

Appendix B: Air Quality and Greenhouse Gas Emissions

**Beaumont Recharge
Onsite Emissions**

Construction Emissions (without mitigation)

Emission Summary

Activity	ROG (lbs/day)	CO (lbs/day)	Nox (lbs/day)	PM10 Exhaust (lbs/day)	PM10 Fugitive (lbs/day)	PM10 Total (lbs/day)	PM2.5 Exhaust (lbs/day)	PM2.5 Fugitive (lbs/day)	PM2.5 Total (lbs/day)	Sox (lbs/day)	CO2 (lbs/day)
Recharge Basin											
Offroad Equipment	8.7	42.1	104.7	4.4	8.2	12.6	4.0	4.5	8.6	0.1	8769.0
Haul Truck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Worker Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Subtotal	8.7	42.1	104.7	4.4	8.2	12.6	4.0	4.5	8.6	0.1	8769.0
Pipeline Construction											
Excavation and Shoring											
Offroad Equipment	2.7	13.6	29.9	1.6	11.2	12.8	1.4	1.7	3.1	0.1	2876.6
Haul Truck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Worker Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Subtotal	2.7	13.6	29.9	1.6	11.2	12.8	1.4	1.7	3.1	0.1	2876.6
Installation and Backfill											
Offroad Equipment	0.8	3.1	4.0	0.3	0.0	0.3	0.0	0.0	0.0	0.0	434.9
Haul Truck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Worker Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Subtotal	0.8	3.1	4.0	0.3	0.0	0.3	0.0	0.0	0.0	0.0	434.9
Street Restoration											
Offroad Equipment	0.3	0.9	2.0	0.2	0.0	0.2	0.1	0.0	0.1	0.0	164.7
Haul Truck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Worker Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Subtotal	0.3	0.9	2.0	0.2	0.0	0.2	0.1	0.0	0.1	0.0	164.7
Jack and Bore											
Offroad Equipment	2.7	17.7	35.6	1.4	0.0	1.4	1.3	0.0	1.3	0.0	3605.4
Haul Trucks	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Worker Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Subtotal	2.7	17.7	35.6	1.4	0.0	1.4	1.3	0.0	1.3	0.0	3605.4
Service Connection											
Offroad Equipment	0.9	4.4	9.7	0.5	0.0	0.5	0.5	0.0	0.5	0.0	1047.4
Haul Trucks	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Worker Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Subtotal	0.9	4.4	9.7	0.5	0.0	0.5	0.5	0.0	0.5	0.0	1047.4
Well Construction											
Offroad Equipment	6.1	31.9	46.8	2.1	0.0	2.1	2.0	0.0	2.0	0.1	6126.1
Worker Vehicles	0	0	0	0	0	0	0	0	0	0	0
Subtotal	6.1	31.9	46.8	2.1	0.0	2.1	2.0	0.0	2.0	0.1	6126.1
Total (All Activities)	22.2	113.7	232.6	10.5	19.4	29.9	9.3	6.2	15.6	0.3	23024.0
Total (Recharge)	8.7	42.1	104.7	4.4	8.2	12.6	4.0	4.5	8.6	0.1	8769.0
Total (Pipeline)	6.5	35.3	71.4	3.4	11.2	14.6	2.9	1.7	4.6	0.1	7081.6
Total (Service Connection)	0.9	4.4	9.7	0.5	0.0	0.5	0.5	0.0	0.5	0.0	1047.4
Total (Well Construction)	6.1	31.9	46.8	2.1	0.0	2.1	2.0	0.0	2.0	0.1	6126.1

Beaumont Recharge
Offsite Emissions

Construction Emissions (without mitigation)

Emission Summary

Activity	ROG (lbs/day)	CO (lbs/day)	Nox (lbs/day)	PM10 Exhaust (lbs/day)	PM10 Fugitive (lbs/day)	PM10 Total (lbs/day)	PM2.5 Exhaust (lbs/day)	PM2.5 Fugitive (lbs/day)	PM2.5 Total (lbs/day)	Sox (lbs/day)	CO2 (lbs/day)
Recharge Basin											
Offroad Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Haul Truck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Worker Vehicles	0.1	2.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	516.1
Subtotal	0.1	2.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	516.1
Pipeline Construction											
Excavation and Shoring											
Offroad Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Haul Truck	0.0	0.14	0.5	0.0	8.0	8.0	0.0	1.7	1.7	0.0	83.6
Worker Vehicles	0.1	2.5	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	645.1
Subtotal	0.1	2.7	0.8	0.0	8.0	8.0	0.0	1.7	1.7	0.0	728.8
Installation and Backfill											
Offroad Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Haul Truck	0.0	0.1	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	152.0
Worker Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Subtotal	0.0	0.1	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	152.0
Street Restoration											
Offroad Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Haul Truck	0.1	0.5	2.8	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.0
Worker Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Subtotal	0.1	0.5	2.8	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.0
Jack and Bore											
Offroad Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Haul Trucks	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Worker Vehicles	0.0	0.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	215.0
Subtotal	0.0	0.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	215.0
Service Connection											
Offroad Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Haul Trucks	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Worker Vehicles	0.0	1.9	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	258.0
Subtotal	0.0	1.9	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	258.0
Well Construction											
Offroad Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Worker Vehicles	0.0	0.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	215.0
Subtotal	0.0	0.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	215.0
Total (All Activities)	0.4	9.0	4.9	0.1	8.0	8.1	0.1	1.7	1.8	0.1	2085.0
Total (Recharge)	0.1	2.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	516.1
Total (Pipeline)	0.3	4.2	4.4	0.1	8.0	8.1	0.1	1.7	1.8	0.1	1095.8
Total (Service Connection)	0.0	1.9	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	258.0
Total (Well Construction)	0.7	17.2	9.7	0.2	16.1	16.2	0.2	3.4	3.5	0.2	3954.9

