of disturbance) would be located within the SRWTP site in a previously disturbed area north of the existing digesters. The project area is bordered by Digesters Way/Oregon Trail to the south and Septage Way to the north. The staging area would be immediately east of the proposed biogeneration facility site (Figure ES-2).

ES.2.2 Background and Need for the Project

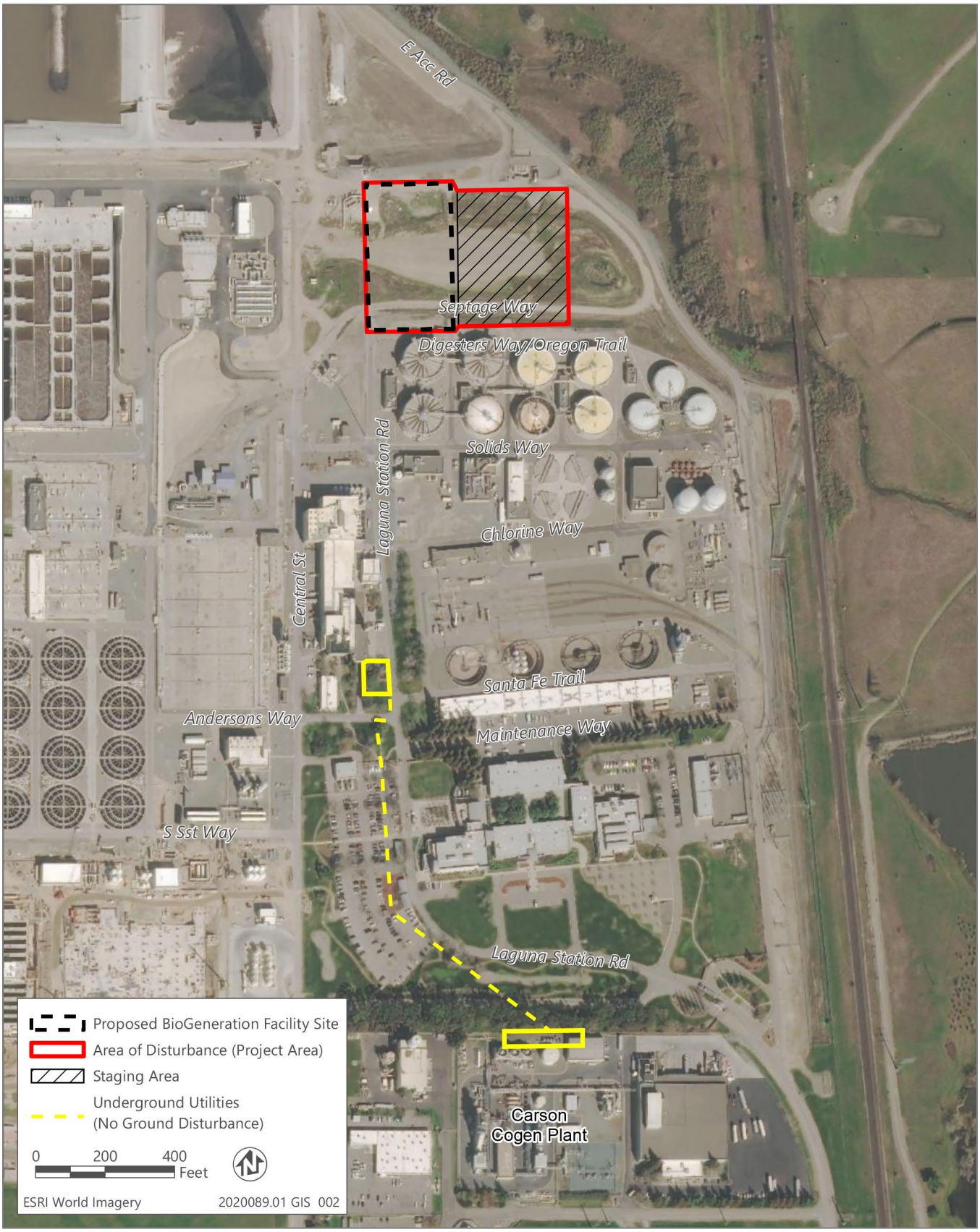
Regional San owns and operates a regional wastewater conveyance system (sewer lines and interceptors) and the SRWTP, and provides wastewater conveyance and treatment services to residential, industrial, and commercial customers throughout unincorporated Sacramento County; the cities of Citrus Heights, Elk Grove, Folsom, Rancho Cordova, Sacramento, and West Sacramento; and the communities of Courtland and Walnut Grove. The wastewater treatment process generates a variety of solids including primary sludge, grit, screenings (i.e., large debris), return activated sludge (activated sludge returned to the beginning of the secondary process), and waste activated sludge (sludge to be disposed of). Regional San feeds blended primary sludge and thickened waste activated sludge to six primary anaerobic digesters and two blending digesters. Anaerobic digestion produces biogas, which is a methane-rich, renewable byproduct of the solids digestion process that can be used as a renewable fuel.

Regional San has been in partnership with Sacramento Municipal Utility District (SMUD) for nearly 30 years. Under this partnership, Regional San delivers renewable biogas generated by the SRWTP wastewater treatment process to SMUD in exchange for reliable utility and backup power, steam for digester heating, and revenue according to the terms of the existing Commodity Agreement. The original driver for the agreement was the co-location of SMUD's Carson Cogeneration (Cogen) Plant on the SRWTP site, where biogas helped fuel the Carson Cogen plant, and steam from the Carson Cogen plant could be returned for digester heating. However, the benefits of co-location are no longer a driver for this agreement because SMUD now sends the biogas offsite to the Consumnes Power Plant (CPP), to generate electricity which is claimed as credits towards its obligations under the Renewable Portfolio Standard (RPS) Program.



Source: adapted by Ascent in 2022

Figure ES-1 Regional Location



Source: adapted by Ascent in 2022

Figure ES-2 Project Location

With the Commodity Agreement expiring in 2025, Regional San is pursuing the project described below as an alternative use for its biogas. Use of biogas at the SRWTP site rather than off-site at SMUD's facilities would increase efficiencies and reduce costs for Regional San. Operation of a biogas conditioning system on-site would allow Regional San to schedule and stagger maintenance of the system such that downtime would be minimized. Minimizing downtime would eliminate current surplus flaring related to maintenance and unforeseeable overpressure events. Construction of an on-site biogas system would also allow decommissioning of three boilers currently operated by Regional San under the Sacramento Metropolitan Air Quality Management District (SMAQMD) permits, thereby eliminating emissions.

ES.2.3 Project Objectives

The goal of the project is to design and construct a biogas cogeneration facility before the Commodity Agreement expires in October 2025 that meets the following objectives:

- make the best use of biogas (highest economic and environmental value, greatest overall efficiency);
- minimize operations and maintenance costs;
- integrate into the existing SRWTP facilities;
- reduce emissions associated with use of biogas venting and flaring compared to existing conditions; and
- protect the environment through responsible stewardship of natural resources.

ES.2.4 Characteristics of the Project

The project would include construction and operation of a new cogeneration engine system to use biogas onsite to produce electricity and heat for the SRWTP. The biogas cogeneration system would have several major interfaces with existing SRWTP systems including the following:

- gas management system,
- digester heating system,
- electrical power distribution system,
- plant computer control system, and
- site utilities.

The project would include the following components:

- up to six internal combustion engine generators,
- engine exhaust treatment (oxidation catalyst and selective catalytic reduction),
- a biogas conditioning system (as part of the gas management system),
- hot water boiler (standby), and
- a new building.

The project would also result in abandonment and demolition of existing utilities connecting the SRWTP and the Carson Cogen Plant. Three pipelines used for digester gas, condensate, and steam would be abandoned. Implementation of the project would also result in the curtailment of stationary sources operated by Regional San under existing conditions, including digester gas flaring by SRWTP's enclosed flares (ground flares) and waste gas burners. In addition, three boilers used to generate steam would be eliminated. The project would eliminate surplus flaring related to maintenance and unforeseeable overpressure events because this project would allow Regional San to operate its own digester gas conditioning system and schedule and stagger maintenance of the Combined Heat and Power engines such that downtime would be minimized. Three boilers currently operated by Regional San would be decommissioned as part of the project.

Construction of the project would last between 18 and 24 months and is anticipated to begin in 2024. In total, up to 5.6 acres would be disturbed by project construction and staging. Construction would require between 15 and 20 construction workers per day during construction of the new facilities. Once construction is complete, four construction workers per day for up to 2 weeks would be required for abandonment/demolition of the existing utilities. Typical work hours would be Monday through Friday from 7:00 a.m. to 7:00 p.m. (construction noise is exempt from noise ordinances between 6:00 a.m. and 8:00 p.m. on weekdays within Sacramento County). No nighttime work is anticipated. Ingress and egress for construction traffic would be via Laguna Boulevard to Dwight Road then to Central Street, which connects to Septage Way.

The project is expected to become operational in 2025. Operation of the project would not change the operating hours at the existing SRWTP, which operates continuously 24 hours per day, every day. Operation of the project would require up to 10 additional full-time employees to operate and maintain the new facilities.

ES.2.5 Potential Approvals and Permits Required

Regional San is the lead agency, as defined by CEQA, for this EIR and has the principal responsibility for ensuring that the requirements of CEQA have been met. After the EIR public review process is complete, the Regional San Board of Directors (Board) is the party responsible for certifying that the EIR adequately evaluates the environmental impacts of the project. The Board has the authority to approve, approve with modifications, or reject the proposed Regional San BioGeneration Facility Project.

The project would require an Authority to Construct Permit and Permit to Operate from SMAQMD (for devices that emit air pollutants).

Stormwater Pollution Prevention would be subject to a Water Pollution Control Plan and runoff would be contained within the SRWTP. If dewatering is required during construction, the project would comply with the General Order for Dewatering. It is not expected that the project would require a National Pollutant Discharge Elimination System construction stormwater permit (Notice of Intent to proceed under General Construction Permit) for disturbance of more than 1 acre administered by the State Water Resources Control Board because the project is within SRWTP's ring levee and existing process area.

ES.3 ENVIRONMENTAL IMPACTS AND RECOMMENDED MITIGATION MEASURES

Table ES-1, presented at the end of this chapter, provides a summary of the environmental impacts for the proposed Regional San BioGeneration Facility Project. The table provides the level of significance of the impact before mitigation, recommended mitigation measures, and the level of significance of the impact after implementation of the mitigation measures.

As shown in Table ES-1, all of the impacts associated with the project would be less than significant after implementation of mitigation measures.

ES.4 ALTERNATIVES TO THE PROPOSED PROJECT

The following provides brief descriptions of the alternatives evaluated in this Draft EIR. Table ES-2 presents a comparison of the environmental impacts between the alternatives and the proposed project.

- Alternative 1: No Project – No Action Alternative assumes the proposed biogeneration facility would not be constructed. The project area would remain in its current condition and biogas generated at the SRWTP would be used to fuel boilers, with the rest being flared.
- Alternative 2: No Project – SMUD Agreement Extension Alternative assumes the biogeneration facility would not be constructed. The project area would remain in its current condition, and Regional San would continue to

deliver renewable biogas generated at the SRWTP to SMUD in exchange for reliable utility and backup power, steam for digester heating, and revenue. The existing Commodity Agreement would be extended beyond 2025 under this alternative.

- Alternative 3: Trigeneration Alternative would include use of fuel cells to convert biogas from the SRWTP to heat and power. Heat and power would be used onsite for the SRWTP. In addition, this alternative would be designed to allow for generation of renewable hydrogen in the future.

For a more thorough discussion of project alternatives, see Chapter 5, "Alternatives." Table ES-2 presents a comparison of the environmental effects of each alternative relative to the proposed project.

ES.4.1 Environmentally Superior Alternative

CEQA requires identification of an environmentally superior alternative in an EIR but gives no definition for the term (State CEQA Guidelines Section 15126.6(e)). For the purposes of this EIR, the environmentally superior alternative is the alternative that would result in the fewest potentially significant impacts while achieving most of the basic project objectives to the greatest extent. Table ES-2 presents a comparison of the environmental effects of each alternative relative to the proposed project.

As illustrated in Table ES-2, Alternatives 1 and 2 would be marginally environmentally superior with respect to biological and cultural resources, even though these impacts are fully mitigated with the project. However, impacts related to air quality and GHG emissions would be greater for Alternatives 1 and 2. Alternatives 1 and 2 would avoid or reduce some mitigated (to less-than-significant) impacts associated with the project but would result in greater impacts for other resource areas. Alternative 3 would reduce impacts associated air quality compared to the project but would result in greater impacts related to GHG emissions. With each alternative, there would be environmental tradeoffs; that is, impacts to certain resource areas from an alternative would increase while others would decrease relative to the proposed project. In light of these tradeoffs among the alternatives and the proposed project, none of the alternatives clearly stands out as environmentally superior. Identification of the environmentally superior alternative is, therefore, not an objective choice based on quantifiable criteria, but rather, an exercise of discretion in balancing environmental priorities among potential impacts in relation to the extent to which the alternative would meet the project objectives.

ES.5 AREAS OF CONTROVERSY AND ISSUES TO BE RESOLVED

In accordance with Public Resources Code Section 21092 and California Code of Regulations Section 15082, Regional San issued a notice of preparation (NOP) and Initial Study for the proposed Regional San BioGeneration Facility Project on August 16, 2021, to inform agencies and the general public that an EIR was being prepared and to invite comments on the scope and content of the document. The NOP and responses to the NOP are included in Appendix A of this Draft EIR. Based on the comments received during the NOP comment period, the major areas of controversy associated with the project include:

- potential air quality impacts (during construction and operation) and mitigation measures,
- potential GHG emissions,
- alternatives, and
- potential impacts to biological resources and mitigation measures.

Areas of controversy that are within the scope of CEQA are addressed in this Draft EIR. Issues that are outside the scope of CEQA are not evaluated in this Draft EIR; however, Regional San will continue to respond to these issues through the project planning process.

All of the substantive environmental issues raised in the NOP comment letters have been addressed or otherwise considered during preparation of this Draft EIR.

3 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

This chapter is organized by environmental resource category; each resource category is organized to provide an integrated discussion of the existing environmental conditions (including regulatory setting and environmental setting), potential environmental effects (including direct and indirect impacts), and measures to reduce significant effects, where feasible, of construction and operation of the proposed Regional San BioGeneration Facility Project.

Cumulative and growth-inducing impacts are discussed in Chapters 4, "Cumulative Impacts," and 6, "Other CEQA Sections," respectively.

APPROACH TO THE ENVIRONMENTAL ANALYSIS

In accordance with Section 15126.2 of the State CEQA Guidelines, this Draft EIR identifies and focuses on the significant direct and indirect environmental effects of the project, giving due consideration to both its short-term and its long-term effects. Short-term effects are generally those associated with construction, and long-term effects are generally those associated with facility operations. As described in Chapter 1, "Introduction," this analysis focuses on a limited number of environmental resource topics because other topics have been found to be less than significant in the Initial Study (see Appendix A).

The remainder of this chapter addresses the following resource topics:

- Section 3.1, Air Quality
- Section 3.2, Biological Resources
- Section 3.3, Cultural and Tribal Cultural Resources
- Section 3.4, Greenhouse Gas Emissions and Climate Change

Sections 3.1 through 3.4 follow the same general format:

Regulatory Setting presents the laws, regulations, plans, and policies that are relevant to each issue area. Regulations originating from the federal, state, and local levels are each discussed as appropriate.

Environmental Setting presents the existing environmental conditions in the project area and in the surrounding area as appropriate, in accordance with State CEQA Guidelines (California Code of Regulations [CCR] Section 15125). This setting generally serves as the baseline against which environmental impacts are evaluated. The extent of the environmental setting area evaluated differs among resources, depending on the locations where impacts would be expected. For example, air quality impacts are assessed for the air basin (macroscale) as well as the project vicinity (microscale).

