

**TO** Air Quality Permit File: OP-65-00163  
Pa. Department of Human Services/ Torrance State Hospital

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**THROUGH** Barbara R. Hatch, P.E. *BRH*  
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**DATE** April 7, 2015

**RE** Review of Application for Renewed Title V Operating Permit  
Pa. Department of Human Services/ Torrance State Hospital  
Derry Township, Westmoreland County  
APS #780658; AUTH #926625; PF #275548

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**Background:**

Torrance State Hospital is operated by the Pa. Department of Human Services. Air emission sources at the facility consist of steam generating boilers, emergency engines and #2 fuel oil tanks. The initial Title V Operating Permit (TVOP) for this facility was issued on November 04, 1998, with an expiration date of November 04, 2003.

The operators of the facility submitted an application for General Permit Authorization GPA1-General Plan Approval Small Gas and No. 2 Oil Fired Combustion Units on February 11, 2004 to construct a 350hp NG-fired boiler. Construction of the 350hp boiler was authorized by GP-1-65-00163 on February 20, 2004. The TVOP was renewed on October 19, 2007. The 350hp boiler was included in this permit as Source ID 035. The expiration date of this permit was October 19, 2012. On November 30, 2013, Torrance submitted a letter requesting a 1-year extension for the compliance date for Torrance for the requirements of 40 CFR Part 63, Subpart JJJJJ. This extension was necessary for planning and execution of changes necessary to meet the requirements of the rule. The Department agreed to this extension, changing the date of compliance for this rule from March 21, 2014 to March 21, 2015.

For the later part of the winter of 2014-2015, the operators of the facility rented an 800hp NG-fired boiler which was intended to meet steam demand until new steam generating equipment could be purchased. Installation of this temporary boiler was performed, without authorization from the Department, on January 12, 2015. To rectify this situation, the operators of the facility submitted an application for a GPA-1-General Plan Approval Small Gas and No. 2 Oil Fired Combustion Units on January 14, 2015. Since Torrance is a Title V source, GP1 cannot be used to authorize continuing operation. General Plan Approval GPA-1-65-00163A was issued on

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February 9, 2015 for an operating shakedown period of 6-months. This fixed the expiration date of the GPA at July 12, 2015. After installation, the approval of capital funding for the new equipment was delayed. The 800hp boiler will now remain in operation for an indeterminate period and is considered part of the facility. It is contained in the proposed TVOP as Source ID 036.

An application to renew the TVOP was submitted on May 8, 2012. The application was found to be Administratively Complete on June 15, 2012. This Technical Review Document (TRD) is a review of that application.

### **Sources, Control Devices, and Emissions:**

Air emission sources at the facility consists of four steam generating boilers to provide steam for heating and other uses and thirteen engines that power emergency generators. Two of the boilers (Source IDs 032 - 45 MMBtu/hr and 034 - 17 MMBtu/hr) are exclusively coal-fired. The coal boilers are limited-use, meaning that the maximum utilization of each unit is 10% of annual capacity. The other two boilers (Source IDs 035 - 14.04 MMBtu/hr and 036 - 32.10 MMBtu/hr) are fired by natural gas (NG) and are equipped with distillate fuel oil backup burners. Distillate oil is only fired during periods of utility natural gas curtailment, maintenance, and system reliability testing. The coal-fired boilers are equipped with Breslove Separators to control particulate. The NG boilers have low NO<sub>x</sub> burners. The engines drive emergency generators. Five are fueled by Liquid Petroleum Gas (LPG) (Source ID 101 - 112 bhp, total) and eight are fueled by diesel (Source ID 102 - 1,300 bhp, total, largest engine 298-bhp). Operation of the LPG engines is limited to a maximum of 100 hours per year. Operation of the diesel engines is limited to a maximum of 500 hours per year. Opacity is limited to 20% and the permitted equipment at the site is inspected daily.

Emission processes at the Torrance State Hospital and their control are listed in Table 1:

**Table 1: Emission Sources and Control**  
**Pa. Department of Human Services**  
**Torrance State Hospital (TVOP-65-00163)**

ID	Source Name	Rated Heat Input (MMBtu/hr)/ Power (Bhp)	Emission Control	Installation or Startup
032	Babcock & Wilcox Boiler 1-750hp	45 MMBtu/hr, Coal	Limited-Use	1984
034	Keeler/Dorr-Oliver 6-400hp	17 MMBtu/hr, Coal	Limited-Use	1984
035	Cleaver Brooks Boiler #7-350hp	14.04 MMBtu/Hr, NG w/F.O. backup	Low-NO <sub>x</sub> Burner	2007
036	Cleaver Brooks Boiler 800hp	32.10 MMBtu/Hr, NG w/F.O. backup	Low-NO <sub>x</sub> Burner	2/9/2015
101	Emergency Generator Engines (5 Units 75-kw total, LPG)	112-bhp Total	Emergency (100-hr/yr)	Pre-NSPS
102	Emergency Generator Engines (8 Units, 872.5-kw total, Diesel)	1,300-bhp Total	Emergency (500-hr/yr)	Pre-NSPS

Notes: The unit of hp in boiler names is rated boiler horsepower output.  
 The unit of bhp for engines is rated brake horsepower output.

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Total annual emissions from the site are listed in the following table as estimated based on EPA AP-42 emission factors, with any exceptions noted. Annual emissions of criteria pollutants from the Torrance State Hospital are shown in Table 2:

**Table 2: Facility Criteria Emissions  
 Pa. Department of Human Services  
 Torrance State Hospital (TVOP-65-00163)**

ID	Source	Pollutant									
		PM <sub>10</sub>		SO <sub>2</sub>		CO		NO <sub>x</sub>		VOC	
		Lb/ Hr	Ton/ Yr	Lb/ Hr	Ton/ Yr	Lb/ Hr	Ton/ Yr	Lb/ Hr	Ton/ Yr	Lb/ Hr	Ton/ Yr
032	Babcock & Wilcox Boiler 1-750hp <sup>1</sup>	18.0	7.88	180	78.84	0.84	0.37	15.95	6.99	0.08	0.04
034	Keeler/Dorr-Oliver 6-400hp <sup>1</sup>	6.8	2.98	68	29.78	0.32	0.14	6.03	2.64	0.03	0.01
035	Cleaver Brooks Boiler #7-350hp <sup>2</sup>	0.140	0.37	1.30	0.10	0.54	2.23	1.69	2.18	0.14	0.29
036	Cleaver Brooks Boiler 800hp <sup>2</sup>	0.32	0.84	2.98	0.24	1.25	5.10	3.87	4.99	0.32	0.67
101	Emergency Generator Engines (5 Units 112-bhp total, LPG) <sup>3</sup>	0.0063	0.00	0.00	0.00	0.20	0.01	0.54	0.03	0.07	0.00
102	Emergency Generator Engines (8 Units, 1,300-bhp total, Diesel) <sup>4</sup>	2.9	0.72	2.7	0.67	8.7	2.17	40.3	10.08	3.3	0.82
<b>Facility Total</b>		<b>28.1</b>	<b>12.78</b>	<b>255.0</b>	<b>109.63</b>	<b>11.8</b>	<b>10.02</b>	<b>68.4</b>	<b>26.90</b>	<b>3.9</b>	<b>1.84</b>

<sup>1</sup> Under 40 CFR Part 63, Subpart JJJJJ, limited-use boilers have a maximum utilization of 10%, determined on an annual basis.

