APPENDIX B2-1

TOTAL EMISSIONS WITH UPRR UNDERCROSSING

Emissions Summaries

Criteria Emissions

Segment	Category	Criteria Emissions (lbs/d)				
		ROG	CO	NO_X	PM_{10}	$PM_{2.5}$
Segment O	Offroad equipment	0.53	4.58	5.90	0.24	0.22
	Onroad trucks	0.01	0.08	0.42	0.03	0.01
	Employees	0.02	1.62	0.10	0.11	0.05
	Asphalt offgassing	3.31	---	---	---	---
	Maximum Daily	***3.9***	***6.3***	***6.4***	***0.4***	***0.3***
Segment P	Offroad equipment	6.69	56.73	56.34	2.31	2.18
	Onroad trucks	0.02	0.26	0.99	0.09	0.04
	Employees	0.04	2.84	0.17	0.19	0.08
	Asphalt offgassing	2.46	---	---	---	---
	Maximum Daily	***9.2***	***59.8***	***57.5***	***2.6***	***2.3***
Segment Q	Offroad equipment	6.48	50.37	57.30	2.27	2.14
	Onroad trucks	0.02	0.19	0.88	0.07	0.03
	Employees	0.04	2.84	0.17	0.19	0.08
	Asphalt offgassing	4.06	---	---	---	---
	Maximum Daily	***10.6***	***53.4***	***58.4***	***2.5***	***2.2***

GHG Emissions

Segment	Category	GHG Emissions (tonnes)			
		CO_2	CH_4	N_2O	CO_2e
Segment O	Offroad equipment	36.93	0.0099	N/A	37.17
	Onroad trucks	0.75	0.0000	0.0001	0.77
	Employees	3.80	0.0000	0.0001	3.82
	Total for Segment O	**41.5**	**0.010**	**0.000**	**41.8**
Segment P	Offroad equipment	86.29	0.0234	N/A	86.88
	Onroad trucks	2.71	0.0000	0.0002	2.77
	Employees	9.69	0.0001	0.0002	9.73
	Total for Segment P	**98.7**	**0.024**	**0.000**	**99.4**
Segment Q	Offroad equipment	72.62	0.0204	N/A	73.13
	Onroad trucks	2.69	0.0000	0.0002	2.75
	Employees	7.99	0.0001	0.0001	8.03
	Total for Segment Q	**83.3**	**0.020**	**0.000**	**83.9**
	Grand Total for Project	***223.5***	***0.054***	***0.001***	***225.1***
				Amortized	***7.50***

Employees

Segment O Employees

Activity	Activity					Criteria Emissions (lbs/d)					GHG Emissions (tonnes)			
	# of days	# of employees	Round Trip	VMT/ day	total VMT	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e
O-01	25	15	20	300	7,500	0.007	0.449	0.027	0.031	0.013	2.058	0.00002	0.00003	2.068
O-03	6	3	20	60	360	0.001	0.090	0.005	0.006	0.003	0.099	0.00000	0.00000	0.099
O-06	14	5	20	100	1,400	0.002	0.150	0.009	0.010	0.004	0.384	0.00000	0.00001	0.386
O-08	7	5	20	100	700	0.002	0.150	0.009	0.010	0.004	0.192	0.00000	0.00000	0.193
O-02	5	10	20	200	1,000	0.004	0.299	0.018	0.020	0.008	0.274	0.00000	0.00000	0.276
O-04	4	5	20	100	400	0.002	0.150	0.009	0.010	0.004	0.110	0.00000	0.00000	0.110
O-07	10	8	20	160	1,600	0.004	0.239	0.014	0.016	0.007	0.439	0.00000	0.00001	0.441
O-05	15	3	20	60	900	0.001	0.090	0.005	0.006	0.003	0.247	0.00000	0.00000	0.248
					Segment O Totals	***0.02***	***1.62***	***0.10***	***0.11***	***0.05***	***3.80***	***0.0000***	***0.0001***	***3.82***

Segment P Employees

Activity	Activity					Criteria Emissions (lbs/d)					GHG Emissions (tonnes)			
	# of days	# of employees	Round Trip	VMT/ day	total VMT	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e
P-12	4	5	20	100	400	0.002	0.150	0.009	0.010	0.004	0.110	0.00000	0.00000	0.110
P-01	40	15	20	300	12,000	0.007	0.449	0.027	0.031	0.013	3.293	0.00003	0.00005	3.309
P-02	40	10	20	200	8,000	0.004	0.299	0.018	0.020	0.008	2.195	0.00002	0.00004	2.206
P-04	10	10	20	200	2,000	0.004	0.299	0.018	0.020	0.008	0.549	0.00001	0.00001	0.552
P-07	5	10	20	200	1,000	0.004	0.299	0.018	0.020	0.008	0.274	0.00000	0.00000	0.276
P-08	4	5	20	100	400	0.002	0.150	0.009	0.010	0.004	0.110	0.00000	0.00000	0.110
P-09	15	10	20	200	3,000	0.004	0.299	0.018	0.020	0.008	0.823	0.00001	0.00001	0.827
P-10	10	10	20	200	2,000	0.004	0.299	0.018	0.020	0.008	0.549	0.00001	0.00001	0.552
P-05	20	15	20	300	6,000	0.007	0.449	0.027	0.031	0.013	1.646	0.00002	0.00003	1.655
P-11	5	5	20	100	500	0.002	0.150	0.009	0.010	0.004	0.137	0.00000	0.00000	0.138
					Segment P Totals	***0.04***	***2.84***	***0.17***	***0.19***	***0.08***	***9.69***	***0.0001***	***0.0002***	***9.73***