Beaumont Recharge
Onsite + Offsite Emissions

Construction Emissions (without mitigation)

Emission Summary

Activity	ROG (lbs/day)	CO (lbs/day)	Nox (lbs/day)	PM10 Exhaust (lbs/day)	PM10 Fugitive (lbs/day)	PM10 Total (lbs/day)	PM2.5 Exhaust (lbs/day)	PM2.5 Fugitive (lbs/day)	PM2.5 Total (lbs/day)	Sox (lbs/day)	CO2 (lbs/day)
Recharge Basin											
Offroad Equipment	8.7	42.1	104.7	4.4	8.2	12.6	4.0	4.5	8.6	0.1	8769.0
Haul Truck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Worker Vehicles	0.1	2.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	516.1
Subtotal	8.8	44.2	105.0	4.4	8.2	12.6	4.0	4.5	8.6	0.1	9285.1
Pipeline Construction											
Excavation and Shoring											
Offroad Equipment	2.7	13.6	29.9	1.6	11.2	12.8	1.4	1.7	3.1	0.1	2876.6
Haul Truck	0.0	0.1	0.5	0.0	8.0	8.0	0.0	1.7	1.7	0.0	83.6
Worker Vehicles	0.1	2.5	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	645.1
Subtotal	2.8	16.3	30.7	1.6	19.2	20.8	1.5	3.4	4.8	0.1	3605.3
Installation and Backfill											
Offroad Equipment	0.8	3.1	4.0	0.3	0.0	0.3	0.0	0.0	0.0	0.0	434.9
Haul Truck	0.0	0.1	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	152.0
Worker Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Subtotal	0.8	3.2	4.7	0.3	0.0	0.3	0.0	0.0	0.0	0.0	586.8
Street Restoration											
Offroad Equipment	0.3	0.9	2.0	0.2	0.0	0.2	0.1	0.0	0.1	0.0	164.7
Haul Truck	0.1	0.5	2.8	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.0
Worker Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Subtotal	0.4	1.5	4.8	0.2	0.0	0.2	0.2	0.0	0.2	0.1	164.7
Jack and Bore											
Offroad Equipment	2.7	17.7	35.6	1.4	0.0	1.4	1.3	0.0	1.3	0.0	3605.4
Haul Trucks	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Worker Vehicles	0.0	0.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	215.0
Subtotal	2.8	18.5	35.7	1.4	0.0	1.4	1.3	0.0	1.3	0.0	3820.4
Service Connection											
Offroad Equipment	0.9	4.4	9.7	0.5	0.0	0.5	0.5	0.0	0.5	0.0	1047.4
Haul Trucks	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Worker Vehicles	0.0	1.9	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	258.0
Subtotal	0.9	6.4	9.8	0.5	0.0	0.5	0.5	0.0	0.5	0.0	1305.5
Well Construction											
Offroad Equipment	6.1	31.9	46.8	2.1	0.0	2.1	2.0	0.0	2.0	0.1	6126.1
Worker Vehicles	0.0	0.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	215.0
Subtotal	6.1	32.7	46.9	2.1	0.0	2.1	2.0	0.0	2.0	0.1	6341.1
Total (All Activities)	22.5	122.7	237.5	10.5	27.5	38.0	9.4	7.9	17.3	0.4	25109.0
Total (Recharge)	8.8	44.2	105.0	4.4	8.2	12.6	4.0	4.5	8.6	0.1	9285.1
Total (Pipeline)	6.7	39.5	75.8	3.5	19.2	22.7	2.9	3.4	6.3	0.2	8177.3
Total (Service Connection)	0.9	6.4	9.8	0.5	0.0	0.5	0.5	0.0	0.5	0.0	1305.5
Total (Well Construction)	6.1	32.7	46.9	2.1	0.0	2.1	2.0	0.0	2.0	0.1	6341.1

Annual CO2 Emissions

	Annual CO2 Emissions (tons/year)	Annual CO2e Emissions (tons/year)
Recharge Basin	371.4	338.0
Pipeline Construction		
Excavation and Shoring	21.6	19.7
Installation and Backfilling	2.9	2.7
Street Restoration	9.8	8.9
Jack and Bore	7.6	7.0
Subtotal	42.0	38.2
Service Connection	7.8	7.1
Well Construction	6.3	5.8
Total	427.6	389.1
		12.969171

30-year ammortized emissions 14.3

Beaumont Recharge
Onsite + Offsite Emissions

Construction Emissions (with mitigation)

