ALLEGHENY COUNTY HEALTH DEPARTMENT
AIR QUALITY PROGRAM

June 17, 2004

SUBJECT: Review of Application
Title V Operating Permit
Bellefield Boiler Plant
Boundary Street
Pittsburgh, PA 15213

RE: Operating Permit File No. 0047
Commercial steam generation plant

TO: Sandra L. Etzel
Chief Engineer

FROM: Erin J. O'Brian, P.E.
Permit Coordinator

FACILITY DESCRIPTION:

The Bellefield Boiler Plant, is a commercial steam generation facility located on Boundary Street in the Oakland section of Pittsburgh, PA, which supplies steam for heating and refrigeration to institutional sites in that area. The plant is composed of six boilers exhausting to one of two stacks, which fire no.2 fuel oil, coal, natural gas or a combination of coal/natural gas. The facility is a major source of nitrogen oxides (NO_X) and carbon monoxide emissions (CO), a minor source of particulate matter (PM), particulate matter < 10 microns in diameter. (PM-10), sulfur dioxide (SO2), volatile organic compounds (VOCs) and hazardous air pollutants (HAPs) as defined in section 2101.20 of Article XXI.

The facility consists of the following emission units:

1. Boilers no.1 and no.5 at 124 & 134 mmbtus/hr respectively - natural gas/coal
2. Boiler no.3 at 115 - no. 2 fuel oil, natural gas/coal
3. Boilers no. 6 & 7 at 179 & 188 mmbtus/hr - natural gas
4. Boiler no. 8 at 166 mmbtus/hr- natural gas, rental unit
5. One 5.4 mmbtus/hr, 500 kw emergency generator – no. 2 fuel oil
6. No.2 fuel oil underground storage tanks no 1 through 4 – 30,000 gallons each

Coal fired boilers no.2 & no.4 were shut down in December 2003 and November 2002 respectively.

POTENTIAL EMISSION SUMMARY:

Boiler No.1/StackNo.1:

Pollutant	Natural Gas		Coal		Maximum tons/yr*
	lbs/mmbtu	lbs/hr	lbs/mmbtu	lbs/hr	
PM	0.008	0.59	0.2354	29.19	127.85
PM10	NA	0.59	NA	10.8	47.31
NOx	NA	68.08	0.92	114.08	376.00
CO	NA	6.09	NA	28.20	123.50
SO2	NA	0.04	0.8657	107.34	470.18
VOC	NA	0.40	NA	0.49	2.16

Boilers No.3, No.5, No.6 & No.7/Stack No.2:

Pollutant	Natural Gas		Oil		Coal		Maximum tons/yr*
	lbs/ mmbtu	lbs/hr	lbs/ mmbtu	lbs/hr	lbs/ mmbtu	lbs/hr	
PM	0.008	4.55	0.015	7.29	0.1593	39.66	173.71
PM10	NA	4.55	NA	7.29	NA	21.81	94.54
NOx	NA	212.02	NA	162.69	NA	151.51	662.23
CO	NA	38.20	NA	17.35	NA	56.64	248.08
SO2	NA	0.32	NA	272.49	NA	215.37	943.32
VOC	NA	3.06	NA	1.18	NA	0.47	11.04

Boiler No.8/Stack No.2:

Pollutant	Natural Gas		Maximum tons/yr*
	lbs/mmbtu @3% O_2	lbs/hr	
PM	0.0018	0.29	1.30
PM10	NA	0.29	1.30
NOx	0.055	8.80	38.50
CO	0.082	13.10	45.00
SO2	0.0006	0.10	0.42
VOC	0.0054	0.86	3.80

Facility Potential Emissions

Pollutant	Stack No.1 tons/yr*	Stack No.2 tons/yr*	Boiler No.8 Stack No.2 tons/yr*	Total tons/yr*
PM	127.85	173.71	1.30	302.86
PM10	47.31	94.54	1.30	143.15
NOx	376.00	662.23	38.50	1076.73
CO	123.50	248.08	45.00	416.58
SO_2	470.18	943.32	0.42	1413.92
VOC	2.16	11.04	3.80	17.00

*** A year is defined as any consecutive 12-month period.**

Emission Unit Data:

See Appendix A

Potential and Allowable Emissions:

See Appendix B

Fugitive emission sources:

Paved areas: Total paved areas are <2,000 ft^2 including parking spaces.
Unpaved roads: None
Parking areas: Included in paved areas above
Other sources: None

EMISSION SOURCES OF MINOR SIGNIFICANCE:

1. Paved areas are a source of minor significance with negligible emissions of PM and PM-10 as per US EPA, AP-42, Section 13.2.1, "Paved Roads", 10-97.

2. The four No. 2 fuel oil under ground storage tanks have negligible emissions of VOCs and HAPs as per US EPA, AP-42, Section 7.1, "Organic Liquid Storage Tanks", 9-97.

EMISSION CONTROL:

Boilers no.3 and no.5 are equipped with cyclones for control of particulate matter. Boiler no.6 is equipped with flue gas recirculation for control of NO_X emissions. Boilers no.7 and no.8 are equipped with low NO_X burners and flue gas recirculation for control of NO_X emissions. Boilers no.1 through no.5 have coal sulfur content restrictions for control of SO_2.

