

## SCS ENGINEERS

Formerly Tracer Environmental Sciences & Technologies, Inc., now a part of SCS Engineers.

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**SUBJECT: Line 901 & 903 Replacement Project- Air Quality Emissions Calculations**

**SITE: 123.4- Mile Pipeline Corridor & Associated Facilities  
Santa Barbara, San Luis Obispo, and Kern County, California**

SCS Engineers (SCS), on behalf of Plains Pipeline, L.P. (Plains), prepared the attached air quality emissions calculations associated with the proposed replacement of the existing Line 901 and Line 903 pipelines (*Project*). The proposed *Project* consists of the abandonment<sup>1</sup> of the existing pipelines in place, the installation and operation of approximately 123.4 miles of new pipelines, as well as the installation and operation of supporting access roads, valves, and pump stations as described in further detail below. The majority, 109.7 out of 123.4 miles (89%), of the pipeline length and associated facilities are located within the South Central Coast Air Basin including the Las Flores, Gaviota, Sisquoc, and Russell Ranch Pump Stations. The remaining 13.7 miles of pipeline and the Pentland Delivery Point lie within the San Joaquin Valley Air Basin. This memorandum includes a summary of air quality emissions for the entire *Project*, irrespective of air basin, from each applicable source (i.e. stationary facilities, mobile maintenance vehicles, construction equipment, etc.) as discussed in greater specificity below. Detailed emissions calculations have also been provided via digital transfer of Excel workbooks. Total long-term, net *Project* emissions from both stationary and mobile sources have been summarized in Table 1 below.

**Table 1- Summary of Estimated Increase in Air Quality Emissions**

Source	Lbs./Day					Direct	Indirect
						MTs/Yr	MTs/Yr
	NO <sub>x</sub>	ROC	CO	SO <sub>x</sub>	PM <sub>10</sub>	CO <sub>2e</sub>	CO <sub>2e</sub>
Proposed Stationary Source	80.99	36.67	232.78	13.43	7.91	18,790.68	8,300
Existing Stationary Source	140.03	32.11	33.21	0.06	11.07	20.14	2,924
<b>Net Stationary Source Increase</b>	<b>-59.04</b>	<b>4.56</b>	<b>199.57</b>	<b>13.37</b>	<b>-3.16</b>	<b>18,770.54</b>	<b>5,376</b>
<b>Net On-Road Source Increase</b>	<b>7.76</b>	<b>0.46</b>	<b>2.22</b>	<b>0.01</b>	<b>63.01</b>	<b>211.08</b>	<b>0</b>
<b>Net Off-Road Equip. Increase</b>	<b>5.04</b>	<b>0.41</b>	<b>3.48</b>	<b>0</b>	<b>0.21</b>	<b>3.09</b>	<b>0</b>
<b>TOTAL PROJECT INCREASE</b>	<b>-46.24</b>	<b>5.43</b>	<b>205.27</b>	<b>13.38</b>	<b>60.06</b>	<b>18,984.71</b>	<b>5,376</b>
Stationary + Mobile Threshold	55.00	55.00	N/A	55.00	80.00	1,000	N/A
On-Road Only Threshold	25.00	25.00	800 PHTs <sup>2</sup>	N/A	N/A	N/A	N/A
Exceeds Threshold?	No	No	No	No	No	Yes	N/A

<sup>1</sup> Plains proposes abandonment of the existing pipeline as their preferred *Project*, however, removal of portions of the existing pipelines may be required per the request of private land owners or agencies. Therefore, construction scenarios and varying emissions calculations have been provided for both abandonment and removal.

<sup>2</sup> PHTs: Peak Hour Trips

In accordance with Santa Barbara County's adopted Thresholds of Significance, pursuant to the California Environmental Quality Act (CEQA), the Project is expected to have less than significant air quality impacts in all categories except Greenhouse Gas Emissions (GHGs). Santa Barbara County's threshold of significance for GHG emissions is 1,000 metric tonnes (MT) per year. The *Project* would produce a net increase of approximately 18,984 MTs per year of GHGs, not including the potential increase in indirect GHGs. This impact could be mitigated to less than significant levels through the purchase of approved GHG offsets.