Emission Summary

Activity	ROG (lbs/day)	CO (lbs/day)	Nox (lbs/day)	PM10 Exhaust (lbs/day)	PM10 Fugitive (lbs/day)	PM10 Total (lbs/day)	PM2.5 Exhaust (lbs/day)	PM2.5 Fugitive (lbs/day)	PM2.5 Total (lbs/day)	Sox (lbs/day)	CO2 (lbs/day)
Recharge Basin											
Offroad Equipment	8.2	52.7	93.6	4.1	8.2	12.6	3.7	4.5	8.6	0.0	8769.0
Haul Truck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Worker Vehicles	0.1	2.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	516.1
Subtotal	8.3	54.7	93.9	4.1	8.2	12.3	3.7	4.5	8.2	0.0	9285.1
Pipeline Construction											
Excavation and Shoring											
Offroad Equipment	2.7	13.6	29.9	1.6	11.2	12.8	1.4	1.7	3.1	0.1	2876.6
Haul Truck	0.0	0.1	0.5	0.0	8.0	8.0	0.0	1.7	1.7	0.0	83.6
Worker Vehicles	0.1	2.5	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	645.1
Subtotal	2.8	16.3	30.7	1.6	19.2	20.8	1.5	3.4	4.8	0.1	3605.3
Installation and Backfill											
Offroad Equipment	0.8	3.1	4.0	0.3	0.0	0.3	0.0	0.0	0.0	0.0	434.9
Haul Truck	0.0	0.1	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	152.0
Worker Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Subtotal	0.8	3.2	4.7	0.3	0.0	0.3	0.0	0.0	0.0	0.0	586.8
Street Restoration											
Offroad Equipment	0.3	0.9	2.0	0.2	0.0	0.2	0.1	0.0	0.1	0.0	164.7
Haul Truck	0.1	0.5	2.8	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.0
Worker Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Subtotal	0.4	1.5	4.8	0.2	0.0	0.2	0.2	0.0	0.2	0.1	164.7
Jack and Bore											
Offroad Equipment	2.7	17.7	35.6	1.4	0.0	1.4	1.3	0.0	1.3	0.0	3605.4
Haul Trucks	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Worker Vehicles	0.0	0.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	215.0
Subtotal	2.8	18.5	35.7	1.4	0.0	1.4	1.3	0.0	1.3	0.0	3820.4
Service Connection											
Offroad Equipment	0.9	4.4	9.7	0.5	0.0	0.5	0.5	0.0	0.5	0.0	1047.4
Haul Trucks	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Worker Vehicles	0.0	1.9	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	258.0
Subtotal	0.9	6.4	9.8	0.5	0.0	0.5	0.5	0.0	0.5	0.0	1305.5
Total (All Activities)	15.9	100.6	179.5	8.1	27.5	35.5	7.1	7.9	15.0	0.2	18767.8
Total (Recharge)	8.3	54.7	93.9	4.1	8.2	12.3	3.7	4.5	8.2	0.0	9285.1
Total (Pipe Ex+J&B)	5.6	34.8	66.4	3.0	19.2	22.2	2.7	3.4	6.1	0.1	7425.8

Annual CO2 Emissions

	Annual CO2 Emissions (tons/year)
Recharge Basin	371.4
Pipeline Construction	
Excavation and Shoring	21.6
Installation and Backfilling	2.9
Street Restoration	9.8
Subtotal	34.3
Jack and Bore	7.6
Service Connection	7.8
Total	421.2
30-year ammortized emissions	14.0

Beaumont Recharge Project
Recharge Basin

Construction Emissions

Onsite Exhaust Pollutant Emissions

Equipment	Number	Horsepower	Hours of Operation (hrs/day)	ROG Emission Factor (g/hp-hr)	ROG Daily Emissions (lb/day)	CO Emission Factor (g/hp-hr)	CO Daily Emissions (lb/day)	Nox Emission Factor (g/hp-hr)	Nox Daily Emissions (lb/day)	PM10 Emission Factor (g/hp-hr)	PM10 Daily Emissions (lb/day)	PM2.5 Emission Factor (g/hp-hr)	PM2.5 Daily Emissions (lb/day)	SOx Emission Factor (g/hp-hr)	SOx Daily Emissions (lb/day)	CO2 Emission Factor (g/hp-hr)	CO2 Daily Emissions (lb/day)
Scrapers	2	232	7	0.375	2.7	1.130	8.1	4.252	30.4	0.194	1.4	0.179	1.3	0.002	0.0	250	1791.6
Crawler Tractor	2	358	7	0.185	2.0	1.224	13.5	2.408	26.6	0.093	1.0	0.086	0.9	0.002	0.0	226	2494.2
Tracker Dozers	2	358	7	0.185	2.0	1.224	13.5	2.408	26.6	0.093	1.0	0.086	0.9	0.002	0.0	226	2494.2
Grader	1	162	6	0.362	0.8	1.133	2.4	3.557	7.6	0.200	0.4	0.184	0.4	0.002	0.0	218	467.5
Water Truck	3	381	3	0.157	1.2	0.610	4.6	1.789	13.5	0.069	0.5	0.063	0.5	0.002	0.0	201	1521.4
Total					8.7		42.1		104.7		4.4		4.0		0.1		8769.0

Construction equipment emission factors derived from OFFROAD2011

Onsite Fugitive Dust from Bulldozer Operations

$EF_{TSP} = C_{TSP} \times S^{1.2} / M^{1.3}$

where:

EF_{TSP} = emission factor for TSP (lb/hr)

C_{TSP} = coefficient in USEPA AP42 = 5.7

S = material silt content (%) = 6.9

M = material moisture content (%) = 7.9

EF_{TSP} = 3.94 lb/hr

$EF_{PM2.5} = EF_{TSP} \times F_{PM2.5}$

$F_{PM2.5}$ = scaling factor = 0.105

$EF_{PM2.5}$ = 0.414 lb/hr

Hours/day = 7

Number of dozers = 4

PM2.5 Emissions = 11.59 lb/day

$EF_{PM10} = C_{PM10} \times S^{1.5} / M^{1.4}$

where:

EF_{PM10} = emission factor for PM10 (lb/hr)

C_{PM10} = coefficient in USEPA AP42 = 1

S = material silt content (%) = 6.9

M = material moisture content (%) = 7.9

EF_{PM10} = 1.00 lb/hr

$EF_{PM10} = EF_{PM10} \times F_{PM10}$

F_{PM10} = scaling factor = 0.75

EF_{PM10} = 0.75 lb/hr

Hours/day = 7

Number of dozers = 4

PM10 Emissions = 21.08 lb/day

Mitigation under Rule 403

Watering 2 x per day = 61% reduction from soil disturbance

Mitigated PM2.5 = 4.52 lbs/day

Mitigated PM10 = 8.22 lbs/day

Methodology derived from CalEEMod

Offsite Vehicle Exhaust Emissions

Worker Vehicles (assumed to be LDT2 Gas Vehicles for All Speeds)

