

**APPENDIX C**

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Air Quality and Greenhouse Gas Emissions Calculations

**PG&E R-687 L-215 San Joaquin River Crossing Replacement Project  
Phase 1: Site Support/Project Management**

**OFF-ROAD SOURCES**

Source	Fuel	BHP	Number	Total Hours per Source	Emission Factors: pounds/BHP-hr <sup>1</sup>							Total English Tons											
					NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O	NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O			
Excavator	Diesel	310	0	0	0.00173	0.00015	0.00005	0.00005	0.00096	0.44473	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
Light plant	Diesel	20	4	672	0.00742	0.00093	0.00035	0.00032	0.00482	0.92723	0.000023	0.000010	0.20	0.02	0.01	0.01	0.13	24.92	0.001	0.000			
Generator (40 KW)	Diesel	60	1	672	0.00033	0.00033	0.00003	0.00003	0.00389	0.37887	0.000023	0.000010	0.01	0.01	0.00	0.00	0.08	7.64	0.000	0.000			
Air compressor	Diesel	50	1	672	0.00259	0.00018	0.00008	0.00007	0.00277	0.37887	0.000023	0.000010	0.04	0.00	0.00	0.00	0.05	6.37	0.000	0.000			
Welding machine	Diesel	20	0	0	0.00453	0.00062	0.00022	0.00020	0.00287	0.56374	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000			
Side-boom pipelayer	Diesel	260	0	0	0.00488	0.00039	0.00020	0.00018	0.00207	0.49875	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000			
Skid-steer loader	Diesel	75	0	0	0.00202	0.00015	0.00009	0.00008	0.00286	0.42879	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000			
Backhoe	Diesel	75	0	0	0.01026	0.00131	0.00082	0.00076	0.00435	0.42882	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000			
Dozer (DB)	Diesel	215	0	0	0.00488	0.00039	0.00020	0.00018	0.00207	0.49875	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000			
HDD drill rig	Diesel	700	0	0	0.00136	0.00012	0.00005	0.00004	0.00109	0.59053	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000			
Mud pump	Diesel	600	0	0	0.00124	0.00008	0.00005	0.00005	0.00083	0.34080	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000			
Fill pump	Gasoline	10	0	0	0.00710	0.00948	0.00407	0.00307	0.34576	0.85330	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000			
Pipe flush pump	Gasoline	20	0	0	0.00710	0.00948	0.00407	0.00307	0.34576	0.85330	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000			
Concrete pump	Diesel	300	0	0	0.00097	0.00008	0.00003	0.00003	0.00065	0.34080	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000			
													<b>0.25</b>	<b>0.03</b>	<b>0.01</b>	<b>0.01</b>	<b>0.26</b>	<b>38.93</b>	<b>0.001</b>	<b>0.001</b>			

**ON-ROAD SOURCES**

On Road Sources	Miles/Trip <sup>2</sup>	Total Trips	Emission Factors, grams/mile <sup>3</sup>							Total English Tons											
			NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O	NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O			
Light-duty truck (LDT2)	40	168	0.12375	0.02129	0.00139	0.00128	1.29305	331.5704	0.00466	0.00908	0.0009	0.0002	0.0000	0.0000	0.0096	2.4561	0.0000	0.0001			
Medium-duty truck (MDV)	40	84	0.07819	0.01228	0.00647	0.00619	0.18535	346.6425	0.00057	0.05449	0.0003	0.0000	0.0000	0.0000	0.0007	1.2839	0.0000	0.0002			
Heavy-duty truck (T6 instate)	0	0	3.88892	0.15147	0.08338	0.07977	0.55408	973.1576	0.00704	0.15297	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			
Water Truck (on-site) <sup>4</sup>	20	84	3.88892	0.15147	0.08338	0.07977	0.55408	973.1576	0.00704	0.15297	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			
<b>Totals =&gt;</b>											<b>0.0684</b>	<b>0.0005</b>	<b>0.0002</b>	<b>0.0002</b>	<b>0.0113</b>	<b>5.5421</b>	<b>0.0001</b>	<b>0.0006</b>			

Off-Road & On-Road Source Totals      0.258      0.035      0.012      0.011      0.266      44.489      0.002      0.001

**Greenhouse Gas Emissions Summary**

Metric Tons	39.705	0.001	0.001
CO2E	39.705	0.039	0.282
<b>Total CO2E</b>			<b>40.0</b>

**Notes:**

- <sup>1</sup> Emission factors from OFFROAD 2017 (ver 1.0.1) for the San Joaquin Valley Air Basin
- <sup>2</sup> Round trip distance to Modesto
- <sup>3</sup> Emission factors from EMFAC 2017 for Stanislaus County year 2020 annual emissions
- <sup>4</sup> Assumes 20 miles per day cycling through work areas, total trips=work days



**PG&E R-687 L-215 San Joaquin River Crossing Replacement Project  
Phase 1: Pipe/Materials Procurement**

**OFF-ROAD SOURCES**

Source	Fuel	BHP	Number	Total Hours per Source	Emission Factors: pounds/BHP-hr <sup>1</sup>								Total English Tons											
					NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O	NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O				
Excavator	Diesel	310	2	48	0.00173	0.00015	0.00005	0.00005	0.00096	0.44473	0.000023	0.000010	0.03	0.00	0.00	0.00	0.01	6.62	0.000	0.000				
Light plant	Diesel	20	0	0	0.00742	0.00093	0.00035	0.00032	0.00482	0.92723	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000				
Generator (40 KVA)	Diesel	60	0	0	0.00033	0.00033	0.00003	0.00003	0.00389	0.37887	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000				
Air compressor (185 cfm)	Diesel	50	0	0	0.00259	0.00018	0.00008	0.00007	0.00277	0.37887	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000				
Welding machine	Diesel	20	0	0	0.00453	0.00062	0.00022	0.00020	0.00287	0.56374	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000				
Side-boom pipelayer	Diesel	260	0	0	0.00488	0.00039	0.00020	0.00018	0.00207	0.49875	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000				
Skid-steer loader	Diesel	75	0	0	0.00202	0.00015	0.00009	0.00008	0.00266	0.42879	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000				
Backhoe	Diesel	75	0	0	0.01026	0.00131	0.00082	0.00076	0.00435	0.42882	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000				
Dozer (D6)	Diesel	215	0	0	0.00488	0.00039	0.00020	0.00018	0.00207	0.49875	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000				
HDD drill rig	Diesel	700	0	0	0.00136	0.00012	0.00005	0.00004	0.00169	0.59053	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000				
Mud pump	Diesel	600	0	0	0.00124	0.00008	0.00005	0.00005	0.00063	0.34080	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000				
Fill pump	Gasoline	10	0	0	0.00710	0.00948	0.00407	0.00307	0.34576	0.85330	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000				
Pipe flush pump	Gasoline	20	0	0	0.00710	0.00948	0.00407	0.00307	0.34576	0.85330	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000				
Concrete pump	Diesel	300	0	0	0.00097	0.00008	0.00003	0.00003	0.00065	0.34080	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000				
													<b>0.026</b>	<b>0.002</b>	<b>0.001</b>	<b>0.001</b>	<b>0.014</b>	<b>6.618</b>	<b>0.0003</b>	<b>0.0001</b>				

**ON-ROAD SOURCES**

On Road Sources	Miles/Trip	Total Trips	Emission Factors, grams/mile <sup>3</sup>								Total English Tons											
			NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O	NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O				
Light-duty truck (LDT) <sup>2,4</sup>	40	24	0.12375	0.02129	0.00139	0.00128	1.29305	331.5704	0.00496	0.00908	0.0001	0.0000	0.0000	0.0000	0.0014	0.3509	0.0000	0.0000				
Medium-duty truck (MDV)	0	0	0.07819	0.01228	0.00647	0.00619	0.18535	346.6425	0.00057	0.05449	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000				
Heavy-duty truck (T6 instate) <sup>5</sup>	100	30	3.88892	0.15147	0.08338	0.07977	0.55408	973.1576	0.00704	0.15297	0.0129	0.0005	0.0003	0.0003	0.0018	3.2181	0.0000	0.0005				
Water Truck (on-site) <sup>5</sup>	0	0	3.88892	0.15147	0.08338	0.07977	0.55408	973.1576	0.00704	0.15297	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000				
<b>Totals =&gt;</b>											<b>0.0130</b>	<b>0.0005</b>	<b>0.0003</b>	<b>0.0003</b>	<b>0.0032</b>	<b>3.5690</b>	<b>0.0000</b>	<b>0.0005</b>				

Off-Road & On-Road Source Totals      0.039      0.003      0.001      0.001      0.017      10.187      0.0004      0.0007

**Notes:**

- <sup>1</sup> Emission factors from OFFROAD 2017 (ver 1.0.1) for the San Joaquin Valley Air Basin
- <sup>2</sup> Round trip distance to Modesto
- <sup>3</sup> Emission factors from EMFAC 2017 for Stanislaus County year 2020 annual emissions
- <sup>4</sup> Assumes two workers per truck, one round trip per day
- <sup>5</sup> Materials delivery

**Greenhouse Gas Emissions Summary**

Metric Tons	9.095	0.000	0.001
CO2E	9.095	0.009	0.157
<b>Total CO2E</b>			<b>9.3</b>