### **Proposed Stationary Source Development**

The new pipeline system will have a proposed maximum daily throughput capacity of 40,000 bbls. The *Project* includes the installation, maintenance, and operation of the following mechanical components:

- A twelve (12) inch diameter steel pipeline, which is approximately 10.7 miles in length between the existing Santa Ynez Unit (SYU) facility in Las Flores Canyon and the existing pump station at the Gaviota Heating Oil Facility.
- A sixteen (16) inch diameter steel pipeline, which is approximately 38.6 miles in length between the existing Gaviota Heating Oil Facility and the existing Sisquoc Pump Station.
- A fourteen (14) inch diameter steel pipeline, which is approximately 74.1 miles in length between the existing Sisquoc Pump Station and the existing Pentland Pump Station.
- The operation of approximately forty-nine (49) pipeline control valves of varying types. All valve stations have various components capable of releasing fugitive emissions as well as diesel powered generators which are utilized for emergency back-up power only.
- Minor equipment modifications to (resizing of pumps, pig launchers/receivers, etc.) and continued operation of the Las Flores, Gaviota, and Pentland Pump Stations.
- Minor equipment modifications, site expansion, and continued operation of the Sisquoc Pump Station. The site and facility expansion includes the development of a new 120,000 barrel crude oil break-out tank (floating roof), secondary containment area for the oil tank, two (2) 20 MMBtu/hr heaters, a new fire water storage tank, and a foam fire suppression system.
- The construction and operation of a new Russell Ranch Pump Station located in the Cuyama Valley region of San Luis Obispo County, including electrically driven pumps, a pig launcher and pig receiver.
- Various pipeline-related safety equipment including but not limited to: markers, cathodic protection, fiber optic lines, SCADA systems, remote communication equipment, solar panels, etc.

Emissions for the stationary sources would consist primarily of:

- Various fugitive leak points (valves, flanges, etc.) throughout all pump and valve stations, biocide tanks, and the large oil tank at the Sisquoc Pump Station.
- Emissions released during pigging operations.
- Typical combustion sources are limited to the daily operation of the primary 20 MMBtu/hr heater at the Sisquoc Pump Station. A secondary 20 MMBtu/hr heater will also be installed as a back-up in the event that the primary unit is down for maintenance or repair. If in the rare instance that both heaters must run simultaneously, the calculations below account for such a circumstance.
- Diesel powered emergency generators are present at each pump and valve station so that SCADA systems and motor-operated valves (MOVs) can still be controlled throughout loss of electrical power from the utility grid.
- Indirect emissions from electrically driven pumps.

Air quality emissions from all proposed stationary source facilities are summarized in Table 2 below.

**Table 2- Summary of Proposed Stationary Source Emissions**

Equip. Category	Capacity ea.	NO <sub>x</sub>	ROC	CO	SO <sub>x</sub>	PM <sub>10</sub>	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	MT CO <sub>2e</sub>
<b>Pump Emergency Generators (4 generators)</b>										
lbs/day	166 bhp	10.54	4.92	129.99	0.19	0.35	19,723.55	20.0	47.68	19,790.2
tons/year		0.04	0.02	0.45	0.00	0.00	0.21	0.00	0.00	0.21
<b>Valve Emergency Generators (21 generators)</b>										
lbs/day	49 bhp	59.89	3.63	67.15	0.10	0.36	10,067.23	10.21	24.34	10,101.3
tons/year		0.63	0.04	0.71	0.00	0.00	95.88	0.10	0.23	96.20
<b>Heaters (2 heaters)</b>										
lbs/day	20 mmBtu/hr	10.56	5.18	35.64	13.13	7.20	112,236.5	1.90	0.21	112,338.6
tons/year		1.93	0.95	6.50	2.40	1.31	18,595.38	0.32	0.04	18,595.7
<b>Pigging Operations</b>										
lbs/day		0.00	6.41	0.00	0.00	0.00	0.00	2.75	0.00	68.6
tons/year		0.00	0.06	0.00	0.00	0.00	0.00	0.02	0.00	0.6
<b>Crude Tank Emissions (90% control efficiency)</b>										
lbs/day		0.00	1.76	0.00	0.00	0.00	0.00	0.75	0.00	18.8
tons/year		0.00	0.32	0.00	0.00	0.00	0.00	0.14	0.00	3.4
<b>Drain Tank Emissions (4 sump tanks, 90% control efficiency)</b>										
lbs/day		0.00	0.85	0.00	0.00	0.00	0.00	0.37	0.00	9.2
tons/year		0.00	0.16	0.00	0.00	0.00	0.00	0.07	0.00	1.7
<b>Bacteriacide Tank Emissions (4 tanks)</b>										
lbs/day		0.00	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.0
tons/year		0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.0
<b>Fugitive Component Emissions</b>										
lbs/day		0.00	13.56	0.00	0.00	0.00	0.00	20.34	0.00	508.6
tons/year		0.00	2.47	0.00	0.00	0.00	0.00	3.71	0.00	92.8
<b>TOTAL</b>										
lbs/day		<b>80.99</b>	<b>36.67</b>	<b>232.78</b>	<b>13.43</b>	<b>7.91</b>	<b>142,127.2</b>	<b>56.32</b>	<b>72.23</b>	<b>142,835.2</b>
tons/year		<b>2.59</b>	<b>4.09</b>	<b>7.66</b>	<b>2.40</b>	<b>1.32</b>	<b>18,691.5</b>	<b>4.35</b>	<b>0.27</b>	<b>18,790.7</b>

