

A P P E N D I X C

AIR QUALITY AND GREENHOUSE  
GAS MODELING





# **Assumptions Worksheet**

## CalEEMod Inputs -Alameda Grant Line Solar 1 Project, Construction

**Name:** Alameda Grant Line Solar 1 Project  
**Project Number:** SOLT-01.0  
**Project Location:** The intersection of West Grant Line Road and Great Valley Parkway  
**County/Air Basin:** Alameda  
**Climate Zone:** 5  
**Land Use Setting:** Urban  
**Operational Year:** 2022  
**Utility Company:** PG&E  
**Air Basin:** San Francisco Bay Area Air Basin (SFBAAB)  
**Air District:** BAAQMD

**Project Site Acreage** 23.07  
**Disturbed Site Acreage** 14.13

Project Components			
<i>New Construction</i>	SQFT	Building Footprint	ACRES
<i>Total Hardscape</i> <sup>1</sup>	2,200	N/A	0.05
Staging area	20,000	N/A	0.46
Gravel road	2,348	N/A	0.05
Temporary pad	5,400	N/A	0.12
Solar arrays area	585,555	N/A	13.44
<i>Total Landscaping</i>	613,303	N/A	14.08
<b>Total Other Non-asphalt Surfaces</b>	<b>615,503</b>	<b>N/A</b>	<b>14.13</b>

Notes:

<sup>1</sup> Includes 500 squarefoot electrical pad.

### CalEEMod Land Use Inputs

Land Use Type	Land Use Subtype	Unit Amount	Size Metric	Lot Acreage	Land Use Square Feet
Parking	Other Non-asphalt Surfaces	615.50	1000 sqft	14.13	615,503
				<b>14.13</b>	

**BAAQMD Construction BMPs**

Replace Ground Cover	PM10:	5	% Reduction
	PM2.5:	5	% Reduction
Water Exposed Area	Frequency:	2	per day
	PM10:	55	% Reduction
	PM25:	55	% Reduction
Unpaved Roads	Vehicle Speed:	15	mph
<b>SCAQMD Rule 1186</b>	Clean Paved Road	9	% PM Reduction

**PG&E Carbon Intensity Factors**

	lbs/MWH
CO <sub>2</sub> : <sup>1</sup>	203.98
CH <sub>4</sub> : <sup>1</sup>	0.033
N <sub>2</sub> O: <sup>1</sup>	0.004

**Notes:**

<sup>1</sup> CalEEMod default values.

Global Warming Potentials (GWP)		
	AR4	AR5
CO <sub>2</sub>	1	1
CH <sub>4</sub>	25	28
N <sub>2</sub> O	298	265
Based on Intergovernmental Panel on Climate Change Fourth Assessment Report global warming potentials for CH4 and N2O; Intergovernmental Panel on Climate Change (IPCC).		

## Construction Activities and Schedule Assumptions: Alameda Grant Line Solar 1 Project

\*based on durations provided by the Applicant

### Construction Schedule

Construction Activities	Phase Type	Start Date	End Date	CalEEMod Duration (Workday)
Site Preparation	Site Preparation	7/4/2022	7/12/2022	7
Installation of Solar PV Equipment	Building Construction	7/13/2022	9/6/2022	40
Utility Trenching	Trenching	8/22/2022	8/26/2022	5

### Overlapping Construction Schedule

Construction Activities	Start Date	End Date	CalEEMod Duration (Workday)
Site Preparation	7/4/2022	7/12/2022	7
Installation of Solar PV Equipment	7/13/2022	8/21/2022	28
Installation of Solar PV Equipment and Utility Trenching	8/22/2022	8/26/2022	5
Installation of Solar PV Equipment	8/27/2022	9/6/2022	7