Environmental Impacts and Mitigation Measures identifies the thresholds of significance used to determine the level of significance of the environmental impacts for each resource topic, in accordance with the State CEQA Guidelines (CCR Sections 15126, 15126.2, and 15143). The thresholds of significance used in this Draft EIR are based on the checklist presented in Appendix G of the State CEQA Guidelines; best available data; and regulatory standards of federal, state, and local agencies. The level of each impact is determined by comparing the effects of the project to the environmental setting. Key methods and assumptions used to frame and conduct the impact analysis as well as issues or potential impacts not discussed further (such issues for which the project would have no impact) are also described.

Project impacts are organized numerically in each subsection (e.g., Impact 3.1-1, Impact 3.1-2, Impact 3.1-3). A bold-font impact statement, a summary of each impact, and its level of significance precedes the discussion of each impact. The discussion that follows the impact summary includes the substantial evidence supporting the impact significance conclusion.

The Draft EIR must describe any feasible measures that could avoid, minimize, rectify, reduce, or compensate for significant adverse impacts, and the measures are to be fully enforceable through incorporation into the project and

adoption of a Mitigation Monitoring and Reporting Plan (Public Resources Code Section 21081.6[b]). Mitigation measures are not required for effects that are found to be less than significant. Where feasible mitigation for a significant impact is available, it is described following the impact along with its effectiveness at addressing the impact. Each identified mitigation measure is labeled numerically to correspond with the number of the impact that would be mitigated by the measure. Where sufficient feasible mitigation is not available to reduce impacts to a less-than-significant level, or where Regional San lacks the authority to ensure that the mitigation is implemented when needed, the impacts are identified as remaining "significant and unavoidable."

3.1 AIR QUALITY

This section includes a discussion of existing air quality conditions, a summary of applicable regulations, and an analysis of potential construction and operational air quality impacts that could occur from the proposed construction of the Regional San BioGeneration Facility Project (project).

3.1.1 Regulatory Setting

Air quality in the project area is regulated through the efforts of various federal, state, regional, and local government agencies. These agencies work jointly, as well as individually, to improve air quality through legislation, planning, policymaking, education, and a variety of programs. The agencies responsible for improving the air quality within the air basins are discussed below.

FEDERAL

U.S. Environmental Protection Agency

The U.S. Environmental Protection Agency (EPA) has been charged with implementing national air quality programs. EPA's air quality mandates draw primarily from the federal Clean Air Act (CAA), which was enacted in 1970. The most recent major amendments were made by Congress in 1990. EPA's air quality efforts address both criteria air pollutants (CAPs) and hazardous air pollutants (HAPs). EPA regulations concerning CAPs and HAPs are presented in greater detail below.

Criteria Air Pollutants

The CAA required EPA to establish national ambient air quality standards (NAAQS) for six common air pollutants found throughout the U.S. referred to as criteria air pollutants. EPA has established primary and secondary NAAQS for the following criteria air pollutants: ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), respirable particulate matter with aerodynamic diameter of 10 micrometers or less (PM_{10}), fine particulate matter with aerodynamic diameter of 2.5 micrometers or less ($PM_{2.5}$), and lead. The NAAQS are shown in Table 3.1-1. The primary standards protect public health, and the secondary standards protect public welfare. The CAA also required each state to prepare a state implementation plan (SIP) for attaining and maintaining the NAAQS. The federal Clean Air Act Amendments of 1990 (CAAA) added requirements for states with nonattainment areas to revise their SIPs to incorporate additional control measures to reduce air pollution. California's SIP is modified periodically to reflect the latest emissions inventories, planning documents, and rules and regulations of the air basins as reported by their jurisdictional agencies. EPA is responsible for reviewing all SIPs to determine whether they conform to the mandates of the CAA and its amendments, and whether implementation will achieve air quality goals. If EPA determines a SIP to be inadequate, EPA may prepare a federal implementation plan that imposes additional control measures. If an approvable SIP is not submitted or implemented within the mandated time frame, sanctions may be applied to transportation funding and stationary air pollution sources in the air basin.

Table 3.1-1 National and California Ambient Air Quality Standards

Pollutant	Averaging Time	California (CAAQS)[a,b]	National (NAAQS)[c]	
			Primary[b,d]	Secondary[b,e]
Ozone	1-hour	0.09 ppm (180 µg/m^3)	–[e]	Same as primary standard
	8-hour	0.07 ppm (137 µg/m^3)	0.070 ppm (137 µg/m^3)[f]	
Carbon monoxide (CO)	1-hour	20.0 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	Same as primary standard
	8-hour	9.0 ppm[g] (10 mg/m^3)	9 ppm (10 mg/m^3)	
Nitrogen dioxide (NO_2)	Annual arithmetic mean	0.03 ppm (57 µg/m^3)	53 ppb (100 µg/m^3)	Same as primary standard
	1-hour	0.18 ppm (339 µg/m^3)	100 ppb (188 µg/m^3)	—

Pollutant	Averaging Time	California (CAAQS)[a,b]	National (NAAQS)[c]	
			Primary[b,d]	Secondary[b,e]
Sulfur dioxide (SO_2)	24-hour	0.04 ppm (105 µg/m^3)	—	—
	3-hour	—	—	0.5 ppm (1300 µg/m^3)
	1-hour	0.25 ppm (655 µg/m^3)	75 ppb (196 µg/m^3)[h]	—
Respirable particulate matter (PM_{10})	Annual arithmetic mean	20 µg/m^3	—	Same as primary standard
	24-hour	50 µg/m^3	150 µg/m^3	
Fine particulate matter ($PM_{2.5}$)	Annual arithmetic mean	12 µg/m^3	12.0 µg/m^3	15.0 µg/m^3
	24-hour	—	35 µg/m^3	Same as primary standard
Lead [f]	Calendar quarter	—	—	—
	30-Day average	1.5 µg/m^3	—	—
	Rolling 3-Month Average	–	0.15 µg/m^3[i]	Same as primary standard
Hydrogen sulfide	1-hour	0.03 ppm (42 µg/m^3)	No national standards	
Sulfates	24-hour	25 µg/m^3		
Vinyl chloride [f]	24-hour	0.01 ppm (26 µg/m^3)		
Visibility-reducing particulate matter	8-hour	Extinction of 0.23 per km		

Notes: µg/m^3 = micrograms per cubic meter; km = kilometers; ppb = parts per billion; ppm = parts per million.

[a] California standards for ozone, CO, SO_2 (1- and 24-hour), NO_2, particulate matter, and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

[b] Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based on a reference temperature of 25 degrees Celsius (°C) and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

[c] National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic means) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. The PM_{10} 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m^3 is equal to or less than one. The $PM_{2.5}$ 24-hour standard is attained when 98 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard. Contact the EPA for further clarification and current federal policies.

[d] National primary standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

[e] National secondary standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

[f] Final rule signed October 1, 2015, and effective December 28, 2015. The previous (2008) O_3 standards are not revoked and remain in effect for designated areas. Additionally, some areas may have certain continuing implementation obligations under the prior revoked 1-hour (1979) and 8-hour (1997) O_3 standards.

[g] The California Air Resources Board has identified lead and vinyl chloride as toxic air contaminants with no threshold of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

[h] The previous SO_2 standards (0.14 ppm 24-hour and 0.03 ppm annual) will additionally remain in effect in certain areas: (1) any area for which it is not yet 1 year since the effective date of designation under the current (2010) standards, and (2) any area for which an implementation plan providing for attainment of the current (2010) standard has not been submitted and approved and which is designated nonattainment under the previous SO_2 standards or is not meeting the requirements of a SIP call under the previous SO_2 standards (40 CFR 50.4(3)). A SIP call is an EPA action requiring a state to resubmit all or part of its SIP to demonstrate attainment of the required NAAQS.

[i] In areas designated nonattainment for the lead standards prior to the promulgation of the current (2008) standards, and for which implementation plans to attain or maintain the current (2008) standards have not been submitted and approved, the previous standards (1.5 µg/m_3 as a calendar quarter average) also remain in effect.

Source: California Air Resources Board (CARB) 2016a, EPA 2021a

Hazardous Air Pollutants and Toxic Air Contaminants

Toxic air contaminants (TACs), or in federal parlance, hazardous air pollutants (HAPs), are a defined set of airborne pollutants that may pose a present or potential hazard to human health. A TAC is defined as an air pollutant that may cause or contribute to an increase in mortality or in serious illness, or that may pose a hazard to human health. TACs are usually present in minute quantities in the ambient air; however, their high toxicity or health risk may pose a threat to public health even at low concentrations.

A wide range of sources, from industrial plants to motor vehicles, emit TACs. The health effects associated with TACs are quite diverse and generally are assessed locally, rather than regionally. TACs can cause long-term chronic health effects such as cancer, birth defects, neurological damage, asthma, bronchitis, or genetic damage; or short-term acute effects such as eye watering, respiratory irritation (a cough), runny nose, throat pain, and headaches.

For evaluation purposes, TACs are separated into carcinogens and non-carcinogens based on the nature of the health effects associated with exposure to the pollutant. Carcinogenic and non-carcinogenic TACs are assumed to have no threshold below which health impacts would not occur. Cancer risk from TACs is expressed as excess cancer cases per 1 million exposed individuals, typically over a lifetime of exposure.

EPA regulates HAPs through its National Emission Standards for Hazardous Air Pollutants. The standards for a particular source category require the maximum degree of emission reduction that the EPA determines to be achievable, which is known as the Maximum Achievable Control Technology—MACT standards. These standards are authorized by Section 112 of the 1970 CAA and the regulations are published in 40 CFR Parts 61 and 63.

STATE

The California Air Resources Board (CARB) is the agency responsible for coordination and oversight of state and local air pollution control programs in California and for implementing the California Clean Air Act (CCAA). The CCAA, which was adopted in 1988, required CARB to establish California ambient air quality standards (CAAQS) (Table 3.1-1).

Criteria Air Pollutants

CARB has established CAAQS for sulfates, hydrogen sulfide, vinyl chloride, visibility-reducing particulate matter, and the above-mentioned criteria air pollutants. In most cases the CAAQS are more stringent than the NAAQS. Differences in the standards are generally explained by the health effects studies considered during the standard-setting process and the interpretation of the studies. In addition, the CAAQS incorporate a margin of safety to protect sensitive individuals.

The CCAA requires that all local air districts in the state endeavor to attain and maintain the CAAQS by the earliest date practical. The CCAA specifies that local air districts should focus particular attention on reducing the emissions from stationary and transportation and area-wide emission sources. The CCAA also provides air districts with the authority to regulate indirect sources. CARB is responsible for monitoring the regulatory activity of all air districts within the state.

Toxic Air Contaminants

TACs in California are regulated primarily through the Tanner Air Toxics Act (Assembly Bill [AB] 1807, Chapter 1047, Statutes of 1983) and the Air Toxics "Hot Spots" Information and Assessment Act of 1987 (AB 2588, Chapter 1252, Statutes of 1987). AB 1807 sets forth a formal procedure for CARB to designate substances as TACs. Research, public participation, and scientific peer review are required before CARB can designate a substance as a TAC. To date, CARB has identified more than 21 TACs and adopted EPA's list of HAPs as TACs. Most recently, particulate matter (PM) exhaust from diesel engines (diesel PM) was added to CARB's list of TACs.

After a TAC is identified, CARB may adopt an airborne toxics control measure for sources that emit that particular TAC. If a threshold exists for a substance at which there is no toxic effect, the control measure must reduce exposure below that threshold. If no threshold exists, the measure must incorporate Best Available Control Technology (BACT) for toxics to minimize emissions.

In addition, CARB has published its *Air Quality and Land Use Handbook* that provides guidance on land use compatibility with TAC sources (CARB 2005). The *Air Quality and Land Use Handbook* offers recommendations for siting sensitive receptors near TAC sources such as high-volume roadways, distribution centers, rail yards, ports, refineries, dry cleaners, gasoline stations, and industrial facilities.

The Hot Spots Act (AB 2588) requires that existing facilities that emit toxic substances above a specified level prepare an inventory of toxic emissions, prepare a risk assessment if emissions exceed prioritization thresholds, notify the public of significant risk levels, and prepare and implement risk reduction measures.

The Community Air Protection Program (AB 617 of 2017) aims to reduce exposure in communities most affected by air pollution from industries subject to the state's cap-and-trade program for greenhouse gas (GHG) emissions. AB 617 imposes a new state-mandated local program to address non-vehicular sources (e.g., refineries, manufacturing facilities) of criteria air pollutants and TACs. The program requires CARB to identify high-pollution areas and directs air districts to focus air quality improvement efforts through adoption of community emission reduction programs within these identified areas. Under existing stationary source permitting programs, air districts review individual sources and impose emissions limits on emitters based on BACT, pollutant type, and proximity to nearby existing land uses. In addition, the AB 617 program addresses the cumulative and additive nature of air pollutant health effects by requiring community-wide air quality assessment and emission reduction planning.

CARB has adopted diesel exhaust control measures and more stringent emissions standards for various transportation-related mobile sources of emissions, including transit buses, and off-road diesel equipment (e.g., tractors, generators). Over time, the replacement of older vehicles will result in a vehicle fleet that produces substantially lower levels of TACs than under current conditions. Mobile-source emissions of TACs (e.g., benzene, 1-3-butadiene, diesel PM) have been reduced significantly over the last decade and will be reduced further in California through a progression of regulatory measures (e.g., Low Emission Vehicle/Clean Fuels and Phase II reformulated gasoline regulations) and control technologies. Adopted regulations are also expected to continue to reduce formaldehyde emissions emitted by cars and light-duty trucks. As emissions are reduced, it is expected that risks associated with exposure to the emissions will also be reduced.

LOCAL

Sacramento Metropolitan Air Quality Management District

Criteria Air Pollutants

The Sacramento Metropolitan Air Quality Management District (SMAQMD) is the primary agency responsible for planning to meet NAAQS and CAAQS in Sacramento County. SMAQMD works with other local air districts in the Sacramento Valley Air Basin to maintain the region's portion of the SIP for ozone. The SIP is a compilation of plans and regulations that govern how the region and state will comply with the CAA requirements to attain and maintain the NAAQS for ozone. As of February 2022, the Sacramento region has been designated as a "serious" non-attainment area for the 2015 8-hour ozone standard (EPA 2022, 2014). The 2018 Sacramento Regional 2008 8-Hour Ozone Attainment and Further Reasonable Progress Plan was approved by CARB on November 16, 2017. The previous 2013 Update to the 8-Hour Ozone Attainment and Reasonable Further Progress Plan was approved and promulgated by EPA for the 1997 8-Hour Ozone Standard. EPA has not released a notice of approval and promulgation of the 2017 SIP (EPA 2021b).

SMAQMD has developed a set of guidelines for use by lead agencies when preparing environmental documents pursuant to CEQA. The guidelines contain thresholds of significance for criteria pollutants and TACs and make recommendations for conducting air quality analyses.

All construction activities are subject to adopted SMAQMD rules and regulations in effect at the time of construction. Specific rules applicable to the construction of the project may include but are not limited to the following:

- Rule 201: General Permit Requirements. Any project that includes the use of equipment capable of releasing emissions to the atmosphere may be required to obtain permit(s) from SMAQMD before equipment operation. The Applicant, developer, or operator of a project that includes a generator, boiler, or heater should contact SMAQMD

early to determine whether a permit is required, and to begin the permit application process. Portable construction equipment (e.g., generators, compressors, pile drivers, lighting equipment) with an internal combustion engine greater than 50 horsepower must have a SMAQMD permit or CARB portable equipment registration.