The proposed Project would produce indirect GHGs, primarily through the operation of electric pumps at multiple stations. Such indirect GHGs have been estimated in Table 3 below.

**Table 3- Summary of Proposed Indirect Greenhouse Gas (GHG) Emissions**

Pump Station	Electric	Total Load	Annual	GHG Intensity Factors (lbs/MW-hr)				Indirect CO <sub>2</sub> e Emissions	
				Location	Utility	kW	MW-hrs	CO <sub>2</sub>	CH <sub>4</sub>
Las Flores	SCE	378	3,311	702.44	0.029	0.00617	705.00	2,334,452	1,059
Gaviota	SCE	666	5,834	702.44	0.029	0.00617	705.00	4,113,083	1,866
Sisquoc	PG&E	1,237	10,836	641.35	0.029	0.00617	643.91	6,977,486	3,165
Russell Ranch	PG&E	864	7,569	641.35	0.029	0.00617	643.91	4,873,523	2,211
<b>TOTALS</b>								<b>18,298,544</b>	<b>8,300</b>

### Proposed Long-term Operational/Maintenance Mobile Sources

Once the new pipeline system is constructed and operational, the various facilities will be monitored on a daily basis by a crew of ten (10) operators and a fixed-wing aircraft will fly the length of the pipelines once per week to check for visual evidence of pipeline damage or malfunction. Due to the increased number of surface facilities (i.e. more valve and pump stations) associated with the proposed Project pipeline system versus the existing pipeline system, it is assumed that operators' daily routes would increase by a maximum of approximately 100 miles per day (round trip distance of 3 paved miles per 15 stations visited plus 10 additional unpaved miles). The pipeline system, valve stations, and pump stations will also undergo more intensive maintenance operations sporadically throughout the year (assumed to occur 48 days per year). Therefore, long-term operational emissions would occur from the following vehicle/equipment fleet:

- Ten (10) ¾ ton or smaller trucks utilized by full-time operators travelling a maximum daily roundtrip distance of 290 miles per day.
- One (1) utility all-terrain vehicle (UTV) used to access portions of the pipeline right-of-way which cannot accommodate a full size truck.
- One (1) fixed-wing aircraft flying the pipeline on a weekly basis.
- One (1) 1-ton truck and one (1) vacuum truck which are utilized during pigging and similar maintenance events, travelling a maximum 150-mile roundtrip distance per day of use.
- One (1) flatbed tractor-trailer utilized to transport bull dozers, backhoes, and similar equipment to and from the pipeline maintenance area, travelling a maximum 150-mile roundtrip distance per day of use.
- One (1) water truck for dust and/or fire suppression.
- One (1) bulldozer, two (2) backhoes, one (1) air compressor, one (1) generator, and two (2) welding trucks are operated at onsite repair locations.
- One (1) 30 ton crane used primarily for maintenance of the break-out tank at the Sisquoc Pump Station.

The long-term operational emissions have been summarized in Table 4 below. For the purposes of this summary, “mobile” emissions generally include street legal vehicles which travel to and from the Project site under their own power; “equipment” emissions include air compressors, generators, etc. which operate onsite but have no mileage based emissions. The emission estimates are based on the use of EMFAC 2014 (v1.0.7), EPA AP-42 and CalEEMod Appendix D Table 3.4. These databases provide emissions in terms of grams per horsepower-hour for specific equipment such as cranes, loaders, air compressors, etc.

