

1. Emissions Summaries

Average Daily Criteria Pollutant Construction Emissions

Total Emissions per site (tons)				
Construction Activity Source	ROG	NO _x	PM ₁₀	PM _{2.5}
Staging Site	0.02	0.21	0.01	0.01
Site 1, Line F-4 (#793)	0.00	0.01	0.00	0.00
Site 2, Line J-1 (#812)	0.00	0.04	0.00	0.00
Site 3, Line F (#814)	0.00	0.00	0.00	0.00
Site 4, Line F (#820)	0.00	0.05	0.00	0.00
Site 5, Line G (#797)	0.00	0.03	0.00	0.00
Site 6, Line K Tassajara Ck (#799)	0.00	0.01	0.00	0.00
Site 7, Line G Arroyo Mocho (#813)	0.00	0.02	0.00	0.00
Site 8, Line F (#823)	0.00	0.03	0.00	0.00
Site 9, Line F (#824)	0.00	0.03	0.00	0.00
Site 10, Line R Altamont Creek (#542)	0.01	0.08	0.00	0.00
Total Project Emissions (tons)	0.04	0.51	0.02	0.02
Average Daily Emissions for entire project (lbs/day)				
Total Project Emissions (lbs)	75.72	1,012.44	40.55	35.00
Daily Average (lbs/day over 85 workdays)	0.89	11.91	0.48	0.41
Significance Thresholds	54	54	82	54
Significant Impact?	No	No	No	No

Total Combined Annual GHG Construction Emissions

Construction Activity Source	CO ₂ e (metric tons)
Staging Site	26.27
Site 1, Line F-4 (#793)	1.98
Site 2, Line J-1 (#812)	6.58
Site 3, Line F (#814)	1.52
Site 4, Line F (#820)	7.93
Site 5, Line G (#797)	5.50
Site 6, Line K Tassajara Ck (#799)	2.42
Site 7, Line G Arroyo Mocho (#813)	3.22
Site 8, Line F (#823)	5.28
Site 9, Line F (#824)	5.18
Site 10, Line R Altamont Creek (#542)	9.14
Total Emissions	75.02
Significance Thresholds	1,100
Significant Impact?	No

2. Emission Summaries and Worker Vehicle and Truck Emissions

On-Road Vehicle Criteria Pollutant Emission Factors

Vehicle Type (calendar year)	grams/mile			
	ROG	NO _x	PM10*	PM2.5*
Light duty truck Gasoline (2016)	0.0306	0.1627	0.05	0.0193
Heavy Duty Truck Diesel (2016)	0.4176	9.1220	0.26	0.1903
Water Truck (2016)	0.2923	7.9735	0.21	0.1462

*PM10 and PM2.5 emission factors include tire and break wear.

Vehicle emission factors were obtained from EMFAC2014.

Light duty truck = LDT2; Heavy diesel truck = T7 tractor construction.

On-Road Vehicle GHG Emission Factors

Vehicle Type (calendar year)	grams/mile		
	CO ₂	CH ₄	N ₂ O
Light duty truck (2016)	422	0.0333	0.00
Heavy Diesel Truck (2016)	1719	0.0051	0.00
Water Truck (2016)	1709	0.0051	0.00

Notes:

Vehicle emission factors for CO₂ is from EMFAC2014 (see appendix section 3, EMFAC2014 Emission Factors., CH₄ and N₂O emission factors are from TCR, 2015. Gasoline Light Trucks Model Year 2012 and Diesel Heavy-Duty Trucks All Model Years.

Light duty truck = LDT2; Heavy diesel truck = T7 tractor construction; water truck = T7 single construction.

Reference:

The Climate Registry (TCR), 2015. 2015 Climate Registry Default Emission Factors, Table 13.5. Released: April 2015.

Staging Site

Criteria Pollutant Emissions Summary

Emissions Source	Total Emissions (tons)			
	ROG	NO _x	PM10	PM2.5
Off-road Equipment and Vehicles	0.02	0.19	0.01	0.01
Worker Commute, Water Truck	0.00	0.02	0.00	0.00
Total	0.02	0.21	0.01	0.01

For Off-road Equipment and Vehicle Emissions see CalEEMod output sheets.