## CalEEMod Construction Off-Road Equipment Inputs

\*Based on equipment mix and horsepower provided by the Applicant

General Construction Hour 8 hours

btwn 7:00 AM to 4:00 PM (with 1 hr break), Mon-Fri

CalEEMod Equipment	CalEEMod	# of Equipment	hr/day	Days Equipment Onsite	Average Hours per day	hp	load factor	total trips/Day
<b>Site Preparation</b>								
Backhoe	Tractor/loader/Backhoe	1	6	7	6	97	0.37	7
Skid Steer	Skid Steer Loaders	1	4	7	4	65	0.3685	7
Telehandler	Aerial Lift	1	4	7	4	63	0.3082	7
Excavator	Excavators	1	6	7	6	158	0.3819	7
Front Loader	Rubber Tired Loader	1	6	7	6	203	0.3618	7
Worker Trips/Day								6
Water Truck Trips (added to Vendor Trips)								2
304 CY of Gravel (added to Vendor Trips)								3
Other Vendor Trips								1
Total Vendor Trips								6
Hauling Trips (TOTAL TRIPS)								0
<b>Utility Trenching</b>								
Backhoe	Tractor/loader/Backhoe	1	3	5	3	97	0.3685	5
Excavator	Excavators	1	3	5	3	158	0.3819	5
Skid Steer	Skid Steer Loaders	1	3	5	3	65	0.3685	5
Front Loader	Rubber Tired Loader	1	3	5	3	203	0.3618	5
Compactor	Rollers	1	3	2	1.2	80	0.3752	2
Worker Trips/Day								6
Water Truck Trips (added to Vendor Trips)								2
Total Vendor Trips								2
Hauling Trips (TOTAL TRIPS)								0
<b>Installation of Solar PV Equipment</b>								
Telehandler	Aerial Lift	1	4	40	4	63	0.3082	40
Pile Driver	Bore/Drill Rig	1	7	5	0.9	221	0.5025	5
Backhoe	Tractor/loader/Backhoe	1	2	3	0.2	97	0.37	3
Excavator	Excavators	1	2	3	0.2	158	0.3819	3
Skid Steer	Skid Steer Loaders	1	4	40	4	65	0.3685	40
Worker Trips/Day								20
Vendor Trips/Day								2
Hauling Trips (TOTAL TRIPS)								0

## Construction Trips Worksheet

Phase Name	Worker Trip Ends	Vendor Trip Ends	Haul Truck Trip Ends	Total Haul Truck	Start Date	End Date	Workdays
	Per Day	Per Day		Trip Ends			
Site Preparation	6	6	0	0	7/4/2022	7/12/2022	7
Installation of Solar PV Equipment	20	2	0	0	7/13/2022	9/6/2022	40
Utility Trenching	6	2	0	0	8/22/2022	8/26/2022	5

Construction Activity (Overlapping)	Worker Trip Ends	Vendor Trip Ends	Haul Truck Trip Ends	Total Trip Ends	Start Date	End Date	Workdays
	Per Day	Per Day	Per Day	Per Day			
Site Preparation	6	6	0	12	7/4/2022	7/12/2022	7
Installation of Solar PV Equipment	20	2	0	22	7/13/2022	8/21/2022	28
Installation of Solar PV Equipment and Utility Trenching	26	4	0	30	8/22/2022	8/26/2022	5
Installation of Solar PV Equipment	20	2	0	22	8/27/2022	9/6/2022	7
<b>Maximum Daily Trips</b>	<b>26</b>	<b>6</b>	<b>0</b>	<b>30</b>			



# **Emissions Worksheet**



## Criteria Air Pollutant Emissions Summary - Construction Unmitigated

Annual emissions divided by total construction duration to obtain average daily emissions. Average construction emissions accounts for the duration of each construction phase and the time each piece of construction equipment is onsite.

Total Construction		Calendar
Days	2022	Days
47	47	65

Unmitigated Run - with Best Control Measures for Fugitive Dust												
average lbs/day		ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	
<b>Total</b>		0	2	3	0	0.17	0.08	0	0.08	0.07	0	
<b>BAAQMD Threshold</b>		54	54	NA	NA	BMP	82	54	BMP	54	NA	
<b>Exceeds Threshold</b>		No	No	NA	NA	NA	No	No	NA	No	NA	

## Average Daily Emissions and Emission Rates

Onsite Construction PM10 Exhaust Emissions <sup>1</sup>			
Year	Average Daily Emissions (lbs/day)	Average Daily Emissions (lbs/hr)	Emission Rate (g/s)
2022	0.08	9.79E-03	1.23E-03

