APPENDIX C

Air Quality Data

URBEMIS 2002 For Windows 8.7.0

File Name: C:\Program Files\URBEMIS 2002 Version 8.7\Projects2k2\Rocklin 60.urb
Project Name: Rocklin 60
Project Location: Lower Sacramento Valley Air Basin
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT
(Pounds/Day - Summer)

CONSTRUCTION EMISSION ESTIMATES

*** 2008 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (lbs/day,unmitigated)	12.64	78.74	106.74	0.00	144.85	2.84	142.01

*** 2009 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (lbs/day,unmitigated)	9.50	61.25	78.96	0.00	2.69	2.57	0.12

*** 2010 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (lbs/day,unmitigated)	34.80	78.76	116.27	0.00	3.12	2.87	0.25

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	10.04	2.33	6.41	0.04	0.02

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	11.54	12.69	130.55	0.09	15.14

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	21.58	15.02	136.96	0.12	

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URBEMIS 2002 For Windows 8.7.0

File Name: C:\Program Files\URBEMIS 2002 Version 8.7\Projects2k2\Rocklin 60.urb
Project Name: Rocklin 60
Project Location: Lower Sacramento Valley Air Basin
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT
(Pounds/Day - Summer)

Construction Start Month and Year: June, 2008
Construction Duration: 28
Total Land Use Area to be Developed: 56.9 acres
Maximum Acreage Disturbed Per Day: 14.2 acres
Single Family Units: 179 Multi-Family Units: 0
Retail/Office/Institutional/Industrial Square Footage: 0

CONSTRUCTION EMISSION ESTIMATES UNMITIGATED (lbs/day)

Source	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2008***							
Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	142.00	-	142.00
Off-Road Diesel	12.51	78.59	103.89	-	2.83	2.83	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.13	0.15	2.85	0.00	0.02	0.01	0.01
Maximum lbs/day	12.64	78.74	106.74	0.00	144.85	2.84	142.01
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	8.84	64.20	67.82	-			

2.74	2.74	0.00				
Bldg Const Worker Trips	0.72	0.44	9.39	0.00		
0.13	0.01	0.12				
Arch Coatings Off-Gas	0.00	-	-	-		
-	-	-				
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00		
0.00	0.00	0.00				
Asphalt Off-Gas	0.00	-	-	-		
-	-	-				
Asphalt Off-Road Diesel	0.00	0.00	0.00	-		
0.00	0.00	0.00				
Asphalt On-Road Diesel	0.00	0.00	0.00	0.00		
0.00	0.00	0.00				
Asphalt Worker Trips	0.00	0.00	0.00	0.00		
0.00	0.00	0.00				
Maximum lbs/day	9.56	64.64	77.21	0.00		
2.87	2.75	0.12				
Max lbs/day all phases	12.64	78.74	106.74	0.00		
144.85	2.84	142.01				

*** 2009***

Phase 1 - Demolition Emissions						
Fugitive Dust	-	-	-	-		
0.00	-	0.00				
Off-Road Diesel	0.00	0.00	0.00	-		
0.00	0.00	0.00				
On-Road Diesel	0.00	0.00	0.00	0.00		
0.00	0.00	0.00				
Worker Trips	0.00	0.00	0.00	0.00		
0.00	0.00	0.00				
Maximum lbs/day	0.00	0.00	0.00	0.00		
0.00	0.00	0.00				
Phase 2 - Site Grading Emissions						
Fugitive Dust	-	-	-	-		
0.00	-	0.00				
Off-Road Diesel	0.00	0.00	0.00	-		
0.00	0.00	0.00				
On-Road Diesel	0.00	0.00	0.00	0.00		
0.00	0.00	0.00				
Worker Trips	0.00	0.00	0.00	0.00		
0.00	0.00	0.00				
Maximum lbs/day	0.00	0.00	0.00	0.00		
0.00	0.00	0.00				
Phase 3 - Building Construction						
Bldg Const Off-Road Diesel	8.84	60.84	70.30	-		
2.56	2.56	0.00				
Bldg Const Worker Trips	0.66	0.41	8.66	0.00		
0.13	0.01	0.12				
Arch Coatings Off-Gas	0.00	-	-	-		
-	-	-				
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00		
0.00	0.00	0.00				
Asphalt Off-Gas	0.00	-	-	-		
-	-	-				
Asphalt Off-Road Diesel	0.00	0.00	0.00	-		
0.00	0.00	0.00				