**PG&E R-687 L-215 San Joaquin River Crossing Replacement Project  
Phase 1: Excavation**

**OFF-ROAD SOURCES**

Source	Fuel	BHP	Number	Total Hours per Source	Emission Factors: pounds/BHP-hr <sup>1</sup>								Total English Tons									
					NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O	NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O		
Excavator	Diesel	310	2	144	0.00173	0.00015	0.00005	0.00005	0.00096	0.44473	0.000023	0.000010	0.08	0.01	0.00	0.00	0.04	19.85	0.001	0.000		
Light plant	Diesel	20	0	0	0.00742	0.00093	0.00035	0.00032	0.00482	0.92723	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000		
Generator (40 KV)	Diesel	60	0	0	0.00033	0.00033	0.00003	0.00003	0.00389	0.37887	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000		
Air compressor (185 cfm)	Diesel	50	1	144	0.00299	0.00018	0.00008	0.00007	0.00277	0.37887	0.000023	0.000010	0.01	0.00	0.00	0.00	0.01	1.36	0.000	0.000		
Welding machine	Diesel	20	0	0	0.00453	0.00062	0.00022	0.00020	0.00287	0.56374	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000		
Side-boom pipelayer	Diesel	260	0	0	0.00488	0.00039	0.00020	0.00018	0.00207	0.49875	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000		
Skid-steer loader	Diesel	75	0	0	0.00202	0.00015	0.00009	0.00008	0.00286	0.42879	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000		
Backhoe	Diesel	75	0	0	0.01026	0.00131	0.00082	0.00076	0.00435	0.42882	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000		
Dozer (D6)	Diesel	215	0	0	0.00488	0.00039	0.00020	0.00018	0.00207	0.49875	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000		
HDD drill rig	Diesel	700	0	0	0.00136	0.00012	0.00005	0.00004	0.00109	0.59053	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000		
Mud pump	Diesel	600	0	0	0.00124	0.00008	0.00005	0.00005	0.00063	0.34080	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000		
Fill pump	Gasoline	10	0	0	0.00710	0.00948	0.00407	0.00307	0.34576	0.65330	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000		
Pipe flush pump	Gasoline	20	0	0	0.00710	0.00948	0.00407	0.00307	0.34576	0.65330	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000		
Concrete pump	Diesel	300	0	0	0.00097	0.00008	0.00003	0.00003	0.00065	0.34080	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000		
												<b>0.087</b>	<b>0.007</b>	<b>0.003</b>	<b>0.002</b>	<b>0.053</b>	<b>21.217</b>	<b>0.0011</b>	<b>0.0005</b>			

**ON-ROAD SOURCES**

On Road Sources	Miles/Trip	Total Trips	Emission Factors, grams/mile <sup>3</sup>								Total English Tons							
			NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O	NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O
Light-duty truck (LD <sub>T</sub> ) <sup>2,4</sup>	40	72	0.12375	0.02129	0.00139	0.00128	1.29305	331.5704	0.00496	0.00908	0.0004	0.0001	0.0000	0.0000	0.0041	1.0526	0.0000	0.0000
Medium-duty truck (MDV)	0	0	0.07819	0.01228	0.00647	0.00619	0.18535	346.6425	0.00057	0.05449	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Heavy-duty truck (T6 instate)	0	0	3.88892	0.15147	0.08338	0.07977	0.55408	973.1576	0.00704	0.15297	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water Truck (on-site) <sup>5</sup>	0	0	3.88892	0.15147	0.08338	0.07977	0.55408	973.1576	0.00704	0.15297	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
<b>Totals =&gt;</b>											<b>0.0004</b>	<b>0.0001</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0041</b>	<b>1.0526</b>	<b>0.0000</b>	<b>0.0000</b>

**Off-Road & On-Road Source Totals      0.087      0.007      0.003      0.002      0.057      22.269      0.0011      0.0005**

**Notes:**

- <sup>1</sup> Emission factors from OFFROAD 2017 (ver 1.0.1) for the San Joaquin Valley Air Basin
- <sup>2</sup> Round trip distance to Modesto
- <sup>3</sup> Emission factors from EMFAC 2017 for Stanislaus County year 2020 annual emissions
- <sup>4</sup> Assumes two workers per truck, one round trip per day
- <sup>5</sup> Assumes 20 miles per day cycling through work areas, total trips=work days

**Greenhouse Gas Emissions Summary**

<b>Metric Tons</b>	19.883	0.001	0.000
<b>CO2E</b>	19.883	0.029	0.121
<b>Total CO2E</b>			<b>20.0</b>

**PG&E R-687 L-215 San Joaquin River Crossing Replacement Project  
Phase 1: Pipe String Welding**

**OFF-ROAD SOURCES**

Source	Fuel	BHP	Number	Total Hours per Source	Emission Factors: pounds/BHP-hr <sup>1</sup>								Total English Tons								
					NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O	NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O	
Excavator	Diesel	310	2	304	0.00173	0.00015	0.00005	0.00005	0.00096	0.44473	0.00023	0.000010	0.16	0.01	0.00	0.00	0.09	41.91	0.002	0.001	
Light plant	Diesel	20	0	0	0.00742	0.00093	0.00035	0.00032	0.00482	0.92723	0.00023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	
Generator (40 KW)	Diesel	60	0	0	0.00033	0.00033	0.00003	0.00003	0.00389	0.37887	0.00023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	
Air compressor (185 cfm)	Diesel	50	0	0	0.00259	0.00018	0.00008	0.00007	0.00277	0.37887	0.00023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	
Welding machine	Diesel	20	6	304	0.00453	0.00062	0.00022	0.00020	0.00287	0.56374	0.00023	0.000010	0.08	0.01	0.00	0.00	0.05	10.28	0.000	0.000	
Side-boom pipelayer	Diesel	260	1	304	0.00488	0.00039	0.00020	0.00018	0.00207	0.49875	0.00023	0.000010	0.19	0.02	0.01	0.01	0.08	19.71	0.001	0.000	
Skid-steer loader	Diesel	75	0	0	0.00202	0.00015	0.00009	0.00008	0.00266	0.42879	0.00023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	
Backhoe	Diesel	75	0	0	0.01028	0.00131	0.00082	0.00076	0.00435	0.42882	0.00023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	
Dozer (D6)	Diesel	215	0	0	0.00468	0.00039	0.00020	0.00018	0.00207	0.49875	0.00023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	
HDD drill rig	Diesel	700	0	0	0.00136	0.00012	0.00005	0.00004	0.00109	0.59653	0.00023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	
Mud pump	Diesel	600	0	0	0.00124	0.00008	0.00005	0.00005	0.00063	0.34080	0.00023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	
Fill pump	Gasoline	10	0	0	0.00710	0.00948	0.00407	0.00307	0.34576	0.65330	0.00023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	
Pipe flush pump	Gasoline	20	0	0	0.00710	0.00948	0.00407	0.00307	0.34576	0.65330	0.00023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	
Concrete pump	Diesel	300	0	0	0.00097	0.00008	0.00003	0.00003	0.00065	0.34080	0.00023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	
												<b>0.438</b>	<b>0.041</b>	<b>0.017</b>	<b>0.016</b>	<b>0.225</b>	<b>71.905</b>	<b>0.0038</b>	<b>0.0015</b>		

**ON-ROAD SOURCES**

On Road Sources	Miles/Trip <sup>2</sup>	Total Trips	Emission Factors, grams/mile <sup>3</sup>								Total English Tons									
			NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O	NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O		
Light-duty truck (LD <sub>2</sub> ) <sup>4</sup>	40	380	0.12375	0.02129	0.00139	0.00128	1.29305	331.5704	0.00498	0.00908	0.0021	0.0004	0.0000	0.0000	0.0217	5.5554	0.0001	0.0002		
Medium-duty truck (MDV)	40	266	0.07819	0.01228	0.00647	0.00619	0.18535	346.6425	0.00657	0.05449	0.0009	0.0001	0.0001	0.0001	0.0022	4.0656	0.0000	0.0006		
Heavy-duty truck (TG instate)	0	0	3.88892	0.15147	0.08338	0.07977	0.55408	973.1576	0.00704	0.15297	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		
Water Truck (on-site) <sup>5</sup>	0	0	3.88892	0.15147	0.08338	0.07977	0.55408	973.1576	0.00704	0.15297	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		
<b>Totals =&gt;</b>											<b>0.0030</b>	<b>0.0005</b>	<b>0.0001</b>	<b>0.0001</b>	<b>0.0238</b>	<b>9.6210</b>	<b>0.0001</b>	<b>0.0008</b>		

Off-Road & On-Road Source Totals      0.442      0.041      0.017      0.016      0.248      81.526      0.0036      0.0023

**Notes:**

- <sup>1</sup> Emission factors from OFFROAD 2017 (ver 1.0.1) for the San Joaquin Valley Air Basin
- <sup>2</sup> Round trip distance to Modesto
- <sup>3</sup> Emission factors from EMFAC 2017 for Stanislaus County year 2020 annual emissions
- <sup>4</sup> Assumes two workers per truck, one round trip per day
- <sup>5</sup> Assumes 20 miles per day cycling through work areas, total trips=work days

**Greenhouse Gas Emissions Summary**

Metric Tons	72.791	0.003	0.002
CO2E	72.791	0.091	0.547
<b>Total CO2E</b>			<b>73.4</b>