**Table 4- Summary of Proposed Long-term/Maintenance Emissions**

Mobile/On-Road Emissions									
Emission Type	Combustion							Fugitive Dust	
Pollutant	ROC	CO	CO <sub>2</sub>	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>
Lbs/day	1.77	11.35	7,166.13	29.44	0.07	0.29	0.30	180.30	395.56
Tons/year	0.25	1.26	669.37	4.15	0.01	0.04	0.05	21.84	48.20
Onsite Maintenance Equipment									
Emission Type	Combustion							Fugitive Dust	
Pollutant	ROC	CO	CO <sub>2</sub>	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>
Lbs/day	4.54	32.52	4,449.36	37.97	0.05	1.81	1.87	2.90	13.96
Tons/year	0.09	0.61	76.99	0.68	0.00	0.03	0.03	0.07	0.34
Total Emissions									
Emission Type	Combustion							Fugitive Dust	
Pollutant	ROC	CO	CO <sub>2</sub>	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>
Lbs/day	6.32	43.87	11,615.49	67.41	0.12	2.09	2.17	183.20	409.52
Tons/year	0.34	1.87	746.08	4.83	0.01	0.08	0.08	21.91	48.54

### Proposed Short-term Construction Mobile Sources

Construction of the replacement pipelines is expected to occur over a 12-18 month period, during which a fleet of construction and delivery vehicles/equipment would be deployed across the Project area. Where allowed, Project construction would occur up to six (6) days a week from 6:30 am to 7:30 pm. Although equipment would likely operate an average of nine (9) hours per day for two-hundred and seventy (270) days per year<sup>3</sup> because equipment is not operated during required employee breaks, daily safety briefings, etc., the emissions calculations assume a maximum worst case operating scenario of thirteen (13) hours per day and 312 days per year. Table 5 below provides a list of onsite construction equipment which will predominantly stay within the right-of-way throughout construction. Table 6 provides a summary of mobile construction vehicles which are utilized to deliver employees, construction materials, dust control water, etc. to and from the Project site on a daily basis. Both tables include the vehicles and equipment necessary to construct the replacement pipelines/facilities only, additional vehicles and emissions associated with pipeline removal or abandonment have been quantified and discussed in subsequent sections of this report.

<sup>3</sup> Although allowed construction hours would be up to 13 hours per day, no single piece of equipment is expected to operate for that entire period given the need for safety meetings, operator breaks, refueling, etc.; additionally, although construction can occur up to six (6) days a week the occurrence of weather interruptions, long holiday breaks for operators, and other factors no construction will occur several weeks in each calendar year.

**Table 5- Onsite Construction Fleet**

Type of Equipment	No. of Units	Horsepower	Hrs/Day	Days/Yr
16 G Grader	3	250	13	312
D8 Dozer	12	350	13	312
336 Trackhoes	33	300	13	312
324 Trackhoes	3	160	13	312
329 Trackhoes	6	235	13	312
Rubber Tired Backhoe	3	100	13	312
Sidebooms	30	330	13	312
Padding Machines	3	50	13	312
1360 Trencher	6	440	13	312
Bending Machines	3	150	13	312
966 Loaders	3	170	13	312
Forklifts	3	150	13	312
HDD Machine	4	225	13	312
Boring Machine	4	260	13	312
Circulating Mud Pumps	8	200	13	312
30 Ton RT Crane	3	460	13	312
Air Compressors	15	175	13	312
Welders	42	46	13	312
Water Truck	21	8.5	13	312
Generators	15	175	13	312

**Table 6- Proposed Offsite/Mobile Construction Fleet**

Vehicle Type	No. of Units	Days/Yr	Paved Miles/Day	Unpaved Miles/Day
Stringing Truck	9	312	1080	18
Lowbed Trucks	9	312	1080	18
Fuel Trucks	6	312	360	12
3/4 Ton Trucks	30	312	2100	300
1 Ton Trucks	30	312	2100	300
2 Ton Trucks	12	312	840	120
Water Trucks	21	312	1470	210
Welding Trucks	42	312	2940	420
Light Duty Trucks/Vans	81	312	5670	810
Delivery/Haul Away Trucks	21	312	14520	66

Table 7 below provides a summary of air quality emissions from short-term construction vehicles and equipment. Although required to be quantified and disclosed during the CEQA process, the County of Santa Barbara does not have an adopted threshold of significance for construction related emissions. Instead, construction related emissions countywide are generally expected to be insignificant and sporadic relative to long-term emissions from permanent stationary source facilities. The emission estimates are based on the use of EMFAC2014 (v1.0.7) Emission Rates, EPA AP-42 Fugitive Dust Calculations Equations and CalEEMod Appendix D Table 3.4.

