APPENDIX C – AIR QUALITY AND GREENHOUSE GAS SUPPLEMENTAL INFORMATION

CONTENTS

Table C.1 Planned Construction Equipment for Project

Phase - Activity	Equipment Needed	Category	Planned Quantity
Phase 1 - Site Grading & Access	Large Dozer (CAT D9)	Offroad	1
	Medium Dozer (CAT D5)	Offroad	1
	Elevating Scraper (CAT 613)	Offroad	1
	Motor Grader (CAT 140)	Offroad	1
	Compactor (CAT 815)	Offroad	1
	Paver (CAT AP500)	Offroad	1
	Roller (CAT CB34)	Offroad	1
	Pickup Truck/SUV	Onroad LD	12
	Crew Truck	Onroad MD	1
	Fuel Truck	Onroad MD	1
	Mechanical Truck	Onroad MD	1
	Semi Truck	Onroad HHD	10
	Water Truck	Onroad HHD	1
Phase 2 - Foundations & Footings	Backhoe/Loader (CAT 450)	Offroad	1
	Skid-Steer Bobcat	Offroad	1
	Generator (10 kW)	Offroad	1
	Hole Auger (PTO mode)	Offroad	1
	Pickup Truck/SUV	Onroad LD	12
	Crew Truck	Onroad MD	1
	Work Truck (1-ton)	Onroad MD	1
	Backhoe/Loader Truck	Onroad MD	1
	Dump Truck	Onroad HHD	1
	Concrete Truck	Onroad HHD	1
	Hole Auger Truck	Onroad HHD	1
	Water Truck	Onroad HHD	1
Phase 3 - Equipment & Component Installation	Manlift, small (JLG 400)	Offroad	2
	Manlift, large (JLG 800)	Offroad	2
	Rough Terrain Forklift (Gradall 544D)	Offroad	2
	Backhoe/Loader (CAT 450)	Offroad	2
	Mini Excavator	Offroad	1
	Skid-Steer Bobcat	Offroad	1
	Skip Loader	Offroad	1
	Mobile Crane (PTO mode)	Offroad	3
	Pickup Truck/SUV	Onroad LD	20
	Crew Truck	Onroad MD	1
	Boom Truck	Onroad MD	1
	Backhoe/Loader Truck	Onroad MD	2
	Mobile Crane Transporter	Onroad HHD	3
	Semi Truck	Onroad HHD	25
	Tool/Office Trailers Transport	Onroad HHD	10
	Water Truck	Onroad HHD	1

Table C.1 Planned Construction Equipment for Project

Phase - Activity	Equipment Needed	Category	Planned Quantity
Phase 4 - Line & Tower Configuration	Rough Terrain Forklift (Gradall 544D)	Offroad	1
	Backhoe/Loader (CAT 450)	Offroad	1
	Hole Auger (PTO mode)	Offroad	1
	Mobile Crane (PTO mode)	Offroad	1
	Line Puller	Offroad	1
	Line Tensioner	Offroad	1
	Pickup Truck/SUV	Onroad LD	9
	Crew Truck	Onroad MD	6
	Lighting Truck	Onroad MD	1
	Line Truck	Onroad MD	2
	Bucket Truck	Onroad MD	3
	Flatbed Truck (2-ton)	Onroad MD	3
	Backhoe/Loader Truck	Onroad MD	1
	Hole Auger Truck	Onroad HHD	1
	Mobile Crane Transporter	Onroad HHD	1
	Dump Truck	Onroad HHD	1
	Water Truck	Onroad HHD	1
Phase 5 - Existing Equipment Removal & Post-Construction Finishing/Cleanup	Manlift, small (JLG 400)	Offroad	1
	Manlift, large (JLG 800)	Offroad	1
	Mobile Crane (PTO mode)	Offroad	1
	Demolition Crane (PTO mode)	Offroad	1
	Rough Terrain Forklift (Gradall 544D)	Offroad	2
	Hydraulic Excavator (CAT 320D)	Offroad	2
	Pickup Truck/SUV	Onroad LD	2
	Recycle roll-on/off bin transport	Onroad HHD	1
	Gas removal/transport	Onroad HHD	1
	Oil removal/transport	Onroad HHD	1
	Bushing removal/transport	Onroad HHD	1
	Breaker removal/transport	Onroad HHD	1
	Salvagable steel transport	Onroad HHD	1
	Mobile Crane Transporter	Onroad HHD	1
	Demolition Crane Transporter	Onroad HHD	1
	Water Truck	Onroad HHD	1

Source: Applicant (PG&E)

Notes:

LD = light duty, MD = medium duty, HHD = heavy heavy duty

Table C.2 Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards		National Standards	
		ppmv	ug/m^3	ppmv	ug/m^3
Ozone (O_3)	1-hour	0.09	177	—	—
	8-hour	0.07	137	0.075	147
Nitrogen Dioxide (NO_2)	1-hour	0.18	338	0.100	188
	Annual	0.03	56	0.053	100
Sulfur Dioxide (SO_2)	1-hour	0.25	655	0.075	196
	3-hour (secondary)	—	—	0.50	1,309
	24-hour	0.04	105	—	—
	Annual	—	—	0.03	79
Carbon Monoxide (CO)	1-hour	20	22,898	35	40,071
	8-hour	9	10,304	9	10,304
	Lake Tahoe (8-hr)	6	6,869	—	—
Particulates (as PM_{10})	24-hour	—	50	—	150
	Annual	—	20	—	—
Particulates (as $PM_{2.5}$)	24-hour	—	—	—	35
	Annual	—	12	—	15
Lead (Pb)	30-day	—	1.5	—	—
	3-month (rolling)*	—	—	—	0.15
Sulfates (as SO_4)	24-hour	—	25	—	—
Hydrogen Sulfide (H_2S)	1-hour	0.03	42	—	—
Vinyl Chloride (C_2H_3Cl)	24-hour	0.01	26	—	—
Visibility Reducing Particles	8-hour	Extinction coefficient of 0.23 per km; visibility of 10 miles or more (0.07 to 30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70%.		—	—

Sources: CARB 2012, EPA 2011a

Notes:

ppmv = parts per million by volume

ug/m^3 = micrograms per cubic meter

** The 1.5 ug/m^3 federal quarterly lead standard applied until 2008; 0.15 ug/m^3 rolling 3-month average thereafter*

For gases, ug/m^3 calculated from ppmv based on molecular weight and standard conditions

Standard Temperature	*25*	*deg C*
Standard Molar Volume	*24.465*	*liter/g-mole*

Table C.3 Emissions Significance Thresholds - San Joaquin Valley (Fresno County)

Criteria Pollutant	Attainment Status		SIP/CEQA	Federal GC
	State	Federal	tons/year	tons/year
Volatile Organic Compounds (VOC as CH_4)	Severe	Extreme	10	10
Carbon Monoxide (CO)	Attainment	Maintenance	—	100
Oxides of Nitrogen (NO_X as NO_2)	Severe	Extreme	10	10
Sulfur Dioxide (SO_X as SO_2)	Attainment	Unclassified	—	—
Respirable Particulates (PM_{10})	Nonattainment	Attainment	15	—
Fine Particulates ($PM_{2.5}$)	Nonattainment	Nonattainment	15	100

Sources: CARB 2011, EPA 2012a, SJVAPCD 2012, 40 CFR 93.153(b)(1,2)

Notes:

SIP/CEQA = State Implementation Plan/California Environmental Quality Act

GC = General Conformity (Federal); not applicable to this project since no federal licensing involved

No daily thresholds apply in SJVAPCD

Table C.4 Estimated Construction Criteria Emissions - CEQA Thresholds

Criteria Emissions	Maximum	Total	Threshold	Significance
	lbs/day	tons	tons/yr	
Volatile Organic Compounds (VOC as CH_4)	13	0.8	10	Less
Carbon Monoxide (CO)	61	4.2	—	—
Oxides of Nitrogen (NO_X as NO_2)	110	4.6	10	Less
Sulfur Dioxide (SO_X as SO_2)	0	0.0	—	—
Combustion Particulates (C-PM_{10})	6	0.3	15	Less
Combustion Particulates (C-$PM_{2.5}$)	5	0.3	15	Less
Fugitive Dust (F-PM_{10})	56	2.0	15	Less
Fugitive Dust (F-$PM_{2.5}$)	12	0.3	15	Less

Sources: SCAQMD 2008, EPA 2011b, NOAA 2008, SJVAPCD 2012

Note:

No daily thresholds apply in SJVAPCD

Table C.5 Estimated Construction Greenhouse Gas Emissions

Greenhouse Gas Emissions	Maximum	Total Project		CO2-e lbs/da	CO2-e metr
	lbs/day	tons	tonnes		
Carbon Dioxide (GHG - CO_2)	16,110	696	631		
Methane (GHG - CH_4)	0.9	0.07	0.06	19.76284081	1.33800141
Nitrous Oxide (GHG - N_2O)	0.6	0.04	0.04	194.5020965	12.3403554
Carbon Dioxide Equivalents (CO_2 eqv)	16,325	711	645		

Sources: SCAQMD 2008, EPA 2012b, CCAR 2009

Notes:

No significance thresholds apply to GHG emissions for nonstationary sources

1 short ton = 2,000 lbs

1 metric tonne = 1,000 kg or 2,204.6 lbs

Table C.6 Estimated Emissions Reductions from APMs Addressing GHG Impacts During Construction and Operation

Mitigation Measure	Unmitigated	Reduction	Mitigated	Reduction	Notes
	MT CO_2e	MT CO_2e	MT CO_2e	percent of unmitigated	
Construction worker carpooling	214	64	150	8.7%	Reduce average number of commute vehicle trips by 30%
Minimize equipment idling	248	25	223	3.3%	Reduce average hours of operation from 10 to 9 hours per day
Maintain correct tire inflation	125	8	118	1.0%	Effective for onroad vehicles under project control
Recycle demolition/construction wastes (metals, concrete, etc.)	—	—	—	—	Will implement as feasible - not readily quantifiable from available information
Minimize welding and torch cutting	—	—	—	—	Will implement as feasible - not readily quantifiable from available information
Natural gas/electric/hybrid light duty vehicles for routine O&M service trips	—	—	—	—	Will implement as feasible - not readily quantifiable from available information
Not readily mitigable construction emissions	154	0	154	0.0%	
Total construction emissions	742	97	645	13.0%	

Sources: SCAQMD 2008, EPA 2012b, CCAR 2009, Applicant (PG&E)

Notes:

No significance thresholds apply to GHG emissions for nonstationary sources

CO_2e = carbon dioxide equivalents (calculated per EPA global warming potentials - GWP)

BMPs = Best Management Practices

1 metric tonne (MT) = 1,000 kg or 2,204.6 lbs

Table C.7 Screening Health Risk Assessment for Construction Period

DPM Screen Parameter	Units	Maximum	Average
Onsite Emission Rate	g/sec	0.0161	0.0038
Receptor Distance	meters	205	205
Annual Concentration	$\mu g/m^3$	1.822	0.415
Unit Risk Value (70-year MEI)	$(\mu g/m^3)^{-1}$	3.00E-04	3.00E-04
Activity Duration	days	200	565
Annual MEI Correction	fraction	0.0078	0.0221
Cancer Risk	probability	4.3E-06	2.8E-06
	per million	4.3	2.8
CEQA Threshold	per million	10	10
	significance	Less	Less

Sources: NOAA 2008, EPA 1992, EPA 2011c, OEHHA 2009, WC 2012, SJVAPCD 2012

Notes:

DPM = diesel particulate matter (PM_{10})

Maximum is for most intensive activity (Phase 5); Average is for entire project

70-year Maximally Exposed Individual = 25,550 days = 613,200 hours

Table C.8 Estimated Equipment and Vehicle Schedule						
Equipment and Vehicles		**Rating**	**Planned**	**Utilization**		
Type	**Category**	**BHP**	**qty.**	**days**	**hrs/day**	**mi/day**
Phase 1 - Site Grading & Access						
Large Dozer (CAT D9)	Offroad	410	1	10	9	—
Medium Dozer (CAT D5)	Offroad	90	1	20	9	—
Elevating Scraper (CAT 613)	Offroad	180	1	20	9	—
Motor Grader (CAT 140)	Offroad	180	1	10	9	—
Compactor (CAT 815)	Offroad	240	1	20	9	—
Paver (CAT AP500)	Offroad	140	1	3	9	—
Roller (CAT CB34)	Offroad	50	1	10	9	—
Pickup Truck/SUV	Onroad LD	—	12	60	—	50
Crew Truck	Onroad MD	—	1	60	—	50
Fuel Truck	Onroad MD	—	1	60	—	20
Mechanical Truck	Onroad MD	—	1	60	—	20
Semi Truck	Onroad HHD	—	10	20	—	20
Water Truck	Onroad HHD	—	1	60	—	10
Phase 2 - Foundations & Footings						
Backhoe/Loader (CAT 450)	Offroad	120	1	30	9	—
Skid-Steer Bobcat	Offroad	85	1	60	9	—
Generator (10 kW)	Offroad	16	1	60	9	—
Hole Auger (PTO mode)	Offroad	180	1	30	9	—
Pickup Truck/SUV	Onroad LD	—	12	60	—	50
Crew Truck	Onroad MD	—	1	60	—	50
Work Truck (1-ton)	Onroad MD	—	1	60	—	20
Backhoe/Loader Truck	Onroad MD	—	1	60	—	20
Dump Truck	Onroad HHD	—	1	60	—	20
Concrete Truck	Onroad HHD	—	1	30	—	20
Hole Auger Truck	Onroad HHD	—	1	30	—	20
Water Truck	Onroad HHD	—	1	60	—	10
Phase 3 - Equipment & Component Installation						
Manlift, small (JLG 400)	Offroad	50	2	200	6	—
Manlift, large (JLG 800)	Offroad	64	2	200	6	—
Rough Terrain Forklift (Gradall 544D)	Offroad	125	2	150	4	—
Backhoe/Loader (CAT 450)	Offroad	120	2	60	9	—
Mini Excavator	Offroad	55	1	120	6	—
Skid-Steer Bobcat	Offroad	85	1	60	2	—
Skip Loader	Offroad	90	1	200	2	—
Mobile Crane (PTO mode)	Offroad	180	3	30	8	—
Pickup Truck/SUV	Onroad LD	—	20	200	—	50
Crew Truck	Onroad MD	—	1	200	—	50
Boom Truck	Onroad MD	—	1	60	—	50
Backhoe/Loader Truck	Onroad MD	—	2	5	—	50
Mobile Crane Transporter	Onroad HHD	—	3	5	—	50
Semi Truck	Onroad HHD	—	25	5	—	50
Tool/Office Trailers Transport	Onroad HHD	—	10	5	—	100
Water Truck	Onroad HHD	—	1	60	—	10

Table C.8 Estimated Equipment and Vehicle Schedule						
Equipment and Vehicles		**Rating**	**Planned**	**Utilization**		
Type	**Category**	**BHP**	**qty.**	**days**	**hrs/day**	**mi/day**
Phase 4 - Line & Tower Configuration						
Rough Terrain Forklift (Gradall 544D)	Offroad	125	1	5	9	—
Backhoe/Loader (CAT 450)	Offroad	120	1	12	9	—
Hole Auger (PTO mode)	Offroad	180	1	30	6	—
Mobile Crane (PTO mode)	Offroad	180	1	30	8	—
Line Puller	Offroad	25	1	5	9	—
Line Tensioner	Offroad	120	1	5	9	—
Pickup Truck/SUV	Onroad LD	—	9	15	—	50
Crew Truck	Onroad MD	—	6	15	—	50
Lighting Truck	Onroad MD	—	1	15	—	50
Line Truck	Onroad MD	—	2	15	—	50
Bucket Truck	Onroad MD	—	3	15	—	50
Flatbed Truck (2-ton)	Onroad MD	—	3	15	—	50
Backhoe/Loader Truck	Onroad MD	—	1	2	—	50
Hole Auger Truck	Onroad HHD	—	1	6	—	20
Mobile Crane Transporter	Onroad HHD	—	1	4	—	50
Dump Truck	Onroad HHD	—	1	30	—	50
Water Truck	Onroad HHD	—	1	45	—	10
Phase 5 - Existing Equipment Removal & Post-Construction Finishing/Cleanup						
Manlift, small (JLG 400)	Offroad	50	1	45	9	—
Manlift, large (JLG 800)	Offroad	64	1	45	9	—
Mobile Crane (PTO mode)	Offroad	180	1	45	9	—
Demolition Crane (PTO mode)	Offroad	180	1	10	9	—
Rough Terrain Forklift (Gradall 544D)	Offroad	125	2	120	9	—
Hydraulic Excavator (CAT 320D)	Offroad	148	2	20	9	—
Pickup Truck/SUV	Onroad LD	—	2	200	—	30
Recycle roll-on/off bin transport	Onroad HHD	—	1	20	—	350
Gas removal/transport	Onroad HHD	—	1	4	—	700
Oil removal/transport	Onroad HHD	—	1	12	—	30
Bushing removal/transport	Onroad HHD	—	1	6	—	200
Breaker removal/transport	Onroad HHD	—	1	12	—	200
Salvagable steel transport	Onroad HHD	—	1	12	—	50
Mobile Crane Transporter	Onroad HHD	—	1	2	—	50
Demolition Crane Transporter	Onroad HHD	—	1	2	—	50
Water Truck	Onroad HHD	—	1	45	—	10
Projected Annual Operation & Maintenance of Completed Facility (GHG)						
Pickup Truck/SUV	Onroad LD	—	1	60	—	30
Service Truck (1-ton)	Onroad MD	—	1	12	—	30
Semi Truck	Onroad HHD	—	1	6	—	30
Historic Annual Operation & Maintenance of Existing Facility (GHG)						
Pickup Truck/SUV	Onroad LD	—	1	60	—	30
Service Truck (1-ton)	Onroad MD	—	1	12	—	30
Semi Truck	Onroad HHD	—	1	6	—	30

Source: Applicant (PG&E)

Notes:

LD = light duty, MD = medium duty, HHD = heavy heavy duty, BHP = brake horsepower

Table C.9 Estimated Equipment and Vehicle Activity							
Equipment and Vehicles		**Rating**	**Planned**	**Max Daily**		**Project Total**	
Type	**Category**	**BHP**	**qty.**	**hours**	**VMT**	**hours**	**VMT**
Phase 1 - Site Grading & Access							
Large Dozer (CAT D9)	Offroad	410	1	9		90	
Medium Dozer (CAT D5)	Offroad	90	1	9		180	
Elevating Scraper (CAT 613)	Offroad	180	1	9		180	
Motor Grader (CAT 140)	Offroad	180	1	9		90	
Compactor (CAT 815)	Offroad	240	1	9		180	
Paver (CAT AP500)	Offroad	140	1	9		27	
Roller (CAT CB34)	Offroad	50	1	9		90	
Pickup Truck/SUV	Onroad LD	—	12		600		36000
Crew Truck	Onroad MD	—	1		50		3000
Fuel Truck	Onroad MD	—	1		20		1200
Mechanical Truck	Onroad MD	—	1		20		1200
Semi Truck	Onroad HHD	—	10		200		4000
Water Truck	Onroad HHD	—	1		10		600
Phase 2 - Foundations & Footings							
Backhoe/Loader (CAT 450)	Offroad	120	1	9		270	
Skid-Steer Bobcat	Offroad	85	1	9		540	
Generator (10 kW)	Offroad	16	1	9		540	
Hole Auger (PTO mode)	Offroad	180	1	9		270	
Pickup Truck/SUV	Onroad LD	—	12		600		36000
Crew Truck	Onroad MD	—	1		50		3000
Work Truck (1-ton)	Onroad MD	—	1		20		1200
Backhoe/Loader Truck	Onroad MD	—	1		20		1200
Dump Truck	Onroad HHD	—	1		20		1200
Concrete Truck	Onroad HHD	—	1		20		600
Hole Auger Truck	Onroad HHD	—	1		20		600
Water Truck	Onroad HHD	—	1		10		600
Phase 3 - Equipment & Component Installation							
Manlift, small (JLG 400)	Offroad	50	2	12		2400	
Manlift, large (JLG 800)	Offroad	64	2	12		2400	
Rough Terrain Forklift (Gradall 544D)	Offroad	125	2	8		1200	
Backhoe/Loader (CAT 450)	Offroad	120	2	18		1080	
Mini Excavator	Offroad	55	1	6		720	
Skid-Steer Bobcat	Offroad	85	1	2		120	
Skip Loader	Offroad	90	1	2		400	
Mobile Crane (PTO mode)	Offroad	180	3	24		720	
Pickup Truck/SUV	Onroad LD	—	20		1000		200000
Crew Truck	Onroad MD	—	1		50		10000
Boom Truck	Onroad MD	—	1		50		3000
Backhoe/Loader Truck	Onroad MD	—	2		100		500
Mobile Crane Transporter	Onroad HHD	—	3		150		750
Semi Truck	Onroad HHD	—	25		1250		6250
Tool/Office Trailers Transport	Onroad HHD	—	10		1000		5000
Water Truck	Onroad HHD	—	1		10		600

Table C.9 Estimated Equipment and Vehicle Activity							
Equipment and Vehicles		**Rating**	**Planned**	**Max Daily**		**Project Total**	
Type	**Category**	**BHP**	**qty.**	**hours**	**VMT**	**hours**	**VMT**
Phase 4 - Line & Tower Configuration							
Rough Terrain Forklift (Gradall 544D)	Offroad	125	1	9		45	
Backhoe/Loader (CAT 450)	Offroad	120	1	9		108	
Hole Auger (PTO mode)	Offroad	180	1	6		180	
Mobile Crane (PTO mode)	Offroad	180	1	8		240	
Line Puller	Offroad	25	1	9		45	
Line Tensioner	Offroad	120	1	9		45	
Pickup Truck/SUV	Onroad LD	—	9		450		6750
Crew Truck	Onroad MD	—	6		300		4500
Lighting Truck	Onroad MD	—	1		50		750
Line Truck	Onroad MD	—	2		100		1500
Bucket Truck	Onroad MD	—	3		150		2250
Flatbed Truck (2-ton)	Onroad MD	—	3		150		2250
Backhoe/Loader Truck	Onroad MD	—	1		50		100
Hole Auger Truck	Onroad HHD	—	1		20		120
Mobile Crane Transporter	Onroad HHD	—	1		50		200
Dump Truck	Onroad HHD	—	1		50		1500
Water Truck	Onroad HHD	—	1		10		450
Phase 5 - Existing Equipment Removal & Post-Construction Finishing/Cleanup							
Manlift, small (JLG 400)	Offroad	50	1	9		405	
Manlift, large (JLG 800)	Offroad	64	1	9		405	
Mobile Crane (PTO mode)	Offroad	180	1	9		405	
Demolition Crane (PTO mode)	Offroad	180	1	9		90	
Rough Terrain Forklift (Gradall 544D)	Offroad	125	2	18		2160	
Hydraulic Excavator (CAT 320D)	Offroad	148	2	18		360	
Pickup Truck/SUV	Onroad LD	—	2		60		12000
Recycle roll-on/off bin transport	Onroad HHD	—	1		350		7000
Gas removal/transport	Onroad HHD	—	1		700		2800
Oil removal/transport	Onroad HHD	—	1		30		360
Bushing removal/transport	Onroad HHD	—	1		200		1200
Breaker removal/transport	Onroad HHD	—	1		200		2400
Salvagable steel transport	Onroad HHD	—	1		50		600
Mobile Crane Transporter	Onroad HHD	—	1		50		100
Demolition Crane Transporter	Onroad HHD	—	1		50		100
Water Truck	Onroad HHD	—	1		10		450
Projected Operation & Maintenance of Completed Facility (GHG)							
Pickup Truck/SUV	Onroad LD	—	1		30		1800
Service Truck (1-ton)	Onroad MD	—	1		30		360
Semi Truck	Onroad HHD	—	1		30		180
Historic Operation & Maintenance of Existing Facility (GHG)							
Pickup Truck/SUV	Onroad LD	—	1		30		1800
Service Truck (1-ton)	Onroad MD	—	1		30		360
Semi Truck	Onroad HHD	—	1		30		180

