

Appendix C

Air Emission Report

**HELLMAN PROPERTIES, LLC
HELLMAN RANCH GAS PLANT PROJECT**

AIR EMISSION REPORT

NOVEMBER 2018

PREPARED FOR:

**HELLMAN PROPERTIES, LLC
SEAL BEACH, CALIFORNIA**

PREPARED BY:

**MRS ENVIRONMENTAL, INC.
SMITTLE & ASSOCIATES, LLC**

Table of Contents

1.0	Introduction.....	1
2.0	Gas Plant Construction Emissions.....	5
3.0	Gas Plant Operational Emissions.....	8

List of Table

Table 1	Major Gas Plant Equipment Specifications.....	1
Table 2	Estimated Onsite Construction Equipment.....	5
Table 3	Estimated Offsite Construction Equipment.....	6
Table 4	Peak Day Construction Emissions by Phase	7
Table 5	Total Construction Emission by Phase.....	7
Table 6	Peak Day Operational Criteria Pollutant Emissions.....	8
Table 7	Annual Operational Emissions	8
Table 8	Toxic Air Contaminants (TAC) Emissions	9
Table 9	Air Toxic Risk Estimates (Tier 1 Screening)	9

List of Figures

Figure 1	Regional Map	2
Figure 2	Project Area Map.....	3
Figure 3	Equipment Layout for the Proposed Gas Plant	4

List of Appendices

Appendix A – CalEEMod Output Files for Construction Emissions

Appendix B – Detailed Operation Emission Calculations

Appendix C – Air Toxic Tier 1 Screening Results

1.0 Introduction

Hellman Properties, LLC is proposing to construct and operate a one million standard cubic foot per day (MMscfd) gas plant at their Hellman Ranch Oil and Gas Production Facility (OGPF). This document provides a discussion of the potential air emissions associated with the proposed gas plant. The document covers both construction and operational emissions.

The existing Hellman Ranch OGPF site is located east of the San Gabriel River, and north of Pacific Coast Highway in the City of Seal Beach. Seal Beach is located in the northwest portion of the County of Orange. A "Regional Map" is provided as Figure 1. Hellman Properties, LLC owns and operates the OGPF on the Hellman Ranch in Seal Beach, California. A project area map is provided in Figure 2. This facility has been in operation since the 1930's and consists of over 60 wells, oil and gas pipelines, offices, storage facilities, crude oil truck loading facilities, and a crude oil tank farm.

The proposed gas plant has been designed with capacity to allow other users that currently process their gas at the Joint Venture facility to process their gas at the proposed gas plant. Existing pipelines are in place from the to deliver other gas to the proposed gas plant for processing. The layout of the major pieces of equipment for the proposed gas plant is provided in Figure 3 and the equipment specifications are listed in Table 1.

Table 1 Major Gas Plant Equipment Specifications

Equipment	Quantity	Dimensions	Power Use	Design Size
Gas Scrubbers	2	5' diameter x 24'H	NA	1,000 Mscfd
Main Gas Compressors	2 ^a	22'L x 8'W x 7'10"H	200 hp	1,000 Mscfd
Recycle Compressors	2 ^a	20'L x 8'W x 7'6"H	100 hp	420 Mscfd
Pressure Swing Absorption Unit	1	19'L x 7'6"W x 10'H	NA	1,000 Mscfd
Microturbines	5 ^b	32'L x 8'W x 13'H	NA	1,000 kW output
Absorption Chiller	1	21'6"L x 7'9"W x 8'4"H	7 hp	859 MBtu/hr
Air-Chilled Heat Exchangers	1	21'L x 12"W x 13'H	20 hp	859 MBtu/hr
Main Gas Compressor Discharge Heat Exchangers	2 ^a	Included with Main Gas Compressor	NA	657.6 MBtu/hr
Recycle Gas Compressor Discharge Heat Exchangers	2 ^a	Included with Recycle Gas Compressor	NA	201.4 MBtu/hr
Switch Gear	1	15'L x 3'W x 10'H	NA	NA
Transformers	2	4'L x 3'6"W x 7'H	NA	1,500 KVA
Sales Gas Compressor ^c	1	10'L x 6'W x 5'H	100 hp	673 Mscfd

a. One is a backup for use during downtime on the main unit.

b. Each microturbine unit has a design capacity of 200 kW.

c. Sales gas compressor would be located offsite at the SoCal Gas injection point (see Figure 2).

MBtu/hr – thousand british thermal units per hour.

Mscfd – million standard cubic feet per day.