Number	12 per day	ROG Emission Factor (g/mi)	ROG Daily Emissions (lb/day)	CO Emission Factor (g/mi)	CO Daily Emissions (lb/day)	Nox Emission Factor (g/mi)	Nox Daily Emissions (lb/day)	PM10 Emission Factor (g/mi)	PM10 Daily Emissions (lb/day)	PM2.5 Emission Factor (g/mi)	PM2.5 Daily Emissions (lb/day)	SOx Emission Factor (g/mi)	SOx Daily Emissions (lb/day)	CO2 Emission Factor (g/mi)	CO2 Daily Emissions (lb/day)
Trip Length	20 miles														
Worker Vehicles		0.06	0.06	1.93	2.04	0.23	0.24	0.00	0.00	0.00	0.00	0.00	0.01	488.14	516.10

Number of vehicle trips = 1.2 x number of pieces of equipment

Annual CO2 Emissions

Total Daily Emissions (lbs/day)	Duration of Construction (days)	Annual Emissions (tons/year)
9285.1	80	371.40

Beaumont Recharge Project
Pipeline Construction

Construction Emissions

Onsite Pollutant Emissions

			Hours of	ROG	ROG	CO	CO	Nox	Nox	PM10	PM10	PM2.5	PM2.5	SOx	SOx	CO2	CO2	
			Operation	Emission	Daily	Emission	Daily	Emission	Daily	Emission	Daily	Emission	Daily	Emission	Daily	Emission	Daily	
Equipment	Number	Horsepower	(hrs/day)	Factor	Emissions	Factor	Emissions	Factor	Emissions	Factor	Emissions	Factor	Emissions	Factor	Emissions	Factor	Emissions	
			(g/hp-hr)	(lb/day)	(g/hp-hr)	(lb/day)	(g/hp-hr)	(lb/day)	(g/hp-hr)	(lb/day)	(g/hp-hr)	(lb/day)	(g/hp-hr)	(lb/day)	(g/hp-hr)	(lb/day)	(g/hp-hr)	(lb/day)
Excavating and Shoring																		
Backhoe	1	108	7	0.225	0.4	0.914	1.5	2.057	3.4	0.162	0.3	0.149	0.2	0.002	0.0	195	324.9	
Loader	1	108	7	0.225	0.4	0.914	1.5	2.057	3.4	0.162	0.3	0.149	0.2	0.002	0.0	195	324.9	
Excavator	2	168	7	0.156	0.8	0.973	5.0	1.779	9.2	0.087	0.5	0.080	0.4	0.002	0.0	200	1035.2	
Compactor	1	8	4	0.284	0.0	1.492	0.1	1.781	0.1	0.069	0.0	0.064	0.0	0.004	0.0	244	17.2	
15-ton crane	1	399	7	0.146	0.9	0.752	4.6	1.805	11.1	0.075	0.5	0.069	0.4	0.001	0.0	151	926.8	
Water Truck	1	189	3	0.193	0.2	0.600	0.7	2.078	2.6	0.090	0.1	0.083	0.1	0.002	0.0	198	247.6	
					2.7		13.6		29.9		1.6		1.4		0.0		2876.6	
Pipeline Installation and Backfilling																		
Hydraulic Jack	1	None	6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	
Welding Truck w/Gen	1	45	4	0.849	0.3	2.579	1.0	2.386	0.9	0.212	0.1	0.195	0.0	0.003	0.0	256	101.4	
40kW Generator	1	60	6	0.532	0.4	2.612	2.1	3.801	3.0	0.285	0.2	0.195	0.0	0.005	0.0	421	333.5	
					0.8		3.1		4.0		0.3		0.0		0.0		434.9	
Street Restoration																		
Paver	1	100	2	0.2970	0.1	1.274	0.6	2.575	1.1	0.201	0.1	0.184	0.1	0.002	0.0	216	95.3	
Roller	1	80	2	0.2729	0.1	1.064	0.4	2.398	0.8	0.179	0.1	0.164	0.1	0.002	0.0	197	69.4	
					0.2		0.9		2.0		0.2		0.1		0.0		164.7	

ROG Evaporating Emissions from Paving

Pipeline Length (ft)	7000
Pipeline Width (ft)	4
Total Area (acres)	0.64
ROG Emission Factor:	2.62 lbs/acre
ROG Emissions	1.68 lbs
Duration of Paving	25 days est
Daily Emissions	0.07 lbs/sday

ROG emission factor derived from CalEEMod

Loading Emissions from Excess Material Handling

$$EF = k \times (0.0032) \times (U/5)^{1.3} / (M/2)^{1.4}$$

k-PM10	0.35
k - PM2.5	0.053
U (wind speed - mph)	5.4
M (moisture content (%))	12
EF=PM10 (lb/ton)	0.000100753
EF=PM2.5 (lb/ton)	1.52569E-05

Excess Material

Material Handled (cu-yd/day)	44
Material Density (ton/cu-yd)	1.264
Material Weight (tons/day)	55.616
PM10 Emissions (lb/day)	11.207
PM2.5 Emissions (lb/day)	1.697

Loading emission factor derived from CalEEMod

Offsite Pollutant Emissions

Excess Material Haul Truck Emissions (HHDT trucks assumed)