Source: Applicant (PG&E)

Notes:

LD = light duty, MD = medium duty, HHD = heavy heavy duty, BHP = brake horsepower

Table C.10 Emission Factors													
Equipment and Vehicles		Rating	Planned	VOC	CO	NO_X	SO_X	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_20	CO_2 eqv
Type	Category	BHP	qty.	lbs/unit	lbs/unit	lbs/unit	lbs/unit	lbs/unit	lbs/unit	lbs/unit	lbs/unit	lbs/unit	lbs/unit
Phase 1 - Site Grading & Access													
Large Dozer (CAT D9)	Offroad	410	1	0.2262	0.7883	2.0069	0.0023	0.0777	0.0660	225.7142	0.0204	0.0091	228.9549
Medium Dozer (CAT D5)	Offroad	90	1	0.1243	0.4167	0.5518	0.0006	0.0503	0.0427	48.2687	0.0112	0.0050	50.0491
Elevating Scraper (CAT 613)	Offroad	180	1	0.2082	0.8927	1.5892	0.0017	0.0878	0.0746	152.1669	0.0188	0.0083	155.1495
Motor Grader (CAT 140)	Offroad	180	1	0.1469	0.7144	1.1393	0.0014	0.0622	0.0529	127.1343	0.0133	0.0059	129.2383
Compactor (CAT 815)	Offroad	240	Planned	0.1260	0.4195	1.2723	0.0017	0.0464	0.0395	147.0973	0.0114	0.0051	148.9028
Paver (CAT AP500)	Offroad	140	1	0.1529	0.6048	1.0325	0.0010	0.0744	0.0632	90.6833	0.0138	0.0061	92.8738
Roller (CAT CB34)	Offroad	50	1	0.1025	0.2911	0.2583	0.0003	0.0245	0.0208	25.9831	0.0092	0.0041	27.4509
Pickup Truck/SUV	Onroad LD	—	12	0.0007	0.0071	0.0007	0.0000	0.0001	0.0001	1.1009	0.0001	0.0001	1.1346
Crew Truck	Onroad MD	—	1	0.0021	0.0141	0.0158	0.0000	0.0006	0.0005	2.7816	0.0001	0.0001	2.8120
Fuel Truck	Onroad MD	—	1	0.0021	0.0141	0.0158	0.0000	0.0006	0.0005	2.7816	0.0001	0.0001	2.8120
Mechanical Truck	Onroad MD	—	1	0.0021	0.0141	0.0158	0.0000	0.0006	0.0005	2.7816	0.0001	0.0001	2.8120
Semi Truck	Onroad HHD	—	10	0.0023	0.0093	0.0274	0.0000	0.0013	0.0011	4.2152	0.0001	0.0001	4.2478
Water Truck	Onroad HHD	—	1	0.0023	0.0093	0.0274	0.0000	0.0013	0.0011	4.2152	0.0001	0.0001	4.2478
Phase 2 - Foundations & Footings													
Backhoe/Loader (CAT 450)	Offroad	120	1	0.0694	0.3529	0.4565	0.0006	0.0383	0.0326	51.7280	0.0063	0.0028	52.7227
Skid-Steer Bobcat	Offroad	85	1	0.0473	0.2505	0.2773	0.0004	0.0201	0.0171	34.1405	0.0043	0.0019	34.8178
Generator (10 kW)	Offroad	16	1	0.0161	0.0706	0.1074	0.0002	0.0061	0.0052	10.9500	0.0015	0.0006	11.1803
Hole Auger (PTO mode)	Offroad	180	1	0.0710	0.7264	0.6977	0.0016	0.0296	0.0252	144.2114	0.0064	0.0028	145.2281
Pickup Truck/SUV	Onroad LD	—	12	0.0007	0.0071	0.0007	0.0000	0.0001	0.0001	1.1009	0.0001	0.0001	1.1346
Crew Truck	Onroad MD	—	1	0.0021	0.0141	0.0158	0.0000	0.0006	0.0005	2.7816	0.0001	0.0001	2.8120
Work Truck (1-ton)	Onroad MD	—	1	0.0021	0.0141	0.0158	0.0000	0.0006	0.0005	2.7816	0.0001	0.0001	2.8120
Backhoe/Loader Truck	Onroad MD	—	1	0.0021	0.0141	0.0158	0.0000	0.0006	0.0005	2.7816	0.0001	0.0001	2.8120
Dump Truck	Onroad HHD	—	1	0.0023	0.0093	0.0274	0.0000	0.0013	0.0011	4.2152	0.0001	0.0001	4.2478
Concrete Truck	Onroad HHD	—	1	0.0023	0.0093	0.0274	0.0000	0.0013	0.0011	4.2152	0.0001	0.0001	4.2478
Hole Auger Truck	Onroad HHD	—	1	0.0023	0.0093	0.0274	0.0000	0.0013	0.0011	4.2152	0.0001	0.0001	4.2478
Water Truck	Onroad HHD	—	1	0.0023	0.0093	0.0274	0.0000	0.0013	0.0011	4.2152	0.0001	0.0001	4.2478
Phase 3 - Equipment & Component Installation													
Manlift, small (JLG 400)	Offroad	50	2	0.0592	0.1757	0.1840	0.0003	0.0156	0.0132	19.6128	0.0053	0.0024	20.4602
Manlift, large (JLG 800)	Offroad	64	2	0.0585	0.1891	0.2223	0.0003	0.0184	0.0157	23.3046	0.0053	0.0023	24.1424
Rough Terrain Forklift (Gradall 544D)	Offroad	125	2	0.0991	0.4593	0.6400	0.0008	0.0535	0.0455	68.1271	0.0089	0.0040	69.5471
Backhoe/Loader (CAT 450)	Offroad	120	2	0.0694	0.3529	0.4565	0.0006	0.0383	0.0326	51.7280	0.0063	0.0028	52.7227
Mini Excavator	Offroad	55	1	0.0835	0.3007	0.2768	0.0004	0.0239	0.0203	28.4894	0.0075	0.0033	29.6857
Skid-Steer Bobcat	Offroad	85	1	0.0473	0.2505	0.2773	0.0004	0.0201	0.0171	34.1405	0.0043	0.0019	34.8178
Skip Loader	Offroad	90	1	0.0780	0.3387	0.3848	0.0005	0.0321	0.0273	42.5648	0.0070	0.0031	43.6817
Mobile Crane (PTO mode)	Offroad	180	3	0.1032	0.4696	0.7914	0.0009	0.0439	0.0373	82.4655	0.0093	0.0041	83.9440
Pickup Truck/SUV	Onroad LD	—	20	0.0007	0.0071	0.0007	0.0000	0.0001	0.0001	1.1009	0.0001	0.0001	1.1346
Crew Truck	Onroad MD	—	1	0.0021	0.0141	0.0158	0.0000	0.0006	0.0005	2.7816	0.0001	0.0001	2.8120
Boom Truck	Onroad MD	—	1	0.0021	0.0141	0.0158	0.0000	0.0006	0.0005	2.7816	0.0001	0.0001	2.8120
Backhoe/Loader Truck	Onroad MD	—	2	0.0021	0.0141	0.0158	0.0000	0.0006	0.0005	2.7816	0.0001	0.0001	2.8120
Mobile Crane Transporter	Onroad HHD	—	3	0.0023	0.0093	0.0274	0.0000	0.0013	0.0011	4.2152	0.0001	0.0001	4.2478
Semi Truck	Onroad HHD	—	25	0.0023	0.0093	0.0274	0.0000	0.0013	0.0011	4.2152	0.0001	0.0001	4.2478
Tool/Office Trailers Transport	Onroad HHD	—	10	0.0023	0.0093	0.0274	0.0000	0.0013	0.0011	4.2152	0.0001	0.0001	4.2478
Water Truck	Onroad HHD	—	1	0.0023	0.0093	0.0274	0.0000	0.0013	0.0011	4.2152	0.0001	0.0001	4.2478
Phase 4 - Line & Tower Configuration													
Rough Terrain Forklift (Gradall 544D)	Offroad	125	1	0.0991	0.4593	0.6400	0.0008	0.0535	0.0455	68.1271	0.0089	0.0040	69.5471
Backhoe/Loader (CAT 450)	Offroad	120	1	0.0694	0.3529	0.4565	0.0006	0.0383	0.0326	51.7280	0.0063	0.0028	52.7227
Hole Auger (PTO mode)	Offroad	180	1	0.0710	0.7264	0.6977	0.0016	0.0296	0.0252	144.2114	0.0064	0.0028	145.2281

Table C.10 Emission Factors													
Equipment and Vehicles		**Rating**	**Planned**	**VOC**	**CO**	**NO_X**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**	**CO_2**	**CH_4**	**N_20**	**CO_2 eqv**
Type	**Category**	**BHP**	**qty.**	**lbs/unit**	**lbs/unit**	**lbs/unit**	**lbs/unit**	**lbs/unit**	**lbs/unit**	**lbs/unit**	**lbs/unit**	**lbs/unit**	**lbs/unit**
Mobile Crane (PTO mode)	Offroad	180	1	0.1032	0.4696	0.7914	0.0009	0.0439	0.0373	82.4655	0.0093	0.0041	83.9440
Line Puller	Offroad	25	1	0.0185	0.0632	0.1170	0.0002	0.0044	0.0037	15.3491	0.0017	0.0007	15.6144
Line Tensioner	Offroad	120	1	0.1177	0.4487	0.6789	0.0007	0.0644	0.0548	62.0360	0.0106	0.0047	63.7224
Pickup Truck/SUV	Onroad LD	—	9	0.0007	0.0071	0.0007	0.0000	0.0001	0.0001	1.1009	0.0001	0.0001	1.1346
Crew Truck	Onroad MD	—	6	0.0021	0.0141	0.0158	0.0000	0.0006	0.0005	2.7816	0.0001	0.0001	2.8120
Lighting Truck	Onroad MD	—	1	0.0021	0.0141	0.0158	0.0000	0.0006	0.0005	2.7816	0.0001	0.0001	2.8120
Line Truck	Onroad MD	—	2	0.0021	0.0141	0.0158	0.0000	0.0006	0.0005	2.7816	0.0001	0.0001	2.8120
Bucket Truck	Onroad MD	—	3	0.0021	0.0141	0.0158	0.0000	0.0006	0.0005	2.7816	0.0001	0.0001	2.8120
Flatbed Truck (2-ton)	Onroad MD	—	3	0.0021	0.0141	0.0158	0.0000	0.0006	0.0005	2.7816	0.0001	0.0001	2.8120
Backhoe/Loader Truck	Onroad MD	—	1	0.0021	0.0141	0.0158	0.0000	0.0006	0.0005	2.7816	0.0001	0.0001	2.8120
Hole Auger Truck	Onroad HHD	—	1	0.0023	0.0093	0.0274	0.0000	0.0013	0.0011	4.2152	0.0001	0.0001	4.2478
Mobile Crane Transporter	Onroad HHD	—	1	0.0023	0.0093	0.0274	0.0000	0.0013	0.0011	4.2152	0.0001	0.0001	4.2478
Dump Truck	Onroad HHD	—	1	0.0023	0.0093	0.0274	0.0000	0.0013	0.0011	4.2152	0.0001	0.0001	4.2478
Water Truck	Onroad HHD	—	1	0.0023	0.0093	0.0274	0.0000	0.0013	0.0011	4.2152	0.0001	0.0001	4.2478
Phase 5 - Existing Equipment Removal & Post-Construction Finishing/Cleanup													
Manlift, small (JLG 400)	Offroad	50	1	0.0592	0.1757	0.1840	0.0003	0.0156	0.0132	19.6128	0.0053	0.0024	20.4602
Manlift, large (JLG 800)	Offroad	64	1	0.0585	0.1891	0.2223	0.0003	0.0184	0.0157	23.3046	0.0053	0.0023	24.1424
Mobile Crane (PTO mode)	Offroad	180	1	0.1032	0.4696	0.7914	0.0009	0.0439	0.0373	82.4655	0.0093	0.0041	83.9440
Demolition Crane (PTO mode)	Offroad	180	1	0.1032	0.4696	0.7914	0.0009	0.0439	0.0373	82.4655	0.0093	0.0041	83.9440
Rough Terrain Forklift (Gradall 544D)	Offroad	125	2	0.0991	0.4593	0.6400	0.0008	0.0535	0.0455	68.1271	0.0089	0.0040	69.5471
Hydraulic Excavator (CAT 320D)	Offroad	148	2	0.1148	0.5936	0.7881	0.0011	0.0549	0.0466	93.2732	0.0104	0.0046	94.9183
Pickup Truck/SUV	Onroad LD	—	2	0.0007	0.0071	0.0007	0.0000	0.0001	0.0001	1.1009	0.0001	0.0001	1.1346
Recycle roll-on/off bin transport	Onroad HHD	—	1	0.0023	0.0093	0.0274	0.0000	0.0013	0.0011	4.2152	0.0001	0.0001	4.2478
Gas removal/transport	Onroad HHD	—	1	0.0023	0.0093	0.0274	0.0000	0.0013	0.0011	4.2152	0.0001	0.0001	4.2478
Oil removal/transport	Onroad HHD	—	1	0.0023	0.0093	0.0274	0.0000	0.0013	0.0011	4.2152	0.0001	0.0001	4.2478
Bushing removal/transport	Onroad HHD	—	1	0.0023	0.0093	0.0274	0.0000	0.0013	0.0011	4.2152	0.0001	0.0001	4.2478
Breaker removal/transport	Onroad HHD	—	1	0.0023	0.0093	0.0274	0.0000	0.0013	0.0011	4.2152	0.0001	0.0001	4.2478
Salvagable steel transport	Onroad HHD	—	1	0.0023	0.0093	0.0274	0.0000	0.0013	0.0011	4.2152	0.0001	0.0001	4.2478
Mobile Crane Transporter	Onroad HHD	—	1	0.0023	0.0093	0.0274	0.0000	0.0013	0.0011	4.2152	0.0001	0.0001	4.2478
Demolition Crane Transporter	Onroad HHD	—	1	0.0023	0.0093	0.0274	0.0000	0.0013	0.0011	4.2152	0.0001	0.0001	4.2478
Water Truck	Onroad HHD	—	1	0.0023	0.0093	0.0274	0.0000	0.0013	0.0011	4.2152	0.0001	0.0001	4.2478
Projected Operation & Maintenance of Completed Facility (GHG)													
Pickup Truck/SUV	Onroad LD	—	1	0.0007	0.0071	0.0007	0.0000	0.0001	0.0001	1.1009	0.0001	0.0001	1.1346
Service Truck (1-ton)	Onroad MD	—	1	0.0021	0.0141	0.0158	0.0000	0.0006	0.0005	2.7816	0.0001	0.0001	2.8120
Semi Truck	Onroad HHD	—	1	0.0023	0.0093	0.0274	0.0000	0.0013	0.0011	4.2152	0.0001	0.0001	4.2478
Historic Operation & Maintenance of Existing Facility (GHG)													
Pickup Truck/SUV	Onroad LD	—	1	0.0007	0.0071	0.0007	0.0000	0.0001	0.0001	1.1009	0.0001	0.0001	1.1346
Service Truck (1-ton)	Onroad MD	—	1	0.0021	0.0141	0.0158	0.0000	0.0006	0.0005	2.7816	0.0001	0.0001	2.8120
Semi Truck	Onroad HHD	—	1	0.0023	0.0093	0.0274	0.0000	0.0013	0.0011	4.2152	0.0001	0.0001	4.2478
Sources: SCAQMD 2008, EPA 2012													

Notes:

SCAQMD emission factors for 2013 (SCAQMD 2008)

Offroad diesel exhaust $PM_{2.5}$ = 85% of PM_{10} per EMFAC 2007 version 2.3 (SCAQMD 2008)

N_2O & CO_2 eqv per Inventory of U.S. GHG Emissions & Sinks - Annex 3 (EPA 2012)

Non-matching application-specific values interpolated or extrapolated for improved accuracy

Table C.11 Estimated Daily Emissions													
Equipment and Vehicles		Max Daily		VOC	CO	NO_X	SO_X	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_20	CO_2 eqv
Type	Category	hours	VMT	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs
Phase 1 - Site Grading & Access													
Large Dozer (CAT D9)	Offroad	9		2.04	7.09	18.06	0.02	0.70	0.59	2,031	0.18	0.08	2,061
Medium Dozer (CAT D5)	Offroad	9		1.12	3.75	4.97	0.01	0.45	0.38	434	0.10	0.04	450
Elevating Scraper (CAT 613)	Offroad	9		1.87	8.03	14.30	0.02	0.79	0.67	1,370	0.17	0.08	1,396
Motor Grader (CAT 140)	Offroad	9		1.32	6.43	10.25	0.01	0.56	0.48	1,144	0.12	0.05	1,163
Compactor (CAT 815)	Offroad	9		1.13	3.78	11.45	0.01	0.42	0.36	1,324	0.10	0.05	1,340
Paver (CAT AP500)	Offroad	9		1.38	5.44	9.29	0.01	0.67	0.57	816	0.12	0.06	836
Roller (CAT CB34)	Offroad	9		0.92	2.62	2.32	0.00	0.22	0.19	234	0.08	0.04	247
Pickup Truck/SUV	Onroad LD		600	0.45	4.26	0.43	0.01	0.05	0.04	661	0.04	0.06	681
Crew Truck	Onroad MD		50	0.10	0.70	0.79	0.00	0.03	0.03	139	0.00	0.00	141
Fuel Truck	Onroad MD		20	0.04	0.28	0.32	0.00	0.01	0.01	56	0.00	0.00	56
Mechanical Truck	Onroad MD		20	0.04	0.28	0.32	0.00	0.01	0.01	56	0.00	0.00	56
Semi Truck	Onroad HHD		200	0.45	1.86	5.49	0.01	0.27	0.23	843	0.02	0.02	850
Water Truck	Onroad HHD		10	0.02	0.09	0.27	0.00	0.01	0.01	42	0.00	0.00	42
Phase 2 - Foundations & Footings													
Backhoe/Loader (CAT 450)	Offroad	9		0.62	3.18	4.11	0.01	0.34	0.29	466	0.06	0.03	475
Skid-Steer Bobcat	Offroad	9		0.43	2.25	2.50	0.00	0.18	0.15	307	0.04	0.02	313
Generator (10 kW)	Offroad	9		0.14	0.64	0.97	0.00	0.05	0.05	99	0.01	0.01	101
Hole Auger (PTO mode)	Offroad	9		0.64	6.54	6.28	0.01	0.27	0.23	1,298	0.06	0.03	1,307
Pickup Truck/SUV	Onroad LD		600	0.45	4.26	0.43	0.01	0.05	0.04	661	0.04	0.06	681
Crew Truck	Onroad MD		50	0.10	0.70	0.79	0.00	0.03	0.03	139	0.00	0.00	141
Work Truck (1-ton)	Onroad MD		20	0.04	0.28	0.32	0.00	0.01	0.01	56	0.00	0.00	56
Backhoe/Loader Truck	Onroad MD		20	0.04	0.28	0.32	0.00	0.01	0.01	56	0.00	0.00	56
Dump Truck	Onroad HHD		20	0.05	0.19	0.55	0.00	0.03	0.02	84	0.00	0.00	85
Concrete Truck	Onroad HHD		20	0.05	0.19	0.55	0.00	0.03	0.02	84	0.00	0.00	85
Hole Auger Truck	Onroad HHD		20	0.05	0.19	0.55	0.00	0.03	0.02	84	0.00	0.00	85
Water Truck	Onroad HHD		10	0.02	0.09	0.27	0.00	0.01	0.01	42	0.00	0.00	42
Phase 3 - Equipment & Component Installation													
Manlift, small (JLG 400)	Offroad	12		0.71	2.11	2.21	0.00	0.19	0.16	235	0.06	0.03	246
Manlift, large (JLG 800)	Offroad	12		0.70	2.27	2.67	0.00	0.22	0.19	280	0.06	0.03	290
Rough Terrain Forklift (Gradall 544D)	Offroad	8		0.79	3.67	5.12	0.01	0.43	0.36	545	0.07	0.03	556
Backhoe/Loader (CAT 450)	Offroad	18		1.25	6.35	8.22	0.01	0.69	0.59	931	0.11	0.05	949
Mini Excavator	Offroad	6		0.50	1.80	1.66	0.00	0.14	0.12	171	0.05	0.02	178
Skid-Steer Bobcat	Offroad	2		0.09	0.50	0.55	0.00	0.04	0.03	68	0.01	0.00	70
Skip Loader	Offroad	2		0.16	0.68	0.77	0.00	0.06	0.05	85	0.01	0.01	87
Mobile Crane (PTO mode)	Offroad	24		2.48	11.27	18.99	0.02	1.05	0.90	1,979	0.22	0.10	2,015
Pickup Truck/SUV	Onroad LD		1000	0.75	7.09	0.71	0.01	0.09	0.06	1,101	0.07	0.10	1,135
Crew Truck	Onroad MD		50	0.10	0.70	0.79	0.00	0.03	0.03	139	0.00	0.00	141
Boom Truck	Onroad MD		50	0.10	0.70	0.79	0.00	0.03	0.03	139	0.00	0.00	141
Backhoe/Loader Truck	Onroad MD		100	0.21	1.41	1.58	0.00	0.06	0.05	278	0.01	0.01	281
Mobile Crane Transporter	Onroad HHD		150	0.34	1.40	4.11	0.01	0.20	0.17	632	0.02	0.01	637
Semi Truck	Onroad HHD		1250	2.83	11.65	34.29	0.05	1.67	1.43	5,269	0.13	0.12	5,310
Tool/Office Trailers Transport	Onroad HHD		1000	2.26	9.32	27.43	0.04	1.34	1.15	4,215	0.10	0.10	4,248
Water Truck	Onroad HHD		10	0.02	0.09	0.27	0.00	0.01	0.01	42	0.00	0.00	42
Phase 4 - Line & Tower Configuration													
Rough Terrain Forklift (Gradall 544D)	Offroad	9		0.89	4.13	5.76	0.01	0.48	0.41	613	0.08	0.04	626
Backhoe/Loader (CAT 450)	Offroad	9		0.62	3.18	4.11	0.01	0.34	0.29	466	0.06	0.03	475
Hole Auger (PTO mode)	Offroad	6		0.43	4.36	4.19	0.01	0.18	0.15	865	0.04	0.02	871
Mobile Crane (PTO mode)	Offroad	8		0.83	3.76	6.33	0.01	0.35	0.30	660	0.07	0.03	672
Line Puller	Offroad	9		0.17	0.57	1.05	0.00	0.04	0.03	138	0.02	0.01	141
Line Tensioner	Offroad	9		1.06	4.04	6.11	0.01	0.58	0.49	558	0.10	0.04	574
Pickup Truck/SUV	Onroad LD		450	0.34	3.19	0.32	0.00	0.04	0.03	495	0.03	0.05	511
Crew Truck	Onroad MD		300	0.62	4.22	4.73	0.01	0.18	0.15	834	0.03	0.03	844