KVA– kilo-volt-ampere

kW– kilowatts

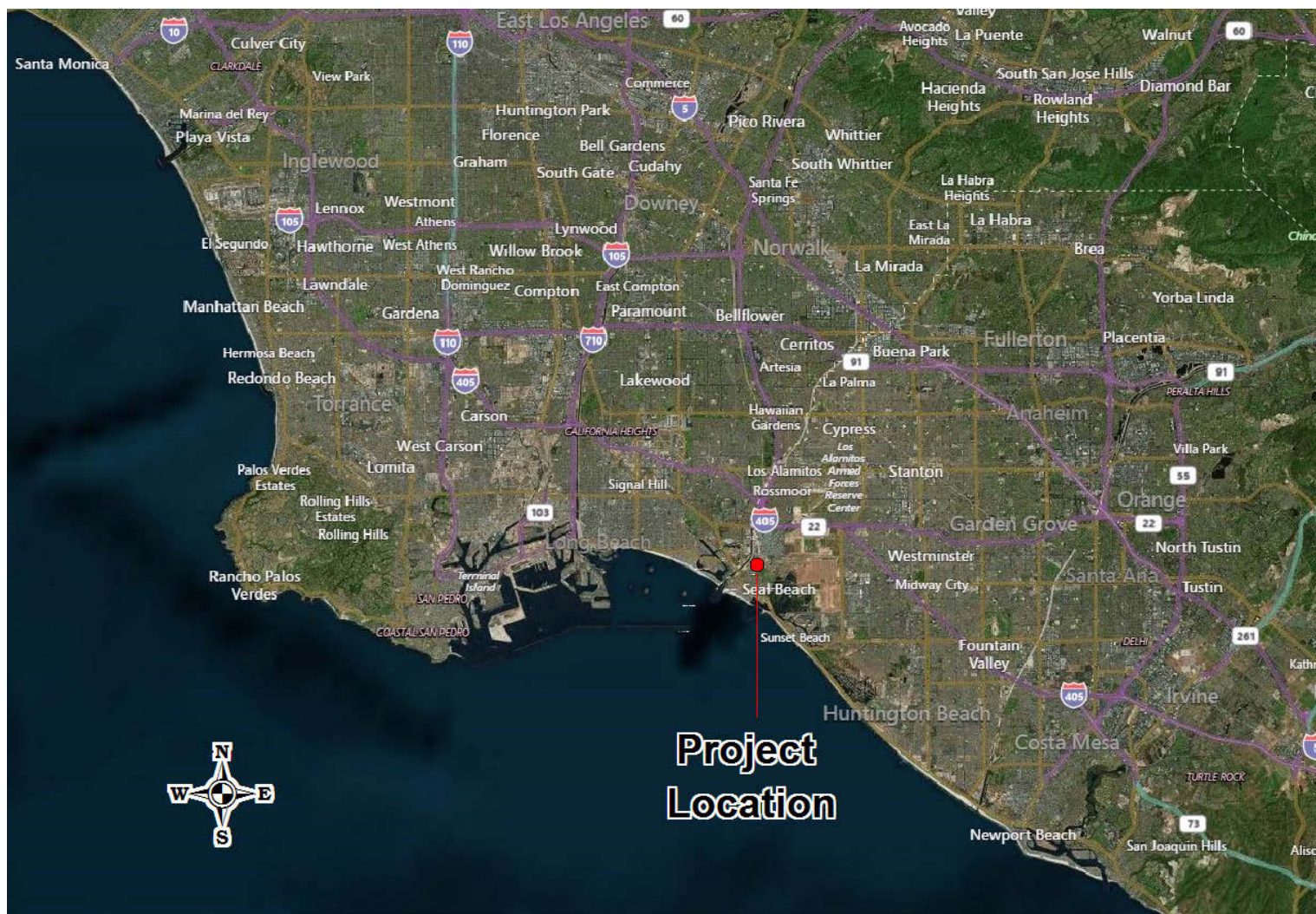


Figure 2 Project Area Map

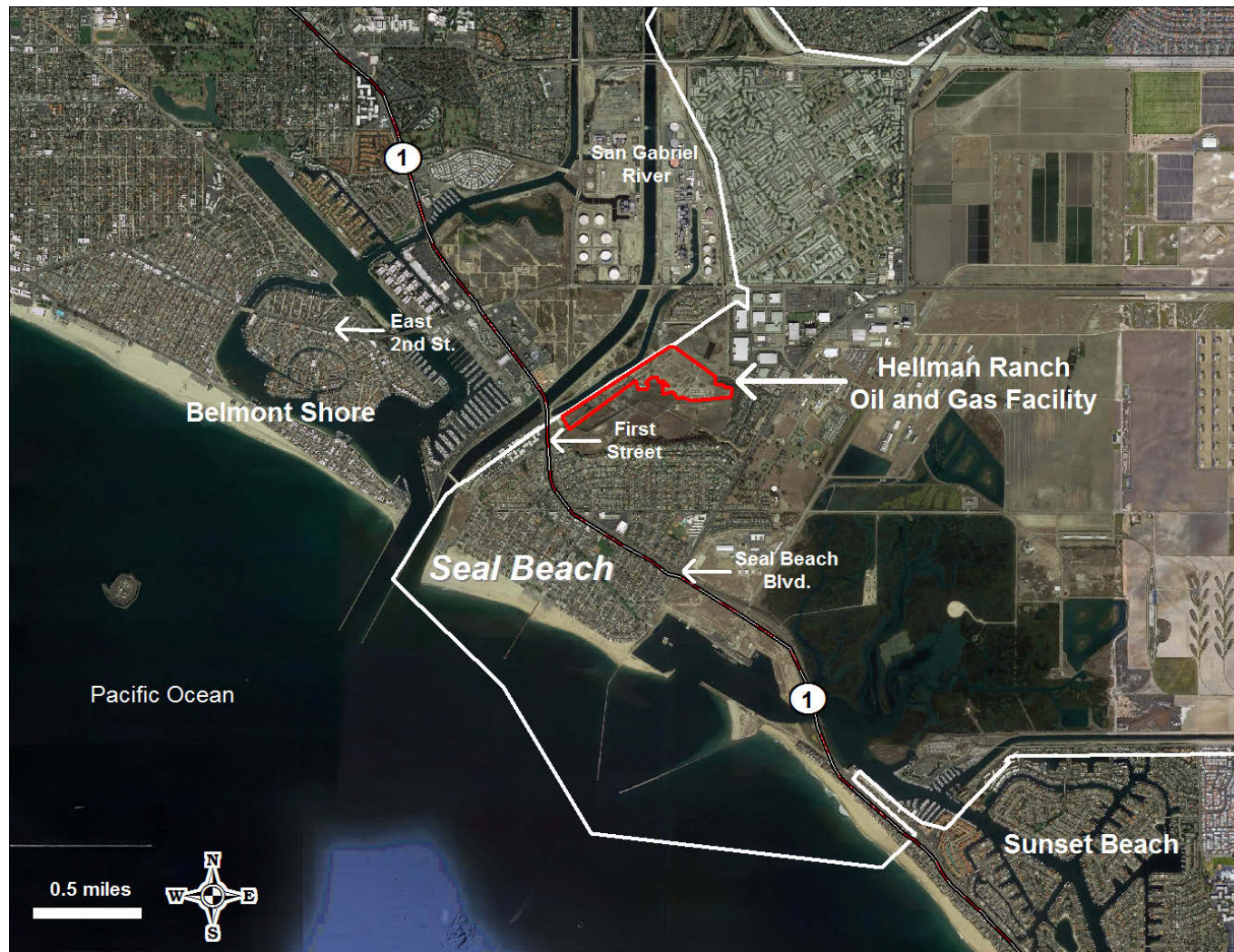


Figure 3 Equipment Layout for the Proposed Gas Plant



2.0 Gas Plant Construction Emissions

Construction of the proposed gas plant would take about six to eight months to complete and would involve several phases that include (1) Site Preparation and Grading; (2) Foundation Installation; (3) Equipment Installation; and (4) Paving and Finish Work.

Table 2 provides a list of estimated onsite equipment that would be needed for each phase of construction. Table 3 provides a list of estimated offsite equipment that would be needed for each phase of construction.

Table 2 Estimated Onsite Construction Equipment

Phase/Equipment	Number	Horsepower	Duration (working days)
Site Preparation/Grading			
Dozer, Cat D6	1	207	60
Grader, Cat14	1	259	60
Excavator, 4.0 cy	1	225	60
Tractor/Loader/Backhoe, 1.5-2.0 cy	2	100	60
Wheel Loader, 3.4-4.0 cy	1	200	60
Truck, 10 cy	2	210	60
Compactor, Cat815	1	235	60
Water Truck, 4-5k Gallons	1	175	60
Concrete Intertrial Saw, ,5-7" wet cut	2	35	60
Foundation Installation			
Tractor/Loader/Backhoe, 1.5-2.0 CY	1	100	20
Bore/Drill Rig, 24-36" Auger	1	68	20
Water Pump, 100-500 gpm	2	50	20
Concrete Pump	1	150	15
Concrete Vibrator, heavy duty	2	6	15
Water Truck, 4-5k Gallons	1	175	20
Equipment Installation			
Crane, 20-50 ton, hydraulic	1	150	10
Forklift, 8-9 K# teleboom	2	73	60
Aerial Lift, 30'	2	60	40
Tractor/Loader/Backhoe, 1.5-2.0 CY	2	100	60
Generator Set, 6-10kW, diesel	4	18	75
Welding Units, 500-800 AMP, diesel	4	42	75
Air Compressor, 100-200 CFM, diesel	3	50	75
Paving and Finish Work			
Paver	1	130	10
Compactor, 24-36" Roller Walk behind	1	10	10
Tractor/Loader/Backhoe, 1.5-2.0 CY	1	100	10

Table 3 Estimated Offsite Construction Equipment

Phase/Equipment	Vehicle	Vehicle Type	Quantity (Round Trips)	
			Peak Day	Total
Site Preparation/Grading				
Equipment Delivery/Removal	Truck	T7 Tractor Con.	10	20
Soil and Other Base Material	Truck	T7 Tractor Con.	35	360
Other Supplies	Truck	T7 Tractor Con.	8	40
Other Deliveries	Truck	T7 Tractor Con.	3	40
Workers	Auto/Pickup	LDA	22	1,320
Foundation Installation				
Concrete Deliveries	Truck	T7 Tractor Con.	16	30
Other Supplies	Truck	T7 Tractor Con.	3	25
Other Deliveries	Truck	T7 Tractor Con.	3	25
Workers	Auto/Pickup	LDA	14	250
Equipment Installation				
Equipment Delivery/Removal	Truck	T7 Tractor Con.	10	40
Other Supplies	Truck	T7 Tractor Con.	3	50
Other Deliveries	Truck	T7 Tractor Con.	5	70
Workers	Auto/Pickup	LDA	25	1,850
Paving and Finish Work				
Equipment Delivery/Removal	Truck	T7 Tractor Con.	3	6
Other Supplies	Truck	T7 Tractor Con.	3	20
Other Deliveries	Truck	T7 Tractor Con.	3	20
Workers	Auto/Pickup	LDA	8	80

Due to the clay rich composition of the existing soils, the pad area would need to be excavated down and engineered material would need to be brought into the site to construct the final pad. This work would require about 2,305 cubic yards of cut and 3,555 cubic yards of fill. The site would be excavated down about four feet and the soil would be removed. The excavated depth would be about minus one-foot mean sea level. The excavated material would spread out in various soil recovery areas that were also used for cut removed during the tank farm replacement project. The location of these soil recovery areas is shown in Figure 5. Any organic rich soil would be stockpiled separately for future landscaping use.

CalEEMod was used to estimate the construction emission for the project. The CalEEMod output files are provided in Appendix A. Table 4 provides a summary of the peak day construction emissions for each phase. Table 5 provides to the total construction emissions by phase. None of the construction emissions would exceed the South Coast Air Quality Management District (SCAQMD) CEQA construction thresholds, or the localized thresholds.

Table 4 Peak Day Construction Emissions by Phase

Construction Phase	Peak Day Emissions, lbs/day					
	VOC	NO _x	CO	SO ₂	PM ₁₀	PM _{2.5}
Site Preparation/Grading	3.780	42.146	21.237	0.068	2.273	1.606
Foundation Installation	2.047	18.396	16.981	0.036	1.130	0.837
Equipment Installation	5.036	32.327	29.139	0.051	2.221	1.791
Paving and Finish Work	0.765	7.430	6.236	0.013	0.513	0.354
Max Peak Day	5.036	42.146	29.139	0.068	2.273	1.791
SCAQMD CEQA Thresholds	75	100	550	150	150	55
Exceed Threshold?	No	No	No	No	No	No
Localized Thresholds (lbs/day)¹		93	738		13	5
Exceed Localized Thresholds?		No	No		No	No

1. Localized Thresholds based upon SCAQMD Lookup Tables, for North Coastal Orange County, 1-acre site, 50 meters to property boundary.

Construction emission estimates calculated using CalEEMod Version: CalEEMod.2016.3.2.

See Appendix A for CalEEMod output files.

Table 5 Total Construction Emission by Phase

Construction Phase	Total Emissions, Tons/yr						GHG Emissions, MT/Yr	
	VOC	NO _x	CO	SO ₂	PM ₁₀	PM _{2.5}	CO ₂	CO _{2e}
Site Preparation/Grading	0.113	1.268	0.636	0.002	0.021	0.047	186.01	187.21
Foundation Installation	0.020	0.185	0.169	0.000	0.004	0.008	32.23	32.34
Equipment Installation	0.188	1.215	1.093	0.002	0.018	0.065	159.30	160.05
Paving and Finish Work	0.004	0.037	0.031	0.000	0.001	0.002	5.91	5.94
Total Tons	0.325	2.705	1.929	0.004	0.044	0.121	383.45	385.54

Construction emission estimates calculated using CalEEMod Version: CalEEMod.2016.3.2.

See Appendix A for CalEEMod output files.

3.0 Gas Plant Operational Emissions

The sources of operational emissions would be combustion of gas in the microturbine and fugitive hydrocarbon emissions from some of the equipment. Table 6 provides a summary of the peak day criteria pollutant emissions associated with the operation of the facility and includes both onsite and offsite mobile sources.

Table 6 Peak Day Operational Criteria Pollutant Emissions

Source	Peak Day Emissions, lbs/day					
	VOC	NO _x	CO	SO ₂	PM ₁₀	PM _{2.5}
Microturbine	2.400	9.600	26.400	0.089	1.284	1.284
Fugitive Emissions	4.001	0.000	0.000	0.000	0.000	0.000
Offsite Mobile Sources	0.006	0.283	0.095	0.000	0.002	0.002
Totals	6.406	9.883	26.495	0.089	1.286	1.286
SCAQMD CEQA Thresholds	55	550	55	150	150	55
Exceed Threshold?	No	No	No	No	No	No
Localized Thresholds (lbs/day)¹		738	93		4	2
Exceed Localized Thresholds?		No	No		No	No

1. Localized Thresholds based upon SCAQMD Lookup Tables, for North Coastal Orange County, 1-acre site, 50 meters to property boundary.

See Appendix B for detailed emission calculations.

None of the operational emissions would exceed the SCAQMD CEQA operational thresholds, or the localized thresholds.

Table 7 provides the annual operational emissions for the gas plant and includes onsite and mobile offsite sources. Table 7 includes both criteria and greenhouse gas (GHG) emissions. The proposed project would not exceed the SCAQMD GHG annual threshold.

Table 7 Annual Operational Emissions

Source	Total Emissions, Tons/yr						GHG Emissions, MT/Yr	
	VOC	NO _x	CO	SO ₂	PM ₁₀	PM _{2.5}	CO ₂	CO _{2e}
Microturbine	0.438	1.752	4.818	0.016	0.234	0.234	5,242.86	5,248.27
Fugitive Emissions	0.730	0.000	0.000	0.000	0.000	0.000		57.95
Offsite Mobile Sources	0.000	0.007	0.003	0.000	0.000	0.000	3.21	3.24
Construction GHG Amortized over 30 Years								12.85
Totals	1.1683	1.7590	4.8215	0.0163	0.2344	0.2344	5,246.07	5,322.32
SCAQMD CEQA Threshold								10,000
Exceed Threshold?								No

See Appendix B for detailed emission calculations.

The microturbine and fugitive emissions contain air toxic components. The estimated daily air toxic emissions from operation are provided in Table 8.