**Table 7- Summary of Short-term/Construction Emissions**

<b>Mobile/On-road Emissions</b>									
<b>Emission Type</b>	<b>Combustion</b>							<b>Fugitive Dust</b>	
<b>Pollutant</b>	<b>ROC</b>	<b>CO</b>	<b>CO<sub>2</sub></b>	<b>NO<sub>x</sub></b>	<b>SO<sub>x</sub></b>	<b>PM<sub>2.5</sub></b>	<b>PM<sub>10</sub></b>	<b>PM<sub>2.5</sub></b>	<b>PM<sub>10</sub></b>
Lbs/day	8.43	58.97	78,568.8	203.87	0.76	1.29	1.35	1,626.30	7,717.85
Tons/year	1.31	9.20	11,122.2	31.80	0.12	0.20	0.21	253.70	1203.98
<b>Onsite Construction Equipment</b>									
<b>Emission Type</b>	<b>Combustion</b>							<b>Fugitive Dust</b>	
<b>Pollutant</b>	<b>ROC</b>	<b>CO</b>	<b>CO<sub>2</sub></b>	<b>NO<sub>x</sub></b>	<b>SO<sub>x</sub></b>	<b>PM<sub>2.5</sub></b>	<b>PM<sub>10</sub></b>	<b>PM<sub>2.5</sub></b>	<b>PM<sub>10</sub></b>
Lbs/day	171.90	1,252.74	276,462.6	1,750.20	3.03	68.69	73.05	43.13	207.36
Tons/year	25.76	189.17	36,354.7	260.98	0.44	10.37	11.04	6.73	32.35
<b>Total Emissions</b>									
<b>Emission Type</b>	<b>Combustion</b>							<b>Fugitive Dust</b>	
<b>Pollutant</b>	<b>ROC</b>	<b>CO</b>	<b>CO<sub>2</sub></b>	<b>NO<sub>x</sub></b>	<b>SO<sub>x</sub></b>	<b>PM<sub>2.5</sub></b>	<b>PM<sub>10</sub></b>	<b>PM<sub>2.5</sub></b>	<b>PM<sub>10</sub></b>
Lbs/day	180.33	1,311.71	355,031.4	1,954.06	3.79	69.98	74.40	1,669.43	7,925.21
Tons/year	27.08	198.37	47,477.0	292.79	0.56	10.58	11.25	260.43	1236.33

### **Proposed Short-term Pipeline Abandonment Mobile Sources**

Where technically feasible and allowed by agreement with private landowners and permits issued by public agencies, and subject to engineering requirements, the 122.9 miles of existing Line 901 and 903 pipeline segments will be abandoned in-place. In most instances the abandonment of the existing pipelines in-place would minimize total below grade excavation during construction, eliminate the need for additional trucks to haul out old pipe, eliminate the need for additional trucks to haul in additional fill soil, and minimize other various *Project* related impacts. Although much of the pipeline abandonment process can be completed by using personnel and equipment from the primary construction spreads, Tables 8 and 9 provide a summary of additional onsite equipment and mobile vehicles which are utilized for the pipeline abandonment process.

**Table 8- Onsite Abandonment Equipment**

Type of Equipment	No. of Units	Horsepower	Hrs/Day	Days/Yr
Inert Pumps	3	100	13	312

**Table 9- Proposed Offsite/Mobile Abandonment Fleet**

Vehicle Type	No. of Units	Days/Yr	Unpaved Miles/Day	Paved Miles/Day
Stringing Truck	6	312	120	840
Pump Trucks	3	312	12	720
Light Duty Trucks/Vans	12	312	30	210
Dump/Fill Import Trucks	3	312	6	360

Table 10 below provides a summary of air quality emissions from short-term abandonment vehicles and equipment. The emission estimates are based on the use of EMFAC2014 (v1.0.7) Emission Rates, EPA AP-42 Fugitive Dust Calculations Equations, and CalEEMod Appendix D Table 3.4.