Worker Commute and Water Truck Criteria Pollutant Emissions

Vehicle Type	Workdays	Trips/day	miles/trip	ROG	NO _x	PM10	PM2.5
Light-Duty Gasoline Trucks	85	1	50.00	0.29	1.52	0.43	0.18
Water Truck	85	2	10.00	1.10	29.88	0.80	0.55
Total pounds				1.38	31.41	1.23	0.73
Total tons				0.00	0.02	0.00	0.00

GHG Emissions Summary

Emissions Source	CO ₂ e
	(metric tons)
Off-road Equipment and Vehicles	21.56
Worker Commute Truck Haul Trips	4.71
Total	26.27

For Off-road Equipment and Vehicle Emissions see CalEEMod output sheets.

Worker Commute and Water Truck Trip GHG Emissions

Vehicle Type	Workdays	Trips/day	miles/trip	CO ₂	CH ₄	N ₂ O	CO ₂ e
Light-Duty Gasoline Trucks	85	1	50.00	1.79	0.00	0.00	1.80
Heavy-Duty Diesel Trucks	85	2	10.00	2.91	0.00	0.00	2.91
Total (metric tons/year)				4.70	0.00	0.00	4.71

Global Warming Potential for CH₄ = 25; GWP for N₂O = 298 (CARB, 2014).

One construction crew members would commute average of 25 miles (50 miles roundtrip) to the site eachday. One water truck would make two trips per day to the water supply site and the active creek restoration site (assumed average of 10 miles roundtrip). It is assumed that the staging area would be active for the duration of the project, which would be approximately 85 workdays.

Site 1, Line F-4 (#793)

Criteria Pollutant Emissions Summary

Emissions Source	Total Emissions (pounds/day)			
	ROG	NO _x	PM10	PM2.5
Off-road Equipment and Vehicles	0.00	0.01	0.00	0.00
Worker Commute Truck Haul Trips	0.00	0.00	0.00	0.00
Total	0.00	0.01	0.00	0.00

For Off-road Equipment and Vehicle Emissions see CalEEMod output sheets.

Worker Commute and Truck Haul Trip Criteria Pollutant Emissions

Vehicle Type	Workdays	Trips/day	miles/trip	ROG	NO _x	PM10	PM2.5
Light-Duty Gasoline Trucks	7	4	50.00	0.09	0.50	0.14	0.06
Heavy-Duty Diesel Trucks	7	1.1	15.20	0.11	2.45	0.07	0.05
Total pounds				0.21	2.95	0.21	0.11
Total tons				0.00	0.00	0.00	0.00

GHG Emissions Summary

Emissions Source	CO ₂ e (metric tons)
Off-road Equipment and Vehicles	1.18
Worker Commute Truck Haul Trips	0.80
Total	1.98

For Off-road Equipment and Vehicle Emissions see CalEEMod output sheets.

Worker Commute and Truck Haul Trip GHG Emissions

Vehicle Type	Workdays	Trips	miles/trip	CO ₂	CH ₄	N ₂ O	CO ₂ e
Light-Duty Gasoline Trucks	7	4	50.00	0.59	0.00	0.00	0.59
Heavy-Duty Diesel Trucks	7	1.1	15.20	0.21	0.00	0.00	0.21
Total (metric tons/year)				0.80	0.00	0.00	0.80

Four construction crew members would commute average of 25 miles (50 miles roundtrip) to the site each day. There would be a total of 8 trips to the Bernal Staging site (roundtrip estimated to be approximately 15.2 miles).

Global Warming Potential for CH₄ = 25; GWP for N₂O = 298 (CARB, 2014).

Site 2, Line J-1 (#812)

Criteria Pollutant Emissions Summary

Emissions Source	Total Emissions (pounds/day)			
	ROG	NO _x	PM10	PM2.5
Off-road Equipment and Vehicles	0.00	0.02	0.00	0.00
Worker Commute Truck Haul Trips	0.00	0.02	0.00	0.00
Total	0.00	0.04	0.00	0.00

For Off-road Equipment and Vehicle Emissions see CalEEMod output sheets.