- Rule 202: New Source Review. The purpose of this rule is to provide for the issuance of authorities to construct and permits to operate for new and modified stationary air pollution sources and to provide mechanisms, including emission offsets, by which authorities to construct and permits for such sources may be granted without interfering with the attainment or maintenance of ambient air quality standards.
  - Part 301. Best Available Control Technology. This section requires applicants to apply BACT to any new or modified existing emissions units, except cargo carriers, for each emissions change of a regulated pollutant if that change results in a net increase in emissions of volatile organic compounds (VOCs), nitrogen oxides (NO_X), sulfur oxides (SO_X), PM_{10}, or $PM_{2.5}$ or results in an increase of more than 500 pounds per day of CO or 3.3 pounds per day of lead.
  - Part 302.1a: Emission Offset Requirements. This section requires applicants to provide emissions offsets for regulated air pollutants where the potential to emit that pollutant meets or exceeds the following levels.
    - VOCs meets or exceeds 5,000 pounds per quarter
    - NO_X meets or exceeds 5,000 pounds per quarter
    - SO_X meets or exceeds 13,650 pounds per quarter
    - PM_{10} meets or exceeds 7,300 pounds per quarter
    - $PM_{2.5}$ meets or exceeds 15 tons per year
    - CO meets or exceeds 49,500 pounds per quarter
- Rule 204: Emission Reduction Credits. The purpose of this rule is to provide an administrative mechanism for quantifying, adjusting, and certifying surplus emission reductions for later use as offsets pursuant to District, state or federal rules or regulations; or transfer to other sources as offsets pursuant to Rule 202, New Source Review.
- Rule 207: Federal Operating Permit. The purpose this rule is to establish an operating permitting system for "major" stationary sources consistent with the requirements of Title V of the United States Code and pursuant to 40 CFR Part 71. Stationary sources subject to the requirements of this rule are also required to comply with any other applicable federal, state, or SMAQMD orders, rules, and regulations, including requirements pertaining to prevention of significant deterioration pursuant to Rule 203, requirements to obtain an authority to construct pursuant to Rule 201, or applicable requirements under SMAQMD's new source review rule in the SIP.
- Rule 402: Nuisance. This rule prohibits persons from discharging from any source whatsoever such quantities of air contaminants or other materials which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause or have natural tendency to cause injury or damage to business or property.
- Rule 403: Fugitive Dust. The developer or contractor is required to control dust emissions from earthmoving activities or any other construction activity to prevent airborne dust from leaving the project site.
- Rule 442: Architectural Coatings. The purpose of this rule is to limit the emissions of volatile organic compounds from the use of architectural coatings supplied, sold, offered for sale, applied, solicited for application, or manufactured for use within Sacramento County.

In addition, if modeled construction-generated emissions for a project are not reduced to levels below SMAQMD's mass emission threshold of 85 pounds per day [lb/day] for NO_X, 80 lb/day or 14.6 tons per year [tons/year] for PM_{10}, and 82 lb/day or 15 tons/year for $PM_{2.5}$ after the standard construction mitigation is applied, then SMAQMD requires commitment to an off-site construction mitigation fee to purchase off-site emissions reductions.

Toxic Air Contaminants

At the local level, air districts may adopt and enforce CARB control measures for TACs. Under SMAQMD Rule 201 ("General Permit Requirements"), Rule 202 ("New Source Review"), and Rule 207 ("Federal Operating Permit"), all sources that possess the potential to emit TACs are required to obtain permits from SMAQMD. Permits may be granted to these operations if they are constructed and operated in accordance with applicable regulations, including New Source Review standards and air toxics control measures. Pursuant to the New Source Review standards, SMAQMD provides a BACT Clearinghouse that contains a list of most recent BACT emission controls for the most common types of equipment. This clearinghouse list also includes specific emission controls, called Toxic Best Available Control Technology (T-BACT), for certain stationary sources of TACs. SMAQMD limits emissions and public exposure to TACs through a number of programs. SMAQMD permits TAC-emitting stationary sources based on the quantity and toxicity of the TAC emissions and the proximity of the facilities to sensitive receptors. Sensitive receptors are people or facilities that generally house people (e.g., schools and residences) that may experience adverse effects from unhealthy concentrations of air pollutants.

Odors

Although offensive odors rarely cause any physical harm, they can be unpleasant, leading to considerable stress among the public and often generating citizen complaints to local governments and SMAQMD. SMAQMD's Rule 402 ("Nuisance," discussed above) regulates odorous emissions.

Health Effects

SMAQMD has also issued *Guidance to Address the Friant Ranch Ruling for CEQA Projects in the Sac Metro Air District, Sacramento, California* (SMAQMD 2020b), which contains guidance on how to address the California Supreme Court decision in Sierra Club v. County of Fresno, 6 Cal.5th 502 (2018)—a court decision often referred to as the Friant Ranch decision. In that decision, the California Supreme Court held that an EIR should "relate the expected adverse air quality impacts to likely health consequences or explain in meaningful detail why it is not feasible at the time of drafting to provide such an analysis." The concern of the air quality impacts on public health largely focus on the impacts of adverse concentrations of criteria air pollutants, such as ozone precursors (i.e., reactive organic gases [ROG] and NO_X) and PM, as SMAQMD already has specific separate guidance for evaluating the health impacts of TACs. In following the Friant Ranch decision and to assist projects in determining the health impacts of criteria air pollutant concentrations, SMAQMD developed the "Minor Project Health Effects Tool" (Minor Project Tool). This tool estimates the level of health effects for an emissions source that results in emissions at or below criteria air pollutant and precursor thresholds of significance. The sole input for the Minor Project Tool is the project's geographical location, and the output of the Minor Project Tool is based on that location and modeled emissions at 82 pounds per day of NO_X, ROG, or PM, which are the highest thresholds of significance for each of these pollutants in the SMAQMD and neighboring air districts. Therefore, the Minor Project Tool is used for projects with emissions at or below air district thresholds of significance.

Sacramento County General Plan of 2005-2030

The following policies of the *Sacramento County General Plan of 2005-2030* (County of Sacramento 2020) are relevant to air quality within the project area:

Air Quality

- **Policy AQ-4.** Developments which meet or exceed thresholds of significance for ozone precursor pollutants, and/or Greenhouse Gases (GHG) as adopted by the SMAQMD, shall be deemed to have a significant environmental impact. An Air Quality Mitigation Plan and/or a Greenhouse Gas Reduction Plan shall be submitted to the County of Sacramento prior to project approval, subject to review and recommendation as to technical adequacy by the SMAQMD.
- **Policy AQ-19.** Require all feasible reductions in emissions for the operation of construction vehicles and equipment on major land development and roadway construction projects.
- **Policy AQ-22.** Reduce greenhouse gas emissions from County operations as well as private development.

3.1.2 Environmental Setting

The project area is located in the Sacramento Valley Air Basin (SVAB). The SVAB includes all of Butte, Colusa, Glenn, Sacramento, Shasta, Sutter, Tehama, Yolo, and Yuba counties and parts of Solano and Placer counties. The ambient concentrations of air pollutant emissions are determined by the amount of emissions released by the sources of air pollutants and the atmosphere's ability to transport and dilute such emissions. Natural factors that affect transport and dilution include terrain, wind, atmospheric stability, and sunlight. Therefore, existing air quality conditions in the area are determined by such natural factors as topography, meteorology, and climate, in addition to the amount of emissions released by existing air pollutant sources, as discussed separately below.

CLIMATE, METEOROLOGY, AND TOPOGRAPHY

The SVAB is a relatively flat area bordered by the Northeast Plateau to the north, Coast Ranges to the west, and the northern Sierra Nevada to the east. Air flows into the SVAB through the Carquinez Strait, the only breach in the western mountain barrier, and moves across the Sacramento River–San Joaquin River Delta (Delta) from the San Francisco Bay area.

The Mediterranean climate type of the SVAB is characterized by hot, dry summers and cool, rainy winters. During the summer, daily temperatures range from 50 degrees Fahrenheit (°F) to more than 100°F. The inland location and surrounding mountains shelter the area from much of the ocean breezes that keep the coastal regions moderate in temperature. Most precipitation in the area results from air masses that move in from the Pacific Ocean, usually from the west or northwest, during the winter months. More than half the total annual precipitation falls during the winter rainy season (November through February); the average winter temperature is a moderate 49°F. Also, characteristic of SVAB winters are periods of dense and persistent low-level fog, which are most prevalent between storms. The prevailing winds are moderate in speed and vary from moisture-laden breezes from the south to dry land flows from the north.

The mountains surrounding the SVAB create a barrier to airflow, which leads to the entrapment of air pollutants when meteorological conditions are unfavorable for transport and dilution. The highest frequency of poor air movement occurs in the fall and winter when high-pressure cells are present over the SVAB. The lack of surface wind during these periods, combined with the reduced vertical flow caused by a decline in surface heating, reduces the influx of air and leads to the concentration of air pollutants under stable metrological conditions. Surface concentrations of air pollutant emissions are highest when these conditions occur in combination with agricultural burning activities or with temperature inversions, which hamper dispersion by creating a ceiling over the area and trapping air pollutants near the ground.

May through October is ozone season in the SVAB. This period is characterized by poor air movement in the mornings with the arrival of the Delta sea breeze from the southwest in the afternoons. In addition, longer daylight hours provide a plentiful amount of sunlight to fuel photochemical reactions between ROG and NO_X, which result in ozone formation. Typically, the Delta breeze transports air pollutants northward out of the SVAB; however, a phenomenon known as the Schultz Eddy prevents this from occurring during approximately half of the time from July to September. The Schultz Eddy phenomenon causes the wind to shift southward and blow air pollutants back into the SVAB. This phenomenon exacerbates the concentration of air pollutant emissions in the area and contributes to the area violating the ambient-air quality standards.

The local meteorology of the project area and surrounding area is represented by measurements recorded at the Western Regional Climate Center Sacramento 5 ESE station. The normal annual precipitation is approximately 18 inches. January temperatures range from a normal minimum of 40°F to a normal maximum of 54°F. July temperatures range from a normal minimum of 59°F to a normal maximum of 92°F (WRCC 2016). The predominant wind direction is from the south (WRCC 2022).

CRITERIA AIR POLLUTANTS

Concentrations of criteria air pollutants are used to indicate the quality of the ambient air. A brief description of key criteria air pollutants in the SVAB is provided below. Emission source types and health effects are summarized in Table 3.1-2. Sacramento County's attainment status for the CAAQS and the NAAQS are shown in Table 3.1-3.

Ozone

Ozone is a photochemical oxidant (a substance whose oxygen combines chemically with another substance in the presence of sunlight) and the primary component of smog. Ozone is not directly emitted into the air but is formed through complex chemical reactions between precursor emissions of ROG and NO_X in the presence of sunlight. ROG are volatile organic compounds that are photochemically reactive. ROG emissions result primarily from incomplete combustion and the evaporation of chemical solvents and fuels. NO_X are a group of gaseous compounds of nitrogen and oxygen that result from the combustion of fuels.

Emissions of the ozone precursors ROG and NO_X have decreased over the past several years because of more stringent motor vehicle standards and cleaner burning fuels. Emissions of ROG and NO_X decreased from 2000 to 2010 and are projected to continue decreasing from 2010 to 2035 (CARB 2013).

It should be noted that, although many regulations and modeling tools use the term VOC, the shorthand "ROG," which stands for reactive organic gases, will be used consistently instead of VOC throughout this analysis. This terminology convention is applied for several reasons: 1) the modeling software used to inform this analysis directly calculates ROG in place of VOC, 2) there are only minor differences between the definitions of VOC and ROG, and 3) the public is more likely to understand this analysis if consistent terminology is applied throughout (CARB 2009).

Nitrogen Dioxide

NO_2 is a brownish, highly reactive gas that is present in all urban environments. The major human-made sources of NO_2 are combustion devices, such as boilers, gas turbines, and mobile and stationary reciprocating internal combustion engines. Combustion devices emit primarily nitric oxide (NO), which reacts through oxidation in the atmosphere to form NO_2. The combined emissions of NO and NO_2 are referred to as NO_X and are reported as equivalent NO_2. Because NO_2 is formed and depleted by reactions associated with photochemical smog (ozone), the NO_2 concentration in a particular geographical area may not be representative of the local sources of NO_X emissions (EPA 2008, 2021c).

Particulate Matter

Respirable particulate matter with an aerodynamic diameter of 10 micrometers or less is referred to as PM_{10}. PM_{10} consists of particulate matter emitted directly into the air, such as fugitive dust, soot, and smoke from mobile and stationary sources, construction operations, fires and natural windblown dust, and particulate matter formed in the atmosphere by reaction of gaseous precursors (CARB 2013). PM_{10} emissions in the SVAB are dominated by emissions from area sources, primarily fugitive dust from vehicle travel on unpaved and paved roads, farming operations, construction and demolition, and particles from residential fuel combustion. Direct emissions of PM_{10} are projected to remain relatively constant through 2035. Fine particulate matter ($PM_{2.5}$) includes a subgroup of smaller particles that have an aerodynamic diameter of 2.5 micrometers or less. Direct emissions of $PM_{2.5}$ have steadily declined in the SVAB between 2000 and 2010 and then are projected to increase very slightly through 2035. Emissions of $PM_{2.5}$ in the SVAB are dominated by the same sources as emissions of PM_{10} (CARB 2013).

Carbon Monoxide

CO is usually formed as the result of the incomplete combustion of fuels. The single largest source of CO is motor vehicle engines; the highest emissions occur during low travel speeds, stop-and-go driving, cold starts, and hard acceleration. Exposure to high concentrations of CO reduces the oxygen-carrying capacity of the blood and can cause headaches, nausea, dizziness, and fatigue; impair central nervous system function; and induce angina (chest pain) in persons with serious heart disease. Very high levels of CO can be fatal.

Sulfur Dioxide

SO_2 is a combustion product of sulfur or sulfur-containing fuels such as coal and diesel. SO2 is also a precursor to the formation of particulate matter, atmospheric sulfate, and atmospheric sulfuric acid formation that could precipitate downwind as acid rain.

Lead

Leaded gasoline, lead-based paint, smelters (metal refineries), and the manufacture of lead storage batteries have been the primary sources of lead released into the atmosphere, with lead levels in the air decreasing substantially since leaded gasoline was complete phased out in the United States by 1996. Lead has a range of adverse reproductive and neurotoxic health effects, including neurological, endocrine, and cardiovascular effects.

Table 3.1-2 Sources and Health Effects of Criteria Air Pollutants

Pollutant	Sources	Acute[1] Health Effects	Chronic[2] Health Effects
Ozone	secondary pollutant resulting from reaction of ROG and NO_X in presence of sunlight. ROG emissions result from incomplete combustion and evaporation of chemical solvents and fuels; NO_X results from the combustion of fuels	increased respiration and pulmonary resistance; cough, pain, shortness of breath, lung inflammation	permeability of respiratory epithelia, possibility of permanent lung impairment
Carbon monoxide (CO)	incomplete combustion of fuels; motor vehicle exhaust	headache, dizziness, fatigue, nausea, vomiting, death	permanent heart and brain damage
Nitrogen dioxide (NO_2)	combustion devices; e.g., boilers, gas turbines, and mobile and stationary reciprocating internal combustion engines	coughing, difficulty breathing, vomiting, headache, eye irritation, chemical pneumonitis or pulmonary edema; breathing abnormalities, cough, cyanosis, chest pain, rapid heartbeat, death	chronic bronchitis, decreased lung function
Sulfur dioxide (SO_2)	coal and oil combustion, steel mills, refineries, and pulp and paper mills	Irritation of upper respiratory tract, increased asthma symptoms	Insufficient evidence linking SO_2 exposure to chronic health impacts
Respirable particulate matter (PM_{10}), Fine particulate matter ($PM_{2.5}$)	fugitive dust, soot, smoke, mobile and stationary sources, construction, fires and natural windblown dust, and formation in the atmosphere by condensation and/or transformation of SO_2 and ROG	breathing and respiratory symptoms, aggravation of existing respiratory and cardiovascular diseases, premature death	alterations to the immune system, carcinogenesis
Lead	metal processing	reproductive/ developmental effects (fetuses and children)	numerous effects including neurological, endocrine, and cardiovascular effects

Notes: NO_X = oxides of nitrogen; ROG = reactive organic gases.