TESTING REQUIREMENTS:

Plan Approval Order and Agreement Upon Consent Number 248, dated November 19, 1996:

In order to comply with §2105.06.b.4.B of Article XXI, Major Sources of NO_X and VOCs Reasonably Available Control Technology, the facility will test boilers no.1 through no.6 for compliance with NO_X emissions every two years (24 consecutive months) according to approved U.S. EPA test methods and Section 2108.02 of Article XXI.

Article XXI §2104.02 & RACT:

The permittee shall perform NO_X, PM, PM10, CO and SO_2 emission testing once every two consecutive years on each boiler for all fuels used and boiler efficiency determinations on each unit once during the term of each operating permit.

APPLICABLE REQUIREMENTS:

Article XXI, Requirements for Issuance:

The requirements of Article XXI, Parts B and C for the issuance of major source operating permits have been met for this facility. Article XXI, Part D, Part E & Part H will have the necessary sections addressed individually.

40 CFR PART 64, "Compliance Assurance Monitoring":

The requirements of 40 CFR Part 64, "Compliance Assurance Monitoring," were found be applicable to boilers no.3 & no.5 due to cyclones for particulate control and to boilers no.7 and no.8 due to the presence of flue gas recirculation systems for NO_X control. Part 64 requirements will be incorporated into the Operating Permit upon the renewal of the permit.

NEW SOURCE PERFORMANCE STANDARDS:

40 CFR PART 60, subpart Db, Standards of Performance for Industrial Commercial-Institutional Steam Generating Units:

Boilers no.7 and no. 8 were installed in 1994 and 2003 therefore subpart Db does apply. Boiler no.7 fires natural gas and may burn fuel oil in natural gas curtailment situations and is subject to a use of fuel oil with a maximum sulfur content of 0.05% by weight, a NO_X emission limitation of 0.2 lbs/mmbtu, monitoring of NO_X emissions by CEM, monitoring of SO2 emissions by fuel sulfur content, opacity limits and opacity monitoring requirements along with specified record keeping and recording. Boiler no. 8 may fire natural gas only and is subject to the NO_X limitations specified above for boiler no. 7. See Operating Permit 0047 for specific conditions.

40 CFR PART 63 Subpart DDDDD--National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers and Process Heaters:

As per §63.7490 of subpart DDDDD existing boilers no.1, no.3, no.5, no.6, no.7 and no.8 are a major source of HAPs and therefore subject to the above referenced. The facility must comply with subpart DDDDD within three years after promulgation of the final rule in the Federal Register. As commercial boilers under subpart DDDDD the units must comply with the emission standards in lbs/mmbtu for PM or total metals, HCl and Hg as specified in Table 1 of the subpart as well as operating limits as set forth in Tables 2, 3 & 4. In addition, the units are subject to monitoring, testing, record keeping and reporting requirements as stated in the final rule.

STREAMLINING:

Boilers no. 1 through no. 6, SO2 allowable emissions:

Boilers no., no.3, no.5 & no.6:

The sulfur dioxide emissions standard of Article XXI §2104.03.a.2.B provides for the following allowable sulfur dioxide emissions for boilers no.1, no.3, no.5 & no.6 in columns 1 and 2. Maximum theoretical potential emissions of sulfur dioxide in lbs/mmbtutu for natural gas and no. 2 fuel oil (based on AP-42 emission factors) for boilers no. 1 through 6 are provided in columns 3 & 4:

Unit	Allowable		Potential	
	NG	Oil	NG	Oil
Boiler no.1	0.0006	NA	0.0006	NA
Boiler no.3	0.0006	0.8707	0.0006	0.5607
Boiler no.5	0.0006	NA	0.0006	NA
Boiler no.6	0.0006	0.8223	0.0006	0.5607

Emissions above the maximum potential to emit are not possible if the boilers are operated and maintained properly according to proper combustion practices and using the fuel type specified. §2101.02.c.4 of Article XXI requires the application of RACT on all existing sources. The above allowable emission limits from §2104.03.a.2 represent generic, minimum standards for allowable emissions. Case-by-case RACT for sulfur dioxide emissions from boilers no.1 through no.6 has been determined to be maximum potential emissions under proper operation and maintenance of the boilers, along with record keeping and reporting requirements for fuel type, usage, sulfur content of fuel, etc.

NO_X REASONABLY AVAILABLE CONTROL TECHNOLOGY (RACT):

Section 2105.06 of Article XXI requires that RACT be applied to all major sources of NO_X . A NO_X RACT analysis found that no combustion or stack gas NO_X control equipment was technically or economically feasible for use on boilers no. 1 through no.7. Plan Approval Order and Agreement Upon Consent Number 248, dated December 19, 1996, submitted to the US EPA as a site specific SIP revision to Allegheny County's portion of the PA SIP, has established the following conditions for NO_X RACT:

Maximum Allowable NO_X emissions:

Unit	lbs/mmbtu	tons/yr
Boiler no.1	0.92	376
Boiler no.3	0.63	242
Boiler no.5	0.59	261
Boiler no.6	0.28	191
Boiler no.7	0.20	65

NO_X emission testing on boilers no.1 through no.6 every five years is required along with a NO_X CEM on boiler no.7 in accordance with 40 CFR 60, subpart Db. In addition, natural gas input to the burner in boiler no.3 is limited to a maximum of 64 mmbtu/hr or 560,640 mmbtus/yr along with record keeping and recording requirements for each boiler.