Table C.11 Estimated Daily Emissions													
Equipment and Vehicles		**Max Daily**		**VOC**	**CO**	**NO_X**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**	**CO_2**	**CH_4**	**N_20**	**CO_2 eqv**
Type	**Category**	**hours**	**VMT**	**lbs**	**lbs**	**lbs**	**lbs**	**lbs**	**lbs**	**lbs**	**lbs**	**lbs**	**lbs**
Lighting Truck	Onroad MD		50	0.10	0.70	0.79	0.00	0.03	0.03	139	0.00	0.00	141
Line Truck	Onroad MD		100	0.21	1.41	1.58	0.00	0.06	0.05	278	0.01	0.01	281
Bucket Truck	Onroad MD		150	0.31	2.11	2.37	0.00	0.09	0.08	417	0.01	0.01	422
Flatbed Truck (2-ton)	Onroad MD		150	0.31	2.11	2.37	0.00	0.09	0.08	417	0.01	0.01	422
Backhoe/Loader Truck	Onroad MD		50	0.10	0.70	0.79	0.00	0.03	0.03	139	0.00	0.00	141
Hole Auger Truck	Onroad HHD		20	0.05	0.19	0.55	0.00	0.03	0.02	84	0.00	0.00	85
Mobile Crane Transporter	Onroad HHD		50	0.11	0.47	1.37	0.00	0.07	0.06	211	0.01	0.00	212
Dump Truck	Onroad HHD		50	0.11	0.47	1.37	0.00	0.07	0.06	211	0.01	0.00	212
Water Truck	Onroad HHD		10	0.02	0.09	0.27	0.00	0.01	0.01	42	0.00	0.00	42
Phase 5 - Existing Equipment Removal & Post-Construction Finishing/Cleanup													
Manlift, small (JLG 400)	Offroad	9		0.53	1.58	1.66	0.00	0.14	0.12	177	0.05	0.02	184
Manlift, large (JLG 800)	Offroad	9		0.53	1.70	2.00	0.00	0.17	0.14	210	0.05	0.02	217
Mobile Crane (PTO mode)	Offroad	9		0.93	4.23	7.12	0.01	0.39	0.34	742	0.08	0.04	755
Demolition Crane (PTO mode)	Offroad	9		0.93	4.23	7.12	0.01	0.39	0.34	742	0.08	0.04	755
Rough Terrain Forklift (Gradall 544D)	Offroad	18		1.78	8.27	11.52	0.01	0.96	0.82	1,226	0.16	0.07	1,252
Hydraulic Excavator (CAT 320D)	Offroad	18		2.07	10.68	14.19	0.02	0.99	0.84	1,679	0.19	0.08	1,709
Pickup Truck/SUV	Onroad LD		60	0.04	0.43	0.04	0.00	0.01	0.00	66	0.00	0.01	68
Recycle roll-on/off bin transport	Onroad HHD		350	0.79	3.26	9.60	0.01	0.47	0.40	1,475	0.04	0.03	1,487
Gas removal/transport	Onroad HHD		700	1.58	6.52	19.20	0.03	0.94	0.80	2,951	0.07	0.07	2,973
Oil removal/transport	Onroad HHD		30	0.07	0.28	0.82	0.00	0.04	0.03	126	0.00	0.00	127
Bushing removal/transport	Onroad HHD		200	0.45	1.86	5.49	0.01	0.27	0.23	843	0.02	0.02	850
Breaker removal/transport	Onroad HHD		200	0.45	1.86	5.49	0.01	0.27	0.23	843	0.02	0.02	850
Salvagable steel transport	Onroad HHD		50	0.11	0.47	1.37	0.00	0.07	0.06	211	0.01	0.00	212
Mobile Crane Transporter	Onroad HHD		50	0.11	0.47	1.37	0.00	0.07	0.06	211	0.01	0.00	212
Demolition Crane Transporter	Onroad HHD		50	0.11	0.47	1.37	0.00	0.07	0.06	211	0.01	0.00	212
Water Truck	Onroad HHD		10	0.02	0.09	0.27	0.00	0.01	0.01	42	0.00	0.00	42
Projected Operation & Maintenance of Completed Facility (GHG)													
Pickup Truck/SUV	Onroad LD		30	0.02	0.21	0.02	0.00	0.00	0.00	33	0.00	0.00	34
Service Truck (1-ton)	Onroad MD		30	0.06	0.42	0.47	0.00	0.02	0.02	83	0.00	0.00	84
Semi Truck	Onroad HHD		30	0.07	0.28	0.82	0.00	0.04	0.03	126	0.00	0.00	127
Historic Operation & Maintenance of Existing Facility (GHG)													
Pickup Truck/SUV	Onroad LD		30	0.02	0.21	0.02	0.00	0.00	0.00	33	0.00	0.00	34
Service Truck (1-ton)	Onroad MD		30	0.06	0.42	0.47	0.00	0.02	0.02	83	0.00	0.00	84
Semi Truck	Onroad HHD		30	0.07	0.28	0.82	0.00	0.04	0.03	126	0.00	0.00	127
Maximum Daily Emissions, pounds (Phase 1, parsed)				5.44	25.72	43.61	0.06	2.16	1.82	5,634	0.46	0.27	5,726
Maximum Daily Emissions, pounds (Phase 2, whole)				2.63	18.78	17.62	0.04	1.05	0.88	3,375	0.22	0.15	3,427
Maximum Daily Emissions, pounds (Phase 3, whole)				13.29	61.02	110.16	0.16	6.26	5.32	16,110	0.94	0.63	16,325
Maximum Daily Emissions, pounds (Phase 4, whole)				6.27	35.70	44.05	0.07	2.67	2.25	6,569	0.48	0.29	6,670
Maximum Daily Emissions, pounds (Phase 5, whole)				10.52	46.40	88.63	0.12	5.24	4.47	11,755	0.79	0.44	11,907
Maximum Daily Emissions, pounds (All Phases)				**13.29**	**61.02**	**110.16**	**0.16**	**6.26**	**5.32**	**16,110**	**0.94**	**0.63**	**16,325**
Maximum Daily Emissions, pounds (onsite offroad DPM only - Phase 5)				**—**	**—**	**—**	**—**	**3.06**	**—**	**—**	**—**	**—**	**—**
Projected Maximum Daily O&M Emissions, pounds				**0.15**	**0.91**	**1.32**	**0.00**	**0.06**	**0.05**	**242.93**	**0.01**	**0.01**	**245.83**
HIstoric Maximum Daily O&M Emissions, pounds				**0.15**	**0.91**	**1.32**	**0.00**	**0.06**	**0.05**	**242.93**	**0.01**	**0.01**	**245.83**
Sources: SCAQMD 2008, EPA 2012													

Notes:

SCAQMD emission factors for 2013 (SCAQMD 2008)

Offroad diesel exhaust $PM_{2.5}$ = 85% of PM_{10} per EMFAC 2007 version 2.3 (SCAQMD 2008)

N_2O & CO_2 eqv per Inventory of U.S. GHG Emissions & Sinks - Annex 3 (EPA 2012)

Non-matching application-specific values interpolated or extrapolated for improved accuracy

Table C.12 Estimated Total Emissions													
Equipment and Vehicles		Project Total		VOC	CO	NO_X	SO_X	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_20	CO_2 eqv
Type	Category	hours	VMT	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs
Phase 1 - Site Grading & Access													
Large Dozer (CAT D9)	Offroad	90		20.36	70.95	180.62	0.21	6.99	5.94	20,314	1.84	0.82	20,606
Medium Dozer (CAT D5)	Offroad	180		22.37	75.01	99.33	0.10	9.05	7.69	8,688	2.02	0.90	9,009
Elevating Scraper (CAT 613)	Offroad	180		37.47	160.69	286.06	0.31	15.80	13.43	27,390	3.38	1.50	27,927
Motor Grader (CAT 140)	Offroad	90		13.22	64.30	102.54	0.13	5.60	4.76	11,442	1.19	0.53	11,631
Compactor (CAT 815)	Offroad	180		22.68	75.52	229.02	0.30	8.36	7.10	26,478	2.05	0.91	26,803
Paver (CAT AP500)	Offroad	27		4.13	16.33	27.88	0.03	2.01	1.71	2,448	0.37	0.17	2,508
Roller (CAT CB34)	Offroad	90		9.22	26.20	23.24	0.03	2.20	1.87	2,338	0.83	0.37	2,471
Pickup Truck/SUV	Onroad LD		36000	26.84	255.32	25.62	0.39	3.26	2.10	39,631	2.41	3.76	40,847
Crew Truck	Onroad MD		3000	6.19	42.23	47.32	0.08	1.80	1.51	8,345	0.29	0.27	8,436
Fuel Truck	Onroad MD		1200	2.48	16.89	18.93	0.03	0.72	0.60	3,338	0.12	0.11	3,374
Mechanical Truck	Onroad MD		1200	2.48	16.89	18.93	0.03	0.72	0.60	3,338	0.12	0.11	3,374
Semi Truck	Onroad HHD		4000	9.05	37.27	109.72	0.16	5.35	4.59	16,861	0.42	0.39	16,991
Water Truck	Onroad HHD		600	1.36	5.59	16.46	0.02	0.80	0.69	2,529	0.06	0.06	2,549
Phase 2 - Foundations & Footings													
Backhoe/Loader (CAT 450)	Offroad	270		18.75	95.27	123.25	0.16	10.34	8.79	13,967	1.69	0.75	14,235
Skid-Steer Bobcat	Offroad	540		25.53	135.27	149.74	0.22	10.84	9.21	18,436	2.30	1.02	18,802
Generator (10 kW)	Offroad	540		8.68	38.14	57.97	0.09	3.29	2.80	5,913	0.78	0.35	6,037
Hole Auger (PTO mode)	Offroad	270		19.16	196.13	188.39	0.44	8.00	6.80	38,937	1.73	0.77	39,212
Pickup Truck/SUV	Onroad LD		36000	26.84	255.32	25.62	0.39	3.26	2.10	39,631	2.41	3.76	40,847
Crew Truck	Onroad MD		3000	6.19	42.23	47.32	0.08	1.80	1.51	8,345	0.29	0.27	8,436
Work Truck (1-ton)	Onroad MD		1200	2.48	16.89	18.93	0.03	0.72	0.60	3,338	0.12	0.11	3,374
Backhoe/Loader Truck	Onroad MD		1200	2.48	16.89	18.93	0.03	0.72	0.60	3,338	0.12	0.11	3,374
Dump Truck	Onroad HHD		1200	2.72	11.18	32.92	0.05	1.60	1.38	5,058	0.13	0.12	5,097
Concrete Truck	Onroad HHD		600	1.36	5.59	16.46	0.02	0.80	0.69	2,529	0.06	0.06	2,549
Hole Auger Truck	Onroad HHD		600	1.36	5.59	16.46	0.02	0.80	0.69	2,529	0.06	0.06	2,549
Water Truck	Onroad HHD		600	1.36	5.59	16.46	0.02	0.80	0.69	2,529	0.06	0.06	2,549
Phase 3 - Equipment & Component Installation													
Manlift, small (JLG 400)	Offroad	2400		141.98	421.79	441.50	0.61	37.33	31.73	47,071	12.81	5.69	49,105
Manlift, large (JLG 800)	Offroad	2400		140.36	453.83	533.57	0.70	44.20	37.57	55,931	12.66	5.63	57,942
Rough Terrain Forklift (Gradall 544D)	Offroad	1200		118.94	551.14	767.97	0.95	64.22	54.58	81,752	10.73	4.77	83,457
Backhoe/Loader (CAT 450)	Offroad	1080		74.99	381.09	492.99	0.66	41.36	35.15	55,866	6.77	3.01	56,941
Mini Excavator	Offroad	720		60.13	216.53	199.29	0.26	17.21	14.63	20,512	5.43	2.41	21,374
Skid-Steer Bobcat	Offroad	120		5.67	30.06	33.28	0.05	2.41	2.05	4,097	0.51	0.23	4,178
Skip Loader	Offroad	400		31.19	135.49	153.94	0.21	12.84	10.91	17,026	2.81	1.25	17,473
Mobile Crane (PTO mode)	Offroad	720		74.30	338.12	569.80	0.67	31.60	26.86	59,375	6.70	2.98	60,440
Pickup Truck/SUV	Onroad LD		200000	149.13	1,418.46	142.32	2.14	18.13	11.67	220,175	13.41	20.87	226,926
Crew Truck	Onroad MD		10000	20.63	140.78	157.73	0.27	6.00	5.02	27,816	0.97	0.91	28,120
Boom Truck	Onroad MD		3000	6.19	42.23	47.32	0.08	1.80	1.51	8,345	0.29	0.27	8,436
Backhoe/Loader Truck	Onroad MD		500	1.03	7.04	7.89	0.01	0.30	0.25	1,391	0.05	0.05	1,406
Mobile Crane Transporter	Onroad HHD		750	1.70	6.99	20.57	0.03	1.00	0.86	3,161	0.08	0.07	3,186
Semi Truck	Onroad HHD		6250	14.14	58.24	171.43	0.26	8.36	7.16	26,345	0.65	0.61	26,549
Tool/Office Trailers Transport	Onroad HHD		5000	11.32	46.59	137.15	0.20	6.68	5.73	21,076	0.52	0.49	21,239
Water Truck	Onroad HHD		600	1.36	5.59	16.46	0.02	0.80	0.69	2,529	0.06	0.06	2,549
Phase 4 - Line & Tower Configuration													
Rough Terrain Forklift (Gradall 544D)	Offroad	45		4.46	20.67	28.80	0.04	2.41	2.05	3,066	0.40	0.18	3,130
Backhoe/Loader (CAT 450)	Offroad	108		7.50	38.11	49.30	0.07	4.14	3.52	5,587	0.68	0.30	5,694
Hole Auger (PTO mode)	Offroad	180		12.77	130.75	125.59	0.29	5.33	4.53	25,958	1.15	0.51	26,141
Mobile Crane (PTO mode)	Offroad	240		24.77	112.71	189.93	0.22	10.53	8.95	19,792	2.23	0.99	20,147
Line Puller	Offroad	45		0.83	2.84	5.27	0.01	0.20	0.17	691	0.08	0.03	703
Line Tensioner	Offroad	45		5.30	20.19	30.55	0.03	2.90	2.46	2,792	0.48	0.21	2,868
Pickup Truck/SUV	Onroad LD		6750	5.03	47.87	4.80	0.07	0.61	0.39	7,431	0.45	0.70	7,659
Crew Truck	Onroad MD		4500	9.28	63.35	70.98	0.12	2.70	2.26	12,517	0.44	0.41	12,654
Lighting Truck	Onroad MD		750	1.55	10.56	11.83	0.02	0.45	0.38	2,086	0.07	0.07	2,109
Line Truck	Onroad MD		1500	3.09	21.12	23.66	0.04	0.90	0.75	4,172	0.15	0.14	4,218

Table C.12 Estimated Total Emissions

Equipment and Vehicles		Project Total		VOC	CO	NO_X	SO_X	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_20	CO_2 eqv
Type	**Category**	**hours**	**VMT**	**lbs**	**lbs**	**lbs**	**lbs**	**lbs**	**lbs**	**lbs**	**lbs**	**lbs**	**lbs**
Bucket Truck	Onroad MD		2250	4.64	31.68	35.49	0.06	1.35	1.13	6,259	0.22	0.21	6,327
Flatbed Truck (2-ton)	Onroad MD		2250	4.64	31.68	35.49	0.06	1.35	1.13	6,259	0.22	0.21	6,327
Backhoe/Loader Truck	Onroad MD		100	0.21	1.41	1.58	0.00	0.06	0.05	278	0.01	0.01	281
Hole Auger Truck	Onroad HHD		120	0.27	1.12	3.29	0.00	0.16	0.14	506	0.01	0.01	510
Mobile Crane Transporter	Onroad HHD		200	0.45	1.86	5.49	0.01	0.27	0.23	843	0.02	0.02	850
Dump Truck	Onroad HHD		1500	3.39	13.98	41.14	0.06	2.01	1.72	6,323	0.16	0.15	6,372
Water Truck	Onroad HHD		450	1.02	4.19	12.34	0.02	0.60	0.52	1,897	0.05	0.04	1,912
Phase 5 - Existing Equipment Removal & Post-Construction Finishing/Cleanup													
Manlift, small (JLG 400)	Offroad	405		23.96	71.18	74.50	0.10	6.30	5.35	7,943	2.16	0.96	8,286
Manlift, large (JLG 800)	Offroad	405		23.69	76.58	90.04	0.12	7.46	6.34	9,438	2.14	0.95	9,778
Mobile Crane (PTO mode)	Offroad	405		41.79	190.19	320.51	0.38	17.77	15.11	33,399	3.77	1.68	33,997
Demolition Crane (PTO mode)	Offroad	90		9.29	42.27	71.23	0.08	3.95	3.36	7,422	0.84	0.37	7,555
Rough Terrain Forklift (Gradall 544D)	Offroad	2160		214.10	992.05	1,382.35	1.71	115.59	98.25	147,154	19.32	8.59	150,222
Hydraulic Excavator (CAT 320D)	Offroad	360		41.34	213.70	283.71	0.38	19.75	16.79	33,578	3.73	1.66	34,171
Pickup Truck/SUV	Onroad LD		12000	8.95	85.11	8.54	0.13	1.09	0.70	13,210	0.80	1.25	13,616
Recycle roll-on/off bin transport	Onroad HHD		7000	15.84	65.23	192.01	0.29	9.36	8.02	29,506	0.73	0.69	29,735
Gas removal/transport	Onroad HHD		2800	6.34	26.09	76.80	0.11	3.74	3.21	11,803	0.29	0.28	11,894
Oil removal/transport	Onroad HHD		360	0.81	3.35	9.87	0.01	0.48	0.41	1,517	0.04	0.04	1,529
Bushing removal/transport	Onroad HHD		1200	2.72	11.18	32.92	0.05	1.60	1.38	5,058	0.13	0.12	5,097
Breaker removal/transport	Onroad HHD		2400	5.43	22.36	65.83	0.10	3.21	2.75	10,116	0.25	0.24	10,195
Salvagable steel transport	Onroad HHD		600	1.36	5.59	16.46	0.02	0.80	0.69	2,529	0.06	0.06	2,549
Mobile Crane Transporter	Onroad HHD		100	0.23	0.93	2.74	0.00	0.13	0.11	422	0.01	0.01	425
Demolition Crane Transporter	Onroad HHD		100	0.23	0.93	2.74	0.00	0.13	0.11	422	0.01	0.01	425
Water Truck	Onroad HHD		450	1.02	4.19	12.34	0.02	0.60	0.52	1,897	0.05	0.04	1,912
Projected Operation & Maintenance of Completed Facility (GHG)													
Pickup Truck/SUV	Onroad LD		1800	1.34	12.77	1.28	0.02	0.16	0.11	1,982	0.12	0.19	2,042
Service Truck (1-ton)	Onroad MD		360	0.74	5.07	5.68	0.01	0.22	0.18	1,001	0.03	0.03	1,012
Semi Truck	Onroad HHD		180	0.41	1.68	4.94	0.01	0.24	0.21	759	0.02	0.02	765
Historic Operation & Maintenance of Existing Facility (GHG)													
Pickup Truck/SUV	Onroad LD		1800	1.34	12.77	1.28	0.02	0.16	0.11	1,982	0.12	0.19	2,042
Service Truck (1-ton)	Onroad MD		360	0.74	5.07	5.68	0.01	0.22	0.18	1,001	0.03	0.03	1,012
Semi Truck	Onroad HHD		180	0.41	1.68	4.94	0.01	0.24	0.21	759	0.02	0.02	765
Total Project Emissions, tons (Phase 1)				0.09	0.43	0.59	0.00	0.03	0.03	86.57	0.01	0.00	88.26
Total Project Emissions, tons (Phase 2)				0.06	0.41	0.36	0.00	0.02	0.02	72.28	0.00	0.00	73.53
Total Project Emissions, tons (Phase 3)				0.43	2.13	1.95	0.00	0.15	0.12	326.23	0.04	0.02	334.66
Total Project Emissions, tons (Phase 4)				0.04	0.28	0.34	0.00	0.02	0.02	53.23	0.00	0.00	53.95
Total Project Emissions, tons (Phase 5)				0.20	0.91	1.32	0.00	0.10	0.08	157.71	0.02	0.01	160.69
Total Project Emissions, tons (All Phases)				**0.82**	**4.15**	**4.55**	**0.01**	**0.31**	**0.26**	**696.02**	**0.07**	**0.04**	**711.09**
Total Project Emissions, tons (onsite offroad DPM only)				—	—	—	—	**0.27**	—	—	—	—	—
Projected Annual O&M Emissions, tons				**0.001**	**0.010**	**0.006**	**0.000**	**0.000**	**0.000**	**1.87**	**0.000**	**0.000**	**1.91**
Historic Annual O&M Emissions, tons				**0.001**	**0.010**	**0.006**	**0.000**	**0.000**	**0.000**	**1.87**	**0.000**	**0.000**	**1.91**
Construction Worker Commuting, tonnes GHG (mitigated)				—	—	—	—	—	—	—	—	—	**149.64**
Offroad Idling Minimization, tonnes GHG (mitigated)				—	—	—	—	—	—	—	—	—	**223.43**
Onroad Tire Inflation, tonnes GHG (mitigated)				—	—	—	—	—	—	—	—	—	**117.69**
Remainder, tonnes (GHG)				—	—	—	—	—	—	—	—	—	**154.34**

