

## **APPENDIX P**

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## **AIR EMISSIONS CALCULATIONS**



## ESTIMATED EMISSIONS FROM STORAGE POND CONSTRUCTION

Construction Imports Inputs						
<b>Total days Allowed for Project</b>			600.00			
<b>Total Days Allowed for Construction (Days)</b>			600.00			
<b>Total Site Acres (Acres)</b>			802.00			
<b>Number of Employees</b>			25			
<b>Average Trip Length One Way POV (Miles)</b>			30			
<b>Total Work Hours Per Day (Hours/Day)</b>			8			
<b>Daily Number of Haul Trucks</b>			2			
<b>Average Trip Length One Way Haul Trucks (Miles)</b>			15			
<b>Total VMT Water Trucks per day (Miles)</b>			30			
<b>Total VMT Dump Trucks per day (Miles)</b>			0			
<b>Total Number of Each Equipment used for Construction</b>						
# of equipment	2	0	0	0	0	1
Hours per Day	8	0	0	0	0	8
Days in Operation	413	0	0	0	0	450
Miles Per Hour	1					
	scraper diesel	forklift diesel	compressor diesel	boom truck diesel	welder diesel	backhoe diesel
# of equipment	1	2	0	0	0	0
Hours per Day	8	8	0	0	0	0
Days in Operation	413	413	0	0	0	0
Miles Per Hour	1					
	loaders diesel	crawler dozer diesel	mortor mix diesel	roller diesel	paver diesel	trencher diesel
<b>Assumptions Used in EMFAC2002</b>						
% LDA	66.00%			Daily VMT LDA & LDT	1530.000	
%LDT	34.00%			Daily VMT Haul Truck	60	
Season	summer					
<b>EMFAC2002 Inputs</b>						
		LDA	LDT	HDD		
		Grams/Mile	Grams/Mile	Grams/Mile		
Carbon Monoxide (CO)		3.02	3.6	2.9		
Reactive Organic Compounds (ROC)		0.19	0.2	0.65		
Nitrogen Oxides (NOx)		0.25	0.3	15.97		
Particulates (PM10)		0.01	0.01	0.26		

Source: EMFAC2002

## Vehicle Exhaust Emissions from POV, Construction

### Construction Workers POV Emissions

	EMFAC Emissions	
	Factor. Grams/Mile	Est. Emissions lbs/day
Carbon Monoxide (CO)	3.2172	10.84
Reactive Organic Compounds (ROC)	0.1934	0.65
Nitrogen Oxides (NOx)	0.267	0.90
Particulates (PM10)	0.01	0.03

Source: Emission Factors From EMFAC2002

### Haul Truck Emissions

	EMFAC Emissions	
	Factor. Grams/Mile	Est. Emissions lbs/day
Carbon Monoxide (CO)	2.9	0.38
Reactive Organic Compounds (ROC)	0.65	0.09
Nitrogen Oxides (NOx)	15.97	2.11
Sulfur Oxides (SOx)	NA	0
Particulates (PM10)	0.26	0.03

Source: EMFAC2002

### Construction Equipment Emissions

	scraper	forklift	compressor	boom truck	welder	backhoe	Total Emissions lbs/day
	500 hp diesel	175 hp diesel	50 hp diesel	175 hp diesel	50 hp diesel	120 hp diesel	
	lbs/hour	lbs/hour	lbs/hour	lbs/hour	lbs/hour	lbs/hour	
Carbon Monoxide (CO)	0.62	0.24	0.55	0.2	0.55	0.11	7.5
Reactive Organic Compounds (ROC)	0.24	0.13	0.1	0.11	0.1	0.06	3.0
Nitrogen Oxides (NOx)	4.82	2.24	0.9	1.85	0.9	1.01	59.1
Particulates (PM10)	0.10	0.05	0.05	0.05	0.05	0.02	1.2

	loaders	crawler dozer	mortor mixer	roller	paver	crane	Total Emissions lbs/day
	175 hp diesel	250 hp diesel	50 hp diesel	120 hp diesel	175 hp diesel	175 hp diesel	
	lbs/hour	lbs/hour	lbs/hour	lbs/hour	lbs/hour	lbs/hour	
Carbon Monoxide (CO)	0.23	0.31	0.5	0.12	0.24	0.22	4.7
Reactive Organic Compounds (ROC)	0.12	0.16	0.1	0.06	0.13	0.11	2.4
Nitrogen Oxides (NOx)	2.07	2.79	1.2	1.13	2.22	2.01	42.1
Particulates (PM10)	0.05	0.07	0.05	0.03	0.05	0.05	1.0

Source: ARB Emission Inventory Publication Number MO99\_32.3 Table 13 released: 2000

Source: ARB Inventory Publication MO99\_32.5 App. B released: 2000

### Total PM10 Fugitive Dust Emissions from construction

Air Pollutant	Emission Factor	Unmitigated Emissions	Mitigation Efficiency	Est. Emissions (lbs/day)
Particulates (PM10) Loaders*	0.000035 lb/ton	0.09996 lb/day	50%	0.0
Particulates (PM10) Bulldozer**	2.4 lb/hr	38.4 lb/day	50%	19
Particulates (PM10) Scraper***	4.3 lb/vmt	68.8 lb/day	50%	34.4
Particulates (PM10) Backhoe****	0.000035 lb/ton	0.04816 lb/day	50%	0.0
Particulates (PM10) Trencher*****	0.000035 lb/ton	0 lb/day	50%	0.0
Particulates (PM10) POV & Haul Truck	0.42 gm/mile			1.47
<b>Total Particulates</b>				<b>55</b>

\* Aggregate Batch Drop Equation AP-42, 13.2.4-3 (1) Assume mean wind speed = 1.6475 mph, 7.9% soil moisture content & 280 cubic yards per hour per loader, 1 cubic yard = 2550 pounds.