[1] "Acute" refers to effects of short-term exposures to criteria air pollutants, usually at fairly high concentrations.

[2] "Chronic" refers to effects of long-term exposures to criteria air pollutants, usually at lower, ambient concentrations.

Sources: EPA 2016

Attainment Status

As shown in Table 3.1-3, Sacramento County is designated as a nonattainment for ozone with respect to both the NAAQS (8-hour standard) and CAAQS (1-hour Classification and 8-hour standard), nonattainment for PM_{10} with respect to the CAAQS, and nonattainment for $PM_{2.5}$ with respect to the NAAQS.

Table 3.1-3 Attainment Status Designations for Sacramento County

Pollutant	National Ambient Air Quality Standard	California Ambient Air Quality Standard
Ozone	Attainment (1-hour)[1]	Nonattainment (1-hour) Classification-Serious[2]
	Nonattainment (8-hour)[3] Classification=Severe	Nonattainment (8-hour)
	Nonattainment (8-hour)[4] Classification=Serious	Nonattainment (8-hour)

Pollutant	National Ambient Air Quality Standard	California Ambient Air Quality Standard
Respirable particulate matter (PM_{10})	Attainment (24-hour)	Nonattainment (24-hour)
	Attainment (24-hour)	Nonattainment (Annual)
Fine particulate matter ($PM_{2.5}$)	Nonattainment (24-hour)	(No State Standard for 24-Hour)
	Attainment (Annual)	Attainment (Annual)
Carbon monoxide (CO)	Attainment (1-hour)	Attainment (1-hour)
	Attainment (8-hour)	Attainment (8-hour)
Nitrogen dioxide (NO_2)	Unclassified/Attainment (1-hour)	Attainment (1-hour)
	Unclassified/Attainment (Annual)	Attainment (Annual)
Sulfur dioxide (SO_2)[5]	(Attainment Pending) (1-Hour)	Attainment (1-hour)
	(Attainment Pending) (1-Hour)	Attainment (24-hour)
Lead (Particulate)	Attainment (3-month rolling avg.)	Attainment (30 day average)
Hydrogen Sulfide	No Federal Standard	Unclassified (1-hour)
Sulfates	No Federal Standard	Attainment (24-hour)
Visibly Reducing Particles	No Federal Standard	Unclassified (8-hour)
Vinyl Chloride	No Federal Standard	Unclassified (24-hour)

[1] Air Quality meets federal 1-hour Ozone standard (77 FR 64036). EPA revoked this standard, but some associated requirements still apply. SMAQMD attained the standard in 2009. SMAQMD has requested EPA recognize attainment to fulfill the requirements.

[2] Per Health and Safety Code (HSC) § 40921.5(c), the classification is based on 1989 – 1991 data, and therefore does not change.

[3] 2008 Standard.

[4] 2015 Standard.

[5] 2010 Standard.

Source: EPA 2022 and CARB 2019a.

TOXIC AIR CONTAMINANTS

According to the *California Almanac of Emissions and Air Quality* (CARB 2013), most of the estimated health risks from TACs can be attributed to relatively few compounds, the most important being diesel PM. Diesel PM differs from other TACs in that it is not a single substance, but rather a complex mixture of hundreds of substances. Although diesel PM is emitted by diesel-fueled internal combustion engines, the composition of the emissions varies depending on engine type, operating conditions, fuel composition, lubricating oil, and whether an emissions control system is being used. Unlike the other TACs, no ambient monitoring data are available for diesel PM because no routine measurement method currently exists. However, CARB has made preliminary concentration estimates based on a PM exposure method. This method uses the CARB emissions inventory's PM_{10} database, ambient PM_{10} monitoring data, and the results from several studies to estimate concentrations of diesel PM. In addition to diesel PM, the TACs for which data are available that pose the greatest existing ambient risk in California are benzene, 1,3-butadiene, acetaldehyde, carbon tetrachloride, hexavalent chromium, para-dichlorobenzene, formaldehyde, methylene chloride, and perchloroethylene.

Diesel PM poses the greatest health risk among these 10 TACs mentioned. Based on receptor modeling techniques, Overall, levels of most TACs, except para-dichlorobenzene and formaldehyde, have decreased since 1990 (CARB 2013).

ODORS

Odors are generally regarded as an annoyance rather than a health hazard. However, manifestations of a person's reaction to foul odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache).

The ability to detect odors varies considerably among the population and overall is quite subjective. Some individuals can smell very minute quantities of specific substances; others may not have the same sensitivity but may have sensitivities to odors of other substances. In addition, people may have different reactions to the same odor; an odor that is offensive to one person may be perfectly acceptable to another (e.g., fast food restaurant). It is important to also note that an unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. This is because of the phenomenon known as odor fatigue, in which a person can become desensitized to almost any odor and recognition only occurs with an alteration in the intensity. Odor sources of concern include wastewater treatment plants, sanitary landfills, composting facilities, recycling facilities, petroleum refineries, chemical manufacturing plants, painting operations, rendering plants, and food packaging plants (SMAQMD 2016). The project would install and operate a cogeneration facility at the existing Sacramento Regional Wastewater Treatment Plant (SRWTP), generally considered an odor source by SMAQMD as a result of onsite treatment processes.

SENSITIVE RECEPTORS

Sensitive receptors are generally considered to include those land uses where exposure to pollutants could result in health-related risks to sensitive individuals, such as children or the elderly. Residential dwellings, schools, hospitals, playgrounds, and similar facilities are of primary concern because of the presence of individuals particularly sensitive to pollutants and/or the potential for increased and prolonged exposure of individuals to pollutants.

The SRWTP facility where the project area is located is an area of Sacramento County that is buffered from urban development. There are no residential land uses, schools, or other sensitive receptors adjacent to the project area. The nearest residential area lies east of Franklin Boulevard, which is approximately 4,740 feet away.

3.1.3 Environmental Impacts and Mitigation Measures

METHODOLOGY

Project criteria emissions were assessed for local and regional impacts, as well as impacts from TACs and odors in accordance with SMAQMD-recommended methodologies. The project's emissions are compared to SMAQMD-adopted thresholds.

Construction and operational emissions of criteria air pollutants and precursors were calculated using a combination of the California Emissions Estimator Model (CalEEMod) version 2020.4.0 computer program, as recommended by SMAQMD, and off-model calculations using available project-specific information. CalEEMod modeling was based on project-specific information (e.g., land use type, building square footage) where available; reasonable assumptions based on typical construction activities; and default values in CalEEMod that are based on the project's location and land use type.

Construction

As stated in Chapter 2, "Project Description," construction of the project is anticipated to begin in summer of 2024 and last between 18 and 24 months. Project construction would result in temporary emissions of ROG, NO_X, PM_{10}, and $PM_{2.5}$ associated with the use of off-road equipment, haul trucks delivering equipment and materials, and worker commute trips. Fugitive PM_{10} and $PM_{2.5}$ dust emissions would be associated primarily with site preparation and earthwork and vary as a function of soil silt content, soil moisture, wind speed, acreage of disturbance, and travel by off-road equipment and delivery trucks on unpaved surfaces. Per SMAQMD construction BMPs and Rule 403, unpaved areas are assumed to be watered twice per day. Exhaust from off-road equipment, haul trucks, and construction worker vehicles would also contain PM_{10} and $PM_{2.5}$. Emissions of ozone precursors, ROG, and NO_X, would primarily be associated with construction equipment and on-road mobile exhaust. Construction activities associated with the project would likely require the use of equipment such as excavators, graders, dozers, backhoes, trenchers, forklifts, compactors, graders, welding machines, haul trucks, cement trucks, and paving equipment.

Emissions associated with construction were estimated using CalEEMod 2020.4.0. Modeling was based on project-specific information where available, assumptions based on typical construction activities, and default values in CalEEMod that are based on the project's location and land use type. Worst-case maximum daily construction emissions were estimated based on anticipated construction activities that would occur simultaneously. For detailed assumptions and modeling inputs, refer to Appendix B.

Operations

To understand the air quality impacts that would occur because of the project, this analysis evaluates the net change in emissions between existing and project conditions. Full calculations are provided in Appendix B.

This analysis only evaluates existing emissions sources that would change with implementation of the project (i.e., boilers, flares). Sources that would remain unchanged between existing and project conditions, such as wastewater treatment process emissions, were not evaluated. Daily and annual emissions from existing boilers were calculated using the digester gas and natural gas fuel use records for 2021, available from required permit reports submitted to SMAQMD (Ross, pers. comm. 2022). Flare emissions were calculated from the amount of digester gas sent to flares, assumed to be 18 percent of total digester gas production (Ross, pers. comm., 2022). The annual flared digester gas was multiplied by the emission factors shown in the flare permits, which assume that BACT is applied (SMAQMD 2019). Calculations of total existing on-site combustion of digester and natural gas and related emissions are provided in Appendix B.

The relevant existing emissions were compared with emissions from the proposed project. Maximum daily and annual emissions of criteria air pollutants and precursors from the proposed project were estimated using emission rates for the combined heat and power (CHP) engines and additional auxiliary emissions (e.g., new worker commute activity and area source emissions) calculated from CalEEMod modeling. For the purposes of this analysis and to provide the most conservative assessment, the emissions rates assume five 3-MW Jenbacher JMS 620 engines would run at full capacity and combust 100 percent of the average annual digester gas generated by the facility (Regional San 2021: Table 4-1). In addition, to meet the specification of the engine, 10 percent of fuel used by the engines is assumed to come from natural gas. This assumption is based on South Coast Air Quality Management District's BACT determination, which allows for up to 10 percent natural gas blending in engines that utilize biogas; SMAQMD does not currently have an equivalent BACT determination for biogas engines (Regional San 2021:5-2). The emissions analysis assumes that the proposed engines will utilize BACT and applies BACT emission factors for both digester gas and natural gas combustion in the CHP engines to meet BACT determination standards (Regional San 2021). Although no emissions from flares or standby boilers are assumed in this scenario, this analysis represents the highest emissions scenario for the proposed project. As such, the emissions estimates presented in this analysis are conservatively high.

In addition to the modeled project emissions, the analysis also accounts for ROG and NO_X offsets required under the facility's air permit. Under Rule 202, a permit applicant is required to provide emission offsets for a regulated air pollutant where the potential to emit that pollutant meets or exceeds levels as defined in Rule 202 part 302.1a (SMAQMD 2012). The project's worst-case scenario would result in the exceedance of the ROG and NO_X offset thresholds. As such, Regional San plans to purchase 18 tons of ROG and 22 tons of NO_X offsets per year for the proposed project operations, although the required offset values may be different (higher or lower) depending on SMAQMD's calculations during the permitting process (Regional San 2021:Table 4-8). These offset totals represent the base values, before the application of any ratios required by Rule 202, and the purchased values would account for those ratios. These offsets are applied to project operational emissions as a reduction in ROG and NOx emissions.

Under the project, the SRWTP would no longer utilize steam-generated heat currently provided by the adjacent Sacramento Municipal Utility District (SMUD) Carson Cogeneration (Cogen) Plant to facilitate on-site digesters. However, Regional San does not have jurisdiction over operations at Carson Cogen and SMUD may or may not change their operations at Carson Cogen as a result of the proposed project. Thus, any emissions changes at Carson Cogen are excluded from this analysis and no emissions reductions are attributed to future operations at Carson Cogen.

The emissions from additional worker commute and area source emissions from non-engine operation of the new facility were estimated using CalEEMod 2020.4.0. Modeling assumed 10 additional workers and used model default

assumptions for the commute trip rates and lengths. Area source emissions were estimated based on model default assumptions on occasional maintenance of architectural coating and the use of consumer products, such as cleaners, for a 15,000-square foot general light industry land use. No landscaping activity or related emissions are assumed to occur under the project.

The Minor Project Tool was used to evaluate potential health effects of mass emissions of ozone precursors and PM associated with implementation of the project. The model estimates the health effects at a given project assuming a project emits pollutants at the SMAQMD threshold for ROG, NO_X, and $PM_{2.5}$ (i.e., 82 pounds per day). The outputs in Appendix B reflect the potential increase in premature deaths over the background health incidence rate of each health endpoint in the region.

Project-generated TAC emissions and odors were assessed in accordance with methodologies recommended by CARB and SMAQMD.

THRESHOLDS OF SIGNIFICANCE

Per Appendix G of the CEQA Guidelines and SMAQMD recommendations, the project's impact to air quality is considered significant if it would do any of the following:

- conflict with or obstruct implementation of the applicable air quality plan;
- construction-generated criteria air pollutant or precursor emissions to exceed SMAQMD-recommended thresholds of 85 lb/day for NO_X, 0 lb/day of PM_{10}, and 0 lb/day of $PM_{2.5}$. As noted in SMAQMD's recommended significance thresholds, if all feasible "Best Management Practices" (BMPs), as defined by SMAQMD, for controlling construction emissions are applied, the applicable threshold would be 80 lb/day and 14.6 tons/year for PM_{10}, and 82 lb/day and 15 tons/year for $PM_{2.5}$;
- a net increase in long-term operational criteria air pollutant or precursor emissions that exceed the SMAQMD-recommended thresholds of 65 lb/day for ROG and NO_X, 0 lb/day of PM_{10}, and 0 lb/day of $PM_{2.5}$. If all feasible BMPs, as defined by SMAQMD, for controlling operational phase emissions are applied, the applicable threshold would be 80 lb/day and 14.6 tons/year for PM_{10}, and 82 lb/day and 15 tons/year for $PM_{2.5}$;
- expose sensitive receptors to TAC concentrations resulting in a maximum incremental cancer risk of 10 in 1 million (for carcinogenic risk) or a chronic and/or acute hazard index of 1.0 or greater (for noncancer effects); and/or
- create objectionable odors affecting a substantial number of people.

ISSUES NOT DISCUSSED FURTHER

CO, SO_2, Lead, Sulfates, Visibility Reducing Particles, H_2S, and Vinyl Chloride Emissions

With respect to CO, SO_2, lead, sulfates, visibility reducing particles, H_2S, and vinyl chloride, the project would be required to meet all SMAQMD requirements established through the stationary source permitting process. All areas of the SVAB have been in attainment for these pollutants for multiple years, and as a result, SMAQMD has concentration-based thresholds, instead of mass emission thresholds. These concentration-based thresholds are based on the AAQS. As an air pollution control district, SMAQMD is responsible for issuing permits to reduce air pollution and maintain (or attain) the AAQS (SMAQMD 2020a). Through the stationary source permitting process, SMAQMD evaluates the potential emissions from all permitted sources and allocates permits, including emission limits to each permit, such that the regional concentrations do not exceed the AAQS.

Additionally, localized mobile-source CO are not included in this analysis. The project would only result in an increase of 10 additional workers resulting in a negligible increase in mobile-source emissions. As discussed in SMAQMD's CEQA Guide, CO emissions are "predominately generated in the form of mobile-source exhaust from vehicle trips. These vehicle trips occur throughout a paved network of roads, and therefore, associated exhaust emissions of [CO] are not generated in a single location where high concentrations could be formed" (SMAQMD 2020b:4-7). A CO impact is not anticipated unless an intersection experiences more than 31,600 vehicles per hour. According to the City

of Elk Grove Traffic Monitoring Program, the highest peak hour volume at any intersection in the city is 3,835 vehicles per hour (intersection of Laguna Boulevard/Big Horn Boulevard (City of Elk Grove 2020). Considering the project would only result in an increase in commute trips related to 10 additional workers, the number of vehicles traveling through intersections fall well short of the 31,600-vehicles-per-hour threshold.

Because the project's emissions would be required to meet the AAQS through the permitting process and the project additional vehicle trips would be well below SMAQMD's traffic flow threshold, emissions of CO, SO_2, lead, sulfates, visibility reducing particles, H_2S, and vinyl chloride from the project are not anticipated to exceed SMAQMD's thresholds and therefore are not discussed further in this analysis.

ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Impact 3.1-1: Conflict with or Obstruct Implementation of an Applicable Air Quality Plan

Implementation of the project would not increase projected growth beyond the County's 2030 General Plan, which considered the growth in the unincorporated County in which the project is located. Because the 2030 General Plan was used to inform the projected growth in the air quality attainment plans (AQAPs), the project would be consistent with the AQAPs. The project is consistent with the AQAP and this impact would be **less than significant**.

The SVAB is currently designated as nonattainment for ozone and PM_{10}. SMAQMD has developed AQAPs (i.e., Sacramento Regional 2008 NAAQS 8-Hour Ozone Attainment and Reasonable Further Progress Plan, Second 10-Year PM_{10} Maintenance Plan) that present comprehensive strategies to reduce volatile organic compounds, NO_X, PM_{10}, and $PM_{2.5}$ emissions from stationary, area, mobile, and indirect sources to achieve attainment status of the NAAQS and CAAQS. The emission inventories used to develop the applicable AQAPs are based primarily on projected population and employment growth and associated vehicle miles travelled (VMT) for the SVAB. This growth is estimated for the region, based in part, on the planned growth identified in regional and local land use plans such as general plans or community plans. Therefore, projects that would result in increases in population or employment growth beyond that projected in regional or local plans could result in increases in VMT above that forecasted in the attainment plans, further resulting in mobile source emissions that could conflict with or obstruct implementation of the AQAP. Increases in VMT beyond that projected in the County's General Plan, SACOG's regional VMT modeling, and SMAQMD regional AQAPs generally would be considered to have a significant adverse incremental effect on the SVAB's ability to attain CAAQS and NAAQS for all criteria air pollutants.

The proposed project would not result in any increases in population or housing and only a minor increase in employment and would therefore not increase population or employment beyond those projected in the General Plans of local jurisdictions within Regional San's service area. The project would also not increase wastewater treatment capacity that would support an increased population.

To achieve attainment status of NAAQS and CAAQS, strategies in the AQAPs include the adoption of rules and regulations; enhancement of CEQA participation; implementation of a new and modified indirect source review program; adoption of local air quality plans; and stationary, mobile, and indirect source control measures. Because the project is consistent with the land uses of the County's General Plan, the project would not conflict with the implementation of the SMAQMD AQAP for long-range air quality planning and would not facilitate further growth. This impact would be **less than significant**.

Mitigation Measures

No mitigation is required for this impact.

Impact 3.1-2: Cause Construction-Generated Criteria Air Pollutant or Precursor Emissions to Exceed SMAQMD-Recommended Thresholds

Construction of the project would result in modest emissions of ROG, NO_X, PM_{10}, and $PM_{2.5}$. Additionally, SMAQMD Basic Construction Emission Control Practices would be implemented during construction of the project, which would effectively control emissions levels. Therefore, construction-related emissions from the project would not exceed SMAQMD's thresholds of significance. This impact would be **less than significant.**

Project construction activities would result in emissions of ROG, NO_X, PM_{10}, and $PM_{2.5}$ from site preparation (e.g., excavation, clearing), off-road equipment, material delivery, worker commute trips, building construction, utility demolition, asphalt paving, and application of architectural coatings. Fugitive dust emissions of PM_{10} and $PM_{2.5}$ are associated primarily with site preparation and grading and vary as a function of soil silt content, soil moisture, wind speed, acreage of disturbance, and VMT on and off the site. Emissions of ozone precursors, ROG, and NO_X are associated primarily with construction equipment and on-road mobile exhaust. Paving and the application of architectural coatings result in off-gas emissions of ROG. PM_{10} and $PM_{2.5}$ are also contained in vehicle exhaust.

Table 3.1-4 summarizes the modeled maximum daily and annual emissions from construction activities.

Table 3.1-4 Summary of Criteria Air Pollutants and Precursors Emitted during Project Construction

	Maximum Daily Emissions (lb/day)				Maximum Annual Emissions (tons/year)	
	ROG	NO_X	PM_{10} (Exhaust/Fugitive)	$PM_{2.5}$ (Exhaust/Fugitive)	PM_{10} (Exhaust/Fugitive)	$PM_{2.5}$ (Exhaust/Fugitive)
Construction-Related Emissions	7.9	33.1	21.4	11.6	0.07	0.06
SMAQMD Threshold of Significance (with BACT and BMPs applied)[1]	**No Threshold**	**85**	**80**	**82**	**14.6**	**15**

Notes: lb/day = pounds per day; ROG = reactive organic gases; NO_X = oxides of nitrogen; PM_{10} = respirable particulate matter; $PM_{2.5}$ = fine particulate matter; SMAQMD = Sacramento Metropolitan Air Quality Management District; BACT = Best Available Control Technologies; BMP = Best Management Practices

See Appendix B for detailed modeling and calculations.

[1] The PM_{10} and $PM_{2.5}$ threshold is zero for projects that do not apply BACT or BMPs.

Source: Modeled by Ascent Environmental in 2022.

As shown in Table 3.1-4, project construction would not result in emissions of ROG or NO_X that exceed applicable mass emission thresholds. The applicable thresholds were based on the project's commitment to implementing SMAQMD's Basic Construction Emission Control Practices for controlling fugitive PM_{10} and $PM_{2.5}$ dust emissions and limiting exhaust emissions from construction equipment that would be implemented during construction. These measures would include the following:

- Water all exposed surfaces at least two times daily. Exposed surfaces include, but are not limited to, soil piles, graded areas, unpaved parking areas, staging areas, and access roads.
- Limit vehicle speed on unpaved roads to 15 miles per hour.
- Cover or maintain at least 2 feet of free board on haul trucks transporting soil, sand, or other loose material on the site.
- Use wet power vacuum street sweepers to remove any visible trackout mud or dirt onto adjacent public roads at least once a day.
- All roadways, driveways, sidewalks, and parking lots to be paved will be completed as soon as possible. In addition, building pads will be laid as soon as possible after grading unless seeding or soil binders are used.

- Minimize idling time either by shutting equipment off when not in use or reducing idling time to 5 minutes (required by California Code of Regulations Title 13, Sections 2449[d][3] and 2485). Provide clear signage that posts this requirement for workers at the entrances to the site.
- Maintain all construction equipment in proper working condition according to manufacturer's specifications. Equipment will be checked by a certified mechanic and determined to be running in proper condition before it is operated.

For projects that do not implement these practices, SMAQMD has a zero threshold for both PM_{10} and $PM_{2.5}$ for construction activities.

The project's emissions of all pollutants, including PM_{10} and $PM_{2.5,}$ is modest in relation to the applicable thresholds. With incorporation of SMAQMD-recommended Basic Construction Emission Control Practices, emissions of PM_{10} and $PM_{2.5}$ associated with construction activities would not contribute localized concentrations of these pollutants that exceed applicable NAAQS and CAAQS. Therefore, construction-related emissions would not conflict with air quality planning efforts in the region or result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment with respect to the NAAQS or CAAQS. This impact would be **less than significant.**

Mitigation Measures

No mitigation is required for this impact.

Impact 3.1-3: Result in a Net Increase in Long-Term Operational Criteria Air Pollutant and Precursor Emissions that Exceed SMAQMD-Recommended Thresholds

Implementation of the project would result in long-term operational emissions that are not expected to exceed the SMAQMD's thresholds of significance. Thus, operation-generated emissions would not contribute substantially to the nonattainment status of SVAB. Additionally, examination of the project using SMAQMD's Minor Project Health Effects Tool indicates that the project would not result in sizeable health effects in the region. This impact would be **less than significant**.

Project operation would result in the generation of long-term operational emissions of ROG, NO_X, and particulate matter (e.g., PM_{10} and $PM_{2.5}$) as a result of stationary, mobile, and area-wide sources. Mobile-source emissions of criteria air pollutants and precursors would result from vehicle trips generated by new employee commute trips. Area source emissions would consist of ROG emissions generated by periodic application of architectural coating and on-site use of consumer products (e.g., cleaners). Stationary source emissions from the CHP engines would result in long-term operational emissions, however, the project is subject to the permitting requirements set forth by SMAQMD, which would require that all emissions standards are met. The project would also eliminate emissions from standby boilers and reduce emissions from existing flares. However, the reduced emissions from these sources are not quantified as they are variable from year to year and are only operated on an as-needed basis. Thus, as explained under Methodology, only emissions from CHP engines are evaluated for stationary sources under this impact. ROG and NO_X offsets required under the air permit are also included in this analysis.

To reduce operational PM emissions for projects, SMAQMD recommends projects to implement operational BACT or BMPs, which also allows for projects to apply a non-zero threshold of significance. With respect to the main stationary sources of the project, the emission rates for criteria air pollutants and precursors emitted by CHP engines are dictated by the requirement to apply BACT pursuant to SMAQMD Rule 202—New Source Review, Section 301. As discussed under Methodology, the emissions estimates for the project apply BACT emission rates. Thus, the project would comply with SMAQMD's BMPs for PM reduction through implementation of BACT.

Project operation would result in the following actions:

- decommissioning three on-site boilers at the SRWTP,
- halting delivery of digester gas to SMUD,

- reducing combustion of digester gas in flares from 18 percent of total production to near zero, and
- diverting all digester gas production to cogeneration engines that would use a 9:1 blend of digester gas to natural gas to generate electricity for the SRWTP.

The project would eliminate most of the emissions from the combustion of digester gas and natural gas in on-site boilers and flares and would, instead, emit emissions from the combustion of digester gas and natural gas in cogeneration engines. Under the worst case project scenario, the new stationary sources (i.e., cogeneration engines) would emit 9,005 and 11,393 pounds per quarter of VOCs (or ROG) and NOx, respectively, which would exceed SMAQMD's offset threshold of 5,000 pounds per quarter for each of these pollutants (Regional San 2021:Table 4-8). However, Regional San proposes to purchase ROG and NO_X offsets for the project, which are required as a Condition of Approval and Permit to Operate because the facility would exceed the offset thresholds for these pollutants as indicated in SMAQMD Rule 202 Part 302.1a.

The comparison of the project's emissions to existing emissions excludes any emissions from the combustion of digester gas delivered to SMUD, which would occur offsite and is not under the jurisdiction of Regional San.

Table 3.1-5 summarizes the maximum daily and annual operational emissions of criteria air pollutants and ozone precursors at full buildout for emissions sources that would be affected by the project. The detailed modeling calculations, including informational results for CO and SO_2, are shown in Appendix B.

Table 3.1-5 Unmitigated Criteria Air Pollutant and Precursor Emissions Associated with Project Buildout Operations (2045)

Source	ROG	NO_X	PM_{10}		$PM_{2.5}$	
	lb/day	lb/day	lb/day	tpy	lb/day	tpy
Existing						
Boilers[1]	0.2	2.3	0.9	0.2	0.9	0.2
Flares[1]	6.4	12.9	2.9	0.5	2.9	0.5
Total	**6.6**	**15.2**	**3.8**	**0.7**	**3.8**	**0.7**
Project						
CHP Engines[2]	97.9	123.8	77.5	14.1	77.5	14.1
Area[3]	0.4	0.0	0.0	0.0	0.0	0.0
Mobile[3]	0.1	0.1	0.1	0.0	>0.1	0.0
Required Permit Offsets[4]	-97	-118	0	0	0	0
Total	**0.9**	**6.0**	**77.6**	**14.1**	**77.5**	**14.1**
Net Change						
Stationary Sources (CHP Engines/Boilers/Flares)	91.3	108.7	73.7	13.5	73.7	13.5
Area	0.4	0.0	0.0	0.0	0.0	0.0
Mobile	0.1	0.1	0.1	0.0	>0.1	0.0
Required Permit Offsets[4]	-97	-118	0	0	0	0
Total	-5.7	-9.1	73.8	13.5	73.7	13.5
SMAQMD Thresholds of Significance	**65**	**65**	**80[5]**	**14.6[5]**	**82[6]**	**15[6]**

Notes: ROG = reactive organic gas; NO_X = oxides of nitrogen; PM_{10} = respirable particulate matter; lb/day = pounds per day; SMAQMD = Sacramento Metropolitan Air Quality Management District; CHP = combined heat and power

[1] Emissions calculated based on actual annual combustion of natural gas and digester gas in 2021 (Ross, pers. comm. 2022.)

[2] Based on engines running at full capacity (100 percent annual average digester gas + natural gas). No flare or boiler operation.

[3] Area sources include occasional maintenance of architectural coating and the use of consumer products, such as cleaners. Mobile sources from the project represent additional emissions from new employee commute.

[4] Based on annual offsets of 18 tons of ROG and 22 tons of NO_X divided by 365 days per year.

[5] If all feasible BACT/BMPs are applied, then 80 lb/day and 14.6 tpy.

[6] If all feasible BACT/BMPs are applied, then 82 lb/day and 15 tpy.

See Appendix B for detailed calculations.

Source: Modeled by Ascent Environmental in 2022

As shown in Table 3.1-5, the net change in operational emissions of criteria air pollutants or precursors associated with the project would not exceed the daily or annual mass emission thresholds adopted by SMAQMD. The majority of ROG and NO_X emissions would be reduced by the required permit offsets, even resulting in a net reduction in ROG and NO_X due to the offsets exceeding the estimated project emissions. Modeling estimates that the project would result in a net increase in daily PM_{10} and $PM_{2.5}$ emissions by 73.8 and 73.7 lbs. per day, respectively. These are below SMAQMD's PM_{10} and $PM_{2.5}$ thresholds of 80 and 82 lb per day, assuming BACT is applied. However, these estimates are also conservative as they represent the maximum emissions operation scenario of a Jenbacher JMS engine 620 operating at full capacity throughout the year. This engine has the highest fuel capacity of all the engines considered for the project.

The *Guidance to Address the Friant Ranch Ruling for CEQA Projects in the Sac Metro Air District, Sacramento, California* (SMAQMD 2020b) notes that, by default, the Minor Project Health Effects Tool model generates conservatively high health effects. As explained in the guidance, the outputs are based on simulation of a full year of exposure at the maximum daily average of increases in air pollutant concentrations. In the Minor Project Tool, emissions are assumed to be at 82 pounds per day of NO_X, ROG, or $PM_{2.5}$ and show the incidences of respiratory, cardiovascular, and mortality effects. As described above, the project emissions would be less than SMAQMD's recommended mass thresholds for criteria air pollutants. At the project location, the model calculates additional mortality of 2.1 persons per year due to ozone and $PM_{2.5}$ exposure. However, this result unequivocally overstates the potential cardiovascular and respiratory health impacts of the project, and it is possible there would be no cardiovascular and respiratory health impacts (i.e., zero cases of additional mortality) attributable to mass emissions of the project (SMAQMD 2020b:A-15). The SMAQMD guidance also notes that the model output includes only health effects with sufficient research to provide quantification. Other health effects are linked to emissions of $PM_{2.5}$ and ozone that are not quantified in the Minor Project Health Effects Tool (SMAQMD 2020c). Other health effects of criteria air pollutants and ozone are discussed in Section 3.1.2," Environmental Setting," above. The linkage between mass emissions and other health effects are not quantifiable, and the project would not result in sizeable quantifiable health effects if it resulted in health effects at all. Therefore, it is presumed that these other health effects would not occur.

Summary

The project would not result in a SMAQMD threshold of significance exceedance or substantially contribute to a nonattainment status of the SVAB. Furthermore, based on health effect modeling, the project would not result in adverse health impacts. This impact would be **less than significant**.

Mitigation Measures

No mitigation is required for this impact.