Table 8 Toxic Air Contaminants (TAC) Emissions

Microturbine			
TAC Pollutant	Emission Factors (lbs/mmscf) ¹		Max Emission Rate (lbs/hr) ¹
Acetaldehyde	4.30E-03		3.42E-05
Acrolein	2.70E-03		2.15E-05
Ammonia	3.20E+00		2.54E-02
Benzene	8.00E-03		6.36E-05
Ethyl Benzene	9.50E-03		7.55E-05
Formaldehyde	1.70E-02		1.35E-04
n-Hexane	6.30E-03		5.01E-05
Polycyclic Aromatic Hydrocarbon (PAH)	1.00E-04		7.95E-07
Naphthalene	3.00E-04		2.39E-06
Toluene	3.66E-02		2.91E-04
Xylenes (Mixed Isomers)	2.72E-02		2.16E-04
Fugitives			
TAC Pollutant	Emission Factor (lbs/lb VOC) ²	Fugitive Emissions (lbs VOC/hr) ³	Emission Rate (lbs/hr)
Benzene	1.00E-03	1.67e-01	1.67e-04

1. Emission Factors and max emission rate from SCAQMD risktool-(v1-1)-r102617---aqmd-procedure-8-1.xlsm for boilers.
2. Emission Factor from CARB organic profile data in orgprofile19oct16.xlsx for profile #s 756, 757, and 758.

Air toxic emission present potential health risk to nearby residences and other receptors such as commercial development. The SCAQMD has developed several tools for evaluating the health risk associated with air toxic emissions. The SCAQMD risktool was used to estimate the level of risk associated with the air toxic emissions. The analysis was done using the Tier 1 screen method, which is the most conservative. The Tier 1 screening analysis results are presented in Table 9. The results show that the risk levels would be below the application screening index (ASI) for both cancer/chronic and acute. Levels below an ASI of one assures the project would not exceed a cancer risk of one in a million, and a chronic hazard index (CHI), 8-hour Chronic Hazard Index (HIC8), nor the total Acute Hazard Index (HIA) of one.

Table 9 Air Toxic Risk Estimates (Tier 1 Screening)

Item	Cancer/Chronic ASI¹	Acute ASI¹
Microturbine	2.91E-01	1.55E-02
Fugitives	3.28E-01	4.47E-03
Totals	6.19E-01	2.00E-02
SCAQMD Threshold	1	1
Exceeds Threshold?	No	No

1. ASI=Application Screening Index

Risk number calculated from SCAQMD risktool-(v1-1)-r102617---aqmd-procedure-8-1.xlsm for boiler.

See Appendix C for risktool output files.

Appendix A – CalEEMod Output Files for Construction Emissions

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1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	16.12	1000sqft	0.37	16,117.00	0
Other Asphalt Surfaces	0.37	Acre	0.37	16,117.20	0

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	31
Climate Zone	8			Operational Year	2020
Utility Company	Southern California Edison				
CO2 Intensity (lb/MW hr)	702.44	CH4 Intensity (lb/MW hr)	0.029	N2O Intensity (lb/MW hr)	0.006

1.3 User Entered Comments & Non-Default Data

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Project Characteristics -

Land Use -

Construction Phase - Site Preparation Phase includes grading activities.

Off-road Equipment - Equipment data per application Table 2.

Off-road Equipment - Equipment data per application Table 2.

Off-road Equipment - Equipment data per application Table 2.

Off-road Equipment - Equipment data per application Table 2.

Trips and VMT - Vehicle trips from application Table3

Grading - Total acres graded = gas plant pad size + soil disturbed areas to account for distribution of cut over 6.8 acres per soil relocation map.

Total material imported based on 8 cubic yards per truck and 360 truck trips.

Vehicle Trips - Operational trip rates based on 3 maintenance visits and 1 delivery per week

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_Nonresidential_Exterior	8059	0
tblAreaCoating	Area_Nonresidential_Interior	24176	0
tblAreaCoating	Area_Parking	967	0
tblConstructionPhase	NumDays	100.00	20.00
tblConstructionPhase	NumDays	100.00	75.00
tblConstructionPhase	NumDays	5.00	10.00
tblConstructionPhase	NumDays	1.00	60.00
tblFleetMix	HHD	0.03	0.00
tblFleetMix	LDA	0.55	0.00
tblFleetMix	LDT1	0.04	0.00
tblFleetMix	LDT2	0.20	0.00
tblFleetMix	LHD1	0.02	0.00
tblFleetMix	LHD2	5.8620e-003	0.00
tblFleetMix	MCY	4.7770e-003	0.00

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tblFleetMix	MDV	0.12	0.00
tblFleetMix	MH	9.5600e-004	0.00
tblFleetMix	MHD	0.02	0.00
tblFleetMix	OBUS	2.0370e-003	0.00
tblFleetMix	SBUS	7.0500e-004	0.00
tblFleetMix	UBUS	1.9440e-003	0.00
tblGrading	AcresOfGrading	60.00	7.17
tblGrading	MaterialImported	0.00	2,880.00
tblLandUse	LandUseSquareFeet	16,120.00	16,117.00
tblOffRoadEquipment	HorsePower	231.00	150.00
tblOffRoadEquipment	HorsePower	89.00	73.00
tblOffRoadEquipment	HorsePower	187.00	259.00
tblOffRoadEquipment	HorsePower	97.00	100.00
tblOffRoadEquipment	HorsePower	97.00	100.00
tblOffRoadEquipment	HorsePower	97.00	100.00
tblOffRoadEquipment	HorsePower	97.00	100.00
tblOffRoadEquipment	HorsePower	63.00	60.00
tblOffRoadEquipment	HorsePower	78.00	50.00
tblOffRoadEquipment	HorsePower	221.00	68.00
tblOffRoadEquipment	HorsePower	212.00	207.00
tblOffRoadEquipment	HorsePower	158.00	225.00
tblOffRoadEquipment	HorsePower	84.00	18.00
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tblOffRoadEquipment	HorsePower	402.00	210.00
tblOffRoadEquipment	HorsePower	402.00	175.00
tblOffRoadEquipment	HorsePower	88.00	35.00
tblOffRoadEquipment	HorsePower	8.00	235.00

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tblOffRoadEquipment	HorsePower	8.00	6.00
tblOffRoadEquipment	HorsePower	8.00	10.00
tblOffRoadEquipment	HorsePower	84.00	50.00
tblOffRoadEquipment	HorsePower	84.00	150.00
tblOffRoadEquipment	HorsePower	203.00	200.00
tblOffRoadEquipment	HorsePower	46.00	42.00
tblOffRoadEquipment	LoadFactor	0.37	0.29
tblOffRoadEquipment	LoadFactor	0.50	0.20
tblOffRoadEquipment	LoadFactor	0.43	0.41
tblOffRoadEquipment	LoadFactor	0.34	0.37
tblOffRoadEquipment	LoadFactor	0.43	0.38
tblOffRoadEquipment	LoadFactor	0.74	0.37
tblOffRoadEquipment	LoadFactor	0.36	0.41
tblOffRoadEquipment	OffRoadEquipmentType	Off-Highway Trucks	Dumpers/Tenders
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	PhaseName		Site Preparation
tblOffRoadEquipment	PhaseName		Site Preparation
tblOffRoadEquipment	PhaseName		Site Preparation
tblOffRoadEquipment	PhaseName		Site Preparation
tblOffRoadEquipment	PhaseName		Site Preparation

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tblOffRoadEquipment	PhaseName		Site Preparation
tblOffRoadEquipment	PhaseName		Site Preparation
tblOffRoadEquipment	UsageHours	4.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblSolidWaste	SolidWasteGenerationRate	19.99	0.00
tblTripsAndVMT	VendorTripNumber	0.00	21.00
tblTripsAndVMT	VendorTripNumber	5.00	22.00
tblTripsAndVMT	VendorTripNumber	5.00	18.00
tblTripsAndVMT	VendorTripNumber	0.00	9.00
tblTripsAndVMT	VendorVehicleClass	HDT_Mix	HHDT
tblTripsAndVMT	VendorVehicleClass	HDT_Mix	HHDT
tblTripsAndVMT	VendorVehicleClass	HDT_Mix	HHDT
tblTripsAndVMT	VendorVehicleClass	HDT_Mix	HHDT
tblTripsAndVMT	WorkerTripNumber	28.00	22.00
tblTripsAndVMT	WorkerTripNumber	14.00	25.00
tblVehicleTrips	ST_TR	1.32	0.00
tblVehicleTrips	SU_TR	0.68	0.00
tblVehicleTrips	WD_TR	6.97	4.00
tblWater	IndoorWaterUseRate	3,727,750.00	0.00

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2.0 Emissions Summary**2.1 Overall Construction (Maximum Daily Emission)****Unmitigated Construction**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	5.0362	42.1462	29.1393	0.0676	0.7134	1.7200	2.2724	0.1709	1.6571	1.7910	0.0000	6,805.1348	6,805.1348	1.7573	0.0000	6,849.0666
Maximum	5.0362	42.1462	29.1393	0.0676	0.7134	1.7200	2.2724	0.1709	1.6571	1.7910	0.0000	6,805.1348	6,805.1348	1.7573	0.0000	6,849.0666

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	5.0362	42.1462	29.1393	0.0676	0.7134	1.7200	2.2724	0.1709	1.6571	1.7910	0.0000	6,805.1348	6,805.1348	1.7573	0.0000	6,849.0666
Maximum	5.0362	42.1462	29.1393	0.0676	0.7134	1.7200	2.2724	0.1709	1.6571	1.7910	0.0000	6,805.1348	6,805.1348	1.7573	0.0000	6,849.0666

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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3.0 Construction Detail**Construction Phase**

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	1/7/2019	3/29/2019	5	60	
2	Foundation Installation	Building Construction	3/30/2019	4/26/2019	5	20	
3	Equipment Installation	Building Construction	4/27/2019	8/9/2019	5	75	
4	Paving	Paving	8/12/2019	8/23/2019	5	10	

Acres of Grading (Site Preparation Phase): 7.17**Acres of Grading (Grading Phase): 0****Acres of Paving: 0.37****Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)****OffRoad Equipment**

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Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Crawler Tractors	1	8.00	207	0.41
Site Preparation	Excavators	1	8.00	225	0.38
Site Preparation	Graders	1	8.00	259	0.41
Site Preparation	Dumpers/Tenders	1	8.00	175	0.38
Site Preparation	Off-Highway Trucks	2	8.00	210	0.38
Site Preparation	Other General Industrial Equipment	1	8.00	35	0.37
Site Preparation	Plate Compactors	1	8.00	235	0.43
Site Preparation	Rubber Tired Loaders	1	8.00	200	0.41
Site Preparation	Tractors/Loaders/Backhoes	2	8.00	100	0.37
Foundation Installation	Bore/Drill Rigs	1	8.00	68	0.20
Foundation Installation	Off-Highway Trucks	1	8.00	175	0.38
Foundation Installation	Plate Compactors	2	8.00	6	0.43
Foundation Installation	Pumps	2	8.00	50	0.37
Foundation Installation	Pumps	1	8.00	150	0.74
Foundation Installation	Tractors/Loaders/Backhoes	1	8.00	100	0.29
Equipment Installation	Aerial Lifts	2	8.00	60	0.31
Equipment Installation	Air Compressors	3	8.00	50	0.48
Equipment Installation	Cranes	1	8.00	150	0.29
Equipment Installation	Forklifts	2	8.00	73	0.20
Equipment Installation	Generator Sets	4	8.00	18	0.74
Equipment Installation	Tractors/Loaders/Backhoes	2	8.00	100	0.37
Equipment Installation	Welders	4	8.00	42	0.45
Paving	Pavers	1	8.00	130	0.42
Paving	Plate Compactors	1	8.00	10	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	100	0.37