\*\* Bulldozing Overburden Equation Table 11.9-1 AP-42 Assume 15% silt content, 7.9 % soil moisture content

\*\*\* Cut and Fill Operations with 15 Cubic Meter Pan Scraper Equation SCAQMD CEQA Air Quality Handbook, Table A9-9

\*\*\*\* Aggregate Batch Drop Equation AP-42, 13.2.4-3 (1) Assume mean wind speed = 1.6475 mph, 7.9% soil moisture content & 135 cubic yards per hour per backhoe, 1 cubic yard = 2550 pounds.

\*\*\*\*\* Aggregate Batch Drop Equation AP-42, 13.2.4-3 (1) Assume mean wind speed = 1.6475 mph, 7.9% soil moisture content & 135 cubic yards per hour per Trencher, 1 cubic yard = 2550 pounds.

Source: Table 11.9-1 EPA AP-42

\*Source: ARB Recommended

### Volatile Organic Compounds from Architectural Coatings

Square Footage per day	Coating Equivalent	Equivalent Square Footage
1500 ft <sup>2</sup> /day	2	3000 ft <sup>2</sup> /day
Paint Coating Factor	Paint VOC Content	
400 ft <sup>2</sup> /day	2.08 lb/gal	
	Total Commercial VOC from Architectural Coatings	
	15.6 lb/day VOC	

Source: SCAQMD Recommended

### Reactive Organic Compounds From Street Paving

Asphalt ROC Emission Factor*	2.62 lb/acre
Total Acres Being Paved	1 acres/day
Total ROC from Paving	2.62 lb/day ROC

\*Source: Urbemis 7G Asphalt Emission Factor

### Total Air Emissions from Construction Including POV, Fugitive Dust, and

Air Pollutant	Est. Emissions (lbs/day)	AVAQMD Thresholds (lbs/day)	Significant?
Carbon Monoxide (CO)	23.39	548.00	NO
Reactive Organic Compounds (ROC)	24.38	137.00	NO
Nitrogen Oxides (NOx)	104.28	137.00	NO
Particulates (PM10)	57.48	82.00	NO

Source: EMFAC2002 and SCAQMD CEQA Air Quality Handbook

## ESTIMATED EMISSIONS FROM ACTIVATED SLUDGE TREATMENT

Construction Imports Inputs						
<b>Total days Allowed for Project</b>			480.00			
<b>Total Days Allowed for Construction (Days)</b>			480.00			
<b>Total Site Acres (Acres)</b>			5.00			
<b>Number of Employees</b>			50			
<b>Average Trip Length One Way POV (Miles)</b>			30			
<b>Total Work Hours Per Day (Hours/Day)</b>			8			
<b>Daily Number of Haul and Concrete Trucks</b>			20			
<b>Average Trip Length One Way Haul Trucks (Miles)</b>			15			
<b>Total VMT Water Trucks per day (Miles)</b>			5			
<b>Total VMT Dump Trucks per day (Miles)</b>			0			
<b>Total Number of Each Equipment used for Construction</b>						
# of equipment	1	1	0	0	0	1
Hours per Day	8	2	0	0	0	8
Days in Operation	45	15	0	0	0	75
Miles Per Hour	1					
	scraper diesel	forklift diesel	compressor diesel	boom truck diesel	welder diesel	backhoe diesel
# of equipment	1	1	0	0	0	0
Hours per Day	8	8	0	0	0	0
Days in Operation	75	75	0	0	0	0
Miles Per Hour	1					
	loaders diesel	crawler dozer diesel	mortor mix diesel	roller diesel	paver diesel	trencher diesel
<b>Assumptions Used in EMFAC2002</b>						
% LDA	66.00%			Daily VMT LDA & LDT	3005.000	
%LDT	34.00%			Daily VMT Haul Truck	600	
Season	summer					
<b>EMFAC2002 Inputs</b>						
		LDA	LDT	HDD		
		Grams/Mile	Grams/Mile	Grams/Mile		
Carbon Monoxide (CO)		3.02	3.6	2.9		
Reactive Organic Compounds (ROC)		0.19	0.2	0.65		
Nitrogen Oxides (NOx)		0.25	0.3	15.97		
Particulates (PM10)		0.01	0.01	0.26		

Source: EMFAC2002

## Vehicle Exhaust Emissions from POV, Construction

### Construction Workers POV Emissions

	EMFAC Emissions	
	Factor. Grams/Mile	Est. Emissions lbs/day
Carbon Monoxide (CO)	3.2172	21.29
Reactive Organic Compounds (ROC)	0.1934	1.28
Nitrogen Oxides (NOx)	0.267	1.77
Particulates (PM10)	0.01	0.07

Source: Emission Factors From EMFAC2002

### Haul Truck Emissions

	EMFAC Emissions	
	Factor. Grams/Mile	Est. Emissions lbs/day
Carbon Monoxide (CO)	2.9	3.83
Reactive Organic Compounds (ROC)	0.65	0.86
Nitrogen Oxides (NOx)	15.97	21.11
Sulfur Oxides (SOx)	NA	0
Particulates (PM10)	0.26	0.34