Sources: SCAQMD 2008, EPA 2012

Notes:

SCAQMD emission factors for 2013 (SCAQMD 2008)

Offroad diesel exhaust $PM_{2.5}$ = 85% of PM_{10} per EMFAC 2007 version 2.3 (SCAQMD 2008)

N_2O & CO_2 eqv per Inventory of U.S. GHG Emissions & Sinks - Annex 3 (EPA 2012)

Non-matching application-specific values interpolated or extrapolated for improved accuracy

Table C.13 Estimated Offroad Fugitive Dust Emissions

Earthmoving	Activity		Required Variables								Uncontrolled		Controlled Emissions				
	Pk. Daily	Project	EET	Moist (M)	Silt (s)	Drop (d)	Speed (S)	Wind (U)	Den (D)	Rate (V)	PM_{10}	$PM_{2.5}$	Control	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
	hours	hours	code	percent	percent	feet	mph	mph	ton/cy	cy/hr	lb/hr	lb/hr	%	lb/day	lb/day	lbs	lbs
PHASE 1																	
Bulldozer (tracked)	18	270	A	14	14						0.97650	0.46083	85%	2.6	1.2	39.5	18.7
Bulldozer (wheeled)	-	-	A	14	14						0.73238	0.34562	85%	-	-	-	-
Scraper (dumper)	9	180	B+C	14		3	5			30	3.92192	0.33705	85%	5.3	0.5	105.9	9.1
Dump Truck/ADT	-	-	B	14		6				30	0.07623	0.00351	85%	-	-	-	-
Clamshell Derrick	-	-	B	14		9				30	0.10124	0.00549	85%	-	-	-	-
Dragline (small)	-	-	B	14		12				60	0.24766	0.01506	85%	-	-	-	-
Motor Grader	9	90	C	14			4				1.98400	0.15360	85%	2.7	0.2	26.8	2.1
Tractor/Offroad Forklift	-	-	C	14			3				0.83700	0.05612	85%	-	-	-	-
Compactor/Roller	9	180	C	14			2				0.24800	0.01358	85%	0.3	0.0	6.7	0.4
Crane (tracked)	-	-	C	14			1				0.03100	0.00120	85%	-	-	-	-
Backhoe/Skip Loader	-	-	D	14				6.4	1.5	20	0.00298	0.00046	85%	-	-	-	-
Bobcat/Skid Steer Loader	-	-	D	14				6.4	1.5	10	0.00149	0.00023	85%	-	-	-	-
Drill Auger/Borer	-	-	D	14				6.4	1.5	10	0.00149	0.00023	85%	-	-	-	-
Hydraulic Excavator	-	-	D	14				6.4	1.5	60	0.00895	0.00138	85%	-	-	-	-
Front End Loader	-	-	D	14				6.4	1.5	30	0.00448	0.00069	85%	-	-	-	-
Concrete Grinder	-	-	E	10					1.9	40	0.18240	0.03040	78%	-	-	-	-
Screener (coarse)	-	-	F	18					1.9	40	0.66120	0.04560	92%	-	-	-	-
PHASE 2																	
Bulldozer (tracked)	-	-	A	14	14						0.97650	0.46083	85%	-	-	-	-
Bulldozer (wheeled)	-	-	A	14	14						0.73238	0.34562	85%	-	-	-	-
Scraper (dumper)	-	-	B+C	14		3	5			30	3.92192	0.33705	85%	-	-	-	-
Dump Truck/ADT	-	-	B	14		6				30	0.07623	0.00351	85%	-	-	-	-
Clamshell Derrick	-	-	B	14		9				30	0.10124	0.00549	85%	-	-	-	-
Dragline (small)	-	-	B	14		12				60	0.24766	0.01506	85%	-	-	-	-
Motor Grader	-	-	C	14			4				1.98400	0.15360	85%	-	-	-	-
Tractor/Offroad Forklift	-	-	C	14			3				0.83700	0.05612	85%	-	-	-	-
Compactor/Roller	-	-	C	14			2				0.24800	0.01358	85%	-	-	-	-
Crane (tracked)	-	-	C	14			1				0.03100	0.00120	85%	-	-	-	-
Backhoe/Skip Loader	9	270	D	14				6.4	1.5	20	0.00298	0.00046	85%	0.0	0.0	0.1	0.0
Bobcat/Skid Steer Loader	9	540	D	14				6.4	1.5	10	0.00149	0.00023	85%	0.0	0.0	0.1	0.0
Drill Auger/Borer	9	270	D	14				6.4	1.5	10	0.00149	0.00023	85%	0.0	0.0	0.1	0.0
Hydraulic Excavator	-	-	D	14				6.4	1.5	60	0.00895	0.00138	85%	-	-	-	-
Front End Loader	-	-	D	14				6.4	1.5	30	0.00448	0.00069	85%	-	-	-	-
Concrete Grinder	-	-	E	10					1.9	40	0.18240	0.03040	78%	-	-	-	-
Screener (coarse)	-	-	F	18					1.9	40	0.66120	0.04560	92%	-	-	-	-

Table C.13 Estimated Offroad Fugitive Dust Emissions

Earthmoving	Activity		Required Variables								Uncontrolled		Controlled Emissions				
	Pk. Daily	Project	EET	Moist (M)	Silt (s)	Drop (d)	Speed (S)	Wind (U)	Den (D)	Rate (V)	PM_{10}	$PM_{2.5}$	Control	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
	hours	hours	code	percent	percent	feet	mph	mph	ton/cy	cy/hr	lb/hr	lb/hr	%	lb/day	lb/day	lbs	lbs
PHASE 3																	
Bulldozer (tracked)	-	-	A	14	14						0.97650	0.46083	85%	-	-	-	-
Bulldozer (wheeled)	-	-	A	14	14						0.73238	0.34562	85%	-	-	-	-
Scraper (dumper)	-	-	B+C	14		3	5			30	3.92192	0.33705	85%	-	-	-	-
Dump Truck/ADT	-	-	B	14		6				30	0.07623	0.00351	85%	-	-	-	-
Clamshell Derrick	-	-	B	14		9				30	0.10124	0.00549	85%	-	-	-	-
Dragline (small)	-	-	B	14		12				60	0.24766	0.01506	85%	-	-	-	-
Motor Grader	-	-	C	14			4				1.98400	0.15360	85%	-	-	-	-
Tractor/Offroad Forklift	8	1,200	C	14			3				0.83700	0.05612	85%	1.0	0.1	150.7	10.1
Compactor/Roller	-	-	C	14			2				0.24800	0.01358	85%	-	-	-	-
Crane (tracked)	-	-	C	14			1				0.03100	0.00120	85%	-	-	-	-
Backhoe/Skip Loader	20	1,480	D	14				6.4	1.5	20	0.00298	0.00046	85%	0.0	0.0	0.7	0.1
Bobcat/Skid Steer Loader	2	120	D	14				6.4	1.5	10	0.00149	0.00023	85%	0.0	0.0	0.0	0.0
Drill Auger/Borer	-	-	D	14				6.4	1.5	10	0.00149	0.00023	85%	-	-	-	-
Hydraulic Excavator	6	720	D	14				6.4	1.5	10	0.00149	0.00023	85%	0.0	0.0	0.2	0.0
Front End Loader	-	-	D	14				6.4	1.5	30	0.00448	0.00069	85%	-	-	-	-
Concrete Grinder	-	-	E	10					1.9	40	0.18240	0.03040	78%	-	-	-	-
Screener (coarse)	-	-	F	18					1.9	40	0.66120	0.04560	92%	-	-	-	-
PHASE 4																	
Bulldozer (tracked)	-	-	A	14	14						0.97650	0.46083	85%	-	-	-	-
Bulldozer (wheeled)	-	-	A	14	14						0.73238	0.34562	85%	-	-	-	-
Scraper (dumper)	-	-	B+C	14		3	5			30	3.92192	0.33705	85%	-	-	-	-
Dump Truck/ADT	-	-	B	14		6				30	0.07623	0.00351	85%	-	-	-	-
Clamshell Derrick	-	-	B	14		9				30	0.10124	0.00549	85%	-	-	-	-
Dragline (small)	-	-	B	14		12				60	0.24766	0.01506	85%	-	-	-	-
Motor Grader	-	-	C	14			4				1.98400	0.15360	85%	-	-	-	-
Tractor/Offroad Forklift	9	45	C	14			3				0.83700	0.05612	85%	1.1	0.1	5.6	0.4
Compactor/Roller	-	-	C	14			2				0.24800	0.01358	85%	-	-	-	-
Crane (tracked)	-	-	C	14			1				0.03100	0.00120	85%	-	-	-	-
Backhoe/Skip Loader	9	108	D	14				6.4	1.5	20	0.00298	0.00046	85%	0.0	0.0	0.0	0.0
Bobcat/Skid Steer Loader	-	-	D	14				6.4	1.5	10	0.00149	0.00023	85%	-	-	-	-
Drill Auger/Borer	6	180	D	14				6.4	1.5	10	0.00149	0.00023	85%	0.0	0.0	0.0	0.0
Hydraulic Excavator	-	-	D	14				6.4	1.5	60	0.00895	0.00138	85%	-	-	-	-
Front End Loader	-	-	D	14				6.4	1.5	30	0.00448	0.00069	85%	-	-	-	-
Concrete Grinder	-	-	E	10					1.9	40	0.18240	0.03040	78%	-	-	-	-
Screener (coarse)	-	-	F	18					1.9	40	0.66120	0.04560	92%	-	-	-	-

Table C.13 Estimated Offroad Fugitive Dust Emissions

Earthmoving	Activity		Required Variables								Uncontrolled		Controlled Emissions				
	Pk. Daily	Project	EET	Moist (M)	Silt (s)	Drop (d)	Speed (S)	Wind (U)	Den (D)	Rate (V)	PM_{10}	$PM_{2.5}$	Control	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
	hours	hours	code	percent	percent	feet	mph	mph	ton/cy	cy/hr	lb/hr	lb/hr	%	lb/day	lb/day	lbs	lbs
PHASE 5																	
Bulldozer (tracked)	-	-	A	14	14						0.97650	0.46083	85%	-	-	-	-
Bulldozer (wheeled)	-	-	A	14	14						0.73238	0.34562	85%	-	-	-	-
Scraper (dumper)	-	-	B+C	14		3	5			30	3.92192	0.33705	85%	-	-	-	-
Dump Truck/ADT	-	-	B	14		6				30	0.07623	0.00351	85%	-	-	-	-
Clamshell Derrick	-	-	B	14		9				30	0.10124	0.00549	85%	-	-	-	-
Dragline (small)	-	-	B	14		12				60	0.24766	0.01506	85%	-	-	-	-
Motor Grader	-	-	C	14			4				1.98400	0.15360	85%	-	-	-	-
Tractor/Offroad Forklift	18	2,160	C	14			3				0.83700	0.05612	85%	2.3	0.2	271.2	18.2
Compactor/Roller	-	-	C	14			2				0.24800	0.01358	85%	-	-	-	-
Crane (tracked)	9	90	C	14			1				0.03100	0.00120	85%	0.0	0.0	0.4	0.0
Backhoe/Skip Loader	-	-	D	14				6.4	1.5	20	0.00298	0.00046	85%	-	-	-	-
Bobcat/Skid Steer Loader	-	-	D	14				6.4	1.5	10	0.00149	0.00023	85%	-	-	-	-
Drill Auger/Borer	-	-	D	14				6.4	1.5	10	0.00149	0.00023	85%	-	-	-	-
Hydraulic Excavator	18	360	D	14				6.4	1.5	60	0.00895	0.00138	85%	0.0	0.0	0.5	0.1
Front End Loader	-	-	D	14				6.4	1.5	30	0.00448	0.00069	85%	-	-	-	-
Concrete Grinder	-	-	E	10					1.9	40	0.18240	0.03040	78%	-	-	-	-
Screener (coarse)	-	-	F	18					1.9	40	0.66120	0.04560	92%	-	-	-	-
CHECKSUMS	177	8263	8440														

Onsite Equipment	lbs/day	lbs/day	tons	tons
PHASE 1	10.9	1.9	0.09	0.02
PHASE 2	0.0	0.0	0.00	0.00
PHASE 3	1.0	0.1	0.08	0.01
PHASE 4	1.1	0.1	0.00	0.00
PHASE 5	2.3	0.2	0.14	0.01

Table C.13 Estimated Offroad Fugitive Dust Emissions

Earthmoving	Activity		Required Variables								Uncontrolled		Controlled Emissions				
	Pk. Daily	Project	EET	Moist (M)	Silt (s)	Drop (d)	Speed (S)	Wind (U)	Den (D)	Rate (V)	PM_{10}	$PM_{2.5}$	Control	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
	hours	hours	code	percent	percent	feet	mph	mph	ton/cy	cy/hr	lb/hr	lb/hr	%	lb/day	lb/day	lbs	lbs
Construction Earthmoving	**Activity**		**Required Variables**								**Uncontrolled**		**Controlled Emissions**				
	Pk. Daily	Project	EET	Moist (M)	Silt (s)	Drop (d)	Speed (S)	Wind (U)	Den (D)	Rate (V)	PM_{10}	$PM_{2.5}$	Control	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
	hours	hours	code	percent	percent	feet	mph	mph	ton/cy	cy/hr	lb/hr	lb/hr	%	lb/day	lb/day	lbs	lbs
Bulldozer (tracked)			A	7	9						1.32827	0.66775	56%	-	-	-	-
Bulldozer (wheeled)			A	7	9						0.99621	0.50081	56%	-	-	-	-
Scraper (dumper)			B+C	7		3	5			30	3.93277	0.33743	56%	-	-	-	-
Dump Truck/ADT			B	7		6				30	0.09385	0.00432	56%	-	-	-	-
Clamshell Derrick			B	7		9				30	0.12465	0.00675	56%	-	-	-	-
Dragline (small)			B	7		12				60	0.30491	0.01854	56%	-	-	-	-
Motor Grader			C	7			4				1.98400	0.15360	56%	-	-	-	-
Tractor/Offroad Forklift			C	7			3				0.83700	0.05612	56%	-	-	-	-
Compactor/Roller			C	7			2				0.24800	0.01358	56%	-	-	-	-
Crane (tracked)			C	7			1				0.03100	0.00120	56%	-	-	-	-
Backhoe/Skip Loader			D	7				7.0	1.5	20	0.00885	0.00137	56%	-	-	-	-
Bobcat/Skid Steer Loader			D	7				7.0	1.5	10	0.00442	0.00068	56%	-	-	-	-
Drill Auger/Borer			D	7				7.0	1.5	10	0.00442	0.00068	56%	-	-	-	-
Hydraulic Excavator			D	7				7.0	1.5	60	0.02654	0.00410	56%	-	-	-	-
Front End Loader			D	7				7.0	1.5	30	0.01327	0.00205	56%	-	-	-	-
Concrete Grinder			E	10					1.9	40	0.18240	0.03040	78%	-	-	-	-
Screener (coarse)			F	18					1.9	40	0.66120	0.04560	92%	-	-	-	-

EET Code A

AP-42 Chapter 11.9 for bulldozer, tractor dozer (Tables 11.9-1):

$E = 0.75 * 1.0 * (s)^{1.5} / (M)^{1.4}$ for PM_{10}

$E = 0.105 * 5.7 * (s)^{1.2} / (M)^{1.3}$ for $PM_{2.5}$

Simplifies to $E = 0.75 * (s)^{1.5} / (M)^{1.4}$ for PM_{10}

Simplifies to $E = 0.60 * (s)^{1.2} / (M)^{1.3}$ for $PM_{2.5}$

E = lb/hr fugitive

s = silt content, percent

M = moisture content, percent

EET Code B

AP-42 Chapter 11.9 for small dragline, clamshell, dumping, scraper (Table 11.9-1):

$E = 0.75 * 0.0021 * (d)^{0.7} / (M)^{0.3}$ for PM_{10}

$E = 0.017 * 0.0021 * (d)^{1.1} / (M)^{0.3}$ for $PM_{2.5}$

Simplifies to $E = 1.6e\text{-}3 * (d)^{0.7} / (M)^{0.3}$ for PM_{10}

Simplifies to $E = 3.6e\text{-}5 * (d)^{1.1} / (M)^{0.3}$ for $PM_{2.5}$

E = lb/cy * cy/hr = lb/hr fugitive

M = moisture content, percent

d = drop distance = 12 feet (small dragline)

d = drop distance = 9 feet (clamshell)

d = drop distance = 6 feet (dump truck/ADT)

d = drop distance = 3 feet (scraper)

Table C.13 Estimated Offroad Fugitive Dust Emissions

Earthmoving	Activity		Required Variables								Uncontrolled		Controlled Emissions				
	Pk. Daily	Project	EET	Moist (M)	Silt (s)	Drop (d)	Speed (S)	Wind (U)	Den (D)	Rate (V)	PM_{10}	$PM_{2.5}$	Control	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
	hours	hours	code	percent	percent	feet	mph	mph	ton/cy	cy/hr	lb/hr	lb/hr	%	lb/day	lb/day	lbs	lbs

EET Code C

AP-42 Chapter 11.9 for scraper, grader, tractor, compactor, crane (Table 11.9-1) :

$E = S * 0.60 * 0.051 \times (S)^{2.0}$ for PM_{10}

$E = S * 0.031 * 0.040 \times (S)^{2.5}$ for $PM_{2.5}$

Simplifies to $E = 0.031 \times (S)^{3.0}$ for PM_{10}

Simplifies to $E = 0.0012 \times (S)^{3.5}$ for $PM_{2.5}$

E = lb/VMT * VMT/hr = lb/hr fugitive

S = Mean Vehicle Speed = 5 mph (scrapers)

S = Mean Vehicle Speed = 4 mph (graders)

S = Mean Vehicle Speed = 3 mph (tractors)

S = Mean Vehicle Speed = 2 mph (compactors)

S = Mean Vehicle Speed = 1 mph (cranes)

EET Code D

AP-42 Chapter 13.2.4 Loading/Handling (backhoe, Bobcat, drill auger, excavator, backhoe, front end loader):

$E = V * D * 0.35 * 0.0032 * (U/5)^{1.3} / (M/2)^{1.4}$ for PM_{10}

$E = V * D * 0.053 * 0.0032 * (U/5)^{1.3} / (M/2)^{1.4}$ for $PM_{2.5}$

Simplifies to $E = V * D * 1.1e\text{-}3 * (U/5)^{1.3} / (M/2)^{1.4}$ for PM_{10}

Simplifies to $E = V * D * 1.7e\text{-}4 * (U/5)^{1.3} / (M/2)^{1.4}$ for $PM_{2.5}$

V = cy/hr

M = moisture content, percent

E = lb/ton * tons/cy * cy/hr = lb/hr fugitive

D = 1.3 tons/cy for sand or cinder concrete

D = 1.5 tons/cy for soil (typical)

D = 1.9 tons/cy for sandstone or stone concrete

D = 2.1 tons/cy for granite rock

U = wind speed = 1 m/s or 2.2 mi/hr (light air)

U = wind speed = 2 m/s or 4.5 mi/hr (light breeze)

U = wind speed = 3 m/s or 6.7 mi/hr (light breeze)

U = wind speed = 4 m/s or 8.9 mi/hr (gentle breeze)

U = wind speed = 5 m/s or 11.2 mi/hr (gentle breeze)

U = wind speed = 6 m/s or 13.4 mi/hr (moderate breeze)

U = wind speed = 7 m/s or 15.7 mi/hr (moderate breeze)

Table C.13 Estimated Offroad Fugitive Dust Emissions

Earthmoving	Activity		Required Variables								Uncontrolled		Controlled Emissions				
	Pk. Daily	Project	EET	Moist (M)	Silt (s)	Drop (d)	Speed (S)	Wind (U)	Den (D)	Rate (V)	PM_{10}	$PM_{2.5}$	Control	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
	hours	hours	code	percent	percent	feet	mph	mph	ton/cy	cy/hr	lb/hr	lb/hr	%	lb/day	lb/day	lbs	lbs

EET Code E

AP-42 Chapter 11.19.2 Coarse Tertiary Crushing

E = 0.0024 lb/ton uncontrolled PM_{10}

E = 0.0004 lb/ton uncontrolled $PM_{2.5}$

E = D * V * 0.0024 lb/hr uncontrolled PM10

E = D * V* 0.0004 lb/hr uncontrolled PM2.5

V = cy/hr

E = lb/ton * tons/cy * cy/hr = lb/hr fugitive

D = 1.3 tons/cy for sand or cinder concrete

D = 1.9 tons/cy for sandstone or stone concrete

D = 2.1 tons/cy for granite rock

Control efficiency = 78% where applicable (water spray)

EET Code F

AP-42 Chapter 11.19.2 Coarse Screening

E = 0.0087 lb/ton uncontrolled PM_{10}

E = 0.0006 lb/ton uncontrolled $PM_{2.5}$

E = D * V * 0.0087 lb/hr uncontrolled PM10

E = D * V * 0.0006 lb/hr uncontrolled PM2.5

V = cy/hr

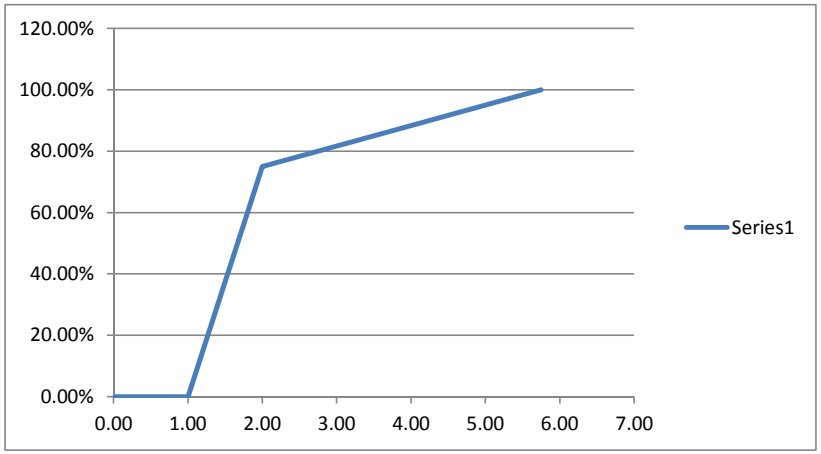
E = lb/ton * tons/cy * cy/hr = lb/hr fugitive