Worker Commute and Truck Haul Trip Criteria Pollutant Emissions

Vehicle Type	Workdays	Trips/day	miles/trip	ROG	NO _x	PM10	PM2.5
Light-Duty Gasoline Trucks	7	4	50.00	0.09	0.50	0.14	0.06
Heavy-Duty Diesel Trucks	7	13.7	16.60	1.47	32.05	0.91	0.67
Total pounds				1.56	32.55	1.06	0.73
Total tons				0.00	0.02	0.00	0.00

GHG Emissions Summary

Emissions Source	CO ₂ e
	(metric tons)
Off-road Equipment and Vehicles	3.24
Worker Commute Truck Haul Trips	3.34
Total	6.58

For Off-road Equipment and Vehicle Emissions see CalEEMod output sheets.

Worker Commute and Truck Haul Trip GHG Emissions

Vehicle Type	Workdays	Trips	miles/trip	CO ₂	CH ₄	N ₂ O	CO ₂ e
Light-Duty Gasoline Trucks	7	4	50.00	0.59	0.00	0.00	0.59
Heavy-Duty Diesel Trucks	7	13.7	16.60	2.74	0.00	0.00	2.74
Total (metric tons/year)				3.33	0.00	0.00	3.34

Four construction crew members would commute average of 25 miles (50 miles roundtrip) to the site each day. There would be a total of 96 truck trips to the Bernal Staging site (roundtrip estimated to be approximately 16.6 miles).

Global Warming Potential for CH₄ = 25; GWP for N₂O = 298 (CARB, 2014).

Site 3, Line F (#814)

Criteria Pollutant Emissions Summary

Emissions Source	Total Emissions (pounds/day)			
	ROG	NO _x	PM10	PM2.5
Off-road Equipment and Vehicles	0.00	0.00	0.00	0.00
Worker Commute Truck Haul Trips	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00

For Off-road Equipment and Vehicle Emissions see CalEEMod output sheets.

Worker Commute and Truck Haul Trip Criteria Pollutant Emissions

Vehicle Type	Workdays	Trips/day	miles/trip	ROG	NO _x	PM10	PM2.5
Light-Duty Gasoline Trucks	15	4	50.00	0.20	1.08	0.31	0.13
Heavy-Duty Diesel Trucks	15	0.5	18.00	0.13	2.90	0.08	0.06
Total pounds				0.34	3.97	0.39	0.19
Total tons				0.00	0.00	0.00	0.00

GHG Emissions Summary

Emissions Source	CO ₂ e (metric tons)
Off-road Equipment and Vehicles	0.00
Worker Commute Truck Haul Trips	1.52
Total	1.52

For Off-road Equipment and Vehicle Emissions see CalEEMod output sheets.

Worker Commute and Truck Haul Trip GHG Emissions

Vehicle Type	Workdays	Trips/day	miles/trip	CO ₂	CH ₄	N ₂ O	CO ₂ e
Light-Duty Gasoline Trucks	15	4	50.00	1.27	0.00	0.00	1.27
Heavy-Duty Diesel Trucks	15	0.5	18.00	0.25	0.00	0.00	0.25
Total (metric tons/year)				1.51	0.00	0.00	1.52

Four construction crew members would commute average of 25 miles (50 miles roundtrip) to the site each day. There would be a total of 8 trips to the Bernal Staging site (roundtrip estimated to be approximately 18 miles).

Global Warming Potential for CH₄ = 25; GWP for N₂O = 298 (CARB, 2014).

Site 4, Line F (#820)

Criteria Pollutant Emissions Summary

Emissions Source	Total Emissions (pounds/day)			
	ROG	NO _x	PM10	PM2.5
Off-road Equipment and Vehicles	0.00	0.02	0.00	0.00
Worker Commute Truck Haul Trips	0.00	0.02	0.00	0.00
Total	0.00	0.05	0.00	0.00

For Off-road Equipment and Vehicle Emissions see CalEEMod output sheets.

Worker Commute and Truck Haul Trip Criteria Pollutant Emissions

Vehicle Type	Workdays	Trips/day	miles/trip	ROG	NO _x	PM10	PM2.5
Light-Duty Gasoline Trucks	8	4	50.00	0.11	0.57	0.16	0.07
Heavy-Duty Diesel Trucks	8	18.5	14.60	1.99	43.45	1.24	0.91
Total pounds				2.10	44.03	1.40	0.97
Total tons				0.00	0.02	0.00	0.00

Four construction crew members would commute average of 25 miles (50 miles roundtrip) to the site each day. There would be a total of 148 trips to the Bernal Staging site (roundtrip estimated to be approximately 14.6 miles).

