Appendix B.

Air Quality Calculations

ESTIMATED EMISSIONS FROM DEMOLITION

Construction Imports Inputs

Total days Allowed for Project	10.00
Total Days Allowed for Construction (Days)	10.00
Total Site Acres (Acres)	0.00
Total Cubic Yards Husing for Demolition	29629
Number of Employees	15
Average Trip Length One Way POV (Miles)	30
Total Work Hours Per Day (Hours/Day)	8
Daily Number of Haul Trucks	10
Average Trip Length One Way Haul Trucks (Miles)	15
Total VMT Water Trucks per day (Miles)	1
Total VMT Dump Trucks per day (Miles)	0

Total Number of Each Equipment used for Construction

	scraper diesel	forklift diesel	compressor diesel	boom truck diesel	welder diesel	backhoe diesel
# of equipment	0	0	0	0	0	1
Hours per Day	0	0	0	0	0	6
Days in Operation	0	0	0	0	0	10
Miles Per Hour	1					

	loaders diesel	crawler dozer diesel	mortor mix diesel	roller diesel	paver diesel	trencher diesel
# of equipment	1	1	0	0	0	0
Hours per Day	6	6	0	0	0	0
Days in Operation	10	10	0	0	0	0
Miles Per Hour	1					

Assumptions Used in EMFAC2002

% LDA	66.00%	Daily VMT LDA & LDT	901.000
%LDT	34.00%	Daily VMT Haul Truck	300
Season	summer		

EMFAC2002 Inputs

	LDA Grams/Mile	LDT Grams/Mile	HDD 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	6.38
Reactive Organic Compounds (ROC)	0.1934	0.38
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 500 hp diesel lbs/hour	forklift 175 hp diesel lbs/hour	compressor 50 hp diesel lbs/hour	boom truck 175 hp diesel lbs/hour	welder 50 hp diesel lbs/hour	backhoe 120 hp diesel lbs/hour	Total Emissions lbs/day
Carbon Monoxide (CO)	0.62	0.24	0.55	0.2	0.55	0.11	0.7
Reactive Organic Compounds (ROC)	0.24	0.13	0.1	0.11	0.1	0.06	0.4
Nitrogen Oxides (NOx)	4.82	2.24	0.9	1.85	0.9	1.01	6.1
Particulates (PM10)	0.10	0.05	0.05	0.05	0.05	0.02	0.1

	loaders 175 hp diesel lbs/hour	crawler dozer 250 hp diesel lbs/hour	mortor mixer 50 hp diesel lbs/hour	roller 120 hp diesel lbs/hour	paver 175 hp diesel lbs/hour	crane 175 hp diesel lbs/hour	Total Emissions lbs/day
Carbon Monoxide (CO)	0.23	0.31	0.5	0.12	0.24	0.22	3.2
Reactive Organic Compounds (ROC)	0.12	0.16	0.1	0.06	0.13	0.11	1.7
Nitrogen Oxides (NOx)	2.07	2.79	1.2	1.13	2.22	2.01	29.2
Particulates (PM10)	0.05	0.07	0.05	0.03	0.05	0.05	0.7

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	0.07497	lb/day	50%	0.0
Particulates (PM10) Bulldozer**	2.4	lb/hr	14.4	lb/day	50%	7
Particulates (PM10) Scraper***	4.3	lb/vmt	0	lb/day	50%	0
Particulates (PM10) Backhoe****	0.000035	lb/ton	0.03612	lb/day	50%	0.0
Particulates (PM10) Trencher*****	0.000035	lb/ton	0	lb/day	50%	0.0
Particulates (PM10) demolition******	0.00042	lb/ft^3	1.244418	lb/day	50%	0.6
Particulates (PM10) POV & Haul Truck	0.42	gm/mile				1.11
				Total Particulates		9

* Aggragate 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

**** Aggragate 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.

***** Aggragate 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.

****** Demolition emissions factor, Table A9-9 SCAQMD CEQA Air Quality Handbook, 1993.

Source: Table 11.9-1 EPA AP-42

*Source: ARB Recommended

Total Air Emissions from Construction Including POV, Fugitive Dust, and			
Air Pollutant	Est. Emissions (lbs/day)	SCAQMD Thresholds (lbs/day)	Significant?
Carbon Monoxide (CO)	12.20	550.00	NO
Reactive Organic Compounds (ROC)	2.85	75.00	NO
Nitrogen Oxides (NOx)	46.30	100.00	NO
Particulates (PM10)	10.02	150.00	NO