**PG&E R-687 L-215 San Joaquin River Crossing Replacement Project  
Phase 1: Pipe Installation**

**OFF-ROAD SOURCES**

Source	Fuel	BHP	Number	Total Hours per Source	Emission Factors: pounds/BHP-hr <sup>1</sup>								Total English Tons									
					NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O	NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O		
Excavator	Diesel	310	2	88	0.00173	0.00015	0.00005	0.00005	0.00096	0.44473	0.000023	0.000010	0.05	0.00	0.00	0.00	0.03	12.13	0.001	0.000		
Light plant	Diesel	20	0	0	0.00742	0.00093	0.00035	0.00032	0.00482	0.92723	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000		
Generator (40 KW)	Diesel	60	0	0	0.00033	0.00033	0.00003	0.00003	0.00389	0.37887	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000		
Air compressor (185 cfm)	Diesel	50	1	88	0.00259	0.00018	0.00008	0.00007	0.00277	0.37887	0.000023	0.000010	0.01	0.00	0.00	0.00	0.01	0.83	0.000	0.000		
Welding machine	Diesel	20	2	88	0.00453	0.00062	0.00022	0.00020	0.00287	0.56374	0.000023	0.000010	0.01	0.00	0.00	0.00	0.01	0.99	0.000	0.000		
Side-boom pipelayer	Diesel	260	0	0	0.00488	0.00039	0.00020	0.00018	0.00207	0.49875	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000		
Skid-steer loader	Diesel	75	0	0	0.00202	0.00015	0.00009	0.00008	0.00266	0.42879	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000		
Backhoe	Diesel	75	0	0	0.01026	0.00131	0.00082	0.00076	0.00435	0.42882	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000		
Dozer (D6)	Diesel	215	0	0	0.00488	0.00039	0.00020	0.00018	0.00207	0.49875	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000		
HDD drill rig	Diesel	700	0	0	0.00136	0.00012	0.00005	0.00004	0.00109	0.59053	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000		
Mud pump	Diesel	600	0	0	0.00124	0.00008	0.00005	0.00005	0.00063	0.34080	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000		
Fill pump	Gasoline	10	0	0	0.00710	0.00948	0.00407	0.00307	0.34576	0.65330	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000		
Pipe flush pump	Gasoline	20	0	0	0.00710	0.00948	0.00407	0.00307	0.34576	0.65330	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000		
Concrete pump	Diesel	300	0	0	0.00097	0.00008	0.00003	0.00003	0.00065	0.34080	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000		
													<b>0.061</b>	<b>0.006</b>	<b>0.002</b>	<b>0.002</b>	<b>0.037</b>	<b>13.868</b>	<b>0.0007</b>	<b>0.0003</b>		

**ON-ROAD SOURCES**

On Road Sources	Miles/Trip	Total Trips	Emission Factors, grams/mile <sup>3</sup>								Total English Tons									
			NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O	NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O		
Light-duty truck (LDT) <sup>2,4</sup>	40	66	0.12375	0.02129	0.00139	0.00128	1.29305	331.5704	0.00496	0.00908	0.0004	0.0001	0.0000	0.0000	0.0038	0.9649	0.0000	0.0000		
Medium-duty truck (MDV) <sup>2</sup>	40	33	0.07819	0.01228	0.00647	0.00619	0.18535	346.6425	0.00057	0.05449	0.0001	0.0000	0.0000	0.0000	0.0003	0.5044	0.0000	0.0001		
Heavy-duty truck (T6 instate)	0	0	3.88892	0.15147	0.08338	0.07977	0.55408	973.1576	0.00704	0.15297	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		
Water Truck (on-site) <sup>5</sup>	0	0	3.88892	0.15147	0.08338	0.07977	0.55408	973.1576	0.00704	0.15297	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		
<b>Totals =&gt;</b>											<b>0.0005</b>	<b>0.0001</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0040</b>	<b>1.4693</b>	<b>0.0000</b>	<b>0.0001</b>		

Off-Road & On-Road Source Totals      0.061      0.006      0.002      0.002      0.041      15.427      0.0007      0.0004

Notes:

- <sup>1</sup> Emission factors from OFFROAD 2017 (ver 1.0.1) for the San Joaquin Valley Air Basin
- <sup>2</sup> Round trip distance to Modesto
- <sup>3</sup> Emission factors from EMFAC 2017 for Stanislaus County year 2020 annual emissions
- <sup>4</sup> Assumes two workers per truck, one round trip per day
- <sup>5</sup> Assumes 20 miles per day cycling through work areas, total trips=work days

**Greenhouse Gas Emissions Summary**

Metric Tons	13.774	0.001	0.000
CO2E	13.774	0.019	0.099
Total CO2E			13.9

**PG&E R-687 L-215 San Joaquin River Crossing Replacement Project  
Phase 1: HDD Operation**

**OFF-ROAD SOURCES**

Source	Fuel	BHP	Number	Total Hours per Source	Emission Factors: pounds/BHP-hr <sup>1</sup>								Total English Tons											
					NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O	NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O				
Excavator	Diesel	310	2	480	0.00173	0.00015	0.00005	0.00005	0.00096	0.44473	0.000023	0.000010	0.26	0.02	0.01	0.01	0.14	66.18	0.003	0.001				
Light plant	Diesel	20	0	0	0.00742	0.00093	0.00035	0.00032	0.00482	0.92723	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000				
Generator (40 KW)	Diesel	60	0	0	0.00033	0.00033	0.00003	0.00003	0.00389	0.37887	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000				
Air compressor (185 cfm)	Diesel	50	0	0	0.00259	0.00018	0.00008	0.00007	0.00277	0.37887	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000				
Welding machine	Diesel	20	0	0	0.00453	0.00062	0.00022	0.00020	0.00287	0.56374	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000				
Side-boom pipelayer	Diesel	260	0	0	0.00488	0.00039	0.00020	0.00018	0.00207	0.49875	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000				
Skid-steer loader	Diesel	75	2	480	0.00202	0.00015	0.00009	0.00008	0.00266	0.42879	0.000023	0.000010	0.07	0.01	0.00	0.00	0.10	15.44	0.001	0.000				
Backhoe	Diesel	75	0	0	0.01026	0.00131	0.00082	0.00076	0.00435	0.42882	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000				
Dozer (D6)	Diesel	215	1	480	0.00488	0.00039	0.00020	0.00018	0.00207	0.49875	0.000023	0.000010	0.25	0.02	0.01	0.01	0.11	25.74	0.001	0.001				
HDD drill rig	Diesel	700	2	600	0.00136	0.00012	0.00005	0.00004	0.00109	0.59053	0.000023	0.000010	0.57	0.05	0.02	0.02	0.46	248.02	0.010	0.004				
Mud pump	Diesel	600	2	600	0.00124	0.00008	0.00005	0.00005	0.00063	0.34080	0.000023	0.000010	0.45	0.03	0.02	0.02	0.23	122.69	0.008	0.004				
Fill pump	Gasoline	10	0	0	0.00710	0.00948	0.00407	0.00307	0.34576	0.65330	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000				
Pipe flush pump	Gasoline	20	0	0	0.00710	0.00948	0.00407	0.00307	0.34576	0.65330	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000				
Concrete pump	Diesel	300	0	0	0.00097	0.00008	0.00003	0.00003	0.00065	0.34080	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000				
													<b>1.600</b>	<b>0.127</b>	<b>0.060</b>	<b>0.054</b>	<b>1.030</b>	<b>478.06</b>	<b>0.0238</b>	<b>0.0102</b>				

**ON-ROAD SOURCES**

On Road Sources	Miles/Trip	Total Trips	Emission Factors, grams/mile <sup>3</sup>								Total English Tons											
			NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O	NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O				
Light-duty truck (LDT2) <sup>2,4</sup>	40	630	0.12375	0.02129	0.00139	0.00123	1.29305	331.5704	0.00496	0.00908	0.0034	0.0006	0.0000	0.0000	0.0359	9.2103	0.0001	0.0003				
Medium-duty truck (MDV)	0	0	0.07819	0.01228	0.00547	0.00519	0.18535	346.6425	0.00057	0.05449	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000				
Heavy-duty truck (T6 instate)	40	120	3.88892	0.15147	0.08338	0.07977	0.55408	973.1576	0.00704	0.15297	0.0206	0.0008	0.0004	0.0004	0.0029	5.1490	0.0000	0.0008				
Heavy-duty truck (T6 instate) <sup>5</sup>	40	260	3.88892	0.15147	0.08338	0.07977	0.55408	973.1576	0.00704	0.15297	0.0446	0.0017	0.0010	0.0009	0.0064	11.1561	0.0001	0.0132				
Water Truck (on-site) <sup>6</sup>	0	0	3.88892	0.15147	0.08338	0.07977	0.55408	973.1576	0.00704	0.15297	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000				
											<b>0.0686</b>	<b>0.0031</b>	<b>0.0014</b>	<b>0.0014</b>	<b>0.0452</b>	<b>25.5154</b>	<b>0.0093</b>	<b>0.0143</b>				

**Off-Road & On-Road Source Totals**      1.668      0.130      0.061      0.056      1.075      503.574      0.0240      0.0244

**Notes:**

- <sup>1</sup> Emission factors from OFFROAD 2017 (ver 1.0.1) for the San Joaquin Valley Air Basin
- <sup>2</sup> Round trip distance to Modesto
- <sup>3</sup> Emission factors from EMFAC 2017 for Stanislaus County year 2020 annual emissions
- <sup>4</sup> Assumes two workers per truck, one round trip per day
- <sup>5</sup> Water import, assumes 40 miles round trip
- <sup>6</sup> Assumes 20 miles per day cycling through work areas, total trips=work days

**Greenhouse Gas Emissions Summary**

Metric Tons	449.619	0.021	0.022
CO2E	449.619	0.601	5.783
<b>Total CO2E</b>			<b>456.0</b>