GHG Emissions Summary

Emissions Source	CO ₂ e (metric tons)
Off-road Equipment and Vehicles	3.54
Worker Commute Truck Haul Trips	4.40
Total	7.93

For Off-road Equipment and Vehicle Emissions see CalEEMod output sheets.

Worker Commute and Truck Haul Trip GHG Emissions

Vehicle Type	Workdays	Trips/day	miles/trip	CO ₂	CH ₄	N ₂ O	CO ₂ e
Light-Duty Gasoline Trucks	8	4	50.00	0.68	0.00	0.00	0.68
Heavy-Duty Diesel Trucks	8	18.5	14.60	3.72	0.00	0.00	3.72
Total (metric tons/year)				4.39	0.00	0.00	4.40

Four construction crew members would commute average of 25 miles (50 miles roundtrip) to the site each day. There would be a total of 148 trips to the Bernal Staging site (roundtrip estimated to be approximately 14.6 miles).

Global Warming Potential for CH₄ = 25; GWP for N₂O = 298 (CARB, 2014).

Site 5, Line G (#797)

Criteria Pollutant Emissions Summary

Emissions Source	Total Emissions (pounds/day)			
	ROG	NO _x	PM10	PM2.5
Off-road Equipment and Vehicles	0.00	0.02	0.00	0.00
Worker Commute Truck Haul Trips	0.00	0.01	0.00	0.00
Total	0.00	0.03	0.00	0.00

For Off-road Equipment and Vehicle Emissions see CalEEMod output sheets.

Worker Commute and Truck Haul Trip Criteria Pollutant Emissions

Vehicle Type	Workdays	Trips/day	miles/trip	ROG	NO _x	PM10	PM2.5
Light-Duty Gasoline Trucks	9	4	50.00	0.12	0.65	0.18	0.08
Heavy-Duty Diesel Trucks	9	16.4	6.00	0.82	17.86	0.51	0.37
Total pounds				0.94	18.50	0.69	0.45
Total tons				0.00	0.01	0.00	0.00

GHG Emissions Summary

Emissions Source	CO ₂ e
	(metric tons)
Off-road Equipment and Vehicles	3.21
Worker Commute Truck Haul Trips	2.29
Total	5.50

For Off-road Equipment and Vehicle Emissions see CalEEMod output sheets.

Worker Commute and Truck Haul Trip GHG Emissions

Vehicle Type	Workdays	Trips/day	miles/trip	CO ₂	CH ₄	N ₂ O	CO ₂ e
Light-Duty Gasoline Trucks	9	4	50.00	0.76	0.00	0.00	0.76
Heavy-Duty Diesel Trucks	9	16.4	6.00	1.53	0.00	0.00	1.53
Total (metric tons/year)				2.29	0.00	0.00	2.29

Four construction crew members would commute average of 25 miles (50 miles roundtrip) to the site each day. There would be a total of 148 trips to the Bernal Staging site (roundtrip estimated to be approximately 6.0 miles).

Global Warming Potential for CH₄ = 25; GWP for N₂O = 298 (CARB, 2014).

Site 6, Line K Tassajara Ck (#799)

Criteria Pollutant Emissions Summary

Emissions Source	Total Emissions (pounds/day)			
	ROG	NO _x	PM10	PM2.5
Off-road Equipment and Vehicles	0.00	0.01	0.00	0.00
Worker Commute Truck Haul Trips	0.00	0.00	0.00	0.00
Total	0.00	0.01	0.00	0.00

For Off-road Equipment and Vehicle Emissions see CalEEMod output sheets.