<sup>2</sup> These boilers are allowed up to 48 hours per year of non-emergency and unlimited emergency use while burning oil and unlimited use while burning natural gas.

<sup>3</sup> Use of these engines is limited to a maximum of 100 hours per year.

<sup>4</sup> Use of these engines is limited to a maximum of 500 hours per year.

The sources of emission factors in this table are discussed in the appended calculations.

The estimate of HAP emissions in Table 3 is also based on AP-42:

**Table 3: Facility Hazardous Air Pollutant (HAP) Emissions  
 Pa. Department of Human Services  
 Torrance State Hospital (TVOP-65-00163)**

Source ID	032 & 034	035 & 036	101	102	Source ID	Units
Hazardous Air Pollutant	Coal Fired Boilers <sup>1</sup>	Natural Gas Fired Boilers <sup>2</sup>	LP Gas Emergency Generators <sup>3</sup>	Diesel Emergency Generators <sup>4</sup>		
Hydrochloric Acid	1.22	0.00	0.00	0.00	1.22	Tons/Year
Hydrofluoric Acid	0.15	0.00	0.00	0.00	0.15	Tons/Year
Other HAPs	0.01	0.00	-	-	0.01	Tons/Year
<b>Sum of All HAPs</b>	<b>1.38</b>	<b>0.00</b>	<b>-</b>	<b>-</b>	<b>1.38</b>	<b>Tons/Year</b>

<sup>1</sup> Under 40 CFR Part 63, Subpart JJJJJ, limited-use boilers have a maximum utilization of 10%, determined on an annual basis.

<sup>2</sup> These boilers are allowed up to 48 hours per year of non-emergency and unlimited emergency use while burning oil and unlimited use while burning natural gas.

<sup>3</sup> Use of these engines is limited to a maximum of 100 hours per year.

<sup>4</sup> Use of these engines is limited to a maximum of 500 hours per year.

All emission factors are based on EPA's AP-42

Greenhouse gas (GHG) emissions from the facility are shown in Table 4. Again, the emissions shown are based on AP-42:

**Table 4: Facility Greenhouse Gas (GHG) Emissions**  
**Pa. Department of Human Services**  
**Torrance State Hospital (TVOP-65-00163)**

Source	Greenhouse Gas							
	CO <sub>2</sub>		CH <sub>4</sub>		N <sub>2</sub> O		Total CO <sub>2</sub> e	
	Lb/Hr	Ton/Yr	Lb/Hr	Ton/Yr	Lb/Hr	Ton/Yr	Lb/Hr	Ton/Yr
032-Babcock & Wilcox Boiler 1 <sup>1</sup>	9,252	4,052	0.101	0.044	0.067	0.029	9,275	4,062
034-Kcceler/Dorr-Oliver Boiler 6 <sup>1</sup>	3,495	1,531	0.038	0.0167	0.025	0.0111	3,504	1,535
035-Cleaver Brooks Boiler #7-350hp (14.04 MMBtu/Hr) <sup>2</sup>	2,237	7,112	0.0052	0.135	0.026	0.038	2,245	7,127
036-Cleaver Brooks Boiler (32.10 MMBtu/Hr) <sup>2</sup>	4,256	16,236	0.0099	0.31	0.050	0.087	4,272	16,270
101-Emergency Generators (5 Units, 251-Bhp Total, LPG-Fired) <sup>3</sup>	70	3.5	0.79	0.040			86	4
102-Emergency Diesel Generators (8 Units, 2,925-Bhp Total) <sup>4</sup>	1,495	374					1,495	374
<b>Facility Total</b>	<b>20,805</b>	<b>29,309</b>	<b>0.94</b>	<b>0.55</b>	<b>0.168</b>	<b>0.166</b>	<b>20,877</b>	<b>29,372</b>

<sup>1</sup> Under 40 CFR Part 63, Subpart JJJJJ, limited-use boilers have a maximum utilization of 10%, determined on an annual basis.

<sup>2</sup> These boilers are allowed up to 48 hours per year of non-emergency and unlimited emergency use while burning oil and unlimited use while burning natural gas.

<sup>3</sup> Use of these engines is limited to a maximum of 100 hours per year.

<sup>4</sup> Use of these engines is limited to a maximum of 500 hours per year.

All emission factors are based on EPA's AP-42

1 Ton CH<sub>4</sub> = 21 Tons CO<sub>2</sub>e and 1 Ton N<sub>2</sub>O = 310 Tons CO<sub>2</sub>e)

1. Emission Increases

This Title V Operating Permit was last renewed on October 19, 2007. Since that time, the Cleaver Brooks, NG-fired, 800-hp boiler (Source ID 036) has been installed at the hospital. In addition, the two coal-fired boilers (Source IDs 032-034), which could previously operate full time, are now limited use boilers. Operation of limited-use boilers can only operate at a maximum utilization of 10% of annual capacity. Changes in emissions since the last renewal of this Title V Operating Permit are shown in Table 5.

**Table 5: Facility Emission Changes since Issuance of Last TVOP Renewal**  
 Pa. Department of Human Services  
 Torrance State Hospital (TVOP-65-00163)

Source ID	Change	PM <sub>10</sub>	SO <sub>2</sub>	CO	NO <sub>x</sub>	VOC
		Ton/Yr	Ton/Yr	Ton/Yr	Ton/Yr	Ton/Yr
Date of previous TVOP renewal	Establishment of Facility Baseline on October 8, 2007	109.71	1,087.01	9.48	108.55	1.62
Source ID 036	Addition of 800hp NG-fired Boiler	0.84	0.24	5.10	4.99	0.67
Source IDs 032 & 034	Classification of Coal-fired boilers as limited-use	(97.76)	(977.62)	(4.56)	(86.64)	(0.46)
Total Addition over the Period		(96.92)	(977.38)	0.54	(81.64)	0.22
<b>Date of proposed TVOP renewal</b>	<b>New Facility Baseline</b>	<b>12.78</b>	<b>109.63</b>	<b>10.02</b>	<b>26.90</b>	<b>1.84</b>

The CO<sub>2</sub>e emission baseline decreased from 63,475 tons per to 29,372 tons per year over the same period. This was a net decrease of 34, 104 tons per year.