Asphalt On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	9.50	61.25	78.96	0.00	2.69	2.57	0.12
Max lbs/day all phases	9.50	61.25	78.96	0.00	2.69	2.57	0.12

*** 2010***

Phase 1 - Demolition Emissions

Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Phase 2 - Site Grading Emissions

Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Phase 3 - Building Construction

Bldg Const Off-Road Diesel	8.84	57.57	72.69	-	2.30	2.30	0.00
Bldg Const Worker Trips	0.60	0.37	7.97	0.00	0.13	0.01	0.12
Arch Coatings Off-Gas	20.56	-	-	-	-	-	-
Arch Coatings Worker Trips	0.60	0.37	7.97	0.00	0.13	0.01	0.12
Asphalt Off-Gas	0.89	-	-	-	-	-	-
Asphalt Off-Road Diesel	3.18	18.42	26.99	-	0.51	0.51	0.00
Asphalt On-Road Diesel	0.11	2.03	0.41	0.00	0.05	0.05	0.00
Asphalt Worker Trips	0.02	0.01	0.25	0.00	0.00	0.00	0.00

Maximum lbs/day	34.80	78.76	116.27	0.00	3.12
2.87	0.25				
Max lbs/day all phases	34.80	78.76	116.27	0.00	3.12
2.87	0.25				

Phase 1 - Demolition Assumptions: Phase Turned OFF

Phase 2 - Site Grading Assumptions
Start Month/Year for Phase 2: Jun '08
Phase 2 Duration: 3.1 months
On-Road Truck Travel (VMT): 0
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Crawler Tractors	143	0.575	8.0
1	Graders	174	0.575	8.0
1	Off Highway Trucks	417	0.490	8.0
1	Rubber Tired Loaders	165	0.465	8.0
1	Tractor/Loaders/Backhoes	79	0.465	8.0

Phase 3 - Building Construction Assumptions
Start Month/Year for Phase 3: Sep '08
Phase 3 Duration: 24.9 months
Start Month/Year for SubPhase Building: Sep '08
SubPhase Building Duration: 24.9 months
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
4	Other Equipment	190	0.620	8.0

Start Month/Year for SubPhase Architectural Coatings: Jul '10
SubPhase Architectural Coatings Duration: 2.5 months
Start Month/Year for SubPhase Asphalt: Aug '10
SubPhase Asphalt Duration: 1.2 months
Acres to be Paved: 9
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Pavers	132	0.590	8.0
1	Rollers	114	0.430	8.0

AREA SOURCE EMISSION ESTIMATES (Summer Pounds per Day, Unmitigated)

Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.17	2.24	0.95	0	0.00
Hearth - No summer emissions					
Landscaping	0.68	0.09	5.46	0.04	0.02
Consumer Prdcts	8.76	-	-	-	-
Architectural Coatings	0.43	-	-	-	-
TOTALS(lbs/day,unmitigated)	10.04	2.33	6.41	0.04	0.02

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Single family housing	11.54	12.69	130.55	0.09	15.14
TOTAL EMISSIONS (lbs/day)	11.54	12.69	130.55	0.09	15.14

Does not include correction for passby trips.
Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2010 Temperature (F): 85 Season: Summer

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Acreage	Trip Rate	No. Units	Total Trips
Single family housing	56.90	9.57 trips/dwelling unit	179.00	1,713.03

Sum of Total Trips 1,713.03

Total Vehicle Miles Traveled 9,974.46

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	54.70	1.10	98.70	0.20
Light Truck < 3,750 lbs	15.20	2.00	96.00	2.00
Light Truck 3,751- 5,750	16.20	1.20	98.10	0.70
Med Truck 5,751- 8,500	7.30	1.40	95.90	2.70
Lite-Heavy 8,501-10,000	1.10	0.00	81.80	18.20
Lite-Heavy 10,001-14,000	0.30	0.00	66.70	33.30
Med-Heavy 14,001-33,000	1.00	0.00	20.00	80.00
Heavy-Heavy 33,001-60,000	0.90	0.00	11.10	88.90
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.20	0.00	50.00	50.00
Motorcycle	1.60	68.80	31.20	0.00
School Bus	0.10	0.00	0.00	100.00
Motor Home	1.40	7.10	85.70	7.20

Travel Conditions

	Residential				Commercial
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	9.7	3.8	4.6	7.8	4.5	4.5
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip Speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	27.3	21.2	51.5			

