pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

December 1, 2015

CERTIFIED MAIL NO. 9171 9690 0935 0033 0687 39

Mr. James Palumbo
Birdsboro Power LLC
72 Glenmaura National Blvd.
Moosic, PA 18507

Re: Technical Deficiency Letter
Birdsboro Power LLC
Plan Approval Application No. 06-05154A
APS ID# 875628, AUTH ID# 1086513
Birdsboro Borough, Berks County

Dear Mr. Palumbo:

The Department of Environmental Protection (DEP) has reviewed the above referenced application and has identified the following significant technical deficiencies. This information is required pursuant to 25 Pa. Code §127.12(a)(2).

Technical Deficiencies

1. Cooling Tower

   a. The cooling tower BAT analysis was not provided.

   b. Please provide the PM emission calculations for verification.

   c. The TDS is listed as 400 ppm. Is this in units of ppmw? Calpine Mid-Merit, LLC is permitted with TDS of 2,000 ppmw and Berks Hollow Energy Associates is permitted with TDS of 5,000 ppmw.

   d. Is the water drift droplet rate of .0050% guaranteed by the manufacturer? Calpine Mid-Merit, LLC and Berks Hollow Energy Associates are permitted with a water drift droplet limit of 0.0005%.

   e. Please propose methods for TDS sampling and analysis.

   f. Will the site have a Department issued NPDES water quality operating permit? If so, the blowdown water discharge will need to be tested for TDS content by sampling and analysis methods approved in the Department issued NPDES water quality permit.

g. Does the cooling tower have a mist eliminator? If so, please provide the PM/PM10/PM2.5 control efficiency of the mist eliminator.

h. Were other alternative cooling devices considered?

2. Please provide the sulfuric acid mist (H_2SO_4) emission rate, annual emissions and calculations with consideration given to other recent DEP plan approvals for similar facilities.

3. In Table 3-4, the facility PTE for NOx, CO, SO_2 and VOC do not match the facility PTE in Appendix E. Please explain or correct this discrepancy.

4. In Appendix E, Startup Emissions. The shutdown lb/event numbers appear to be too high. The emissions appear to be based on a 65 minute shutdown event instead of 25.5 minutes. Please explain or correct this discrepancy.

5. In Appendix E, the emergency generator NOx 3.49 gm/bhp-hr appears to be too high. The NSPS IIII NMHC+NOx limit is 3.0 gm/bhp-hr. Please explain or correct this discrepancy.

6. In Appendix E, the emergency fire pump SO_2 5.46E-03 lb/hr appears to be too high. The emission factor 1.21E-05 gm/bhp-hr converts to 1.20E-05 lb/hr using 450 HP and 454 gm/lb. The annual emission would be 6.0E-07 tpy. Please explain or correct this discrepancy.

7. In Appendix E, HAPs totals chart. Using the emission factors provided and 2944 mmbtu/hr for the turbine, my calculated emissions are higher by approximately a factor of 1.5. I estimate the formaldehyde emissions to be 8.78 tpy. I calculated the duct burner emissions, using 500 mmbtu/hr, and determined the emissions for formaldehyde (0.03 tpy) and hexane (0.7 tpy), which are lower. Please explain or correct this discrepancy.

8. The proposed VOC emission limit for the combined cycle unit (CCU) is 2.4 ppm as methane. Some recent plan approvals issued for natural gas fired CCU have lower VOC emission limits. Please revise and re-justify this number, or else explain why it is correct.

9. The proposed BAT limit for the CCU for $PM/PM_{10}/PM_{2.5}$ is 22.0 lb/hr. In Appendix E, Turbine Stack Siemens Unit, the $PM/PM_{10}/PM_{2.5}$ emission factor w/o Duct Burner is 12 lb/hr and with Duct Burner is 16 lb/hr. Please explain the difference. If you propose to retain the 22 lb/hr limit, please explain why this unit cannot achieve lower PM emissions, as have been imposed in several other recent DEP plan approvals for similar facilities.

10. Is an auxiliary fuel heater required?

11. The SO_2 BAT emission limit for the CCU of 22.0 lb/hr appears to be too high. Based on pipeline natural gas sulfur limit of 0.5 gr/100 dscf and SO_2 emissions of 0.0015

lb/mmBtu, the SO_2 emission w/o duct burner is 4.4 lb/hr and with duct burner 4.6 lb/hr. Please explain the difference.

12. Please further explain why CEMS are or are not necessary for each of the pollutants with short term limits (NOx, CO, VOC, ammonia).

13. Please provide a top-down BAT analysis for each pollutant for the CCU. CO – please address the technical and economic feasibility of Thermal Oxidation, XONON Catalytic Combustor and SCONOX Process. $PM/PM_{10}/PM_{2.5}$ - please address the technical and economic feasibility of Fabric Collector, Electrostatic Precipitator (ESP), Wet ESP and Wet Scrubber. NOx - please address the technical and economic feasibility of Water or Steam Injection, XONON Catalytic Combustor, Selective Non-Catalytic Reduction and SCONOX Process. VOC - please address the technical and economic feasibility of XONON Catalytic Combustor and SCONOX Process. SOx - please address the technical and economic feasibility of Dry Scrubber (Spray Dryer Absorber), Wet Scrubber and Flue Gas Desulfurization Scrubber. Sulfuric Acid Mist (H_2SO_4) - please address the technical and economic feasibility of Flue Gas Desulfurization Scrubber, Wet Scrubber and Dry Scrubber (Spray Dryer Absorber). The above list of controls for each pollutant is not all-inclusive. Please provide technical and economic feasibility for other controls, if applicable.