Source: EMFAC2002

### Construction Equipment Emissions

	scraper	forklift	compressor	boom truck	welder	backhoe	Total Emissions lbs/day
	500 hp diesel	175 hp diesel	50 hp diesel	175 hp diesel	50 hp diesel	120 hp diesel	
	lbs/hour	lbs/hour	lbs/hour	lbs/hour	lbs/hour	lbs/hour	
Carbon Monoxide (CO)	0.62	0.24	0.55	0.2	0.55	0.11	0.6
Reactive Organic Compounds (ROC)	0.24	0.13	0.1	0.11	0.1	0.06	0.3
Nitrogen Oxides (NOx)	4.82	2.24	0.9	1.85	0.9	1.01	5.0
Particulates (PM10)	0.10	0.05	0.05	0.05	0.05	0.02	0.1

	loaders	crawler dozer	mortor mixer	roller	paver	crane	Total Emissions lbs/day
	175 hp diesel	250 hp diesel	50 hp diesel	120 hp diesel	175 hp diesel	175 hp diesel	
	lbs/hour	lbs/hour	lbs/hour	lbs/hour	lbs/hour	lbs/hour	
Carbon Monoxide (CO)	0.23	0.31	0.5	0.12	0.24	0.22	0.7
Reactive Organic Compounds (ROC)	0.12	0.16	0.1	0.06	0.13	0.11	0.4
Nitrogen Oxides (NOx)	2.07	2.79	1.2	1.13	2.22	2.01	6.1
Particulates (PM10)	0.05	0.07	0.05	0.03	0.05	0.05	0.2

Source: ARB Emission Inventory Publication Number MO99\_32.3 Table 13 released: 2000

Source: ARB Inventory Publication MO99\_32.5 App. B released: 2000

Total PM10 Fugitive Dust Emissions from construction					
Air Pollutant	Emission Factor		Unmitigated Emissions	Mitigation Efficiency	Est. Emissions (lbs/day)
Particulates (PM10) Loaders*	0.000035 lb/ton		0.09996 lb/day	50%	0.0
Particulates (PM10) Bulldozer**	2.4 lb/hr		19.2 lb/day	50%	10
Particulates (PM10) Scraper***	4.3 lb/vmt		34.4 lb/day	50%	17.2
Particulates (PM10) Backhoe****	0.000035 lb/ton		0.04816 lb/day	50%	0.0
Particulates (PM10) Trencher*****	0.000035 lb/ton		0 lb/day	50%	0.0
Particulates (PM10) POV & Haul Truck	0.42 gm/mile				3.34
Total Particulates					<b>30</b>

\* Aggregate Batch Drop Equation AP-42, 13.2.4-3 (1) Assume mean wind speed = 1.6475 mph, 7.9% soil moisture content & 280 cubic yards per hour per loader, 1 cubic yard = 2550 pounds.

\*\* Bulldozing Overburden Equation Table 11.9-1 AP-42 Assume 15% silt content, 7.9 % soil moisture content

\*\*\* Cut and Fill Operations with 15 Cubic Meter Pan Scraper Equation SCAQMD CEQA Air Quality Handbook, Table A9-9

\*\*\*\* Aggregate Batch Drop Equation AP-42, 13.2.4-3 (1) Assume mean wind speed = 1.6475 mph, 7.9% soil moisture content & 135 cubic yards per hour per backhoe, 1 cubic yard = 2550 pounds.

\*\*\*\*\* Aggregate Batch Drop Equation AP-42, 13.2.4-3 (1) Assume mean wind speed = 1.6475 mph, 7.9% soil moisture content & 135 cubic yards per hour per Trencher, 1 cubic yard = 2550 pounds.

Source: Table 11.9-1 EPA AP-42

\*Source: ARB Recommended

Volatile Organic Compounds from Architectural Coatings		
Square Footage per day	Coating Equivalent	Equivalent Square Footage
1500 ft <sup>2</sup> /day	2	3000 ft <sup>2</sup> /day
Paint Coating Factor	Paint VOC Content	
400 ft <sup>2</sup> /day	2.08 lb/gal	
	Total Commercial VOC from Architectural Coatings	
	15.6 lb/day VOC	

Source: SCAQMD Recommended

Reactive Organic Compounds From Street Paving	
Asphalt ROC Emission Factor*	2.62 lb/acre
Total Acres Being Paved	1 acres/day
Total ROC from Paving	2.62 lb/day ROC

\*Source: Urbemis 7G Asphalt Emission Factor

Total Air Emissions from Construction Including POV, Fugitive Dust, and			
Air Pollutant	Est. Emissions (lbs/day)	AVAQMD Thresholds (lbs/day)	Significant?
Carbon Monoxide (CO)	26.42	548.00	NO
Reactive Organic Compounds (ROC)	20.97	137.00	NO
Nitrogen Oxides (NOx)	33.97	137.00	NO
Particulates (PM10)	30.87	82.00	NO