Trips and VMT

Hellman Gas Plant Project

Hellman - South Coast AQMD Air District, Winter

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	11	22.00	21.00	360.00	19.80	7.90	20.00	LD_Mix	HHDT	HHDT
Foundation Installation	8	14.00	22.00	0.00	19.80	7.90	20.00	LD_Mix	HHDT	HHDT
Equipment Installation	18	25.00	18.00	0.00	19.80	7.90	20.00	LD_Mix	HHDT	HHDT
Paving	3	8.00	9.00	0.00	19.80	7.90	20.00	LD_Mix	HHDT	HHDT

3.1 Mitigation Measures Construction**3.2 Site Preparation - 2019****Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1322	0.0000	0.1322	0.0145	0.0000	0.0145			0.0000			0.0000
Off-Road	3.4822	36.5844	18.9999	0.0521		1.5397	1.5397		1.4165	1.4165		5,157.595 2	5,157.595 2	1.6318		5,198.390 4
Total	3.4822	36.5844	18.9999	0.0521	0.1322	1.5397	1.6719	0.0145	1.4165	1.4310		5,157.595 2	5,157.595 2	1.6318		5,198.390 4

Hellman - South Coast AQMD Air District, Winter

3.2 Site Preparation - 2019**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0508	1.7703	0.3617	4.6200e-003	0.1049	6.6000e-003	0.1115	0.0287	6.3200e-003	0.0351		498.8700	498.8700	0.0362		499.7757
Vendor	0.0976	3.6836	0.7133	7.6300e-003	0.1452	0.0102	0.1554	0.0398	9.7400e-003	0.0496		823.0989	823.0989	0.0792		825.0794
Worker	0.1494	0.1079	1.1616	3.2700e-003	0.3312	2.5300e-003	0.3337	0.0878	2.3300e-003	0.0901		325.5708	325.5708	0.0100		325.8212
Total	0.2978	5.5618	2.2367	0.0155	0.5812	0.0193	0.6005	0.1564	0.0184	0.1748		1,647.5396	1,647.5396	0.1255		1,650.6762

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1322	0.0000	0.1322	0.0145	0.0000	0.0145			0.0000			0.0000
Off-Road	3.4822	36.5844	18.9999	0.0521		1.5397	1.5397		1.4165	1.4165	0.0000	5,157.5952	5,157.5952	1.6318		5,198.3904
Total	3.4822	36.5844	18.9999	0.0521	0.1322	1.5397	1.6719	0.0145	1.4165	1.4310	0.0000	5,157.5952	5,157.5952	1.6318		5,198.3904

Hellman - South Coast AQMD Air District, Winter

3.2 Site Preparation - 2019**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0508	1.7703	0.3617	4.6200e-003	0.1049	6.6000e-003	0.1115	0.0287	6.3200e-003	0.0351		498.8700	498.8700	0.0362		499.7757
Vendor	0.0976	3.6836	0.7133	7.6300e-003	0.1452	0.0102	0.1554	0.0398	9.7400e-003	0.0496		823.0989	823.0989	0.0792		825.0794
Worker	0.1494	0.1079	1.1616	3.2700e-003	0.3312	2.5300e-003	0.3337	0.0878	2.3300e-003	0.0901		325.5708	325.5708	0.0100		325.8212
Total	0.2978	5.5618	2.2367	0.0155	0.5812	0.0193	0.6005	0.1564	0.0184	0.1748		1,647.5396	1,647.5396	0.1255		1,650.6762

3.3 Foundation Installation - 2019**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.8496	14.4682	15.4943	0.0264		0.7553	0.7553		0.7278	0.7278		2,460.3574	2,460.3574	0.4006		2,470.3712
Total	1.8496	14.4682	15.4943	0.0264		0.7553	0.7553		0.7278	0.7278		2,460.3574	2,460.3574	0.4006		2,470.3712

Hellman - South Coast AQMD Air District, Winter

3.3 Foundation Installation - 2019**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1023	3.8591	0.7473	7.9900e-003	0.1521	0.0107	0.1628	0.0417	0.0102	0.0519		862.2941	862.2941	0.0830		864.3688
Worker	0.0951	0.0687	0.7392	2.0800e-003	0.2107	1.6100e-003	0.2123	0.0559	1.4800e-003	0.0574		207.1814	207.1814	6.3700e-003		207.3407
Total	0.1973	3.9277	1.4865	0.0101	0.3629	0.0123	0.3752	0.0976	0.0117	0.1093		1,069.4755	1,069.4755	0.0894		1,071.7096

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.8496	14.4682	15.4943	0.0264		0.7553	0.7553		0.7278	0.7278	0.0000	2,460.3574	2,460.3574	0.4006		2,470.3712
Total	1.8496	14.4682	15.4943	0.0264		0.7553	0.7553		0.7278	0.7278	0.0000	2,460.3574	2,460.3574	0.4006		2,470.3712

Hellman - South Coast AQMD Air District, Winter

3.3 Foundation Installation - 2019**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1023	3.8591	0.7473	7.9900e-003	0.1521	0.0107	0.1628	0.0417	0.0102	0.0519		862.2941	862.2941	0.0830		864.3688
Worker	0.0951	0.0687	0.7392	2.0800e-003	0.2107	1.6100e-003	0.2123	0.0559	1.4800e-003	0.0574		207.1814	207.1814	6.3700e-003		207.3407
Total	0.1973	3.9277	1.4865	0.0101	0.3629	0.0123	0.3752	0.0976	0.0117	0.1093		1,069.4755	1,069.4755	0.0894		1,071.7096

3.4 Equipment Installation - 2019**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	4.7828	29.0468	27.2078	0.0407		1.7084	1.7084		1.6461	1.6461		3,584.6475	3,584.6475	0.8141		3,604.9990
Total	4.7828	29.0468	27.2078	0.0407		1.7084	1.7084		1.6461	1.6461		3,584.6475	3,584.6475	0.8141		3,604.9990

Hellman - South Coast AQMD Air District, Winter

3.4 Equipment Installation - 2019**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0837	3.1574	0.6114	6.5400e-003	0.1245	8.7300e-003	0.1332	0.0341	8.3500e-003	0.0425		705.5133	705.5133	0.0679		707.2109
Worker	0.1698	0.1226	1.3200	3.7100e-003	0.3763	2.8700e-003	0.3792	0.0998	2.6500e-003	0.1024		369.9668	369.9668	0.0114		370.2513
Total	0.2535	3.2800	1.9314	0.0103	0.5008	0.0116	0.5124	0.1339	0.0110	0.1449		1,075.480 1	1,075.480 1	0.0793		1,077.462 2

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	4.7828	29.0468	27.2078	0.0407		1.7084	1.7084		1.6461	1.6461	0.0000	3,584.647 5	3,584.647 5	0.8141		3,604.999 0
Total	4.7828	29.0468	27.2078	0.0407		1.7084	1.7084		1.6461	1.6461	0.0000	3,584.647 5	3,584.647 5	0.8141		3,604.999 0

Hellman - South Coast AQMD Air District, Winter

3.4 Equipment Installation - 2019**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0837	3.1574	0.6114	6.5400e-003	0.1245	8.7300e-003	0.1332	0.0341	8.3500e-003	0.0425		705.5133	705.5133	0.0679		707.2109
Worker	0.1698	0.1226	1.3200	3.7100e-003	0.3763	2.8700e-003	0.3792	0.0998	2.6500e-003	0.1024		369.9668	369.9668	0.0114		370.2513
Total	0.2535	3.2800	1.9314	0.0103	0.5008	0.0116	0.5124	0.1339	0.0110	0.1449		1,075.480 1	1,075.480 1	0.0793		1,077.462 2

3.5 Paving - 2019**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5720	5.8119	5.5081	8.4400e-003		0.3247	0.3247		0.2996	0.2996		820.6394	820.6394	0.2516		826.9280
Paving	0.0969					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	0.6690	5.8119	5.5081	8.4400e-003		0.3247	0.3247		0.2996	0.2996		820.6394	820.6394	0.2516		826.9280

Hellman - South Coast AQMD Air District, Winter

3.5 Paving - 2019**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0418	1.5787	0.3057	3.2700e-003	0.0622	4.3700e-003	0.0666	0.0171	4.1800e-003	0.0212		352.7567	352.7567	0.0340		353.6054
Worker	0.0543	0.0392	0.4224	1.1900e-003	0.1204	9.2000e-004	0.1213	0.0319	8.5000e-004	0.0328		118.3894	118.3894	3.6400e-003		118.4804
Total	0.0962	1.6179	0.7281	4.4600e-003	0.1827	5.2900e-003	0.1879	0.0490	5.0300e-003	0.0540		471.1460	471.1460	0.0376		472.0859

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5720	5.8119	5.5081	8.4400e-003		0.3247	0.3247		0.2996	0.2996	0.0000	820.6394	820.6394	0.2516		826.9280
Paving	0.0969					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	0.6690	5.8119	5.5081	8.4400e-003		0.3247	0.3247		0.2996	0.2996	0.0000	820.6394	820.6394	0.2516		826.9280

Hellman - South Coast AQMD Air District, Winter

3.5 Paving - 2019**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0418	1.5787	0.3057	3.2700e-003	0.0622	4.3700e-003	0.0666	0.0171	4.1800e-003	0.0212		352.7567	352.7567	0.0340		353.6054
Worker	0.0543	0.0392	0.4224	1.1900e-003	0.1204	9.2000e-004	0.1213	0.0319	8.5000e-004	0.0328		118.3894	118.3894	3.6400e-003		118.4804
Total	0.0962	1.6179	0.7281	4.4600e-003	0.1827	5.2900e-003	0.1879	0.0490	5.0300e-003	0.0540		471.1460	471.1460	0.0376		472.0859

Hellman - South Coast AQMD Air District, Annual

Hellman

South Coast AQMD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	16.12	1000sqft	0.37	16,117.00	0
Other Asphalt Surfaces	0.37	Acre	0.37	16,117.20	0

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	31
Climate Zone	8			Operational Year	2020
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)	0.006

1.3 User Entered Comments & Non-Default Data

Hellman - South Coast AQMD Air District, Annual

Project Characteristics -

Land Use -

Construction Phase - Site Preparation Phase includes grading activities.