Amount of Material	1100 cu yards
Length of Construction	25 days
Material Moved/Day	44 cu yards/day
Truck Capacity	10 cu yards
Number of Trucks	4.4 trucks/day
Average Trip Distance	1 mile/trip
Total Daily VMT	8.8 miles/day
Idling Time	15 min/day/truck

Pollutant	EMFAC2011 HHDT Exhaust Emission		EMFAC2011 HHDT Emission	
	Factor @ All Speeds (g/mi)	Daily Emissions (lb/day)	Idling (g/hr)	Daily Emissions (lbs/day)
ROG	0.292	0.01	6.267	0.02
CO	1.498	0.06	33.361	0.08
Nox	7.926	0.31	69.56	0.17
PM10	0.163	0.01	0.3331	0.00
PM2.5	0.15	0.01	0.3065	0.00
CO2	1725	66.87	6920.433	16.77
Sox	0.0164	0.00	0.067	0.00

Worker Vehicles (assumed to be LDT2 Gas Vehicles for All Speeds)

Number	Trip Length	Worker Vehicles	ROG	ROG	CO	CO	Nox	Nox	PM10	PM10	PM2.5	PM2.5	SOx	SOx	CO2	CO2
			Emission Factor (g/mi)	Daily Emissions (lb/day)	Emission Factor (g/mi)	Daily Emissions (lb/day)	Emission Factor (g/mi)	Daily Emissions (lb/day)	Emission Factor (g/mi)	Daily Emissions (lb/day)	Emission Factor (g/mi)	Daily Emissions (lb/day)	Emission Factor (g/mi)	Daily Emissions (lb/day)	Emission Factor (g/mi)	Daily Emissions (lb/day)
15 per day	20 miles		0.0517	0.0683	1.927	2.547	0.229	0.303	0.0022	0.003	0.00201	0.003	0.0049	0.006	488.14	645.119

Asphalt Delivery Emissions (HHDT trucks assumed)

Pipeline Length (ft)	7000	
Pipeline Width (ft)	4	
Trench Depth (ft)	0.5	
Volume of Asphalt (cu-ft)	14000 or	518.5185185 cu-yds
Density of Asphalt (lb/cu-yd)	3915	
Total Weight of Asphalt (tons)	1015	
Capacity of Delivery Truck (tons)	10	
Number of Delivery Trucks	101.5	
Delivery Trucks/day	4.06	
Travel Distance (1-way) (miles)	20	
Total VMT (miles/day)	81.2	

Emissions Pollutant	Daily Emissions (lb/day)
ROG	0.10
CO	0.54
Nox	2.84
PM10	0.06
PM2.5	0.05
CO2	617.05
Sox	0.01

Pipeline Segment Delivery Trucks

Delivery Trucks/day	1
Travel Distance (1-way) (miles)	20
Total VMT (miles/day)	20

Emissions Pollutant	Daily Emissions (lb/day)
ROG	0.03
CO	0.13
Nox	0.70
PM10	0.01
PM2.5	0.01
CO2	151.98
Sox	0.00

On-road haul truck and worker vehicle emissions derived from EMFAC2011

Pipeline Construction Truck Paved Road Dust (Asphalt delivery + Excess Soil Haul + Pipeline Delivery)

Paved Road Dust Emission Factor (lb/VMT) = $k \times (sL/2)^{0.65} \times (W/3)^{1.5}$	
sL, Silt Loading	0.035 g/m2 (assumed to be arterial road travel)
W, Average Vehicle Weight (tons)	30 tons (weight of haul trucks)
k, Particulate Size Multiplier	0.016
PM10 Emission Factor	0.03648335 lbs/mi (URBEMIS Model equation for paved road dust)
Daily VMT	220 miles/day
PM10 Emissions	8.0 lbs/day
PM2.5 Emissions	1.7 lbs/day - assumed to be 21% of PM10

Paved road dust derived from Cal EEMod

Annual CO2 Emissions

Construction Activity	Total Daily Emissions (lbs/day)	Annual Duration (days)	Annual Emissions (tons/year)	Annual Emissions (tons/year)
Excavation and Shoring		3605	12	22
Pipeline Installation and Backfilling		587	10	3
Street Restoration		782	25	10
		Total		34

Beaumont Recharge Project
Jack and Bore

Construction Emissions

Onsite Pollutant Emissions

Equipment	Number	Horsepower	Hours of Operation (hrs/day)	ROG	ROG	CO	CO	Nox	Nox	PM10	PM10	PM2.5	PM2.5	SOx	SOx	CO2	CO2
				Emission Factor (g/hp-hr)	Daily Emissions (lb/day)	Emission Factor (g/hp-hr)	Daily Emissions (lb/day)	Emission Factor (g/hp-hr)	Daily Emissions (lb/day)	Emission Factor (g/hp-hr)	Daily Emissions (lb/day)	Emission Factor (g/hp-hr)	Daily Emissions (lb/day)	Emission Factor (g/hp-hr)	Daily Emissions (lb/day)	Emission Factor (g/hp-hr)	Daily Emissions (lb/day)
Bore/Drill Rig	1	120	7	0.168	0.3	1.025	1.9	2.108	3.9	0.125	0.2	0.115	0.2	0.002	0.0	255	471.8
Excavator	2	250	7	0.118	0.9	0.974	7.5	1.670	12.9	0.053	0.4	0.049	0.4	0.002	0.0	200	1541.7
Other Materials	2	250	7	0.197	1.5	1.076	8.3	2.440	18.8	0.096	0.7	0.088	0.7	0.002	0.0	206	1591.8
					2.7		17.7		35.6		1.4		1.3		0.0		3605.4

Construction equipment emission factors derived from OFFROAD2011

Offsite Pollutant Emissions

Worker Vehicles (assumed to be LDT2 Gas Vehicles for All Speeds)