Source: EMFAC2002 and SCAQMD CEQA Air Quality Handbook



## ESTIMATED EMISSIONS FROM PIPELINE CONSTRUCTION

Construction Imports Inputs						
<b>Total days Allowed for Project</b>		360.00				
<b>Total Days Allowed for Construction (Days)</b>		360.00				
<b>Total Site Acres (Acres)</b>		0.00				
<b>Number of Employees</b>		15				
<b>Average Trip Length One Way POV (Miles)</b>		30				
<b>Total Work Hours Per Day (Hours/Day)</b>		8				
<b>Daily Number of Haul Trucks</b>		15				
<b>Average Trip Length One Way Haul Trucks (Miles)</b>		15				
<b>Total VMT Water Trucks per day (Miles)</b>		100				
<b>Total VMT Work Trucks per day (Miles)</b>		90				
<b>Total Number of Each Equipment used for Construction</b>						
# of equipment	1	0	0	0	0	1
Hours per Day	8	0	0	0	0	8
Days in Operation	300	0	0	0	0	300
Miles Per Hour	2					2
	excavator diesel	forklift diesel	compressor diesel	boom truck diesel	welder diesel	backhoe diesel
# of equipment	1	0	0	0	0	0
Hours per Day	8	0	0	0	0	0
Days in Operation	300	0	0	0	0	0
Miles Per Hour	2					
	loaders diesel	crawler dozer diesel	mortor mix diesel	roller diesel	paver diesel	crane diesel
<b>Assumptions Used in EMFAC2002</b>						
% LDA	66.00%			Daily VMT LDA & LDT	1090.000	
%LDT	34.00%			Daily VMT Haul Truck	450	
Season	summer					
<b>EMFAC2002 Inputs</b>						
		LDA	LDT	HDD		
		Grams/Mile	Grams/Mile	Grams/Mile		
Carbon Monoxide (CO)		3.02	3.6	2.9		
Reactive Organic Compounds (ROC)		0.19	0.2	0.65		
Nitrogen Oxides (NOx)		0.25	0.3	15.97		
Particulates (PM10)		0.01	0.01	0.26		

Source: EMFAC2002

## Vehicle Exhaust Emissions from POV, Construction

### Construction Workers POV Emissions

	EMFAC Emissions	
	Factor. Grams/Mile	Est. Emissions lbs/day
Carbon Monoxide (CO)	3.2172	7.72
Reactive Organic Compounds (ROC)	0.1934	0.46
Nitrogen Oxides (NOx)	0.267	0.64
Particulates (PM10)	0.01	0.02

Source: Emission Factors From EMFAC2002

### Haul Truck Emissions

	EMFAC Emissions	
	Factor. Grams/Mile	Est. Emissions lbs/day
Carbon Monoxide (CO)	2.9	2.87
Reactive Organic Compounds (ROC)	0.65	0.64
Nitrogen Oxides (NOx)	15.97	15.83
Sulfur Oxides (SOx)	NA	0
Particulates (PM10)	0.26	0.26

Source: EMFAC2002

### Construction Equipment Emissions

	excavator	forklift	compressor	boom truck	welder	backhoe	Total Emissions lbs/day
	500 hp diesel	175 hp diesel	50 hp diesel	175 hp diesel	50 hp diesel	120 hp diesel	
	lbs/hour	lbs/hour	lbs/hour	lbs/hour	lbs/hour	lbs/hour	
Carbon Monoxide (CO)	0.57	0.24	0.55	0.2	0.55	0.11	4.5
Reactive Organic Compounds (ROC)	0.21	0.13	0.1	0.11	0.1	0.06	1.8
Nitrogen Oxides (NOx)	4.43	2.24	0.9	1.85	0.9	1.01	36.3
Particulates (PM10)	0.09	0.05	0.05	0.05	0.05	0.02	0.7

	loaders	crawler dozer	mortor mixer	roller	paver	crane	Total Emissions lbs/day
	175 hp diesel	250 hp diesel	50 hp diesel	120 hp diesel	175 hp diesel	175 hp diesel	
	lbs/hour	lbs/hour	lbs/hour	lbs/hour	lbs/hour	lbs/hour	
Carbon Monoxide (CO)	0.23	0.31	0.5	0.12	0.24	0.22	1.5
Reactive Organic Compounds (ROC)	0.12	0.16	0.1	0.06	0.13	0.11	0.8
Nitrogen Oxides (NOx)	2.07	2.79	1.2	1.13	2.22	2.01	13.8
Particulates (PM10)	0.05	0.07	0.05	0.03	0.05	0.05	0.3

Source: ARB Emission Inventory Publication Number MO99\_32.3 Table 13 released: 2000

Source: ARB Inventory Publication MO99\_32.5 App. B released: 2000

### Total PM10 Fugitive Dust Emissions from construction

Air Pollutant	Emission Factor	Unmitigated Emissions	Mitigation Efficiency	Est. Emissions (lbs/day)
Particulates (PM10) Loaders*	0.000035 lb/ton	0.09996 lb/day	50%	0.0
Particulates (PM10) Bulldozer**	2.4 lb/hr	0 lb/day	50%	0
Particulates (PM10) Scraper***	4.3 lb/vmt	68.8 lb/day	50%	34.4
Particulates (PM10) Backhoe****	0.000035 lb/ton	0.04816 lb/day	50%	0.0
Particulates (PM10) Trencher*****	0.000035 lb/ton	0 lb/day	50%	0.0
Particulates (PM10) POV & Haul Truck	0.42 gm/mile			1.42
<b>Total Particulates</b>				<b>36</b>

\* Aggregate Batch Drop Equation AP-42, 13.2.4-3 (1) Assume mean wind speed = 1.6475 mph, 7.9% soil moisture content & 280 cubic yards per hour per loader, 1 cubic yard = 2550 pounds.