Boiler no.8 was constructed after the Plan Approval Order took effect therefore there are no conditions from the order applicable to that unit.

Streamlining:

Boiler no.1: The natural gas burner in this unit has a maximum heat input of 74 mmbtu/hr which results in maximum potential NO_X emissions from the boiler fired solely on natural gas of 298.19 tons NO_X/yr. This PTE for natural gas combustion only has been specified in the operating permit.

Boiler no.3: The natural gas burners in this unit have a maximum heat input of 128 mmbtu/hr and an annual heat input limitation of 560,640 mmbtu/yr which results in maximum potential NO_X emissions from the boiler fired solely on natural gas of 176.60 tons NO_X/yr. This PTE for natural gas combustion only has been specified in the operating permit.

Boiler no.5: The natural gas burner in this unit has a maximum heat input of 74 mmbtu/hr which results in maximum potential NO_X emissions from the boiler fired solely on natural gas of 191.23 tons NO_X/yr. This PTE for natural gas combustion only has been specified in the operating permit.

No other boilers required streamlining of NO_X RACT conditions.

Streamlining Installation Permit 91-I-0056-C, Boiler No.7:

Installation Permit #91-I-0056-C specifies NO_X emission limits for Boiler no.7 at, 38 lbs/hr and 38 tons/yr for natural gas and oil combustion. These permit limits are more restrictive than NO_X RACT and being the controlling regulation for NO_X has been used as the controlling set of limitations for NO_X in the Operating Permit. The RACT 0.20 lbs/mmbtu emission limitation remains in the Operating Permit and is equivalent to the IP limit of 38 lbs/hr.

The above referenced installation permit was issued on December 3, 1991 and contains emission limitations for boiler no.7 firing natural gas only. Fuel oil was a permitted fuel for emergency only in the permit with no oil only emission limitations or restrictions on maximum annual oil usage. Fuel oil emission limitations based on AP-42, 1.3, 9/98 as well as a maximum of 500 hours/yr of fuel oil combustion at maximum capacity were added to the Title V Operating Permit.

REGULATED POLLUTANTS WITH NO ESTABLISHED REGULATORY EMISSION LIMITATION:

Section 2103.12.a.2.B of Article XXI requires that RACT be applied to pollutants regulated by Article XXI without established regulatory emission limitations. RACT for carbon monoxide and volatile organic compound emissions from boilers no. 1 through no. 6 have been determined to be proper operation and maintenance of the boilers according to accepted combustion practices, therefore, the emission limitations for these pollutants will be the maximum potential emissions under proper operation of the boilers as shown in the above emission summary.

METHOD OF COMPLIANCE DETERMINATION:

Compliance with the boiler emission limitations may be demonstrated by compliance with the maximum fuel usage limitations, fuel certifications, coal sulfur content monitoring and conditions continuous monitoring where applicable and recording of flue gas oxygen content and record keeping and recording requirements that include inspection, maintenance and repair data and monthly usage of natural gas and fuel oil. In addition, NOx compliance may be demonstrated by the specified periodic NOx emission tests. See the Operating Permit No. 0044 for the specific compliance methods, record keeping and reporting requirements
for the facility.

RECOMMENDATIONS:

The facility is in compliance with all applicable regulations of Article XXI and it is recommended that the Operating Permit No. 0044 be issued.

APPENDIX A
Emission Unit Data

Emission Unit Data

Unit:	**Boiler no.1**
Make:	Babcock & Wilcox
Model:	2 drum
Type:	Chain-grate (overfeed) stoker with sidewall gas burner
Input rating:	124 MMBtu/hr total for unit
Gas burner:	74 MMBtu/hr maximum heat input
Date installed:	1956
Primary fuel:	Coal or natural gas/coal
Exhaust	Stack no.148,450 acfm at 557^0F
Emission controls:	None

Unit:	**Boiler no.3**
Make:	Erie City
Model:	VC
Type:	Chain grate stoker
Fuels:	
Coal:	115 MMBtu/hr
Gas:	128 MMBtu/hr maximum heat input
Oil:	119 MMBtu/hr maximum heat input
Date installed:	1977
Primary fuel:	Coal
Secondary fuel:	Natural gas/no.2 fuel oil
Tertiary fuel:	No.2 fuel oil
Exhaust	Stack no.2, boilers no.3 through 7 combined = 385,000 acfm at 500^0F
Emission controls:	Cyclone, Erie City 9VM10T-96-8
Outlet grain loading:	0.038 gr/dscf – manufacturer's specifications

Unit:	**Boiler no.5**
Make:	Erie City
Model:	VC
Type:	Chain grate stoker with gas burner
Fuels:	
Coal:	134 MMBtu/hr
Gas:	74 MMBtu/hr maximum heat input
Date installed:	1965
Primary fuel:	Coal/ Natural gas
Exhaust	Stack no.2, boilers no.3 through 7 combined = 385,000 acfm at 500^0F
Emission controls:	Cyclone fly ash arrestor, MTSA-90-9 CYT
Outlet grain loading:	0.044 gr/dscf – manufacturer's specifications

Unit:	**Boiler no.6**
Make:	Erie City
Model:	Keystone M21
Type:	Natural gas with FGR
Input rating:	179 MMBtu/hr
Date installed:	1973
Primary fuel:	Natural gas/ No.2 fuel oil
Exhaust	Stack no.2, boilers no.3 through 7 combined = 385,000 acfm at 500^0F
Emission controls:	None