Number	5 per day	ROG	ROG	CO	CO	Nox	Nox	PM10	PM10	PM2.5	PM2.5	SOx	SOx	CO2	CO2
		Emission Factor (g/mi)	Daily Emissions (lb/day)	Emission Factor (g/mi)	Daily Emissions (lb/day)	Emission Factor (g/mi)	Daily Emissions (lb/day)	Emission Factor (g/mi)	Daily Emissions (lb/day)	Emission Factor (g/mi)	Daily Emissions (lb/day)	Emission Factor (g/mi)	Daily Emissions (lb/day)	Emission Factor (g/mi)	Daily Emissions (lb/day)
Trip Length	20 miles														
Worker Vehicles		0.058	0.025	1.927	0.849	0.229	0.101	0.002	0.001	0.002	0.001	0.005	0.002	488.140	215.040

Mobile source emission factors derived from EMFAC2011

Annual CO2 Emissions

Total Daily Emissions (lbs/day)	Duration of Construction (days)	Annual Emissions (tons/year)
3820.4	4	7.6

**Beaumont Recharge Project
Well Construction**

Construction Emissions

Onsite Pollutant Emissions

Equipment	Number	Horsepower	Hours of Operation (hrs/day)	ROG	ROG	CO	CO	Nox	Nox	PM10	PM10	PM2.5	PM2.5	SOx	SOx	CO2	CO2
				Emission Factor (g/hp-hr)	Daily Emissions (lb/day)	Emission Factor (g/hp-hr)	Daily Emissions (lb/day)	Emission Factor (g/hp-hr)	Daily Emissions (lb/day)	Emission Factor (g/hp-hr)	Daily Emissions (lb/day)	Emission Factor (g/hp-hr)	Daily Emissions (lb/day)	Emission Factor (g/hp-hr)	Daily Emissions (lb/day)	Emission Factor (g/hp-hr)	Daily Emissions (lb/day)
Bore/drill rig	1	250	24	0.114	1.5	1.047	13.8	1.771	23.4	0.053	0.7	0.049	0.6	0.002	0.0	261	3449.3
Generator Set	1	40	24	1.048	2.2	3.455	7.3	3.731	7.9	0.288	0.6	0.265	0.6	0.005	0.0	421	890.2
Forklift	1	90	6	0.167	0.2	0.572	0.7	1.377	1.6	0.058	0.1	0.053	0.1	0.001	0.0	105	124.9
Grout Pump	1	125	12	0.374	1.2	2.212	7.3	3.42	11.3	0.164	0.5	0.151	0.5	0.005	0.0	421	1391.0
Welder	1	40	12	0.849	0.9	2.579	2.7	2.386	2.5	0.212	0.2	0.195	0.2	0.003	0.0	256	270.7
					6.1		31.9		46.8		2.1		2.0		0.1		6126.1

Offsite Pollutant Emissions

Worker Vehicles (assumed to be LDT2 Gas Vehicles for All Speeds)

Number	5 per day	ROG	ROG	CO	CO	Nox	Nox	PM10	PM10	PM2.5	PM2.5	SOx	SOx	CO2	CO2
		Emission Factor (g/mi)	Daily Emissions (lb/day)	Emission Factor (g/mi)	Daily Emissions (lb/day)	Emission Factor (g/mi)	Daily Emissions (lb/day)	Emission Factor (g/mi)	Daily Emissions (lb/day)	Emission Factor (g/mi)	Daily Emissions (lb/day)	Emission Factor (g/mi)	Daily Emissions (lb/day)	Emission Factor (g/mi)	Daily Emissions (lb/day)
Trip Length	20 miles														
Worker Vehicles		0.058	0.025	1.927	0.849	0.229	0.101	0.002	0.001	0.002	0.001	0.005	0.002	488.140	215.040

Mobile source emission factors derived from EMFAC2011

Annual CO2 Emissions

Total Daily Emissions (lbs/day)	Duration of Construction (days)	Annual Emissions (tons/year)
6341.1	2	6.3

Beaumont Recharge Project
Service Connection

Construction Emissions

Onsite Pollutant Emissions

Equipment	Number	Horsepower	Hours of Operation (hrs/day)	ROG	ROG	CO	CO	Nox	Nox	PM10	PM10	PM2.5	PM2.5	SOx	SOx	CO2	CO2
				Emission Factor (g/hp-hr)	Daily Emissions (lb/day)	Emission Factor (g/hp-hr)	Daily Emissions (lb/day)	Emission Factor (g/hp-hr)	Daily Emissions (lb/day)	Emission Factor (g/hp-hr)	Daily Emissions (lb/day)	Emission Factor (g/hp-hr)	Daily Emissions (lb/day)	Emission Factor (g/hp-hr)	Daily Emissions (lb/day)	Emission Factor (g/hp-hr)	Daily Emissions (lb/day)
Excavator	1	157	7	0.156	0.4	0.973	2.4	1.779	4.3	0.087	0.2	0.080	0.2	0.002	0.0	200	483.7
Tractor/Loader/Backhoe	1	75	7	0.225	0.3	0.914	1.1	2.057	2.4	0.162	0.2	0.149	0.2	0.002	0.0	195	225.6
Water Truck	1	381	2	0.157	0.3	0.610	1.0	1.789	3.0	0.069	0.1	0.063	0.1	0.002	0.0	201	338.1
					0.9		4.4		9.7		0.5		0.5		0.0		1047.4

Offsite Pollutant Emissions

Worker Vehicles (assumed to be LDT2 Gas Vehicles for All Speeds)

