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Table A-1. Maximum Estimated Potential Emissions for Residual Oil, Natural Gas and Natural Gas/Orimulsion Firing at FPL Sanford Unit 4
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Data	Residual Oil	Natural Gas	Natural Gas and Orimulsion ^a
Heat Input (10 ⁶ Btu/hr)	4,050	4,293	4,196
Fuel Flow (lb/hr)	221,311	217,037	254,838
Sulfur Dioxide			
Emissions Basis	Permit	See Note b	See Note c
Emissions Basis (lb/10 ⁶ Btu)	2.75	0.00276	1.66
Emissions (lb/hour)	11,138	12	6,986
Emissions (tons/year) ^d	48,782	52	30,597
Particulate Matter			
Emissions Basis	Permit ^e	AP-42	Permit ^e
Emissions Basis (lb/10 ⁶ Btu)	0.125	0.0048	0.125
Emissions (lb/hour)	506	21	506
Emissions (tons/year) ^d	2,217	91	2,217
Particulate Matter (PM10)			
Emissions Basis	AP-42 ^f	AP-42	AP-42 ^f
Emissions Basis (lb/10 ⁶ Btu)	0.09	0.0048	0.09
Emissions (lb/hour)	365	21	365
Emissions (tons/year) ^d	1,597	91	1,597
Nitrogen Oxides			
Emissions Basis	AP-42 ^g	AP-42	Test Results
Emissions Basis (lb/10 ⁶ Btu)	0.70	0.53	0.57
Emissions (lb/hour)	2,834	2,277	2,373
Emissions (tons/year) ^d	12,412	9,973	10,394
Carbon Monoxide			
Emissions Basis	AP-42	AP-42	AP-42
Emissions Basis (lb/10 ⁶ Btu)	0.03	0.04	0.04
Emissions (lb/hour)	135	166	153
Emissions (tons/year) ^d	591	725	672
Volatile Organic Compounds			
Emissions Basis	AP-42	AP-42	Test Results
Emissions Basis (lb/10 ⁶ Btu)	0.005	0.0014	0.0031
Emissions (lb/hour)	20.5	5.8	13.2
Emissions (tons/year) ^d	89.8	25.4	57.8
Lead			
Emissions Basis	EPA(1989)	--	Test Results
Emissions Basis (lb/10 ⁶ Btu)	2.80e-05	neg.	ND
Emissions (lb/hour)	0.11	0.00	ND
Emissions (tons/year) ^d	0.50	0	ND

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Table A-1. Maximum Estimated Potential Emissions for Residual Oil, Natural Gas and Natural Gas/Orimulsion Firing at FPL Sanford Unit 4
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Data	Residual Oil	Natural Gas	Natural Gas and Orimulsion ^a
Sulfuric Acid Mist			
Emissions Basis	AP-42	AP-42	Test Results
Emissions Basis (lb/10 ⁶ Btu)	0.048	2.76e-05	0.0027
Emissions (lb/hour)	196	0.12	11.4
Emissions (tons/year) ^d	857	1	50
Total Fluorides			
Emissions Basis	EPA (1981)		EPA (1981)
Emissions Basis (lb/10 ⁶ Btu)	6.27e-06	neg.	6.27e-06
Emissions (lb/hour)	2.54e-02	0.00	1.02e-02
Emissions (tons/year) ^d	1.11e-01	0	4.45e-02
Mercury			
Emissions Basis	EPA (1989)		Test Results
Emissions Basis (lb/10 ⁶ Btu)	3.2e-06	neg.	2.10e-07
Emissions (lb/hour)	1.30e-02	0.00	3.40e-04
Emissions (tons/year) ^d	5.68e-02	0	1.49e-03
Beryllium			
Emissions Basis	EPA (1989)		Test Results
Emissions Basis (lb/10 ⁶ Btu)	4.20e-06	neg.	6.15e-08
Emissions (lb/hour)	1.70e-02	0.00	9.96e-05
Emissions (tons/year) ^d	7.45e-02	0	4.36e-04
Arsenic			
Emissions Basis	EPA (1989)		Test Results
Emissions Basis (lb/10 ⁶ Btu)	1.9e-05	neg.	2.45e-06
Emissions (lb/hour)	7.69e-02	0.00	3.97e-03
Emissions (tons/year) ^d	0.34	0	1.74e-02

Notes:

- ^a Based on 60% natural gas based on gas usage (2,576 10⁶ Btu/hr) and 40% Orimulsion as oil (1,620 10⁶ Btu/hr).
- ^b 1 grains sulfur /100 scf from Florida Gas Transmission data.
- ^c 40% Orimulsion with 2.8% sulfur and 13,000 Btu/lb plus 60% gas emissions.
- ^d Assumes 8,760 hours per year operation.
- ^e Based on an average of 0.1 lb/10⁶ Btu for 21 hours and excess emissions of 0.3 lb/10⁶ Btu for 3 hours.
- ^f PM10 emissions is 71 % of PM emissions.
- ^g Based on vertical fired boilers, could be as high as 1 lb/10⁶ Btu due to low excess air burners.