14. 40 CFR Part 60 Subpart KKKK – it appears the facility will elect to comply with 60.4365(a) so it will be exempt from monitoring the sulfur content of natural gas. Please confirm.

15. It appears the turbine will not use water injection to control NOx emissions. Please confirm.

16. Please provide a technical basis/justification for the Startup and Shutdown emission (lb/hr) values provided in Appendix E.

17. Please provide a detailed definition of Cold Startup, Warm Startup and Hot Startup. Each definition may include measureable characteristics such as the steam turbine's high pressure bowl metal temperature range and the water temperature in the heat recovery steam generator's high pressure steam drum.

18. Will natural gas condensate tanks be utilized? If so, what are the estimated monthly and annual emissions?

19. Please provide a copy of the manufacturer guarantee documents that were used to determine emission estimates.

20. Will the selective catalytic reduction system be equipped with instrumentation to continuously measure and display the catalyst be inlet gas temperature, pressure

differential across the catalyst bed and the ammonia solution injection rate? Will any other operating characteristics be monitored?

21. Will the oxidation catalyst be equipped with instrumentation to continuously measure and display the catalyst bed inlet gas temperature and pressure differential across the catalyst bed? Will any other operating characteristics be monitored?

Please submit a response fully addressing each of the significant technical deficiencies set forth above within 30 calendar days or DEP may deny the application or, if you believe that time frame is unworkable, please promptly propose an alternative expeditious time frame.

If you believe that any of the stated deficiencies is not significant, instead of submitting a response to that deficiency, you have the option of asking DEP to make a decision based on the information with regard to the subject matter of that deficiency that you have already made available. If you choose this option with regard to any deficiency, you should explain and justify how your current submission satisfies that deficiency. Please keep in mind that if you fail to respond, your application may be denied.

Should you have any questions regarding the identified deficiencies, please contact Darrell Hartline at 717.705.4879 and refer to Application No. 875628, Authorization No. 1086513 to discuss your concerns, or to schedule a meeting if any.

The meeting must be scheduled within the 30-day period allotted for your reply, unless otherwise extended by DEP. You may also follow your application through the review process via *eFACTS on the Web* at: http://www.ahs2.dep.state.pa.us/eFactsWeb/default.aspx.

Sincerely,

Darrell Hartline

Darrell Hartline
Air Quality Program

cc: Osman Environmental Solutions, LLC
Southcentral Regional File, B2
Reading District
Permits

OES
OSMAN ENVIRONMENTAL SOLUTIONS, LLC

December 11, 2015

Mr. Darrell Hartline
Air Quality Program
South Central Regional Office
PA Department of Environmental Protection
909 Elmerton Avenue
Harrisburg, PA 17110

RE: Birdsboro Power LLC

Dear Mr. Hartline:

This letter is in response to the issues raised in your letter of December 1, 2015, and follows your numbering scheme to respond to the questions you have raised. Please let me know if after reviewing these responses you have any additional questions. I am providing three copies of this letter along with revised narratives and revised Appendix E's.

1.a. Cooling tower BAT. Since the SCRO issued the recent Calpine Mid-Merit plan approval with a BACT determined drift limit of 0.0005% and issued Berks Hollow with a BAT approved drift limit also at 0.0005%, we agree that a drift limit of 0.0005% has been established as BAT by DEP, and Birdsboro Power will comply with that limit. We also note that in the case of Calpine, this was a BACT limit also approved by EPA.

1.b. The previous application had an incorrect circulating flow. Rather than 57,700 gpm the value was actually in thousands pounds per hour (kpph). So with the higher flow, the lower drift as in 1.a, and the higher TDS explained below, the correct equation is:

TDS 2,000 PPM (mg/L) = 2 g/liter/454 g/lb = 4.4e-03 lb/L X 3.79 l/gal = 0.0167 lb/gal TDS
Average recirculating flow = 57,700,000 lbs/hr /8.33 gal/lb = 6.93 E06 gallons per hour
Recirculating PM = 0.0167 lb/gal X 6.93E06 gph = 115.7 Klbs/hr
With a drift loss of 0.0005% X 115.7 Klbs/hr = 0.6 lb/hr

And assuming 8760 hours per year = 2.53 TPY

Although the answer remains the same as in the application the spreadsheets have been updated to reflect these corrections.

4708 ROCK LEDGE DRIVE, HARRISBURG, PA 17110 717-234-3610 FREDOSMAN@OSMANENVIRONMENTAL.COM

1.c. We have revised the acceptable TDS to a limit of 2,000 PPM to reflect the lower of the two values that DEP has previously approved as BAT and BACT.