Worker Commute and Truck Haul Trip Criteria Pollutant Emissions

Vehicle Type	Workdays	Trips/day	miles/trip	ROG	NO _x	PM10	PM2.5
Light-Duty Gasoline Trucks	5	4	50.00	0.07	0.36	0.10	0.04
Heavy-Duty Diesel Trucks	0	0	0.00	0.00	0.00	0.00	0.00
Total pounds				0.07	0.36	0.10	0.04
Total tons				0.00	0.00	0.00	0.00

Four construction crew members would commute average of 25 miles (50 miles roundtrip) to the site each day. Three dump trucks would make 5 trips per day to the Bernal Staging site (roundtrip estimated to be approximately 11 miles).

GHG Emissions Summary

Emissions Source	CO ₂ e (metric tons)
Off-road Equipment and Vehicles	2.00
Worker Commute Truck Haul Trips	0.42
Total	2.42

For Off-road Equipment and Vehicle Emissions see CalEEMod output sheets.

Worker Commute and Truck Haul Trip GHG Emissions

Vehicle Type	Workdays	Trips/day	miles/trip	CO ₂	CH ₄	N ₂ O	CO ₂ e
Light-Duty Gasoline Trucks	5	4	50.00	0.42	0.00	0.00	0.42
Heavy-Duty Diesel Trucks	5	0	0.00	0.00	0.00	0.00	0.00
Total (metric tons/year)				0.42	0.00	0.00	0.42

Four construction crew members would commute average of 25 miles (50 miles roundtrip) to the site each day for 5 days. Three dump trucks would make 5 trips per day to the Bernal Staging site (roundtrip estimated to be approximately 11 miles) for 5 days.

Global Warming Potential for CH₄ = 25; GWP for N₂O = 298 (CARB, 2014).

Site 7, Line G Arroyo Mocho (#813)

Criteria Pollutant Emissions Summary

Emissions Source	Total Emissions (pounds/day)			
	ROG	NO _x	PM10	PM2.5
Off-road Equipment and Vehicles	0.00	0.02	0.00	0.00
Worker Commute Truck Haul Trips	0.00	0.00	0.00	0.00
Total	0.00	0.02	0.00	0.00

For Off-road Equipment and Vehicle Emissions see CalEEMod output sheets.

Worker Commute and Truck Haul Trip Criteria Pollutant Emissions

Vehicle Type	Workdays	Trips/day	miles/trip	ROG	NO _x	PM10	PM2.5
Light-Duty Gasoline Trucks	5	4	50.00	0.07	0.36	0.10	0.04
Heavy-Duty Diesel Trucks	5	6.4	6.00	0.18	3.86	0.11	0.08
Total pounds				0.24	4.22	0.21	0.12
Total tons				0.00	0.00	0.00	0.00

Four construction crew members would commute average of 25 miles (50 miles roundtrip) to the site each day. There would be a total of 32 trips to the Bernal Staging site (roundtrip estimated to be approximately 6.0 miles).

GHG Emissions Summary

Emissions Source	CO ₂ e (metric tons)
Off-road Equipment and Vehicles	2.46
Worker Commute Truck Haul Trips	0.75
Total	3.22

For Off-road Equipment and Vehicle Emissions see CalEEMod output sheets.

Worker Commute and Truck Haul Trip GHG Emissions

Vehicle Type	Workdays	Trips/day	miles/trip	CO ₂	CH ₄	N ₂ O	CO ₂ e
Light-Duty Gasoline Trucks	5	4	50.00	0.42	0.00	0.00	0.42
Heavy-Duty Diesel Trucks	5	6.4	6.00	0.33	0.00	0.00	0.33
Total (metric tons/year)				0.75	0.00	0.00	0.75

Four construction crew members would commute average of 25 miles (50 miles roundtrip) to the site each day. There would be a total of 32 trips to the Bernal Staging site (roundtrip estimated to be approximately 6.0 miles).

Global Warming Potential for CH₄ = 25; GWP for N₂O = 298 (CARB, 2014).

Site 8, Line F (#823)

Criteria Pollutant Emissions Summary

Emissions Source	Total Emissions (pounds/day)			
	ROG	NO _x	PM10	PM2.5
Off-road Equipment and Vehicles	0.00	0.03	0.00	0.00
Worker Commute Truck Haul Trips	0.00	0.01	0.00	0.00
Total	0.00	0.03	0.00	0.00

For Off-road Equipment and Vehicle Emissions see CalEEMod output sheets.