Impact 3.1-4: Expose Sensitive Receptors to Substantial Pollutant Concentrations

Both construction related and operational emissions of TACs associated with proposed project would occur more than 4,000 feet from the nearest sensitive receptor. In addition, the project would be a new permitted emission unit and would be required to meet SMAQMD's permitting requirements, including the application of T-BACT (i.e., equipment installed or employed that result in the lowest achievable TAC emission rate) to reduce criteria pollutant and TAC emissions. The requirements for T-BACT are identical to SMAQMD's thresholds of significance for TACs (i.e., 10 chances in a million for cancer risk and a hazard index greater than 1 at any off-site receptor). Thus, the project would not result in exposure of existing receptors to substantial TAC concentrations from construction or operational emissions. This impact would be **less than significant**.

TACs would be emitted during both project construction and operations. TACs are a defined set of airborne pollutants that may pose a present or potential hazard to human health. TACs may cause or contribute to an increase in mortality or in serious illness. TACs are usually present in minute quantities in the ambient air; however, their high toxicity or health risk may pose a threat to public health even at low concentrations.

The health effects associated with TACs are quite diverse and generally are assessed locally, rather than regionally. TACs can cause long-term health effects such as cancer, birth defects, neurological damage, asthma, bronchitis, or genetic damage; or short-term acute affects such as eye watering, respiratory irritation (a cough), runny nose, throat pain, and headaches.

For evaluation purposes, TACs are separated into carcinogens and non-carcinogens based on the nature of the health effects associated with exposure to the pollutant. Carcinogenic TACs are assumed to have no threshold below which health impacts would not occur. This contrasts with criteria air pollutants for which acceptable levels of exposure can be determined and for which the NAAQS and CAAQS have been established. Cancer risk from TACs is expressed as excess cancer cases per 1 million exposed individuals, typically over a lifetime of exposure. Noncancer health effects are expressed via a relative exposure level applicable to chronic and acute effects, separately.

The levels of TACs emitted during project construction and project operations are discussed separately below.

Construction

Project construction would result in new emissions of criteria air pollutants and precursors, as described above, as well as TACs. Particulate matter emitted from diesel construction equipment (diesel PM) would be the primary TAC of concern associated with the project. As shown above in Table 3.1-4, construction-related activities would emit up to 1.6 lb/day of diesel PM. The dose to which receptors are exposed is the primary factor used to determine health risk (i.e., potential exposure to TAC emission levels that exceed applicable standards). Dose is a function of the concentration of a substance or substances in the environment and the duration of exposure to the substance. Dose is positively correlated with time, meaning that a longer exposure period would result in a higher exposure level for the maximally exposed individual. Thus, the risks estimated for a maximally exposed individual are higher if a fixed exposure occurs over a longer period. According to the Office of Environmental Health Hazard Assessment (OEHHA), health risk assessments, which determine the exposure of sensitive receptors to TAC emissions, should be based on a 30- or 70-year exposure period; however, such assessments should be limited to the period/duration of activities associated with the project (OEHHA 2015). Additionally, construction would occur intermittently over a limited period of 18–24 months, a duration substantially shorter than the exposure period used for typical health risk calculations (i.e., 30 or 70 years), and not all phases of construction would involve heavy use of diesel PM-emitting equipment.

In addition, studies show that diesel PM is highly dispersive and that concentrations of diesel PM decline with distance from the source (e.g., 500 feet from a freeway, the concentration of diesel PM decreases by 70 percent) (Roorda-Knape et al. 1999; Zhu et al. 2002, as cited in CARB 2005:9). The nearest off-site sensitive receptors are the residences east of Franklin Boulevard, which is approximately 4,740 feet away.

Due to the low level of modeled diesel PM emissions from construction activities and because sensitive receptors are located nearly 1 mile away from the closest construction activity and because diesel PM disperses rapidly, the project's construction would not result in adverse health effects from TACs.

Operations

As explained in Chapter 2, "Project Description," the proposed project would be required to have an Authority to Construct permit prior to the construction and operation of the project. Additionally, as a stationary source of TAC emissions, the project would be subject to a detailed permitting process under SMAQMD Regulation 2, Permits (SMAQMD 2020a:5-6). During the permitting process, which SMAQMD would not commence formally until after the project has undergone CEQA review, SMAQMD would assess the impact from the project's operational emissions of TACs based on its guidance, as well as any applicable guidance from the OEHHA and CARB. SMAQMD requires T-BACT for certain stationary sources of TACs. Applicable T-BACTs include an add-on catalytic oxidizer that reduces ROG emissions, and therefore, most TAC species. In addition to T-BACT requirements, permits for equipment that may emit TACs may also contain conditions required by the National Emission Standards for Hazardous Air Pollutants and Air Toxic Control Measures promulgated by the EPA and CARB, respectively. The application of T-BACT would be

required as part of the permitting process, and the specific T-BACT (i.e., add-on catalytic oxidizer) to be applied to the equipment will be determined by the SMAQMD during the permitting process. In short, SMAQMD's permitting process would ensure that the new stationary sources of TACs that would be part of the project, most notably the new biogeneration facility, would not receive the authority to construct or permit to operate if they would result in:

- A cancer risk greater than 10.0 in 1 million at any off-site receptor; and/or
- An off-site ground-level concentration of non-carcinogenic TACs generated from the project that would result in a Hazard Index greater than 1.0.

These permitting criteria are identical to the SMAQMD's thresholds of significance for TACs (SMAQMD 2020a).

Summary

Because of the relatively short duration of TAC-generating construction activity and the distance to offsite sensitive receptors, the cancer risk associated with diesel PM generated by construction-related activities would not adversely affect any nearby sensitive receptors. In addition, SMAQMD's permitting process would ensure that the operation of new stationary sources of TACs as part of the project, would not receive the authority to construct or permit to operate if they would result in exceedance of these same criteria. Therefore, this impact would be **less than significant**.

Mitigation Measures

No mitigation is required for this impact.

Impact 3.1-5: Create Objectionable Odors Affecting a Substantial Number of People

The project would result in minimal construction-related odors and would not introduce new odor sources during operations and, therefore, would not result in an odor impact. As a result, potential exposure of sensitive receptors to objectionable odors would be **less than significant**.

Minor odors from the use of heavy equipment during construction would be temporary and intermittent and would dissipate rapidly from the source with increases in distance. It is not anticipated that these odors would be noticeable at the nearest residential receptors, which are located approximately 4,740 feet from the project area. Operation of the project would not result in the generation of more digester gas or the generation of any new odors. The project would also not affect the wastewater treatment capacity at the facility or the amount of effluent that would be released which could result in an increase in odor-generating sources. Therefore, project construction or operation would not result in exposure of a substantial number of people to objectionable odors, and this impact would be **less than significant**.

Mitigation Measures

No mitigation is required for this impact.

Final EIR

(Appendices Removed for Brevity)

FINAL ENVIRONMENTAL IMPACT REPORT FOR THE

REGIONAL SAN BIOGENERATION FACILITY PROJECT

State Clearinghouse No. 2021050080

Prepared for

REGIONALSAN

Sacramento Regional County
Sanitation District

September 2023

FINAL ENVIRONMENTAL IMPACT REPORT FOR THE

Regional San BioGeneration Facility Project

State Clearinghouse No. 2021050080

Prepared for:

REGIONALSAN

Sacramento Regional County Sanitation District
8521 Laguna Station Road
Elk Grove, CA 95758

Contact:

Steve Nebozuk
Senior Civil Engineer
916.876.6118

Prepared by

ASCENT

Ascent, Inc.
455 Capitol Mall, Suite 300
Sacramento, CA 95814

Contact:

Stephanie Rasmussen
Project Manager
916.842.3173

September 2023

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LIST OF ABBREVIATIONS

CalEEMod	California Emissions Estimator Model
CalGEM	California Geologic Energy Management Division
CEQA Guidelines	California Environmental Quality Act Guidelines
CEQA	California Environmental Quality Act
Draft EIR	draft environmental impact report
EPA	United States Environmental Protection Agency
Final EIR	final environmental impact report
GHG	greenhouse gas
MW	megawatts
NPDES	National Pollutant Discharge Elimination System
OAL	Office of Administrative Law
project	BioGeneration Facility Project
Regional San	Sacramento Regional County Sanitation District
RFQ	Request for Qualifications
SMAQMD	Sacramento Metropolitan Air Quality Management District
SRWTP	Sacramento Regional Wastewater Treatment Plant
SWPPP	Storm Water Pollution Prevention Plan
WDR	Waste Discharge Requirement

1 INTRODUCTION

This final environmental impact report (Final EIR) has been prepared by Sacramento Regional County Sanitation District (Regional San), as lead agency, in accordance with the requirements of the California Environmental Quality Act (CEQA) and the CEQA Guidelines (California Code of Regulations Section 15132). This Final EIR contains responses to comments received on the draft environmental impact report (Draft EIR) for the BioGeneration Facility Project (project). The Final EIR consists of the Draft EIR and this document (response to comments document), which includes comments on the Draft EIR, responses to those comments, and revisions to the Draft EIR.

1.1 PURPOSE AND INTENDED USES OF THIS FINAL EIR

CEQA requires a lead agency that has prepared a Draft EIR to consult with and obtain comments from responsible and trustee agencies that have jurisdiction by law with respect to the project, and to provide the public with an opportunity to comment on the Draft EIR. The Final EIR is the mechanism for responding to these comments. This Final EIR has been prepared to respond to comments received on the Draft EIR, which are reproduced in this document; and to present corrections, revisions, and other clarifications and amplifications to the Draft EIR, including project updates, made in response to these comments and as a result of the applicant's ongoing planning and design efforts. The Final EIR will be used to support Regional San Board of Director's decision regarding whether to approve the BioGeneration Facility Project.

This Final EIR will also be used by CEQA responsible and trustee agencies to ensure that they have met their requirements under CEQA before deciding whether to approve or permit project elements over which they have jurisdiction. It may also be used by other state, regional, and local agencies that may have an interest in resources that could be affected by the project or that have jurisdiction over portions of the project.

Responsible, trustee, and interested agencies may include:

- Sacramento Metropolitan Air Quality Management District (SMAQMD)
- California Department of Fish and Wildlife

1.2 PROJECT LOCATION

The project area (area of disturbance) would be located within the Sacramento Regional Wastewater Treatment Plant (SRWTP) site in a previously disturbed area north of the existing SRWTP digesters. The SRWTP site is located at 8521 Laguna Station Road in Elk Grove and is surrounded by approximately 2,150 acres of open space owned by Regional San and known as the Bufferlands (Figure 1-1). The entire SRWTP site and Bufferlands are located north of Laguna Boulevard and lie predominantly within the unincorporated area of Sacramento County, between Franklin Boulevard and Interstate 5. The project area within the SRWTP site is bordered by Digesters Way/Oregon Trail to the south and Septage Way to the north. The staging area would be immediately east of the proposed biogeneration facility site.

Source: adapted by Ascent Environmental in 2021

Figure 1-1 Project Location

1.3 PROJECT OBJECTIVES

The goal of the project is to design and construct a biogas cogeneration facility before the Commodity Agreement expires in October 2025 that meets the following objectives:

- make the best use of biogas (highest economic and environmental value, greatest overall efficiency);
- minimize operations and maintenance costs;
- integrate into the existing SRWTP facilities;
- reduce emissions associated with use of biogas venting and flaring compared to existing conditions; and
- protect the environment through responsible stewardship of natural resources.

1.4 SUMMARY DESCRIPTION OF THE PROJECT

The BioGeneration Facility Project would include construction and operation of a new cogeneration engine system to use biogas, a byproduct of the wastewater treatment process, onsite to produce electricity and heat for the SRWTP. The biogas cogeneration system would have several major interfaces with existing SRWTP systems including the following:

- gas management system,
- digester heating system,
- electrical power distribution system,
- plant computer control system, and
- site utilities.

The project would include the following components:

- up to six internal combustion engine generators,
- engine exhaust treatment (oxidation catalyst and selective catalytic reduction),
- a biogas conditioning system (as part of the gas management system),
- hot water boiler (standby), and
- a new building.

1.5 MAJOR CONCLUSIONS OF THE ENVIRONMENTAL ANALYSIS

The Draft EIR identified the following potentially significant impacts related to the project:

- Biological Resources:
  - Project implementation could lead to potential loss of bird nests due to disturbance from construction activities proximate to nesting trees. Loss of nests could include nest abandonment, failure, and/or mortality of chicks or eggs. Mitigation Measures 3.2-1a (avoid disturbance of Swainson's hawk, loggerhead shrike, and other raptor nests), 3.2-1b (avoid disturbance of burrowing owl nests), and 3.2-1c (avoid disturbance of tricolored blackbird or common native bird nests or foraging habitat) are included to reduce this impact to a less-than-significant level (Impact 3.2-1).
- Cultural and Tribal Cultural Resources:
  - Project-related ground-disturbing activities could result in discovery or damage of yet undiscovered archaeological resources as defined in CEQA Guidelines Section 15064.5. Mitigation Measure 3.3-1 (unanticipated discoveries of archaeological resources) is included to reduce this impact to a less-than-significant level (Impact 3.3-1).

- It is possible that yet-undiscovered tribal cultural resources could be encountered or damaged during ground-disturbing construction activities. Mitigation Measure 3.3-2 (unanticipated discoveries of potential tribal cultural resources) is included to reduce this impact to a less-than-significant level (Impact 3.3-2).

However, all significant impacts associated with the project would be reduced to less than significant with mitigation that the lead agency has agreed to adopt.

1.6 CEQA PUBLIC REVIEW PROCESS

On March 29, 2023, Regional San released the Draft EIR for a 45-day public review and comment period. The Draft EIR was submitted to the State Clearinghouse for distribution to reviewing agencies; posted on Regional San's website (https://www.regionalsan.com/biogas-recycling); and was made available at Regional San's offices and the Valley Hi-North Laguna Library. A notice of availability of the Draft EIR was published in the Sacramento Bee and distributed by Regional San to a project-specific mailing list.

A public meeting was held on May 3, 2023, to receive input from agencies and the public on the Draft EIR. The meeting was held via Zoom webinar from 3:00 p.m. to 4:00 p.m. The meeting was recorded, and a transcript was prepared.

As a result of these notification efforts, written and verbal comments were received from two state agencies (California Department of Conservation, Central Valley Regional Water Quality Control Board), one local agency (SMAQMD), and one organization on the content of the Draft EIR. Chapter 3, "Responses to Comments," identifies these commenting parties, their respective comments, and responses to these comments. None of the comments received, or the responses provided, constitute "significant new information" by CEQA standards (CEQA Guidelines Section 15088.5).

1.7 ORGANIZATION OF THE FINAL EIR

This Final EIR is organized as follows:

Chapter 1, "Introduction," describes the purpose of the Final EIR, summarizes the BioGeneration Facility Project and the major conclusions of the Draft EIR, provides an overview of the CEQA public review process, and describes the content of the Final EIR.

Chapter 2, "Project Updates and Revisions to the Draft EIR," presents minor updates related to the BioGeneration Facility Project as a result of ongoing planning and design refinements since release of the Draft EIR and presents minor revisions to the Draft EIR text. Changes in the text are signified by ~~strikeouts~~ where text is removed and by <u>underline</u> where text is added.

Chapter 3, "Responses to Comments," contains a list of all parties who submitted comments on the Draft EIR during the public review period, all comments received on the Draft EIR, and responses to the comments.

Chapter 4, "List of Preparers," identifies the lead agency contacts as well as the preparers of this Final EIR.

2 PROJECT UPDATES AND REVISIONS TO THE DRAFT EIR

In March 2023, during preparation of the Draft EIR, Regional San issued a Request for Qualifications (RFQ) and began a competitive selection process for design-build teams. The RFQ does not obligate Regional San to certify this EIR or approve the project covered in this EIR, nor any variations to the project that may be proposed through the RFQ process. However, in the event the EIR is certified, the RFQ process, by seeking proposals for actual projects, facilitates more efficient consideration of the project and whether it should be approved.