Unit:	**Boiler no.7**
Make:	IBW
Model:	WM 1500
Type:	Natural gas with FGR
Input rating:	188 MMBtu/hr
Date installed:	1994
Primary fuel:	Natural gas
Secondary fuel:	No.2 fuel oil emergency only
Exhaust:	Stack no.2, boilers no.3 through 7 combined = 385,000 acfm at 500^0F
Emission controls:	Low NO_X burner for natural gas

Unit:	**Boiler no.8 – Rental unit subject to replacement**
Make:	Rental Unit - Not yet determined
Model:	Rental Unit - Not yet determined
Type:	Natural gas with optional FGR
Input rating:	160 MMBtu/hr maximum
Date installed:	2004
Primary fuel:	Natural gas
Exhaust:	Stack no.2, boilers no.3 through 8 combined = 385,000 acfm at 500^0F
Emission controls:	Low NO_X burner for natural gas

Unit:	**Emergency generator**
Make:	Caterpillar
Model:	3412
Type:	IC engine
Input rating:	5.4 MMBtu/hr, 500 kw
Primary fuel:	Diesel
Exhaust	Stack no.3
Emission controls:	None

Unit:	**Tanks No.1 through 4**
Type:	Underground horizontal each
Capacity:	30,000 gallons each
Material stored:	No.2 fuel oil each
Emission controls:	None

Unit:	**Paved areas**
Amount:	<2,000 ft^2
Emission controls:	None

APPENDIX B
Allowable & Potential Emissions

Emission Calculation Data:

Average coal heating capacity = 26.4 mmbtu/ton
Average coal sulfur content = 1.0% by mass
Average natural gas heating capacity = 1020 btu/ft^3
All natural gas is pipeline quality with respect to impurities and sulfur content
Average no.2 fuel oil heating capacity = 140,000 btu/gallon
Maximum no.2 fuel oil sulfur content = 0.5% by mass

Boiler No.1:

	Natural Gas[1]				Natural Gas/Coal[1]				Coal[1]				Maximum Potential		
Pollutant	**lbs/mmbtu**	**lbs/hr**	**tons/yr**	**Basis**	**lbs/mmbtu**	**lbs/hr**	**tons/yr**	**Basis**	**lbs/mmbtu**	**lbs/hr**	**tons/yr**	**Basis**	**lbs/mmbtu**	**lbs/hr**	**tons/yr**
PM	0.008	0.59	2.58	Article XXI, §2104.02.a.1.A[2]	< mmbtu x allowable $_{coal}$ + mmbtu $_{NG}$ x 0.008 lbs/mmbtu			Article XXI, §2104.02.a.3	0.2354	29.19	127.85	Article XXI, §2104.02.a.2.B	0.2354	29.19	127.85
PM10	NA	0.59	2.58	PTE[2, 6]	< mmbtu x allowable $_{coal}$ x 0.37 + mmbtu $_{NG}$ x 0.008 lbs/mmbtu			PTE[5]	NA	10.8	47.31	PTE[5]	NA	10.8	47.31
NOx	0.92	68.08	298.19	PTE[2,3]	0.92	114.08	376.00	RACT[3]	0.92	114.08	376.00	RACT[3]	0.92	114.08	376.00
CO	NA	6.09	26.69	PTE[4]	NA	28.20	123.50	PTE[4, 6]	NA	28.20	123.50	PTE[4]	NA	28.20	123.50
SO2	0.0006	0.04	0.19	PTE[4]	0.8657	107.34	470.18	Article XXI, §2104.03.a	0.8657	107.34	470.18	Article XXI, §2104.03.a	0.8657	107.34	470.18
VOC	NA	0.40	1.75	PTE[4]	NA	0.49	2.16	PTE[4, 6]	NA	0.24	1.05	PTE[4]	NA	0.49	2.16

Notes:
[1]Maximum natural gas capacity = 74 mmbtu/hr, coal and coal/natural gas = 124 mmbtu/hr.
[2]PTE or allowable calculated using natural gas capacity 74 mmbtu/hr.
[3]Hourly and annual PTE based on allowable of 0.92 lbs/mmbtu – streamlined RACT annual limit for NG.
[4]Allowable is NG PTE using 74 mmbtu/hr and EFs from AP-42, 1.4, 7/98, Coal PTEs using AP-42, 1.1, 9/98. – stream lined Article XXI, §2104.03.a, allowable NG SOx lbs/mmbtu limitation.
[5]PM-10 emissions for coal are taken as 37% of PM as per AP-42, 1.1, 9/98 for overfeed stokers. All PM emissions from natural gas are PM-10.
[6]PTE based on a maximum usage of the worst-case fuel for the subject pollutant. VOCs using NG at 74 mmbtu/hr and coal at 50 mmbtu/hr and CO using 100% coal.