1.d. Birdsboro Power will require a guarantee from the selected vendor to provide a cooling tower that meets the drift limit established in any permit issued. As indicated in the response to 1.a., we are now proposing a drift limit of 0.0005%, recently determined to be BAT by the Southcentral Office.

1.e. Birdsboro Power proposes to use conductivity sampling as a surrogate for TDS testing. Daily conductivity testing will be conducted. Since the chemistry of the cooling tower water is consistent, the relationship between cooling tower water TDS and conductivity can be demonstrated. Birdsboro Power will establish the relationship by collecting pairs of conductivity/TDS data sets using an on-site conductivity meter and sending a sample for TDS analysis to a DEP approved laboratory. Once the relationship is demonstrated, Birdsboro Power will provide the data to the Department and upon Department approval will utilize the daily conductivity readings to calculate TDS. Until the Department approves the methodology, Birdsboro proposes monthly TDS sampling.

1.f. No, the facility will discharge to a POTW. An NPDES permit is not required. The POTW plant has existing capacity. Birdsboro Power will discharge to the POTW and treat its effluent to the pretreatment standards required by the POTW.

1.g. I assume that the question relates to drift eliminators, which do in fact eliminate mist. And as discussed above, Birdsboro will install a cooling tower with a drift elimination rate of 0.0005%. It is difficult to provide an accurate control efficiency since it is difficult to establish what the baseline for uncontrolled drift should be. Even a poorly designed cooling tower would not have unlimited drift. AP-42 has a calculation in Table 13.4-1 which assumes a drift loss of 0.02%. If that factor is chosen as the factor for an "uncontrolled" cooling tower, the control efficiency in the Birdsboro project would be 97.5%. And we have assumed in our application that the PM from the cooling tower is all PM, PM10, and PM2.5, again as a conservative approach.

1.h. The only cooling systems in general use at power plants are air-cooled condensers and cooling towers, with the large majority of sources using cooling towers. Air cooled condensers are used in areas where adequate water is unavailable. They impose a negative efficiency impact of about 1% in the worst case and may be rejected as BAT and BACT due to the energy and economic impacts they impose on a project.

2. H_2SO_4 emissions are included in the revised emission spreadsheet and are estimated at 10.7 tons per year, based on the assumptions that sulfur is converted to SO_3 at the rate of 5% in the initial combustion and that 30% of the SO_2 is oxidized to SO_3 in the catalytic oxidizer and another 5% is oxidized to SO_3 in the SCR. All SO_3 is assumed to be converted to H_2SO_4. Also, please note that as a conservative estimate the SO_2 emissions assume all fuel sulfur is alternatively converted to SO_2, so there is some double counting in the SO_2/H_2SO_4 calculations.

3. I apologize for this embarrassing oversight. The tables were not updated to reflect the latest emission calculations in the spreadsheets. Appendix E contains the correct values. A revised narrative is included to correct this error.

4. You are correct. The shutdown emissions have been corrected and included in the revised spreadsheets. Because the shutdown emissions for particulate matter and SO_2 were less than the normal-operations emissions, we have used the normal operations levels as another level of conservatism.

5. A correction has been made and included in a revised spreadsheet and narrative, included with this response.

6. Actually, the calculation is correct but the units are incorrectly labeled. The emission factor for SO_2 (and only for SO_2) is in lb/hp-hr from AP-42. A separate column has been added to the spreadsheet to clarify this oversight.

7. The emissions calculations you suggested are uncontrolled emissions based on AP-42 emission factors. Our evaluation is that the HAPS emissions of consequence are nearly all VOCs which are controlled by the catalytic oxidizer. Since I don't have controlled values for the HAPs I assumed that they were controlled by the same factor that VOCs in general were controlled. Consequently the calculation in Appendix E takes the ratio of the emission factor for the uncontrolled HAP in the second column, divides it by the AP-42 factor for uncontrolled VOCs from the bottom of the second column and multiplies by the controlled VOC emissions in lbs/hr from the bottom of the third column. This provides an estimate of the controlled HAP emission rate in lbs/hr. I've added a note to Appendix E explaining this.

8. Most of the NGCC facilities recently permitted by DEP were major sources subject to LAER. This source is subject to BAT only since it is a minor source. In attempting to permit this source, Birdsboro Power has evaluated 3 different vendors and chosen emission limits which can be met by a responsible vendor.

The difficulty with extremely low VOCs limits has to do with very high outside ambient temperatures when duct firing would be used to increase power output. We believe that the 2.4 ppm limit is needed for that scenario. Birdsboro Power could accept a limit of 1.0 PPM without duct firing if the 2.4 PPM limit remains for duct firing. The 1.0 ppm is consistent with recent DEP LAER determinations and the 2.4 PPM limit with duct firing is equal to one of the recent permits issued by DEP, Tenaska. The PTE in tons per year had already been calculated with these lower limits for non-duct firing so incorporating a lower PPM limit when not duct firing has no impact on the application, apart from that single issue.