**PG&E R-687 L-215 San Joaquin River Crossing Replacement Project  
Phase 1: Pipe String Pull-back**

**OFF-ROAD SOURCES**

Source	Fuel	BHP	Number	Total Hours per Source	Emission Factors: pounds/BHP-hr <sup>1</sup>								Total English Tons							
					NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O	NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O
Excavator	Diesel	310	4	16	0.00173	0.00015	0.00005	0.00005	0.00096	0.44473	0.000023	0.000010	0.02	0.00	0.00	0.00	0.01	4.41	0.000	0.000
Light plant	Diesel	20	8	8	0.00742	0.00063	0.00035	0.00032	0.00482	0.92723	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.59	0.000	0.000
Generator (40 KV)	Diesel	60	0	0	0.00033	0.00033	0.00003	0.00003	0.00389	0.37887	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000
Air compressor (185 cfm)	Diesel	50	0	0	0.00259	0.00018	0.00008	0.00007	0.00277	0.37887	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000
Welding machine	Diesel	20	2	16	0.00453	0.00062	0.00022	0.00020	0.00287	0.56374	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.18	0.000	0.000
Slide-boom pipelayer	Diesel	260	3	16	0.00488	0.00039	0.00020	0.00018	0.00207	0.49875	0.000023	0.000010	0.03	0.00	0.00	0.00	0.01	3.11	0.000	0.000
Skid-steer loader	Diesel	75	0	0	0.00202	0.00015	0.00009	0.00008	0.00286	0.42879	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000
Backhoe	Diesel	75	1	16	0.01028	0.00131	0.00082	0.00076	0.00435	0.42882	0.000023	0.000010	0.01	0.00	0.00	0.00	0.00	0.26	0.000	0.000
Dozer (D8)	Diesel	215	0	0	0.00488	0.00039	0.00020	0.00018	0.00207	0.49875	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000
HDD drill rig	Diesel	700	0	0	0.00136	0.00012	0.00005	0.00004	0.00109	0.59053	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000
Mud pump	Diesel	600	0	0	0.00124	0.00008	0.00005	0.00005	0.00063	0.34080	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000
Fill pump	Gasoline	10	0	0	0.00710	0.00948	0.00407	0.00307	0.34576	0.65330	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000
Pipe flush pump	Gasoline	20	0	0	0.00710	0.00948	0.00407	0.00307	0.34576	0.65330	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000
Concrete pump	Diesel	300	0	0	0.00097	0.00008	0.00003	0.00003	0.00085	0.34080	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000
													<b>0.060</b>	<b>0.006</b>	<b>0.003</b>	<b>0.002</b>	<b>0.029</b>	<b>8.555</b>	<b>0.0004</b>	<b>0.0002</b>

**ON-ROAD SOURCES**

On Road Sources	Miles/Trip <sup>2</sup>	Total Trips	Emission Factors, grams/mile <sup>3</sup>								Total English Tons							
			NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O	NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O
Light-duty truck (LDT2) <sup>4</sup>	40	11	0.12375	0.02129	0.00139	0.00128	1.29305	331.5704	0.00496	0.00908	0.0001	0.0000	0.0000	0.0000	0.0006	0.1608	0.0000	0.0000
Medium-duty truck (MDV)	40	2	0.07819	0.01228	0.00647	0.00619	0.18535	346.6425	0.00057	0.05449	0.0000	0.0000	0.0000	0.0000	0.0306	0.0000	0.0000	
Heavy-duty truck (T6 insiate)	0	0	3.88892	0.15147	0.08338	0.07977	0.55408	973.1576	0.00704	0.15297	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Water Truck (on-site) <sup>5</sup>	0	0	3.88892	0.15147	0.08338	0.07977	0.55408	973.1576	0.00704	0.15297	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
<b>Totals =&gt;</b>											<b>0.0001</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0006</b>	<b>0.1914</b>	<b>0.0000</b>	<b>0.0000</b>

**Off-Road & On-Road Source Totals**      0.060      0.006      0.003      0.002      0.030      8.746      0.0004      0.0002

**Notes:**

- <sup>1</sup> Emission factors from OFFROAD 2017 (ver 1.0.1) for the San Joaquin Valley Air Basin
- <sup>2</sup> Round trip distance to Modesto
- <sup>3</sup> Emission factors from EMFAC 2017 for Stanislaus County year 2020 annual emissions
- <sup>4</sup> Assumes two workers per truck, one round trip per day
- <sup>5</sup> Assumes 20 miles per day cycling through work areas, total trips=work days

**Greenhouse Gas Emissions Summary**

Metric Tons	7.809	0.000	0.000
CO2E	7.809	0.010	0.044
<b>Total CO2E</b>			<b>7.9</b>

**PG&E R-687 L-215 San Joaquin River Crossing Replacement Project  
Phase 1: Strength Test and Caliper Piggng**

**OFF-ROAD SOURCES**

Source	Fuel	BHP	Number	Total Hours per Source	Emission Factors: pounds/BHP-hr <sup>1</sup>								Total English Tons											
					NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O	NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O				
Excavator	Diesel	310	1	48	0.00173	0.00015	0.00005	0.00005	0.00096	0.44473	0.000023	0.000010	0.01	0.00	0.00	0.00	0.01	3.31	0.000	0.000				
Light plant	Diesel	20	0	0	0.00742	0.00093	0.00035	0.00032	0.00482	0.92723	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000				
Generator (40 KVV)	Diesel	60	0	0	0.00033	0.00033	0.00003	0.00003	0.00389	0.37887	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000				
Air compressor (1600 cfm)	Diesel	580	2	48	0.00120	0.00009	0.00004	0.00004	0.00064	0.34080	0.000023	0.000010	0.03	0.00	0.00	0.00	0.02	9.49	0.001	0.000				
Welding machine	Diesel	20	2	48	0.00453	0.00062	0.00022	0.00020	0.00287	0.56374	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.54	0.000	0.000				
Side-boom pipelayer	Diesel	250	0	0	0.00488	0.00039	0.00020	0.00018	0.00207	0.49875	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000				
Skid-steer loader	Diesel	75	0	0	0.00202	0.00015	0.00009	0.00008	0.00266	0.42879	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000				
Backhoe	Diesel	75	0	0	0.01026	0.00131	0.00082	0.00076	0.00435	0.42882	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000				
Dozer (D6)	Diesel	215	0	0	0.00488	0.00039	0.00020	0.00018	0.00207	0.49875	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000				
HDD drill rig	Diesel	700	0	0	0.00136	0.00012	0.00005	0.00004	0.00109	0.59053	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000				
Mud pump	Diesel	600	0	0	0.00124	0.00008	0.00005	0.00005	0.00063	0.34080	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000				
Fill pump	Gasoline	10	1	48	0.00710	0.00948	0.00407	0.00307	0.34576	0.65330	0.000023	0.000010	0.00	0.00	0.00	0.00	0.08	0.16	0.000	0.000				
Pipe flush pump	Gasoline	20	0	0	0.00710	0.00948	0.00407	0.00307	0.34576	0.65330	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000				
Concrete pump	Diesel	300	0	0	0.00097	0.00008	0.00003	0.00003	0.00065	0.34080	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000				
													<b>0.052</b>	<b>0.006</b>	<b>0.003</b>	<b>0.002</b>	<b>0.111</b>	<b>13.495</b>	<b>0.0009</b>	<b>0.0004</b>				

**ON-ROAD SOURCES**

On Road Sources	Miles/Trip <sup>2</sup>	Total Trips	Emission Factors, grams/mile <sup>3</sup>								Total English Tons											
			NOx	ROG	PM10	PM2.5	CO	CO2	CH4	N2O	NOx	ROG	PM10	PM2.5	CO	CO2	CH4	N2O				
Light-duty truck (LDT2) <sup>4</sup>	40	27	0.12375	0.02129	0.00139	0.00128	1.29305	331.5704	0.00496	0.00908	0.0001	0.0000	0.0000	0.0000	0.0015	0.3947	0.0000	0.0000				
Medium-duty truck (MDV)	40	18	0.07819	0.01228	0.00647	0.00619	0.18535	346.6425	0.00057	0.05449	0.0001	0.0000	0.0000	0.0001	0.2751	0.0000	0.0000					
Heavy-duty truck (TG instate) <sup>5</sup>	18	60	3.88892	0.15147	0.08338	0.07977	0.55408	973.1576	0.00704	0.15297	0.0046	0.0002	0.0001	0.0001	0.0007	1.1585	0.0000	0.0002				
Water Truck (on-site)	0	0	3.88892	0.15147	0.08338	0.07977	0.55408	973.1576	0.00704	0.15297	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000				
<b>Totals =&gt;</b>											<b>0.0049</b>	<b>0.0002</b>	<b>0.0001</b>	<b>0.0001</b>	<b>0.0023</b>	<b>1.8294</b>	<b>0.0000</b>	<b>0.0002</b>				

**Off-Road & On-Road Source Totals**      0.057      0.007      0.003      0.003      0.113      15.323      0.0009      0.0006

**Greenhouse Gas Emissions Summary**

<b>Metric Tons</b>	13.681	0.001	0.001
<b>CO2E</b>	13.681	0.022	0.142
<b>Total CO2E</b>			<b>13.8</b>

**Notes:**

- <sup>1</sup> Emission factors from OFFROAD 2017 (ver 1.0.1) for the San Joaquin Valley Air Basin
- <sup>2</sup> Round trip distance to Modesto
- <sup>3</sup> Emission factors from EMFAC 2017 for Stanislaus County year 2020 annual emissions
- <sup>4</sup> Assumes two workers per truck, one round trip per day
- <sup>5</sup> Trucking of 180,000 gallons of hydrostatic test water to Modesto WWTP