**Table 10- Summary of Short-term/Abandonment Emissions**

Mobile/On-road Emissions									
Emission Type	Combustion							Fugitive Dust	
Pollutant	ROC	CO	CO <sub>2</sub>	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>
Lbs/day	0.50	5.60	5,356.18	10.26	0.05	0.05	0.05	193.05	891.96
Tons/year	0.08	0.87	758.22	1.60	0.01	0.01	0.01	30.12	139.15
Onsite Equipment Emissions									
Emission Type	Combustion							Fugitive Dust	
Pollutant	ROC	CO	CO <sub>2</sub>	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>
Lbs/day	2.79	21.94	3,612.58	22.36	0.04	1.41	1.41	N/A	N/A
Tons/year	0.43	3.42	511.40	3.49	0.01	0.22	0.22	N/A	N/A
Total Emissions									
Emission Type	Combustion							Fugitive Dust	
Pollutant	ROC	CO	CO <sub>2</sub>	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>
Lbs/day	3.29	27.55	8,968.76	32.61	0.09	1.46	1.46	193.05	891.96
Tons/year	0.51	4.30	1,269.62	5.09	0.01	0.23	0.23	30.12	139.15

### Proposed Short-term Pipeline Removal Mobile Sources

Where required by agreement with private landowners, Project Conditions, or for technical reasons, some pipeline segments may be removed. For example, approximately 117 parcels of the total 257 parcels which are currently transected by the existing pipelines have a right-of-way clause which gives the property owner the option of requiring pipeline removal instead of abandonment in-place. Should all such property owners invoke that option, approximately 77.8 miles of pipeline would be removed. Although much of the pipeline removal process can be completed by using personnel and equipment from the primary construction spreads, Tables 11



and 12 provide a summary of additional onsite equipment and mobile vehicles which are utilized for the pipeline removal process.

**Table 11- Onsite Removal Fleet**

Type of Equipment	No. of Units	Horsepower	Hrs/Day	Days/Yr
Welding Units	6	46	13	312

**Table 12- Proposed Offsite/Mobile Removal Fleet**

Vehicle Type	No. of Units	Days/Yr	Paved Miles/Day	Unpaved Miles/Day
Stringing Truck	12	312	1440	24
Welding Trucks	6	312	420	60
Light Duty Trucks/Vans	18	312	1260	180
Dump/Fill Import Trucks	12	312	1440	24

Table 13 below provides a summary of air quality emissions from short-term pipeline removal vehicles and equipment. The emission estimates are based on the use of EMFAC2014 (v1.0.7) Emission Rates, EPA AP-42 Fugitive Dust Calculations Equations and CalEEMod Appendix D Table 3.4.

**Table 13- Summary of Short-term/Removal Emissions**

On-road/Mobile Emissions									
Emission Type	Combustion							Fugitive Dust	
Pollutant	ROC	CO	CO <sub>2</sub>	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>
Lbs/day	1.00	9.29	11,767.39	24.96	0.11	0.13	0.13	418.93	1,890.25
Tons/year	0.16	1.45	1,665.33	3.89	0.02	0.02	0.02	65.35	294.88
On-site Equipment Emissions									
Emission Type	Combustion							Fugitive Dust	
Pollutant	ROC	CO	CO <sub>2</sub>	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>
Lbs/day	2.67	16.57	2,021.09	10.37	0.03	0.86	0.86	N/A	N/A
Tons/year	0.42	2.59	286.11	1.62	0.00	0.13	0.13	N/A	N/A
Total Emissions									
Emission Type	Combustion							Fugitive Dust	
Pollutant	ROC	CO	CO <sub>2</sub>	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>
Lbs/day	3.67	25.87	13,788.49	35.33	0.14	0.99	0.99	418.93	1,890.25
Tons/year	0.57	4.04	1,951.44	5.51	0.02	0.15	0.15	65.35	294.88

## Existing/Baseline Facilities and Operations

The existing Line 901 and 903 pipeline system consists primarily of the following facilities and mechanical components:

- Various electrically driven pumps, gate valves, pig launchers, pig receivers, and bactericide tanks at the Las Flores Pump Station, Gaviota Pump Station, Sisquoc Pump Station, and Pentland Delivery Point.
- Seven (7) stand-alone gate valve stations.
- Emergency generators at existing pump and valve stations.
- Approximately 122.9 miles of variable diameter pipeline whose joints are welded except at valve and pump stations.