9. Again, this represents a lack of attention on my part to detail in the final application. While this is in no way an excuse, the point of the table was to show that BAT for particulate was firing with a low sulfur natural gas. The table has been corrected to show the highest particulate loading with duct firing, consistent with the correct value in Appendix E.

10. No, the project does not include an auxiliary fuel heater. If fuel is heated, steam from the process is utilized.

11. You are once again correct. The correct limits are shown in Appendix E. I've corrected the BAT discussion to reflect the maximum calculated value with duct burning.

12. We believe that CEMS are indeed necessary for CO and NO_X and should be required by DEP. On the other hand, we do not propose CEMS for VOCs or ammonia. Regarding VOCs, DEP has not certified any CEMs for this parameter. And as to ammonia, there has so far been only one CEMs certified in the state and that is at a major source of NO_X. A recent permit issued by DEP to a minor source similar to the Birdsboro project was Future Power, PA, issued in March 2014 by the Northeast Region. This was for a 346 MW NGCC project that was a minor source. That permit required CO and NO_X CEMS but not CEMS for VOCs or ammonia.

13. I believe the Department is confusing BACT with BAT in this comment. BAT does not necessarily require a top-down analysis, particularly in cases where comparable facilities have been routinely permitted. Note that in the FAQs document prepared by DEP regarding the recently revised GP-5, DEP stated "The BAT requirements for the sources included in a Plan Approval Application are determined on a case-by-case basis, which **may** (emphasis added) include a top-down analysis." The BAT document the Department generated on its own regarding the GP-5 is instructive in this instance, particularly so since it contains a section on emissions from turbines.

In DEP's GP-5 turbine BAT analysis, the Department identified pollutants of concern, including: NO_X, NMNEHC, Formaldehyde, SO_X, and PM. Next, they identified turbine emission reduction technologies, including: Oxidation catalysts to reduce CO and VOCs, water

injection, dry controls and catalytic reduction systems to reduce NO_X, including XONON and SCONOX. Significantly, DEP did not note any add on particulate control or sulfur control technologies in their analysis.

Furthermore, even under a formal top-down BACT analysis, if an applicant chooses the most stringent applicable control, no further analysis is required, including any economic analysis. The sole purpose of the economic analysis is to reject a technology as uneconomical. If there is no rejection there is no need for the analysis. DEP has, in calendar year 2015, issued or proposed at least 5 power projects that can inform a BAT decision. Four of those were major sources and the fifth, UGI Hunlock, a minor source, is the one most similar to Birdsboro Power in terms of applicable BAT. A summary of those projects is included below with their limits for comparison to the limits proposed by Birdsboro Power.

Comparison of Birdsboro Power with Recent DEP Plan Approvals

Project	Lackawanna Energy	Moxie Freedom	Calpine Mid-Merit	Tenaska Penn	UGI Hunlock	Birdsboro Power
P/A Issued	Proposed	9/1/15	6/15/15	4/1/15	4/30/15	
CO Std.	BACT	BACT	BACT	BACT	BAT	BAT
CO Limit	2 PPM	2 PPM	2 PPM	2 PPM	4 PPM	2 PPM
PM10/PM2.5	BACT	BACT	BACT	BAT	BAT	BAT
PM10/PM2.5 (lb/MMBTU)	5.9E-03	6.3E-03	Lb/hr limit only	3.9E-03	1.3E-02	5.3E-03
NO_X Std	LAER	LAER	LAER	LAER	BAT	BAT
NO_X Limit	2	2	2	2	2.5	2
VOC Std.	LAER	LAER	LAER	LAER	BAT	BAT
VOC w/o DB	1	1	1.5	1.4	1.2	1
VOC w/ DB	1.5	2	1.9	2.4	1.2	2.4
SO_2 Std.	BAT	BAT	BAT	BAT	BAT	BAT
SO_2 lb/MMBTU	1.1E-03	1.13E-03	1.49E-03	8.61E-04	2.7E-03	1.39E-03
H_2SO_4	BAT	BAT	BAT	BAT	BAT	BAT
H_2SO_4	8.6E-04	8.6E-04	1.14E-03	5.74E-04	8.1E-04	8.53E-04

With the background of the recent DEP decisions on approved technology limits, LAER, BACT, and BAT, each pollutant is addressed below:

- CO – Birdsboro power has proposed Good Combustion Practice (GCP) with catalytic oxidation as BAT with a proposed permit limit of 2 PPM. These measures are recognized as the most stringent control in a top-down analysis and no further evaluation is required. Recent permits issued by DEP for similar major sources of CO were all permitted at 2 PPM. Hunlock, the minor source most similar to Birdsboro was permitted at 4 PPM. DEP in their GP-5 BAT analysis for the largest turbines determined that oxidation catalysts were cost prohibitive at uncontrolled levels of up to 10 PPM. Birdsboro proposes to install an oxidation catalyst and control to 2 PPM, which clearly meets BAT for CO.