**PG&E R-687 L-215 San Joaquin River Crossing Replacement Project  
Phase 1: Backfill/Site Restoration**

**OFF-ROAD SOURCES**

Source	Fuel	BHP	Number	Total Hours per Source	Emission Factors: pounds/BHP-hr <sup>1</sup>								Total English Tons										
					NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O	NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O			
Excavator	Diesel	310	2	80	0.00173	0.00015	0.00005	0.00005	0.00096	0.44473	0.000023	0.000010	0.04	0.00	0.00	0.00	0.02	11.03	0.001	0.000			
Light plant	Diesel	20	0	0	0.00742	0.00093	0.00035	0.00032	0.00482	0.92723	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000			
Generator (40 KW)	Diesel	60	0	0	0.00033	0.00033	0.00003	0.00003	0.00389	0.37887	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000			
Air compressor (185 cfm)	Diesel	50	1	80	0.00259	0.00018	0.00008	0.00007	0.00277	0.37887	0.000023	0.000010	0.01	0.00	0.00	0.00	0.01	0.76	0.000	0.000			
Welding machine	Diesel	20	0	0	0.00453	0.00062	0.00022	0.00020	0.00287	0.56374	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000			
Side-boom pipelayer	Diesel	260	0	0	0.00468	0.00039	0.00020	0.00018	0.00207	0.49875	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000			
Skid-steer loader	Diesel	75	0	0	0.00202	0.00015	0.00009	0.00008	0.00266	0.42879	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000			
Backhoe	Diesel	75	0	0	0.01026	0.00131	0.00082	0.00076	0.00435	0.42882	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000			
Dozer (D6)	Diesel	215	0	0	0.00488	0.00039	0.00020	0.00018	0.00207	0.49875	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000			
HDD drill rig	Diesel	700	0	0	0.00136	0.00012	0.00005	0.00004	0.00109	0.59053	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000			
Mud pump	Diesel	600	0	0	0.00124	0.00008	0.00005	0.00005	0.00063	0.34080	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000			
Fill pump	Gasoline	10	0	0	0.00710	0.00948	0.00407	0.00307	0.34576	0.65330	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000			
Pipe flush pump	Gasoline	20	0	0	0.00710	0.00948	0.00407	0.00307	0.34576	0.65330	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000			
Concrete pump	Diesel	300	0	0	0.00097	0.00008	0.00003	0.00003	0.00065	0.34080	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000			
													<b>0.048</b>	<b>0.004</b>	<b>0.001</b>	<b>0.001</b>	<b>0.029</b>	<b>11.787</b>	<b>0.0006</b>	<b>0.0003</b>			

**ON-ROAD SOURCES**

On Road Sources	Miles/Trip <sup>2</sup>	Total Trips	Emission Factors, grams/mile <sup>3</sup>								Total English Tons										
			NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O	NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O			
Light-duty truck (LD <sub>2</sub> ) <sup>4</sup>	40	45	0.12375	0.02129	0.00139	0.00128	1.29305	331.5704	0.00496	0.00908	0.0002	0.0000	0.0000	0.0000	0.0026	0.6579	0.0000	0.0000			
Medium-duty truck (MDV)	0	0	0.07819	0.01228	0.00647	0.00619	1.18535	346.6425	0.00057	0.05449	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			
Heavy-duty truck (T6 instate) <sup>5</sup>	40	60	3.88892	0.15147	0.08338	0.07977	0.55408	973.1576	0.00704	0.15297	0.0103	0.0004	0.0002	0.0002	0.0015	2.5745	0.0000	0.0004			
Heavy-duty truck (T6 instate) <sup>6</sup>	100	89	3.88892	0.15147	0.08338	0.07977	0.55408	973.1576	0.00704	0.15297	0.0382	0.0015	0.0008	0.0008	0.0054	9.5471	0.0001	0.0015			
Heavy-duty truck (T6 instate) <sup>7</sup>	40	20	3.88892	0.15147	0.08338	0.07977	0.55408	973.1576	0.00704	0.15297	0.0034	0.0001	0.0001	0.0001	0.0005	0.8582	0.0000	0.0001			
Water Truck (on-site) <sup>7</sup>	0	0	3.88892	0.15147	0.08338	0.07977	0.55408	973.1576	0.00704	0.15297	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			
Totals =>											<b>0.0521</b>	<b>0.0021</b>	<b>0.0011</b>	<b>0.0011</b>	<b>0.0100</b>	<b>13.6376</b>	<b>0.0001</b>	<b>0.0021</b>			

Off-Road & On-Road Source Totals      0.100      0.006      0.003      0.002      0.039      25.425      0.0007      0.0023

Notes:

- <sup>1</sup> Emission factors from OFFROAD 2017 (ver 1.0.1) for the San Joaquin Valley Air Basin
- <sup>2</sup> Round trip distance to Modesto
- <sup>3</sup> Emission factors from EMFAC 2017 for Stanislaus County year 2020 annual emissions
- <sup>4</sup> Assumes two workers per truck, one round trip per day
- <sup>5</sup> Hydrostatic test water disposal: 180,000 gallons
- <sup>6</sup> Drill cuttings (1000 cy) and waste drilling fluid (10000 gallons) disposal
- <sup>7</sup> Assumes 20 miles per day cycling through work areas, total trips=work days

**Greenhouse Gas Emissions Summary**

Metric Tons	22.701	0.001	0.002
CO2E	22.701	0.018	0.550
<b>Total CO2E</b>			<b>23.3</b>

**PG&E R-687 L-215 San Joaquin River Crossing Replacement Project  
Phase 1: Existing Pipeline Decommissioning**

**OFF-ROAD SOURCES**

Source	Fuel	BHP	Number	Total Hours per Source	Emission Factors: pounds/BHP-hr <sup>1</sup>								Total English Tons											
					NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O	NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O				
Excavator	Diesel	310	1	48	0.00173	0.00015	0.00005	0.00005	0.00096	0.44473	0.000023	0.000010	0.01	0.00	0.00	0.00	0.01	3.31	0.000	0.000				
Light plant	Diesel	20	0	0	0.00742	0.00093	0.00035	0.00032	0.00482	0.92723	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000				
Generator (40 KW)	Diesel	60	0	0	0.00033	0.00033	0.00003	0.00003	0.00389	0.37887	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000				
Air compressor (185 cfm)	Diesel	50	1	8	0.00259	0.00018	0.00008	0.00007	0.00277	0.37887	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.08	0.000	0.000				
Welding machine	Diesel	20	1	12	0.00453	0.00062	0.00022	0.00020	0.00287	0.58374	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.07	0.000	0.000				
Side-boom pipelayer	Diesel	260	0	0	0.00488	0.00039	0.00020	0.00018	0.00207	0.49875	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000				
Skid-steer loader	Diesel	75	0	0	0.00202	0.00015	0.00009	0.00008	0.00286	0.42879	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000				
Backhoe	Diesel	75	0	0	0.01026	0.00131	0.00082	0.00076	0.00435	0.42882	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000				
Dozer (D6)	Diesel	215	0	0	0.00488	0.00039	0.00020	0.00018	0.00207	0.49875	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000				
HDD drill rig	Diesel	700	0	0	0.00136	0.00012	0.00005	0.00004	0.00109	0.59053	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000				
Mud pump	Diesel	600	0	0	0.00124	0.00008	0.00005	0.00005	0.00063	0.34080	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000				
Fill pump	Gasoline	10	0	0	0.00710	0.00948	0.00407	0.00307	0.34576	0.65330	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000				
Pipe flush pump	Gasoline	20	1	8	0.00710	0.00948	0.00407	0.00307	0.34576	0.65330	0.000023	0.000010	0.00	0.00	0.00	0.00	0.03	0.05	0.000	0.000				
Concrete pump	Diesel	300	1	4	0.00097	0.00008	0.00003	0.00003	0.00065	0.34080	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.20	0.000	0.000				
													<b>0.015</b>	<b>0.002</b>	<b>0.001</b>	<b>0.001</b>	<b>0.036</b>	<b>3.709</b>	<b>0.0002</b>	<b>0.0001</b>				

**ON-ROAD SOURCES**

On Road Sources	Miles/Trip <sup>2</sup>	Total Trips	Emission Factors, grams/mile <sup>3</sup>								Total English Tons											
			NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O	NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O				
Light-duty truck (LD <sub>12</sub> ) <sup>4</sup>	40	13	0.12375	0.02129	0.00139	0.00128	1.29305	331.5704	0.00496	0.00908	0.0001	0.0000	0.0000	0.0000	0.0007	0.1901	0.0000	0.0000				
Medium-duty truck (MDV)	0	0	0.07819	0.01228	0.00647	0.00619	0.18535	346.6425	0.00057	0.05449	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000				
Heavy-duty truck (T6 instate)	40	7	3.88892	0.15147	0.08338	0.07977	0.55408	973.1576	0.00704	0.15297	0.0012	0.0000	0.0000	0.0000	0.0002	0.3004	0.0000	0.0000				
Water Truck (on-site) <sup>5</sup>	0	0	3.88892	0.15147	0.08338	0.07977	0.55408	973.1576	0.00704	0.15297	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000				
<b>Totals =&gt;</b>											<b>0.0013</b>	<b>0.0001</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0009</b>	<b>0.4904</b>	<b>0.0000</b>	<b>0.0001</b>				

Off-Road & On-Road Source Totals      0.016      0.002      0.001      0.001      0.037      4.199      0.0002      0.0001

**Greenhouse Gas Emissions Summary**

Metric Tons	3.749	0.000	0.000
CO2E	3.749	0.005	0.032
<b>Total CO2E</b>			<b>3.8</b>

**Notes:**

- <sup>1</sup> Emission factors from OFFROAD 2017 (ver 1.0.1) for the San Joaquin Valley Air Basin
- <sup>2</sup> Round trip distance to Modesto
- <sup>3</sup> Emission factors from EMFAC 2017 for Stanislaus County year 2020 annual emissions
- <sup>4</sup> Assumes two workers per truck, one round trip per day
- <sup>5</sup> Assumes 20 miles per day cycling through work areas, total trips=work days

**PG&E R-687 L-215 San Joaquin River Crossing Replacement Project  
Phase 1: Air Pollutant and Greenhouse Gas Emissions Totals**