### **Regulatory Analysis:**

The Torrance State Hospital is a Title V source because its unrestricted potential emissions of SO<sub>2</sub> from the facility are greater than the major source threshold of 100 tons per year. The facility does not have the potential to emit NO<sub>x</sub> and CO in amounts greater than the 100 tons per year major source threshold. Potential emissions of VOC are less than the major source threshold of 50 tons per year, and HAP emissions do not have an emission potential greater than either 10 TPY of any single HAP and 25 TPY of the sum of all emitted HAPs. Because of HAP emission potential, the facility is also considered an area source of HAPs. The plant is also a minor source of greenhouse gases.

The facility was evaluated for applicability of New Source Performance Standards (NSPS), National Emission Standards for Hazardous Air Pollutants (NESHAP), other Federal Standards, and applicable requirements of 25 Pa. Code Chapters 121 - 145 of the Commonwealth of Pennsylvania. The following standards were considered:

#### **I. New Source Performance Standards (NSPS)**

**a. 40 CFR Part 60 Subpart D - Standards of Performance for Fossil-Fuel-Fired Steam Generators.** - This subpart applies to any fossil-fuel-fired steam generating unit that has a maximum heat input capacity of more than 250 MMBtu per hour and last commenced construction or modification after August 17, 1971 and prior to September 18, 1978. The maximum heat input to any fossil-fueled fired boiler at the plant is 45 MMBtu/hr. Therefore, no boiler at the facility is subject to the requirements of 40 CFR Part 60, Subpart D.

**b. 40 CFR Part 60 Subpart Da - Standards of Performance for Electric Utility Steam Generating Units.** - This subpart applies to fossil-fueled electrical steam generating units with a maximum heat input capacity of greater than 250 MMBtu/hour and last commenced construction or modification after September 18, 1978. The maximum heat input to any boiler at the plant is 45 MMBtu/hr and steam from no fossil-fueled fired boiler at the facility is used to generate electricity. Therefore, no boiler at the station is subject to the requirements of 40 CFR Part 60, Subpart Da.

**c. 40 CFR Part 60 Subpart Db - Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units.** - This subpart applies to any fossil-fuel-fired steam generating unit that has a maximum heat input capacity of more than 100 MMBtu per hour, less than 250 MMBtu per hour, and last commenced construction or modification after June 19, 1984, or oil fired oil-fired units with a heat input capacity greater than 250 MMBtu per hour and subject to Subpart D. No fossil-fueled fired boiler at the plant has a heat capacity of



100 MMBtu/hr. Therefore, no boiler at the facility is subject to the requirements of 40 CFR Part 60, Subpart Db.

**d. 40 CFR Part 60 Subpart Dc - Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units.** - Subpart Dc is applicable to facilities with fossil-fueled fired steam generating units constructed after June 9, 1989 with a minimum heat input capacity of 10 MMBtu/hour, and a maximum heat input capacity of 100 MMBtu/hour. All four boilers at Torrance (Source IDs 032, 034, 035, and 036) have heat input capacities within this range. However, the two coal-fired Boilers (Source IDs 032 and 034) were constructed before this time. The two NG-fired boilers (Source IDs 035 and 036) were constructed after this time and therefore have applicable requirements under 40 CFR Part 60, Subpart Dc. These boilers are also designed to burn distillate oil. Oil-firing of these units only takes place when the natural gas supply is not available, maintenance, or system reliability testing. Both NG-fired boilers are subject to the sulfur in fuel limit of this subpart. The subpart also contains monitoring, recordkeeping, and reporting requirements for both boilers. Flue gas from boilers with a heat input capacity greater opacity from the exhaust of boilers that have a heat input capacity greater than 30 MMBtu/hr while burning oil is limited and monitored. Therefore, the 800hp boiler (Source ID 036) has additional requirements for opacity under the subpart.

**e. 40 CFR Part 60 Subpart K - Standards of Performance for Storage Vessels for Petroleum Liquids for Which Construction, Reconstruction, or Modification Commenced After June 11, 1973, and Prior to May 19, 1978.** - Subpart K is applicable to storage vessels for petroleum liquids which have a storage capacity greater than 40,000 gallons. Subparts Ka and Kb contain requirements for storage vessels constructed at later times. Storage vessels which contain petroleum liquids with a Reid Vapor Pressure (RVP) less than 1.0 psia are excluded from the requirements of these subparts. Vessels that store #2 Fuel Oil, which is a petroleum liquid, but has vapor pressure of 0.009 psia (0.062 kilopascal) at 70° F, are therefore excluded from Subpart K. Only #2 Fuel Oil is stored at the plant. Therefore, no storage vessel at the facility is subject to the requirements of 40 CFR Part 60, Subparts K, Ka, or Kb.

**f. 40 CFR Part 60 Subpart IIII - Standards of Performance for Stationary Compression Ignition Internal Combustion Engines.** - Subpart IIII is applicable to compression ignition (CI) engines with displacement of individual cylinders less than 30 liters that commenced construction, or reconstruction after July 11, 2005 and were not fire pump engines. It is also applicable to fire pump engines with this cylinder size range that commenced construction, or reconstruction after July 1, 2006. All of the diesel engines at Torrance are emergency and drive generators and are grouped as Source ID 102. No engine at the facility was constructed this recently. Therefore, no engine at the facility is subject to the requirements of 40 CFR Part 60, Subpart IIII.

**g. 40 CFR Part 60 Subpart JJJJ - Standards of Performance for Stationary Spark Ignition Internal Combustion Engines.** - Subpart JJJJ has applicable requirements for spark ignition engines that commenced construction after June 12, 2006. The LPG-fired engines

at Torrance are spark ignition engines. These are emergency engines that power generators. They are grouped into Source ID 101. However, all of these engines were constructed before this date. Therefore, no engine at the facility is subject to the requirements of 40 CFR Part 60, Subpart JJJJ.

## II. National Emission Standards for Hazardous Air Pollutants (NESHAP)

a. **40 CFR Part 63 Subpart ZZZZ – National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines. (RICE)** - Subpart ZZZZ establishes federal emission and operating limitations for HAPs emitted by stationary RICE at major and area sources of HAP emissions. The Torrance State Hospital is an area source of HAP emissions. There are thirteen stationary RICE (Source IDs 101 and 102) at the facility. The largest engine at the facility has a rated power output of 298-bhp. In accordance with § 63.6585(f)(3), emergency stationary RICE at institutions that are located at area sources and are not contractually available for emergency demand response, are not subject to Subpart ZZZZ. However, these engines must meet the definition of emergency stationary RICE in the subpart. Compliance with this definition is verified by other requirements in the permit.

b. **40 CFR Part 63 Subpart DDDDD - National Emission Standards for Industrial, Commercial, Institutional (ICI) Boilers and Process Heaters.** - Subpart DDDDD contains applicable requirements for Industrial, Commercial, Institutional (ICI) Boilers and Process Heaters not otherwise excluded, at major sources of HAPs. The Torrance State Hospital is not a major source of HAPs. Therefore, no source at the station has applicable requirements under Subpart DDDDD.

c. **40 CFR Part 63 Subpart JJJJJ - National Emission Standards for Hazardous Air Pollutants for Area Sources: Industrial, Commercial, and Institutional Boilers.** - Combustion boilers which produce steam or hot water and are located at area sources of HAP emissions have requirements under this subpart, with certain exceptions. Torrance State Hospital is an area source of HAP emissions. The four boilers (Source IDs 032, 034, 035, and 036) are subject to this subpart. However, the two coal-fired boilers (Source IDs 032 and 034) are considered boilers in the limited-use boiler subcategory, for the purposes of this subpart. Limited-use boilers have a maximum utilization of 10% of annual capacity. These two boilers have no other applicable requirements under this subpart than meeting this definition. There are requirements under other citations in the permit to assure that the boilers comply with this subcategory definition.