D = 1.3 tons/cy for sand or cinder concrete

D = 1.9 tons/cy for sandstone or stone concrete

D = 2.1 tons/cy for granite rock

Control efficiency = 92% where applicable (water spray)



AP-42 Figure 13.2.2-2		
Moisture (M)		Control
percent	ratio	%
0	0.00	0.00%
1	0.25	0.00%
2	0.50	0.00%
3	0.75	0.00%
4	1.00	0.00%
5	1.25	18.75%
6	1.50	37.50%
7	1.75	56.25%
8	2.00	75.00%
9	2.25	76.67%
10	2.50	78.33%
11	2.75	80.00%
12	3.00	81.67%
13	3.25	83.33%
14	3.50	85.00%
15	3.75	86.67%
16	4.00	88.34%
17	4.25	90.00%
18	4.50	91.67%
19	4.75	93.34%
20	5.00	95.00%
21	5.25	96.67%
22	5.50	98.34%
23	5.75	100.00%

AP-42	Silt Content, percent			Moisture Content, percent		
Table	lower	upper	g-mean	lower	upper	g-mean
11.9-3	3.8	15.1	6.9	2.2	16.8	7.9
11.9-3	7.2	25.2	16.4	0.2	16.3	3.2
11.9-3	1.2	19.2	4.3	0.3	20.1	2.4
13.2.2-1	2.4	16.0	10.0			
13.2.2-1	5.0	15.0	8.3			
13.2.2-1	2.8	18.0	8.4			
13.2.2-1	0.6	23.0	8.5			
13.2.2-1	2.2	21.0	6.4			
13.2.4-1	3.8	15.0	7.5	2.8	20.0	6.9
13.2.4-1	5.1	21.0	15.0	0.8	6.4	3.4
13.2.4-1	5.0	16.0	9.0	8.9	16.0	12.0
13.2.4-1	4.5	7.4	6.0	8.9	11.0	10.0
Averages (rounded)	4	18	9	3	15	7
EET application as:	coarse	fine	typical	dry	moist	typical

Table C.14 Estimated Onroad Fugitive Dust Emissions

All Roads Travelled	Vehicle Category	Activity		Usage	
		Pk. Daily	Project	Unpaved	Paved
		VMT	VMT	%	%
PHASE 1					
Tractor Trailer (materials/hauling)	onroad HHD	0	0	0%	100%
Tractor Trailer (equipment/supplies)	onroad HHD	200	4000	1%	99%
Cement Truck (concrete/pumping)	onroad HHD	0	0	0%	100%
Dump Truck (soil/sand/gravel transport)	onroad HHD	0	0	0%	100%
Water Truck (dust control)	onroad HHD	10	600	90%	10%
Work Truck (all trades)	onroad MD	90	5400	1%	99%
Pickup/SUV (managers/engineers)	onroad LD	0	0	0%	100%
Pickup/SUV (supervisors/foremen)	onroad LD	0	0	0%	100%
Pickup/SUV (operators/drivers)	onroad LD	0	0	0%	100%
Pickup/SUV (tradesmen/laborers)	onroad LD	600	36000	1%	99%
PHASE 2					
Tractor Trailer (materials/hauling)	onroad HHD	20	600	1%	99%
Tractor Trailer (equipment/supplies)	onroad HHD	0	0	0%	100%
Cement Truck (concrete/pumping)	onroad HHD	20	600	1%	99%
Dump Truck (soil/sand/gravel transport)	onroad HHD	20	1200	10%	90%
Water Truck (dust control)	onroad HHD	10	600	90%	10%
Work Truck (all trades)	onroad MD	90	5400	1%	99%
Pickup/SUV (managers/engineers)	onroad LD	0	0	0%	100%
Pickup/SUV (supervisors/foremen)	onroad LD	0	0	0%	100%
Pickup/SUV (operators/drivers)	onroad LD	0	0	0%	100%
Pickup/SUV (tradesmen/laborers)	onroad LD	600	36000	1%	99%
PHASE 3					
Tractor Trailer (materials/hauling)	onroad HHD	1250	6250	1%	99%
Tractor Trailer (equipment/supplies)	onroad HHD	1150	5750	1%	99%
Cement Truck (concrete/pumping)	onroad HHD	0	0	0%	100%
Dump Truck (soil/sand/gravel transport)	onroad HHD	0	0	0%	100%
Water Truck (dust control)	onroad HHD	10	600	90%	10%
Work Truck (all trades)	onroad MD	200	13500	1%	99%
Pickup/SUV (managers/engineers)	onroad LD	0	0	0%	100%
Pickup/SUV (supervisors/foremen)	onroad LD	0	0	0%	100%
Pickup/SUV (operators/drivers)	onroad LD	0	0	0%	100%
Pickup/SUV (tradesmen/laborers)	onroad LD	1000	200000	1%	99%
PHASE 4					
Tractor Trailer (materials/hauling)	onroad HHD	20	120	1%	99%
Tractor Trailer (equipment/supplies)	onroad HHD	50	200	1%	99%
Cement Truck (concrete/pumping)	onroad HHD	0	0	0%	100%
Dump Truck (soil/sand/gravel transport)	onroad HHD	50	1500	10%	90%
Water Truck (dust control)	onroad HHD	10	450	90%	10%
Work Truck (all trades)	onroad MD	800	11350	1%	99%
Pickup/SUV (managers/engineers)	onroad LD	0	0	0%	100%
Pickup/SUV (supervisors/foremen)	onroad LD	0	0	0%	100%
Pickup/SUV (operators/drivers)	onroad LD	0	0	0%	100%
Pickup/SUV (tradesmen/laborers)	onroad LD	450	6750	1%	99%

PHASE 5					
Tractor Trailer (materials/hauling)	onroad HHD	1530	14360	1%	99%
Tractor Trailer (equipment/supplies)	onroad HHD	100	200	1%	99%
Cement Truck (concrete/pumping)	onroad HHD	0	0	0%	100%
Dump Truck (soil/sand/gravel transport)	onroad HHD	0	0	0%	100%
Water Truck (dust control)	onroad HHD	10	450	0%	100%
Work Truck (all trades)	onroad MD	0	0	0%	100%
Pickup/SUV (managers/engineers)	onroad LD	0	0	0%	100%
Pickup/SUV (supervisors/foremen)	onroad LD	0	0	0%	100%
Pickup/SUV (operators/drivers)	onroad LD	0	0	0%	100%
Pickup/SUV (tradesmen/laborers)	onroad LD	60	12000	1%	99%

Unpaved Road Dust	Vehicle Category	Activity		Required Variables						Uncontrolled		Controlled Emissions				
		Pk. Daily	Project	EET	Moist (M)	Silt (s)	Weight (W)	Speed (S)	Precip (P)	PM_{10}	$PM_{2.5}$	Control	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
		VMT	VMT	code	percent	percent	tons	mph	days/yr	lb/VMT	lb/VMT	%	lb/day	lb/day	lbs	lbs
PHASE 1																
Tractor Trailer (materials/hauling)	onroad HHD	-	-	G	14	14	30	20	50	2.86839	0.28668	85%	-	-	-	-
Tractor Trailer (equipment/supplies)	onroad HHD	2	40	G	14	14	30	50	50	3.12424	0.31227	85%	0.9	0.1	16.2	1.6
Cement Truck (concrete/pumping)	onroad HHD	-	-	G	14	14	30	20	50	2.86839	0.28668	85%	-	-	-	-
Dump Truck (soil/sand/gravel transport)	onroad HHD	-	-	G	14	14	30	20	50	2.86839	0.28668	85%	-	-	-	-
Water Truck (dust control)	onroad HHD	9	540	G	14	14	30	5	50	2.64826	0.26467	85%	3.6	0.4	185.1	18.5
Work Truck (all trades)	onroad MD	1	54	G	14	14	8	20	50	1.77970	0.17781	85%	0.2	0.0	12.4	1.2
Pickup/SUV (managers/engineers)	onroad LD	-	-	G	14	14	3	20	50	1.30164	0.13001	85%	-	-	-	-
Pickup/SUV (supervisors/foremen)	onroad LD	-	-	G	14	14	3	20	50	1.30164	0.13001	85%	-	-	-	-
Pickup/SUV (operators/drivers)	onroad LD	-	-	G	14	14	3	20	50	1.30164	0.13001	85%	-	-	-	-
Pickup/SUV (tradesmen/laborers)	onroad LD	6	360	G	14	14	3	20	50	1.30164	0.13001	85%	1.2	0.1	60.7	6.1
PHASE 2																
Tractor Trailer (materials/hauling)	onroad HHD	0	6	G	14	14	30	20	50	2.86839	0.28668	85%	0.1	0.0	2.2	0.2
Tractor Trailer (equipment/supplies)	onroad HHD	-	-	G	14	14	30	20	50	2.86839	0.28668	85%	-	-	-	-
Cement Truck (concrete/pumping)	onroad HHD	0	6	G	14	14	30	20	50	2.86839	0.28668	85%	0.1	0.0	2.2	0.2
Dump Truck (soil/sand/gravel transport)	onroad HHD	2	120	G	14	14	30	20	50	2.86839	0.28668	85%	0.9	0.1	44.6	4.5
Water Truck (dust control)	onroad HHD	9	540	G	14	14	30	5	50	2.64826	0.26467	85%	3.6	0.4	185.1	18.5
Work Truck (all trades)	onroad MD	1	54	G	14	14	8	20	50	1.77970	0.17781	85%	0.2	0.0	12.4	1.2
Pickup/SUV (managers/engineers)	onroad LD	-	-	G	14	14	3	20	50	1.30164	0.13001	85%	-	-	-	-
Pickup/SUV (supervisors/foremen)	onroad LD	-	-	G	14	14	3	20	50	1.30164	0.13001	85%	-	-	-	-
Pickup/SUV (operators/drivers)	onroad LD	-	-	G	14	14	3	20	50	1.30164	0.13001	85%	-	-	-	-
Pickup/SUV (tradesmen/laborers)	onroad LD	6	360	G	14	14	3	20	50	1.30164	0.13001	85%	1.2	0.1	60.7	6.1
PHASE 3																
Tractor Trailer (materials/hauling)	onroad HHD	13	63	G	14	14	30	20	50	2.86839	0.28668	85%	5.4	0.5	23.2	2.3
Tractor Trailer (equipment/supplies)	onroad HHD	12	58	G	14	14	30	20	50	2.86839	0.28668	85%	4.9	0.5	21.4	2.1
Cement Truck (concrete/pumping)	onroad HHD	-	-	G	14	14	30	20	50	2.86839	0.28668	85%	-	-	-	-
Dump Truck (soil/sand/gravel transport)	onroad HHD	-	-	G	14	14	30	20	50	2.86839	0.28668	85%	-	-	-	-
Water Truck (dust control)	onroad HHD	9	540	G	14	14	30	5	50	2.64826	0.26467	85%	3.6	0.4	185.1	18.5
Work Truck (all trades)	onroad MD	2	135	G	14	14	8	20	50	1.77970	0.17781	85%	0.5	0.1	31.1	3.1
Pickup/SUV (managers/engineers)	onroad LD	-	-	G	14	14	3	20	50	1.30164	0.13001	85%	-	-	-	-
Pickup/SUV (supervisors/foremen)	onroad LD	-	-	G	14	14	3	20	50	1.30164	0.13001	85%	-	-	-	-
Pickup/SUV (operators/drivers)	onroad LD	-	-	G	14	14	3	20	50	1.30164	0.13001	85%	-	-	-	-
Pickup/SUV (tradesmen/laborers)	onroad LD	10	2,000	G	14	14	3	20	50	1.30164	0.13001	85%	2.0	0.2	337.0	33.7
PHASE 4																
Tractor Trailer (materials/hauling)	onroad HHD	0	1	G	14	14	30	20	50	2.86839	0.28668	85%	0.1	0.0	0.4	0.0
Tractor Trailer (equipment/supplies)	onroad HHD	1	2	G	14	14	30	20	50	2.86839	0.28668	85%	0.2	0.0	0.7	0.1
Cement Truck (concrete/pumping)	onroad HHD	-	-	G	14	14	30	20	50	2.86839	0.28668	85%	-	-	-	-
Dump Truck (soil/sand/gravel transport)	onroad HHD	5	150	G	14	14	30	20	50	2.86839	0.28668	85%	2.2	0.2	55.7	5.6
Water Truck (dust control)	onroad HHD	9	405	G	14	14	30	5	50	2.64826	0.26467	85%	3.6	0.4	138.8	13.9
Work Truck (all trades)	onroad MD	8	114	G	14	14	8	20	50	1.77970	0.17781	85%	2.1	0.2	26.1	2.6
Pickup/SUV (managers/engineers)	onroad LD	-	-	G	14	14	3	20	50	1.30164	0.13001	85%	-	-	-	-
Pickup/SUV (supervisors/foremen)	onroad LD	-	-	G	14	14	3	20	50	1.30164	0.13001	85%	-	-	-	-
Pickup/SUV (operators/drivers)	onroad LD	-	-	G	14	14	3	20	50	1.30164	0.13001	85%	-	-	-	-
Pickup/SUV (tradesmen/laborers)	onroad LD	5	68	G	14	14	3	20	50	1.30164	0.13001	85%	0.9	0.1	11.4	1.1

PHASE 5																
Tractor Trailer (materials/hauling)	onroad HHD	15	144	G	14	14	30	20	50	2.86839	0.28668	85%	6.6	0.7	53.3	5.3
Tractor Trailer (equipment/supplies)	onroad HHD	1	2	G	14	14	30	20	50	2.86839	0.28668	85%	0.4	0.0	0.7	0.1
Cement Truck (concrete/pumping)	onroad HHD	-	-	G	14	14	30	20	50	2.86839	0.28668	85%	-	-	-	-
Dump Truck (soil/sand/gravel transport)	onroad HHD	-	-	G	14	14	30	20	50	2.86839	0.28668	85%	-	-	-	-
Water Truck (dust control)	onroad HHD	-	-	G	14	14	30	5	50	2.64826	0.26467	85%	-	-	-	-
Work Truck (all trades)	onroad MD	-	-	G	14	14	8	20	50	1.77970	0.17781	85%	-	-	-	-
Pickup/SUV (managers/engineers)	onroad LD	-	-	G	14	14	3	20	50	1.30164	0.13001	85%	-	-	-	-
Pickup/SUV (supervisors/foremen)	onroad LD	-	-	G	14	14	3	20	50	1.30164	0.13001	85%	-	-	-	-
Pickup/SUV (operators/drivers)	onroad LD	-	-	G	14	14	3	20	50	1.30164	0.13001	85%	-	-	-	-
Pickup/SUV (tradesmen/laborers)	onroad LD	1	120	G	14	14	3	20	50	1.30164	0.13001	85%	0.1	0.0	20.2	2.0

Special Note: Daily maximums do not include importing equipment from other areas in state (local emissions only)

Unpaved Roads	lbs/day	lbs/day	tons	tons
PHASE 1	**5.0**	**0.5**	**0.14**	**0.01**
PHASE 2	**6.0**	**0.6**	**0.15**	**0.02**
PHASE 3	**11.4**	**1.1**	**0.30**	**0.03**
PHASE 4	**8.8**	**0.9**	**0.12**	**0.01**
PHASE 5	**6.7**	**0.7**	**0.04**	**0.00**

Paved Road Dust	Vehicle Category	Activity		Required Variables						Uncontrolled		Controlled Emissions				
		Pk. Daily	Project	EET	Moist (M)	Silt (sL)	Weight (W)	Speed (S)	Precip (P)	PM_{10}	$PM_{2.5}$	Control	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
		VMT	VMT	code	percent	g/m^2	tons	mph	days/yr	lb/VMT	lb/VMT	%	lb/day	lb/day	lbs	lbs
PHASE 1																
Tractor Trailer (materials/hauling)	onroad HHD	-	-	H	--	0.4	30	--	50	0.03069	0.00753	--	-	-	-	-
Tractor Trailer (equipment/supplies)	onroad HHD	198	3,960	H	--	0.015	30	--	50	0.00155	0.00038	--	0.3	0.1	5.9	1.5
Cement Truck (concrete/pumping)	onroad HHD	-	-	H	--	0.4	30	--	50	0.03069	0.00753	--	-	-	-	-
Dump Truck (soil/sand/gravel transport)	onroad HHD	-	-	H	--	0.4	30	--	50	0.03069	0.00753	--	-	-	-	-
Water Truck (dust control)	onroad HHD	1	60	H	--	0.4	30	--	50	0.03069	0.00753	--	0.0	0.0	1.8	0.4
Work Truck (all trades)	onroad MD	89	5,346	H	--	0.4	8	--	50	0.00797	0.00196	--	0.7	0.2	41.1	10.1
Pickup/SUV (managers/engineers)	onroad LD	-	-	H	--	0.4	3	--	50	0.00293	0.00072	--	-	-	-	-
Pickup/SUV (supervisors/foremen)	onroad LD	-	-	H	--	0.4	3	--	50	0.00293	0.00072	--	-	-	-	-
Pickup/SUV (operators/drivers)	onroad LD	-	-	H	--	0.4	3	--	50	0.00293	0.00072	--	-	-	-	-
Pickup/SUV (tradesmen/laborers)	onroad LD	594	35,640	H	--	0.4	3	--	50	0.00293	0.00072	--	1.7	0.4	100.9	24.8
PHASE 2																
Tractor Trailer (materials/hauling)	onroad HHD	20	594	H	--	0.4	30	--	50	0.03069	0.00753	--	0.6	0.1	17.6	4.3
Tractor Trailer (equipment/supplies)	onroad HHD	-	-	H	--	0.015	30	--	50	0.00155	0.00038	--	-	-	-	-
Cement Truck (concrete/pumping)	onroad HHD	20	594	H	--	0.4	30	--	50	0.03069	0.00753	--	0.6	0.1	17.6	4.3
Dump Truck (soil/sand/gravel transport)	onroad HHD	18	1,080	H	--	0.4	30	--	50	0.03069	0.00753	--	0.6	0.1	32.0	7.9
Water Truck (dust control)	onroad HHD	1	60	H	--	0.4	30	--	50	0.03069	0.00753	--	0.0	0.0	1.8	0.4
Work Truck (all trades)	onroad MD	89	5,346	H	--	0.4	8	--	50	0.00797	0.00196	--	0.7	0.2	41.1	10.1
Pickup/SUV (managers/engineers)	onroad LD	-	-	H	--	0.4	3	--	50	0.00293	0.00072	--	-	-	-	-
Pickup/SUV (supervisors/foremen)	onroad LD	-	-	H	--	0.4	3	--	50	0.00293	0.00072	--	-	-	-	-
Pickup/SUV (operators/drivers)	onroad LD	-	-	H	--	0.4	3	--	50	0.00293	0.00072	--	-	-	-	-
Pickup/SUV (tradesmen/laborers)	onroad LD	594	35,640	H	--	0.4	3	--	50	0.00293	0.00072	--	1.7	0.4	100.9	24.8
PHASE 3																
Tractor Trailer (materials/hauling)	onroad HHD	1,238	6,188	H	--	0.4	30	--	50	0.03069	0.00753	--	38.0	9.3	183.4	45.0
Tractor Trailer (equipment/supplies)	onroad HHD	1,139	5,693	H	--	0.015	30	--	50	0.00155	0.00038	--	1.8	0.4	8.5	2.1
Cement Truck (concrete/pumping)	onroad HHD	-	-	H	--	0.4	30	--	50	0.03069	0.00753	--	-	-	-	-
Dump Truck (soil/sand/gravel transport)	onroad HHD	-	-	H	--	0.4	30	--	50	0.03069	0.00753	--	-	-	-	-
Water Truck (dust control)	onroad HHD	1	60	H	--	0.4	30	--	50	0.03069	0.00753	--	0.0	0.0	1.8	0.4
Work Truck (all trades)	onroad MD	198	13,365	H	--	0.4	8	--	50	0.00797	0.00196	--	1.6	0.4	102.9	25.2
Pickup/SUV (managers/engineers)	onroad LD	-	-	H	--	0.4	3	--	50	0.00293	0.00072	--	-	-	-	-
Pickup/SUV (supervisors/foremen)	onroad LD	-	-	H	--	0.4	3	--	50	0.00293	0.00072	--	-	-	-	-
Pickup/SUV (operators/drivers)	onroad LD	-	-	H	--	0.4	3	--	50	0.00293	0.00072	--	-	-	-	-
Pickup/SUV (tradesmen/laborers)	onroad LD	990	198,000	H	--	0.4	3	--	50	0.00293	0.00072	--	2.9	0.7	560.4	137.6

PHASE 4																
Tractor Trailer (materials/hauling)	onroad HHD	20	119	H	--	0.4	30	--	50	0.03069	0.00753	--	0.6	0.1	3.5	0.9
Tractor Trailer (equipment/supplies)	onroad HHD	50	198	H	--	0.015	30	--	50	0.00155	0.00038	--	0.1	0.0	0.3	0.1
Cement Truck (concrete/pumping)	onroad HHD	-	-	H	--	0.4	30	--	50	0.03069	0.00753	--	-	-	-	-
Dump Truck (soil/sand/gravel transport)	onroad HHD	45	1,350	H	--	0.4	30	--	50	0.03069	0.00753	--	1.4	0.3	40.0	9.8
Water Truck (dust control)	onroad HHD	1	45	H	--	0.4	30	--	50	0.03069	0.00753	--	0.0	0.0	1.3	0.3
Work Truck (all trades)	onroad MD	792	11,237	H	--	0.4	8	--	50	0.00797	0.00196	--	6.3	1.5	86.5	21.2
Pickup/SUV (managers/engineers)	onroad LD	-	-	H	--	0.4	3	--	50	0.00293	0.00072	--	-	-	-	-
Pickup/SUV (supervisors/foremen)	onroad LD	-	-	H	--	0.4	3	--	50	0.00293	0.00072	--	-	-	-	-
Pickup/SUV (operators/drivers)	onroad LD	-	-	H	--	0.4	3	--	50	0.00293	0.00072	--	-	-	-	-
Pickup/SUV (tradesmen/laborers)	onroad LD	446	6,683	H	--	0.4	3	--	50	0.00293	0.00072	--	1.3	0.3	18.9	4.6
PHASE 5																
Tractor Trailer (materials/hauling)	onroad HHD	1,515	14,216	H	--	0.4	30	--	50	0.03069	0.00753	--	46.5	11.4	421.3	103.4
Tractor Trailer (equipment/supplies)	onroad HHD	99	198	H	--	0.015	30	--	50	0.00155	0.00038	--	0.2	0.0	0.3	0.1
Cement Truck (concrete/pumping)	onroad HHD	-	-	H	--	0.4	30	--	50	0.03069	0.00753	--	-	-	-	-
Dump Truck (soil/sand/gravel transport)	onroad HHD	-	-	H	--	0.4	30	--	50	0.03069	0.00753	--	-	-	-	-
Water Truck (dust control)	onroad HHD	10	450	H	--	0.4	30	--	50	0.03069	0.00753	--	0.3	0.1	13.3	3.3
Work Truck (all trades)	onroad MD	-	-	H	--	0.4	8	--	50	0.00797	0.00196	--	-	-	-	-
Pickup/SUV (managers/engineers)	onroad LD	-	-	H	--	0.4	3	--	50	0.00293	0.00072	--	-	-	-	-
Pickup/SUV (supervisors/foremen)	onroad LD	-	-	H	--	0.4	3	--	50	0.00293	0.00072	--	-	-	-	-
Pickup/SUV (operators/drivers)	onroad LD	-	-	H	--	0.4	3	--	50	0.00293	0.00072	--	-	-	-	-
Pickup/SUV (tradesmen/laborers)	onroad LD	59	11,880	H	--	0.4	3	--	50	0.00293	0.00072	--	0.2	0.0	33.6	8.3