Off-road Equipment - Equipment data per application Table 2.

Off-road Equipment - Equipment data per application Table 2.

Off-road Equipment - Equipment data per application Table 2.

Off-road Equipment - Equipment data per application Table 2.

Trips and VMT - Vehicle trips from application Table3

Grading - Total acres graded = gas plant pad size + soil disturbed areas to account for distribution of cut over 6.8 acres per soil relocation map.

Total material imported based on 8 cubic yards per truck and 360 truck trips.

Vehicle Trips - Operational trip rates based on 3 maintenance visits and 1 delivery per week

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_Nonresidential_Exterior	8059	0
tblAreaCoating	Area_Nonresidential_Interior	24176	0
tblAreaCoating	Area_Parking	967	0
tblConstructionPhase	NumDays	100.00	20.00
tblConstructionPhase	NumDays	100.00	75.00
tblConstructionPhase	NumDays	5.00	10.00
tblConstructionPhase	NumDays	1.00	60.00
tblFleetMix	HHD	0.03	0.00
tblFleetMix	LDA	0.55	0.00
tblFleetMix	LDT1	0.04	0.00
tblFleetMix	LDT2	0.20	0.00
tblFleetMix	LHD1	0.02	0.00
tblFleetMix	LHD2	5.8620e-003	0.00
tblFleetMix	MCY	4.7770e-003	0.00

Hellman - South Coast AQMD Air District, Annual

tblFleetMix	MDV	0.12	0.00
tblFleetMix	MH	9.5600e-004	0.00
tblFleetMix	MHD	0.02	0.00
tblFleetMix	OBUS	2.0370e-003	0.00
tblFleetMix	SBUS	7.0500e-004	0.00
tblFleetMix	UBUS	1.9440e-003	0.00
tblGrading	AcresOfGrading	60.00	7.17
tblGrading	MaterialImported	0.00	2,880.00
tblLandUse	LandUseSquareFeet	16,120.00	16,117.00
tblOffRoadEquipment	HorsePower	231.00	150.00
tblOffRoadEquipment	HorsePower	89.00	73.00
tblOffRoadEquipment	HorsePower	187.00	259.00
tblOffRoadEquipment	HorsePower	97.00	100.00
tblOffRoadEquipment	HorsePower	97.00	100.00
tblOffRoadEquipment	HorsePower	97.00	100.00
tblOffRoadEquipment	HorsePower	97.00	100.00
tblOffRoadEquipment	HorsePower	63.00	60.00
tblOffRoadEquipment	HorsePower	78.00	50.00
tblOffRoadEquipment	HorsePower	221.00	68.00
tblOffRoadEquipment	HorsePower	212.00	207.00
tblOffRoadEquipment	HorsePower	158.00	225.00
tblOffRoadEquipment	HorsePower	84.00	18.00
tblOffRoadEquipment	HorsePower	16.00	175.00
tblOffRoadEquipment	HorsePower	402.00	210.00
tblOffRoadEquipment	HorsePower	402.00	175.00
tblOffRoadEquipment	HorsePower	88.00	35.00
tblOffRoadEquipment	HorsePower	8.00	235.00

Hellman - South Coast AQMD Air District, Annual

tblOffRoadEquipment	HorsePower	8.00	6.00
tblOffRoadEquipment	HorsePower	8.00	10.00
tblOffRoadEquipment	HorsePower	84.00	50.00
tblOffRoadEquipment	HorsePower	84.00	150.00
tblOffRoadEquipment	HorsePower	203.00	200.00
tblOffRoadEquipment	HorsePower	46.00	42.00
tblOffRoadEquipment	LoadFactor	0.37	0.29
tblOffRoadEquipment	LoadFactor	0.50	0.20
tblOffRoadEquipment	LoadFactor	0.43	0.41
tblOffRoadEquipment	LoadFactor	0.34	0.37
tblOffRoadEquipment	LoadFactor	0.43	0.38
tblOffRoadEquipment	LoadFactor	0.74	0.37
tblOffRoadEquipment	LoadFactor	0.36	0.41
tblOffRoadEquipment	OffRoadEquipmentType	Off-Highway Trucks	Dumpers/Tenders
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	PhaseName		Site Preparation
tblOffRoadEquipment	PhaseName		Site Preparation
tblOffRoadEquipment	PhaseName		Site Preparation
tblOffRoadEquipment	PhaseName		Site Preparation
tblOffRoadEquipment	PhaseName		Site Preparation

Hellman - South Coast AQMD Air District, Annual

tblOffRoadEquipment	PhaseName		Site Preparation
tblOffRoadEquipment	PhaseName		Site Preparation
tblOffRoadEquipment	UsageHours	4.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblSolidWaste	SolidWasteGenerationRate	19.99	0.00
tblTripsAndVMT	VendorTripNumber	0.00	21.00
tblTripsAndVMT	VendorTripNumber	5.00	22.00
tblTripsAndVMT	VendorTripNumber	5.00	18.00
tblTripsAndVMT	VendorTripNumber	0.00	9.00
tblTripsAndVMT	VendorVehicleClass	HDT_Mix	HHDT
tblTripsAndVMT	VendorVehicleClass	HDT_Mix	HHDT
tblTripsAndVMT	VendorVehicleClass	HDT_Mix	HHDT
tblTripsAndVMT	VendorVehicleClass	HDT_Mix	HHDT
tblTripsAndVMT	WorkerTripNumber	28.00	22.00
tblTripsAndVMT	WorkerTripNumber	14.00	25.00
tblVehicleTrips	ST_TR	1.32	0.00
tblVehicleTrips	SU_TR	0.68	0.00
tblVehicleTrips	WD_TR	6.97	4.00
tblWater	IndoorWaterUseRate	3,727,750.00	0.00

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2.0 Emissions Summary**2.1 Overall Construction****Unmitigated Construction**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.3251	2.7046	1.9291	4.3900e-003	0.0440	0.1206	0.1646	0.0112	0.1141	0.1253	0.0000	383.4471	383.4471	0.0838	0.0000	385.5409
Maximum	0.3251	2.7046	1.9291	4.3900e-003	0.0440	0.1206	0.1646	0.0112	0.1141	0.1253	0.0000	383.4471	383.4471	0.0838	0.0000	385.5409

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.3251	2.7046	1.9291	4.3900e-003	0.0440	0.1206	0.1646	0.0112	0.1141	0.1253	0.0000	383.4468	383.4468	0.0838	0.0000	385.5406
Maximum	0.3251	2.7046	1.9291	4.3900e-003	0.0440	0.1206	0.1646	0.0112	0.1141	0.1253	0.0000	383.4468	383.4468	0.0838	0.0000	385.5406

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	1-7-2019	4-6-2019	1.4034	1.4034
2	4-7-2019	7-6-2019	1.0931	1.0931
3	7-7-2019	9-30-2019	0.4886	0.4886
		Highest	1.4034	1.4034

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3.0 Construction Detail**Construction Phase**

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	1/7/2019	3/29/2019	5	60	
2	Foundation Installation	Building Construction	3/30/2019	4/26/2019	5	20	
3	Equipment Installation	Building Construction	4/27/2019	8/9/2019	5	75	
4	Paving	Paving	8/12/2019	8/23/2019	5	10	

Acres of Grading (Site Preparation Phase): 7.17**Acres of Grading (Grading Phase): 0****Acres of Paving: 0.37****Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)****OffRoad Equipment**

Hellman - South Coast AQMD Air District, Annual

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Crawler Tractors	1	8.00	207	0.41
Site Preparation	Excavators	1	8.00	225	0.38
Site Preparation	Graders	1	8.00	259	0.41
Site Preparation	Dumpers/Tenders	1	8.00	175	0.38
Site Preparation	Off-Highway Trucks	2	8.00	210	0.38
Site Preparation	Other General Industrial Equipment	1	8.00	35	0.37
Site Preparation	Plate Compactors	1	8.00	235	0.43
Site Preparation	Rubber Tired Loaders	1	8.00	200	0.41
Site Preparation	Tractors/Loaders/Backhoes	2	8.00	100	0.37
Foundation Installation	Bore/Drill Rigs	1	8.00	68	0.20
Foundation Installation	Off-Highway Trucks	1	8.00	175	0.38
Foundation Installation	Plate Compactors	2	8.00	6	0.43
Foundation Installation	Pumps	2	8.00	50	0.37
Foundation Installation	Pumps	1	8.00	150	0.74
Foundation Installation	Tractors/Loaders/Backhoes	1	8.00	100	0.29
Equipment Installation	Aerial Lifts	2	8.00	60	0.31
Equipment Installation	Air Compressors	3	8.00	50	0.48
Equipment Installation	Cranes	1	8.00	150	0.29
Equipment Installation	Forklifts	2	8.00	73	0.20
Equipment Installation	Generator Sets	4	8.00	18	0.74
Equipment Installation	Tractors/Loaders/Backhoes	2	8.00	100	0.37
Equipment Installation	Welders	4	8.00	42	0.45
Paving	Pavers	1	8.00	130	0.42
Paving	Plate Compactors	1	8.00	10	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	100	0.37

Trips and VMT

Hellman Gas Plant Project

A-27

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Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	11	22.00	21.00	360.00	19.80	7.90	20.00	LD_Mix	HHDT	HHDT
Foundation Installation	8	14.00	22.00	0.00	19.80	7.90	20.00	LD_Mix	HHDT	HHDT
Equipment Installation	18	25.00	18.00	0.00	19.80	7.90	20.00	LD_Mix	HHDT	HHDT
Paving	3	8.00	9.00	0.00	19.80	7.90	20.00	LD_Mix	HHDT	HHDT

3.1 Mitigation Measures Construction**3.2 Site Preparation - 2019****Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					3.9600e-003	0.0000	3.9600e-003	4.4000e-004	0.0000	4.4000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1045	1.0975	0.5700	1.5600e-003		0.0462	0.0462		0.0425	0.0425	0.0000	140.3668	140.3668	0.0444	0.0000	141.4770
Total	0.1045	1.0975	0.5700	1.5600e-003	3.9600e-003	0.0462	0.0502	4.4000e-004	0.0425	0.0429	0.0000	140.3668	140.3668	0.0444	0.0000	141.4770