Worker Commute and Truck Haul Trip Criteria Pollutant Emissions

Vehicle Type	Workdays	Trips/day	miles/trip	ROG	NO _x	PM10	PM2.5
Light-Duty Gasoline Trucks	8	4	50.00	0.11	0.57	0.16	0.07
Heavy-Duty Diesel Trucks	8	15.0	4.80	0.53	11.58	0.33	0.24
Total pounds				0.64	12.16	0.49	0.31
Total tons				0.00	0.01	0.00	0.00

GHG Emissions Summary

Emissions Source	CO ₂ e (metric tons)
Off-road Equipment and Vehicles	3.61
Worker Commute Truck Haul Trips	1.67
Total	5.28

For Off-road Equipment and Vehicle Emissions see CalEEMod output sheets.

Worker Commute and Truck Haul Trip GHG Emissions

Vehicle Type	Workdays	Trips/day	miles/trip	CO ₂	CH ₄	N ₂ O	CO ₂ e
Light-Duty Gasoline Trucks	8	4	50.00	0.68	0.00	0.00	0.68
Heavy-Duty Diesel Trucks	8	15.0	4.80	0.99	0.00	0.00	0.99
Total (metric tons/year)				1.67	0.00	0.00	1.67

Four construction crew members would commute average of 25 miles (50 miles roundtrip) to the site each day. There would be a total of 120 trips to the Bernal Staging site (roundtrip estimated to be approximately 4.8 miles).

Global Warming Potential for CH₄ = 25; GWP for N₂O = 298 (CARB, 2014).

Site 9, Line F (#824)

Criteria Pollutant Emissions Summary

Emissions Source	Total Emissions (pounds/day)			
	ROG	NO _x	PM10	PM2.5
Off-road Equipment and Vehicles	0.00	0.02	0.00	0.00
Worker Commute	0.00	0.01	0.00	0.00
Total	0.00	0.03	0.00	0.00

For Off-road Equipment and Vehicle Emissions see CalEEMod output sheets.

Worker Commute and Truck Haul Trip Criteria Pollutant Emissions

Vehicle Type	Workdays	Trips/day	miles/trip	ROG	NO _x	PM10	PM2.5
Light-Duty Gasoline Trucks	6	4	50.00	0.08	0.43	0.12	0.05
Heavy-Duty Diesel Trucks	6	20.0	10.00	1.10	24.13	0.69	0.50
Total pounds				1.19	24.56	0.81	0.55
Total tons				0.00	0.01	0.00	0.00

GHG Emissions Summary

Emissions Source	CO ₂ e (metric tons)
Off-road Equipment and Vehicles	2.61
Worker Commute	2.57
Total	5.18

For Off-road Equipment and Vehicle Emissions see CalEEMod output sheets.

Worker Commute and Truck Haul Trip GHG Emissions

Vehicle Type	Workdays	Trips/day	miles/trip	CO ₂	CH ₄	N ₂ O	CO ₂ e
Light-Duty Gasoline Trucks	6	4	50.00	0.51	0.00	0.00	0.51
Heavy-Duty Diesel Trucks	6	20.0	10.00	2.06	0.00	0.00	2.07
Total (metric tons/year)				2.57	0.00	0.00	2.57

One construction crew member would commute average of 25 miles (50 miles roundtrip) to the site each day. There would be a total of 120 trips to the Bernal Staging site (roundtrip estimated to be approximately 10.0 miles).

Global Warming Potential for CH₄ = 25; GWP for N₂O = 298 (CARB, 2014).

Site 10, Line R Altamont Creek (#542)

Criteria Pollutant Emissions Summary

Emissions Source	Total Emissions (pounds/day)			
	ROG	NO _x	PM10	PM2.5
Off-road Equipment and Vehicles	0.00	0.05	0.00	0.00
Worker Commute	0.00	0.03	0.00	0.00
Total	0.01	0.08	0.00	0.00

For Off-road Equipment and Vehicle Emissions see CalEEMod output sheets.