\*\* Bulldozing Overburden Equation Table 11.9-1 AP-42 Assume 15% silt content, 7.9 % soil moisture content

\*\*\* Cut and Fill Operations with 15 Cubic Meter Pan Scraper Equation SCAQMD CEQA Air Quality Handbook, Table A9-9

\*\*\*\* Aggregate Batch Drop Equation AP-42, 13.2.4-3 (1) Assume mean wind speed = 1.6475 mph, 7.9% soil moisture content & 135 cubic yards per hour per backhoe, 1 cubic yard = 2550 pounds.

\*\*\*\*\* Aggregate Batch Drop Equation AP-42, 13.2.4-3 (1) Assume mean wind speed = 1.6475 mph, 7.9% soil moisture content & 135 cubic yards per hour per Trencher, 1 cubic yard = 2550 pounds.

Source: Table 11.9-1 EPA AP-42

\*Source: ARB Recommended

### Volatile Organic Compounds from Architectural Coatings

Square Footage per day	Coating Equivalent	Equivalent Square Footage
1500 ft <sup>2</sup> /day	2	3000 ft <sup>2</sup> /day
Paint Coating Factor	Paint VOC Content	
400 ft <sup>2</sup> /day	2.08 lb/gal	
	Total Commercial VOC from Architectural Coatings	
	15.6 lb/day VOC	

Source: SCAQMD Recommended

### Reactive Organic Compounds From Street Paving

Asphalt ROC Emission Factor*	2.62 lb/acre
Total Acres Being Paved	1 acres/day
Total ROC from Paving	2.62 lb/day ROC

\*Source: Urbemis 7G Asphalt Emission Factor

### Total Air Emissions from Construction Including POV, Fugitive Dust, and

Air Pollutant	Est. Emissions (lbs/day)	AVAQMD Thresholds (lbs/day)	Significant?
Carbon Monoxide (CO)	16.67	548.00	NO
Reactive Organic Compounds (ROC)	21.93	137.00	NO
Nitrogen Oxides (NOx)	66.54	137.00	NO
Particulates (PM10)	37.25	82.00	NO

Source: EMFAC2002 and SCAQMD CEQA Air Quality Handbook

## ESTIMATED EMISSIONS FROM AGRICULTURAL TRANSFORMATION

Construction Imports Inputs						
<b>Total days Allowed for Project</b>	120.00					
<b>Total Days Allowed for Construction (Days)</b>	120.00					
<b>Total Site Acres (Acres)</b>	0.00					
<b>Number of Employees</b>	15					
<b>Average Trip Length One Way POV (Miles)</b>	30					
<b>Total Work Hours Per Day (Hours/Day)</b>	8					
<b>Daily Number of Haul Trucks</b>	10					
<b>Average Trip Length One Way Haul Trucks (Miles)</b>	15					
<b>Total VMT Water Trucks per day (Miles)</b>	5					
<b>Total VMT Dump Trucks per day (Miles)</b>	0					
<b>Total Number of Each Equipment used for Construction</b>						
# of equipment	2	0	0	0	0	0
Hours per Day	8	0	0	0	0	0
Days in Operation	120	0	0	0	0	0
Miles Per Hour	3					
	tractor	forklift	compressor	boom truck	welder	backhoe
	diesel	diesel	diesel	diesel	diesel	diesel
# of equipment	4	4	0	0	0	1
Hours per Day	4	4	0	0	0	8
Days in Operation	60	60	0	0	0	60
Miles Per Hour						0
	loaders	dozer	mortor mix	roller	paver	crane
	diesel	diesel	diesel	diesel	diesel	diesel
<b>Assumptions Used in EMFAC2002</b>						
% LDA	66.00%			Daily VMT LDA & LDT	905.000	
% LDT	34.00%			Daily VMT Haul Truck	300	
Season	summer					
<b>EMFAC2002 Inputs</b>						
		LDA	LDT	HDD		
		Grams/Mile	Grams/Mile	Grams/Mile		
Carbon Monoxide (CO)		3.02	3.6	2.9		
Reactive Organic Compounds (ROC)		0.19	0.2	0.65		
Nitrogen Oxides (NOx)		0.25	0.3	15.97		
Particulates (PM10)		0.01	0.01	0.26		

Source: EMFAC2002

## Vehicle Exhaust Emissions from POV, Construction

### Construction Workers POV Emissions

	EMFAC Emissions	
	Factor. Grams/Mile	Est. Emissions lbs/day
Carbon Monoxide (CO)	3.2172	6.41
Reactive Organic Compounds (ROC)	0.1934	0.39
Nitrogen Oxides (NOx)	0.267	0.53
Particulates (PM10)	0.01	0.02

Source: Emission Factors From EMFAC2002

### Haul Truck Emissions

	EMFAC Emissions	
	Factor. Grams/Mile	Est. Emissions lbs/day
Carbon Monoxide (CO)	2.9	1.92
Reactive Organic Compounds (ROC)	0.65	0.43
Nitrogen Oxides (NOx)	15.97	10.55
Sulfur Oxides (SOx)	NA	0
Particulates (PM10)	0.26	0.17