Onsite Construction PM2.5 Exhaust Emissions <sup>2</sup>		
Year	Average Daily Emissions (lbs/day)	Emission Rate (g/s)
2022	0.07	1.13E-03

Offsite Construction PM10 Exhaust Emissions <sup>1</sup>			
Year	Average Daily Emissions (lbs/day)	Hauling Emissions w/in 1,000ft (lbs/day) <sup>3</sup>	Emission Rate (lbs/hr)
2022	2.13E-03	4.10E-05	5.12E-06

Offsite Construction PM2.5 Exhaust Emissions <sup>2</sup>			
Year	Average Daily Emissions (lbs/day)	Hauling Emissions w/in 1,000ft (lbs/day) <sup>3</sup>	Emission Rate (lbs/hr)
2022	2.13E-03	4.10E-05	5.12E-06

Note: Emissions evenly distributed over 48 modeled volume sources.

	Year	Workdays	Construction Duration <sup>5</sup>
Hauling Length (miles)	2022	47	0.18
Haul Length within 1,000 ft of Site (mile) <sup>3</sup>			
Hours per work day (7:00 AM to 4:00 PM, 1-hour of breaks) <sup>4</sup>			

<sup>1</sup> DPM emissions taken as PM<sub>10</sub> exhaust emissions from CalEEMod average daily emissions.

<sup>2</sup> PM<sub>2.5</sub> emissions taken as PM<sub>2.5</sub> exhaust emissions from CalEEMod average daily emissions.

<sup>3</sup> Emissions from CalEEMod offsite average daily emissions, which is based on proportioned haul truck trip distances, are adjusted to evaluate emissions from the 0.39-mile route within 1,000 of the project site.

<sup>4</sup> Work hours applied in By Hour/Day (HRDOW) variable emissions module in air dispersion model (see App B - Air Dispersion Model Output).

<sup>5</sup> Construction duration for 2022 determined to adjust receptor exposures to the exposure durations for each construction year (see App C - Risk Calculations).

Phase Name	Start Date	End Date	CalEEMod Days	Total Days
Site Preparation	7/4/2022	7/12/2022	7	8
Installation of Solar PV Equipment	7/13/2022	9/6/2022	40	55
Utility Trenching	8/22/2022	8/26/2022	5	4

Number of Construction Days Per Year			
2022	7/4/2022	9/6/2022	47
	<b>CONSTRUCTION DAYS</b>		<b>47</b>

Total Construction Days Per Year		
1/1/2022	12/31/2022	260
<b>TOTAL DAYS</b>		<b>260</b>

## GHG Emissions Inventory

### Construction

	MTCO <sub>2</sub> e Total Project*	
2022	15	
<b>Total Construction</b>	<b>15</b>	
30-Yr Amortized Construction Emissions	<b>1</b>	
BAAQMD Bright-Line Screening Threshold	660	MTCO <sub>2</sub> e/Year
<b>Exceed Threshold?</b>	<b>No</b>	

\*CalEEMod, Version 2020.4

# **CalEEMod Construction Model**

Alameda Grant Line Solar 1 Project - Alameda County, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

**Alameda Grant Line Solar 1 Project  
Alameda County, Annual**

**1.0 Project Characteristics**

**1.1 Land Usage**

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	615.50	1000sqft	14.13	615,503.00	0

**1.2 Other Project Characteristics**

<b>Urbanization</b>	Urban	<b>Wind Speed (m/s)</b>	2.2	<b>Precipitation Freq (Days)</b>	63
<b>Climate Zone</b>	5			<b>Operational Year</b>	2022
<b>Utility Company</b>	Pacific Gas and Electric Company				
<b>CO2 Intensity (lb/MWhr)</b>	203.98	<b>CH4 Intensity (lb/MWhr)</b>	0.033	<b>N2O Intensity (lb/MWhr)</b>	0.004

**1.3 User Entered Comments & Non-Default Data**

Project Characteristics -

Land Use - See assumptions file

Construction Phase - Based on applicant info., see assumptions file

Off-road Equipment - Based on equipment mix provided by applicant, see assumptions file