Fuel Capacity and VOC & CO PTEs:
Maximum potential coal usage = 124 mmbtu/hr / 26.4 mmbtu/ton = 4.70 tons/hr = 41,170 tons/yr
VOC PTE coal only = 0.05 lbs/ton x 4.7 tons/hr = 0.24 lbs/hr = 1.05 tons/yr
CO PTE coal only = 6.0 lbs/ton x 4.7 tons/hr = 28.2 lbs/hr = 123.5 tons/yr
VOC PTE NG/coal = 0.05 lbs/ton x (50 mmbtu/hr / 26.4 mmbtu/ton) +0.399 lbs/hr = 0.494 lbs/hr = 2.16 tons/yr

Boiler No.3:

Natural Gas[1]					Oil[1]				Coal[1]			
Pollutant	**lbs/mmbtu**	**lbs/hr**	**tons/yr[7]**	**Basis**	**lbs/mmbtu**	**lbs/hr**	**tons/yr**	**Basis**	**lbs/mmbtu**	**lbs/hr**	**tons/yr**	**Basis**
PM	0.008	1.02	2.09	Article XXI, §2104.02.a.1.A[2]	0.015	1.78	7.82	Article XXI, §2104.02.a.1.B	0.2455	28.23	123.65	Article XXI, §2104.02.a.2.B
PM10	NA	1.02	2.09	PTE[2, 5]	NA	1.78	7.82	PTE[5]	NA	15.53	68.02	PTE[5]
NOx	0.63	80.64	176.60	RACT[2, 3]	0.63	74.97	242.00	RACT[2, 3]	0.63	72.45	242.00	RACT[2, 3]
CO	NA	10.54	46.17	PTE[4]	NA	4.25	18.62	PTE[4]	NA	26.16	114.58	PTE[4]
SO2	0.0006	0.08	0.17	PTE[4]	0.5607	66.72	292.26	PTE[5]	0.8749	100.61	440.67	Article XXI, §2104.03.a.2.B
VOC	NA	0.69	1.51	PTE[4]	NA	0.29	1.27	PTE[4]	NA	0.22	0.96	PTE[4]

Notes:

[1]Maximum natural gas capacity = 128 mmbtu/hr, maximum fuel oil capacity = 119 mmbtu/hr, maximum coal capacity = 115 mmbtu/hr.

[2]PTE or allowable calculated using the maximum potential heat inputs for natural gas = 128mmbtu/hr, oil = 119 mmbtu/hr and coal = 115 mmbtu/hr

[3]Hourly and annual PTE based on allowable of 0.63 lbs/mmbtu.

[4] Allowable is PTE using maximum burner input for fuel type and EFs, NG from AP-42, 1.4, 7/98, oil from AP-42, 1.3, 9/98 and coal from AP-42, 1.1, 9/98 – stream-lined Article XXI, §2104.03.a, allowable SOx lbs/mmbtu limitations for NG and oil.

[5]PM-10 emissions for coal controlled by multiple cyclones are taken as 55% of PM as per AP-42, 1.1, 9/98 for overfeed stokers. All PM emissions from natural gas and no.2 fuel oil are considered PM-10.

[6]PTE based on a maximum usage of the worst-case fuel for the subject pollutant. NG/coal: VOCs using NG at 128 mmbtu/hr and coal at 0 mmbtu/hr and CO using 100% coal at 115 mmbtu/hr, NG/oil: VOCs and CO using NG at 128 mmbtu/hr and oil at 0 mmbtu/hr. Annual PTE for NG/oil is from 100% oil due to the NG burner annual usage restriction

[7]Average annual NG burner limitation of 64 mmbtu/hr or 560,640 mmbtu/Yr

Natural Gas/Oil					Natural Gas/Coal				Maximum Potential/Allowable		
Pollutant	**lbs/mmbtu**	**lbs/hr**	**tons/yr**	**Basis**	**lbs/mmbtu**	**lbs/hr**	**tons/yr**	**Basis**	**lbs/mmbtu**	**lbs/hr**	**tons/yr**
PM	< $mmbtu_{oil}$ x 0.015 lbs/mmbtu + $mmbtu_{NG}$ x 0.008 lbs/mmbtu			Article XXI, §2104.02.a.3	< mmbtu x $allowable_{coal}$ + $mmbtu_{NG}$ x 0.008 lbs/mmbtu			Article XXI, §2104.02.a.3	0.2455	28.23	123.65
PM10	< $mmbtu_{oil}$ x 0.015 lbs/mmbtu + $mmbtu_{NG}$ x 0.008 lbs/mmbtu			PTE[6]	< mmbtu x $allowable_{coal}$ x 0.55 + $mmbtu_{NG}$ x 0.008 lbs/mmbtu			PTE[6]	NA	15.53	60.02
NOx	0.63	80.64	242.00	RACT[2, 3]	0.63	74.97	242.00	RACT[2, 3]	0.63	80.64	242.00
CO	NA	10.54	46.17	PTE[4, 6]	NA	26.16	114.58	PTE[4, 6]	NA	26.16	114.58
SO2	0.5607	66.72	292.26	PTE[5]	0.8749	100.61	440.67	Article XXI, §2104.03.a.2.B	0.8749	100.61	440.67
VOC	NA	0.69	1.27	PTE[4, 6]	NA	0.69	3.02	PTE[4, 6]	NA	0.69	1.27

Fuel Capacity and VOC & CO PTEs:

Maximum potential coal usage = 115 mmbtu/hr / 26.4 mmbtu/ton = 4.36 tons/hr = 38,190 tons/yr

VOC PTE coal only = 0.05 lbs/ton x 4.36 tons/hr = 0.218 lbs/hr = 0.95 tons/yr

CO PTE coal only = 6.0 lbs/ton x 4.36 tons/hr = 26.16 lbs/hr = 114.58 tons/yr

Maximum potential oil usage = 119 mmbtu/hr / 140 mmbtu/10^3 gallons = 0.85 x 10^3 gallons /hr = 7446 x 10^3 gallons /yr