Segment Q Employees

Activity	Activity					Criteria Emissions (lbs/d)					GHG Emissions (tonnes)			
	# of days	# of employees	Round Trip	VMT/ day	total VMT	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e
Q-01	6	3	20	60	360	0.001	0.090	0.005	0.006	0.003	0.099	0.00000	0.00000	0.099
Q-02	3	5	20	100	300	0.002	0.150	0.009	0.010	0.004	0.082	0.00000	0.00000	0.083
Q-03	5	3	20	60	300	0.001	0.090	0.005	0.006	0.003	0.082	0.00000	0.00000	0.083
Q-04	6	5	20	100	600	0.002	0.150	0.009	0.010	0.004	0.165	0.00000	0.00000	0.165
Q-05	40	15	20	300	12,000	0.007	0.449	0.027	0.031	0.013	3.293	0.00003	0.00005	3.309
Q-06	4	2	20	40	160	0.001	0.060	0.004	0.004	0.002	0.044	0.00000	0.00000	0.044
Q-07	40	10	20	200	8,000	0.004	0.299	0.018	0.020	0.008	2.195	0.00002	0.00004	2.206
Q-10	5	3	20	60	300	0.001	0.090	0.005	0.006	0.003	0.082	0.00000	0.00000	0.083
Q-11	3	5	20	100	300	0.002	0.150	0.009	0.010	0.004	0.082	0.00000	0.00000	0.083
Q-08	15	15	20	300	4,500	0.007	0.449	0.027	0.031	0.013	1.235	0.00001	0.00002	1.241
Q-09	5	15	20	300	1,500	0.007	0.449	0.027	0.031	0.013	0.412	0.00000	0.00001	0.414
Q-15	2	5	20	100	200	0.002	0.150	0.009	0.010	0.004	0.055	0.00000	0.00000	0.055
Q-12	5	4	20	80	400	0.002	0.120	0.007	0.008	0.003	0.110	0.00000	0.00000	0.110
Q-13	2	5	20	100	200	0.002	0.150	0.009	0.010	0.004	0.055	0.00000	0.00000	0.055
					Segment Q Totals	***0.04***	***2.84***	***0.17***	***0.19***	***0.08***	***7.99***	***0.0001***	***0.0001***	***8.03***

Onroad Trucks

Segment O - Onroad Trucks

Activity	Truck Type	Activity					Criteria Emissions (lbs/d)					GHG Emissions (tonnes)			
		# of days	Trucks /day	Round Trip	VMT/ day	total VMT	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e
O-03	dump truck	6	1	24	24	96	0.002	0.024	0.034	0.005	0.002	0.062	0.00000	0.00000	0.063
O-06	dump truck	14	1	24	24	240	0.002	0.024	0.034	0.005	0.002	0.154	0.00000	0.00001	0.157
O-02	product delivery	5	1	100	100	400	0.003	0.033	0.356	0.024	0.010	0.530	0.00000	0.00008	0.555
						Segment O Totals	***0.01***	***0.08***	***0.42***	***0.03***	***0.01***	***0.75***	***0.0000***	***0.0001***	***0.77***

Segment P - Onroad Trucks

Activity	Truck Type	Activity					Criteria Emissions (lbs/d)					GHG Emissions (tonnes)			
		# of days	Trucks /day	Round Trip	VMT/ day	total VMT	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e
P-01	product delivery	2	1	100	100	200	0.003	0.033	0.356	0.024	0.010	0.265	0.00000	0.00004	0.277
P-02	dump truck	40	3	24	72	2,760	0.006	0.073	0.103	0.015	0.007	1.776	0.00001	0.00010	1.807
P-04	dump truck	10	2	24	48	384	0.004	0.049	0.069	0.010	0.004	0.247	0.00000	0.00001	0.251
P-07	dump truck	5	2	24	48	192	0.004	0.049	0.069	0.010	0.004	0.124	0.00000	0.00001	0.126
P-10	dump truck	10	1	24	24	48	0.002	0.024	0.034	0.005	0.002	0.031	0.00000	0.00000	0.031
P-05	product delivery	15	1	100	100	200	0.003	0.033	0.356	0.024	0.010	0.265	0.00000	0.00004	0.277
						Segment P Totals	***0.02***	***0.26***	***0.99***	***0.09***	***0.04***	***2.71***	***0.0000***	***0.0002***	***2.77***