Special Note: Daily maximums do not include importing equipment from other areas in state (local emissions only)

Paved Roads	lbs/day	lbs/day	tons	tons
PHASE 1	**2.5**	**0.6**	**0.07**	**0.02**
PHASE 2	**4.2**	**1.0**	**0.11**	**0.03**
PHASE 3	**42.5**	**10.4**	**0.43**	**0.11**
PHASE 4	**9.6**	**2.4**	**0.08**	**0.02**
PHASE 5	**47.0**	**11.5**	**0.23**	**0.06**

EET Code G

Unpaved Road Dust (AP-42 Section 13.2.2):

$E = [1.5 * (s/12)^{0.9} * (W/3)^{0.45}] * P_C * (1\text{-}CE)$ for PM_{10}

$E = [1.8 * (s/12)^{1.0} * (S/30)^{0.5} / (M/0.5)^{0.2} - 0.00047] * P_C * (1\text{-}CE)$ for PM_{10}

$E = [0.15 * (s/12)^{0.9} * (W/3)^{0.45}] * P_C * (1\text{-}CE)$ for $PM_{2.5}$

$E = [0.18 * (s/12)^{1.0} * (S/30)^{0.5} / (M/0.5)^{0.2} - 0.00036] * P_C * (1\text{-}CE)$ for $PM_{2.5}$

Equation pairs calculated for average factoring of both vehicle weight and speed

s = silt content, percent

W = average vehicle weight (see below)

M = moisture content, percent

S = mean vehicle speed = 5-10 mph for watering trucks

S = mean vehicle speed = 15 mph for haul roads (general mitigation measure)

S = mean vehicle speed = 20 mph for graded dirt/gravel roads

E = lb/VMT fugitive

$P_C = (365\text{-}P)/365$

P = Number of wet days over 0.01 in precipitation for averaging period (from AP-42 Figure 13.2.1-2)

Note: precipitation correction not used ($P_C = 1$) for worst case day calculations

CE = control efficiency for watering (moisture content)

Light Duty = 3 tons average (loaded)

Medium Duty = 8 tons average (loaded)

Heavy Heavy Duty = 30 tons average (loaded 40 tons, unloaded 20 tons)

Offroad+Unpaved+Paved	lbs/day	lbs/day	tons	tons
PHASE 1	**18.4**	**3.0**	**0.30**	**0.05**
PHASE 2	**10.3**	**1.6**	**0.26**	**0.04**
PHASE 3	**54.9**	**11.6**	**0.80**	**0.14**
PHASE 4	**19.6**	**3.3**	**0.19**	**0.03**
PHASE 5	**56.0**	**12.4**	**0.41**	**0.07**
PROJECT	**56.0**	**12.4**	**1.97**	**0.33**

EET Code H

Paved Road Dust (New AP-42 Section 13.2.1):

$E = 0.0022 * (sL)^{0.91} * (W)^{1.02} * P_C$ for PM_{10}

$E = 0.00054 * (sL)^{0.91} * (W)^{1.02} * P_C$ for $PM_{2.5}$

E = lb/VMT fugitive

sL = Silt Loading from Table 13.2.1-2

W = Average weight of vehicles in tons (below)

$P_C = (1-P/4N)$

P = Number of wet days over 0.01 in precipitation for averaging period (from AP-42 Figure 13.2.1-2)

N = days of period = 365 days (4N = 1460)

Note: precipitation correction not used ($P_C = 1$) for worst case day calculations

Light Duty = 3 tons average (loaded)

Medium Duty = 8 tons average (loaded)

Heavy Heavy Duty = 30 tons average (loaded 40 tons, unloaded 20 tons)

AP-42 Figure 13.2.1-2 (California)	
Values for Precipitation (P)	**days/yr**
Low Deserts	20
High Deserts & Inland SoCal	30
South/Central Coast/Valley & Mountains	40
Mid/Northern Central Valley	50
Bay & Delta Areas	60
Wine Country & Sierras	90
North Coast	120

AP-42 Table 13.2.1-2 (US)	
Values for Silt Loading (sL)	**g/m^3**
< 500 average daily traffic (ADT) count	0.6
500 - 5,000 ADT	0.2
5,000 - 10,000 ADT	0.06
> 10,000 ADT (surface streets)	0.03
> 10,000 ADT (limited access)	0.015
Average Rural	0.4
Average Mid-Range	0.13
Average Urban	0.023
Average for All Roads	0.18

AP-42 Figure 13.2.2-2		
Moisture (M)		**Control**
percent	**ratio**	**%**
0	0.00	0.00%
1	0.25	0.00%
2	0.50	0.00%
3	0.75	0.00%
4	1.00	0.00%
5	1.25	18.75%
6	1.50	37.50%
7	1.75	56.25%
8	2.00	75.00%
9	2.25	76.67%
10	2.50	78.33%
11	2.75	80.00%
12	3.00	81.67%
13	3.25	83.33%
14	3.50	85.00%
15	3.75	86.67%
16	4.00	88.34%
17	4.25	90.00%
18	4.50	91.67%
19	4.75	93.34%
20	5.00	95.00%
21	5.25	96.67%
22	5.50	98.34%
23	5.75	100.00%

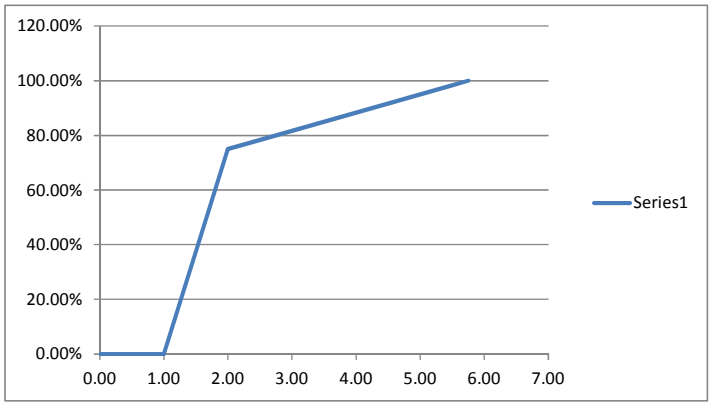


Table C-15 SCAB Fleet Average Emission Factors (Diesel)

Offroad 2013

Air Basin	SC

Extrapolation (down)
Interpolation
Extrapolation (up)

Equipment	MaxHP	(lb/hr) ROG	(lb/hr) CO	(lb/hr) NOX	(lb/hr) SOX	(lb/hr) PM10	(lb/hr) PM2.5	(lb/hr) CO2	(lb/hr) CH4	(lb/hr) N2O	(lb/hr) CO2 eqv
	10	0.0068	0.0352	0.0424	0.0001	0.0018	0.0015	5.8	0.0006	0.0003	5.9
Aerial Lifts	15	0.0101	0.0528	0.0637	0.0001	0.0027	0.0023	8.7	0.0009	0.0004	8.8
	25	0.0166	0.0503	0.0937	0.0001	0.0051	0.0043	11.0	0.0015	0.0007	11.2
	50	0.0592	0.1757	0.1840	0.0003	0.0156	0.0132	19.6	0.0053	0.0024	20.5
	64	0.0585	0.1891	0.2223	0.0003	0.0184	0.0157	23.3	0.0053	0.0023	24.1
	120	0.0558	0.2425	0.3758	0.0004	0.0299	0.0254	38.1	0.0050	0.0022	38.9
	500	0.1191	0.4671	1.5310	0.0021	0.0448	0.0381	212.9	0.0107	0.0048	214.6
	750	0.2221	0.8443	2.8534	0.0039	0.0825	0.0702	384.8	0.0200	0.0089	387.9
	800	0.2369	0.9006	3.0436	0.0041	0.0880	0.0748	410.4	0.0214	0.0095	413.8
Aerial Lifts Composite		0.0529	0.1925	0.3059	0.0004	0.0202	0.0172	34.7	0.0048	0.0021	35.5
Air Compressors	15	0.0122	0.0484	0.0732	0.0001	0.0048	0.0041	7.2	0.0011	0.0005	7.4
	25	0.0266	0.0744	0.1306	0.0002	0.0081	0.0069	14.4	0.0024	0.0011	14.8
	50	0.0921	0.2546	0.2221	0.0003	0.0220	0.0187	22.3	0.0083	0.0037	23.6
	120	0.0825	0.3251	0.4991	0.0006	0.0456	0.0387	47.0	0.0074	0.0033	48.1
	175	0.1059	0.5054	0.8385	0.0010	0.0472	0.0401	88.5	0.0096	0.0042	90.0
	250	0.1007	0.2955	1.1320	0.0015	0.0347	0.0295	131.2	0.0091	0.0040	132.7
	500	0.1626	0.5399	1.7639	0.0023	0.0570	0.0485	231.7	0.0147	0.0065	234.1
	750	0.2547	0.8344	2.8139	0.0036	0.0898	0.0764	358.1	0.0230	0.0102	361.8
	1000	0.4190	1.4213	5.0841	0.0049	0.1474	0.1253	486.4	0.0378	0.0168	492.4
Air Compressors Composite		0.0913	0.3376	0.6065	0.0007	0.0434	0.0369	63.6	0.0082	0.0037	64.9
Bore/Drill Rigs	15	0.0120	0.0632	0.0754	0.0002	0.0029	0.0025	10.3	0.0011	0.0005	10.5
	25	0.0193	0.0658	0.1226	0.0002	0.0049	0.0042	16.0	0.0017	0.0008	16.3
	50	0.0289	0.2282	0.2568	0.0004	0.0120	0.0102	31.0	0.0026	0.0012	31.5
	120	0.0447	0.4698	0.4583	0.0009	0.0257	0.0219	77.1	0.0040	0.0018	77.8
	175	0.0704	0.7538	0.6931	0.0016	0.0302	0.0256	141.1	0.0063	0.0028	142.1
	180	0.0710	0.7264	0.6977	0.0016	0.0296	0.0252	144.2	0.0064	0.0028	145.2
	250	0.0795	0.3429	0.7632	0.0021	0.0221	0.0188	188.1	0.0072	0.0032	189.2
	500	0.1295	0.5517	1.1717	0.0031	0.0361	0.0307	311.3	0.0117	0.0052	313.2
	750	0.2565	1.0899	2.3376	0.0062	0.0715	0.0608	615.1	0.0231	0.0103	618.8
	1000	0.4163	1.6675	5.9553	0.0093	0.1544	0.1312	928.3	0.0376	0.0167	934.2
Bore/Drill Rigs Composite		0.0786	0.5044	0.8125	0.0017	0.0302	0.0256	165.0	0.0071	0.0032	166.1
Cement and Mortar Mixers	15	0.0074	0.0386	0.0470	0.0001	0.0021	0.0018	6.3	0.0007	0.0003	6.4
	25	0.0270	0.0813	0.1510	0.0002	0.0083	0.0071	17.6	0.0024	0.0011	17.9
Cement and Mortar Mixers Composite		0.0091	0.0421	0.0556	0.0001	0.0026	0.0022	7.2	0.0008	0.0004	7.4
Concrete/Industrial Saws	25	0.0199	0.0678	0.1257	0.0002	0.0049	0.0041	16.5	0.0018	0.0008	16.8
	50	0.0955	0.2918	0.2858	0.0004	0.0247	0.0210	30.2	0.0086	0.0038	31.6

		(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)
Equipment	**MaxHP**	**ROG**	**CO**	**NOX**	**SOX**	**PM10**	**PM2.5**	**CO2**	**CH4**	**N2O**	**CO2 eqv**
	120	0.1065	0.4836	0.7154	0.0009	0.0589	0.0501	74.1	0.0096	0.0043	75.7
	175	0.1569	0.8701	1.3612	0.0018	0.0706	0.0600	160.2	0.0142	0.0063	162.4
Concrete/Industrial Saws Composite		0.1002	0.4088	0.5572	0.0007	0.0452	0.0385	58.5	0.0090	0.0040	59.9
Cranes	50	0.1015	0.2892	0.2394	0.0003	0.0239	0.0203	23.2	0.0092	0.0041	24.6
	120	0.0919	0.3618	0.5508	0.0006	0.0493	0.0419	50.1	0.0083	0.0037	51.5
	175	0.1031	0.4821	0.7769	0.0009	0.0445	0.0378	80.3	0.0093	0.0041	81.8
	180	0.1032	0.4696	0.7914	0.0009	0.0439	0.0373	82.5	0.0093	0.0041	83.9
	250	0.1040	0.2948	0.9948	0.0013	0.0351	0.0298	112.2	0.0094	0.0042	113.6
	500	0.1551	0.5292	1.4230	0.0018	0.0518	0.0441	180.1	0.0140	0.0062	182.3
	750	0.2625	0.8887	2.4614	0.0030	0.0885	0.0752	303.0	0.0237	0.0105	306.8
	1000	0.9491	3.3249	10.3665	0.0098	0.3189	0.2711	970.6	0.0856	0.0381	984.2
Cranes Composite		0.1348	0.4737	1.1934	0.0014	0.0508	0.0432	128.6	0.0122	0.0054	130.6
Crawler Tractors	50	0.1176	0.3246	0.2627	0.0003	0.0270	0.0230	24.9	0.0106	0.0047	26.6
	90	0.1243	0.4167	0.5518	0.0006	0.0503	0.0427	48.3	0.0112	0.0050	50.0
	120	0.1293	0.4858	0.7686	0.0008	0.0677	0.0576	65.8	0.0117	0.0052	67.7
	175	0.1674	0.7448	1.2529	0.0014	0.0713	0.0606	121.2	0.0151	0.0067	123.6
	250	0.1764	0.5000	1.5945	0.0019	0.0613	0.0521	166.1	0.0159	0.0071	168.7
	410	0.2262	0.7883	2.0069	0.0023	0.0777	0.0660	225.7	0.0204	0.0091	229.0
	500	0.2542	0.9504	2.2389	0.0025	0.0868	0.0738	259.2	0.0229	0.0102	262.9
	750	0.4574	1.6983	4.1042	0.0047	0.1573	0.1337	464.7	0.0413	0.0183	471.2
	1000	0.6901	2.6950	7.3731	0.0066	0.2361	0.2007	658.1	0.0623	0.0277	668.0
Crawler Tractors Composite		0.1584	0.5900	1.1593	0.0013	0.0697	0.0592	114.0	0.0143	0.0064	116.3
Crushing/Proc. Equipment	50	0.1741	0.5009	0.4359	0.0006	0.0422	0.0359	44.0	0.0157	0.0070	46.5
	120	0.1402	0.5764	0.8552	0.0010	0.0779	0.0662	83.1	0.0127	0.0056	85.2
	175	0.1942	0.9615	1.5237	0.0019	0.0864	0.0735	167.3	0.0175	0.0078	170.0
	250	0.1848	0.5425	2.0202	0.0028	0.0620	0.0527	244.5	0.0167	0.0074	247.2
	500	0.2608	0.8480	2.7097	0.0037	0.0884	0.0751	373.6	0.0235	0.0105	377.4
	750	0.4147	1.3191	4.4498	0.0059	0.1418	0.1206	588.8	0.0374	0.0166	594.8
	1000	1.1270	3.6752	13.3218	0.0131	0.3880	0.3298	1307.8	0.1017	0.0452	1323.9
Crushing/Proc. Equipment Composite		0.1733	0.6773	1.1752	0.0015	0.0748	0.0636	132.3	0.0156	0.0070	134.8
Dumpers/Tenders	25	0.0097	0.0320	0.0601	0.0001	0.0029	0.0025	7.6	0.0009	0.0004	7.8
Dumpers/Tenders Composite		0.0097	0.0320	0.0601	0.0001	0.0029	0.0025	7.6	0.0009	0.0004	7.8
Excavators	25	0.0198	0.0677	0.1253	0.0002	0.0047	0.0040	16.4	0.0018	0.0008	16.7
	50	0.0816	0.2841	0.2458	0.0003	0.0212	0.0180	25.0	0.0074	0.0033	26.2
	55	0.0835	0.3007	0.2768	0.0004	0.0239	0.0203	28.5	0.0075	0.0033	29.7
	120	0.1086	0.5177	0.6791	0.0009	0.0586	0.0498	73.6	0.0098	0.0044	75.2
	148	0.1148	0.5936	0.7881	0.0011	0.0549	0.0466	93.3	0.0104	0.0046	94.9
	175	0.1208	0.6668	0.8932	0.0013	0.0512	0.0435	112.2	0.0109	0.0048	114.0
	250	0.1242	0.3541	1.1360	0.0018	0.0372	0.0316	158.7	0.0112	0.0050	160.5
	500	0.1735	0.5271	1.4763	0.0023	0.0516	0.0439	233.7	0.0157	0.0070	236.2
	750	0.2895	0.8731	2.5290	0.0039	0.0871	0.0741	387.4	0.0261	0.0116	391.6
Excavators Composite		0.1220	0.5338	0.9071	0.0013	0.0481	0.0409	119.6	0.0110	0.0049	121.3

		(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)
Equipment	**MaxHP**	**ROG**	**CO**	**NOX**	**SOX**	**PM10**	**PM2.5**	**CO2**	**CH4**	**N2O**	**CO2 eqv**
Forklifts	50	0.0445	0.1623	0.1431	0.0002	0.0121	0.0103	14.7	0.0040	0.0018	15.3
	120	0.0438	0.2176	0.2788	0.0004	0.0241	0.0205	31.2	0.0040	0.0018	31.9
	175	0.0572	0.3307	0.4261	0.0006	0.0246	0.0209	56.1	0.0052	0.0023	56.9
	250	0.0570	0.1614	0.5281	0.0009	0.0168	0.0142	77.1	0.0051	0.0023	77.9
	500	0.0781	0.2208	0.6592	0.0011	0.0228	0.0194	111.0	0.0070	0.0031	112.1
Forklifts Composite		0.0541	0.2235	0.3950	0.0006	0.0204	0.0173	54.4	0.0049	0.0022	55.2
Generator Sets	15	0.0149	0.0684	0.1016	0.0002	0.0058	0.0049	10.2	0.0013	0.0006	10.4
	16	0.0161	0.0706	0.1074	0.0002	0.0061	0.0052	11.0	0.0015	0.0006	11.2
	25	0.0266	0.0908	0.1594	0.0002	0.0091	0.0077	17.6	0.0024	0.0011	18.0
	50	0.0872	0.2639	0.2847	0.0004	0.0234	0.0199	30.6	0.0079	0.0035	31.9
	120	0.1106	0.4905	0.7587	0.0009	0.0590	0.0502	77.9	0.0100	0.0044	79.5
	175	0.1347	0.7388	1.2314	0.0016	0.0592	0.0503	142.0	0.0122	0.0054	143.9
	250	0.1277	0.4365	1.6763	0.0024	0.0464	0.0394	212.5	0.0115	0.0051	214.3
	500	0.1818	0.7230	2.3955	0.0033	0.0690	0.0587	336.9	0.0164	0.0073	339.5
	750	0.3035	1.1671	3.9863	0.0055	0.1134	0.0964	543.8	0.0274	0.0122	548.1
	1000	0.7957	2.8065	10.2314	0.0105	0.2844	0.2417	1048.6	0.0718	0.0319	1060.0
Generator Sets Composite		0.0767	0.3045	0.5430	0.0007	0.0324	0.0275	61.0	0.0069	0.0031	62.1
Graders	50	0.1080	0.3263	0.2772	0.0004	0.0262	0.0223	27.5	0.0097	0.0043	29.1
	120	0.1254	0.5310	0.7729	0.0009	0.0676	0.0574	75.0	0.0113	0.0050	76.8
	175	0.1467	0.7345	1.1193	0.0014	0.0631	0.0537	123.9	0.0132	0.0059	126.0
	180	0.1469	0.7144	1.1393	0.0014	0.0622	0.0529	127.1	0.0133	0.0059	129.2
	250	0.1492	0.4331	1.4184	0.0019	0.0494	0.0420	172.1	0.0135	0.0060	174.3
	500	0.1855	0.6289	1.6842	0.0023	0.0608	0.0517	229.5	0.0167	0.0074	232.1
	750	0.3952	1.3289	3.6674	0.0049	0.1306	0.1110	485.7	0.0357	0.0158	491.4
Graders Composite		0.1446	0.6053	1.1663	0.0015	0.0593	0.0504	132.7	0.0130	0.0058	134.8
Off-Highway Tractors	120	0.2113	0.7191	1.2368	0.0011	0.1078	0.0916	93.7	0.0191	0.0085	96.8
	175	0.2045	0.8335	1.5337	0.0015	0.0871	0.0740	130.4	0.0185	0.0082	133.3
	250	0.1641	0.4691	1.4453	0.0015	0.0601	0.0511	130.4	0.0148	0.0066	132.8
	750	0.6538	2.8815	5.8130	0.0057	0.2353	0.2000	568.1	0.0590	0.0262	577.5
	1000	0.9818	4.4978	10.0554	0.0082	0.3436	0.2920	814.3	0.0886	0.0394	828.4
Off-Highway Tractors Composite		0.2077	0.7649	1.7062	0.0017	0.0818	0.0696	151.4	0.0187	0.0083	154.4
Off-Highway Trucks	175	0.1441	0.7580	1.0305	0.0014	0.0602	0.0512	125.1	0.0130	0.0058	127.2
	250	0.1400	0.3837	1.2373	0.0019	0.0412	0.0351	166.5	0.0126	0.0056	168.6
	500	0.2170	0.6362	1.7865	0.0027	0.0634	0.0538	272.3	0.0196	0.0087	275.4
	750	0.3542	1.0311	2.9938	0.0044	0.1046	0.0889	441.7	0.0320	0.0142	446.8
	1000	0.5484	1.6691	5.9808	0.0063	0.1796	0.1527	624.7	0.0495	0.0220	632.6
Off-Highway Trucks Composite		0.2141	0.6361	1.8543	0.0027	0.0644	0.0548	260.1	0.0193	0.0086	263.1
Other Construction Equipment	15	0.0118	0.0617	0.0737	0.0002	0.0029	0.0024	10.1	0.0011	0.0005	10.3
	25	0.0160	0.0544	0.1013	0.0002	0.0041	0.0034	13.2	0.0014	0.0006	13.4
	50	0.0753	0.2653	0.2585	0.0004	0.0205	0.0174	28.0	0.0068	0.0030	29.1
	120	0.1006	0.5277	0.7025	0.0009	0.0567	0.0482	80.9	0.0091	0.0040	82.3
	175	0.0935	0.5873	0.8011	0.0012	0.0420	0.0357	106.5	0.0084	0.0038	107.9