- Particulate Matter – Birdsboro has proposed low sulfur natural gas as BAT at a level of 5.3E-03 lb/MMBTU, which is lower than all of the recent permits except for Moxie Freedom and which is nearly twice as stringent as the limit of the most similar UGI Hunlock project. There is not a gas turbine project in the United States that has installed add-on controls for particulate, even those that burn distillate oil. Thus a top-down analysis of baghouses or ESPs or any other device is not required. These types of controls are not "available" in the sense that that component of BAT is generally understood. DEP certainly did not consider any type of add-on particulate controls in their GP-5 turbine evaluation. The Birdsboro limit is 5 times more stringent than DEP's BAT in the GP-5.

- NO_X – As is the case with CO, Birdsboro has elected to propose the most stringent controls available, SCR, and as pointed out above, even under a rigorous top-down BACT or LAER analysis, once the most stringent control is selected, no further analysis is required. All of the recent major sources have been permitted at 2 PPM NO_X as LAER. All have installed SCR. Hunlock was permitted at 2.5 as BAT. DEP, in the GP-5 BAT analysis found that SCR was not required for BAT up to 15 PPM. Birdsboro is installing SCR and taking a 2 PPM NO_X limit, this certainly meets BAT.

- VOCs – Again Birdsboro has chosen the most stringent control available, catalytic oxidation, and again no further analysis is required regarding technology. As discussed in the response to DEP comment 8, above, the Birdsboro permit application assumed 1 PPM without duct firing and 2.4 PPM with duct firing and those assumptions were inherent in the lbs/hr limits shown in the application. As to the proposed unfired limit of 1 PPM, that is equivalent to or lower than any of the LAER determinations DEP has made this year on similar projects and clearly represents BAT. The 2.4 limit with duct burning is a limit that vendors will guarantee and is a limit that was approved by DEP as LAER in the Tenaska permit. DEP established a BAT limit of 25 ppm in the GP-5. This application clearly meets BAT.

- SO_2 – As is the case with particulate, there is not a single turbine-based power plant in the United States that employs add-on sulfur controls. Emissions are addressed by limiting the sulfur in the fuel. In this case Birdsboro has proposed a limit slightly lower than Calpine and about half of the limit approved at Hunlock. Since DEP has recently approved these limits they establish BAT for this project. DEP did not even establish BAT for SO_2 in the GP-5 turbine analysis.

- H_2SO_4 - Similarly to the case of SO_2, no add-on controls are used for this pollutant and the emissions are addressed by limiting the sulfur in the fuel. In this case Birdsboro is proposing an H_2SO_4 limit essentially equivalent to the Lackawanna Energy and Moxie Freedom permits, and more stringent than the Calpine Mid-Merit limit. These recently issued permits confirm that 8.53E-04 lb/MMBTU H_2SO_4 is BAT. And as was the case with SO_2, DEP did not even address this pollutant for large turbines in the GP-5 BAT analysis.

14. You are correct. The facility would like to take advantage of that compliance option.

15. Yes. Steam and water injection are incompatible with dry low NO_X combustors. They are not proposed for this project.

16. The startup shutdown lbs/hr limits contained in Appendix E were based on what a state of the art turbine can achieve based on a review of manufacturers' data. The selected vendor will have to guarantee he can meet those limits.

17. I understand that many of the recent NGCC permits contained provisions for hot start, warm start, and cold start, based on the amount of time the unit was down. It is the preference of Birdsboro Power to try to make this permit as simple as possible to interpret, both from the point of view of the permittee as well as the Department. Consequently, we are proposing a permitting approach where any hour in which the turbine is coming on line is a start-up hour. We will use the CEMS to measure actual emissions for CO and NO_X, and we propose to assume worst case startup emissions for all manually estimated pollutants. This is a conservative approach which tends to overestimate emissions so it is environmentally protective, yet it is easier to implement and track. Even under those conservative assumptions the facility is shown to be a minor source by the calculations in Appendix E. We believe this is a preferable approach but if the Department is firmly committed to defining multiple startup conditions we will be happy to change our approach in that manner. This approach we prefer was permitted in the Future Power PA plan approval recently issued by NERO.

18. No, there will be no condensate tanks on site.

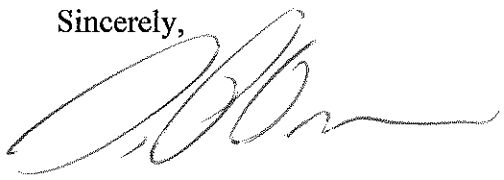
19. We do not have emission guarantees because we have not selected a turbine. The emissions limits established in the permit to be issued will be given to various turbine vendors and they will have to guarantee the limits in order to be selected. As the table above demonstrates, the emission limits proposed are attainable by a wide variety of turbine manufacturers. If the Department wishes to include a plan approval condition that requires a vendor guarantee prior to the start of construction, that approach would be acceptable to the applicant.

20. The parameters you list, catalyst temperature, pressure drop, and ammonia injection rate will all be continuously monitored. Those are the only parameters associated with the SCR system proposed to be continuously monitored.

21. The oxidation catalyst temperature and pressure drop will be continuously monitored. No other parameters associated with the catalytic oxidizer will be monitored.