Off-road Equipment - Based on equipment mix provided by applicant, see assumptions file

Off-road Equipment - Based on equipment mix provided by applicant, see assumptions file

Trips and VMT - Assume 2 vt/day/water truck, added gravel trucks as HHDT vendor trips to site preparation phase, see assumptions file

Grading -

Construction Off-road Equipment Mitigation - BAAQMD Construction BMPs

Table Name	Column Name	Default Value	New Value
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Alameda Grant Line Solar 1 Project - Alameda County, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

tblConstDustMitigation	CleanPavedRoadPercentReduction	0	9
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstructionPhase	NumDays	300.00	40.00
tblConstructionPhase	NumDays	10.00	7.00
tblLandUse	LandUseSquareFeet	615,500.00	615,503.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	UsageHours	7.00	0.20
tblOffRoadEquipment	UsageHours	8.00	6.00
tblTripsAndVMT	VendorTripNumber	0.00	6.00
tblTripsAndVMT	VendorTripNumber	101.00	2.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorVehicleClass	HDT_Mix	HHDT
tblTripsAndVMT	WorkerTripNumber	13.00	6.00
tblTripsAndVMT	WorkerTripNumber	259.00	20.00
tblTripsAndVMT	WorkerTripNumber	13.00	6.00

**2.0 Emissions Summary**

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Alameda Grant Line Solar 1 Project - Alameda County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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					
2022	5.7700e-003	0.0538	0.0751	1.7000e-004	3.8700e-003	1.8900e-003	5.7700e-003	1.0400e-003	1.7400e-003	2.7800e-003	0.0000	15.0847	15.0847	3.6400e-003	3.0000e-004	15.2642
Maximum	5.7700e-003	0.0538	0.0751	1.7000e-004	3.8700e-003	1.8900e-003	5.7700e-003	1.0400e-003	1.7400e-003	2.7800e-003	0.0000	15.0847	15.0847	3.6400e-003	3.0000e-004	15.2642

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					
2022	5.7700e-003	0.0538	0.0751	1.7000e-004	3.5800e-003	1.8900e-003	5.4700e-003	9.7000e-004	1.7400e-003	2.7100e-003	0.0000	15.0847	15.0847	3.6400e-003	3.0000e-004	15.2642
Maximum	5.7700e-003	0.0538	0.0751	1.7000e-004	3.5800e-003	1.8900e-003	5.4700e-003	9.7000e-004	1.7400e-003	2.7100e-003	0.0000	15.0847	15.0847	3.6400e-003	3.0000e-004	15.2642

	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	7.49	0.00	5.20	6.73	0.00	2.52	0.00	0.00	0.00	0.00	0.00	0.00

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	7-4-2022	9-30-2022	0.0550	0.0550
		Highest	0.0550	0.0550

Alameda Grant Line Solar 1 Project - Alameda County, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

**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	7/4/2022	7/12/2022	5	7	a
2	Installation of Solar PV Equipment	Building Construction	7/13/2022	9/6/2022	5	40	b
3	Utility Trenching	Trenching	8/22/2022	8/26/2022	5	5	c

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 14.13

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating –

**OffRoad Equipment**

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Aerial Lifts	1	4.00	63	0.31
Site Preparation	Excavators	1	6.00	158	0.38
Site Preparation	Rubber Tired Dozers	0	8.00	247	0.40
Site Preparation	Rubber Tired Loaders	1	6.00	203	0.36
Site Preparation	Skid Steer Loaders	1	4.00	65	0.37
Site Preparation	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Installation of Solar PV Equipment	Aerial Lifts	1	4.00	63	0.31
Installation of Solar PV Equipment	Bore/Drill Rigs	1	0.90	221	0.50
Installation of Solar PV Equipment	Concrete/Industrial Saws	0		81	0.73
Installation of Solar PV Equipment	Cranes	0	7.00	231	0.29
Installation of Solar PV Equipment	Excavators	1	0.20	158	0.38
Installation of Solar PV Equipment	Forklifts	0	8.00	89	0.20

Alameda Grant Line Solar 1 Project - Alameda County, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