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3.2 Site Preparation - 2019**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.5000e-003	0.0541	0.0104	1.4000e-004	3.0900e-003	2.0000e-004	3.2900e-003	8.5000e-004	1.9000e-004	1.0400e-003	0.0000	13.7226	13.7226	9.6000e-004	0.0000	13.7466
Vendor	2.8400e-003	0.1128	0.0198	2.3000e-004	4.2900e-003	3.0000e-004	4.5800e-003	1.1800e-003	2.9000e-004	1.4600e-003	0.0000	22.9105	22.9105	2.0700e-003	0.0000	22.9623
Worker	4.0500e-003	3.3300e-003	0.0359	1.0000e-004	9.7500e-003	8.0000e-005	9.8300e-003	2.5900e-003	7.0000e-005	2.6600e-003	0.0000	9.0129	9.0129	2.8000e-004	0.0000	9.0199
Total	8.3900e-003	0.1702	0.0661	4.7000e-004	0.0171	5.8000e-004	0.0177	4.6200e-003	5.5000e-004	5.1600e-003	0.0000	45.6460	45.6460	3.3100e-003	0.0000	45.7287

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					3.9600e-003	0.0000	3.9600e-003	4.4000e-004	0.0000	4.4000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1045	1.0975	0.5700	1.5600e-003		0.0462	0.0462		0.0425	0.0425	0.0000	140.3666	140.3666	0.0444	0.0000	141.4769
Total	0.1045	1.0975	0.5700	1.5600e-003	3.9600e-003	0.0462	0.0502	4.4000e-004	0.0425	0.0429	0.0000	140.3666	140.3666	0.0444	0.0000	141.4769

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3.2 Site Preparation - 2019**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.5000e-003	0.0541	0.0104	1.4000e-004	3.0900e-003	2.0000e-004	3.2900e-003	8.5000e-004	1.9000e-004	1.0400e-003	0.0000	13.7226	13.7226	9.6000e-004	0.0000	13.7466
Vendor	2.8400e-003	0.1128	0.0198	2.3000e-004	4.2900e-003	3.0000e-004	4.5800e-003	1.1800e-003	2.9000e-004	1.4600e-003	0.0000	22.9105	22.9105	2.0700e-003	0.0000	22.9623
Worker	4.0500e-003	3.3300e-003	0.0359	1.0000e-004	9.7500e-003	8.0000e-005	9.8300e-003	2.5900e-003	7.0000e-005	2.6600e-003	0.0000	9.0129	9.0129	2.8000e-004	0.0000	9.0199
Total	8.3900e-003	0.1702	0.0661	4.7000e-004	0.0171	5.8000e-004	0.0177	4.6200e-003	5.5000e-004	5.1600e-003	0.0000	45.6460	45.6460	3.3100e-003	0.0000	45.7287

3.3 Foundation Installation - 2019**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0185	0.1447	0.1549	2.6000e-004		7.5500e-003	7.5500e-003		7.2800e-003	7.2800e-003	0.0000	22.3200	22.3200	3.6300e-003	0.0000	22.4108
Total	0.0185	0.1447	0.1549	2.6000e-004		7.5500e-003	7.5500e-003		7.2800e-003	7.2800e-003	0.0000	22.3200	22.3200	3.6300e-003	0.0000	22.4108

Hellman - South Coast AQMD Air District, Annual

3.3 Foundation Installation - 2019**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.9000e-004	0.0394	6.9000e-003	8.0000e-005	1.5000e-003	1.0000e-004	1.6000e-003	4.1000e-004	1.0000e-004	5.1000e-004	0.0000	8.0005	8.0005	7.2000e-004	0.0000	8.0186
Worker	8.6000e-004	7.1000e-004	7.6200e-003	2.0000e-005	2.0700e-003	2.0000e-005	2.0800e-003	5.5000e-004	1.0000e-005	5.6000e-004	0.0000	1.9118	1.9118	6.0000e-005	0.0000	1.9133
Total	1.8500e-003	0.0401	0.0145	1.0000e-004	3.5700e-003	1.2000e-004	3.6800e-003	9.6000e-004	1.1000e-004	1.0700e-003	0.0000	9.9123	9.9123	7.8000e-004	0.0000	9.9319

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0185	0.1447	0.1549	2.6000e-004		7.5500e-003	7.5500e-003		7.2800e-003	7.2800e-003	0.0000	22.3200	22.3200	3.6300e-003	0.0000	22.4108
Total	0.0185	0.1447	0.1549	2.6000e-004		7.5500e-003	7.5500e-003		7.2800e-003	7.2800e-003	0.0000	22.3200	22.3200	3.6300e-003	0.0000	22.4108

Hellman - South Coast AQMD Air District, Annual

3.3 Foundation Installation - 2019**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.9000e-004	0.0394	6.9000e-003	8.0000e-005	1.5000e-003	1.0000e-004	1.6000e-003	4.1000e-004	1.0000e-004	5.1000e-004	0.0000	8.0005	8.0005	7.2000e-004	0.0000	8.0186
Worker	8.6000e-004	7.1000e-004	7.6200e-003	2.0000e-005	2.0700e-003	2.0000e-005	2.0800e-003	5.5000e-004	1.0000e-005	5.6000e-004	0.0000	1.9118	1.9118	6.0000e-005	0.0000	1.9133
Total	1.8500e-003	0.0401	0.0145	1.0000e-004	3.5700e-003	1.2000e-004	3.6800e-003	9.6000e-004	1.1000e-004	1.0700e-003	0.0000	9.9123	9.9123	7.8000e-004	0.0000	9.9319

3.4 Equipment Installation - 2019**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1794	1.0893	1.0203	1.5200e-003		0.0641	0.0641		0.0617	0.0617	0.0000	121.9477	121.9477	0.0277	0.0000	122.6400
Total	0.1794	1.0893	1.0203	1.5200e-003		0.0641	0.0641		0.0617	0.0617	0.0000	121.9477	121.9477	0.0277	0.0000	122.6400

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3.4 Equipment Installation - 2019**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.0400e-003	0.1208	0.0212	2.5000e-004	4.5900e-003	3.2000e-004	4.9100e-003	1.2600e-003	3.1000e-004	1.5700e-003	0.0000	24.5470	24.5470	2.2200e-003	0.0000	24.6024
Worker	5.7500e-003	4.7300e-003	0.0510	1.4000e-004	0.0139	1.1000e-004	0.0140	3.6800e-003	1.0000e-004	3.7800e-003	0.0000	12.8024	12.8024	3.9000e-004	0.0000	12.8123
Total	8.7900e-003	0.1256	0.0722	3.9000e-004	0.0184	4.3000e-004	0.0189	4.9400e-003	4.1000e-004	5.3500e-003	0.0000	37.3494	37.3494	2.6100e-003	0.0000	37.4147

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1794	1.0893	1.0203	1.5200e-003		0.0641	0.0641		0.0617	0.0617	0.0000	121.9475	121.9475	0.0277	0.0000	122.6399
Total	0.1794	1.0893	1.0203	1.5200e-003		0.0641	0.0641		0.0617	0.0617	0.0000	121.9475	121.9475	0.0277	0.0000	122.6399

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3.4 Equipment Installation - 2019**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.0400e-003	0.1208	0.0212	2.5000e-004	4.5900e-003	3.2000e-004	4.9100e-003	1.2600e-003	3.1000e-004	1.5700e-003	0.0000	24.5470	24.5470	2.2200e-003	0.0000	24.6024
Worker	5.7500e-003	4.7300e-003	0.0510	1.4000e-004	0.0139	1.1000e-004	0.0140	3.6800e-003	1.0000e-004	3.7800e-003	0.0000	12.8024	12.8024	3.9000e-004	0.0000	12.8123
Total	8.7900e-003	0.1256	0.0722	3.9000e-004	0.0184	4.3000e-004	0.0189	4.9400e-003	4.1000e-004	5.3500e-003	0.0000	37.3494	37.3494	2.6100e-003	0.0000	37.4147

3.5 Paving - 2019**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.8600e-003	0.0291	0.0275	4.0000e-005		1.6200e-003	1.6200e-003		1.5000e-003	1.5000e-003	0.0000	3.7224	3.7224	1.1400e-003	0.0000	3.7509
Paving	4.8000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	3.3400e-003	0.0291	0.0275	4.0000e-005		1.6200e-003	1.6200e-003		1.5000e-003	1.5000e-003	0.0000	3.7224	3.7224	1.1400e-003	0.0000	3.7509

Hellman - South Coast AQMD Air District, Annual

3.5 Paving - 2019**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.0000e-004	8.0500e-003	1.4100e-003	2.0000e-005	3.1000e-004	2.0000e-005	3.3000e-004	8.0000e-005	2.0000e-005	1.0000e-004	0.0000	1.6365	1.6365	1.5000e-004	0.0000	1.6402
Worker	2.5000e-004	2.0000e-004	2.1800e-003	1.0000e-005	5.9000e-004	0.0000	6.0000e-004	1.6000e-004	0.0000	1.6000e-004	0.0000	0.5462	0.5462	2.0000e-005	0.0000	0.5467
Total	4.5000e-004	8.2500e-003	3.5900e-003	3.0000e-005	9.0000e-004	2.0000e-005	9.3000e-004	2.4000e-004	2.0000e-005	2.6000e-004	0.0000	2.1827	2.1827	1.7000e-004	0.0000	2.1868

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.8600e-003	0.0291	0.0275	4.0000e-005		1.6200e-003	1.6200e-003		1.5000e-003	1.5000e-003	0.0000	3.7224	3.7224	1.1400e-003	0.0000	3.7509
Paving	4.8000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	3.3400e-003	0.0291	0.0275	4.0000e-005		1.6200e-003	1.6200e-003		1.5000e-003	1.5000e-003	0.0000	3.7224	3.7224	1.1400e-003	0.0000	3.7509

Hellman - South Coast AQMD Air District, Annual

3.5 Paving - 2019**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.0000e-004	8.0500e-003	1.4100e-003	2.0000e-005	3.1000e-004	2.0000e-005	3.3000e-004	8.0000e-005	2.0000e-005	1.0000e-004	0.0000	1.6365	1.6365	1.5000e-004	0.0000	1.6402
Worker	2.5000e-004	2.0000e-004	2.1800e-003	1.0000e-005	5.9000e-004	0.0000	6.0000e-004	1.6000e-004	0.0000	1.6000e-004	0.0000	0.5462	0.5462	2.0000e-005	0.0000	0.5467
Total	4.5000e-004	8.2500e-003	3.5900e-003	3.0000e-005	9.0000e-004	2.0000e-005	9.3000e-004	2.4000e-004	2.0000e-005	2.6000e-004	0.0000	2.1827	2.1827	1.7000e-004	0.0000	2.1868

Appendix B – Detailed Operation Emission Calculations

Hellman Gas Plant Project
Summary of Operational Emissions

Peak Day Operational Emissions

Source	Peak Day Emissions, lbs/day					
	VOC	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}
Microturbine	2.400	26.400	9.600	0.089	1.284	1.284
Fugitive Emissions	4.001	0.000	0.000	0.000	0.000	0.000
Offsite Mobile Sources	0.006	0.095	0.283	0.000	0.002	0.002
Totals	6.406	26.495	9.883	0.089	1.286	1.286
SCAQMD CEQA Thresholds	55	550	55	150	150	55
Exceed Threshold?	No	No	No	No	No	No
Localized Thresholds (lbs/day)¹		735	93		4	2
Exceed Localized Thresholds?		No	No		No	No

¹. Localized Thresholds based upon SCAQMD Lookup Tables, for North Coastal Orange County, 1 acre site, 50 meters to property boundary.