Refer to permit application Attachment B.7 for a detailed list of all existing equipment. Between the years 2000 and 2016 the aforementioned pipeline system and facilities operated on a daily basis with an average of 43,189 barrels of crude oil transported per day. Estimated baseline criteria pollutant emissions and GHGs from stationary sources are provided in Table 14 below.

**Table 14- Summary of Existing/Baseline Stationary Source Emissions**

Equipment Category	Capacity ea.	NO <sub>x</sub>	ROC	CO	SO <sub>x</sub>	PM <sub>10</sub>	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	MT CO <sub>2</sub> e
<b>Pump Emergency Generators (2 generators)</b>										
lbs/day	166 bhp	90.82	7.21	19.32	0.04	6.44	447.69	0.45	1.08	449.2
tons/year		0.05	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
<b>Valve Emergency Generators (5 generators)</b>										
lbs/day	68-86 bhp	49.21	5.18	13.89	0.03	4.63	2567.68	2.60	6.21	2576.36
tons/year		0.03	0.00	0.01	0.00	0.00	1.43	0.00	0.00	1.43
<b>Heaters (none existing)</b>										
lbs/day		0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.0
tons/year		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
<b>Pigging Operations</b>										
lbs/day		0.00	16.91	0.00	0.00	0.00	0.00	7.25	0.00	181.2
tons/year		0.00	0.14	0.00	0.00	0.00	0.00	0.06	0.00	1.4
<b>Crude Tank Emissions (none existing)</b>										
lbs/day		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
tons/year		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
<b>Drain Tank Emissions (3 sump tanks)</b>										
lbs/day		0.00	0.26	0.00	0.00	0.00	0.00	0.11	0.00	2.8
tons/year		0.00	0.05	0.00	0.00	0.00	0.00	0.02	0.00	0.5
<b>Bactericide Tank Emissions</b>										
lbs/day		0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.0
tons/year		0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.0
<b>Fugitive Component Emissions</b>										
lbs/day		0.00	2.45	0.00	0.00	0.00	0.00	3.67	0.00	91.8
tons/year		0.00	0.45	0.00	0.00	0.00	0.00	0.67	0.00	16.7
<b>TOTAL EMISSIONS</b>										
lbs/day		<b>140.03</b>	<b>32.11</b>	<b>33.21</b>	<b>0.06</b>	<b>11.07</b>	<b>3015.4</b>	<b>14.09</b>	<b>7.29</b>	<b>3301.3</b>
tons/year		<b>0.08</b>	<b>0.69</b>	<b>0.02</b>	<b>0.00</b>	<b>0.01</b>	<b>1.4</b>	<b>0.75</b>	<b>0.00</b>	<b>20.1</b>

The existing baseline emissions from mobile sources and mobile maintenance equipment is considered essentially identical to the proposed mobile sources described above. Although the new pipeline system has an increased number and size of surface facilities, emissions from operator vehicle travel would remain largely the same since operators primarily make daily visits to major facilities within a set region along the pipeline. Therefore operators would still drive the same primary roads along the 30-60 mile section of pipeline corridor located within their assigned area. Since both the existing and newly proposed pipeline system is similar in length, location, and structure it is anticipated that approximately the same number of daily operators (10) would be required for routine functions along with the maintenance fleet. Long-term maintenance requiring heavy equipment is expected to decrease due to the modern technology and materials used in the replacement pipelines.

The existing Line 901 and 903 pipeline system generated indirect GHGs primarily through the use of electrically driven pump systems. Such indirect GHGs have been estimated in Table 15 below. Baseline Indirect GHGs were calculated using actual average annual electrical usage as documented in utility bills spanning years 2010-2015.