Changes made to the default values for Land Use Trip Percentages

The Trip Rate and/or Acreage values for Single family housing have changed from the defaults 9.57/59.67 to 9.57/56.9

Changes made to the default values for Construction

Architectural Coatings: # ROG/ft2 (residential) changed from 0.0185 to 0.0013
Architectural Coatings: # ROG/ft2 (non-res) changed from 0.0185 to

0.0013

Changes made to the default values for Area

The wood stove percentage changed from 35 to 0.
The wood fireplace percentage changed from 10 to 0.
The natural gas fireplace percentage changed from 55 to 100.
The landscape year changed from 2005 to 2011.
The residential Arch. Coatings ROG emission factor changed from 0.0185 to 0.0013.
The nonresidential Arch. Coatings ROG emission factor changed from 0.0185 to 0.0013.

Changes made to the default values for Operations

The operational emission year changed from 2005 to 2010.

CA 1990 Census Data

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	1990	1999	2020	
Yr VMT	259,003,000,000	299,577,000,000	259,003,000,000	California Department of Transportation. CALIFORNIA MOTOR VEHICLE STOCK, TRAVEL AND FUEL FORECAST. November 2000.
Population	29,760,021	34,036,000	43,851,741	U.S. Census Bureau, 1990 U.S. Census.
VMT/Cap/Day	**24**	24	**16**	*This is the VMT/Capita/day required to achieve that of 1990 accounting for the interim 30 years worth of population growth (i.e., the threshold)
VMT/Cap/Yr	**8,703**	8,802	**5,906**	*Similarly, this is the VMT/Capita/year required to achieve that of 1990 accounting for the interim 30 years worth of population growth (i.e., the threshold)

Rocklin 60

	2010	
Trips/Day	1,713	total trips (LSA, 2007; Table C)
Population	490	Pop & Housing chapter
VMT/Trip	5.82	URBEMIS
VMT/Cap/Day	**20**	
VMT/Cap/Yr	**7,430**	

Resultant CO2 Emission Rates

	1990	2010		
Emission Factors	406.9	366.2	g/mile	ARB 2002; Proposed Methodology to Model Carbon Dioxide Emissions and Estimate Fuel Economy
Statewide CO2/Cap/Yr	3.5	**2.2**	Tons/Cap/Yr	*These rates result in equivalent emissions from respective populations and improvements in emission control technology and cleaner fuels.

	2010	
Rocklin 60 CO2/Cap/Yr	2.7	Tons/Cap/Yr
Tons/Cap/Yr over threshold (2.2 Tons/Cap/Yr)	0.6	Tons/Cap/Yr
Times threshold	1.3	

Assumptions:

Emission factor for 2010 is used for future years, although would likely be lower but was not available.

Mobile source emissions from VMT are used as an indicator of all GHG sources from the project as these would be the most dependent on project-specific parameters; Area-source emissions are considered to be somewhat fixed relative to mobile-sources.

CO2 emissions are used as a proxy for all GHG emissions.

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Urbemis 2007 Version 9.2.2

Combined Annual Emissions Reports (Tons/Year)

File Name:

Project Name: Rocklin 60

Project Location: Placer County APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	CO2
2007 TOTALS (tons/year unmitigated)	37.51
2008 TOTALS (tons/year unmitigated)	439.24

AREA SOURCE EMISSION ESTIMATES

	CO2
TOTALS (tons/year, unmitigated)	728.42

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	CO2
TOTALS (tons/year, unmitigated)	2,618.22

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	CO2
TOTALS (tons/year, unmitigated)	3,346.64

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Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	CO2
2007	37.51
Fine Grading 11/30/2007-01/11/2008	34.49
Fine Grading Dust	0.00
Fine Grading Off Road Diesel	33.08
Fine Grading On Road Diesel	0.00
Fine Grading Worker Trips	1.40
Asphalt 12/28/2007-01/11/2008	3.02
Paving Off-Gas	0.00
Paving Off Road Diesel	1.27
Paving On Road Diesel	1.62
Paving Worker Trips	0.13