Segment Q - Onroad Trucks

Activity	Truck Type	Activity					Criteria Emissions (lbs/d)					GHG Emissions (tonnes)			
		# of days	Trucks /day	Round Trip	VMT/ day	total VMT	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e
Q-05	product delivery	15	1	100	100	200	0.003	0.033	0.356	0.024	0.010	0.265	0.00000	0.00004	0.277
Q-07	dump truck	40	4	24	96	3,048	0.009	0.098	0.138	0.020	0.009	1.962	0.00001	0.00011	1.996
Q-09	product delivery	5	1	100	100	300	0.003	0.033	0.356	0.024	0.010	0.397	0.00000	0.00006	0.416
Q-12	dump truck	5	1	24	24	96	0.002	0.024	0.034	0.005	0.002	0.062	0.00000	0.00000	0.063
					Segment Q Totals		***0.02***	***0.19***	***0.88***	***0.07***	***0.03***	***2.69***	***0.0000***	***0.0002***	***2.75***

Offroad Equipment

Segment O - Offroad Equipment

Activity	Equipment Type	Activity						Criteria Emissions (lbs/d)					GHG Emissions (tonnes)		
		BHP	Load Factor	# of days	# of pieces	hrs / day	total hours	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	CO_2	CH_4	CO_2e
O-01	drilling rig	221	0.50	25	1	6	150	0.16	1.52	1.53	0.05	0.05	7.79	0.00252	7.85
	concrete mixer	9	0.56	25	1	6	150	0.04	0.23	0.28	0.01	0.01	0.43	0.00004	0.43
							Total	**0.2**	**1.8**	**1.8**	**0.1**	**0.1**	**8.2**	**0.0026**	**8.3**
O-03	tractor	97	0.37	6	1	8	48	0.44	2.91	2.46	0.10	0.10	0.98	0.00011	0.98
	grader	187	0.41	4	1	8	32	0.38	1.69	4.65	0.15	0.14	1.16	0.00038	1.17
							Total	**0.8**	**4.6**	**7.1**	**0.2**	**0.2**	**2.1**	**0.0005**	**2.2**
O-06	loader	97	0.37	14	1	8	112	0.44	2.91	2.46	0.10	0.10	2.28	0.00025	2.29
	concrete saw	81	0.73	14	1	8	112	0.33	3.66	2.58	0.13	0.13	3.76	0.00019	3.77
							Total	**0.8**	**6.6**	**5.0**	**0.2**	**0.2**	**6.0**	**0.0004**	**6.1**
O-08	roller	80	0.38	6	1	6	36	0.12	1.39	1.21	0.07	0.06	0.52	0.00017	0.53
	paving equipment	132	0.36	6	1	6	36	0.13	1.92	1.20	0.06	0.05	0.81	0.00026	0.82
	grader	187	0.41	6	1	6	36	0.29	1.27	3.49	0.11	0.10	1.32	0.00043	1.33
							Total	**0.5**	**4.6**	**5.9**	**0.2**	**0.2**	**2.7**	**0.0009**	**2.7**
O-02	cranes	231	0.29	5	2	8	40	0.70	3.67	7.63	0.32	0.29	2.53	0.00082	2.56
	welder	46	0.45	5	2	8	40	0.51	3.36	2.84	0.11	0.11	0.94	0.00010	0.94
							Total	**1.2**	**7.0**	**10.5**	**0.4**	**0.4**	**3.5**	**0.0009**	**3.5**
O-04	roller	80	0.38	4	1	6	23	0.12	1.39	1.21	0.07	0.06	0.34	0.00011	0.34
	paving equipment	132	0.36	4	1	6	23	0.13	1.92	1.20	0.06	0.05	0.52	0.00017	0.52
	grader	187	0.41	4	1	6	23	0.29	1.27	3.49	0.11	0.10	0.85	0.00027	0.85
							Total	**0.5**	**4.6**	**5.9**	**0.2**	**0.2**	**1.7**	**0.0005**	**1.7**

O-07	crane	231	0.29	10	1	6	60	0.26	1.38	2.86	0.12	0.11	1.90	0.00061	1.92
	drilling rig	221	0.50	10	1	4	40	0.11	1.02	1.02	0.03	0.03	2.08	0.00067	2.09
							Total	**0.4**	**2.4**	**3.9**	**0.2**	**0.1**	**4.0**	**0.0013**	**4.0**
O-05	rail truck	402	0.38	15	1	8	120	0.50	3.29	3.57	0.13	0.12	8.71	0.00282	8.78
							Total	**0.5**	**3.3**	**3.6**	**0.1**	**0.1**	**8.7**	**0.0028**	**8.8**
							Segment O Totals	***5.0***	***34.8***	***43.7***	***1.7***	***1.6***	***36.9***	***0.010***	***37.2***