The two other boilers (Source IDs 034 and 035) at Torrance are operated to meet the definition of gas-fired boiler in Subpart JJJJJ. While they normally combust commercial natural gas, during utility curtailments these units burn distillate oil. Periodic testing is also conducted to demonstrate the reliability of the oil system for emergency use. The definition of gas-fired boiler allows for unlimited periods of oil-firing during emergencies. It also authorizes oil-firing for up

to 48-hours per year during nonemergency periods. Both NG-fired boilers are subject to the sulfur in fuel limits of this subpart. The subpart also contains monitoring, recordkeeping, and reporting requirements for both boilers.

### III. Air Programs

d. **40 CFR Part 98, Mandatory Greenhouse Gas Reporting** - This part was promulgated on October 30, 2009. Per 40 CFR Section 98.2(a), the Greenhouse Gas (GHG) reporting requirements and related monitoring, recordkeeping, and reporting requirements of this part apply to the owners and operators of any facility that is located in the United States and that meets the requirements of either paragraph (a)(1), (a)(2), or (a)(3) of this section. General Stationary Fuel Combustion Sources are also subject to this part under (a)(2) of this section. Only facilities that emit 25,000 metric tons CO<sub>2</sub>e or more per year are subject to this rule. The potential emission of CO<sub>2</sub>e from the station is 26,650 metric tons per year. Therefore, the station is subject to 40 CFR Part 98 Subpart C and the specific reporting requirements of the subpart.

However, public comments to the Greenhouse Gas Mandatory Reporting Rule (GHG MRR) questioned the requirements of this rule to meet current definitions of “applicable requirement” at 40 CFR 70.2 and 71.2. The commentators requested that USEPA confirm their interpretation of the regulations. The EPA provided the following response: “As currently written, the definition of “applicable requirement” in 40 CFR 70.2 and 71.2 does not include a monitoring rule such as today’s action, which is promulgated under CAA sections 114(a)(1) and 208.” The preamble of the final version of the GHG MRR, located at 74 Fed Reg 209, pp. 56287-56288, states that the GHG MRR is not considered an “applicable requirement” under the Title V Operating Permit program. Therefore, this Subpart, while an obligation for the Torrance State Hospital, is not considered an applicable requirement for this Title V Operating Permit.

e. **Greenhouse Gas Tailoring Rule** - This rule was issued in May 2010. This rule establishes a process for conducting Prevention of Significant Deterioration (PSD) reviews, including Best Available Control Technology (BACT) determinations for control of greenhouse gases (GHG) when a new source or a modification to an existing source results in emissions of GHGs in excess of certain thresholds. Since May, 2010, there have not been any modifications to the facility that triggered a GHG PSD review.

### IV. Pennsylvania Code Title 25

The Pennsylvania Department of Environmental Protection (PADEP) is authorized to enforce rules for the control of air pollution. The permit contains several standard State Air Pollution

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Control regulations for prohibition of air pollution, fugitive emissions, opacity, and odor. Other emission restrictions, monitoring, recordkeeping, and reporting requirements were added under 127.441.

**V. General Plan Approval GPA1-65-00163A**

At this time, there is one active authorization in addition to the TVOP. General Plan Approval GPA1-65-00163A authorizes construction of the NG 800hp boiler (Source ID 035) at Torrance. The construction of this boiler is now complete and the GPA will be inactivated by issuance of this TVOP, which includes the conditions of GPA1-65-00163A. GPA/GP1 has been revised since it was used to authorize construction of the NG 350hp boiler (Source ID 036) at the facility. Therefore, the emission limit for CO is different between these two boilers. Also, a condition requiring testing to verify compliance with the emission limits in the GPA/GP was added during the revision. Because the 800hp boiler is defined as a gas boiler under Subpart JJJJJ, its emissions while burning fuel oil are low. Therefore, this testing is only required for operation while burning natural gas. Other ongoing conditions for monitoring, operation, reporting, and recordkeeping are identical between the two boilers.

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**Conclusions and Recommendations:**

An inspection of the Torrance State Hospital for a Full Compliance Evaluation was last conducted on March 19, 2015. Phil Sapala, Air Quality Specialist of DEP determined that the plant met all requirements specified by the existing TVOP. Larry Volpato, air permit contact for the facility and Scott Shreffler, of DHS, and Phil Sapala, DEP inspector for the facility, have reviewed a copy of the draft permit.

The Pa. Department of Human Services has proposed, in this application, to operate a steam supply boiler house in Derry Borough, Westmoreland County. I recommend the issuance of a five-year Operating Permit for this facility, subject to the conditions in the proposed Title V Operating Permit.

Permit Authorized by this Authorization					
Quantity	Facility Name			PF ID:	945712
1	FirstEnergy Nuclear Generation, LLC/ Beaver Valley Power Station (OP-04-00086)			APS ID:	792714
				Auth. ID:	945371
Short Descr.	Operating Permit for boilers and engines at a nuclear power plant.				
Permits Inactivated by this Authorization					
Permit #					
		APS ID		Auth. ID	

### Calculation of Emissions for PA DHS-Torrance State Hospital

Table 1: Emission Sources and Control  
Pa. DHS  
Torrance State Hospital (TVOP-65-00163)

ID	Source Name	Emission Control	Installation in or Startup
032	BABCOCK & WILCOX BOILER 1-750hp	Limited Use	1984
034	KEELER/DORR-CLIVER 6-400hp	Limited Use	1984
035	CLEAVER BROOKS BOILER #7-350hp (14.04 MMBtu/hr)	Low NOx Burners	2007
036	CLEAVER BROOKS BOILER-800hp (32.10 MMBTU/hr)	Low NOx Burners	2/9/2015
101	EMERGENCY GENERATORS (5 Units, 112-BHP Total) - LPG FIRED	100 hr/yr	
102	Emergency DIESEL GENERATORS (8 Units, 2,925-BHP Total)	500 hr/yr	

Find maximum operating time for coal-fired boilers.  
Limits for sum of coal-fired boilers in existing permit

Coal Max	14,000 tpy
Min	13,400 Btu/lb
Max	0.0275 S
or	0.11 ash
Max	375,200 MMBtu/yr

For Limited-Use Boiler in Subpart JJJJJJ

Max  
10% Utilization  
54,312 MMBtu/yr

Effective time operating limit is from Subpart JJJJJJ

Source 103-Individual Engines

Emergency 100 hr/yr

Bldg. #1	Greilman Bldg.	Inside	Kohler	El Output	Fuel Tank	3000 gals., U.S.
Bldg. #2	Renner Bldg.	Inside	Onan	30R62 12.5JC 3CR131	LPG LPG	250 gals. U.S.