VOC PTE oil only = 0.34 lbs/10^3 gallons x 0.85 x 10^3 gallons /hr = 0.289 lbs/hr = 0.95 tons/yr

CO PTE oil only = 5.0 lbs/10^3 gallons x 0.85 x 10^3 gallons /hr = 4.25 lbs/hr = 18.62 tons/yr

Boiler No.5:

Natural Gas[1]					Natural Gas/Coal[1]				Coal[1]				Maximum Potential		
Pollutant	**lbs/mmbtu**	**lbs/hr**	**tons/yr**	**Basis**	**lbs/mmbtu**	**lbs/hr**	**tons/yr**	**Basis**	**lbs/mmbtu**	**lbs/hr**	**tons/yr**	**Basis**	**lbs/mmbtu**	**lbs/hr**	**tons/yr**
PM	0.008	0.59	2.58	Article XXI, §2104.02.a.1.A[2]	< mmbtu x allowable $_{coal}$ + mmbtu $_{NG}$ x 0.008 lbs/mmbtu			Article XXI, §2104.02.a.3	0.2254	30.20	132.28	Article XXI, §2104.02.a.2.B	0.2254	30.20	132.28
PM10	NA	0.59	2.58	PTE[2, 5]	< mmbtu x allowable $_{coal}$ x 0.37 + mmbtu $_{NG}$ x 0.008 lbs/mmbtu			PTE[5]	NA	16.61	72.75	PTE[5]	NA	16.61	72.75
NOx	0.59	43.66	191.23	PTE[2,3]	0.59	79.06	261.00	RACT[3]	0.59	79.06	261.00	RACT[3]	0.59	79.06	261.0
CO	NA	6.09	26.69	PTE[4]	NA	30.48	133.50	PTE[4, 6]	NA	30.48	133.50	PTE[4]	NA	28.2	123.5
SO2	0.0006	0.04	0.19	PTE[4]	0.8564	114.76	502.65	Article XXI, §2104.03.a.2.B	0.8564	114.76	502.65	Article XXI, §2104.03.a.2.B	0.8564	114.76	502.65
VOC	NA	0.40	1.75	PTE[4]	NA	0.513	2.25	PTE[4, 6]	NA	0.513	1.10	PTE[4]	NA	0.513	2.25

Notes:

[1]Maximum natural gas capacity = 74 mmbtu/hr, coal and coal/natural gas = 134 mmbtu/hr.

[2]PTE or allowable calculated using natural gas capacity 74 mmbtu/hr.

[3]Hourly and annual PTE based on allowable of 0.59 lbs/mmbtu.

[4]Allowable is PTE using maximum natural gas input of 74 mmbtu/hr and EFs, NG from AP-42, 1.4, 7/98 and/or coal from AP-42, 1.1, 9/98. . – stream lined Article XXI, §2104.03.a, allowable SOx lbs/mmbtu limitation.

[5]PM-10 emissions for coal are taken as 55% of PM as per AP-42, 1.1, 9/98 for overfeed stokers. All PM emissions from natural gas are PM-10.

[6]PTE based on a maximum usage of the worst-case fuel for the subject pollutant. VOCs using NG at 74 mmbtu/hr and coal at 60 mmbtu/hr and CO using 100% coal.

Fuel Capacity and VOC & CO PTEs:

Maximum potential coal usage = 134 mmbtu/hr / 26.4 mmbtu/ton = 5.08 tons/hr = 44,500 tons/yr

VOC PTE coal only = 0.05 lbs/ton x 5.08 tons/hr = 0.25 lbs/hr = 1.10 tons/yr

CO PTE coal only = 6.0 lbs/ton x 5.08 tons/hr = 30.48 lbs/hr = 133.5 tons/yr

VOC PTE NG/coal = 0.05 lbs/ton x (60 mmbtu/hr / 26.4 mmbtu/ton) +0.399 lbs/hr = 0.513 lbs/hr = 2.25 tons/yr

Boiler No.6:

Natural Gas[1]					Natural Gas/Oil				Oil				Maximum Potential		
Pollutant	**lbs/mmbtu**	**lbs/hr**	**tons/yr**	**Basis**	**lbs/mmbtu**	**lbs/hr**	**tons/yr**	**Basis**	**lbs/mmbtu**	**lbs/hr**	**tons/yr**	**Basis**	**lbs/mmbtu**	**lbs/hr**	**tons/yr**
PM	0.008	1.43	6.26	Article XXI, §2104.02.a.1.A	< mmbtu $_{OIL}$ x 0.015 lbs/mmbtu + mmbtu $_{NG}$ x 0.008 lbs/mmbtu			Article XXI, §2104.02.a.3	0.015	2.69	11.74	Article XXI, §2104.02.a.2.B	0.015	2.69	11.74
PM10	NA	1.43	6.26	Same	Same			Same[6]	NA	2.69	11.74	Same[6]	NA	2.69	11.74
NOx	0.28	50.12	191	RACT[3]	0.28	50.12	191	RACT	0.28	50.12	191	RACT	0.28	50.12	191
CO	NA	14.74	64.57	PTE[2, 4]	NA	6.39	28.00	PTE[2]	NA	6.39	28.00	PTE[2]	NA	14.74	64.57
SO2	0.0006	0.11	0.46	PTE[2, 4,]	0.5607	100.36	439.58	PTE[5]	0.5607	100.36	439.58	PTE[5]	0.5607	100.36	439.58
VOC	NA	0.97	4.23	PTE[2, 4]	0.43	1.90	PTE[2]	PTE[2]	NA	0.43	1.90	PTE[2]	NA	0.97	4.23

Notes:

[1]Maximum fuel capacity = 179 mmbtu/hr.