Number	6 per day	Trip Length	20 miles	ROG	ROG	CO	CO	Nox	Nox	PM10	PM10	PM2.5	PM2.5	SOx	SOx	CO2	CO2
				Emission Factor (g/mi)	Daily Emissions (lb/day)	Emission Factor (g/mi)	Daily Emissions (lb/day)	Emission Factor (g/mi)	Daily Emissions (lb/day)	Emission Factor (g/mi)	Daily Emissions (lb/day)	Emission Factor (g/mi)	Daily Emissions (lb/day)	Emission Factor (g/mi)	Daily Emissions (lb/day)	Emission Factor (g/mi)	Daily Emissions (lb/day)
Worker Vehicles				0.058	0.031	1.927	1.019	0.229	0.121	0.002	0.001	0.002	0.001	0.005	0.003	488.140	258.048

Annual CO2 Emissions

Total Daily Emissions (lbs/day)	Duration of Construction (days)	Annual Emissions (tons/year)
1305.5	12	7.8

Beaumont Recharge Project
Recharge Basin

Construction Emissions (with Mitigation)

Onsite Exhaust Pollutant Emissions

Equipment	Number	Horsepower	Hours of Operation (hrs/day)	ROG Emission Factor (g/hp-hr)	ROG Daily Emissions (lb/day)	CO Emission Factor (g/hp-hr)	CO Daily Emissions (lb/day)	Nox Emission Factor (g/hp-hr)	Nox Daily Emissions (lb/day)	PM10 Emission Factor (g/hp-hr)	PM10 Daily Emissions (lb/day)	PM2.5 Emission Factor (g/hp-hr)	PM2.5 Daily Emissions (lb/day)	SOx Emission Factor (g/hp-hr)	SOx Daily Emissions (lb/day)	CO2 Emission Factor (g/hp-hr)	CO2 Daily Emissions (lb/day)
Scraper (Tier 3)	2	232	7	0.300	2.1	2.600	18.6	2.700	19.3	0.150	1.1	0.135	1.0	0.002	0.0	250	1791.6
Crawler Tractor	2	358	7	0.185	2.0	1.224	13.5	2.408	26.6	0.093	1.0	0.086	0.9	0.002	0.0	226	2494.2
Tracker Dozers	2	358	7	0.185	2.0	1.224	13.5	2.408	26.6	0.093	1.0	0.086	0.9	0.002	0.0	226	2494.2
Grader	1	162	6	0.362	0.8	1.133	2.4	3.557	7.6	0.200	0.4	0.184	0.4	0.002	0.0	218	467.5
Water Truck	3	381	3	0.157	1.2	0.610	4.6	1.789	13.5	0.069	0.5	0.063	0.5	0.002	0.0	201	1521.4
Total					8.2		52.7		93.6		4.1		3.7		0.1		8769.0

Construction equipment emission factors derived from OFFROAD2011

Onsite Fugitive Dust from Bulldozer Operations

$EF_{TSP} = C_{TSP} \times S^{1.2} / M^{1.3}$

where:

EF_{TSP} = emission factor for TSP (lb/hr)

C_{TSP} = coefficient in USEPA AP42 =

5.7

S = material silt content (%) =

6.9

M = material moisture content (%) =

7.9

$EF_{TSP} =$

3.94 lb/hr

$EF_{PM2.5} = EF_{TSP} \times F_{PM2.5}$

0.105

$F_{PM2.5}$ = scaling factor =

0.414 lb/hr

Hours/day =

7

Number of dozers =

4

PM2.5 Emissions =

11.59 lb/day

$EF_{PM15} = C_{PM15} \times S^{1.5} / M^{1.4}$

where:

EF_{PM15} = emission factor for PM15 (lb/hr)

C_{PM15} = coefficient in USEPA AP42 =

1

S = material silt content (%) =

6.9

M = material moisture content (%) =

7.9

$EF_{PM15} =$

1.00 lb/hr

$EF_{PM10} = EM_{PM15} \times F_{PM10}$

0.75

F_{PM10} = scaling factor =

0.75 lb/hr

Hours/day =

7

Number of dozers =

4

Mitigation under Rule 403

Watering 2 x per day =

61% reduction from soil disturbance

Mitigated PM2.5 =

4.52 lbs/day

Mitigated PM10 =

#REF! lbs/day

Methodology derived from CalEEMod

Offsite Vehicle Exhaust Emissions

Worker Vehicles (assumed to be LDT2 Gas Vehicles for All Speeds)

Number	12 per day	ROG Emission Factor (g/mi)	ROG Daily Emissions (lb/day)	CO Emission Factor (g/mi)	CO Daily Emissions (lb/day)	Nox Emission Factor (g/mi)	Nox Daily Emissions (lb/day)	PM10 Emission Factor (g/mi)	PM10 Daily Emissions (lb/day)	PM2.5 Emission Factor (g/mi)	PM2.5 Daily Emissions (lb/day)	SOx Emission Factor (g/mi)	SOx Daily Emissions (lb/day)	CO2 Emission Factor (g/mi)	CO2 Daily Emissions (lb/day)
Trip Length	20 miles														
Worker Vehicles		0.06	0.06	1.93	2.04	0.23	0.24	0.00	0.00	0.00	0.00	0.00	0.01	488.14	516.10

Number of vehicle trips = 1.2 x number of pieces of equipment

Annual CO2 Emissions

Total Daily Emissions (lbs/day)	Duration of Construction (days)	Annual Emissions (tons/year)
9285.1	80	371.40

Beaumont Recharge Project Operational Impacts

Maintenance of Recharge Basin

Assumption: Each of the 5 retention basins requires one day each and each basin is maintained twice each year