2008	439.24
Asphalt 12/28/2007-01/11/2008	13.59
Paving Off-Gas	0.00
Paving Off Road Diesel	5.73
Paving On Road Diesel	7.28
Paving Worker Trips	0.57
Fine Grading 11/30/2007-01/11/2008	14.11
Fine Grading Dust	0.00
Fine Grading Off Road Diesel	13.53
Fine Grading On Road Diesel	0.00
Fine Grading Worker Trips	0.57
Building 01/11/2008-08/22/2008	406.00
Building Off Road Diesel	140.58
Building Vendor Trips	53.42
Building Worker Trips	211.99
Coating 08/08/2008-09/05/2008	5.55
Architectural Coating	0.00
Coating Worker Trips	5.55

Phase Assumptions

Phase: Fine Grading 11/30/2007 - 1/11/2008 - Default Fine Site Grading Description

Total Acres Disturbed: 59.67

Maximum Daily Acreage Disturbed: 14.92

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

2 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Paving 12/28/2007 - 1/11/2008 - Default Paving Description

Acres to be Paved: 14.92

Off-Road Equipment:

1 Pavers (100 hp) operating at a 0.62 load factor for 8 hours per day

2 Paving Equipment (104 hp) operating at a 0.53 load factor for 6 hours per day

2 Rollers (95 hp) operating at a 0.56 load factor for 6 hours per day

Phase: Building Construction 1/11/2008 - 8/22/2008 - Default Building Construction Description

Off-Road Equipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 7 hours per day

2 Forklifts (145 hp) operating at a 0.3 load factor for 7 hours per day

1 Generator Sets (49 hp) operating at a 0.74 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

3 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day

Phase: Architectural Coating 8/8/2008 - 9/5/2008 - Default Architectural Coating Description

Rule: Residential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Residential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

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Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	CO2
Natural Gas	522.55
Hearth	204.72
Landscape	1.15
Consumer Products	
Architectural Coatings	
TOTALS (tons/year, unmitigated)	728.42

Area Source Changes to Defaults

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	CO2
Single family housing	2,618.22
TOTALS (tons/year, unmitigated)	2,618.22

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2010 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

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Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	59.67	9.57	dwelling units	179.00	1,713.03	14,645.89
					1,713.03	14,645.89

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	39.8	1.3	98.4	0.3
Light Truck < 3750 lbs	14.2	2.8	88.7	8.5
Light Truck 3751-5750 lbs	22.4	0.9	98.7	0.4
Med Truck 5751-8500 lbs	11.0	0.9	99.1	0.0
Lite-Heavy Truck 8501-10,000 lbs	2.6	0.0	73.1	26.9
Lite-Heavy Truck 10,001-14,000 lbs	0.9	0.0	44.4	55.6
Med-Heavy Truck 14,001-33,000 lbs	0.9	0.0	22.2	77.8
Heavy-Heavy Truck 33,001-60,000 lbs	1.2	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.0	0.0	0.0	0.0
Motorcycle	5.5	67.3	32.7	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.3	0.0	84.6	15.4

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4

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Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			

% of Trips - Commercial (by land use)

Appendix Rocklin 60 GHG Calculations

URBEMIS Output Summary	**CO2 Estimates**		**Conversion Factors**		**Total CO2 Emissions**	
Construction Emissions						
2008	37.51	tons/yr	0.907	metric ton/english ton	34	Metric tons/year
2009	439.24	tons/yr	0.907	metric ton/english ton	398	Metric tons/year
					432	Metric tons
Area-Source Emissions						
Operational Year 2009	728.42	tons/yr	0.907	metric ton/english ton	661	Metric tons/year
Mobile-Source Emissions						
Operational Year 2009	2618.22	tons/yr	0.907	metric ton/english ton	2,375	Metric tons/year
Total Direct Operational Emissions					**3,036**	Metric tons/year

Indirect Emissions from Energy Consumption

KWh/du/year	# du	KWh/ksf/year	# ksf Commercial	Total KWh	MWh	Region	Emission Factor (lb CO2/MWh)	GWP	Emission Factor (lb CH4/MWh)	GWP	Emission Factor (lb N2O/MWh)	GWP	Total CO2e (Metric Tons/year)
7000	179	16,750	0	1,253,000	1,253	CALI	804.54	1	0.0067	23	0.0037	296	**458**

Sources:

California Energy Commission [CEC] 2000. California Energy Demand Staff Report P200-00-002

California Climate Action Registry [CCAR] General Reporting Protocol v 2.2 March 2007

TOTAL DIRECT AND INDIRECT OPERATIONAL EMISSIONS	**3,494**	Metric tons/year		
	7.13	Metric tons/SP	SP = 490	residents