

Appendix I

Climate Change Data

Greenhouse Gas Emission Worksheet

Operational Emissions

Project: Beach Edinger
 Project Number: 100000407

Conversion to CO2e Units based on GWP
 CH4 21
 N2O 310

Indirect Emissions from Electricity Use

Total Project Annual KWh: 35,574,000 kWh/year
 Project Annual MWh: 35,574 MWh/year

1 ton (short, US) = 0.90718474 metric ton.
 1 metric ton = 2,204.62 pounds

Emission Factors for Electricity Use:
 CO2 724.12 lbs/MWh/year
 CH4 0.0302 lbs/MWh/year
 N2O 0.0081 lbs/MWh/year

Annual Emissions from Electricity Use:

	Total Emissions	Total CO2e Units
CO2 emissions:	11684.4830 metric tons	11684.5 metric tons CO2e
CH4 emissions:	0.4873 metric tons	10.2 metric tons CO2e
N2O emissions:	0.1307 metric tons	40.5 metric tons CO2e
Project Total		11,735 metric tons CO2e

Sources:

Table C.1 Comparison of GWPs from the IPCC's 2nd and 3rd TAR, App. C of the CCAR General Reporting Protocol (GAR), Ver. 3.1, Jan. 2009
 Table C.2: CO2, CH4, and N2O Electricity Emission Factors by eGRID Subregion, Subregion CAMX, App C of the CCAR GAR, Ver. 3.1, Jan. 2009.

Emissions from Natural Gas Use

Total Project Usage: 3,119,256 therms/year

1 Therm = 0.1 Million Btu (MMBtu)

Emission Factors for Natural Gas Use:

CO2 11.67 lbs/therm
 CH4 0.001 lbs/therm
 N2O 0.00002 lbs/therm

Annual Emissions from Natural Gas Use:

	Total Emissions	Total CO2e Units
CO2 emissions:	16511.5610 metric tons	16511.6 metric tons CO2e
CH4 emissions:	1.4149 metric tons	29.7 metric tons CO2e
N2O emissions:	0.0283 metric tons	8.8 metric tons CO2e
Project Total		16,550 metric tons CO2e

Sources:

Table C.7: CO2 Emission Factors for Stationary Combustion, Appendix C of the CCAR GAR, Ver. 3.1, Jan. 2009
 Table C.8 CH4 and N2O Emission Factors for Stationary Combustion by Fuel Type and Sector, Appendix C of the CCAR Protocol, 2009 (for residential, commercial, institutional uses).

Indirect Emissions from Solid Waste

Total Solid Waste: 4,315 tons/year
 Landfill Gas: 490 tons/year

Annual Emissions from Solid Waste:

	Total Emissions	Total CO2e Units
CO2 emissions:	312 tons	283 metric tons CO2e
CH4 emissions:	178 tons	3392 metric tons CO2e
Project Total		3,675 metric tons CO2e

Sources:

State Workbook: Methodologies for Estimating Greenhouse Gas Emissions (pages 5-1 to 5-3)

Indirect Emissions from Water Use

Indoor Uses 384.36 MG/year
 Outdoor Uses* 0.00 MG/year
 Total Project Usage: 384.36 MG/year
 Northern or Southern Ca? Southern

Annual Electricity Generation Associated with Water Uses

Water Consumption (MG) Energy Factor (MWh/MG)

Indoor Uses	384.36	13.022	5,005 MWh/year
Outdoor Uses	0.00	11.111	0 MWh/year
Total Project Usage			5,005 MWh/year

0

Emission Factors for Electricity Use:

CO2	742.12 lbs/MWh/year
CH4	0.0302 lbs/MWh/year
N2O	0.0081 lbs/MWh/year

Annual Emissions from Water Use:

	Total Emissions	Total CO2e Units
CO2 emissions:	1684.9 metric tons	1684.9 metric tons CO2e
CH4 emissions:	0.1 metric tons	1.4 metric tons CO2e
N2O emissions:	0.0 metric tons	5.7 metric tons CO2e
	Project Total	1,692 metric tons CO2e

* - Input manually

Sources:

Table C.5: CO2 Emission Factors and Oxidation Rates for Stationary Combustion, Appendix C of the CCAR Protocol, 2009

Table C.6 Methane and Nitrous Oxide Emission Factors for Stationary Combustion by Fuel Type, Appendix C of the CCAR Protocol, 2009.

Table ES-1: Recommended Revised Water-energy Proxies, Refining Estimates of Water-Related Energy Use in California, CEC-500-2006-118.