[2]PTE or allowable calculated using the maximum fuel capacity = 179mmbtu/hr

[3]Hourly PTE based on allowable of 0.28 lbs/mmbtu and annual PTE based on RACT cost analysis.

[4] Allowable is PTE using maximum fuel capacity and EFs for NG from AP-42, 1.4, 7/98 and oil from AP-42, 1.3, 9/98.

[5]Allowable is PTE using maximum burner input for fuel type, pipeline quality natural gas and EFs, NG from AP-42, 1.4, 7/98, oil from AP-42, 1.3, 9/98 – stream lined Article XXI, §2104.03.a.2.B, allowable SOx lbs/mmbtu limitation for NG and oil.

[6]All PM emissions from natural gas and no.2 fuel oil are considered PM-10.

[7]PTE based on a maximum usage of the worst-case fuel for the subject pollutant. NG/coal: VOCs using NG at 179 mmbtu/hr and CO using 100% oil at 179 mmbtu/hr.

Boiler No.7:

Natural Gas[1]					Oil[1]				Maximum Potential		
Pollutant	**lbs/mmbtu**	**lbs/hr**	**tons/yr**	**Basis**	**lbs/mmbtu**	**lbs/hr**	**tons/yr**	**Basis**	**lbs/mmbtu**	**lbs/hr**	**tons/yr**
PM	0.0053	1.00	1.00	IP# 91-I-0056-C	0.015	2.82	0.71	Article XXI, §2104.02.a.2.B [2]	0.015	2.82	1.00
PM10	NA	1.00	1.00	IP# 91-I-0056-C	0.015	2.82	0.71	PTE [2]	0.015	2.82	1.00
NOx	0.20	38.00	38.00	IP# 91-I-0056-C & RACT[3]	0.20	37.6	38	PTE & RACT[3, 2]	0.20	38.00	38.00
CO	NA	27.00	27.00	IP# 91-I-0056-C	NA	6.71	1.68	PTE [2]	NA	27.00	27.00
SO2	0.0005	0.10	0.10	IP# 91-I-0056-C	0.5607	105.41	26.35	PTE[2]	0.5607	105.41	26.35
VOC	NA	3.60	3.60	IP# 91-I-0056-C	NA	0.46	0.11	PTE[2]	NA	3.60	3.60

Notes:
[1]Maximum fuel capacity = 188 mmbtu/hr.
[2] Annual allowable operation is 500 hours of operation @ 188 mmbtu/hr = 680,000 gallons no.2 fuel oil/yr. Allowable is PTE using maximum fuel capacity and EFs for NG from AP-42, 1.4, 7/98 and oil from AP-42, 1.3, 9/98.
[3]Allowable of 0.20 lbs/mmbtu from RACT.
Allowable is PTE using maximum fuel capacity and EFs for NG from AP-42, 1.4, 7/98 and oil from AP-42, 1.3, 9/98.

Boiler No.8:

Natural Gas				
Pollutant	**lbs/mmbtu @3% O_2**	**lbs/hr**	**tons/yr**	**Basis**
PM	0.0018	0.29	1.30	IP# 0047-I001
PM10	NA	0.29	1.30	IP# 0047-I001
NOx	0.055	8.80	38.50	IP# 0047-I001
CO	0.082	13.10	45.00	IP# 0047-I001
SO2	0.0006	0.10	0.42	IP# 0047-I001
VOC	0.0054	0.86	3.80	IP# 0047-I001

Notes:
Maximum fuel capacity = 160 mmbtu/hr.

Emergency Generator:

Diesel				
Pollutant	**lbs/mmbtu**	**lbs/hr**	**tons/yr**	**Basis[1]**
PM		0.54	0.14	PTE
PM10		0.54	0.14	PTE
NOx		17.28	4.32	PTE
CO		4.59	1.15	PTE
SO2		0.11	0.03	PTE
VOC		0.44	0.11	PTE

Notes:
Maximum fuel capacity = 5.4 mmbtu/hr.
Maximum operating hours = 500 hrs/yr.

[1]Potential emissions based on AP-42, 3.4, 10/96,
maximum allowable sulfur content = 0.02% by weight

Stack No.1:

Boiler No. 1 is the only unit exhausting to stack no.1; therefore, the allowables for boiler no.1 are the allowables for that stack.