Throughput	BTU In	NG	#2 FO	Coal	Operation
350 HP	45 MMBtu/hr 17 MMBtu/hr	0.01350 MMBtu/hr	100.3 Gal/hr Back up	1.68 TPH 0.63 TPH	876 hr 876 hr + emergency use on oil, remainder of 8760 hr for NG. MACT allows 48 hr
800 HP	32.10 MMBtu/hr on NG	0.03087 MMBtu/hr	229.3 Gal/hr Back up		+ emergency use on oil, remainder of 8760 hr for NG.

Engine HP  
@90%  
Mechanical  
Efficiency  
to El.  
Efficiency

MMBtu/h  
r @45%  
Engine  
Efficiency

37  
19

Bldg. #4	Bldg. #4	Inside	Onan	12.5JC-3CR131	12.5	KW	LPG	250 gals. U.S.	19	0.105405
Bldg. #10	Barnett Bldg.	Inside	Onan	12.5JC-3CR131	12.5	KW	LPG	250 gals. U.S.	19	0.105405
Bldg. #11	Jamison Bldg.	Inside	Onan	12.5JC-3CR131	12.5	KW	LPG	250 gals. U.S.	19	0.105405
					<b>Total</b>	<b>75</b>	<b>KW</b>		<b>112</b>	<b>0.632</b>

Source 102-Individual Engines		Emergency	500	hr/yr						
Bldg. #1	Greizman Bldg.	Outside	Onan	1500DGA3381231	150	KW	Diesel	336 gals. U.S.	224	1.264861
Bldg. #2	Renner Bldg.	Outside	Onan	D50FPJ4	50	KW	Diesel	130 gals. U.S.	75	0.42162
Bldg. #4	Bldg. #4	Outside	Katolight	12.5JC-3CR131	12.5	KW	Diesel	250 gals. U.S.	19	0.105405
Bldg. #6	Wiseman Bldg.	Outside	Cummins	150D5GA835095	150	KW	Diesel	750 gals. U.S.	224	1.264861
Bldg. #7	Beistal Bldg.	Outside	Katolight	D50FPJ4	50	KW	Diesel	130 gals. U.S.	75	0.42162
Bldg. #12	K.D. Bldg.	Outside	Onan	DFGC4478873	200	KW	Diesel	500 gals. U.S.	298	1.686481
Bldg. #16	Power House	Outside	Caterpillar	D333-5R-4	155	KW	Diesel	500 gals. U.S.	231	1.307023
Bldg. #38	Valve House	Outside	Kohler	100REQZJB	105	KW	Diesel	240 gals. U.S.	156	0.885403
					<b>Total</b>	<b>872.5</b>	<b>KW</b>		<b>1,300</b>	<b>7.36</b>

Emission Factors		PM10	SO2	CO	NOx	VOC
Boilers 032 & 034	Bit Coal (AP-42) Section 1.1	0.4 lb/MMBtu (Permit limit.)	4 lb/MMBtu (Permit limit.)	0.5 lb/ton	9.5 lb/ton	0.05 lb/ton
Boilers 35 & 036	NG-Vender EFs	0.006 lb/MMBtu Vender	0.0017 lb/MMBtu Vender	0.0365 lb/MMBtu Vender	0.0357 lb/MMBtu Vender	0.0048 lb/MMBtu Vender
	FO-Vender EFs	0.01 lb/MMBtu Vender	0.0929 lb/MMBtu Vender	0.0388 lb/MMBtu Vender	0.1206 lb/MMBtu Vender	0.01 lb/MMBtu Vender
LP Gas Engines (Source ID 101)	LP Gas (AP-42) Section 3.2 (Lean Burn, 4 cycle)	0.00999 lb/MMBtu	0.000588 lb/MMBtu	0.317 lb/MMBtu	0.847 lb/MMBtu	0.118 lb/MMBtu
Diesel Engines (Source ID 102)	Diesel (AP-42) Section 3.3	0.0022 lb/hp-hr	0.00205 lb/hp-hr	0.00668 lb/hp-hr	0.031 lb/hp-hr	0.00251 lb/hp-hr
	Distillate - 140,000 Btu/Ggal NG-1,040 BTU/CF					

Table 2: Present Facility Criteria Emissions  
Pa. DHS

Torrance State Hospital (TVOP-65-00163)

ID	Source	Pollutant									
		PM <sub>10</sub>		SO <sub>2</sub>		CO		NO <sub>x</sub>		VOC	
		Lb/Hr	Ton/Yr	Lb/Hr	Ton/Yr	Lb/Hr	Ton/Yr	Lb/Hr	Ton/Yr	Lb/Hr	Ton/Yr
032	BABCOCK & WILCOX BOILER 1	18.0	7.88	180	78.84	0.84	0.37	15.95	6.99	0.08	0.04
034	KEELER/DORR-OLIVER 6	6.8	2.93	68	29.78	0.32	0.14	6.03	2.64	0.03	0.01
035	CLEAVER BROOKS BOILER #7-350HP (14.04 MMBtu/hr)	0.140	0.37	1.30	0.10	0.54	2.23	1.69	2.18	0.14	0.29
036	CLEAVER BROOKS BOILER (32.10 MMBTU/HR)	0.32	0.84	2.98	0.24	1.25	5.10	3.87	4.99	0.32	0.67
101	EMERGENCY GENERATORS (5 Units, 251-BHP Total) - LPG FIRED	0.0063	0.00	0.00	0.00	0.20	0.01	0.54	0.03	0.07	0.00
102	Emergency DIESEL GENERATORS (8 Units, 1,300-BHP Total)	2.9	0.72	2.7	0.67	8.7	2.17	40.3	10.08	3.3	0.82
<b>Facility Total</b>		<b>28.1</b>	<b>12.78</b>	<b>255.0</b>	<b>109.63</b>	<b>11.8</b>	<b>10.02</b>	<b>68.4</b>	<b>26.90</b>	<b>3.9</b>	<b>1.84</b>

PM10 & SO2 emissions from the coal fired boilers (Source ID 032 & 034) are based on permit limits.