Source: EMFAC7G and SCAQMD CEQA Air Quality Handbook

ESTIMATED EMISSIONS FROM SITE PREPERATION

Construction Imports Inputs

Total days Allowed for Project	87.00
Total Days Allowed for Construction (Days)	87.00
Total Site Acres (Acres)	0.00
Number of Employees	52
Average Trip Length One Way POV (Miles)	20
Total Work Hours Per Day (Hours/Day)	8
Daily Number of Haul Trucks	38
Average Trip Length One Way Haul Trucks (Miles)	20
Total VMT Water Trucks per day (Miles)	1.16
Total VMT Dump Trucks per day (Miles)	18

Total Number of Each Equipment used for Construction

	scraper diesel	rollers diesel	compactor diesel	excavator diesel	welder diesel	backhoe diesel
# of equipment	2	4	2	1	0	3
Hours per Day	8	8	8	8	0	8
Days in Operation	29	23	5	76	0	7
Miles Per Hour	1					

	loaders diesel	crawler dozer diesel	mortor mix diesel	grader diesel	paver diesel	trencher diesel
# of equipment	2	0	0	1	0	4
Hours per Day	8	0	0	8	0	8
Days in Operation	24	0	0	72	0	300
Miles Per Hour	1					

Assumptions Used in EMFAC2002

% LDA	66.00%	Daily VMT LDA & LDT	2099.160
%LDT	34.00%	Daily VMT Haul Truck	1520
Season	summer		

EMFAC2002 Inputs

	LDA Grams/Mile	LDT Grams/Mile	HDD 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	14.88
Reactive Organic Compounds (ROC)	0.1934	0.89
Nitrogen Oxides (NOx)	0.267	1.23
Particulates (PM10)	0.01	0.05

Source: Emission Factors From EMFAC2002

Haul Truck Emissions	EMFAC Emissions Factor. Grams/Mile	Est. Emissions lbs/day
Carbon Monoxide (CO)	2.9	9.71
Reactive Organic Compounds (ROC)	0.65	2.18
Nitrogen Oxides (NOx)	15.97	53.47
Sulfur Oxides (SOx)	NA	0
Particulates (PM10)	0.26	0.87

Source: EMFAC2002

Construction Equipment Emissions	scraper 500 hp diesel lbs/hour	roller 175 hp diesel lbs/hour	compactor 50 hp diesel lbs/hour	excavator 250 hp diesel lbs/hour	welder 50 hp diesel lbs/hour	backhoe 120 hp diesel lbs/hour	Total Emissions lbs/day
Carbon Monoxide (CO)	0.62	0.23	0.05	0.33	0.55	0.11	7.8
Reactive Organic Compounds (ROC)	0.24	0.12	0.03	0.12	0.1	0.06	3.3
Nitrogen Oxides (NOx)	4.82	2.08	0.49	2.12	0.9	1.01	60.5
Particulates (PM10)	0.10	0.05	0.01	0.05	0.05	0.02	1.4

	loaders 175 hp diesel lbs/hour	crawler dozer 250 hp diesel lbs/hour	mortor mixer 50 hp diesel lbs/hour	grader 175 hp diesel lbs/hour	paver 175 hp diesel lbs/hour	crane 175 hp diesel lbs/hour	Total Emissions lbs/day
Carbon Monoxide (CO)	0.23	0.31	0.5	0.24	0.24	0.22	25.5
Reactive Organic Compounds (ROC)	0.12	0.16	0.1	0.12	0.13	0.11	13.5
Nitrogen Oxides (NOx)	2.07	2.79	1.2	2.18	2.22	2.01	245.4
Particulates (PM10)	0.05	0.07	0.05	0.05	0.05	0.05	6.1

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) Excavator**	0.000035	lb/ton	0.362355	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	0.14448	lb/day	50%	0.1
Particulates (PM10) Trencher*****	0.000035	lb/ton	0.19264	lb/day	50%	0.1
Particulates (PM10) POV & Haul Truck	0.42	gm/mile				3.35
				Total Particulates		38

* Aggragate 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.

* Aggragate 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 excavator, 1 cubic yard = 2550 pounds.