		(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)
Equipment	**MaxHP**	**ROG**	**CO**	**NOX**	**SOX**	**PM10**	**PM2.5**	**CO2**	**CH4**	**N2O**	**CO2 eqv**
	500	0.1452	0.5234	1.5187	0.0025	0.0491	0.0417	254.2	0.0131	0.0058	256.3
Other Construction Equipment Composite		0.0872	0.3765	0.7938	0.0013	0.0330	0.0280	122.7	0.0079	0.0035	123.9
Other General Industrial Equipment	15	0.0066	0.0391	0.0466	0.0001	0.0018	0.0015	6.4	0.0006	0.0003	6.5
	25	0.0185	0.0632	0.1170	0.0002	0.0044	0.0037	15.3	0.0017	0.0007	15.6
	50	0.0980	0.2738	0.2243	0.0003	0.0232	0.0198	21.7	0.0088	0.0039	23.1
	120	0.1177	0.4487	0.6789	0.0007	0.0644	0.0548	62.0	0.0106	0.0047	63.7
	175	0.1261	0.5728	0.9333	0.0011	0.0549	0.0467	95.9	0.0114	0.0051	97.7
	250	0.1174	0.3177	1.2013	0.0015	0.0380	0.0323	135.6	0.0106	0.0047	137.3
	500	0.2135	0.6384	2.0642	0.0026	0.0693	0.0589	265.4	0.0193	0.0086	268.5
	750	0.3546	1.0522	3.5146	0.0044	0.1165	0.0990	437.4	0.0320	0.0142	442.5
	1000	0.5246	1.6793	6.0067	0.0056	0.1805	0.1534	559.6	0.0473	0.0210	567.1
Other General Industrial Equipmen Composite		0.1542	0.5159	1.3484	0.0016	0.0580	0.0493	152.2	0.0139	0.0062	154.4
Other Material Handling Equipment	50	0.1361	0.3789	0.3119	0.0004	0.0323	0.0274	30.3	0.0123	0.0055	32.3
	120	0.1144	0.4370	0.6628	0.0007	0.0628	0.0534	60.7	0.0103	0.0046	62.3
	175	0.1591	0.7257	1.1860	0.0014	0.0696	0.0591	122.1	0.0144	0.0064	124.4
	250	0.1241	0.3385	1.2829	0.0016	0.0405	0.0344	145.0	0.0112	0.0050	146.8
	500	0.1521	0.4596	1.4883	0.0019	0.0498	0.0423	191.6	0.0137	0.0061	193.8
	1000	0.7021	2.2197	7.9424	0.0073	0.2379	0.2022	741.3	0.0634	0.0282	751.4
Other Material Handling Equipment Composite		0.1473	0.4951	1.3132	0.0015	0.0562	0.0477	141.2	0.0133	0.0059	143.3
Pavers	25	0.0247	0.0799	0.1500	0.0002	0.0075	0.0064	18.7	0.0022	0.0010	19.0
	50	0.1366	0.3592	0.2948	0.0004	0.0308	0.0262	28.0	0.0123	0.0055	29.9
	120	0.1387	0.5057	0.8357	0.0008	0.0729	0.0620	69.2	0.0125	0.0056	71.2
	140	0.1529	0.6048	1.0325	0.0010	0.0744	0.0632	90.7	0.0138	0.0061	92.9
	175	0.1777	0.7784	1.3769	0.0014	0.0769	0.0654	128.3	0.0160	0.0071	130.8
	250	0.2072	0.6081	1.9469	0.0022	0.0756	0.0642	194.4	0.0187	0.0083	197.3
	500	0.2275	0.9254	2.1080	0.0023	0.0818	0.0695	233.2	0.0205	0.0091	236.5
Pavers Composite		0.1511	0.5357	0.8542	0.0009	0.0603	0.0512	77.9	0.0136	0.0061	80.1
Paving Equipment	25	0.0153	0.0520	0.0968	0.0002	0.0039	0.0033	12.6	0.0014	0.0006	12.8
	50	0.1166	0.3049	0.2514	0.0003	0.0263	0.0224	23.9	0.0105	0.0047	25.6
	120	0.1087	0.3958	0.6561	0.0006	0.0574	0.0488	54.5	0.0098	0.0044	56.1
	175	0.1387	0.6079	1.0816	0.0011	0.0602	0.0512	101.0	0.0125	0.0056	103.0
	250	0.1277	0.3763	1.2206	0.0014	0.0467	0.0397	122.3	0.0115	0.0051	124.1
Paving Equipment Composite		0.1142	0.4316	0.7709	0.0008	0.0536	0.0456	68.9	0.0103	0.0046	70.6
Plate Compactors	15	0.0050	0.0263	0.0314	0.0001	0.0012	0.0010	4.3	0.0005	0.0002	4.4
Plate Compactors Composite		0.0050	0.0263	0.0314	0.0001	0.0012	0.0010	4.3	0.0005	0.0002	4.4
Pressure Washers	15	0.0071	0.0328	0.0487	0.0001	0.0028	0.0024	4.9	0.0006	0.0003	5.0
	25	0.0108	0.0368	0.0646	0.0001	0.0037	0.0031	7.1	0.0010	0.0004	7.3
	50	0.0315	0.1037	0.1284	0.0002	0.0094	0.0080	14.3	0.0028	0.0013	14.7
	120	0.0302	0.1443	0.2235	0.0003	0.0157	0.0134	24.1	0.0027	0.0012	24.5
Pressure Washers Composite		0.0159	0.0619	0.0878	0.0001	0.0058	0.0049	9.4	0.0014	0.0006	9.6
Pumps	15	0.0125	0.0497	0.0752	0.0001	0.0049	0.0042	7.4	0.0011	0.0005	7.6
	25	0.0359	0.1004	0.1761	0.0002	0.0109	0.0093	19.5	0.0032	0.0014	20.0

		(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)
Equipment	**MaxHP**	**ROG**	**CO**	**NOX**	**SOX**	**PM10**	**PM2.5**	**CO2**	**CH4**	**N2O**	**CO2 eqv**
	50	0.1052	0.3116	0.3228	0.0004	0.0275	0.0234	34.3	0.0095	0.0042	35.8
	120	0.1149	0.4984	0.7706	0.0009	0.0617	0.0525	77.9	0.0104	0.0046	79.6
	175	0.1385	0.7405	1.2344	0.0016	0.0611	0.0519	140.1	0.0125	0.0056	142.1
	250	0.1266	0.4210	1.6140	0.0023	0.0457	0.0389	201.4	0.0114	0.0051	203.2
	500	0.1952	0.7595	2.4849	0.0034	0.0734	0.0624	345.2	0.0176	0.0078	348.0
	750	0.3326	1.2556	4.2353	0.0057	0.1235	0.1049	570.7	0.0300	0.0133	575.5
	1000	1.0536	3.7127	13.3750	0.0136	0.3744	0.3182	1354.8	0.0951	0.0423	1369.9
Pumps Composite		0.0748	0.2926	0.4705	0.0006	0.0323	0.0275	49.6	0.0067	0.0030	50.7
Rollers	15	0.0074	0.0386	0.0461	0.0001	0.0018	0.0015	6.3	0.0007	0.0003	6.4
	25	0.0161	0.0549	0.1023	0.0002	0.0041	0.0035	13.3	0.0015	0.0006	13.6
	50	0.1025	0.2911	0.2583	0.0003	0.0245	0.0208	26.0	0.0092	0.0041	27.5
	120	0.0986	0.4063	0.6253	0.0007	0.0534	0.0454	59.0	0.0089	0.0040	60.4
	175	0.1247	0.6199	1.0114	0.0012	0.0550	0.0468	108.1	0.0113	0.0050	109.9
	240	0.1260	0.4195	1.2723	0.0017	0.0464	0.0395	147.1	0.0114	0.0051	148.9
	250	0.1262	0.3887	1.3124	0.0017	0.0451	0.0383	153.1	0.0114	0.0051	154.9
	500	0.1654	0.6313	1.6820	0.0022	0.0593	0.0504	219.1	0.0149	0.0066	221.5
Rollers Composite		0.0973	0.4060	0.6546	0.0008	0.0453	0.0385	67.1	0.0088	0.0039	68.4
Rough Terrain Forklifts	50	0.1181	0.3778	0.3316	0.0004	0.0300	0.0255	33.9	0.0107	0.0047	35.6
	120	0.0955	0.4327	0.5995	0.0007	0.0529	0.0450	62.4	0.0086	0.0038	63.8
	125	0.0991	0.4593	0.6400	0.0008	0.0535	0.0455	68.1	0.0089	0.0040	69.5
	175	0.1352	0.7256	1.0448	0.0014	0.0592	0.0503	124.9	0.0122	0.0054	126.8
	250	0.1294	0.3798	1.2955	0.0019	0.0416	0.0353	170.8	0.0117	0.0052	172.7
	500	0.1824	0.5717	1.7096	0.0025	0.0584	0.0497	256.6	0.0165	0.0073	259.2
Rough Terrain Forklifts Composite		0.1009	0.4642	0.6526	0.0008	0.0532	0.0452	70.3	0.0091	0.0040	71.7
Rubber Tired Dozers	175	0.2119	0.8457	1.5561	0.0015	0.0893	0.0759	129.5	0.0191	0.0085	132.5
	250	0.2435	0.6833	2.0817	0.0021	0.0881	0.0748	183.5	0.0220	0.0098	187.0
	500	0.3211	1.4228	2.7305	0.0026	0.1133	0.0963	264.9	0.0290	0.0129	269.5
	750	0.4843	2.1329	4.1797	0.0040	0.1716	0.1459	398.8	0.0437	0.0194	405.7
	1000	0.7496	3.4322	7.4509	0.0060	0.2591	0.2202	591.9	0.0676	0.0301	602.6
Rubber Tired Dozers Composite		0.2986	1.1749	2.5452	0.0025	0.1064	0.0904	239.1	0.0269	0.0120	243.4
Rubber Tired Loaders	25	0.0204	0.0697	0.1292	0.0002	0.0050	0.0043	16.9	0.0018	0.0008	17.2
	50	0.1200	0.3641	0.3118	0.0004	0.0292	0.0248	31.1	0.0108	0.0048	32.9
	120	0.0971	0.4152	0.6015	0.0007	0.0525	0.0446	58.9	0.0088	0.0039	60.3
	175	0.1238	0.6274	0.9501	0.0012	0.0535	0.0455	106.3	0.0112	0.0050	108.1
	250	0.1259	0.3685	1.2125	0.0017	0.0417	0.0354	149.0	0.0114	0.0050	150.8
	500	0.1867	0.6397	1.7158	0.0023	0.0613	0.0521	237.0	0.0168	0.0075	239.7
	750	0.3850	1.3084	3.6184	0.0049	0.1276	0.1084	485.5	0.0347	0.0154	491.0
	1000	0.5190	1.8389	5.9660	0.0060	0.1795	0.1526	593.9	0.0468	0.0208	601.3
Rubber Tired Loaders Composite		0.1195	0.4763	0.9346	0.0012	0.0508	0.0432	108.6	0.0108	0.0048	110.3
Scrapers	120	0.1877	0.6943	1.1141	0.0011	0.0983	0.0835	93.9	0.0169	0.0075	96.6
	175	0.2070	0.9107	1.5564	0.0017	0.0884	0.0751	148.1	0.0187	0.0083	151.0
	180	0.2082	0.8927	1.5892	0.0017	0.0878	0.0746	152.2	0.0188	0.0083	155.1

		(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)
Equipment	**MaxHP**	**ROG**	**CO**	**NOX**	**SOX**	**PM10**	**PM2.5**	**CO2**	**CH4**	**N2O**	**CO2 eqv**
	250	0.2252	0.6408	2.0481	0.0024	0.0791	0.0672	209.5	0.0203	0.0090	212.7
	500	0.3186	1.2113	2.8288	0.0032	0.1099	0.0934	321.4	0.0287	0.0128	326.0
	750	0.5525	2.0861	4.9949	0.0056	0.1918	0.1630	555.3	0.0499	0.0222	563.2
Scrapers Composite		0.2783	1.0395	2.4118	0.0027	0.1005	0.0855	262.5	0.0251	0.0112	266.5
Signal Boards	15	0.0072	0.0377	0.0450	0.0001	0.0018	0.0015	6.2	0.0006	0.0003	6.3
	50	0.1151	0.3456	0.3415	0.0005	0.0296	0.0252	36.2	0.0104	0.0046	37.8
	120	0.1176	0.5214	0.7807	0.0009	0.0644	0.0548	80.2	0.0106	0.0047	81.9
	175	0.1535	0.8341	1.3333	0.0017	0.0685	0.0582	154.5	0.0139	0.0062	156.7
	250	0.1632	0.5350	1.9963	0.0029	0.0580	0.0493	255.3	0.0147	0.0065	257.6
Signal Boards Composite		0.0192	0.0934	0.1399	0.0002	0.0077	0.0065	16.7	0.0017	0.0008	17.0
Skid Steer Loaders	25	0.0202	0.0620	0.1166	0.0002	0.0063	0.0053	13.8	0.0018	0.0008	14.1
	50	0.0517	0.2263	0.2279	0.0003	0.0157	0.0133	25.5	0.0047	0.0021	26.3
	85	0.0473	0.2505	0.2773	0.0004	0.0201	0.0171	34.1	0.0043	0.0019	34.8
	120	0.0429	0.2748	0.3267	0.0005	0.0245	0.0208	42.8	0.0039	0.0017	43.4
Skid Steer Loaders Composite		0.0468	0.2309	0.2522	0.0004	0.0179	0.0152	30.3	0.0042	0.0019	30.9
Surfacing Equipment	50	0.0477	0.1403	0.1359	0.0002	0.0119	0.0101	14.1	0.0043	0.0019	14.8
	120	0.0970	0.4215	0.6523	0.0007	0.0517	0.0439	63.8	0.0088	0.0039	65.2
	175	0.0894	0.4730	0.7742	0.0010	0.0392	0.0333	85.8	0.0081	0.0036	87.1
	250	0.1025	0.3374	1.1177	0.0015	0.0376	0.0320	134.9	0.0092	0.0041	136.3
	500	0.1532	0.6418	1.6597	0.0022	0.0567	0.0482	221.2	0.0138	0.0061	223.4
	750	0.2443	1.0046	2.6697	0.0035	0.0900	0.0765	347.0	0.0220	0.0098	350.5
Surfacing Equipment Composite		0.1277	0.5182	1.2760	0.0017	0.0468	0.0398	166.0	0.0115	0.0051	167.8
Sweepers/Scrubbers	15	0.0124	0.0729	0.0870	0.0002	0.0034	0.0029	11.9	0.0011	0.0005	12.1
	25	0.0237	0.0808	0.1496	0.0002	0.0058	0.0049	19.6	0.0021	0.0009	20.0
	50	0.1048	0.3425	0.3055	0.0004	0.0271	0.0230	31.6	0.0095	0.0042	33.1
	120	0.1107	0.5147	0.6989	0.0009	0.0622	0.0529	75.0	0.0100	0.0044	76.6
	175	0.1439	0.7997	1.1204	0.0016	0.0637	0.0541	139.0	0.0130	0.0058	141.1
	250	0.1146	0.3382	1.1784	0.0018	0.0362	0.0308	162.0	0.0103	0.0046	163.7
Sweepers/Scrubbers Composite		0.1148	0.5145	0.6862	0.0009	0.0510	0.0433	78.5	0.0104	0.0046	80.2
Tractors/Loaders/Backhoes	25	0.0195	0.0657	0.1237	0.0002	0.0056	0.0048	15.9	0.0018	0.0008	16.1
	50	0.0893	0.3199	0.2893	0.0004	0.0238	0.0203	30.3	0.0081	0.0036	31.6
	90	0.0780	0.3387	0.3848	0.0005	0.0321	0.0273	42.6	0.0070	0.0031	43.7
	120	0.0694	0.3529	0.4565	0.0006	0.0383	0.0326	51.7	0.0063	0.0028	52.7
	175	0.0988	0.5861	0.7696	0.0011	0.0428	0.0364	101.4	0.0089	0.0040	102.8
	250	0.1204	0.3666	1.1658	0.0019	0.0370	0.0314	171.7	0.0109	0.0048	173.5
	500	0.2290	0.7443	2.0659	0.0039	0.0701	0.0596	344.9	0.0207	0.0092	348.1
	750	0.3462	1.1159	3.2041	0.0058	0.1072	0.0911	517.3	0.0312	0.0139	522.2
Tractors/Loaders/Backhoes Composite		0.0792	0.3782	0.5392	0.0008	0.0387	0.0329	66.8	0.0071	0.0032	67.9
Trenchers	15	0.0099	0.0517	0.0617	0.0001	0.0024	0.0020	8.5	0.0009	0.0004	8.6
	25	0.0397	0.1355	0.2511	0.0004	0.0097	0.0083	32.9	0.0036	0.0016	33.5
	50	0.1566	0.4082	0.3432	0.0004	0.0353	0.0300	32.9	0.0141	0.0063	35.2
	120	0.1281	0.4684	0.7862	0.0008	0.0669	0.0568	64.9	0.0116	0.0051	66.7

		(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)
Equipment	**MaxHP**	**ROG**	**CO**	**NOX**	**SOX**	**PM10**	**PM2.5**	**CO2**	**CH4**	**N2O**	**CO2 eqv**
	175	0.1955	0.8632	1.5520	0.0016	0.0849	0.0722	143.9	0.0176	0.0078	146.7
	250	0.2354	0.7089	2.2485	0.0025	0.0880	0.0748	222.9	0.0212	0.0094	226.3
	500	0.2985	1.3011	2.8470	0.0031	0.1105	0.0939	311.3	0.0269	0.0120	315.6
	750	0.5663	2.4440	5.4715	0.0059	0.2099	0.1784	586.9	0.0511	0.0227	595.0
Trenchers Composite		0.1427	0.4675	0.6684	0.0007	0.0549	0.0467	58.7	0.0129	0.0057	60.8
Welders	15	0.0104	0.0416	0.0629	0.0001	0.0041	0.0035	6.2	0.0009	0.0004	6.4
	25	0.0208	0.0581	0.1020	0.0001	0.0063	0.0054	11.3	0.0019	0.0008	11.6
	50	0.0979	0.2753	0.2535	0.0003	0.0240	0.0204	26.0	0.0088	0.0039	27.4
	120	0.0654	0.2659	0.4099	0.0005	0.0358	0.0305	39.5	0.0059	0.0026	40.4
	175	0.1101	0.5455	0.9083	0.0011	0.0490	0.0417	98.2	0.0099	0.0044	99.8
	250	0.0855	0.2618	1.0026	0.0013	0.0301	0.0256	119.1	0.0077	0.0034	120.3
	500	0.1092	0.3838	1.2526	0.0016	0.0394	0.0335	167.6	0.0098	0.0044	169.2
Welders Composite		0.0646	0.2096	0.2564	0.0003	0.0225	0.0191	25.6	0.0058	0.0026	26.5

Notes:

SCAQMD emission factors for 2012 (SCAQMD 2008)

Offroad diesel exhaust $PM_{2.5}$ = 85% of PM_{10} per EMFAC 2007 version 2.3 (SCAQMD 2008)

N_2O & CO_2 eqv per Inventory of U.S. GHG Emissions & Sinks - Annex 3 (EPA 2012)

Non-matching application-specific values interpolated or extrapolated for improved accuracy

EPA GWPs for CO_2 eqv (1, 21, 310)

Table C-16 AERSCREEN INPUT DATA	**VALUES**	**VALUES**	**UNITS**
Initial Information			
Title of modeling run	sanger_max	sanger_avg	alpha
Input units, English or metric (E/M)	M	M	alpha
Source type (Point, Volume, Area, Circle, Flare, Shielded, Horizontal)	V	V	alpha
Source Information			
Emission rate	1.61E-02	3.84E-03	grams/sec
Center of volume release height, h (half of zone or building height)	2.5	2.5	meters
Initial lateral dimension of the volume, y (from Table 4-6)	94.7	94.7	meters
Initial vertical dimension of the volume, z (from Table 4-6)	2.33	2.33	meters
Rural/Urban (R/U)	R	R	alpha
Population of urban area			integer
Minimum distance to ambient air	205	205	meters
Option for modeling NO_2 chemistry (1, 2, 3)	1	1	option #
1) No chemistry or pollutant is not NO_2 (worst case unitary)			
2) Use ozone limiting method			
3) Use plume volume molar ratio method			
In-stack NO_2 to NO_X ratio for options 2 or 3	0.1	0.1	ratio
Ozone concentration (ambient) for options 2 or 3			ppmv
Terrain Height Information			
Include terrain heights (Y/N)	N	N	alpha
Maximum distance to probe (2 km radius of vicinity)	2000	2000	meters
Include up to 10 discrete receptors (Y/N)	N	N	alpha
Filename of discrete receptors (*.txt)			.txt
Use flagpole receptors (Y/N)	Y	Y	alpha
Flagpole receptor height	1.5	1.5	meters
Source base elevation above mean sea level (land parcel)	106	106	meters
Meteorology Information for MAKEMET			
Minimum temperature (35 °F)	276	276	°K
Maximum temperature (107 °F)	310	310	°K
Minimum wind speed	1	1	meters/sec
Anemometer height	10	10	meters
Source of surface characteristics (1-user spec, 2-AERMET, 3-ext file)	2	2	option #
Dominant surface profile (land use: 1, 2, 3, 4, 5, 6, 7, 8)	5	5	option #
Dominant climate profile (1-average, 2-wet, 3-dry)	3	3	option #
Output File			
Use non-default name (*.out)	sanger_max	sanger_avg	.out

Table C-17 SCAB Fleet Average Emission Factors

A-14 Onroad 2013

Air Basin		SC

		(lb/mi)	(lb/mi)	(lb/mi)	(lb/mi)	(lb/mi)	(lb/mi)	(lb/mi)	(lb/mi)	(lb/mi)	(lb/mi)
Vehicle Type	**Category**	**ROG**	**CO**	**NOX**	**SOX**	**PM10**	**PM2.5**	**CO2**	**CH4**	**N2O**	**CO2 eqv**
Light Duty (pickups/SUVs)	Onroad LD	0.000746	0.007092	0.000712	0.000011	0.000091	0.000058	1.100874	0.000067	0.000104	1.134628
Medium Duty (work trucks)	Onroad MD	0.002063	0.014078	0.015773	0.000027	0.000600	0.000502	2.781635	0.000097	0.000091	2.811983
Heavy Heavy Duty (tractor/trailers)	Onroad HHD	0.002263	0.009318	0.027429	0.000041	0.001337	0.001146	4.215186	0.000104	0.000098	4.247843

Notes:
SCAQMD 2008
HHD includes tire & brake wear
N_2O & CO_2 eqv per Inventory of U.S. GHG Emissions & Sinks - Annex 3 (EPA 2012)

Highest (Most Conservative) EMFAC2007 (version 2.3)
Emission Factors for On-Road Passenger Vehicles & Delivery Trucks
Projects in the SCAQMD (Scenario Years 2011 - 2026)
Derived from Peak Emissions Inventory (**Winter**, **Annual**, **Summer**)

Vehicle Class:
Passenger Vehicles (<8500 pounds) & Delivery Trucks (>8500 pounds)

The following emission factors were compiled by running the California Air Resources Board's EMFAC2007 (version 2.3) Burden Model, taking the weighted average of vehicle types and simplifying into two categories:
Passenger Vehicles & Delivery Trucks.