Criteria emissions from the NG Boilers (Source IDs 035 & 036) are based on vender supplied data.

All other emission factors are based on AP-42.

Annual emissions from NG Boilers is based on 8712 hours on NG & 48 hours of fuel oil service.

Lb/hr values for NG boilers are based on larger emission of NG or F.O. service.

**HAP Emissions**

**Emissions from Coal Fired Boilers**

Pollutant	FACTOR lb/ton	Source ID 032		Source ID 034	
		lb/hr	tons/yr	lb/hr	tons/yr
Biphenyl	1.70E-06	2.85E-06	1.2503E-06	1.08E-06	4.72E-07
Acenaphthene	5.10E-07	8.56E-07	3.7508E-07	3.24E-07	1.42E-07
Acenaphthylene	2.50E-07	4.20E-07	1.8386E-07	1.59E-07	6.95E-08
Anthracene	2.10E-07	3.53E-07	1.5444E-07	1.33E-07	5.83E-08
Benzo(a)anthracene	8.00E-08	1.34E-07	5.8836E-08	5.07E-08	2.22E-08
Benzo(a)pyrene	3.80E-08	6.38E-08	2.7947E-08	2.41E-08	1.06E-08
Benzo(b,k,l)fluoranthene	1.10E-07	1.85E-07	8.0899E-08	6.98E-08	3.06E-08
Benzo(g,h,i)perylene	2.70E-08	4.53E-08	1.9857E-08	1.71E-08	7.5E-09
Chrysene	1.00E-07	1.68E-07	7.3545E-08	6.34E-08	2.78E-08
Fluoranthene	7.10E-07	1.19E-06	5.2217E-07	4.50E-07	1.97E-07
Fluorene	9.10E-07	1.53E-06	6.6926E-07	5.77E-07	2.53E-07
Indeno(1,2,3-cd)pyrene	6.10E-08	1.02E-07	4.4862E-08	3.87E-08	1.69E-08
Naphthalene	1.30E-05	2.18E-05	9.5608E-06	8.25E-06	3.61E-06
Phenanthrene	2.70E-06	4.53E-06	1.9857E-06	1.71E-06	7.5E-07
Pyrene	3.30E-07	5.54E-07	2.427E-07	2.09E-07	9.17E-08
5-Methyl chrysene	2.20E-08	3.69E-08	1.618E-08	1.40E-08	6.11E-09
Acetaldehyde	5.70E-04	9.57E-04	0.00041921	3.62E-04	0.000158
Acetophenone	1.50E-05	2.52E-05	1.1032E-05	9.51E-06	4.17E-06
Acrolein	2.90E-04	4.87E-04	0.00021328	1.84E-04	8.06E-05
Benzene	1.30E-03	2.18E-03	0.00095608	8.25E-04	0.000361
Benzyl chloride	7.00E-04	1.18E-03	0.00051481	4.44E-04	0.000194
Bis(2-ethylhexyl)phthalate (DEHP)	7.30E-05	1.23E-04	5.3688E-05	4.63E-05	2.03E-05
Bromoform	3.90E-05	6.55E-05	2.8682E-05	2.47E-05	1.08E-05
Carbon disulfide	1.30E-04	2.18E-04	9.5608E-05	8.25E-05	3.61E-05
2-Chloroacetophenone	7.00E-06	1.18E-05	5.1481E-06	4.44E-06	1.94E-06
Chlorobenzene	2.20E-05	3.69E-05	1.618E-05	1.40E-05	6.11E-06
Chloroform	5.90E-05	9.91E-05	4.3391E-05	3.74E-05	1.64E-05
Cumene	5.30E-06	8.90E-06	3.8979E-06	3.36E-06	1.47E-06
Cyanide	2.50E-03	4.20E-03	0.00183862	1.59E-03	0.000695
2,4-Dinitrotoluene	2.80E-07	4.70E-07	2.0593E-07	1.78E-07	7.78E-08
Dimethyl sulfate	4.80E-05	8.06E-05	3.5301E-05	3.04E-05	1.33E-05
Ethyl benzene	9.40E-05	1.58E-04	6.9132E-05	5.96E-05	2.61E-05
Ethyl chloride	4.20E-05	7.05E-05	3.0889E-05	2.66E-05	1.17E-05
Ethylene dichloride	4.00E-05	6.72E-05	2.9418E-05	2.54E-05	1.11E-05
Ethylene dibromide	1.20E-06	2.01E-06	8.8254E-07	7.61E-07	3.33E-07
Formaldehyde	2.40E-04	4.03E-04	0.00017651	1.52E-04	6.67E-05
Hexane	6.70E-05	1.13E-04	4.9275E-05	4.25E-05	1.86E-05
Isophorone	5.80E-04	9.74E-04	0.00042656	3.68E-04	0.000161
Methyl bromide	1.60E-04	2.69E-04	0.00011767	1.01E-04	4.45E-05
Methyl chloride	5.30E-04	8.90E-04	0.00038979	3.36E-04	0.000147
Methyl ethyl ketone	3.90E-04	6.55E-04	0.00028682	2.47E-04	0.000108
Methyl hydrazine	1.70E-04	2.85E-04	0.00012503	1.08E-04	4.72E-05
Methylene chloride	2.90E-04	4.87E-04	0.00021328	1.84E-04	8.06E-05
Phenol	1.60E-05	2.69E-05	1.1767E-05	1.01E-05	4.45E-06
Propionaldehyde	3.80E-04	6.38E-04	0.00027947	2.41E-04	0.000106
Tetrachloroethylene	4.30E-05	7.22E-05	3.1624E-05	2.73E-05	1.19E-05
Toluene	2.40E-04	4.03E-04	0.00017651	1.52E-04	6.67E-05
1,1,1-Trichloroethane	2.00E-05	3.36E-05	1.4709E-05	1.27E-05	5.56E-06
Styrene	2.50E-05	4.20E-05	1.8386E-05	1.59E-05	6.95E-06
Xylenes	3.70E-05	6.21E-05	2.7212E-05	2.35E-05	1.03E-05
Vinyl acetate	7.60E-06	1.28E-05	5.5894E-06	4.82E-06	2.11E-06
Hydrochloric Acid	1.2	2.01E+00	0.88253731	7.61E-01	0.333403
Hydrofluoric Acid	0.15	2.52E-01	0.11031716	9.51E-02	0.041675
Antimony	1.80E-05	3.02E-05	1.3238E-05	1.14E-05	5E-06
Arsenic	4.10E-04	6.88E-04	0.00030153	2.60E-04	0.000114
Beryllium	2.10E-05	3.53E-05	1.5444E-05	1.33E-05	5.83E-06
Cadmium	5.10E-05	8.56E-05	3.7508E-05	3.24E-05	1.42E-05
					<b>1.22 Sum of Both Boilers (TPY)</b>
					<b>0.15 Sum of Both Boilers (TPY)</b>