Source: EMFAC2002

### Construction Equipment Emissions

	scraper	forklift	compressor	boom truck	welder	backhoe	Total
	500 hp diesel	175 hp diesel	50 hp diesel	175 hp diesel	50 hp diesel	120 hp diesel	Emissions
	lbs/hour	lbs/hour	lbs/hour	lbs/hour	lbs/hour	lbs/hour	lbs/day
Carbon Monoxide (CO)	0.62	0.24	0.55	0.2	0.55	0.11	9.9
Reactive Organic Compounds (ROC)	0.24	0.13	0.1	0.11	0.1	0.06	3.8
Nitrogen Oxides (NOx)	4.82	2.24	0.9	1.85	0.9	1.01	77.1
Particulates (PM10)	0.10	0.05	0.05	0.05	0.05	0.02	1.6

	loaders	crawler dozer	mortor mixer	roller	paver	crane	Total
	175 hp diesel	250 hp diesel	50 hp diesel	120 hp diesel	175 hp diesel	175 hp diesel	Emissions
	lbs/hour	lbs/hour	lbs/hour	lbs/hour	lbs/hour	lbs/hour	lbs/day
Carbon Monoxide (CO)	0.23	0.31	0.5	0.12	0.24	0.22	5.2
Reactive Organic Compounds (ROC)	0.12	0.16	0.1	0.06	0.13	0.11	2.7
Nitrogen Oxides (NOx)	2.07	2.79	1.2	1.13	2.22	2.01	46.9
Particulates (PM10)	0.05	0.07	0.05	0.03	0.05	0.05	1.2

Source: ARB Emission Inventory Publication Number MO99\_32.3 Table 13 released: 2000

Source: ARB Inventory Publication MO99\_32.5 App. B released: 2000

Total PM10 Fugitive Dust Emissions from construction					
Air Pollutant	Emission Factor		Unmitigated Emissions	Mitigation Efficiency	Est. Emissions (lbs/day)
Particulates (PM10) Loaders*	0.000035 lb/ton		0.19992 lb/day	50%	0.1
Particulates (PM10) Bulldozer/Tractor**	2.4 lb/hr		76.8 lb/day	50%	38
Particulates (PM10) Scraper***	4.3 lb/vmt		0 lb/day	50%	0
Particulates (PM10) Backhoe****	0.000035 lb/ton		0 lb/day	50%	0.0
Particulates (PM10) Trencher*****	0.000035 lb/ton		0.04816 lb/day	50%	0.0
Particulates (PM10) POV & Haul Truck	0.42 gm/mile				1.11
Total Particulates					<b>40</b>

\* Aggregate Batch Drop Equation AP-42, 13.2.4-3 (1) Assume mean wind speed = 1.6475 mph, 7.9% soil moisture content & 280 cubic yards per hour per loader, 1 cubic yard = 2550 pounds.

\*\* Bulldozing Overburden Equation Table 11.9-1 AP-42 Assume 15% silt content, 7.9 % soil moisture content

\*\*\* Cut and Fill Operations with 15 Cubic Meter Pan Scraper Equation SCAQMD CEQA Air Quality Handbook, Table A9-9

\*\*\*\* Aggregate Batch Drop Equation AP-42, 13.2.4-3 (1) Assume mean wind speed = 1.6475 mph, 7.9% soil moisture content & 135 cubic yards per hour per backhoe, 1 cubic yard = 2550 pounds.

\*\*\*\*\* Aggregate Batch Drop Equation AP-42, 13.2.4-3 (1) Assume mean wind speed = 1.6475 mph, 7.9% soil moisture content & 135 cubic yards per hour per Trencher, 1 cubic yard = 2550 pounds.

Source: Table 11.9-1 EPA AP-42

\*Source: ARB Recommended

Total PM10 Fugitive Dust Emissions from Demolition		
Total Houses	Average Square Feet	Average Height
12	2000	20
Particulate (PM10) Emissions Factor Demolition 0.00042 lbs/cubic feet		
Average Daily Particulate Emissions Demolition		
		1.680 lb/day

Volatile Organic Compounds from Architectural Coatings		
Square Footage per day	Coating Equivalent	Equivalent Square Footage
1500 ft <sup>2</sup> /day	2	3000 ft <sup>2</sup> /day
Paint Coating Factor	Paint VOC Content	
400 ft <sup>2</sup> /day	2.08 lb/gal	
		Total Commercial VOC from Architectural Coatings
		15.6 lb/day VOC

Source: SCAQMD Recommended

Reactive Organic Compounds From Street Paving	
Asphalt ROC Emission Factor*	2.62 lb/acre
Total Acres Being Paved	1 acres/day
Total ROC from Paving	2.62 lb/day ROC

\*Source: Urbemis 7G Asphalt Emission Factor

### Total Air Emissions from Construction Including POV, Fugitive Dust, and

<u>Air Pollutant</u>	Est. Emissions (lbs/day)	AVAQMD Thresholds (lbs/day)	Significant?
Carbon Monoxide (CO)	<b>23.45</b>	548.00	NO
Reactive Organic Compounds (ROC)	<b>25.56</b>	137.00	NO
Nitrogen Oxides (NOx)	<b>135.13</b>	137.00	NO
Particulates (PM10)	<b>44.27</b>	82.00	NO

Source: EMFAC2002 and SCAQMD CEQA Air Quality Handbook

	FLARE	BOILER	ICE	PRESSURE WASHER
	LBS/mm scf	LBS/mm scf	LBS/1000 gal	LBS/1000 gal
CO	2	0.6	130.18	5
NOX	39.1	23.9	604.3	20
PM10	8.3	8.9	42.48	3.3
SO2	4.1	4.1	7.1	7.1
TOG	3	4.1	58.9	7.1

	MMscf	MMscf	gal	gal
FUEL BURNED IN 2000	34.85	7.63	1680	25.6

	FLARE	BOILER	ICE	PRESSUR	TOTAL 2000	TOTAL 2025
	LBS/DAY	LBS/DAY	LBS/DAY	LBS/DAY	LBS/DAY	LBS/DAY
CO	0.1909589	0.012542	0.599185	0.000351	0.803037	1.998669
NOX	3.73324658	0.499608	2.781436	0.001403	7.015693	17.46128
PM10	0.79247945	0.186047	0.195524	0.000231	1.174282	2.922657
SO2	0.39146575	0.085707	0.032679	0.000498	0.51035	1.270205
TOG	0.28643836	0.085707	0.271101	0.000498	0.643745	1.602209