Annual Operational Emissions

Source	Total Emissions, Tons/yr						GHG Emissions, MT/Yr	
	VOC	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}	CO ₂	CO ₂ e
Microturbine	0.438	4.818	1.752	0.016	0.234	0.234	5,242.86	5,248.27
Fugitive Emissions	0.730	0.000	0.000	0.000	0.000	0.000		57.95
Offsite Mobile Sources	0.000	0.003	0.007	0.000	0.000	0.000	3.21	3.24
Construction GHG Amortized over 30 Years								12.85
Totals	1.1683	4.8215	1.7590	0.0163	0.2344	0.2344	5,246.07	5,322.32
SCAQMD CEQA Thresholds								10,000
Exceed Threshold?								No

Hellman Gas Plant Project
Microturbine Operational Emissions

Fuel Use per Turbine

Fuel Btu/hr	Fuel Btu/scf	Btu/mmscf	mmscf/hr
2,280,000	1434	1,434,000,000	0.00159

Fuel Use for Five Turbines

Fuel Btu/hr	Fuel Btu/scf	Btu/mmscf	mmscf/hr
11,400,000	1434	1,434,000,000	0.0079498

Exhaust Rates per Turbine

Exhaust lb/s	Exhaust MW	lb/hr	lbmol/min	scfm	cfm
2.93	28.8	10560	6.11	2,319	4,400

Sulfur Emission Inputs

TS PPMV	SO ₂ MW	scf / lbmol
2.78	64	379.48

Criteria Pollutant Emissions

Pollutant	lb/MWhe	lb/mmscf	lb/hr per Turbine ⁴	lb/day per Turbine	lb/day for Five Turbines	Tons/yr for Five Turbines
VOC ¹	0.1		0.02	0.48	2.40	0.44
NO _x ¹	0.4		0.08	1.92	9.60	1.75
CO ¹	1.1		0.22	5.28	26.40	4.82
PM ₁₀ ²		6.73	0.01	0.26	1.28	0.23
SO _x ³			0.001	0.02	0.09	0.02

Greenhouse Gas Emissions

Pollutant	lb/MWhe	lb/mmscf	lb/hr per Turbine ⁴	lb/day per Turbine	lb/day for Five Turbines	MTons/yr for Five Turbines
CO ₂ ¹	1330		266.00	6,384	31,920	5,243
CO ₂ e ⁵	1331		266.27	6,391	31,953	5,248

¹Based on manufacture's emissions guarantees

²Based on SCAQMD default emissions factor

³Based on fuel sulfur analysis

⁴Microturbines rated at 200kW = 0.2MW each

⁵CO₂e based on Table C-1 and C-2 of 40 CFR part 98.

Hellman Gas Plant Project
Offsite Mobile Operational Emissions

Offsite Mobile Emission Inputs

Source	Vehicle Type	Include in peak Day?	Emission Factors (g/mile)									Max Trips per day	Average Trips per day	Duration, days	Length of RTrip (miles)
			VOC	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}	N ₂ O	CH ₄	CO ₂				
Contractors	LDA15-55	1	0.0109	0.6075	0.0602	0.0000	0.0013	0.0012	0.0120	0.0230	252	2	0.43	365	29.4
Heavy Trucks	HDT15-55	1	0.0635	0.2572	4.2559	0.0000	0.0229	0.0219	0.0240	0.0260	1453	1	0.13	365	29.4

Emission Factors based on EMFAC2014, year 2019, 2011 categories

Length of trip based on CalEEMod urban, home-work distance

Average trips based on 3 contractors per week and 3 trucks per month.

Offsite Mobile Emissions

Source	Peak Day Emissions, lbs/day						Total Emissions, Tons/yr						GHG Emissions, MT/Yr			
	VOC	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}	VOC	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}	N ₂ O	CH ₄	CO ₂	CO ₂ e
Contractors	0.001	0.079	0.008	0.000	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.00	0.00	1.15	1.17
Heavy Trucks	0.004	0.017	0.275	0.000	0.001	0.001	0.000	0.000	0.007	0.000	0.000	0.000	0.00	0.00	2.06	2.07
Totals	0.006	0.095	0.283	0.000	0.002	0.002	0.000	0.003	0.007	0.000	0.000	0.000	0.00	0.00	3.21	3.24

Hellman Gas Plant Project
Estimated Fugitive Emissions

Estimated Fugitive Emissions for Components in Gas Service

Equip ID	Stream	# of Components Gas Service														Contingecy	Total Emissions					
		Valve Stem	TOC ¹ lb/day	VOC ² lb/day	Connections	TOC ¹ lb/day	VOC ² lb/day	Compressor Seals	TOC ¹ lb/day	VOC ² lb/day	Flanges	TOC ¹ lb/day	VOC ² lb/day	Pressure Relief Device	TOC ¹ lb/day		VOC ² lb/day	TOC ¹ tons/yr	VOC ² Tons/yr	CO ₂ e (MT/yr)		
V-101A/B	1	20	0.03704	0.00785	96	0.06095	0.01291	0	0.00000	0.00000	24	0.03556	0.00753	2	0.01556	0.00329	45.5%	0.21694	0.04595	0.040	0.008	0.672
C-201A/B	2	50	0.09259	0.02624	192	0.12191	0.03455	4	0.03111	0.00882	48	0.07111	0.02015	4	0.03111	0.00882	45.5%	0.50610	0.14343	0.092	0.026	1.412
E-201A/B	2	20	0.03704	0.01050	256	0.16254	0.04607	0	0.00000	0.00000	64	0.09482	0.02687	2	0.01556	0.00441	45.5%	0.45098	0.12781	0.082	0.023	1.259
V-201A/B	4	30	0.05556	0.01278	80	0.05079	0.01168	0	0.00000	0.00000	20	0.02963	0.00681	0	0.00000	0.00000	45.5%	0.19785	0.04550	0.036	0.008	0.595
V-220 to 231	4	660	1.22224	0.28110	1,248	0.79239	0.18224	0	0.00000	0.00000	312	0.46223	0.10631	12	0.09333	0.02147	45.5%	3.73964	0.86008	0.682	0.157	11.240
C-202A/B	6	50	0.09259	0.06487	192	0.12191	0.08540	4	0.03111	0.02180	48	0.07111	0.04982	4	0.03111	0.02180	45.5%	0.50610	0.35455	0.092	0.065	0.510
E-202A/B	8	20	0.03704	0.02595	256	0.16254	0.11387	0	0.00000	0.00000	64	0.09482	0.06642	2	0.01556	0.01090	45.5%	0.45098	0.31593	0.082	0.058	0.454
V-202A/B	10	30	0.05556	0.02215	80	0.05079	0.02025	0	0.00000	0.00000	20	0.02963	0.01181	0	0.00000	0.00000	45.5%	0.19785	0.07887	0.036	0.014	0.423
MT-201	12	40	0.07408	0.02953	112	0.07111	0.02835	0	0.00000	0.00000	28	0.04148	0.01654	5	0.03889	0.01550	45.5%	0.32819	0.13083	0.060	0.024	0.701
C-301	9	30	0.05556	0.00073	96	0.06095	0.00080	2	0.01556	0.00021	24	0.03556	0.00047	2	0.01556	0.00021	45.5%	0.26652	0.00351	0.049	0.001	1.046
Totals		950	1.759	0.482	2,608	1.656	0.536	10	0.078	0.031	652	0.966	0.313	33	0.257	0.086		6.861	2.106	1.252	0.384	18.312

Estimated Fugitive Emissions for Components in Liquid Service

Equip ID	Stream	# of Components Liquid Service									Contingency	Total Emissions			
		Valve Stem	TOC ¹ lb/day	VOC ² lb/day	Connections	TOC ¹ lb/day	VOC ² lb/day	Flanges	TOC ¹ lb/day	VOC ² lb/day		TOC ¹ lb/day	VOC ² lb/day	tons/yr	VOCs tons/yr
V-101A/B	16	12	0.02222	0.02060	48	0.03048	0.02825	8	0.01138	0.01055	45.5%	0.09323	0.08641	0.017	0.016
C-201A/B	2	16	0.02963	0.00840	64	0.04064	0.03359	10	0.01517	0.00430	45.5%	0.12431	0.06735	0.023	0.012
V-201A/B	16	20	0.03704	0.03433	80	0.05079	0.04708	13	0.01896	0.01758	45.5%	0.15539	0.14402	0.028	0.026
C-202A/B	8	16	0.02963	0.02076	64	0.04064	0.08303	10	0.01517	0.01063	45.5%	0.12431	0.16647	0.023	0.030
V-202A/B	16	20	0.03704	0.03433	80	0.05079	0.04708	13	0.01896	0.01758	45.5%	0.15539	0.14402	0.028	0.026
Totals		84	0.156	0.118	336	0.213	0.239	54	0.080	0.061		0.653	0.608	0.119	0.111

¹These values are derived from factors for total organic compound emission rates (including non-VOC's such as methane and ethane) and apply to light crude, heavy crude, gas plant, gas production, and off shore facilities.

² Derived from TOC and the fraction which is VOC based upon design composition data.