Chromium	2.60E-04	4.37E-04	0.00019122	1.65E-04	7.22E-05		
Chromium (VI)	7.90E-05	1.33E-04	5.81E-05	5.01E-05	2.19E-05		
Cobalt	1.00E-04	1.68E-04	7.3545E-05	6.34E-05	2.78E-05		
Lead	4.20E-04	7.05E-04	0.00030889	2.66E-04	0.000117		
Manganese	4.90E-04	8.23E-04	0.00036037	3.11E-04	0.000136		
Mercury	8.30E-05	1.39E-04	6.1042E-05	5.26E-05	2.31E-05		
Nickel	2.80E-04	4.70E-04	0.00020593	1.78E-04	7.78E-05	Other HAPs	0.012 Other HAPs (not HCl or HF) Sum of Both Boilers (TPY)
<b>Total</b>		<b>2.29</b>	<b>1.00</b>	<b>0.86</b>	<b>0.38</b>		<b>1.38 Sum of Both Boilers (TPY)</b>

Emissions from NG Boilers on Oil Firing

Pollutant	Emission Factor					Total	0.00058 Sum of Both Boilers (TPY)
	(lb/103 Gal)	Source ID 035		Source ID 036			
		lb/hr	tons/yr	lb/hr	tons/yr		
Benzene	2.14E-04	2.15E-05	5.1521E-07	4.91E-05	1.18E-06		
Ethylbenzene	6.36E-05	6.38E-06	1.5312E-07	1.46E-05	3.5E-07		
Formaldehyde	3.30E-02	3.31E-03	7.9448E-05	7.57E-03	0.000182		
Naphthalene	3.30E-02	3.31E-03	7.9448E-05	7.57E-03	0.000182		
1,1,1-Trichloroethane	2.36E-04	2.37E-05	5.6817E-07	5.41E-05	1.3E-06		
Toluene	6.20E-03	6.22E-04	1.4927E-05	1.42E-03	3.41E-05		
o-Xylene	1.09E-04	1.09E-05	2.6242E-07	2.50E-05	6E-07		
Acenaphthene	2.11E-05	2.12E-06	5.0798E-08	4.84E-06	1.16E-07		
Acenaphthylene	2.53E-07	2.54E-08	6.091E-10	5.80E-08	1.39E-09		
Anthracene	1.22E-06	1.22E-07	2.9372E-09	2.80E-07	6.71E-09		
Benz(a)anthracene	4.01E-06	4.02E-07	9.6541E-09	9.19E-07	2.21E-08		
Benzo(b,k)fluoranthene	1.48E-06	1.48E-07	3.5631E-09	3.39E-07	8.14E-09		
Benzo(g,h,i)perylene	2.26E-06	2.27E-07	5.441E-09	5.18E-07	1.24E-08		
Chrysene	2.38E-06	2.39E-07	5.7299E-09	5.46E-07	1.31E-08		
Dibenzo(a,h)anthracene	1.67E-06	1.68E-07	4.0205E-09	3.83E-07	9.19E-09		
Fluoranthene	4.84E-06	4.85E-07	1.1652E-08	1.11E-06	2.66E-08		
Fluorene	4.47E-06	4.48E-07	1.0762E-08	1.02E-06	2.46E-08		
Indo(1,2,3-cd)pyrene	2.14E-06	2.15E-07	5.1521E-09	4.91E-07	1.18E-08		
Phenanthrene	1.05E-05	1.05E-06	2.5279E-08	2.41E-06	5.78E-08		
Pyrene	4.25E-06	4.26E-07	1.0232E-08	9.74E-07	2.34E-08		
OCDD	3.10E-09	3.11E-10	7.4633E-12	7.11E-10	1.71E-11		
<b>Total</b>		<b>0.0073</b>	<b>0.00018</b>	<b>0.0167</b>	<b>0.00040</b>		

Emissions from NG Boilers on NG Firing

Pollutant	Emission Factor					
	(lb/MMCF)	Source ID 035		Source ID 036		
		lb/hr	tons/yr	lb/hr	tons/yr	
91-57-6	2-Methylnaphthalene	2.40E-05	3.24E-10	1.4117E-09	7.41E-10	3.23E-09
56-49-5	3-Methylchloranthrene	9.00E-07	1.22E-11	5.294E-11	2.78E-11	1.21E-10
	7,12-Dimethylbenz(a)anthracene	8.00E-06	1.08E-10	4.7057E-10	2.47E-10	1.08E-09
83-32-9	Acenaphthene	9.00E-07	1.22E-11	5.294E-11	2.78E-11	1.21E-10
203-96-8	Acenaphthylene	9.00E-07	1.22E-11	5.294E-11	2.78E-11	1.21E-10
120-12-7	Anthracene	1.20E-06	1.62E-11	7.0586E-11	3.70E-11	1.61E-10
56-55-3	Benzo(a)anthracene	9.00E-07	1.22E-11	5.294E-11	2.78E-11	1.21E-10
71-43-2	Benzene	2.10E-03	2.84E-08	1.2353E-07	6.48E-08	2.82E-07
50-32-8	Benzo(a)pyrene	6.00E-07	8.10E-12	3.5293E-11	1.85E-11	8.07E-11
205-99-2	Benzo(b)fluoranthene	9.00E-07	1.22E-11	5.294E-11	2.78E-11	1.21E-10
191-24-2	Benzo(g,h,i)perylene	6.00E-07	8.10E-12	3.5293E-11	1.85E-11	8.07E-11
207-08-9	Benzo(k)fluoranthene	9.00E-07	1.22E-11	5.294E-11	2.78E-11	1.21E-10
218-01-9	Chrysene	9.00E-07	1.22E-11	5.294E-11	2.78E-11	1.21E-10
53-70-3	Dibenzo(a,h)anthracene	6.00E-07	8.10E-12	3.5293E-11	1.85E-11	8.07E-11
25321-22-6	Dichlorobenzene	1.20E-03	1.62E-08	7.0586E-08	3.70E-08	1.61E-07
206-44-0	Fluoranthene	3.00E-06	4.05E-11	1.7647E-10	9.26E-11	4.03E-10
86-73-7	Fluorene	2.80E-06	3.78E-11	1.647E-10	8.64E-11	3.76E-10
50-00-0	Formaldehyde	7.50E-02	1.01E-06	4.4116E-06	2.31E-06	1.01E-05
110-54-3	Hexane	1.80E+00	2.43E-05	0.00010588	5.56E-05	0.000242
193-39-5	Indeno(1,2,3-cd)pyrene	9.00E-07	1.22E-11	5.294E-11	2.78E-11	1.21E-10
91-20-3	Naphthalene	6.10E-04	8.24E-09	3.5801E-08	1.88E-08	8.2E-08