Environmental Protection Agency (EPA). 1989. Estimating Air Toxics Emissions from Coal and Oil Combustion Sources. EPA-450/2-89-001

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Table A-2. Maximum Estimated Emissions for Residual Oil, Natural Gas and Natural Gas/Orimulsion Firing at FPL Sanford Unit 4 (Non-regulated Pollutants)

Data	Residual Oil	Natural Gas	Natural Gas and Orimulsion ^a
Antimony			
Emissions Basis	EPA (1981)		Test Results
Emissions Basis (lb/10 ⁶ Btu)	2.33E-05	neg.	2.62E-06
Emissions (lb/hour)	9.44E-02	0.00	4.24E-03
Emissions (tons/year) ^b	0.41	0	0.019
Barium			
Emissions Basis	EPA (1981)		Test Results
Emissions Basis (lb/10 ⁶ Btu)	6.71E-05	neg.	4.17E-06
Emissions (lb/hour)	2.72E-01	0.00	6.76E-03
Emissions (tons/year) ^b	1.19	0	0.030
Cadmium			
Emissions Basis	EPA (1989)		Test Results
Emissions Basis (lb/10 ⁶ Btu)	1.57E-05	neg.	5.69E-06
Emissions (lb/hour)	6.36E-02	0.00	9.22E-03
Emissions (tons/year) ^b	0.28	0	0.040
Chromium			
Emissions Basis	EPA (1989)		Test Results
Emissions Basis (lb/10 ⁶ Btu)	2.10E-05	neg.	1.96E-05
Emissions (lb/hour)	8.51E-02	0.00	3.18E-02
Emissions (tons/year) ^b	0.37	0	0.139
Copper			
Emissions Basis	EPA (1989)		Test Results
Emissions Basis (lb/10 ⁶ Btu)	2.80E-04	neg.	1.19E-05
Emissions (lb/hour)	1.13	0.00	1.93E-02
Emissions (tons/year) ^b	4.97	0	0.084
Manganese			
Emissions Basis	EPA (1989)		Test Results
Emissions Basis (lb/10 ⁶ Btu)	2.60E-05	neg.	2.01E-05
Emissions (lb/hour)	0.11	0.00	3.26E-02
Emissions (tons/year) ^b	0.46	0	0.143
Nickel			
Emissions Basis	EPA (1989)		Test Results
Emissions Basis (lb/10 ⁶ Btu)	1.26E-03	neg.	3.65E-03
Emissions (lb/hour)	5.10	0.00	5.91
Emissions (tons/year) ^b	22.35	0	25.90

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Table A-2. Maximum Estimated Emissions for Residual Oil, Natural Gas and Natural Gas/Orimulsion Firing at FPL Sanford Unit 4 (Non-regulated Pollutants)

Data	Residual Oil	Natural Gas	Natural Gas and Orimulsion ^a
Phosphorus			
Emissions Basis	EPA (1981)		Test Results
Emissions Basis (lb/10 ⁶ Btu)	5.82E-05	neg.	3.05E-05
Emissions (lb/hour)	0.24	0.00	0.05
Emissions (tons/year) ^b	1.03	0	0.22
Selenium			
Emissions Basis	EPA (1981)		Test Results
Emissions Basis (lb/10 ⁶ Btu)	3.73E-05	neg.	1.26E-05
Emissions (lb/hour)	0.15	0.00	0.02
Emissions (tons/year) ^b	0.66	0	0.09
Silver			
Emissions Basis	EPA (1981)		Test Results
Emissions Basis (lb/10 ⁶ Btu)	1.63E-05	neg.	3.06E-06
Emissions (lb/hour)	0.07	0.00	4.96E-03
Emissions (tons/year) ^b	0.29	0	0.02
Thallium			
Emissions Basis	EPA (1981)		Test Results
Emissions Basis (lb/10 ⁶ Btu)	1.09E-05	neg.	ND
Emissions (lb/hour)	0.04	0.00	ND
Emissions (tons/year) ^b	0.19	0	-
Vanadium			
Emissions Basis	EPA (1981)		Test Results
Emissions Basis (lb/10 ⁶ Btu)	8.52E-03	neg.	1.45E-02
Emissions (lb/hour)	34.50	0.00	23.49
Emissions (tons/year) ^b	151.11	0	102.89

Notes: ^a Based on 60% natural gas based on gas usage (2,576 10⁶ Btu/hr) and 40% Orimulsion as oil (1,620 10⁶ Btu/hr).
^b assumes 8,760 hours per year operation.

Environmental Protection Agency (EPA). 1989. Estimating Air Toxics Emissions from Coal and Oil Combustion Sources. EPA-450/2-89-001

Environmental Protection Agency (EPA). 1981. Emissions Assessment of Conventional Stationary Systems: Volume III. External Combustion Sources of Electricity Generation. EPA-600/7-81-003a

SO2 EMISSIONS V. % ORIMULSION