Beach Edinger Vehicle CO2 Emissions

Operational	#	Measure Type	Trip Rate	Trips	VMT*
Residential	6,400.00	unit	6.62	42,368.00	428,035.42
Commercial	-178.00	ksf	89.25	-15,886.50	-142,549.56
Office	-265.00	ksf	11.42	-3,026.30	-23,236.15
Other	205.60	other	10	2,056.00	18,448.49
				<i>Net Daily Trips</i>	25,511.20
				<i>Net Daily VMT</i>	280,698.20

* From Urbemis 2007

CO2 Emissions

	Annual (tons)
Residential	79,306.34
Commercial	-26,171.79
Office	-5,952.51
Other	3,387.10
Net CO2 emissions	50,569.14

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: P:\Projects - All Employees\+10000\0407 Beach-Edinger Corridor Study Program EIR\Air Data\Beach-Edinger - Area-Operational C-O emis cred.urb924

Project Name: Beach-Edinger - Operational Trip Credit

Project Location: South Coast AQMD

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>	<u>CO2</u>
TOTALS (tons/year, unmitigated)	0.56	0.65	1.09	0.00	0.00	0.00	764.76

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>	<u>CO2</u>
TOTALS (tons/year, unmitigated)	9.64	10.60	106.70	0.32	55.03	10.66	32,124.30

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>	<u>CO2</u>
TOTALS (tons/year, unmitigated)	10.20	11.25	107.79	0.32	55.03	10.66	32,889.06

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Strip mall	7.77	8.66	86.67	0.26	44.88	8.69	26,171.79
Office park	1.87	1.94	20.03	0.06	10.15	1.97	5,952.51
TOTALS (tons/year, unmitigated)	9.64	10.60	106.70	0.32	55.03	10.66	32,124.30

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2030 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Strip mall		89.25	1000 sq ft	178.00	15,886.50	142,549.56
Office park		11.42	1000 sq ft	265.00	3,026.30	32,236.15
					18,912.80	174,785.71

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	49.4	0.0	100.0	0.0
Light Truck < 3750 lbs	7.3	0.0	100.0	0.0
Light Truck 3751-5750 lbs	23.9	0.0	100.0	0.0
Med Truck 5751-8500 lbs	11.4	0.0	100.0	0.0

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Lite-Heavy Truck 8501-10,000 lbs	1.8	0.0	83.3	16.7
Lite-Heavy Truck 10,001-14,000 lbs	0.5	0.0	60.0	40.0
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.6	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	2.7	33.3	66.7	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.1	0.0	90.9	9.1

Travel Conditions

	Residential			Commuter	Commercial	
	Home-Work	Home-Shop	Home-Other		Non-Work	Customer
Urban Trip Length (miles)	12.7	7.0	9.5	13.3	7.4	8.9
Rural Trip Length (miles)	17.6	12.1	14.9	15.4	9.6	12.6
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
Strip mall				2.0	1.0	97.0
Office park				48.0	24.0	28.0

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: P:\Projects - All Employees\+10000\0407 Beach-Edinger Corridor Study Program EIR\Air Data\Beach-Edinger - Area-Operational Res.urb924

Project Name: Beach-Edinger - Operational

Project Location: South Coast AQMD

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>	<u>CO2</u>
TOTALS (tons/year, unmitigated)	63.09	11.73	5.65	0.00	0.02	0.02	14,938.95

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>	<u>CO2</u>
TOTALS (tons/year, unmitigated)	27.97	27.00	281.92	0.82	140.64	27.28	82,693.44

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>	<u>CO2</u>
TOTALS (tons/year, unmitigated)	91.06	38.73	287.57	0.82	140.66	27.30	97,632.39

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Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Apartments low rise	26.86	25.88	270.70	0.79	134.83	26.16	79,306.34
Other	1.11	1.12	11.22	0.03	5.81	1.12	3,387.10
TOTALS (tons/year, unmitigated)	27.97	27.00	281.92	0.82	140.64	27.28	82,693.44

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2030 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Apartments low rise	400.00	6.62	dwelling units	6,400.00	42,368.00	428,035.42
Other		10.00	1000 sq ft	205.60	2,056.00	18,448.49
					44,424.00	446,483.91

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	49.4	0.0	100.0	0.0
Light Truck < 3750 lbs	7.3	0.0	100.0	0.0
Light Truck 3751-5750 lbs	23.9	0.0	100.0	0.0
Med Truck 5751-8500 lbs	11.4	0.0	100.0	0.0

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Lite-Heavy Truck 8501-10,000 lbs	1.8	0.0	83.3	16.7
Lite-Heavy Truck 10,001-14,000 lbs	0.5	0.0	60.0	40.0
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.6	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	2.7	33.3	66.7	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.1	0.0	90.9	9.1

Travel Conditions

	Residential			Commuter	Commercial	
	Home-Work	Home-Shop	Home-Other		Non-Work	Customer
Urban Trip Length (miles)	12.7	7.0	9.5	13.3	7.4	8.9
Rural Trip Length (miles)	17.6	12.1	14.9	15.4	9.6	12.6
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
Other				2.0	1.0	97.0