## ESTIMATED EMISSIONS FROM MOBILE SOURCES

Vehicle Inputs	
Number of Workers	10
Average Trip Distance (One Way/ Miles)	15
Number of Biosolid Truck Trips Per Day	0.8
Average Trip Distance (One Way/ Miles)	138
Number of Grit/Screening Truck Trips Per Day	0.8
Average Trip Distance (One Way/ Miles)	16
Number of maintenance trips Per Day	60
Average Trip Distance (One Way/ Miles)	5
Number of septage disposal trips Per Day	20
Average Trip Distance (One Way/ Miles)	10
Number of Delivery Trucks	1
Average Trip Distance (One Way/ Miles)	70

Total Trips, POV (One Way)	10
Total Trips Truck (One Way)	1.8

Assumptions Used in EMFAC2002 For Automobiles			
% LDA	70.00%	Daily VMT LDA & LDT	300
%LDT	30.00%	Daily VMT Haul Truck	1386.4

EMFAC2002 Inputs			
	LDA	LDT	HDD
	Grams/Mile	Grams/Mile	Grams/Mile
Carbon Monoxide (CO)	3.02	3.6	2.9
(ROC)	0.19	0.2	0.65
Nitrogen Oxides (NOx)	0.25	0.3	15.97
Sulfur Oxides (SOx)	NA	NA	NA
Particulates (PM10)	0.01	0.01	0.26

Source: EMFAC2002

Truck Emissions		
	EMFAC Emissions Factor. Grams/Mile	Est. Emissions lbs/day
Carbon Monoxide (CO)	2.9	8.86
Reactive Organic Compounds (ROC)	0.65	1.98
Nitrogen Oxides (NOx)	15.97	48.77
Sulfur Oxides (SOx) *	0	0.00
Particulates (PM10)	0.26	0.79

\*Source: EMFAC2002

\*Source: Table A9-5-L SCAQMD CEQA Handbook

Energy Inputs	
Offsite Electrical Usage (kwh/ft <sup>2</sup> /year)*	10.5
Project Square Footage	100000
Natural Gas Usage Rate (ft <sup>3</sup> /ft <sup>2</sup> /month)**	2

\*Source: Table A9-11-A CEQA AQMD Handbook

\*\*Source: Table A9-12-A CEQA AQMD Handbook

ESTIMATED EMISSIONS FROM ADDITIONAL ON-SITE NATURAL GAS CONSUMPTION (Stationary Source)		
usage rate per day =		2.0 MCF/day
Air Pollutant	Emission Factor (lbs/MCF)	Est. Emissions (lbs/day)
Carbon Monoxide (CO)	20	0.133
Reactive Organic Compounds (ROC)	5.3	0.035
Nitrogen Oxides (NOx)	120	0.800
Sulfur Oxides (SOx)	Negligible	
Particulates (PM10)	0.2	0.001

Source: Table A912-B of the CEQA Air Quality Handbook

Usage Rate Calculated Using LWRP Air Permit Number C007276-

Current Permitted Volume of Digester Gas Times Two for Doubling of Existing Capacity

POV Emissions		
	EMFAC Emissions Factor. Grams/Mile	Est. Emissions lbs/day
Carbon Monoxide (CO)	3.19	2.11
Reactive Organic Compounds (ROC)	0.19	0.13
Nitrogen Oxides (NOx)	0.27	0.18
Sulfur Oxides (SOx) *	0.05	0.03
Particulates (PM10)	0.01	0.01

Source: Emission Factors From EMFAC2002

\*Source: Table A9-5-L SCAQMD CEQA Handbook

Fugitive Dust Emissions from project-related trips on local		
	PM10 grams/VMT	lbs/day
Local Streets	0.42	1.6

Source: Air Resources Board Recommended

Total Operational Emissions				AVAPCD Sig Thresholds lb/day	Significant?
Air Pollutant	Mobile (lbs/day)	Energy (lbs/day)	Total (lbs/day)		
Carbon Monoxide (CO)	10.97	0.13	11.10	548	NO
Reactive Organic Compounds (ROC)	2.11	0.04	2.15	137	NO
Nitrogen Oxides (NOx)	48.94	0.80	49.74	137	NO
Sulfur Oxides (SOx)	0.03	0.00	0.03	137	NO
Particulates (PM10)	2.37	0.00	2.37	82	NO