Segment P - Offroad Equipment

Activity	Equipment Type	Activity						Criteria Emissions (lbs/d)					GHG Emissions (tonnes)		
		BHP	Load Factor	# of days	# of pieces	hrs / day	total hours	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	CO_2	CH_4	CO_2e
P-12	roller	80	0.38	3	1	6	20	0.12	1.39	1.21	0.07	0.06	0.29	0.00009	0.29
	paving equipment	132	0.36	3	1	6	20	0.13	1.92	1.20	0.06	0.05	0.45	0.00014	0.45
	grader	187	0.41	3	1	6	20	0.29	1.27	3.49	0.11	0.10	0.72	0.00023	0.73
							Total	**0.5**	**4.6**	**5.9**	**0.2**	**0.2**	**1.5**	**0.0005**	**1.5**
P-01	crane	231	0.29	40	1	8	320	0.35	1.83	3.82	0.16	0.15	10.14	0.00328	10.22
	hydraulic jack	221	0.50	40	1	8	320	0.21	2.03	2.04	0.07	0.06	16.61	0.00537	16.74
	loader	97	0.37	40	1	6	240	0.33	2.18	1.85	0.07	0.07	4.90	0.00053	4.91
							Total	**0.9**	**6.0**	**7.7**	**0.3**	**0.3**	**31.6**	**0.0092**	**31.9**
P-02	excavator	158	0.38	40	1	8	320	0.19	3.26	1.55	0.08	0.07	9.07	0.00294	9.15
	drilling rig	221	0.50	40	1	4	160	0.11	1.02	1.02	0.03	0.03	8.30	0.00269	8.37
	loader	97	0.37	40	1	8	320	0.44	2.91	2.46	0.10	0.10	6.53	0.00071	6.54
							Total	**0.7**	**7.2**	**5.0**	**0.2**	**0.2**	**23.9**	**0.0063**	**24.1**
P-04	excavator	158	0.38	10	1	8	80	0.19	3.26	1.55	0.08	0.07	2.27	0.00073	2.29
	loader	97	0.37	10	1	8	80	0.44	2.91	2.46	0.10	0.10	1.63	0.00018	1.64
							Total	**0.6**	**6.2**	**4.0**	**0.2**	**0.2**	**3.9**	**0.0009**	**3.9**

P-07	excavator	158	0.38	5	1	8	40	0.19	3.26	1.55	0.08	0.07	1.13	0.00037	1.14
	loader	97	0.37	5	1	8	40	0.44	2.91	2.46	0.10	0.10	0.82	0.00009	0.82
							Total	**0.6**	**6.2**	**4.0**	**0.2**	**0.2**	**2.0**	**0.0005**	**2.0**
P-08	roller	80	0.38	4	1	6	23	0.12	1.39	1.21	0.07	0.06	0.33	0.00011	0.34
	paving equipment	132	0.36	4	1	6	23	0.13	1.92	1.20	0.06	0.05	0.52	0.00017	0.52
	grader	187	0.41	4	1	6	23	0.29	1.27	3.49	0.11	0.10	0.84	0.00027	0.85
							Total	**0.5**	**4.6**	**5.9**	**0.2**	**0.2**	**1.7**	**0.0005**	**1.7**
P-09	drilling rig	221	0.50	15	1	6	90	0.16	1.52	1.53	0.05	0.05	4.67	0.00151	4.71
	concrete mixer	9	0.56	15	1	6	90	0.04	0.23	0.28	0.01	0.01	0.26	0.00003	0.26
							Total	**0.2**	**1.8**	**1.8**	**0.1**	**0.1**	**4.9**	**0.0015**	**5.0**
P-10	loader	97	0.37	10	1	8	80	0.44	2.91	2.46	0.10	0.10	1.63	0.00018	1.64
	concrete saw	81	0.73	10	1	8	80	0.33	3.66	2.58	0.13	0.13	2.69	0.00013	2.69
							Total	**0.8**	**6.6**	**5.0**	**0.2**	**0.2**	**4.3**	**0.0003**	**4.3**
P-05	excavator	158	0.38	15	1	8	120	0.19	3.26	1.55	0.08	0.07	3.40	0.00110	3.43
	crane	231	0.29	15	1	8	120	0.35	1.83	3.82	0.16	0.15	3.80	0.00123	3.83
	loader	97	0.37	15	1	6	90	0.33	2.18	1.85	0.07	0.07	1.84	0.00020	1.84
	roller	80	0.38	5	1	6	30	0.12	1.39	1.21	0.07	0.06	0.43	0.00014	0.44
	paving equipment	132	0.36	5	1	6	30	0.13	1.92	1.20	0.06	0.05	0.67	0.00022	0.68
	grader	187	0.41	5	1	6	30	0.29	1.27	3.49	0.11	0.10	1.09	0.00035	1.10
							Total	**1.4**	**11.9**	**13.1**	**0.5**	**0.5**	**11.2**	**0.0032**	**11.3**
P-11	crane	231	0.29	5	1	8	40	0.35	1.83	3.82	0.16	0.15	1.27	0.00041	1.28
							Total	**0.4**	**1.8**	**3.8**	**0.2**	**0.1**	**1.3**	**0.0004**	**1.3**
							Segment P Totals	***6.7***	***56.7***	***56.3***	***2.3***	***2.2***	***86.3***	***0.023***	***86.9***