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

**** Aggragate 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.

***** Aggragate 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 Air Emissions from Construction Including POV, Fugitive Dust, and			
Air Pollutant	Est. Emissions (lbs/day)	SCAQMD Thresholds (lbs/day)	Significant?
Carbon Monoxide (CO)	57.89	550.00	NO
Reactive Organic Compounds (ROC)	19.81	75.00	NO
Nitrogen Oxides (NOx)	360.58	100.00	YES
Particulates (PM10)	46.54	150.00	NO

Source: EMFAC7G and SCAQMD CEQA Air Quality Handbook

ESTIMATED EMISSIONS FROM BUILDING CONSTRUCTION

Construction Imports Inputs

Total days Allowed for Project	187.00
Total Days Allowed for Construction (Days)	187.00
Total Site Acres (Acres)	22.83
Number of Employees	200
Average Trip Length One Way POV (Miles)	30
Total Work Hours Per Day (Hours/Day)	8
Daily Number of Haul Trucks	10
Average Trip Length One Way Haul Trucks (Miles)	15
Total VMT Water Trucks per day (Miles)	2
Total VMT Dump Trucks per day (Miles)	2

Total Number of Each Equipment used for Construction

	scraper diesel	forklift diesel	compressor diesel	boom truck diesel	welder diesel	backhoe diesel
# of equipment	0	4	3	2	3	0
Hours per Day	0	6	8	6	8	0
Days in Operation	0	125	150	100	50	0
Miles Per Hour	0	0	0	0	0	0

	loaders diesel	crawler dozer diesel	mortor mix diesel	roller diesel	paver diesel	trencher diesel
# of equipment	0	0	1	1	1	0
Hours per Day	0	0	6	3	8	0
Days in Operation	0	0	75	9	9	0
Miles Per Hour	1	0	0	0	0	0

Assumptions Used in EMFAC2002

% LDA	66.00%	Daily VMT LDA & LDT	12004.000
%LDT	34.00%	Daily VMT Haul Truck	300
Season	summer		

EMFAC2002 Inputs

	LDA Grams/Mile	LDT Grams/Mile	HDD 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	85.06
Reactive Organic Compounds (ROC)	0.1934	5.11
Nitrogen Oxides (NOx)	0.267	7.06
Particulates (PM10)	0.01	0.26

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 500 hp diesel lbs/hour	forklift 175 hp diesel lbs/hour	compressor 50 hp diesel lbs/hour	boom truck 175 hp diesel lbs/hour	welder 50 hp diesel lbs/hour	backhoe 120 hp diesel lbs/hour	Total Emissions lbs/day
Carbon Monoxide (CO)	0.62	0.24	0.55	0.2	0.55	0.11	19.3
Reactive Organic Compounds (ROC)	0.24	0.13	0.1	0.11	0.1	0.06	5.4
Nitrogen Oxides (NOx)	4.82	2.24	0.9	1.85	0.9	1.01	70.9
Particulates (PM10)	0.10	0.05	0.05	0.05	0.05	0.02	2.4

	loaders 175 hp diesel lbs/hour	crawler dozer 250 hp diesel lbs/hour	mortor mixer 50 hp diesel lbs/hour	roller 120 hp diesel lbs/hour	paver 175 hp diesel lbs/hour	crane 175 hp diesel lbs/hour	Total Emissions lbs/day
Carbon Monoxide (CO)	0.23	0.31	0.5	0.12	0.24	0.22	1.3
Reactive Organic Compounds (ROC)	0.12	0.16	0.1	0.06	0.13	0.11	0.3
Nitrogen Oxides (NOx)	2.07	2.79	1.2	1.13	2.22	2.01	3.9
Particulates (PM10)	0.05	0.07	0.05	0.03	0.05	0.05	0.1

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 lb/day	50%	0.0
Particulates (PM10) Bulldozer**	2.4	lb/hr	0 lb/day	50%	0
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 lb/day	50%	0.0
Particulates (PM10) POV & Haul Truck	0.42	gm/mile			11.38
			Total Particulates		11

* Aggragate 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

**** Aggragate 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.

***** Aggragate 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
3000 ft^2/day	2	6000 ft^2/day
Paint Coating Factor	Paint VOC Content	
400 ft^2/day	2.08 lb/gal	
	Total Commercial VOC from Architectural Coatings	
	31.2 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)	SCAQMD Thresholds (lbs/day)	Significant?
Carbon Monoxide (CO)	107.53	550.00	NO
Reactive Organic Compounds (ROC)	45.02	75.00	NO
Nitrogen Oxides (NOx)	92.43	100.00	NO
Particulates (PM10)	14.37	150.00	NO

Source: EMFAC7G and SCAQMD CEQA Air Quality Handbook