## ESTIMATED EMISSIONS FROM AGRICULTURAL OPERATIONS

Construction Imports Inputs						
<b>Total days Allowed for Project</b>			365.00			
<b>Total Days Allowed for Construction (Days)</b>			365.00			
<b>Total Site Acres (Acres)</b>			3200.00			
<b>Number of Employees</b>			10			
<b>Average Trip Length One Way POV (Miles)</b>			15			
<b>Total Work Hours Per Day (Hours/Day)</b>			7			
<b>Daily Number of Haul Trucks</b>			5			
<b>Average Trip Length One Way Haul Trucks (Miles)</b>			15			
<b>Total VMT Water Trucks per day (Miles)</b>						
<b>Total VMT Dump Trucks per day (Miles)</b>						
<b>Total Number of Each Equipment used for Construction</b>						
# of equipment	2	0	0	0	0	0
Hours per Day	8	0	0	0	0	0
Days in Operation	130	0	0	0	0	0
Miles Per Hour	2					
	tractor diesel	forklift diesel	compressor diesel	boom truck diesel	welder diesel	backhoe diesel
# of equipment	0	0	0	0	0	0
Hours per Day	0	0	0	0	0	0
Days in Operation	0	0	0	0	0	0
Miles Per Hour						
	loaders diesel	crawler dozer diesel	mortor mix diesel	roller diesel	paver diesel	crane diesel
<b>Assumptions Used in EMFAC2002</b>						
% LDA	66.00%			Daily VMT LDA & LDT	300.000	
% LDT	34.00%			Daily VMT Haul Truck	150	
Season	summer					
<b>EMFAC2002 Inputs</b>						
	LDA	LDT	HDD			
	Grams/Mile	Grams/Mile	Grams/Mile			
Carbon Monoxide (CO)	3.02	3.6	2.9			
Reactive Organic Compounds (ROC)	0.19	0.2	0.65			
Nitrogen Oxides (NOx)	0.25	0.3	15.97			
Particulates (PM10)	0.01	0.01	0.26			

Source: EMFAC2002

## Vehicle Exhaust Emissions from POV, Construction

### Construction Workers POV Emissions

	EMFAC Emissions	
	Factor. Grams/Mile	Est. Emissions lbs/day
Carbon Monoxide (CO)	3.2172	2.13
Reactive Organic Compounds (ROC)	0.1934	0.13
Nitrogen Oxides (NOx)	0.267	0.18
Particulates (PM10)	0.01	0.01

Source: Emission Factors From EMFAC2002

### Haul Truck Emissions

	EMFAC Emissions	
	Factor. Grams/Mile	Est. Emissions lbs/day
Carbon Monoxide (CO)	2.9	0.96
Reactive Organic Compounds (ROC)	0.65	0.21
Nitrogen Oxides (NOx)	15.97	5.28
Sulfur Oxides (SOx)	NA	0
Particulates (PM10)	0.26	0.09

Source: EMFAC2002

### Construction Equipment Emissions

	tractor	forklift	compressor	boom truck	welder	backhoe	Total Emissions lbs/day
	500 hp diesel	175 hp diesel	50 hp diesel	175 hp diesel	50 hp diesel	120 hp diesel	
	lbs/hour	lbs/hour	lbs/hour	lbs/hour	lbs/hour	lbs/hour	
Carbon Monoxide (CO)	0.62	0.24	0.55	0.2	0.55	0.11	3.5
Reactive Organic Compounds (ROC)	0.24	0.13	0.1	0.11	0.1	0.06	1.4
Nitrogen Oxides (NOx)	4.82	2.24	0.9	1.85	0.9	1.01	27.5
Particulates (PM10)	0.10	0.05	0.05	0.05	0.05	0.02	0.6

	loaders	crawler dozer	mortor mixer	roller	paver	crane	Total Emissions lbs/day
	175 hp diesel	250 hp diesel	50 hp diesel	120 hp diesel	175 hp diesel	175 hp diesel	
	lbs/hour	lbs/hour	lbs/hour	lbs/hour	lbs/hour	lbs/hour	
Carbon Monoxide (CO)	0.23	0.31	0.5	0.12	0.24	0.22	0.0
Reactive Organic Compounds (ROC)	0.12	0.16	0.1	0.06	0.13	0.11	0.0
Nitrogen Oxides (NOx)	2.07	2.79	1.2	1.13	2.22	2.01	0.0
Particulates (PM10)	0.05	0.07	0.05	0.03	0.05	0.05	0.0

Source: ARB Emission Inventory Publication Number MO99\_32.3 Table 13 released: 2000

Source: ARB Inventory Publication MO99\_32.5 App. B released: 2000

**Total PM10 Fugitive Dust Emissions from construction**

<u>Air Pollutant</u>	<u>Emission Factor</u>		<u>Unmitigated Emissions</u>	<u>Mitigation Efficiency</u>	<u>Est. Emissions (lbs/day)</u>
Particulates (PM10) disturbed land*	0.000035 lb/ton		19.23833333 lb/day	0%	19.2
Particulates (PM10) Tractor**	2.4 lb/hr		38.4 lb/day	0%	38
<b>Total Particulates</b>					<b>58</b>

\* Assumes top inch of soil over five square miles would be emit fugitive dust based on Aggregate Batch Drop Equation AP-42, 13.2.4-3 (1) Assume mean wind speed = 1.6475 mph, 7.9% soil moisture content & 280 cubic yards per hour per loader, 1 cubic yard = 2550 pounds.

\*\* Overburden Equation Table 11.9-1 AP-42 Assume 15% silt content, 7.9 % soil moisture content

Source: Table 11.9-1 EPA AP-42

**Total Air Emissions from Construction Including POV, Fugitive Dust, and**

<u>Air Pollutant</u>	<u>Est. Emissions (lbs/day)</u>	<u>AVAQMD Thresholds (lbs/day)</u>	<u>Significant?</u>
Carbon Monoxide (CO)	<b>6.62</b>	548.00	NO
Reactive Organic Compounds (ROC)	<b>1.71</b>	137.00	NO
Nitrogen Oxides (NOx)	<b>32.92</b>	137.00	NO
Particulates (PM10)	<b>58.72</b>	82.00	NO

Source: EMFAC2002 and SCAQMD CEQA Air Quality Handbook