Segment Q - Offroad Equipment

Activity	Equipment Type	Activity						Criteria Emissions (lbs/d)					GHG Emissions (tonnes)		
		BHP	Load Factor	# of days	# of pieces	hrs / day	total hours	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	CO_2	CH_4	CO_2e
Q-01	signal boards	6	0.82	5	1	8	40	0.06	0.30	0.36	0.01	0.01	0.11	0.00001	0.11
							Total	**0.1**	**0.3**	**0.4**	**0.0**	**0.0**	**0.1**	**0.0000**	**0.1**
Q-02	roller	80	0.38	2	1	6	13	0.12	1.39	1.21	0.07	0.06	0.18	0.00006	0.19
	paving equipment	132	0.36	2	1	6	13	0.13	1.92	1.20	0.06	0.05	0.29	0.00009	0.29
	grader	187	0.41	2	1	6	13	0.29	1.27	3.49	0.11	0.10	0.47	0.00015	0.47
							Total	**0.5**	**4.6**	**5.9**	**0.2**	**0.2**	**0.9**	**0.0003**	**0.9**
Q-03	signal boards	6	0.82	5	1	8	40	0.06	0.30	0.36	0.01	0.01	0.11	0.00001	0.11
							Total	**0.1**	**0.3**	**0.4**	**0.0**	**0.0**	**0.1**	**0.0000**	**0.1**
Q-04	roller	80	0.38	6	1	6	35	0.12	1.39	1.21	0.07	0.06	0.51	0.00016	0.51
	paving equipment	132	0.36	6	1	6	35	0.13	1.92	1.20	0.06	0.05	0.79	0.00026	0.80
	grader	187	0.41	6	1	6	35	0.29	1.27	3.49	0.11	0.10	1.28	0.00041	1.30
							Total	**0.5**	**4.6**	**5.9**	**0.2**	**0.2**	**2.6**	**0.0008**	**2.6**
Q-05	crane	231	0.29	40	1	8	320	0.35	1.83	3.82	0.16	0.15	10.14	0.00328	10.22
	hydraulic jack	221	0.50	40	1	8	320	0.21	2.03	2.04	0.07	0.06	16.61	0.00537	16.74
	loader	97	0.37	40	1	6	240	0.33	2.18	1.85	0.07	0.07	4.90	0.00053	4.91
							Total	**0.9**	**6.0**	**7.7**	**0.3**	**0.3**	**31.6**	**0.0092**	**31.9**
Q-06	welder	46	0.45	4	1	8	32	0.25	1.68	1.42	0.06	0.06	0.38	0.00004	0.38
							Total	**0.3**	**1.7**	**1.4**	**0.1**	**0.1**	**0.4**	**0.0000**	**0.4**
Q-07	excavator	158	0.38	40	1	8	320	0.19	3.26	1.55	0.08	0.07	9.07	0.00294	9.15
	drilling rig	221	0.50	40	1	4	160	0.11	1.02	1.02	0.03	0.03	8.30	0.00269	8.37
	loader	97	0.37	40	1	8	320	0.44	2.91	2.46	0.10	0.10	6.53	0.00071	6.54
							Total	**0.7**	**7.2**	**5.0**	**0.2**	**0.2**	**23.9**	**0.0063**	**24.1**

Q-10	signal boards	6	0.82	5	1	8	40	0.06	0.30	0.36	0.01	0.01	0.11	0.00001	0.11
							Total	**0.1**	**0.3**	**0.4**	**0.0**	**0.0**	**0.1**	**0.0000**	**0.1**
Q-11	roller	80	0.38	2	1	6	14	0.12	1.39	1.21	0.07	0.06	0.20	0.00007	0.20
	paving equipment	132	0.36	2	1	6	14	0.13	1.92	1.20	0.06	0.05	0.32	0.00010	0.32
	grader	187	0.41	2	1	6	14	0.29	1.27	3.49	0.11	0.10	0.51	0.00017	0.52
							Total	**0.5**	**4.6**	**5.9**	**0.2**	**0.2**	**1.0**	**0.0003**	**1.0**
Q-08	drilling rig	221	0.50	15	1	8	120	0.21	2.03	2.04	0.07	0.06	6.23	0.00202	6.28
	concrete mixer	9	0.56	15	1	8	120	0.06	0.31	0.37	0.01	0.01	0.34	0.00004	0.34
							Total	**0.3**	**2.3**	**2.4**	**0.1**	**0.1**	**6.6**	**0.0021**	**6.6**
Q-09	cranes	231	0.29	5	1	8	40	0.35	1.83	3.82	0.16	0.15	1.27	0.00041	1.28
	welder	46	0.45	5	1	8	40	0.25	1.68	1.42	0.06	0.06	0.47	0.00005	0.47
							Total	**0.6**	**3.5**	**5.2**	**0.2**	**0.2**	**1.7**	**0.0005**	**1.7**
Q-15	roller	80	0.38	3	1	6	15	0.12	1.39	1.21	0.07	0.06	0.22	0.00007	0.22
	paving equipment	132	0.36	3	1	6	15	0.13	1.92	1.20	0.06	0.05	0.34	0.00011	0.35
	grader	187	0.41	3	1	6	15	0.29	1.27	3.49	0.11	0.10	0.56	0.00018	0.56
							Total	**0.5**	**4.6**	**5.9**	**0.2**	**0.2**	**1.1**	**0.0004**	**1.1**
Q-12	tractor	97	0.37	5	1	8	40	0.44	2.91	2.46	0.10	0.10	0.82	0.00009	0.82
	loader	97	0.37	5	1	8	40	0.44	2.91	2.46	0.10	0.10	0.82	0.00009	0.82
							Total	**0.9**	**5.8**	**4.9**	**0.2**	**0.2**	**1.6**	**0.0002**	**1.6**
Q-13	roller	80	0.38	2	1	6	10	0.12	1.39	1.21	0.07	0.06	0.15	0.00005	0.15
	paving equipment	132	0.36	2	1	6	10	0.13	1.92	1.20	0.06	0.05	0.23	0.00007	0.23
	grader	187	0.41	2	1	6	10	0.29	1.27	3.49	0.11	0.10	0.37	0.00012	0.37
							Total	**0.5**	**4.6**	**5.9**	**0.2**	**0.2**	**0.7**	**0.0002**	**0.7**
							Segment Q Totals	***6.5***	***50.4***	***57.3***	***2.3***	***2.1***	***72.6***	***0.020***	***73.1***