Installation of Solar PV Equipment	Generator Sets	0	8.00	84	0.74
Installation of Solar PV Equipment	Rubber Tired Dozers	0		247	0.40
Installation of Solar PV Equipment	Rubber Tired Dozers	0		247	0.40
Installation of Solar PV Equipment	Rubber Tired Dozers	0		247	0.40
Installation of Solar PV Equipment	Skid Steer Loaders	1	4.00	65	0.37
Installation of Solar PV Equipment	Tractors/Loaders/Backhoes	1	0.20	97	0.37
Installation of Solar PV Equipment	Tractors/Loaders/Backhoes	0	7.00	97	0.37
Installation of Solar PV Equipment	Welders	0	8.00	46	0.45
Utility Trenching	Excavators	1	3.00	158	0.38
Utility Trenching	Graders	0		187	0.41
Utility Trenching	Rollers	1	1.20	80	0.38
Utility Trenching	Rubber Tired Dozers	0		247	0.40
Utility Trenching	Rubber Tired Loaders	1	3.00	203	0.36
Utility Trenching	Scrapers	0		367	0.48
Utility Trenching	Skid Steer Loaders	1	3.00	65	0.37
Utility Trenching	Tractors/Loaders/Backhoes	1	3.00	97	0.37

**Trips and VMT**

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	5	6.00	6.00	0.00	10.80	7.30	20.00	LD_Mix	HHDT	HHDT
Installation of Solar PV Equipment	5	20.00	2.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Utility Trenching	5	6.00	2.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

**3.1 Mitigation Measures Construction**

Replace Ground Cover

Water Exposed Area

Alameda Grant Line Solar 1 Project - Alameda County, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

**3.2 Site Preparation - 2022**

**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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.9100e-003	0.0196	0.0228	4.0000e-005		8.1000e-004	8.1000e-004		7.4000e-004	7.4000e-004	0.0000	3.9267	3.9267	1.2700e-003	0.0000	3.9584
<b>Total</b>	<b>1.9100e-003</b>	<b>0.0196</b>	<b>0.0228</b>	<b>4.0000e-005</b>	<b>0.0000</b>	<b>8.1000e-004</b>	<b>8.1000e-004</b>	<b>0.0000</b>	<b>7.4000e-004</b>	<b>7.4000e-004</b>	<b>0.0000</b>	<b>3.9267</b>	<b>3.9267</b>	<b>1.2700e-003</b>	<b>0.0000</b>	<b>3.9584</b>

**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	5.0000e-005	1.5300e-003	4.5000e-004	1.0000e-005	1.3000e-004	1.0000e-005	1.4000e-004	4.0000e-005	1.0000e-005	5.0000e-005	0.0000	0.5038	0.5038	1.0000e-005	8.0000e-005	0.5278
Worker	6.0000e-005	4.0000e-005	5.0000e-004	0.0000	1.7000e-004	0.0000	1.7000e-004	4.0000e-005	0.0000	5.0000e-005	0.0000	0.1335	0.1335	0.0000	0.0000	0.1347
<b>Total</b>	<b>1.1000e-004</b>	<b>1.5700e-003</b>	<b>9.5000e-004</b>	<b>1.0000e-005</b>	<b>3.0000e-004</b>	<b>1.0000e-005</b>	<b>3.1000e-004</b>	<b>8.0000e-005</b>	<b>1.0000e-005</b>	<b>1.0000e-004</b>	<b>0.0000</b>	<b>0.6373</b>	<b>0.6373</b>	<b>1.0000e-005</b>	<b>8.0000e-005</b>	<b>0.6625</b>

Alameda Grant Line Solar 1 Project - Alameda County, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

**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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.9100e-003	0.0196	0.0228	4.0000e-005		8.1000e-004	8.1000e-004		7.4000e-004	7.4000e-004	0.0000	3.9267	3.9267	1.2700e-003	0.0000	3.9584
<b>Total</b>	<b>1.9100e-003</b>	<b>0.0196</b>	<b>0.0228</b>	<b>4.0000e-005</b>	<b>0.0000</b>	<b>8.1000e-004</b>	<b>8.1000e-004</b>	<b>0.0000</b>	<b>7.4000e-004</b>	<b>7.4000e-004</b>	<b>0.0000</b>	<b>3.9267</b>	<b>3.9267</b>	<b>1.2700e-003</b>	<b>0.0000</b>	<b>3.9584</b>