This chapter evaluates a project alternative proposed during the RFQ process that was identified after publication of the Draft EIR. This chapter provides a brief description and evaluation of potential impacts of the new alternative. In addition, this chapter presents revisions to the Draft EIR text to make minor revisions (Section 2.2).

2.1 HYBRID ALTERNATIVE

Through the RFQ's competitive selection process, a design alternative was proposed that would be a hybrid between the proposed project evaluated in Chapter 2, "Project Description," and the Trigeneration Alternative evaluated in Chapter 5, "Alternatives," of the Draft EIR. The Hybrid Alternative would include approximately 1.4 megawatts (MW) of fuel cell capacity in addition to combustion engine generators that would produce approximately 10 MW of power. Similar to the proposed project, this alternative would also include the following components:

- up to six internal combustion engine generators,
- engine exhaust treatment (oxidation catalyst and selective catalytic reduction),
- a biogas conditioning system (as part of the gas management system),
- hot water boiler (standby), and
- a new building.

This alternative would also include fuel cells, which would use an electrochemical process rather than combustion to convert biogas from the SRWTP to heat and power. This alternative would be designed to allow for generation of renewable hydrogen in the future. Renewable hydrogen can be generated using a separate system (i.e., steam methane reformer) or by using fuel cells and would be sold for offsite use as a fuel. This alternative would be located within the same project area as the proposed project described in Chapter 2, "Project Description," of the Draft EIR and the footprint of the Hybrid Alternative would be similar to the proposed project.

CEQA allows a lead agency to limit the detail of discussion of the environmental effects that are not considered potentially significant (Public Resource Code Section 21100, CEQA Guidelines Sections 15126.2[a] and 15128). Effects dismissed in an Initial Study as clearly less-than-significant need not be discussed further in the EIR unless the lead agency subsequently receives information inconsistent with the finding in the Initial Study (CEQA Guidelines Section 15143). Based on a review of the information presented in the *Initial Study for the Regional San BioGeneration Facility Project* (Appendix A to the Draft EIR) prepared for the proposed project and comments received as part of the public scoping process, as well as additional research and analysis of relevant project data during preparation of the Draft EIR, the following were identified as resources that would not experience any significant environmental impacts from the proposed project. Accordingly, because the Hybrid Alternative would be very similar to the proposed project evaluated in the Draft EIR, it is assumed that these resource areas would not experience significant environmental impacts for the Hybrid Alternative and are, therefore, not addressed further below.

- Aesthetics
- Agriculture and Forestry Resources
- Energy
- Geology and Soils
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use and Planning
- Mineral Resources
- Noise
- Population and Housing
- Public Services
- Recreation
- Transportation
- Utilities and Service Systems
- Wildfire

Potential impacts associated with the Hybrid Alternative are discussed further below.

2.1.1 Evaluation of the Hybrid Alternative

AIR QUALITY

The Hybrid Alternative would result in short-term and long-term air quality emissions related to construction of the alternative and operation of combustion engines and flares. The footprint, intensity, and duration of construction are expected to be similar to the proposed project. Therefore, the construction-related air quality emissions would be similar to the proposed project. The air quality analysis for the proposed project in Section 3.1, "Air Quality," of the Draft EIR evaluated operational air quality impacts associated with combustion engines that would produce up to 15 MW of power. The Hybrid Alternative would include combustion engines that would produce approximately 10 MW of power, which would result in similar air quality emissions compared to engines evaluated for the proposed project in the Draft EIR. In addition, as shown in Table 5-1 in Chapter 5, "Alternatives," of the Draft EIR, operation of fuel cells would not result in air quality emissions. Use of fuel cells instead of engines to generate a portion of the of the heat and power for the SRWTP would result in fewer air quality emissions than the proposed project, and the air quality emissions related to flaring and a supplemental boiler would be less than the Trigeneration Alternative evaluated in Chapter 5, "Alternatives," because combustion engines could be operated during down time for the fuel cells, which would reduce flaring. In addition, the combustion engines would produce enough heat for the SRWTP; therefore, a supplemental boiler would not be needed for the Hybrid Alternative, which would eliminate the emissions associated with a boiler. Purchase of offsets required under the air permit for reactive organic gases and nitrogen oxides would also be required under the Hybrid Alternative similar to the proposed project. However, fewer offsets may be required with the Hybrid Alternative because the Hybrid Alternative would result in fewer emissions of criteria air pollutants. Similar to the proposed project, the air quality impacts would be less than significant under the Hybrid Alternative.

BIOLOGICAL RESOURCES

The location, footprint, and duration of construction for the Hybrid Alternative are expected to be similar to the proposed project. Therefore, potential impacts to biological resources related to special-status species and sensitive habitats would be similar to the proposed project. Mitigation Measures 3.2-1a through 3.2-1c described in Section 3.2, "Biological Resources," of the Draft EIR would also be applicable to the Hybrid Alternative. Similar to the proposed project, the biological resource impacts would be less than significant under the Hybrid Alternative.

CULTURAL AND TRIBAL CULTURAL RESOURCES

The location, footprint, and duration of construction for the Hybrid Alternative are expected to be similar to the proposed project. Therefore, potential impacts to cultural resources related to known and unknown cultural, archaeological, and tribal cultural resources would be similar to the proposed project. Mitigation Measures 3.3-1 and

3.3-2 described in Section 3.3, "Cultural and Tribal Cultural Resources," of the Draft EIR would also be applicable to the Hybrid Alternative. Similar to the proposed project, the cultural resource impacts would be less than significant under the Hybrid Alternative.

GREENHOUSE GAS EMISSIONS AND CLIMATE CHANGE

The Hybrid Alternative would result in short-term and long-term greenhouse gas (GHG) emissions related to construction of the alternative and operation of combustion engines and flares. The footprint, intensity, and duration of construction are expected to be similar to the proposed project. Therefore, the construction-related GHG emissions would be similar to the proposed project. The GHG analysis for the proposed project in Section 3.4, "Greenhouse Gas Emissions and Climate Change," of the Draft EIR evaluated operational GHG impacts associated with combustion engines that would produce up to 15 MW of power. The Hybrid Alternative would include combustion engines similar to those proposed with the proposed project; however, the Hybrid Alternative would produce approximately 10 MW of power with combustion engines. Producing less power (10 MW vs. 15 MW) with combustion engines under the Hybrid Alternative would result in fewer GHG emissions compared to the proposed project evaluated in the Draft EIR. In addition, as shown in Table 5-2 in Chapter 5, "Alternatives," of the Draft EIR, operation of fuel cells would not result in GHG emissions. Use of fuel cells instead of engines to generate a portion of the of the heat and power for the SRWTP would result in fewer GHG emissions than the proposed project. The GHG emissions related to flaring and a supplemental boiler would also be less than the Trigeneration Alternative evaluated in Chapter 5, "Alternatives," because combustion engines could be operated during down time for the fuel cells, which would reduce flaring. In addition, the combustion engines would produce enough heat for the SRWTP, which would eliminate the need for and emissions associated with a supplemental boiler. Similar to the proposed project, the GHG impacts would remain less than significant under the Hybrid Alternative.

2.1.2 Conclusion

The Draft EIR provided a comprehensive analysis of potential impacts of the project and alternatives. The Hybrid Alternative includes components of the proposed project and the Trigeneration Alternative, both of which were evaluated in detail in the Draft EIR. Implementation of the Hybrid Alternative would not generate a new substantial adverse environmental effect and in some cases, the alternative would reduce potential environmental effects compared to the proposed project. The significance of impacts would not change.

CEQA requires recirculation of an EIR when significant new information is added to the EIR after public notice is given of the availability of the Draft EIR for public review, but before certification (CEQA Guidelines Section 15088.5). New information is not "significant" unless the EIR is changed in a way that deprives the public of a meaningful opportunity to comment upon a substantial adverse environmental effect of the project or a feasible way to mitigate or avoid such an effect (CEQA Guidelines Section 15088.5).

Because the information in this section makes insignificant modifications to an otherwise adequate EIR, and because this Final EIR did not result in the identification of any new significant environmental impacts or a substantial increase in the severity of an environmental impact, this Final EIR does not contain "significant new information," and recirculation of the Draft EIR is not required prior to approval.

2.2 REVISIONS TO THE DRAFT EIR

This section presents specific text changes made to the Draft EIR since its publication and public review. The changes are identified by the Draft EIR chapter and page number. Text deletions are shown in ~~strikethrough~~, and text additions are shown in <u>underline</u>.

It should be noted that the following revisions have been made to correct an inconsistency in the Draft EIR and do not change the intent or content of the analysis or effectiveness of mitigation measures presented in the Draft EIR. These revisions make the revised text consistent with conclusions presented elsewhere in the Draft EIR.

2.2.1 Revisions to Chapter 5, "Alternatives"

To correct an inconsistency identified following release of the Draft EIR, Section 5.4.3, "Alternative 3: Trigeneration Alternative," on page 5-7 of the Draft EIR is revised as follows:

> While this alternative would result in less operational air quality emissions, it would result in greater impacts related to GHG emissions~~, biological resources, and cultural resources~~.

3 RESPONSES TO COMMENTS

This chapter contains comment letters received during the public review period for the Draft EIR, which concluded on May 12, 2023, including transcribed comments received during the May 3, 2023, public meeting. In accordance with Section 15088(a) of the California Environmental Quality Act Guidelines (CEQA Guidelines), written responses were prepared addressing comments on environmental issues received from reviewers of the Draft EIR.

3.1 LIST OF COMMENTERS ON THE DRAFT EIR

Table 3-1 presents the list of commenters, including the numerical designation for each comment letter received, the author of the comment letter, and the date of the comment letter.

Table 3-1 List of Commenters

Letter No.	Commenter	Date
AGENCIES		
A1	California Department of Conservation Geologic Energy Management Division Miguel Cabrera, Northern District Deputy	April 25, 2023
A2	Sacramento Metropolitan Air Quality Management District Paul Philley, Program Supervisor CEQA and Land Use	May 12, 2023
A3	Central Valley Regional Water Quality Control Board Peter Minkel, Engineering Geologist	May 12, 2023
PUBLIC HEARING ON THE DRAFT EIR (MAY 3, 2023)		
PH1	J.R. Wellman Bloom Energy	—

3.2 COMMENTS AND RESPONSES

The verbal and written individual comments received on the Draft EIR and the responses to those comments are provided below. The comment letters and verbal comments made at the public hearing are reproduced in their entirety and are followed by the response(s). Where a commenter has provided multiple comments, each comment is indicated by a line bracket and an identifying number in the margin of the comment letter.

3.2.1 Agencies

Letter A1 California Department of Conservation, Geologic Energy Management Division

Miguel Cabrera, Northern District Deputy
April 25, 2023

Comment A1-1

Public Resources Code (PRC) Section 3208.1 establishes well reabandonment responsibility when a previously plugged and abandoned well will be impacted by planned property development or construction activities. Local permitting agencies, property owners, and/or developers should be aware of, and fully understand, that significant and potentially dangerous issues may be associated with development near oil, gas, and geothermal wells.

Response A1-1
Regional San and its contractors will comply will all applicable regulations during utility demolition and abandonment. No revisions have been made to this EIR in response to Comment A1-1.

Comment A1-2
The California Geologic Energy Management Division (CalGEM) has received and reviewed the above referenced project dated 4/24/2023. To assist local permitting agencies, property owners, and developers in making wise land use decisions regarding potential development near oil, gas, or geothermal wells, the Division provides the following well evaluation.

The project is located in Sacramento County, within the boundaries of the following fields:

N/A

Our records indicate there are no known oil or gas wells located within the project boundary as identified in the application.

- Number of wells Not Abandoned to Current Division Requirements as Prescribed by Law and Projected to Be Built Over or Have Future Access Impeded by this project: 0
- Number of wells Not Abandoned to Current Division Requirements as Prescribed by Law and Not Projected to Be Built Over or Have Future Access Impeded by this project: 0
- Number of wells Abandoned to Current Division Requirements as Prescribed by Law and Projected to Be Built Over or Have Future Access Impeded by this project: 0
- Number of wells Abandoned to Current Division Requirements as Prescribed by Law and Not Projected to Be Built Over or Have Future Access Impeded by this project: 0

Response A1-2
Thank you for confirming no known wells are within the project boundary. No revisions have been made to this EIR in response to Comment A1-2.

Comment A1-3
As indicated in PRC Section 3106, the Division has statutory authority over the drilling, operation, maintenance, and abandonment of oil, gas, and geothermal wells, and attendant facilities, to prevent, as far as possible, damage to life, health, property, and natural resources; damage to underground oil, gas, and geothermal deposits; and damage to underground and surface waters suitable for irrigation or domestic purposes. In addition to the Division's authority to order work on wells pursuant to PRC Sections 3208.1 and 3224, it has authority to issue civil and criminal penalties under PRC Sections 3236, 3236.5, and 3359 for violations within the Division's jurisdictional authority. The Division does not regulate grading, excavations, or other land use issues.

If during development activities, any wells are encountered that were not part of this review, the property owner is expected to immediately notify the Division's construction site well review engineer in the Northern district office, and file for Division review an amended site plan with well casing diagrams. The District office will send a follow-up well evaluation letter to the property owner and local permitting agency.

Response A1-3
Regional San and its contractors will comply will all applicable regulations related to drilling, operation, maintenance, and abandonment of oil, gas, and geothermal wells. If any wells are encountered during construction, Regional San will immediately notify the Geologic Energy Management Division's construction site well review engineer. No revisions have been made to this EIR in response to Comment A1-3.

Letter A2 Sacramento Metropolitan Air Quality Management District

Paul Philley, Program Supervisor CEQA and Land Use
May 12, 2023

Comment A2-1
Thank you for routing the DEIR for us to review. The Sac Metro Air District has no comment on the draft.

Response A2-1
Thank you for your review of the Draft EIR. No revisions have been made to this EIR in response to Comment A2-1.

Letter A3 Central Valley Regional Water Quality Control Board

Peter Minkel, Engineering Geologist
May 12, 2023

Comment A3-1
Pursuant to the State Clearinghouse's 28 March 2023 request, the Central Valley Regional Water Quality Control Board (Central Valley Water Board) has reviewed the *Request for Review for the Draft Environmental Impact Report* for the Regional San BioGeneration Facility Project, located in Sacramento County.

Our agency is delegated with the responsibility of protecting the quality of surface and groundwaters of the state; therefore, our comments will address concerns surrounding those issues.

I. Regulatory Setting

Basin Plan

The Central Valley Water Board is required to formulate and adopt Basin Plans for all areas within the Central Valley region under Section 13240 of the Porter-Cologne Water Quality Control Act. Each Basin Plan must contain water quality objectives to ensure the reasonable protection of beneficial uses, as well as a program of implementation for achieving water quality objectives with the Basin Plans. Federal regulations require each state to adopt water quality standards to protect the public health or welfare, enhance the quality of water and serve the purposes of the Clean Water Act. In California, the beneficial uses, water quality objectives, and the Antidegradation Policy are the State's water quality standards. Water quality standards are also contained in the National Toxics Rule, 40 CFR Section 131.36, and the California Toxics Rule, 40 CFR Section 131.38.

The Basin Plan is subject to modification as necessary, considering applicable laws, policies, technologies, water quality conditions and priorities. The original Basin Plans were adopted in 1975, and have been updated and revised periodically as required, using Basin Plan amendments. Once the Central Valley Water Board has adopted a Basin Plan amendment in noticed public hearings, it must be approved by the State Water Resources Control Board (State Water Board), Office of Administrative Law (OAL) and in some cases, the United States Environmental Protection Agency (EPA). Basin Plan amendments only become effective after they have been approved by the OAL and in some cases, the EPA. Every three (3) years, a review of the Basin Plan is completed that assesses the appropriateness of existing standards and evaluates and prioritizes Basin Planning issues. For more information on the Water Quality Control Plan for the Sacramento and San Joaquin River Basins, please visit our website:

http://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/

Antidegradation Considerations

All wastewater discharges must comply with the Antidegradation Policy (State Water Board Resolution 68-16) and the Antidegradation Implementation Policy contained in the Basin Plan. The Antidegradation Implementation Policy is available on page 74 at:

https://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/sacsjr_2018

In part it states:

Any discharge of waste to high quality waters must apply best practicable treatment or control not only to prevent a condition of pollution or nuisance from occurring, but also to maintain the highest water quality possible consistent with the maximum benefit to the people of the State.