2023 Offroad Emission Factors

Equipment Type	BHP	Load Factor	Emission Factor (g/bhp-hr)						
			ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	CO_2	CH_4
Bore/Drill Rig	221	0.50	0.110	1.043	1.047	0.034	0.031	469.7	0.152
Cement and Mortar Mixer	9	0.56	0.661	3.469	4.142	0.161	0.161	568.3	0.059
Concrete/Industrial Saws	81	0.73	0.320	3.507	2.478	0.123	0.123	568.3	0.028
Crane	231	0.29	0.297	1.553	3.229	0.135	0.124	473.0	0.153
Excavator	158	0.38	0.178	3.076	1.462	0.072	0.066	472.3	0.153
Grader	187	0.41	0.284	1.252	3.441	0.111	0.103	473.9	0.153
Hydraulic Jack	221	0.50	0.110	1.043	1.047	0.034	0.031	469.7	0.152
Off-highway Truck	402	0.38	0.187	1.221	1.324	0.048	0.044	475.0	0.154
Paving Equipment	132	0.36	0.204	3.051	1.913	0.093	0.086	470.7	0.152
Roller	80	0.38	0.287	3.455	3.003	0.165	0.152	473.9	0.153
Signal Boards	6	0.82	0.661	3.469	4.142	0.161	0.161	568.3	0.059
Tractors/Loaders/Backhoes	97	0.37	0.239	3.525	2.426	0.120	0.110	476.4	0.154
Welder	46	0.45	0.697	4.596	3.891	0.151	0.151	568.3	0.062

From: CalEEMod Users Guide - Appendix D (November 2017)

EMFAC2017 (v1.0.2) Emission Rates

Calendar Year 2023

EMFAC2011 Vehicle Categories

Orange County

Vehicle Info			Emission Factor (grams/mile)											
Type	Fuel	VMT	ROG	CO	NO_X	PM_{10}			$PM_{2.5}$			CO_2	CH_4	N_2O
						Exhaust	TW+BW	Total	Exhaust	TW+BW	Total			
LDA	GAS	49,965,794	0.0077	0.6049	0.0305	0.0015	0.0448	0.0462	0.0014	0.0178	0.0191	256.70	0.0021	0.0039
LDA	DSL	521,945	0.0136	0.2272	0.0486	0.0056	0.0448	0.0504	0.0054	0.0178	0.0231	199.12	0.0006	0.0313
LDT1	GAS	5,324,604	0.0204	1.0343	0.0775	0.0020	0.0448	0.0467	0.0018	0.0178	0.0196	299.40	0.0048	0.0065
LDT1	DSL	970	0.1739	0.9704	0.8500	0.1360	0.0448	0.1808	0.1301	0.0178	0.1479	397.42	0.0081	0.0625
LDT2	GAS	16,860,834	0.0130	0.8015	0.0578	0.0015	0.0448	0.0462	0.0014	0.0178	0.0191	321.22	0.0033	0.0054
LDT2	DSL	131,714	0.0177	0.1576	0.0382	0.0049	0.0448	0.0497	0.0047	0.0178	0.0225	273.44	0.0008	0.0430
Weighted Average for Employees			***0.010***	***0.678***	***0.040***	***0.002***	***0.045***	***0.046***	***0.001***	***0.018***	***0.019***	***274.4***	***0.0026***	***0.0044***
LHD1	GAS	1,293,611	0.0226	0.5571	0.1550	0.0012	0.0844	0.0856	0.0011	0.0348	0.0358	786.39	0.0049	0.0100
LHD1	DSL	1,009,903	0.0641	0.3410	1.2884	0.0137	0.0884	0.1021	0.0131	0.0358	0.0488	460.69	0.0030	0.0724
Weighted Average for LHD1			***0.041***	***0.462***	***0.652***	***0.007***	***0.086***	***0.093***	***0.006***	***0.035***	***0.042***	***643.6***	***0.0041***	***0.0374***
T7 Single	DSL	171,547	0.014	0.1484	1.6143	0.0113	0.0977	0.1090	0.0108	0.0355	0.0462	1,324.3	0.0006	0.2082