Onsite Exhaust Pollutant Emissions

Equipment	Number	Horsepower	Hours of Operation (hrs/day)	ROG Emission Factor (g/hp-hr)	ROG Daily Emissions (lb/day)	CO Emission Factor (g/hp-hr)	CO Daily Emissions (lb/day)	Nox Emission Factor (g/hp-hr)	Nox Daily Emissions (lb/day)	PM10 Emission Factor (g/hp-hr)	PM10 Daily Emissions (lb/day)	PM2.5 Emission Factor (g/hp-hr)	PM2.5 Daily Emissions (lb/day)	SOx Emission Factor (g/hp-hr)	SOx Daily Emissions (lb/day)	CO2 Emission Factor (g/hp-hr)	CO2 Daily Emissions (lb/day)
Crawler Tractor	1	358	7	0.1849544	1.0	1.224214713	6.8	2.41	13.3	0.09313442	0.5	0.085683666	0.5	0.002157523	0.0	226	1247.1
Water Truck	2	381	3	0.1572529	0.8	0.609859381	3.1	1.789489858	9.0	0.068565329	0.3	0.063080102	0.3	0.001923545	0.0	201	1014.3
Total					1.8		9.8		22.3		0.9		0.8		0.0		2261.4

Emission factors derived from OFFROAD2011

Number of vehicle trips = 1.2 x number of pieces of equipment

Estimation of Fugitive Dust from Bulldozer Operations - Recharge Basin

$EF_{tsp} = C_{tsp} \times S^{1.2} / M^{1.3}$

where:

EF_{tsp} = emission factor for TSP (lb/hr)

C_{tsp} = coefficient in USEPA AP42 = 5.7

S = material silt content (%) = 6.9

M = material moisture content (%) = 7.9

$EF_{tsp} = 3.94$ lb/hr

$EF_{PM2.5} = EF_{tsp} \times F_{PM2.5}$

$F_{PM2.5}$ = scaling factor = 0.105

$EF_{PM2.5} = 0.414$ lb/hr

Hours/day = 7

Number of dozers = 4

PM2.5 Emissions = 11.59 lb/day

$EF_{PM15} = C_{PM15} \times S^{1.5} / M^{1.4}$

where:

EF_{PM15} = emission factor for PM15 (lb/hr)

C_{PM15} = coefficient in USEPA AP42 = 1

S = material silt content (%) = 6.9

M = material moisture content (%) = 7.9

$EF_{PM15} = 1.00$ lb/hr

$EF_{PM10} = EM_{PM15} \times F_{PM10}$

F_{PM10} = scaling factor = 0.75

$EF_{PM10} = 0.75$ lb/hr

Hours/day = 7

Number of dozers = 4

PM10 Emissions = 21.08 lb/day

Mitigation under Rule 403

Watering 2 x per day = 61% reduction from soil disturbance

Mitigated PM2.5 = 4.52 lbs/day

Mitigated PM10 = 8.22 lbs/day

Fugitive dust methodology derived from CalEEMod

Offsite Vehicle Exhaust Emissions

Worker Vehicles (assumed to be LDT2 Gas Vehicles for All Speeds)

		ROG Emission Factor (g/mi)	ROG Daily Emissions (lb/day)	CO Emission Factor (g/mi)	CO Daily Emissions (lb/day)	Nox Emission Factor (g/mi)	Nox Daily Emissions (lb/day)	PM10 Emission Factor (g/mi)	PM10 Daily Emissions (lb/day)	PM2.5 Emission Factor (g/mi)	PM2.5 Daily Emissions (lb/day)	SOx Emission Factor (g/mi)	SOx Daily Emissions (lb/day)	CO2 Emission Factor (g/mi)	CO2 Daily Emissions (lb/day)
Number	4 per day														
Trip Length (1-way)	20 miles														
Worker Vehicles		0.052	0.018	1.927	0.679	0.229	0.081	0.002	0.001	0.002	0.001	0.005	0.002	488.140	172.032

Haul Trucks (assumed to be HHDT)

		ROG Emission Factor (g/mi)	ROG Daily Emissions (lb/day)	CO Emission Factor (g/mi)	CO Daily Emissions (lb/day)	Nox Emission Factor (g/mi)	Nox Daily Emissions (lb/day)	PM10 Emission Factor (g/mi)	PM10 Daily Emissions (lb/day)	PM2.5 Emission Factor (g/mi)	PM2.5 Daily Emissions (lb/day)	SOx Emission Factor (g/mi)	SOx Daily Emissions (lb/day)	CO2 Emission Factor (g/mi)	CO2 Daily Emissions (lb/day)
Number	2 per day														
Trip Length (1-way)	7 miles														
Haul Trucks		0.292	0.018	1.498	0.092	7.926	0.489	0.163	0.010	0.150	0.009	0.016	0.001	1725.000	106.388

Vehicle emission factors derived from EMFAC2011

Annual CO2 Emissions

	Total Daily Emissions (lbs/day)	Duration of Maintenance for All Basins (days/year)	CO2 Annual Emissions (tons/year)	CO2e Annual Emissions (tons/year)
Off Road Construction Equipment	2261.4	10	11.3	10
Worker Vehicles	172.0	10	0.9	1
Haul Trucks	106.4	10	0.5	0
Total			12.7	12

Beaumont Recharge Project Operational Impacts
Electrical Well Pump Operations

Pump Operations

Pump size 20 hp or 14.92 kw
Operations 4 hours/day
 3 days/week
 624 hours/year

CO2 Electrical Emission Factor from SCE 641 lbs/mWh

Pump Electrical Usage 9310.08 kWh/year
 9.31008 mWh/year

Total CO2 5967.76128 lbs/year
 2.98 tons/year

Total CO2e 2.72 tons/year