**Table 15- Summary of Existing/Baseline Indirect Greenhouse Gas (GHG) Emissions**

Pump Station	Electric	Total Load	Annual	GHG Intensity Factors (lbs/MW-hr)				Indirect CO <sub>2</sub> e Emissions	
				Location	Utility	kW	MW-hrs	CO <sub>2</sub>	CH <sub>4</sub>
Las Flores	SCE	N/A	4,044	702.44	0.029	0.00617	705.00	2,851,020	1,293
Gaviota	SCE	N/A	486	702.44	0.029	0.00617	705.00	342,630	155
Sisquoc	PG&E	N/A	5,051	641.35	0.029	0.00617	643.91	3,252,389	1,475
Russell Ranch	PG&E	N/A	0	641.35	0.029	0.00617	643.91	0	0
<b>TOTALS</b>								<b>6,446,039</b>	<b>2,924</b>

Similar to the maintenance fleet described above for the newly proposed pipeline system, the existing pipeline system has been historically monitored on a daily basis by a crew of ten (10) operators and a fixed-wing aircraft flew the length of the pipelines once per week to check for visual evidence of pipeline damage or malfunction. The existing pipeline system, valve stations, and pump stations underwent more intensive maintenance operations sporadically throughout the year (assumed to occur 48 days per year). Therefore, baseline long-term operational emissions occurred from the following vehicle/equipment fleet:

- Ten (10) ¾ ton or smaller trucks utilized by full-time operators travelling a maximum daily roundtrip distance of 180 miles per day.
- One (1) utility all-terrain vehicle (UTV) used to access portions of the pipeline right-of-way which cannot accommodate a full size truck.
- One (1) fixed-wing aircraft flying the pipeline on a weekly basis.
- One (1) 1-ton truck and one (1) vacuum truck which are utilized during pigging and similar maintenance events, travelling a maximum 150-mile roundtrip distance per day of use.

- One (1) flatbed tractor-trailer utilized to transport bull dozers, backhoes, and similar equipment to and from the pipeline maintenance area, travelling a maximum 150-mile roundtrip distance per day of use.
- One (1) water truck for dust and/or fire suppression.
- One (1) bulldozer, two (2) backhoes, one (1) air compressor, one (1) generator, and two (2) welding trucks are operated at onsite repair locations.

The baseline long-term operational emissions have been summarized in Table 16 below. For the purposes of this summary, “mobile” emissions generally include street legal vehicles which travel to and from the Project site under their own power; “equipment” emissions include air compressors, generators, etc. which operate onsite but have no mileage based emissions. The emission estimates are based on the use of EMFAC 2014 (v1.0.7), EPA AP-42 and CalEEMod Appendix D Table 3.4.

**Table 16- Summary of Baseline Long-term/Maintenance Emissions**

Mobile/On-Road Emissions									
Emission Type	Combustion							Fugitive Dust	
Pollutant	ROC	CO	CO <sub>2</sub>	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>
Lbs/day	1.31	9.13	5,891.54	21.69	0.06	0.21	0.21	139.75	139.75
Tons/year	0.16	0.85	458.29	2.73	0.00	0.03	0.03	14.45	14.45
Onsite Maintenance Equipment									
Emission Type	Combustion							Fugitive Dust	
Pollutant	ROC	CO	CO <sub>2</sub>	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>
Lbs/day	4.13	29.04	3,881.09	32.93	0.05	1.62	1.66	2.90	13.96
Tons/year	0.09	0.59	73.90	0.65	0.00	0.03	0.03	0.07	0.34
Total Emissions									
Emission Type	Combustion							Fugitive Dust	
Pollutant	ROC	CO	CO <sub>2</sub>	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>
Lbs/day	5.44	38.17	9,772.63	54.61	0.10	1.82	1.88	142.66	153.71
Tons/year	0.25	1.44	532.19	3.38	0.01	0.06	0.06	14.52	14.78

**Digital Attachments (Excel Workbooks):**

- Line 901\_903 Stationary Source Emissions R5\_Baseline and Proposed
- Line 901\_903 Indirect GHG Emissions\_Proposed
- Line 901\_903 Maintenance Mobile Emissions R4\_Proposed
- Line 901\_903 Construction Mobile Emissions R4\_Proposed
- Line 901\_903 Abandonment Mobile Emissions R4\_Proposed
- Line 901\_903 Removal Mobile Emissions R4\_Proposed
- Line 901\_903 Tank Emissions R4\_Proposed
- Line 901\_903 Indirect GHG Emissions\_Baseline
- Line 901\_903 Maintenance Mobile Emissions R4\_Baseline