Thank you for the opportunity to respond to these issues. I would also like to request a meeting at the Department's convenience to further discuss the issues raised by DEP comments 13, 16, and 17, due to a concern that further discussions may be required to resolve these issues. On the other hand, if you find my responses to these (and all other) issues sufficient, there would be no need to meet.

Sincerely,



Fred P. Osman, P.E., BCEE

Birdsboro Power Pa/NGCC Plant
TurbineStack Siemens Unit

	Max Flow	
Load Condition	DB Off	DB On
Ambient Temperature	0	92
Evap. Cooler Status	Off	On
Fuel Value (BTU/lb) (HHV)	23,289	23,289
Fuel Flow (lb/hr)	126,400	131,617
Heat Input (MMBTU) (HHV)	2,944	3,065
Maximum gas flow (SCFH)	2,869,132	2,987,552
Exhaust Flow K (lbs/hr)	5,246	5,099
Exhaust MolWt	28.42	28.00
Exhaust Moles/hr	184,574	182,107
Exhaust SCFH	71,116,537	70,165,882
Oxygen (Wet)	11.73	9.97
Oxygen (Dry)	12.80	11.40
SCFH @ 15% O2	97,599,836	112,953,937
Water	8.38	12.56
DSCFH@ 15% O2	89,420,970	98,766,923
Dry Exhaust Moles/hr @15% O2	232,081	256,338
Max Sulfur (g/100 scf)	0.5	0.5
Ammonia Slip (ppm)	5.0	5.0
MMBTU/hr (max)(HHV)	**2,944**	**3,065**

Hours	
Total	8400
w DB	1600
w/o DB	6800
Startup	48
Shutdown	48
Normal	8304

Emissions	NO_X	CO	PM	PM_{10}	$PM_{2.5}$	SO_2	VOC	NH_3	H_2SO_4[1]
lb/hr w/o Duct Burners	22.1	13.4	12	12	12	4.1	4.0	19.7	2.51
lb/hr w. Duct Burners	23.0	14.0	16	16	16	4.3	10.0	21.8	2.61
TPY Normal Operation	93.5	57	54	54	54	17.4	22	84.5	10.63
TPY Startup	2.0	11	0.3	0.3	0.3	0.10	1.4		0.06
TPY Shutdown	0.7	2	0.3	0.3	0.3	0.10	0.7		0.06
TPY	**96.3**	**69.4**	**54.2**	**54.2**	**54.2**	**17.5**	**23.7**	**84.5**	**10.7**

[1] H_2SO_4 emissins are based on an assumed conversion of SO_2 to SO_3 of 5% in the turbine and duct burner, 30% in the catalytic oxidizer and 5% in the SCR, for a total conversion of 40% All SO_3 is assumed to be converted to H_2SO_4.

Birdsboro Power Pa/NGCC Plant

Startup Emissions

Air Pollutant	Cold Start		Warm Start		Hot Start		Max lb/hr Startup	Shutdown	
	105	Minutes	85	Minutes	65	Minutes		25.5	Minutes
	lb/event	lb/hr	lb/event	lb/hr	lb/event	lb/hr		lb/event	lb/hr
NO_X	104.0	59.4	92.0	64.9	92.0	84.9	84.9	40	30.2
CO	512.0	292.6	495.00	349.4	495.00	456.9	456.9	150	71.8
VOC	62.0	35.4	61.00	43.1	61.00	56.3	56.3	59	30.8
SO_2	0.7	0.4	0.5	0.4	0.5	0.5	0.5	0.4	4.3
PM	6.3	3.6	4.7	3.3	4.7	4.3	4.3	3.9	16.0

Birdsboro Power Pa/NGCC Plant

Cooling Tower Emissions

Activity	Water Flow (kpph)	Water Flow (gph)	Drift Loss (gal/hr	TDS (mg/l)	TDS (lb/gal)	Maximum Hourly Emissions (lb./hr.)		
						PM	PM_{10}	$PM_{2.5}$
Cooling Tower	57,700	6,926,771	34.63	2,000	0.0167	0.6	0.6	0.6
						Annual Emisisons (TPY)		
Cooling Tower						2.53	2.53	2.53

Assumptions:

Hours of operation	8,760
Drift	0.00050%

Birdsboro Power Pa/NGCC Plant

Emergency Generator

Regulated Air Pollutant	Emission Factor		Emission Rate		Basis of Emission Estimate
			Maximum Hourly	Annual	
	lb./bhp-hr	g/bhp-hr	lb./hr.	tons/year	
SO_2[(a)]	1.01E-05	0.005	0.01	0.00034	Mfg.
NO_X	6.61E-03	3	4.4	0.2	Mfg.
PM-10	7.49E-05	0.034	0.05	0.003	Mfg.
CO	7.71E-04	0.35	0.52	0.03	Mfg.
VOC[(b)]	8.81E-05	0.04	0.06	0.003	Mfg.