Task	Total English Tons					Metric Tons			
	NOx	ROG	PM10	PM2.5	CO	CO2	CH4	N2O	CO2E
Site Support/Project Management	0.258	0.035	0.012	0.011	0.266	39.705	0.001	0.001	40.0
Pipe/Materials Procurement	0.039	0.003	0.001	0.001	0.017	9.095	0.000	0.001	9.3
Excavation	0.087	0.007	0.003	0.002	0.057	19.883	0.001	0.000	20.0
Pipe String Welding	0.442	0.041	0.017	0.016	0.248	72.791	0.003	0.002	73.4
Pipe Installation	0.061	0.006	0.002	0.002	0.041	13.774	0.001	0.000	13.9
HDD Operation	1.668	0.130	0.061	0.056	1.075	449.619	0.021	0.022	456.0
Pipe String Pull-back	0.060	0.006	0.003	0.002	0.030	7.809	0.000	0.000	7.9
Strength Test and Caliper Pigging	0.057	0.007	0.003	0.003	0.113	13.681	0.001	0.001	13.8
Backfill/Site Restoration	0.100	0.006	0.003	0.002	0.039	22.701	0.001	0.002	23.3
Existing Pipeline Decommissioning	0.016	0.002	0.001	0.001	0.037	3.749	0.000	0.000	3.8
<b>Total</b>	<b>2.788</b>	<b>0.243</b>	<b>0.104</b>	<b>0.095</b>	<b>1.924</b>	<b>652.808</b>	<b>0.030</b>	<b>0.029</b>	<b>661.4</b>

**PG&E R-687 L-215 San Joaquin River Crossing Replacement Project  
Phase 2: Mobilization**

**OFF-ROAD SOURCES**

Source	Fuel	BHP	Number	Total Hours per Source	Emission Factors: pounds/BHP-hr <sup>1</sup>								Total English Tons										
					NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O	NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O			
Excavator	Diesel	310	0	0	0.00173	0.00015	0.00005	0.00005	0.00096	0.44473	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000			
Wheeled loader	Diesel	240	0	0	0.00224	0.00018	0.00007	0.00007	0.00101	0.42804	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000			
Generator (60 KW)	Diesel	75	0	0	0.00033	0.00033	0.00003	0.00003	0.00369	0.37887	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000			
Air compressor	Diesel	20	0	0	0.00485	0.00068	0.00023	0.00021	0.00287	0.80481	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000			
Dive compressor	Diesel	50	0	0	0.00470	0.00092	0.00028	0.00026	0.00554	0.80125	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000			
Welding machine	Diesel	20	0	0	0.00453	0.00062	0.00022	0.00020	0.00287	0.56374	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000			
Crane (barge assembly)	Diesel	610	1	120	0.00231	0.00019	0.00009	0.00008	0.00153	0.33457	0.000023	0.000010	0.08	0.01	0.00	0.00	0.06	12.25	0.001	0.000			
Crane (on barge)	Diesel	330	0	0	0.00286	0.00024	0.00012	0.00011	0.00112	0.33516	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000			
Barge support vessel	Diesel	500	0	0	0.00201	0.00082	0.00042	0.00040	0.00181	0.35000	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000			
Pipe flush pump	Gasoline	20	0	0	0.00710	0.00948	0.00407	0.00307	0.34576	0.65330	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000			
Concrete pump	Diesel	300	0	0	0.00097	0.00008	0.00003	0.00003	0.00065	0.34080	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000			
													<b>0.086</b>	<b>0.007</b>	<b>0.003</b>	<b>0.003</b>	<b>0.066</b>	<b>12.245</b>	<b>0.0009</b>	<b>0.0004</b>			

**ON-ROAD SOURCES**

On Road Sources	Miles/Trip <sup>2</sup>	Total Trips	Emission Factors, grams/mile <sup>3</sup>								Total English Tons										
			NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O	NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O			
Light-duty truck (LDT2) <sup>4</sup>	40	40	0.12375	0.02129	0.00139	0.00128	1.29305	331.5704	0.00496	0.00908	0.0002	0.0000	0.0000	0.0000	0.0023	0.5848	0.0000	0.0000			
Medium-duty truck (MDV)	0	0	0.07819	0.01228	0.00647	0.00619	0.18535	346.6425	0.00057	0.05449	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			
Water truck (T6 instate) <sup>5</sup>	0	0	3.88892	0.15147	0.08338	0.07977	0.55408	973.1576	0.00704	0.15297	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			
Heavy-duty truck (T6 instate)	100	41	3.88892	0.15147	0.08338	0.07977	0.55408	973.1576	0.00704	0.15297	0.0176	0.0007	0.0004	0.0004	0.0025	4.3981	0.0000	0.0007			
<b>Totals =&gt;</b>											<b>0.0178</b>	<b>0.0007</b>	<b>0.0004</b>	<b>0.0004</b>	<b>0.0048</b>	<b>4.9829</b>	<b>0.0000</b>	<b>0.0007</b>			

Off-Road & On-Road Source Totals      0.102      0.008      0.004      0.003      0.061      17.228      0.0009      0.0011

**Notes:**

- <sup>1</sup> Emission factors from OFFROAD 2017 (ver 1.0.1) for the San Joaquin Valley Air Basin, except vessel factors from San Pedro Bay Ports Emissions Inventory
- <sup>2</sup> Round trip distance to Modesto (40 miles) for workers
- <sup>3</sup> Emission factors from EMFAC 2017 for Stanislaus County year 2020 annual emissions
- <sup>4</sup> Assumes two workers per truck, one round trip per day
- <sup>5</sup> Assumes 20 miles per day cycling through work areas, total trips=work days

**Greenhouse Gas Emissions Summary**

<b>Metric Tons</b>	15.382	0.001	0.001
<b>CO2E</b>	15.382	0.022	0.254
<b>Total CO2E</b>			<b>15.7</b>

**PG&E R-687 L-215 San Joaquin River Crossing Replacement Project  
Phase 2: Pig and Flush Pipeline**

**OFF-ROAD SOURCES**

Source	Fuel	BHP	Number	Total Hours per Source	Emission Factors: pounds/BHP-hr <sup>1</sup>								Total English Tons									
					NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O	NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O		
Excavator	Diesel	310	2	32	0.00173	0.00015	0.00005	0.00005	0.00056	0.44473	0.000023	0.000010	0.02	0.00	0.00	0.00	0.01	4.41	0.000	0.000		
Wheeled loader	Diesel	240	2	32	0.00224	0.00018	0.00007	0.00007	0.00101	0.42804	0.000023	0.000010	0.02	0.00	0.00	0.00	0.01	3.29	0.000	0.000		
Generator (50 KW)	Diesel	75	0	0	0.00033	0.00033	0.00003	0.00003	0.00389	0.37887	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000		
Air compressor	Diesel	20	1	4	0.00485	0.00068	0.00023	0.00021	0.00287	0.60481	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.02	0.000	0.000		
Dive compressor	Diesel	50	0	0	0.00470	0.00092	0.00028	0.00026	0.00554	0.60125	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000		
Welding machine	Diesel	20	1	4	0.00453	0.00062	0.00022	0.00020	0.00287	0.56374	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.02	0.000	0.000		
Crane (barge assembly)	Diesel	610	0	0	0.00231	0.00019	0.00009	0.00008	0.00153	0.33457	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000		
Crane (on barge)	Diesel	330	0	0	0.00286	0.00024	0.00012	0.00011	0.00112	0.33516	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000		
Barge support vessel	Diesel	500	0	0	0.00201	0.00082	0.00042	0.00040	0.00181	0.35000	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000		
Pipe flush pump	Gasoline	20	1	12	0.00710	0.00848	0.00407	0.00307	0.34576	0.65330	0.000023	0.000010	0.00	0.00	0.00	0.00	0.04	0.08	0.000	0.000		
Concrete pump	Diesel	300	0	0	0.00097	0.00008	0.00003	0.00003	0.00065	0.34080	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000		
													<b>0.036</b>	<b>0.004</b>	<b>0.002</b>	<b>0.001</b>	<b>0.059</b>	<b>7.824</b>	<b>0.004</b>	<b>0.002</b>		

**ON-ROAD SOURCES**

On Road Sources	Miles/Trip	Total Trips	Emission Factors, grams/mile <sup>3</sup>								Total English Tons									
			NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O	NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O		
Light-duty truck (LDT2) <sup>2,4</sup>	40	25	0.12375	0.02129	0.00139	0.00128	1.29305	331.5704	0.00496	0.00908	0.0001	0.0000	0.0000	0.0000	0.0014	0.3655	0.0000	0.0000		
Medium-duty truck (MDV)	0	0	0.07819	0.01228	0.00647	0.00619	0.18535	346.6425	0.00057	0.05449	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		
Water truck (T6 instate) <sup>5</sup>	20	4	3.88892	0.15147	0.08338	0.07977	0.55408	973.1576	0.00704	0.15297	0.0003	0.0000	0.0000	0.0000	0.0000	0.0858	0.0000	0.0000		
Heavy-duty truck (T6 instate) <sup>6</sup>	40	30	3.88892	0.15147	0.08338	0.07977	0.55408	973.1576	0.00704	0.15297	0.0051	0.0002	0.0001	0.0001	0.0007	1.2872	0.0000	0.0015		
Heavy-duty truck (T6 instate) <sup>6</sup>	40	10	3.88892	0.15147	0.08338	0.07977	0.55408	973.1576	0.00704	0.15297	0.0017	0.0001	0.0000	0.0000	0.0002	0.4291	0.0000	0.0001		
<b>Totals =&gt;</b>											<b>0.0073</b>	<b>0.0003</b>	<b>0.0002</b>	<b>0.0001</b>	<b>0.0025</b>	<b>2.1676</b>	<b>0.0000</b>	<b>0.0016</b>		

**Off-Road & On-Road Source Totals**      **0.043**      **0.004**      **0.002**      **0.002**      **0.061**      **9.992**      **0.0004**      **0.0018**

**Notes:**

- <sup>1</sup> Emission factors from OFFROAD 2017 (ver 1.0.1) for the San Joaquin Valley Air Basin, except vessel factors from San Pedro Bay Ports Emissions Inventory
- <sup>2</sup> Round trip distance to Modesto (40 miles) for workers
- <sup>3</sup> Emission factors from: EMFAC 2017 for Stanislaus County year 2020 annual emissions
- <sup>4</sup> Assumes two workers per truck, one round trip per day
- <sup>5</sup> Assumes 20 miles per day cycling through work areas, total trips=work days
- <sup>6</sup> Flush water import, assume 40 miles round trip