**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	5.0000e-005	1.5300e-003	4.5000e-004	1.0000e-005	1.2000e-004	1.0000e-005	1.3000e-004	3.0000e-005	1.0000e-005	5.0000e-005	0.0000	0.5038	0.5038	1.0000e-005	8.0000e-005	0.5278
Worker	6.0000e-005	4.0000e-005	5.0000e-004	0.0000	1.5000e-004	0.0000	1.5000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.1335	0.1335	0.0000	0.0000	0.1347
<b>Total</b>	<b>1.1000e-004</b>	<b>1.5700e-003</b>	<b>9.5000e-004</b>	<b>1.0000e-005</b>	<b>2.7000e-004</b>	<b>1.0000e-005</b>	<b>2.8000e-004</b>	<b>7.0000e-005</b>	<b>1.0000e-005</b>	<b>9.0000e-005</b>	<b>0.0000</b>	<b>0.6373</b>	<b>0.6373</b>	<b>1.0000e-005</b>	<b>8.0000e-005</b>	<b>0.6625</b>

**3.3 Installation of Solar PV Equipment - 2022**

**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	1.7400e-003	0.0217	0.0322	6.0000e-005		7.0000e-004	7.0000e-004		6.4000e-004	6.4000e-004	0.0000	5.5214	5.5214	1.7900e-003	0.0000	5.5660
<b>Total</b>	<b>1.7400e-003</b>	<b>0.0217</b>	<b>0.0322</b>	<b>6.0000e-005</b>		<b>7.0000e-004</b>	<b>7.0000e-004</b>		<b>6.4000e-004</b>	<b>6.4000e-004</b>	<b>0.0000</b>	<b>5.5214</b>	<b>5.5214</b>	<b>1.7900e-003</b>	<b>0.0000</b>	<b>5.5660</b>

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**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

**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	8.0000e-005	2.1900e-003	6.1000e-004	1.0000e-005	2.6000e-004	2.0000e-005	2.9000e-004	8.0000e-005	2.0000e-005	1.0000e-004	0.0000	0.8076	0.8076	1.0000e-005	1.2000e-004	0.8440
Worker	1.1200e-003	8.1000e-004	9.6100e-003	3.0000e-005	3.1600e-003	2.0000e-005	3.1800e-003	8.4000e-004	2.0000e-005	8.6000e-004	0.0000	2.5421	2.5421	8.0000e-005	7.0000e-005	2.5663
<b>Total</b>	<b>1.2000e-003</b>	<b>3.0000e-003</b>	<b>0.0102</b>	<b>4.0000e-005</b>	<b>3.4200e-003</b>	<b>4.0000e-005</b>	<b>3.4700e-003</b>	<b>9.2000e-004</b>	<b>4.0000e-005</b>	<b>9.6000e-004</b>	<b>0.0000</b>	<b>3.3497</b>	<b>3.3497</b>	<b>9.0000e-005</b>	<b>1.9000e-004</b>	<b>3.4103</b>

**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	1.7400e-003	0.0217	0.0322	6.0000e-005		7.0000e-004	7.0000e-004		6.4000e-004	6.4000e-004	0.0000	5.5214	5.5214	1.7900e-003	0.0000	5.5660
<b>Total</b>	<b>1.7400e-003</b>	<b>0.0217</b>	<b>0.0322</b>	<b>6.0000e-005</b>		<b>7.0000e-004</b>	<b>7.0000e-004</b>		<b>6.4000e-004</b>	<b>6.4000e-004</b>	<b>0.0000</b>	<b>5.5214</b>	<b>5.5214</b>	<b>1.7900e-003</b>	<b>0.0000</b>	<b>5.5660</b>