Assumptions:

Engine Power	670	HP	500 kVA
Hours of operation (hr./year)	100		
Maximum Fuel Use	31.9	gal/hr.	
Density ULSD	7.09	lbs./gal	
MMBTU/gal	0.139		
MMBTU/hr.	4.43		

Notes:

a) Diesel Fuel sulfur content assumed to be: 0.0015 %

(b) Limits are for HC which are conservatively assumed to be VOCs

Birdsboro Power Pa/NGCC Plant

Emergency Fire Pump

Regulated Air Pollutant	Emission Factor			Emission Rate		Basis of Emission Estimate
				Maximum Hourly	Annual	
	lb/bhp-hr	g/bhp-hr	g/kw-hr	lb./hr.	tons/year	
SO_2 [(a)]	1.21E-05			5.46E-03	0.0003	AP-42, Table 3.4-1
NO_X		3.0	4.00	2.22	0.111	NSPS Subpart IIII
PM-10		0.15	0.20	0.11	0.01	NSPS Subpart IIII
CO		2	3.50	1.48	0.1	GP-9
VOC [(b)]		1.00		0.74	0.04	GP-9

Assumptions:

Engine Power	450	HP	335.7 KW
Hours of operation (hr./year)	100		
MMBTU/hr.	2.98		
Fuel Use			1.82E+02 lb/hr
			2.62E+01 gal/hr

Notes:

a) Diesel Fuel sulfur content assumed to be: 0.0015 %

(b) NSPS limits are for NMHC which are conservatively assumed to be VOCs

Birdsboro Power Pa/NGCC Plant

Hazardous Air Pollutants

Pollutant	Emission[1] Factor (lb./MM BTU) Turbine	lb./hr. Turbine	Tons per Year Turbine	Emission[2] Factor (lb./MM BTU) Duct Burners	lb./hr. Duct Burners	Tons per Year Duct Burners	Tons per Year Total
Formaldehyde	7.10E-04	1.35	5.7	7.31E-05	0.08	0.1	5.75
Toluene	1.30E-04	0.25	1.0	3.31E-06	0.00	0.0	1.04
Xylenes	6.40E-05	0.12	0.5		-	-	0.51
Acetaldehyde	4.00E-05	0.08	0.3		-	-	0.32
Ethylbenzene	3.20E-05	0.06	0.3		-	-	0.26
Propylene Oxide	2.90E-05	0.06	0.2		-	-	0.23
Benzene	1.20E-05	0.02	0.1	2.05E-06	0.00	0.0	0.10
Acrolein	6.40E-06	0.01	0.05		-	-	0.05
PAH/POM	2.20E-06	0.00	0.02	8.11E-08	0.00	0.0	0.02
Naphthalene	1.30E-06	0.00	0.01	5.95E-07	0.00	0.0	0.01
Dichlorobenzene				1.17E-06	0.00	0.0	0.00
Hexane				1.75E-03	1.96	1.6	1.57
VOCs	2.10E-03	4.00		5.36E-03	6.00		
Total HAPS			8.2			1.6	**9.86**

[1] *AP-42 Tables 3.1-2a and 3.1-3*

[2] *AP-42 Tables1.4-2 and 1.4-3*

Assumptions:

	Turbine	Duct Burner
Hours of operation	8,400	1600

Calculation uses AP-42 factors for HAPS & VOCs and actual controlled VOCs to estimate controlled HAP emissions.

Birdsboro Power Pa/NGCC Plant
Total Facility PTE (Tons per Year)

Emissions	NO_x	CO	PM	PM_{10}	$PM_{2.5}$	SO_2	VOC	Total HAPs	High HAP[1]	H_2SO_4
Turbine/Duct Burner	96.3	69.4	54.2	54.2	54.2	17.5	23.7	**9.9**	**5.7**	**10.75**
Cooling Tower			2.5	2.5	2.5					-
Emergency Engine	0.2	0.0	0.0	0.0	0.0	0.0	0.0		-	-
Fire Pump	0.1	0.1	0.0	0.0	0.0	0.0	0.0		-	-
Total PTE	**96.6**	**69.5**	**56.7**	**56.7**	**56.7**	**17.6**	**23.7**	**9.9**		**10.7**

[1]Formaldehdye

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AIR QUALITY

Birdsboro Power, LLC

Revision 1.0 to

AIR QUALITY PLAN APPROVAL APPLICATION

for a

450 MW (Nominal) NGCC Power Plant

For Submittal To

PENNSYVLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION
AIR QUALITY
SOUTHCENTRAL REGIONAL OFFICE
HARRISBURG, PA

December 11, 2015

Prepared By

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1.0 Introduction

1.1 *General*

This application concerns an approximate 450 MW (gross) Natural Gas Fired Combined Cycle (NGCC) turbine with occasional supplemental duct burning, to be located at an abandoned industrial property in the Borough of Birdsboro in Berks County. A topographic map and a satellite photo of the plant location are included as Figures 1-1, and 1-2. A site layout is included as Figure 1-3. The facility will meet Best Available Technology (BAT) limits for all pollutants. The facility will be a minor source of air pollution, with all criteria pollutants less than 100 tons per year; with each individual HAP less than 10 tons per year; and with an aggregate of all HAPs less than 25 tons per year. The NGCC turbine will install selective catalytic reduction (SCR) technology as well as a catalytic oxidizer to control emissions. The facility will be subject to 40 CFR Part 60 Subparts KKKK (the turbine and duct burners) and IIII (emergency engines), as well as proposed Subpart TTTT regarding the greenhouse gas emissions from the turbine.