These emission factors can be used to calculate on-road mobile source emissions for the vehicle categories listed in the tables below, by use of the following equation:
Emissions (pounds per day) = N x TL x EF
where N = number of trips, TL = trip length (miles/day), and EF = emission factor (pounds per mile)

This methodology replaces the old EMFAC emission factors in Tables A-9-5-J-1 through A-9-5-L in Appendix A9 of the current SCAQMD CEQA Handbook. All the emission factors account for the emissions from start, running and idling exhaust. In addition, the ROG emission factors include diurnal, hot soak, running and resting emissions, and the PM10 & PM2.5 emission factors include tire and brake wear.

Scenario Year: **2011**
All model years in the range 1967 to 2011

Passenger Vehicles (pounds/mile)	
CO	0.00826276
NOx	0.00084460
ROG	0.00085233
SOx	0.00001077
PM10	0.00008879
PM2.5	0.00005653
CO2	1.10235154
CH4	0.00007678
N2O	0.00011943
CO2 eqv	1.14098746

Delivery Trucks (pounds/mile)	
CO	0.01693242
NOx	0.01893366
ROG	0.00241868
SOx	0.00002728
PM10	0.00070097
PM2.5	0.00059682
CO2	2.75180822
CH4	0.00011655
N2O	0.00010970
CO2 eqv	2.78826189

Scenario Year: **2012**
All model years in the range 1968 to 2012

Passenger Vehicles (pounds/mile)	
CO	0.00765475
NOx	0.00077583
ROG	0.00079628
SOx	0.00001073
PM10	0.00008979
PM2.5	0.00005750
CO2	1.10152540
CH4	0.00007169
N2O	0.00011151
CO2 eqv	1.13760039

Delivery Trucks (pounds/mile)	
CO	0.01545741
NOx	0.01732423
ROG	0.00223776
SOx	0.00002667
PM10	0.00064975
PM2.5	0.00054954
CO2	2.76628414
CH4	0.00010668
N2O	0.00010040
CO2 eqv	2.79964841

Scenario Year: **2013**
All model years in the range 1969 to 2013

Passenger Vehicles (pounds/mile)	
CO	0.00709228
NOx	0.00071158
ROG	0.00074567
SOx	0.00001072
PM10	0.00009067
PM2.5	0.00005834
CO2	1.10087435
CH4	0.00006707
N2O	0.00010434
CO2 eqv	1.13462778

Delivery Trucks (pounds/mile)	
CO	0.01407778
NOx	0.01577311
ROG	0.00206295
SOx	0.00002682
PM10	0.00059956
PM2.5	0.00050174
CO2	2.78163459
CH4	0.00009703
N2O	0.00009133
CO2 eqv	2.81198332

Scenario Year: **2014**
All model years in the range 1970 to 2014

Passenger Vehicles (pounds/mile)	
CO	0.00660353
NOx	0.00065484
ROG	0.00070227
SOx	0.00001069
PM10	0.00009185
PM2.5	0.00005939
CO2	1.10257205
CH4	0.00006312
N2O	0.00009818
CO2 eqv	1.13433310

Delivery Trucks (pounds/mile)	
CO	0.01284321
NOx	0.01425162
ROG	0.00189649
SOx	0.00002754
PM10	0.00054929
PM2.5	0.00045519
CO2	2.79845465
CH4	0.00008798
N2O	0.00008280
CO2 eqv	2.82597096

Scenario Year: **2015**

All model years in the range 1971 to 2015

Passenger Vehicles (pounds/mile)	
CO	0.00614108
NOx	0.00060188
ROG	0.00066355
SOx	0.00001070
PM10	0.00009259
PM2.5	0.00006015
CO2	1.10192837
CH4	0.00005923
N2O	0.00009213
CO2 eqv	1.13173218

Delivery Trucks (pounds/mile)	
CO	0.01169445
NOx	0.01285026
ROG	0.00173890
SOx	0.00002741
PM10	0.00050307
PM2.5	0.00041268
CO2	2.81247685
CH4	0.00008076
N2O	0.00007601
CO2 eqv	2.83773531

Scenario Year: **2016**

All model years in the range 1972 to 2016

Passenger Vehicles (pounds/mile)	
CO	0.00575800
NOx	0.00055658
ROG	0.00063254
SOx	0.00001071
PM10	0.00009392
PM2.5	0.00006131
CO2	1.10677664
CH4	0.00005623
N2O	0.00008747
CO2 eqv	1.13507331

Delivery Trucks (pounds/mile)	
CO	0.01080542
NOx	0.01172881
ROG	0.00161521
SOx	0.00002767
PM10	0.00046606
PM2.5	0.00037868
CO2	2.83134285
CH4	0.00007355
N2O	0.00006922
CO2 eqv	2.85434695

Scenario Year: **2017**

All model years in the range 1973 to 2017

Passenger Vehicles (pounds/mile)	
CO	0.00537891
NOx	0.00051297
ROG	0.00060109
SOx	0.00001079
PM10	0.00009446
PM2.5	0.00006192
CO2	1.10627489
CH4	0.00005300
N2O	0.00008245
CO2 eqv	1.13294795

Delivery Trucks (pounds/mile)	
CO	0.00998101
NOx	0.01070034
ROG	0.00150242
SOx	0.00002723
PM10	0.00043131
PM2.5	0.00034605
CO2	2.84005015
CH4	0.00006663
N2O	0.00006271
CO2 eqv	2.86088993

Scenario Year: **2018**

All model years in the range 1974 to 2018

Passenger Vehicles (pounds/mile)	
CO	0.00502881
NOx	0.00047300
ROG	0.00057178
SOx	0.00001071
PM10	0.00009494
PM2.5	0.00006234
CO2	1.10562643
CH4	0.00005003
N2O	0.00007782
CO2 eqv	1.13080168

Delivery Trucks (pounds/mile)	
CO	0.00923234
NOx	0.00979416
ROG	0.00139856
SOx	0.00002749
PM10	0.00040110
PM2.5	0.00031792
CO2	2.84646835
CH4	0.00006203
N2O	0.00005838
CO2 eqv	2.86587008

Scenario Year: **2019**

All model years in the range 1975 to 2019

Passenger Vehicles (pounds/mile)	
CO	0.00471820
NOx	0.00043716
ROG	0.00054654
SOx	0.00001072
PM10	0.00009523
PM2.5	0.00006259
CO2	1.10496100
CH4	0.00004743
N2O	0.00007378
CO2 eqv	1.12882815

Delivery Trucks (pounds/mile)	
CO	0.00857192
NOx	0.00900205
ROG	0.00130563
SOx	0.00002706
PM10	0.00037393
PM2.5	0.00029276
CO2	2.85060182
CH4	0.00005619
N2O	0.00005289
CO2 eqv	2.86817714

Scenario Year: **2020**

All model years in the range 1976 to 2020

Passenger Vehicles (pounds/mile)	
CO	0.00444247
NOx	0.00040506
ROG	0.00052463
SOx	0.00001073
PM10	0.00009550
PM2.5	0.00006279
CO2	1.10456157
CH4	0.00004495
N2O	0.00006992
CO2 eqv	1.12718066

Delivery Trucks (pounds/mile)	
CO	0.00799617
NOx	0.00831802
ROG	0.00122382
SOx	0.00002733
PM10	0.00035054
PM2.5	0.00027128
CO2	2.85148109
CH4	0.00005330
N2O	0.00005016
CO2 eqv	2.86815105

Scenario Year: **2021**
All model years in the range 1977 to 2021

Passenger Vehicles (pounds/mile)	
CO	0.00421218
NOx	0.00037757
ROG	0.00050573
SOx	0.00001073
PM10	0.00009640
PM2.5	0.00006364
CO2	1.11009559
CH4	0.00004322
N2O	0.00006724
CO2 eqv	1.13184726

Delivery Trucks (pounds/mile)	
CO	0.00748303
NOx	0.00773500
ROG	0.00115568
SOx	0.00002755
PM10	0.00033125
PM2.5	0.00025331
CO2	2.86434187
CH4	0.00004905
N2O	0.00004616
CO2 eqv	2.87968274

Scenario Year: **2022**
All model years in the range 1978 to 2022

Passenger Vehicles (pounds/mile)	
CO	0.00397866
NOx	0.00035150
ROG	0.00048658
SOx	0.00001072
PM10	0.00009661
PM2.5	0.00006389
CO2	1.11019931
CH4	0.00004121
N2O	0.00006411
CO2 eqv	1.13093833

Delivery Trucks (pounds/mile)	
CO	0.00699290
NOx	0.00722470
ROG	0.00108569
SOx	0.00002774
PM10	0.00031501
PM2.5	0.00023906
CO2	2.87006769
CH4	0.00004557
N2O	0.00004289
CO2 eqv	2.88431947

Scenario Year: **2023**
All model years in the range 1979 to 2023

Passenger Vehicles (pounds/mile)	
CO	0.00377527
NOx	0.00032851
ROG	0.00046900
SOx	0.00001070
PM10	0.00009676
PM2.5	0.00006405
CO2	1.11023373
CH4	0.00003951
N2O	0.00006146
CO2 eqv	1.13011498

Delivery Trucks (pounds/mile)	
CO	0.00658123
NOx	0.00679147
ROG	0.00102852
SOx	0.00002790
PM10	0.00030109
PM2.5	0.00022582
CO2	2.87466338
CH4	0.00004218
N2O	0.00003970
CO2 eqv	2.88785549

Scenario Year: **2024**
All model years in the range 1980 to 2024

Passenger Vehicles (pounds/mile)	
CO	0.00358611
NOx	0.00030721
ROG	0.00045136
SOx	0.00001080
PM10	0.00009676
PM2.5	0.00006410
CO2	1.11061572
CH4	0.00003781
N2O	0.00005881
CO2 eqv	1.12964186

Delivery Trucks (pounds/mile)	
CO	0.00625076
NOx	0.00647083
ROG	0.00096578
SOx	0.00002807
PM10	0.00029407
PM2.5	0.00021880
CO2	2.88010717
CH4	0.00004019
N2O	0.00003782
CO2 eqv	2.89267641

Scenario Year: **2025**
All model years in the range 1981 to 2025

Passenger Vehicles (pounds/mile)	
CO	0.00342738
NOx	0.00028846
ROG	0.00043545
SOx	0.00001070
PM10	0.00009679
PM2.5	0.00006418
CO2	1.11078571
CH4	0.00003641
N2O	0.00005663
CO2 eqv	1.12910559

Delivery Trucks (pounds/mile)	
CO	0.00595363
NOx	0.00615945
ROG	0.00092178
SOx	0.00002761
PM10	0.00028425
PM2.5	0.00020958
CO2	2.88143570
CH4	0.00003765
N2O	0.00003543
CO2 eqv	2.89321111

Scenario Year: **2026**
All model years in the range 1982 to 2026

Passenger Vehicles (pounds/mile)	
CO	0.00328779
NOx	0.00027141
ROG	0.00042052
SOx	0.00001076
PM10	0.00009687
PM2.5	0.00006415
CO2	1.11105829
CH4	0.00003518
N2O	0.00005472
CO2 eqv	1.12876023

Delivery Trucks (pounds/mile)	
CO	0.00569435
NOx	0.00589869
ROG	0.00088403
SOx	0.00002716
PM10	0.00027657
PM2.5	0.00020187
CO2	2.88298299
CH4	0.00003581
N2O	0.00003370
CO2 eqv	2.89418178

Notes:
SCAQMD 2008
HHD-DSL composite includes tire & brake wear
N_2O & CO_2 eqv per Inventory of U.S. GHG Emissions & Sinks - Annex 3 (EPA 2012)

Highest (Most Conservative) EMFAC2007 (version 2.3)
Emission Factors for On-Road Heavy-Heavy-Duty Diesel Trucks
Projects in the SCAQMD (Scenario Years 2011 - 2026)
Derived from Peak Emissions Inventory (**Winter**, **Annual**, **Summer**)

Vehicle Class:
Heavy-Heavy-Duty Diesel Trucks (33,001 to 60,000 pounds)

The following emission factors were compiled by running the California Air Resources Board's EMFAC2007 (version 2.3) Burden Model and extracting the **Heavy-Heavy-Duty Diesel Truck (HHDT)** Emission Factors.

These emission factors can be used to calculate on-road mobile source emissions for the vehicle/emission categories listed in the tables below, by use of the following equation:

Emissions (pounds per day) = N x TL x EF

where N = number of trips, TL = trip length (miles/day), and EF = emission factor (pounds per mile)

The **HHDT-DSL** vehicle/emission category accounts for all emissions from heavy-heavy-duty diesel trucks, including start, running and idling exhaust. In addition, ROG emission factors account for diurnal, hot soak, running and resting emissions, and the PM10 & PM2.5 emission factors account for tire and brake wear.

The **HHDT-DSL, Exh** vehicle/emission category includes only the exhaust portion of PM10 & PM2.5 emissions from heavy-heavy-duty diesel trucks.

Scenario Year: **2011**
All model years in the range 1967 to 2011

HHDT-DSL (pounds/mile)	
CO	0.01112463
NOx	0.03455809
ROG	0.00279543
SOx	0.00003972
PM10	0.00166087
PM2.5	0.00144489
CO2	4.22045680
CH4	0.00012910
N2O	0.00012150
CO2 eqv	4.26083358

HHDT-DSL, Exh (pounds/mile)	
PM10	0.00151936
PM2.5	0.00139772

Scenario Year: **2012**
All model years in the range 1968 to 2012

HHDT-DSL (pounds/mile)	
CO	0.01021519
NOx	0.03092379
ROG	0.00252764
SOx	0.00004042
PM10	0.00149566
PM2.5	0.00129354
CO2	4.21590774
CH4	0.00011651
N2O	0.00010966
CO2 eqv	4.25234923

HHDT-DSL, Exh (pounds/mile)	
PM10	0.00135537
PM2.5	0.00124837

Scenario Year: **2013**
All model years in the range 1969 to 2013

HHDT-DSL (pounds/mile)	
CO	0.00931790
NOx	0.02742935
ROG	0.00226308
SOx	0.00004086
PM10	0.00133697
PM2.5	0.00114629
CO2	4.21518556
CH4	0.00010441
N2O	0.00009827
CO2 eqv	4.24784287

HHDT-DSL, Exh (pounds/mile)	
PM10	0.00119623
PM2.5	0.00109863

Scenario Year: **2014**
All model years in the range 1970 to 2014

HHDT-DSL (pounds/mile)	
CO	0.00846435
NOx	0.02418049
ROG	0.00201594
SOx	0.00004092
PM10	0.00118458
PM2.5	0.00100582
CO2	4.21279345
CH4	0.00009261
N2O	0.00008716
CO2 eqv	4.24175938

HHDT-DSL, Exh (pounds/mile)	
PM10	0.00104243
PM2.5	0.00096059

Scenario Year: **2015**

All model years in the range 1971 to 2015

HHDT-DSL (pounds/mile)	
CO	0.00766891
NOx	0.02122678
ROG	0.00178608
SOx	0.00004082
PM10	0.00104715
PM2.5	0.00087977
CO2	4.20902225
CH4	0.00008369
N2O	0.00007877
CO2 eqv	4.23519770

HHDT-DSL, Exh (pounds/mile)	
PM10	0.00090631
PM2.5	0.00083282

Scenario Year: **2016**

All model years in the range 1972 to 2016

HHDT-DSL (pounds/mile)	
CO	0.00704604
NOx	0.01887374
ROG	0.00161035
SOx	0.00003952
PM10	0.00094448
PM2.5	0.00078443
CO2	4.21063031
CH4	0.00007508
N2O	0.00007067
CO2 eqv	4.23411393

HHDT-DSL, Exh (pounds/mile)	
PM10	0.00080419
PM2.5	0.00073898

Scenario Year: **2017**

All model years in the range 1973 to 2017

HHDT-DSL (pounds/mile)	
CO	0.00650533
NOx	0.01690387
ROG	0.00145203
SOx	0.00004033
PM10	0.00084894
PM2.5	0.00069721
CO2	4.20820129
CH4	0.00006722
N2O	0.00006327
CO2 eqv	4.22922648

HHDT-DSL, Exh (pounds/mile)	
PM10	0.00070873
PM2.5	0.00065111

Scenario Year: **2018**

All model years in the range 1974 to 2018

HHDT-DSL (pounds/mile)	
CO	0.00604721
NOx	0.01526414
ROG	0.00131697
SOx	0.00003934
PM10	0.00076808
PM2.5	0.00062383
CO2	4.20756838
CH4	0.00006182
N2O	0.00005818
CO2 eqv	4.22690378

HHDT-DSL, Exh (pounds/mile)	
PM10	0.00062758
PM2.5	0.00057700

Scenario Year: **2019**

All model years in the range 1975 to 2019

HHDT-DSL (pounds/mile)	
CO	0.00565433
NOx	0.01389113
ROG	0.00120235
SOx	0.00004032
PM10	0.00070198
PM2.5	0.00056085
CO2	4.20637830
CH4	0.00005499
N2O	0.00005175
CO2 eqv	4.22357577

HHDT-DSL, Exh (pounds/mile)	
PM10	0.00056085
PM2.5	0.00051320

Scenario Year: **2020**

All model years in the range 1976 to 2020

HHDT-DSL (pounds/mile)	
CO	0.00532242
NOx	0.01274755
ROG	0.00110621
SOx	0.00003957
PM10	0.00064574
PM2.5	0.00050904
CO2	4.20541416
CH4	0.00005216
N2O	0.00004909
CO2 eqv	4.22172889

HHDT-DSL, Exh (pounds/mile)	
PM10	0.00050364
PM2.5	0.00046227

Scenario Year: **2021**
All model years in the range 1977 to 2021

HHDT-DSL (pounds/mile)	
CO	0.00503726
NOx	0.01179977
ROG	0.00103095
SOx	0.00004033
PM10	0.00059437
PM2.5	0.00046287
CO2	4.21495573
CH4	0.00004734
N2O	0.00004455
CO2 eqv	4.22976181

HHDT-DSL, Exh (pounds/mile)	
PM10	0.00045411
PM2.5	0.00041729

Scenario Year: **2022**
All model years in the range 1978 to 2022

HHDT-DSL (pounds/mile)	
CO	0.00478830
NOx	0.01098794
ROG	0.00096142
SOx	0.00004106
PM10	0.00055427
PM2.5	0.00042597
CO2	4.21520828
CH4	0.00004448
N2O	0.00004186
CO2 eqv	4.22911963

HHDT-DSL, Exh (pounds/mile)	
PM10	0.00041399
PM2.5	0.00037807

Scenario Year: **2023**
All model years in the range 1979 to 2023

HHDT-DSL (pounds/mile)	
CO	0.00457902
NOx	0.01031407
ROG	0.00090210
SOx	0.00004009
PM10	0.00052122
PM2.5	0.00039592
CO2	4.21483461
CH4	0.00004176
N2O	0.00003931
CO2 eqv	4.22789696

HHDT-DSL, Exh (pounds/mile)	
PM10	0.00037922
PM2.5	0.00034915

Scenario Year: **2024**
All model years in the range 1980 to 2024

HHDT-DSL (pounds/mile)	
CO	0.00444444
NOx	0.00974372
ROG	0.00084009
SOx	0.00003930
PM10	0.00050766
PM2.5	0.00038320
CO2	4.19552935
CH4	0.00003930
N2O	0.00003699
CO2 eqv	4.20782175

HHDT-DSL, Exh (pounds/mile)	
PM10	0.00036682
PM2.5	0.00033735

Scenario Year: **2025**
All model years in the range 1981 to 2025

HHDT-DSL (pounds/mile)	
CO	0.00431086
NOx	0.00932573
ROG	0.00080206
SOx	0.00004018
PM10	0.00048541
PM2.5	0.00036326
CO2	4.19512979
CH4	0.00003697
N2O	0.00003479
CO2 eqv	4.20669226

HHDT-DSL, Exh (pounds/mile)	
PM10	0.00034397
PM2.5	0.00031664

Scenario Year: **2026**
All model years in the range 1982 to 2026

HHDT-DSL (pounds/mile)	
CO	0.00420297
NOx	0.00898990
ROG	0.00077178
SOx	0.00003946
PM10	0.00046717
PM2.5	0.00034564
CO2	4.19349747
CH4	0.00003630
N2O	0.00003417
CO2 eqv	4.20485099

HHDT-DSL, Exh (pounds/mile)	
PM10	0.00032670
PM2.5	0.00029830

Notes:
SCAQMD 2008
HHD-DSL composite includes tire & brake wear
N_2O & CO_2 eqv per Inventory of U.S. GHG Emissions & Sinks - Annex 3 (EPA 2012)