**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	8.0000e-005	2.1900e-003	6.1000e-004	1.0000e-005	2.5000e-004	2.0000e-005	2.7000e-004	7.0000e-005	2.0000e-005	9.0000e-005	0.0000	0.8076	0.8076	1.0000e-005	1.2000e-004	0.8440
Worker	1.1200e-003	8.1000e-004	9.6100e-003	3.0000e-005	2.9200e-003	2.0000e-005	2.9300e-003	7.8000e-004	2.0000e-005	8.0000e-004	0.0000	2.5421	2.5421	8.0000e-005	7.0000e-005	2.5663
<b>Total</b>	<b>1.2000e-003</b>	<b>3.0000e-003</b>	<b>0.0102</b>	<b>4.0000e-005</b>	<b>3.1700e-003</b>	<b>4.0000e-005</b>	<b>3.2000e-003</b>	<b>8.5000e-004</b>	<b>4.0000e-005</b>	<b>8.9000e-004</b>	<b>0.0000</b>	<b>3.3497</b>	<b>3.3497</b>	<b>9.0000e-005</b>	<b>1.9000e-004</b>	<b>3.4103</b>

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**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

**3.4 Utility Trenching - 2022**

**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	7.4000e-004	7.5900e-003	8.5800e-003	2.0000e-005		3.3000e-004	3.3000e-004		3.0000e-004	3.0000e-004	0.0000	1.4534	1.4534	4.7000e-004	0.0000	1.4652
<b>Total</b>	<b>7.4000e-004</b>	<b>7.5900e-003</b>	<b>8.5800e-003</b>	<b>2.0000e-005</b>		<b>3.3000e-004</b>	<b>3.3000e-004</b>		<b>3.0000e-004</b>	<b>3.0000e-004</b>	<b>0.0000</b>	<b>1.4534</b>	<b>1.4534</b>	<b>4.7000e-004</b>	<b>0.0000</b>	<b>1.4652</b>

**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	1.0000e-005	2.7000e-004	8.0000e-005	0.0000	3.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.1010	0.1010	0.0000	2.0000e-005	0.1055
Worker	4.0000e-005	3.0000e-005	3.6000e-004	0.0000	1.2000e-004	0.0000	1.2000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0953	0.0953	0.0000	0.0000	0.0962
<b>Total</b>	<b>5.0000e-005</b>	<b>3.0000e-004</b>	<b>4.4000e-004</b>	<b>0.0000</b>	<b>1.5000e-004</b>	<b>0.0000</b>	<b>1.6000e-004</b>	<b>4.0000e-005</b>	<b>0.0000</b>	<b>4.0000e-005</b>	<b>0.0000</b>	<b>0.1963</b>	<b>0.1963</b>	<b>0.0000</b>	<b>2.0000e-005</b>	<b>0.2017</b>

**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	7.4000e-004	7.5900e-003	8.5800e-003	2.0000e-005		3.3000e-004	3.3000e-004		3.0000e-004	3.0000e-004	0.0000	1.4534	1.4534	4.7000e-004	0.0000	1.4652
<b>Total</b>	<b>7.4000e-004</b>	<b>7.5900e-003</b>	<b>8.5800e-003</b>	<b>2.0000e-005</b>		<b>3.3000e-004</b>	<b>3.3000e-004</b>		<b>3.0000e-004</b>	<b>3.0000e-004</b>	<b>0.0000</b>	<b>1.4534</b>	<b>1.4534</b>	<b>4.7000e-004</b>	<b>0.0000</b>	<b>1.4652</b>

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**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

**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	1.0000e-005	2.7000e-004	8.0000e-005	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.1010	0.1010	0.0000	2.0000e-005	0.1055
Worker	4.0000e-005	3.0000e-005	3.6000e-004	0.0000	1.1000e-004	0.0000	1.1000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0953	0.0953	0.0000	0.0000	0.0962
<b>Total</b>	<b>5.0000e-005</b>	<b>3.0000e-004</b>	<b>4.4000e-004</b>	<b>0.0000</b>	<b>1.4000e-004</b>	<b>0.0000</b>	<b>1.4000e-004</b>	<b>4.0000e-005</b>	<b>0.0000</b>	<b>4.0000e-005</b>	<b>0.0000</b>	<b>0.1963</b>	<b>0.1963</b>	<b>0.0000</b>	<b>2.0000e-005</b>	<b>0.2017</b>