Worker Commute and Truck Haul Trip Criteria Pollutant Emissions

Vehicle Type	Workdays	Trips/day	miles/trip	ROG	NO _x	PM10	PM2.5
Light-Duty Gasoline Trucks	15	4	50.00	0.20	1.08	0.31	0.13
Heavy-Duty Diesel Trucks	15	12.8	14.00	2.47	54.06	1.54	1.13
Total pounds				2.68	55.13	1.84	1.25
Total tons				0.00	0.03	0.00	0.00

GHG Emissions Summary

Emissions Source	CO ₂ e (metric tons)
Off-road Equipment and Vehicles	7.87
Worker Commute	1.27
Total	9.14

For Off-road Equipment and Vehicle Emissions see CalEEMod output sheets.

Worker Commute and Truck Haul Trip GHG Emissions

Vehicle Type	Workdays	Trips/day	miles/trip	CO ₂	CH ₄	N ₂ O	CO ₂ e
Light-Duty Gasoline Trucks	15	4	50.00	1.27	0.00	0.00	1.27
Heavy-Duty Diesel Trucks	15	12.8	14.00	4.62	0.00	0.00	4.63
Total (metric tons/year)				1.27	0.00	0.00	1.27

One construction crew member would commute average of 25 miles (50 miles roundtrip) to the site each day for 17 days.

Global Warming Potential for CH₄ = 25; GWP for N₂O = 298 (CARB, 2014).

3. EMFAC2014 (v1.0.7) Emission Rates

Region Type: County

Region: Alameda

Calendar Year: 2016

Season: Annual

Vehicle Classification: EMFAC2011 Categories

Units: miles/day for VMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip for STREX, HTSK and RUNLS, g/vehicle/day for IDLEX, RESTL and DIURN

Region	CalYr	VehClass	MdlYr	Speed	Fuel	Population	VMT	Trips	(g/mile)									
									ROG_RUNEX	CO_RUNEX	NOx_RUNEX	CO2_RUNEX	PM10_RUNEX	PM10_PMTW	PM10_PMBW	PM2.5_RUNEX	PM2.5_PMTW	PM2.5_PMBW
Alameda	2016	D72	Aggregated	Aggregated	GAS	197749.0481	7691876.014	1241703.24	0.030612911	1.258758094	0.162718787	422.1993167	0.001652688	0.008600002	0.036750011	0.001521801	0.002000001	0.015750005
Alameda	2016	T7 tractor construction	Aggregated	Aggregated	DSL	560.4390868	42903.27919	0	0.417628017	1.439655383	9.121978927	1719.459268	0.161799901	0.03600001	0.061740018	0.154799656	0.009000003	0.026460008
Alameda	2016	T7 single construction	Aggregated	Aggregated	DSL	734.1896536	57543.96528	0	0.292298969	1.033157676	7.973533416	1709.257717	0.115775496	0.03600001	0.061740018	0.110767099	0.009000003	0.026460008

4. Operating Hours for CalEEMod and EMFAC2014 Emissions Calculations

	PROJECT	Line F-4, Project #793	Line J-1, Project #812	Line F Project #814	Line J Project #820	Line G Project #797	Line K Project #799	Line G Project #813	Line F Project #823	Line F Project #824	Line R Project #542
CalEEMod Run	One Excavator, Long Reach				56	48			40	40	
	One Excavator		56				32	40			96
	One Excavator, Mini	16							32		
	One Skiploader	16			16	24	8	8	16	16	
	One Skidsteer	8									192
Estimated outside of CalEEMod using EMFAC2014	One End Dump		48 x 2								192
	One 10 Wheel Dump Truck	8		8	48 x 3	48 x 3		32	40 x 3	40 x 3	
	Work days per site	7	7	15	8	9	5	5	8	6	15
	Ave. hrs per day for each equipment type's total operating hours listed above	2.3	8.0	0.5	7.0	5.3	6.4	8.0	5.0	6.7	6.4
		1.1	13.7		2.0	2.7	1.6	1.6	4.0	2.7	12.8
					18.0	16.0		6.4	2.0	20.0	
									15.0		

Note, it is assumed that all trucks (end dump and 10 wheel dump truck) would be operated by a separate contractor. Those emissions are estimated outside of CalEEMod.

Total Project Work Days	85
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GENERAL (staging area)	
One Water Truck	200
One Cat 980 Loader	240

Ave. hrs per day	2.35
	2.82