85-01-8	Phenanthrene	1.70E-05	2.30E-10	9.9997E-10	5.25E-10	2.29E-09	
129-00-0	Pyrene	5.00E-06	6.75E-11	2.9411E-10	1.54E-10	6.72E-10	
108-88-3	Toluene	3.40E-03	4.59E-08	1.9999E-07	1.05E-07	4.57E-07	
7440-38-2	Arsenic	2.00E-04	2.70E-09	1.1764E-08	6.17E-09	2.69E-08	
7440-41-7	Beryllium	6.00E-06	8.10E-11	3.5293E-10	1.85E-10	8.07E-10	
7440-43-9	Cadmium	1.10E-03	1.49E-08	6.4704E-08	3.40E-08	1.48E-07	
7440-47-3	Chromium	1.40E-03	1.89E-08	8.235E-08	4.32E-08	1.88E-07	
7440-48-4	Cobalt	8.40E-05	1.13E-09	4.941E-09	2.59E-09	1.13E-08	
7439-96-5	Manganese	3.80E-04	5.13E-09	2.2352E-08	1.17E-08	5.11E-08	
7439-97-6	Mercury	2.60E-04	3.51E-09	1.5294E-08	8.03E-09	3.5E-08	
7440-02-0	Nickel	2.10E-03	2.84E-08	1.2353E-07	6.48E-08	2.82E-07	
7782-49-2	Selenium	1.20E-05	1.62E-10	7.0586E-10	3.70E-10	1.61E-09	
	<b>Total</b>	<b>1.887922</b>	<b>0.000025</b>	<b>0.000111</b>	<b>0.000058</b>	<b>0.00025</b>	<b>0.00036 Sum of Both Boilers (TPY)</b>
							<b>Both Fuels 0.00094 Sum of Both Boilers (TPY)</b>

**Table 3: Facility Hazardous Air Pollutant (HAP) Emissions**  
Pa. DHS  
Torrance State Hospital (TVOP-65-00163)

Source ID	032 and-034	035-036	101	102	Facility Emission of Individual HAPs
Pollutant	Coal Fired Boilers	Natural Gas Fired Boilers	LP Gas Emergency	Diesel Emergency Generators	
Hydrochloric Acid	1.22	0.00	0.00	0.00	1.22 Tons/Year
Hydrofluoric Acid	0.15	0.00	0.00	0.00	0.15 Tons/Year
Other HAPs	0.01	0.00	-	-	0.01 Tons/Year
<b>Sum of All HAPs</b>	<b>1.38</b>	<b>0.00</b>	<b>-</b>	<b>-</b>	<b>1.38 Tons/Year</b>

All emission factors are based on AP-42.

**Greenhouse Gas Emissions**

Emission Factors	CO2	CH4	N2O	
Coal Boilers	Coal (AP-42) Section 1.1	5510 lb/ton	0.06 lb/ton	0.04 lb/ton
NG Boilers	NG (AP-42) Section 1.4	120,000 lb/MMCF	2.3 lb/MMCF	0.64 lb/MMCF
	FO (AP-42) Section 1.3	22,300 lb/Mgal	0.052 lb/Mgal	0.26 lb/Mgal
LP Gas Engines	NG (AP-42) Section 3.2*	110 lb/MMBtu	1.25 lb/MMBtu	lb/MMBtu
Emergency Engine	Diesel (AP-42) Section 3.3	1.15 lb/hp-hr	lb/hp-hr	lb/hp-hr

\* Section 3.2 used since these engines use 1% Distillate vs 4% minimum for engines in Section 3.4  
Distillate - 140,000 Btu/Ggal  
NG-1,040 BTU/CF

**Table 4: Present Facility Greenhouse Gas (GHG) Emissions**  
Pa. DHS  
Torrance State Hospital (TVOP-65-00163)

Source	Greenhouse Gas							
	CO <sub>2</sub>		CH <sub>4</sub>		N <sub>2</sub> O		Total CO <sub>2</sub> e	
	Lb/Hr	Ton/Yr	Lb/Hr	Ton/Yr	Lb/Hr	Ton/Yr	Lb/Hr	Ton/Yr
032-BABCOCK & WILCOX BOILER 1	9,252	4,052	0.101	0.044	0.067	0.029	9,275	4,062
034-KEELER/DORR-OLIVER 6	3,495	1,531	0.038	0.0167	0.025	0.0111	3,504	1,535
035-CLEAVER BROOKS BOILER #7-350HP (14.04 MMBtu/hr)	2,237	7,112	0.0052	0.135	0.026	0.038	2,245	7,127
036-CLEAVER BROOKS BOILER (32.10 MMBTU/HR)	5,113	16,257	0.0119	0.31	0.060	0.087	5,132	16,290

101-EMERGENCY GENERATORS (5 Units, 251-BHP Total) - LPG FIRED	70	3.5	0.79	0.040	86	4
102-Emergency DIESEL GENERATORS (8 Units, 2,925-BHP Total)	1,495	374			1,495	374
<b>Facility Total</b>	<b>21,662</b>	<b>29,329</b>	<b>0.95</b>	<b>0.55</b>	<b>21,737</b>	<b>29,392</b>

All emission factors are based on AP-42. Annual emissions from NG Boilers is based on 8712 hours on NG & 48 hours of fuel oil service. Lb/hr values for NG boilers are based on F.O. service.

**Table 5: Emission Increase since the last renewal of the Title V Operating Permit Pa. DHS Torrance State Hospital (TVOP-65-00163)**

ID	Source	Pollutant											
		PM <sub>10</sub>		SO <sub>2</sub>		CO		NO <sub>x</sub>		VOC			
		Lb/Hr	Ton/Yr	Lb/Hr	Ton/Yr	Lb/Hr	Ton/Yr	Lb/Hr	Ton/Yr	Lb/Hr	Ton/Yr		
Date of TVOP previous renewal	Facility Baseline-October 8, 2007		109.71		1,087.01		9.48		108.55		1.62		
Source ID 036	Addition of 800hp Boiler		0.84		0.24		5.10		4.99		0.67		
Source IDs 032 & 034	Classification of Coal-fired boilers as limited use		(97.76)		(977.62)		(4.56)		(86.64)		(0.46)		
Total Addition over the Period			(96.92)		(977.38)		0.54		(81.64)		0.22		
Date of proposed TVOP renewal	New Facility Baseline		12.78		109.63		10.02		26.90		1.84		

**GHG Emission Increase since the last renewal of the Title V Operating Permit Pa. DHS Torrance State Hospital (TVOP-65-00163)**

ID	Source
Date of TVOP previous renewal	Facility Baseline-October 8, 2007
Source ID 036	Addition of 800hp Boiler
Source IDs 032 & 034	Classification of Coal-fired boilers as limited use
Total Addition over the Period	
Date of proposed TVOP renewal	New Facility Baseline

Total CO<sub>2</sub>e  
Ton / Yr  
63,475  
16,290  
(50,373.31)  
(34,083.02)  
29,392