Stack/Boiler No.1:

Allowable Natural Gas					Allowable Coal Only			
Pollutant	**lbs/mmbtu**	**lbs/hr**	**tons/yr**	**Basis**	**lbs/mmbtu**	**lbs/hr**	**tons/yr**	**Basis**
PM	0.008	0.59	2.58	Article XXI, §2104.02.a.1.A	0.2354	29.19	127.85	Article XXI, §2104.02.a.2.B
PM10	NA	0.59	2.58	PTE	NA	10.8	47.31	PTE
NOx	NA	68.08	298.19	PTE	0.92	114.08	376.00	RACT
CO	NA	6.09	26.69	PTE	NA	28.20	123.50	PTE
SO2	NA	0.04	0.19	PTE	0.8657	107.34	470.18	Article XXI, §2104.03.a
VOC	NA	0.40	1.75	PTE	NA	0.49	2.16	PTE

Stack No.2:

Stack No.2:

Allowable Natural Gas[1]					Allowable Oil[1]				Allowable Coal[1]			
Pollutant	**lbs/mmbtu**	**lbs/hr**	**tons/yr**	**Basis**	**lbs/mmbtu**	**lbs/hr**	**tons/yr**	**Basis**	**lbs/mmbtu**	**lbs/hr**	**tons/yr**	**Basis**
PM	0.008	4.55	19.93	Article XXI, §2104.02.a.1.A	0.015	7.29	31.93	Article XXI, §2104.02.a.1.B	0.1593	39.66	173.71	Article XXI, §2104.02.a.2.B
PM10	NA	4.55	19.93	PTE[3]	NA	7.29	31.93	PTE[3]	NA	21.81	94.54	PTE[3]
NOx	NA	212.42	596.83	RACT[4]	NA	162.69	471.00	RACT[2]	NA	151.51	503.00	RACT[2]
CO	NA	64.37	164.43	PTE[2]	NA	17.35	48.30	PTE[2]	NA	56.64	248.08	PTE[2]
SO2	NA	0.33	0.92	PTE[2]	NA	272.49	758.19	PTE[2]	NA	215.37	943.32	Article XXI, §2104.03.a.2.B
VOC	NA	5.66	11.09	PTE[2]	NA	1.18	3.28	PTE[2]	NA	0.73	2.07	PTE[2]

[1]Maximum NG heat input to boilers no.3, no.5, no.6 & no.7 = 569 mmbtu/hr, maximum Oil heat input to boilers no.3, no.6 & no.7 = 486 mmbtu/hr, maximum coal heat input to boilers no.3 & no.5 = 249 mmbtu/hr.
[1]Cumulative hourly and annual boiler limitations for boilers boilers no.3, no.5, no.6 & no.7
[3]PM-10 emissions for coal are taken as 55% of PM as per AP-42, 1.1, 9/98 for overfeed stokers. All PM emissions from natural gas and no.2 fuel oil are PM-10.
[4]Maximum allowable hourly NOx emissions are from allowable lbs/mmbtu in RACT Order, allowable annual emissions are from allowable lbs/mmbtu in RACT Order applied to maximum annual natural gas usage.

Pollutant	**PM**	**PM10**	**NOx**	**CO**	**SO2**	**VOC**
Maximum Annual	173.71	94.54	596.83	248.08	943.32	11.09

Stack No.2/Boiler No.8:

Natural Gas[1]				
Pollutant	**lbs/mmbtu @3% O_2**	**lbs/hr**	**tons/yr**	**Basis**
PM	0.0018	0.29	1.30	IP# 0047-I001
PM10	NA	0.29	1.30	IP# 0047-I001
NOx	0.055	8.80	38.50	IP# 0047-I001
CO	0.082	13.10	45.00	IP# 0047-I001
SO2	0.0006	0.10	0.42	IP# 0047-I001
VOC	0.0054	0.86	3.80	IP# 0047-I001

Potential HAP Emissions From Coal Combustion

Boiler	Maximum Potential Coal Usage, tons/yr	Maximum Potential Coal heat Input, mmbtu/yr	HCl[1]		HF[1]		As[2]		Cd[2]		Formaldehyde[2]		Total HAPs	
			lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr
No.1	41,170	1.0862×10^6	5.64	24.70	0.71	3.10	0.10	0.44	0.01	0.03	0.02	0.08	6.48	28.35
No.2	38,190	1.0074×10^6	5.23	22.91	0.65	2.86	0.09	0.40	0.01	0.03	0.02	0.07	6.00	26.27
No.3	44,500	1.1738×10^6	6.10	26.71	0.76	3.34	0.11	0.48	0.01	0.04	0.02	0.08	7.00	30.65
Totals	123,860	3.2674×10^6	16.97	74.32	2.12	9.30	0.30	1.32	0.03	0.10	0.06	0.23	19.48	85.27

[1]PTE based on EFs for bituminous coal combustion in lbs/ton coal from AP-42, 1.1, 9/98.
[2]PTE based on EFs for bituminous coal combustion in lbs/10^{12} btu coal from AP-42, 1.1, 9/98.

Potential HAP Emissions From Fuel Oil Combustion

Boiler	Maximum Potential Oil Usage, gal/yr	Maximum Potential Coal heat Input, mmbtu/yr	Organics[1]		HAP Metals[2]		Total HAPs	
			lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr
No.3	$7,446 \times 10^3$	1.0862×10^6	insig.	insig.	0.01	0.03	0.01	0.03
No.6	$11,195 \times 10^3$	1.0074×10^6	insig.	insig.	0.01	0.04	0.01	0.04
Totals	$18,641 \times 10^3$	3.2674×10^6	insig.	insig.	0.02	0.07	0.02	0.07

[1]PTE based on EFs for distillate fuel oil combustion in lbs/10^3 gal oil from AP-42, 1.3, 9/98.
[2]PTE based on EFs for distillate fuel oil combustion in lbs/10^{12} btu coal from AP-42, 1.3, 9/98.