Notes: - Criteria and GHG factors come from EMFAC2017 (v1.0.2) and represent Estimated Annual Emission Rates for Orange County in the South Coast Air Basin for the calandar year 2023

- Employee Weighted Average is 69.3% LDA + 7.3% LDT1 + 23.3% LDT2 based on VMT

Bicycle Path Sections Data

Path Section	Activity	Length (ft)	Time (hrs)	Time (days)	Width (ft)	Depth (in)		Amount (yd^3)		Number of Trucks			
						Asphalt	Agg	Asphalt	Agg	Asphalt	Agg	$Total_C$	$Total_A$
Coyote Pedestrian Bridge upstream to Valley View	O-04	1,570	4.8	3.9	12	4	6	232.6	348.9	11.6	17.4	29.1	30
Valley View upstream to Artesia	O-08	3,010	9.1	6.1	12	4	6	445.9	668.9	22.3	33.4	55.7	56
Artesia upstream to RR Xing jackbox	P-12	1,200	3.6	3.3	16	4	6	237.0	355.6	11.9	17.8	29.6	30
Firestone upstream to Knott	P-08	1,550	4.7	3.8	14	4	6	267.9	401.9	13.4	20.1	33.5	34
Knott upstream to RR Xing Warning Signal	Q-02	420	1.3	2.1	14	4	6	72.6	108.9	3.6	5.4	9.1	10
RR Xing Warning Signal upstream to RR Xing jackbox	Q-04	2,900	8.8	5.9	14	4	6	501.2	751.9	25.1	37.6	62.7	62
Stage Rd upstream to Pedestrian Bridge	Q-11	560	1.7	2.3	14	4	6	96.8	145.2	4.8	7.3	12.1	13
Pedestrian Bridge upstream to La Mirada	Q-15	700	2.1	2.6	16	4	6	138.3	207.4	6.9	10.4	17.3	18
Either side of La Mirada south of Coyote Creek	Q-13	128	0.4	1.7	16	4	6	25.3	37.9	1.3	1.9	3.2	4

$Total_C$ = calculated # *$Total_A$ = $Total_C$ rounded up*

*Formula for # hrs = rate of paving was 1/2 mi/day**
*Formula for # days = (hrs*3 / 6 hrs/d) + 1 day prep + 0.5 day cleanup*

LL Pelling Encounters Paving in Tight Spaces, Limited Entry Points . ConstructionPros.com. October 11, 2012.

Onroad Truck Data

Dump Trucks

Activity	Dimensions (ft)			Amount (ft^3)	Amount (yd^3)	# of Trucks	
	Length	Width	Depth			$Total_C$	$Total_A$
O-03				1,750	64.8	3.2	4
O-06				5,000	185.2	9.3	10
P-02	500	13	9.5	61,750	2,287.0	114.4	115
P-04	50	14	12	8,400	311.1	15.6	16
P-05	50	14	7.5	5,250	194.4	9.7	10
P-07	110	12	3	3,960	146.7	7.3	8
P-10				1,000	37.0	1.9	2
Q-07	600	12	9.5	68,400	2,533.3	126.7	127
Q-08				2,500	92.6	4.6	5

$Total_C$ = *calculated #* $Total_A$ = $Total_C$ *rounded up*

Product Delivery

Activity	# of Trucks
O-02	4
P-01	2
P-05	2
Q-05	2
Q-09	3

Asphalt Offgassing Data

Path Section	Segment	Activity	Length (ft)	Width (ft)	Area (ft^2)	Area (acres)	VOC (lb)
Coyote Pedestrian Bridge upstream to Valley View	O	O-04	1,570	12	18,840	0.43	1.1
Valley View upstream to Artesia	O	O-08	3,010	12	36,120	0.83	2.2
				Segment O Total	**54,960**	**1.26**	**3.3**
Artesia upstream to RR Xing jackbox	P	P-12	1,200	16	19,200	0.44	1.2
Firestone upstream to Knott	P	P-08	1,550	14	21,700	0.50	1.3
				Segment P Total	**40,900**	**0.94**	**2.5**
Knott upstream to RR Xing Warning Signal	Q	Q-02	420	14	5,880	0.13	0.4
RR Xing Warning Signal upstream to RR Xing jackbox	Q	Q-04	2,900	14	40,600	0.93	2.4
Stage Rd upstream to Pedestrian Bridge	Q	Q-11	560	14	7,840	0.18	0.5
Pedestrian Bridge upstream to La Mirada	Q	Q-15	700	16	11,200	0.26	0.7
Either side of La Mirada south of Coyote Creek	Q	Q-13	128	16	2,048	0.05	0.1
				Segment Q Total	**67,568**	**1.55**	**4.1**
				Grand Total	***163,428***	***3.75***	***9.8***