This information must be presented as an analysis of the impacts and potential impacts of the discharge on water quality, as measured by background concentrations and applicable water quality objectives.

The antidegradation analysis is a mandatory element in the National Pollutant Discharge Elimination System and land discharge Waste Discharge Requirements (WDRs) permitting processes. The environmental review document should evaluate potential impacts to both surface and groundwater quality.

II. Permitting Requirements

Construction Storm Water General Permit

Dischargers whose project disturb one or more acres of soil or where projects disturb less than one acre but are part of a larger common plan of development that in total disturbs one or more acres, are required to obtain coverage under the General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Construction General Permit), Construction General Permit Order No. 2009-0009-DWQ. Construction activity subject to this permit includes clearing, grading, grubbing, disturbances to the ground, such as stockpiling, or excavation, but does not include regular maintenance activities performed to restore the original line, grade, or capacity of the facility. The Construction General Permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP). For more information on the Construction General Permit, visit the State Water Resources Control Board website at:

http://www.waterboards.ca.gov/water_issues/programs/stormwater/constpermits.sht ml

Clean Water Act Section 404 Permit

If the project will involve the discharge of dredged or fill material in navigable waters or wetlands, a permit pursuant to Section 404 of the Clean Water Act may be needed from the United States Army Corps of Engineers (USACE). If a Section 404 permit is required by the USACE, the Central Valley Water Board will review the permit application to ensure that discharge will not violate water quality standards. If the project requires surface water drainage realignment, the applicant is advised to contact the Department of Fish and Game for information on Streambed Alteration Permit requirements. If you have any questions regarding the Clean Water Act Section 404 permits, please contact the Regulatory Division of the Sacramento District of USACE at (916) 557-5250.

Clean Water Act Section 401 Permit – Water Quality Certification

If an USACE permit (e.g., Non-Reporting Nationwide Permit, Nationwide Permit, Letter of Permission, Individual Permit, Regional General Permit, Programmatic General Permit), or any other federal permit (e.g., Section 10 of the Rivers and Harbors Act or Section 9 from the United States Coast Guard), is required for this project due to the disturbance of waters of the United States (such as streams and wetlands), then a Water Quality Certification must be obtained from the Central Valley Water Board prior to initiation of project activities. There are no waivers for 401 Water Quality Certifications. For more information on the Water Quality Certification, visit the Central Valley Water Board website at:

https://www.waterboards.ca.gov/centralvalley/water_issues/water_quality_certification/

Waste Discharge Requirements – Discharges to Waters of the State

If USACE determines that only non-jurisdictional waters of the State (i.e., "non-federal" waters of the State) are present in the proposed project area, the proposed project may require a Waste Discharge Requirement (WDR) permit to be issued by Central Valley Water Board. Under the California Porter-Cologne Water Quality Control Act, discharges to all waters of the State, including all wetlands and other waters of the State including, but not limited to, isolated wetlands, are subject to State regulation. For more information on the Waste Discharges to Surface Water NPDES Program and WDR processes, visit the Central Valley Water Board website at: https://www.waterboards.ca.gov/centralvalley/water_issues/waste_to_surface_water/

Projects involving excavation or fill activities impacting less than 0.2 acre or 400 linear feet of non-jurisdictional waters of the state and projects involving dredging activities impacting less than 50 cubic yards of non-jurisdictional waters of the state may be eligible for coverage under the State Water Resources Control Board Water Quality Order No. 2004-0004-DWQ (General Order 2004-0004). For more information on the General Order 2004-0004, visit the State Water Resources Control Board website at:

https://www.waterboards.ca.gov/board_decisions/adopted_orders/water_quality/200 4/wqo/wqo2004-0004.pdf

Dewatering Permit

If the proposed project includes construction or groundwater dewatering to be discharged to land, the proponent may apply for coverage under State Water Board General Water Quality Order (Low Threat General Order) 2003-0003 or the Central Valley Water Board's Waiver of Report of Waste Discharge and Waste Discharge Requirements (Low Threat Waiver) R5-2018-0085. Small temporary construction dewatering projects are projects that discharge groundwater to land from excavation activities or dewatering of underground utility vaults. Dischargers seeking coverage under the General Order or Waiver must file a Notice of Intent with the Central Valley Water Board prior to beginning discharge.

For more information regarding the Low Threat General Order and the application process, visit the Central Valley Water Board website at:

http://www.waterboards.ca.gov/board_decisions/adopted_orders/water_quality/2003/wqo/wqo2003-0003.pdf

For more information regarding the Low Threat Waiver and the application process, visit the Central Valley Water Board website at:

https://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/waivers/r5-2018-0085.pdf

Limited Threat General NPDES Permit

If the proposed project includes construction dewatering and it is necessary to discharge the groundwater to waters of the United States, the proposed project will require coverage under a National Pollutant Discharge Elimination System (NPDES) permit. Dewatering discharges are typically considered a low or limited threat to water quality and may be covered under the General Order for Limited Threat Discharges to Surface Water (Limited Threat General Order). A complete Notice of Intent must be submitted to the Central Valley Water Board to obtain coverage under the Limited Threat General Order. For more information regarding the Limited Threat General Order and the application process, visit the Central Valley Water Board website at:

https://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/general_orders/r5-2016-0076-01.pdf

NPDES Permit

If the proposed project discharges waste that could affect the quality of surface waters of the State, other than into a community sewer system, the proposed project will require coverage under a National Pollutant Discharge Elimination System (NPDES) permit. A complete Report of Waste Discharge must be submitted with the Central Valley Water Board to obtain a NPDES Permit. For more information regarding the NPDES Permit and the application process, visit the Central Valley Water Board website at: https://www.waterboards.ca.gov/centralvalley/help/permit/

If you have questions regarding these comments, please contact me at (916) 464-4684 or Peter.Minkel2@waterboards.ca.gov.

Response A3-1

The comment provides a summary of Central Valley Regional Water Quality Control Board regulations that may pertain to the BioGeneration Facility Project. This information is consistent with the analyses in the "Hydrology and Water Quality," section of Section 1.2.1, "Effects Found Not to be Significant," of the Draft EIR. As described on page 1-6 of the Draft EIR:

> Construction of the project would disturb more than 1 acre and would typically be subject to the Construction General Permit. However, the project would not require a National Pollutant Discharge Elimination System construction stormwater permit (Notice of Intent to proceed under General Construction Permit) for

disturbance of more than 1 acre because the project is within SRWTP's ring levee and existing process area. Stormwater Pollution Prevention would be subject to a Water Pollution Control Plan and runoff would be contained within the SRWTP. In addition, if dewatering is required during construction, the project would comply with the General Order for Dewatering.

Treated wastewater, including stormwater, is discharged in accordance with Regional San's existing NPDES permit (Order R5-2021-0019-01) for discharge of treated effluent to the Sacramento River. Construction of the project would alter drainage on the project area and the new facilities would include a restroom that would generate wastewater. With the project, stormwater would continue to drain into the SRWTP's storm drain system and wastewater from the new restroom would be connected to the SRWTP's general sanitary sewer drainage system. Both drainage systems would be routed to the SRWTP headworks for treatment and would continue to be discharged in accordance with Regional San's existing NPDES permit.

No revisions have been made to this EIR in response to Comment A3-1.

3.2.2 Public Hearing

PH1 J.R. Wellman

May 3, 2023

Comment PH1-1

My name is Jr. Wellman, with Bloom Energy in a San Jose. I just wanted to thank everyone for all their work. Putting together these different alternatives to consider in the EIR. It is exciting to see what the energy mosaic of the future with energy transition can look like, and I appreciate Sacramento Regional San taking leadership on the issue. Appreciate it so much, guys. Thank you.

Response PH1-1

Thank you for your expression of support for the alternatives and Regional San's leadership. No revisions have been made to this EIR in response to Comment PH1-1.

Comment PH1-2

Just a quick point when going through the EIR, I notice the Trigeneration Alternative regarding flaring impacts and things like that is the primary case with going with all engines designed to consume all the biogas all the time. And if so, how does the EIR identify the excess heat being released into the atmosphere versus converting more of it into higher and better use electricity, perhaps, in a hybrid model.

Response PH1-2

The air quality and greenhouse gas emissions as a result of flaring were modeled using the California Emissions Estimator Model (CalEEMod) version 2020.4.0 computer program for both the proposed project (see Chapter 2, "Project Description,") and the Trigeneration Alternative (see Chapter 5, "Alternatives"). As discussed in Tables 5-1 and 5-2 in the Draft EIR, emissions related to flaring are expected to be higher with the Trigeneration Alternative compared to the proposed project. The proposed project would only produce enough heat for use in heating the SRWTP. With the proposed project, once heat demands are met, biogas would be used to produce electricity. Therefore, no excess heat would be released into the atmosphere under the proposed project. Fuel cell technology under the Trigeneration Alternative does not rely on combustion and does not have hot exhaust gases for heat recovery and would, therefore, result in release of some amount of heat into the atmosphere, making this alternative less energy efficient. However, release of heat into the atmosphere is not considered an adverse physical environmental effect requiring analysis under CEQA. No revisions have been made to this EIR in response to Comment PH1-2.

4 LIST OF PREPARERS

SACRAMENTO REGIONAL COUNTY SANITATION DISTRICT (LEAD AGENCY)

Christoph Dobson ..... General Manager/District Engineer
Steven Nebozuk ..... Senior Civil Engineer
Bryan Young ..... Environmental Program Manager I
Steve Scott ..... Natural Resource Supervisor
Cristina Lupercio ..... Assistant Engineer
Anna Johnson ..... Senior Civil Engineer
Denisse Camacho Garcia ..... Assistant Civil Engineer
Guillermo Robles ..... Associate Civil Engineer

ASCENT (ENVIRONMENTAL CONSULTANT)

Gary Jakobs, AICP ..... Principal
Stephanie Rasmussen ..... Project Manager
Alta Cunningham ..... Architectural Historian
Linda Leeman ..... Senior Biologist
Hannah Weinberger ..... Biologist
Dimitri Antoniou ..... Senior Air Quality/GHG Specialist
Brenda Hom ..... Senior Air Quality/GHG Specialist
Matthew McFalls ..... Senior Air Quality/GHG Specialist
Sarah Henningsen ..... Senior Environmental Planner
Jim Merk ..... Editor
Brian Perry ..... Graphics Specialist
Phi Ngo ..... GIS Specialist
Riley Smith ..... Publication Specialist
Michele Mattei ..... Publication Specialist

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Print Form

Notice of Determination

Appendix D

To:

☒ Office of Planning and Research

U.S. Mail: P.O. Box 3044, Sacramento, CA 95812-3044

Street Address: 1400 Tenth St., Rm 113, Sacramento, CA 95814

☒ County Clerk
County of: Sacramento
Address: 600 8th Street
Sacramento, CA 95814

From:
Public Agency: Sacramento Regional County Sanitation District
Address: 8521 Laguna Station Road
Elk Grove, CA 95758
Contact: Steve Nebozuk
Phone: 916.876.6118

Lead Agency (if different from above):
Address:
Contact:
Phone:

SUBJECT: Filing of Notice of Determination in compliance with Section 21108 or 21152 of the Public Resources Code.

State Clearinghouse Number (if submitted to State Clearinghouse): 2021050080

Project Title: Regional San BioGeneration Facility Project

Project Applicant: Sacramento Regional County Sanitation District 916.876.6118

Project Location (include county): 8521 Laguna Station Road, Elk Grove, Sacramento County

Project Description:

The proposed project would include construction and operation of a new biogeneration facility including a cogeneration engine system to use biogas onsite to produce electricity and heat for the Sacramento Regional Wastewater Treatment Plant (SRWTP). The proposed project would include up to six internal combustion engine generators, fuel cells, engine exhaust treatment (oxidation catalyst and selective catalytic reduction), a biogas conditioning system (as part of the gas management system), a hot water

This is to advise that the Sacramento Regional County Sanitation District (☒ Lead Agency or ☐ Responsible Agency) has approved the above described project on 9/27/23 (date) and has made the following determinations regarding the above described project.

1. The project [☒ will ☐ will not] have a significant effect on the environment.
2. ☒ An Environmental Impact Report was prepared for this project pursuant to the provisions of CEQA.
   ☐ A Negative Declaration was prepared for this project pursuant to the provisions of CEQA.
3. Mitigation measures [☒ were ☐ were not] made a condition of the approval of the project.
4. A mitigation reporting or monitoring plan [☒ was ☐ was not] adopted for this project.
5. A statement of Overriding Considerations [☐ was ☒ was not] adopted for this project.
6. Findings [☒ were ☐ were not] made pursuant to the provisions of CEQA.

This is to certify that the final EIR with comments and responses and record of project approval, or the negative Declaration, is available to the General Public at:
8521 Laguna Station Road, Elk Grove, CA

Signature (Public Agency): Mike Hunt Title: Director, Policy and Planning

Date: 9/27/2023 Date Received for filing at OPR: _____

Authority cited: Sections 21083, Public Resources Code.
Reference Section 21000-21174, Public Resources Code.

Revised 2011

State of California - Department of Fish and Wildlife

2023 ENVIRONMENTAL DOCUMENT FILING FEE CASH RECEIPT

DFW 753.5a (REV. 01/01/23) Previously DFG 753.5a

Print | StartOver | Save

RECEIPT NUMBER:
34 — 09/28/2023 — 458

STATE CLEARINGHOUSE NUMBER *(If applicable)*
2021050080

SEE INSTRUCTIONS ON REVERSE. TYPE OR PRINT CLEARLY.

LEAD AGENCY	LEAD AGENCY EMAIL	DATE
Sacramento Regional County Sanitation District		09/28/2023

COUNTY/STATE AGENCY OF FILING	DOCUMENT NUMBER
Sacramento	2023-0530

PROJECT TITLE

Regional San BioGeneration Facility Project

PROJECT APPLICANT NAME	PROJECT APPLICANT EMAIL	PHONE NUMBER
Sacramento Regional County Sanitation District, Attn: Steve Nebozuk		(916)876-6118

PROJECT APPLICANT ADDRESS	CITY	STATE	ZIP CODE
8521 Laguna Station Road	Elk Grove	CA	95758

PROJECT APPLICANT *(Check appropriate box)*

☑ Local Public Agency ☐ School District ☐ Other Special District ☐ State Agency ☐ Private Entity

CHECK APPLICABLE FEES:

☑ Environmental Impact Report (EIR)	$3,839.25	$	3,839.25
☐ Mitigated/Negative Declaration (MND)(ND)	$2,764.00	$	0.00
☐ Certified Regulatory Program (CRP) document - payment due directly to CDFW	$1,305.25	$	0.00

☐ Exempt from fee
- ☐ Notice of Exemption (attach)
- ☐ CDFW No Effect Determination (attach)

☐ Fee previously paid (attach previously issued cash receipt copy)

☐ Water Right Application or Petition Fee (State Water Resources Control Board only)	$850.00	$	0.00
☑ County documentary handling fee		$	50.00
☐ Other		$	

PAYMENT METHOD:

☐ Cash ☐ Credit ☑ Check ☐ Other **TOTAL RECEIVED** $ 3,889.25

SIGNATURE	AGENCY OF FILING PRINTED NAME AND TITLE
X	Sacramento County Clerk/Recorder- Jenny Padierna -Deputy Clerk

ORIGINAL - PROJECT APPLICANT | COPY - CDFW/ASB | COPY - LEAD AGENCY | COPY - COUNTY CLERK | DFW 753.5a (Rev. 01/01/2023)