**Greenhouse Gas Emissions Summary**

<b>Metric Tons</b>	8.921	0.000	0.002
<b>CO2E</b>	8.921	0.011	0.424
<b>Total CO2E</b>			<b>9.4</b>

**PG&E R-687 L-215 San Joaquin River Crossing Replacement Project  
Phase 2: Cementing Pipeline**

**OFF-ROAD SOURCES**

Source	Fuel	BHP	Number	Total Hours per Source	Emission Factors: pounds/BHP-hr <sup>1</sup>								Total English Tons							
					NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O	NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O
Excavator	Diesel	310	2	120	0.00173	0.00015	0.00005	0.00005	0.00096	0.44473	0.000023	0.000010	0.06	0.01	0.00	0.00	0.04	16.54	0.001	0.000
Wheeled loader	Diesel	240	2	120	0.00224	0.00018	0.00007	0.00007	0.00101	0.42604	0.000023	0.000010	0.06	0.01	0.00	0.00	0.03	12.33	0.001	0.000
Generator (60 KW)	Diesel	75	0	0	0.00033	0.00033	0.00003	0.00003	0.00389	0.37887	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000
Air compressor	Diesel	20	0	0	0.00485	0.00068	0.00023	0.00021	0.00287	0.60481	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000
Dive compressor	Diesel	50	0	0	0.00470	0.00092	0.00028	0.00026	0.00554	0.60125	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000
Welding machine	Diesel	20	1	12	0.00453	0.00062	0.00022	0.00020	0.00287	0.56374	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.07	0.000	0.000
Crane (barge assembly)	Diesel	610	0	0	0.00231	0.00019	0.00009	0.00008	0.00153	0.33457	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000
Crane (on barge)	Diesel	330	0	0	0.00286	0.00024	0.00012	0.00011	0.00112	0.33516	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000
Barge support vessel	Diesel	500	0	0	0.00201	0.00082	0.00042	0.00040	0.00181	0.35000	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000
Pipe flush pump	Gasoline	20	0	0	0.00710	0.00948	0.00407	0.00307	0.34576	0.65330	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000
Concrete pump	Diesel	300	1	24	0.00097	0.00008	0.00003	0.00003	0.00065	0.34080	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	1.23	0.000	0.000
													<b>0.133</b>	<b>0.011</b>	<b>0.004</b>	<b>0.004</b>	<b>0.067</b>	<b>30.166</b>	<b>0.0016</b>	<b>0.0007</b>

**ON-ROAD SOURCES**

On Road Sources	Miles/Trip <sup>2</sup>	Total Trips	Emission Factors, grams/mile <sup>3</sup>								Total English Tons							
			NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O	NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O
Light-duty truck (LD <sub>T</sub> ) <sup>4</sup>	40	40	0.12375	0.02129	0.00139	0.00128	1.29305	331.5704	0.00496	0.00908	0.0002	0.0000	0.0000	0.0000	0.0023	0.5848	0.0000	0.0000
Medium-duty truck (MDV)	0	0	0.07819	0.01228	0.00647	0.00619	0.18535	346.6425	0.00057	0.05449	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water truck (T6 instate) <sup>5</sup>	0	0	3.88892	0.15147	0.08338	0.07977	0.55408	973.1576	0.00704	0.15297	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Heavy-duty truck (T6 instate)	40	25	3.88892	0.15147	0.08338	0.07977	0.55408	973.1576	0.00704	0.15297	0.0043	0.0002	0.0001	0.0001	0.0006	1.0727	0.0000	0.0002
<b>Totals =&gt;</b>											<b>0.0046</b>	<b>0.0002</b>	<b>0.0001</b>	<b>0.0001</b>	<b>0.0029</b>	<b>1.6576</b>	<b>0.0000</b>	<b>0.0002</b>

Off-Road & On-Road Source Totals 0.137 0.011 0.004 0.004 0.070 31.824 0.0016 0.0009

**Notes:**

- <sup>1</sup> Emission factors from OFFROAD 2017 (ver 1.0.1) for the San Joaquin Valley Air Basin, except vessel factors from San Pedro Bay Ports Emissions Inventory
- <sup>2</sup> Round trip distance to Modesto (40 miles) for workers
- <sup>3</sup> Emission factors from EMFAC 2017 for Stanislaus County year 2020 annual emissions
- <sup>4</sup> Assumes two workers per truck, one round trip per day
- <sup>5</sup> Assumes 20 miles per day cycling through work areas, total trips=work days

**Greenhouse Gas Emissions Summary**

Metric Tons	28.414	0.001	0.001
CO2E	28.414	0.041	0.209
<b>Total CO2E</b>			<b>28.7</b>

**PG&E R-687 L-215 San Joaquin River Crossing Replacement Project  
Phase 2: Onshore Pipeline Removal**

**OFF-ROAD SOURCES**

Source	Fuel	BHP	Number	Total Hours per Source	Emission Factors: pounds/BHP-hr <sup>1</sup>								Total English Tons										
					NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O	NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O			
Excavator	Diesel	310	2	80	0.00173	0.00015	0.00005	0.00005	0.00096	0.44473	0.000023	0.000010	0.04	0.00	0.00	0.00	0.02	11.03	0.001	0.000			
Wheeled loader	Diesel	240	2	80	0.00224	0.00018	0.00007	0.00007	0.00101	0.42804	0.000023	0.000010	0.04	0.00	0.00	0.00	0.02	8.22	0.000	0.000			
Generator (50 KW)	Diesel	75	0	0	0.00033	0.00033	0.00003	0.00003	0.00389	0.37887	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000			
Air compressor	Diesel	20	0	0	0.00485	0.00068	0.00023	0.00021	0.00287	0.60481	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000			
Dive compressor	Diesel	50	0	0	0.00470	0.00092	0.00028	0.00026	0.00554	0.60125	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000			
Welding machine	Diesel	20	0	0	0.00453	0.00062	0.00022	0.00020	0.00287	0.56374	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000			
Crane (barge assembly)	Diesel	610	0	0	0.00231	0.00019	0.00009	0.00008	0.00153	0.33457	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000			
Crane (on barge)	Diesel	330	0	0	0.00286	0.00024	0.00012	0.00011	0.00112	0.33516	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000			
Barge support vessel	Diesel	500	0	0	0.00201	0.00082	0.00042	0.00040	0.00181	0.35000	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000			
Pipe flush pump	Gasoline	20	0	0	0.00710	0.00948	0.00407	0.00307	0.34576	0.65330	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000			
Concrete pump	Diesel	300	0	0	0.00097	0.00006	0.00003	0.00003	0.00065	0.34080	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000			
													<b>0.088</b>	<b>0.007</b>	<b>0.003</b>	<b>0.003</b>	<b>0.043</b>	<b>19.248</b>	<b>0.0010</b>	<b>0.0004</b>			

**ON-ROAD SOURCES**

On Road Sources	Miles/Trip <sup>2</sup>	Total Trips	Emission Factors, grams/mile <sup>3</sup>								Total English Tons										
			NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O	NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O			
Light-duty truck (LDT2) <sup>4</sup>	40	25	0.12375	0.02129	0.00139	0.00128	1.29305	331.5704	0.00496	0.00908	0.0001	0.0000	0.0000	0.0000	0.0014	0.3655	0.0000	0.0000			
Medium-duty truck (MDV)	0	0	0.07819	0.01228	0.00647	0.00619	0.18535	346.6425	0.00057	0.05449	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			
Water truck (T6 instate) <sup>5</sup>	0	0	3.88892	0.15147	0.08338	0.07977	0.55408	973.1576	0.00704	0.15297	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			
Heavy-duty truck (T6 instate)	40	14	3.88892	0.15147	0.08338	0.07977	0.55408	973.1576	0.00704	0.15297	0.0024	0.0001	0.0001	0.0000	0.0003	0.6007	0.0000	0.0001			
<b>Totals =&gt;</b>											<b>0.0025</b>	<b>0.0001</b>	<b>0.0001</b>	<b>0.0001</b>	<b>0.0018</b>	<b>0.9662</b>	<b>0.0000</b>	<b>0.0001</b>			

**Off-Road & On-Road Source Totals**      **0.088**      **0.007**      **0.003**      **0.003**      **0.046**      **20.214**      **0.0010**      **0.0006**

**Notes:**

- <sup>1</sup> Emission factors from OFFROAD 2017 (ver 1.0.1) for the San Joaquin Valley Air Basin, except vessel factors from San Pedro Bay Ports Emissions Inventory
- <sup>2</sup> Round trip distance to Modesto (40 miles) for workers
- <sup>3</sup> Emission factors from EMFAC 2017 for Stanislaus County year 2020 annual emissions
- <sup>4</sup> Assumes two workers per truck, one round trip per day
- <sup>5</sup> Assumes 20 miles per day cycling through work areas, total trips=work days

**Greenhouse Gas Emissions Summary**

<b>Metric Tons</b>	18.048	0.001	0.000
<b>CO2E</b>	18.048	0.026	0.129
<b>Total CO2E</b>			<b>18.2</b>