Total Estimated Fugitive Emissions

Type	# of Components					Total Emissions				
	Valve Stems	Connections	Compressor Seals	Flanges	Pressure Relief Devices	TOC ¹ lb/day	VOC ² lb/day	TOC ¹ tons/yr	VOC ² Tons/yr	CO ₂ e (MT/yr)
Gas Service	950	2,608	10	652	33	6.861	2.106	1.252	0.384	18.312
Liquid Service	84	336	0	54	0	0.653	0.608	0.119	0.111	0.000
Totals						7.514	2.715	1.371	0.495	18.312
Total with Two Year Leak History Adjustment						22.3662	4.0010	4.082	0.730	57.953

Leak History

Quarter	Service	Type	Count	# >10,000	Fraction (2 yr history)		<10,000 EF (lb/hr) ³	>10,000 EF (lb/hr) ³	TOC (lb/hr)	TOC (lb/day)	VOC (lb/day)	Comments
					<10,000	>10,000						
Qtr 1 2016				0								
Qtr 2 2016				0								
Qtr 3 2016	gas	Hatch	420	1	0.9988	0.0012	0.0003	0.3000	0.2842	6.8218	1.0926	Excluded from the leak history since there are no hatches associated with the new equipment.
Qtr 4 2016				0								
Qtr 1 2017	gas	Valve	1,034	1	0.9995	0.0005	0.0001	0.3000	0.2296	5.5099	0.8825	
Qtr 2 2017	gas	Fitting	2,944	1	0.9998	0.0002	0.0000	0.0570	0.1050	2.5207	0.4037	
Qtr 3 2017				0								
Qtr 4 2017				0								
Total										14.8524	1.2862	

¹These values are derived from factors for total organic compound emission rates (including non-VOC's such as methane and ethane) and apply to light crude, heavy crude, gas plant, gas production, and off shore facilities.

² Derived from TOC and the fraction which is VOC based upon design composition data.

³ Emission Factor Source: SCAQMD Fugitive Guidelines/CAPCOA document, Table IV-2c (<10,000 ppmv)

Hellman Gas Plant Project
Fugitive Emission Factors

Component Type	Service Type	<10,000 ppmv (kg/hr/source)²	<10,000 ppmv (lb/hr/source)²	<10,000 ppmv (lb/day/source)²
Valves	Gas/Light Liquid	3.50E-05	7.72E-05	1.85E-03
Pump seals	Gas/Light Liquid	9.96E-04	2.20E-03	5.27E-02
Others ¹	Gas/Light Liquid	1.47E-04	3.24E-04	7.78E-03
Connectors	Gas/Light Liquid	1.20E-05	2.65E-05	6.35E-04
Flanges	Gas/Light Liquid	2.80E-05	6.17E-05	1.48E-03

¹compressors, PRVs

²THC/TOC Emission Factor Source: SCAQMD Fugitive Guidelines/CAPCOA document, Table IV-2c (<10,000 ppmv)

Hellman Gas Plant Project
Composition of Process Streams

Stream	VOC/TOC	VOC	TOC	N2	CO2	C1	C2	C3	C4	C5+	H2O	Total	CO2/TOC	C1/TOC
1	0.2118	0.1900	0.8970	0.0030	0.0630	0.6740	0.0330	0.0620	0.0640	0.0640	0.0370	1	0.0702	0.7514
2	0.2834	0.2460	0.8680	0.0030	0.0980	0.5860	0.0360	0.0900	0.0840	0.0720	0.0310	1	0.1129	0.6751
3	0.2834	0.2460	0.8680	0.0030	0.0980	0.5860	0.0360	0.0900	0.0840	0.0720	0.0310	1	0.1129	0.6751
4	0.2300	0.2040	0.8870	0.0030	0.1070	0.6450	0.0380	0.0900	0.0720	0.0420	0.0030	1	0.1206	0.7272
5	0.0132	0.0130	0.9860	0.0050	0.0090	0.9420	0.0310	0.0080	0.0040	0.0010	0.0000	1	0.0091	0.9554
6	0.7005	0.5100	0.7280	0.0000	0.2650	0.1680	0.0500	0.2220	0.1810	0.1070	0.0070	1	0.3640	0.2308
7	0.7005	0.5100	0.7280	0.0000	0.2650	0.1680	0.0500	0.2220	0.1810	0.1070	0.0070	1	0.3640	0.2308
8	0.7005	0.5100	0.7280	0.0000	0.2650	0.1680	0.0500	0.2220	0.1810	0.1070	0.0070	1	0.3640	0.2308
9	0.0132	0.0130	0.9860	0.0050	0.0090	0.9420	0.0310	0.0080	0.0040	0.0010	0.0000	1	0.0091	0.9554
10	0.3986	0.2340	0.5870	0.0000	0.4120	0.2890	0.0640	0.1610	0.0600	0.0130	0.0010	1	0.7019	0.4923
11	0.0132	0.0130	0.9860	0.0050	0.0090	0.9420	0.0310	0.0080	0.0040	0.0010	0.0000	1	0.0091	0.9554
12	0.3986	0.2340	0.5870	0.0000	0.4120	0.2890	0.0640	0.1610	0.0600	0.0130	0.0010	1	0.7019	0.4923
16	0.9268	0.7220	0.7790	0.0000	0.0520	0.0350	0.0220	0.1810	0.2530	0.2880	0.1690	1	0.0668	0.0449
HG	0.2772	0.2665	0.9613	0.0102	0.0269	0.6401	0.0547	0.1040	0.0952	0.0673	0.0016	1	0.0280	0.6659
Gas avg	0.1602	1.1915	7.4393										0.0590	0.7951

Streams 1-16 compositions obtained from: PROCESS FLOW DIAGRAM HELLMAN RANCH GAS PLANT, DRAWING #6912-PDF-001 6/19/18

Stream HG composition obtained from Hellman Produced Gas Analysis

Hellman Gas Plant Project
Operational Air Toxic Emissions

MicroTurbine

TAC Pollutant	Emission Factors (lbs/mmcf) ¹	Max Emission Rate (lbs/hr) ¹	TAC Code
Acetaldehyde	4.30E-03	3.42E-05	A1
Acrolein	2.70E-03	2.15E-05	A3
Ammonia	3.20E+00	2.54E-02	A9
Benzene	8.00E-03	6.36E-05	B1
Ethyl Benzene	9.50E-03	7.55E-05	E3
Formaldehyde	1.70E-02	1.35E-04	F2
n-Hexane	6.30E-03	5.01E-05	H6
Polycyclic Aromatic Hydrocarbon (PAH)	1.00E-04	7.95E-07	P41
Naphthalene	3.00E-04	2.39E-06	P62
Toluene	3.66E-02	2.91E-04	T3
Xylenes (Mixed Isomers)	2.72E-02	2.16E-04	X1

Firing Rate (MMBTU/hr)	2.28
BTU/scf	1434

¹Emission Factors and max emission rate from SCAQMD risktool-(v1-1)-r102617---aqmd-procedure-8-1.xlsm for boilers.

Fugitives

TAC Pollutant	Emission Factor (lbs/lb VOC) ¹	Fugitive Emissions (lbs VOC/hr)	Lbs TAC/hr	TAC Code
Benzene	1.00E-03	1.67E-01	1.67E-04	B1

¹Emission Factor from CARB organic profile data in orgprofile19oct16.xlsx for profile #s 756, 757, and 758.

Risk Results Tier 1 Screening

Item	Cancer/Chronic ASI ¹	Acute ASI ¹
Microturbine	2.91E-01	1.55E-02
Fugitives	3.28E-01	4.47E-03
Totals	6.19E-01	2.00E-02
SCAQMD Threshold	1	1
Exceeds Threshold?	No	No

¹ASI=Application Screening Index

Risk number calculated from SCAQMD risktool-(v1-1)-r102617---aqmd-procedure-8-1.xlsm for boilers.

Appendix C – Air Toxic Tier 1 Screening Results

TIER 1 SCREENING RISK ASSESSMENT REPORT
(Procedure Version 8.1 & Package N, September 1, 2017)

Application deemed complete date: 10/1/2017

A/N , Hellman Gas Plant

Equipment Type	MicroTurbine	No T-BACT
Nearest Receptor Distance (actual)	396 meters	Burner Rating: 8.35 MMBtu/hr
Receptor Distance (Table 1 Emission look up)	100 meters	Control Type: OTHER
		Fuel HHV: 1050 btu/ft ³

Tier 1 Results	
Cancer/Chronic ASI	Acute ASI
2.91E-01	1.55E-02
PASSED	PASSED

APPLICATION SCREENING INDEX CALCULATION

Compound	Average Annual Emission Rate (lbs/yr)	Max Hourly Emission Rate (lbs/hr)	Cancer/Chronic Pollutant Screening Level (lbs/yr) from Table 1	Acute Pollutant Screening Level (lbs/hr) from Table 1	Cancer/Chronic Pollutant Screening Index (PSI)	Acute Pollutant Screening Index (PSI)
Acetaldehyde	2.99E-01	3.42E-05	4.44E+01	6.49E-01	6.73E-03	5.27E-05
Acrolein	1.88E-01	2.15E-05	5.02E+01	3.45E-03	3.74E-03	6.22E-03
Ammonia	2.22E+02	2.54E-02	6.02E+04	4.42E+00	3.69E-03	5.76E-03
Benzene	5.56E-01	6.36E-05	4.44E+00	3.73E-02	1.25E-01	1.71E-03
Ethyl Benzene	6.60E-01	7.55E-05	5.11E+01		1.29E-02	
Formaldehyde	1.18E+00	1.35E-04	2.12E+01	7.59E-02	5.57E-02	1.78E-03
n-Hexane	4.38E-01	5.01E-05	2.11E+06		2.07E-07	
Polycyclic Aromatic Hydrocarbon (PAH)	6.95E-03	7.95E-07	9.00E-02		7.72E-02	
Naphthalene	2.08E-02	2.39E-06	3.70E+00		5.63E-03	
Toluene	2.54E+00	2.91E-04	9.03E+04	5.11E+01	2.82E-05	5.70E-06
Xylenes (Mixed Isomers)	1.89E+00	2.16E-04	2.11E+05	3.04E+01	8.96E-06	7.12E-06
TOTAL (APPLICATION SCREENING INDEX)					2.91E-01	1.55E-02

TIER 1 SCREENING RISK ASSESSMENT REPORT
(Procedure Version 8.1 & Package N, September 1, 2017)

Application deemed complete date: 10/1/2017

A/N , Hellman Gas Plant

Equipment Type	Fugitives	No T-BACT
Nearest Receptor Distance (actual)	396	meters
Receptor Distance (Table 1 Emission look up)	100	meters

Tier 1 Results	
Cancer/Chronic ASI	Acute ASI
3.28E-01	4.47E-03
PASSED	PASSED

APPLICATION SCREENING INDEX CALCULATION

Compound	Average Annual Emission Rate (lbs/yr)	Max Hourly Emission Rate (lbs/hr)	Cancer/Chronic Pollutant Screening Level (lbs/yr) from Table 1	Acute Pollutant Screening Level (lbs/hr) from Table 1	Cancer/Chronic Pollutant Screening Index (PSI)	Acute Pollutant Screening Index (PSI)
Benzene	1.46E+00	1.67E-04	4.44E+00	3.73E-02	3.28E-01	4.47E-03
TOTAL (APPLICATION SCREENING INDEX)					3.28E-01	4.47E-03