Asphalt Paving Off-Gassing Emissions

CalEEMod estimates VOC off-gassing emissions associated with asphalt paving of parking lots using the following equation:

$$E_{AP} = EF_{AP} \times A_{Parking}$$

where:

E_{AP} = emissions (lb)

EF_{AP} = emission factor (lb/acre) *(SCAQMD default = 2.62)*

$A_{Parking}$ = area of the parking lot (acre)

Equipment Data

Segment O

Phase	Activity	Description	Off-road	On-road	Amt Removed	# Onroad Trucks	Est. Time
I	O-01	Construct cast-in-place concrete end bents on each side of north fork	Drill rig, concrete mixer				3 wks
I	O-03	Remove existing asphalt along north side of East Fork	Tractors, graders	dump truck	1,750 ft^3 of asphalt	1	1 wk
I	O-06	Remove portion of concrete slope underneath Valley View Bridge	loader, concrete saw	2 dump truck	5,000 ft^3 of concrete	2	1 - 2 wks
I	O-08	Place 3,010 feet of asphalt paving from Valley View Ave to Artesia Blvd	roller, paving equipment, grader	asphalt truck		11	
II	O-02	Install truss bridge across north fork of Coyote Creek	2 cranes, welder	4 trucks			2 days
II	O-04	Place 1,570 feet of asphalt paving from pedestrian bridge to Valley View Ave	roller, paving equipment, grader	asphalt truck		6	
II	O-07	Install tieback wall underneath Valley View bridge	Crane, drill	truck			
III	O-05	Install about 4,800 feet of cable railing fencing	rail truck				

Segment P

Phase	Activity	Description	Off-road	On-road	Amt Removed	# Onroad Trucks	Est. Time
I	P-12	Place 1,200 feet of asphalt paving between Artesia Blvd and UPRR udercrossing	roller, paving equipment, grader	asphalt truck		6	
I	P-01	Assemble a concrete box via jacking method underneath UPRR Industrial lead	crane, jack	truck			2 months
I	P-02	Construct open U-cross section channels just down- & up-stream of jacked box +400' channel	excavator, loader, drill rig	dump trucks *concrete trucks*	61,750 ft^3 of earth	22	
I	P-04	Make a 12- or 14-foot wide cut perpendicular open cut across South Firestone Blvd	excavator, loader	trucks in & out	8,400 ft^3 of earth	3	3 weeks
I	P-07	Excavate under Interstate 5	excavator, loader	Dump truck	3,960 ft^3 of earth	2	
I	P-08	Place 1,550 feet of asphalt paving between North Firestone Blvd and Knott Ave	roller, paving equipment, grader	asphalt truck		7	
I	P-09	Install several concrete columns underneath Artesia Blvd Bridge	Bore/Drill Rigs	cement truck			
I	P-10	Remove a portion of concrete slope underneath Artesia Blvd Bridge	loader / jackhammer?	dump truck	1,000 ft^3 of concrete	1	
II	P-05	Install a 12-foot wide, 10-foot tall precast concrete box in channel + 7.5' cover, base, and repave	Crane, excavator, loader, roller, paver, grader	trucks	5,250 ft^3 of earth	2	1 wk
II	P-11	Install a cantilevered deck between the channel bottom and the bottom of the existing bridge	Cranes				

Segment Q

Phase	Activity	Description	Off-road	On-road	Amt Removed	# Onroad Trucks	Est. Time
I	Q-01	Install traffic signals & crosswalk @ at-grade crossing	Signal Boards				
I	Q-02	Place 420 feet of asphalt paving from Knott Avenue upstream	roller, paving equipment, grader	asphalt truck		2	
I	Q-03	Install a railroad crossing warning signal @ at-grade crossing	Signal Boards				
I	Q-04	Place 2,900 feet of asphalt paving upstream of railroad lead line	roller, paving equipment, grader	asphalt truck		12	
I	Q-05	Assemble a concrete box via jacking method @ undercrossing	crane, jack	truck			
I	Q-06	Relocate a Chevron fuel line (cut/cap/remove?)					
I	Q-07	Construct open U-cross section channels just down- and up-stream of jacked box + 500' channel	excavator, loader, drill rig	dump trucks *concrete trucks*	68,400 ft^3 of earth	24	
I	Q-10	Install T intersection traffic signal @ at-grade crossing	Signal Boards				
I	Q-11	Place 560 feet of asphalt paving between Stage Rd and new pedestrian bridge	roller, paving equipment, grader	asphalt truck		3	
	Q-08	Construct cast-in-place concrete end bents on each side of north fork	Drill rig, concrete mixer		2,500 ft^3 of concrete	1	3 wks
	Q-09	Install truss bridge across north fork of Coyote Creek	2 cranes, welder	4 trucks			2 days
I	Q-15	Place 700 feet of asphalt paving between new pedestrian bridge and La Mirada Blvd	roller, paving equipment, grader	asphalt truck		4	
I	Q-12	Remove ornamental trees and do minor grading	backhoe, tractor			1	
I	Q-13	Install 280-foot trail on either side of La Mirada Blvd	roller, paving equipment, grader	asphalt truck		1	