**PG&E R-687 L-215 San Joaquin River Crossing Replacement Project  
Phase 2: In-River Pipeline Removal**

**OFF-ROAD SOURCES**

Source	Fuel	BHP	Number	Total Hours per Source	Emission Factors: pounds/BHP-hr <sup>1</sup>								Total English Tons										
					NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O	NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O			
Excavator	Diesel	310	0	0	0.00173	0.00015	0.00005	0.00005	0.00096	0.44473	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000			
Wheeled loader	Diesel	240	0	0	0.00224	0.00018	0.00007	0.00007	0.00101	0.42804	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000			
Generator (60 KW)	Diesel	75	1	30	0.00033	0.00033	0.00003	0.00003	0.00389	0.37887	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.43	0.000	0.000			
Air compressor	Diesel	20	0	0	0.00485	0.00068	0.00023	0.00021	0.00287	0.60481	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000			
Dive compressor	Diesel	50	1	180	0.00470	0.00092	0.00028	0.00026	0.00554	0.60125	0.000023	0.000010	0.02	0.00	0.00	0.00	0.02	2.71	0.000	0.000			
Welding machine	Diesel	20	0	0	0.00453	0.00062	0.00022	0.00020	0.00287	0.56374	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000			
Crane (barge assembly)	Diesel	610	0	0	0.00231	0.00019	0.00009	0.00008	0.00153	0.33457	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000			
Crane (on barge)	Diesel	330	1	180	0.00286	0.00024	0.00012	0.00011	0.00112	0.33516	0.000023	0.000010	0.08	0.01	0.00	0.00	0.03	9.95	0.001	0.000			
Barge support vessel	Diesel	500	1	180	0.00201	0.00082	0.00042	0.00040	0.00181	0.35000	0.000023	0.000010	0.09	0.04	0.02	0.02	0.08	15.75	0.001	0.000			
Pipe flush pump	Gasoline	20	0	0	0.00710	0.00948	0.00407	0.00307	0.34576	0.65330	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000			
Concrete pump	Diesel	300	0	0	0.00097	0.00008	0.00003	0.00003	0.00065	0.34080	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000			
													<b>0.197</b>	<b>0.049</b>	<b>0.024</b>	<b>0.022</b>	<b>0.144</b>	<b>28.836</b>	<b>0.0019</b>	<b>0.0008</b>			

**ON-ROAD SOURCES**

On Road Sources	Miles/Trip <sup>2</sup>	Total Trips	Emission Factors, grams/mile <sup>3</sup>								Total English Tons										
			NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O	NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O			
Light-duty truck (LDT2) <sup>4</sup>	40	90	0.12375	0.02129	0.00139	0.00128	1.29305	331.5704	0.00496	0.00908	0.0005	0.0001	0.0000	0.0000	0.0051	1.3158	0.0000	0.0000			
Medium-duty truck (MDV)	0	0	0.07819	0.01228	0.00647	0.00619	0.18535	346.6425	0.00057	0.05449	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000				
Water truck (T6 instate) <sup>5</sup>	0	0	3.88892	0.15147	0.08338	0.07977	0.55408	973.1576	0.00704	0.15297	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000				
Heavy-duty truck (T6 instate)	40	4	3.88892	0.15147	0.08338	0.07977	0.55408	973.1576	0.00704	0.15297	0.0007	0.0000	0.0000	0.0000	0.0001	0.1716	0.0000	0.0000			
<b>Totals =&gt;</b>											<b>0.0012</b>	<b>0.0001</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0062</b>	<b>1.4874</b>	<b>0.0000</b>	<b>0.0001</b>			

**Off-Road & On-Road Source Totals**      **0.198**      **0.049**      **0.024**      **0.022**      **0.149**      **30.323**      **0.0019**      **0.0009**

**Greenhouse Gas Emissions Summary**

<b>Metric Tons</b>	27.075	0.002	0.001
<b>CO2E</b>	27.075	0.047	0.205
<b>Total CO2E</b>			<b>27.3</b>

**Notes:**

<sup>1</sup> Emission factors from OFFROAD 2017 (ver 1.0.1) for the San Joaquin Valley Air Basin, except vessel factors from San Pedro Bay Ports Emissions Inventory

<sup>2</sup> Round trip distance to Modesto (40 miles) for workers

<sup>3</sup> Emission factors from EMFAC 2017 for Stanislaus County year 2020 annual emissions

<sup>4</sup> Assumes two workers per truck, one round trip per day

<sup>5</sup> Assumes 20 miles per day cycling through work areas, total trips=work days

**PG&E R-687 L-216 San Joaquin River Crossing Replacement Project  
Phase 2: Demobilization**

**OFF-ROAD SOURCES**

Source	Fuel	BHP	Number	Total Hours per Source	Emission Factors: pounds/BHP-hr <sup>1</sup>								Total English Tons							
					NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O	NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O
Excavator	Diesel	310	0	0	0.00173	0.00015	0.00005	0.00005	0.00096	0.44473	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000
Wheeled loader	Diesel	240	0	0	0.00224	0.00018	0.00007	0.00007	0.00101	0.42804	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000
Generator (60 KW)	Diesel	75	0	0	0.00033	0.00033	0.00003	0.00003	0.00389	0.37887	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000
Air compressor	Diesel	20	0	0	0.00485	0.00068	0.00023	0.00021	0.00287	0.60481	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000
Dive compressor	Diesel	50	0	0	0.00470	0.00092	0.00028	0.00026	0.00554	0.60125	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000
Welding machine	Diesel	20	0	0	0.00453	0.00062	0.00022	0.00020	0.00287	0.56374	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000
Crane (barge assembly)	Diesel	610	1	120	0.00231	0.00019	0.00009	0.00008	0.00153	0.33457	0.000023	0.000010	0.08	0.01	0.00	0.00	0.06	12.25	0.001	0.000
Crane (on barge)	Diesel	330	0	0	0.00286	0.00024	0.00012	0.00011	0.00112	0.33516	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000
Barge support vessel	Diesel	500	0	0	0.00201	0.00082	0.00042	0.00040	0.00181	0.35000	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000
Pipe flush pump	Gasoline	20	0	0	0.00710	0.00948	0.00407	0.00307	0.34576	0.65330	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000
Concrete pump	Diesel	300	0	0	0.00097	0.00008	0.00003	0.00003	0.00065	0.34080	0.000023	0.000010	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000
													<b>0.086</b>	<b>0.007</b>	<b>0.003</b>	<b>0.003</b>	<b>0.056</b>	<b>12.245</b>	<b>0.0009</b>	<b>0.0004</b>

**ON-ROAD SOURCES**

On Road Sources	Miles/Trip <sup>2</sup>	Total Trips	Emission Factors, grams/mile <sup>3</sup>								Total English Tons							
			NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O	NO <sub>x</sub>	ROG	PM10	PM2.5	CO	CO2	CH4	N2O
Light-duty truck (LDT2) <sup>4</sup>	40	40	0.12375	0.02129	0.00139	0.00128	1.29305	331.5704	0.00496	0.00908	0.0002	0.0000	0.0000	0.0000	0.0023	0.5848	0.0000	0.0000
Medium-duty truck (MDV)	0	0	0.07819	0.01228	0.00647	0.00619	0.18535	346.6425	0.00057	0.05449	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water truck (T6 instate) <sup>5</sup>	0	0	3.88892	0.15147	0.08338	0.07977	0.55408	973.1578	0.00704	0.15297	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Heavy-duty truck (T6 instate) <sup>5</sup>	40	30	3.88892	0.15147	0.08338	0.07977	0.55408	973.1578	0.00704	0.15297	0.0051	0.0002	0.0001	0.0001	0.0007	1.2872	0.0000	0.0002
Heavy-duty truck (T6 instate)	100	55	3.88892	0.15147	0.08338	0.07977	0.55408	973.1578	0.00704	0.15297	0.0236	0.0009	0.0005	0.0005	0.0034	5.8999	0.0000	0.0009
<b>Totals =&gt;</b>											<b>0.0288</b>	<b>0.0012</b>	<b>0.0006</b>	<b>0.0006</b>	<b>0.0064</b>	<b>7.7719</b>	<b>0.0001</b>	<b>0.0011</b>

**Off-Road & On-Road Source Totals**      0.113      0.008      0.004      0.004      0.062      20.017      0.0009      0.0016

**Notes:**

- <sup>1</sup> Emission factors from OFFROAD 2017 (ver 1.0.1) for the San Joaquin Valley Air Basin, except vessel factors from San Pedro Bay Ports Emissions Inventory
- <sup>2</sup> Round trip distance to Modesto (40 miles) for workers
- <sup>3</sup> Emission factors from EMFAC 2017 for Stanislaus County year 2020 annual emissions
- <sup>4</sup> Assumes two workers per truck, one round trip per day
- <sup>5</sup> Assumes 20 miles per day cycling through work areas, total trips=work days

**Greenhouse Gas Emissions Summary**

Metric Tons	17.872	0.001	0.001
CO2E	17.872	0.023	0.358
<b>Total CO2E</b>			<b>18.3</b>

**PG&E R-687 L-215 San Joaquin River Crossing Replacement Project  
Phase 2: Air Pollutant and Greenhouse Gas Emissions Totals**

Task	Total English Tons					Metric Tons			
	NOx	ROG	PM10	PM2.5	CO	CO2	CH4	N2O	CO2E
Mobilization	0.102	0.008	0.004	0.003	0.061	15.382	0.001	0.001	15.7
Pigging and Flushing Pipeline	0.043	0.004	0.002	0.002	0.061	8.921	0.000	0.002	9.4
Cementing Pipeline	0.137	0.011	0.004	0.004	0.070	28.414	0.001	0.001	28.7
Onshore Pipeline Removal	0.088	0.007	0.003	0.003	0.045	18.048	0.001	0.000	18.2
In-River Pipeline Removal	0.198	0.049	0.024	0.022	0.149	27.075	0.002	0.001	27.3
Demobilization	0.113	0.008	0.004	0.004	0.062	17.872	0.001	0.001	18.3
<b>Total</b>	<b>0.683</b>	<b>0.088</b>	<b>0.040</b>	<b>0.037</b>	<b>0.449</b>	<b>115.713</b>	<b>0.006</b>	<b>0.006</b>	<b>117.5</b>