1.2 *Application Organization*

There are five sections to the narrative portion of this permit application. The sections consist of the following: 1.0 Introduction, 2.0 Project Description, 3.0 Air Emissions, 4.0 Regulatory Review of Project, and 5.0 Requested Permit Conditions. Section 1.0 describes the proposed project in general terms. Section 2.0 contains a more detailed description of the project for which the plan approval application is being submitted. Section 3.0 provides a summary of the potential air emissions. Section 4.0 discusses the regulatory implications of the project. Section 5.0 lists requested permit conditions which the applicant is seeking and provides justifications for those requests. Finally, the appendices of this application contain the actual application forms, a General Information Form, a compliance review form, emission calculations, and proof of municipal notice.

Please refer to original application for topographic map.

Please refer to original application for satellite photo.

Please refer to original application for site layout.

2.0 Project Description

The proposed electrical generation facility will be located in the Borough of Birdsboro in Berks County, Pennsylvania, at the site of an abandoned steel mill (Armorcast). It is proposed as an approximately 450 MW (gross) natural gas fired combined cycle facility. The application is based on a Siemens SGT6-8000H, but to maintain a competitive business advantage with turbine vendors, this application seeks approval to install the Siemens turbine or any equivalent turbine that meets the same or lower BAT emission limits and has equal or lower hourly and annual emissions. This approach meets all applicable regulations since BAT will be the same for any turbine installed under a plan approval granted by DEP, and since the source, as explained below, will be a minor source, no dispersion modeling is required and the exhaust characteristics of the particular turbine installed have no regulatory impact. The final turbine selected will be reported to DEP before it is installed at the facility.

Emission estimates are based on either the concentration limits guaranteed by the system contractor and the mass flow through the turbine at worst case conditions, the worst case lbs./hr emission limits guaranteed by the manufacturer, or AP-42 calculations. Additionally, the turbine will employ inlet evaporative cooling during periods of hot weather and the increased emissions from this have been accounted for in this application. The facility will be a combined cycle plant (1X1) with heat captured through a heat recovery steam generator (HRSG) with auxiliary duct burners (used in periods of high electrical demand) used to power a steam turbine.

The facility was designed to be minor for all traditional PSD pollutants. Under the Supreme Court's Greenhouse Gas Tailoring Rule decision, greenhouse gases do not trigger PSD for an otherwise minor PSD source, which is the case in this instance.

The PTE of the facility is below 100 tons for NO_X and below 50 tons for VOCs, so LAER and the need for ERCs is not triggered. Additionally, the facility is not a major source of HAPS.

The applicant proposes to control NO_X and CO from the turbine to a level of 2.0 PPM (dry basis, at 15% O_2), and VOCs to 1.0 PPM and 2.4 PPM with duct firing (dry basis, at 15% O_2). Control will be accomplished by a selective catalytic reactor (SCR) for NO_X and a catalytic oxidizer for CO. The same NO_X, CO, and VOC levels (in PPM) are proposed for operation both with and without the duct burners.

In addition to the turbine, the facility will also include an emergency generator, a fire pump, and a cooling tower.

3.0 Air Emissions

3.1 *Turbine Emissions*

Emissions for the turbine were estimated from: 1) the contractor's guarantees for NO_X (2.0 PPM), CO (2.0 PPM), VOCs (1.0 PPM and 2.4 PPM with duct firing), and PM_{10}; 2) Maximum sulfur in the fuel and the maximum amount of fuel burned for SO_2; and 3) AP-42 factors for HAPs. All PM_{10} was assumed to be $PM_{2.5}$, as a conservative assumption, and all PM emissions were assumed to be PM_{10}, based on engineering experience.

The turbine will have the following potential to emit limits.

Table 3-1
Potential to Emit – Turbine (including duct burning emissions)

Assumptions: 8,400 hours total operation
1,600 hours – duct burner operation
48 hours- startup
48 hours - shutdown

Pollutant	PTE (TPY)	Significance Limit (TPY)
NO_X	96.3	100
CO	69.4	100
VOCs (as methane)	23.7	50
PM_{10}	54.2	100
$PM_{2.5}$	54.2	100
SO_2	17.5	100
HAPs	9.9	25
Highest HAP	5.7 (Formaldehyde)	10

3.2 *Emergency Engine Emissions*

There are two emergency engines planned for this project, a 450 hp fire pump, and a 500kVA emergency generator. Emissions from these two engines were estimated based on mfg. data and an assumed operating limit of 100 hours.

Table 3-2
Potential to Emit – Emergency Engines

Assumptions: 100 hours per year operation, each engine

Pollutant	PTE (TPY)
NO_X	0.3
CO	0.1
VOC	0.04

3.3 *Cooling Tower Emissions*

Process water will be cooled by a mechanical cooling tower. Emissions are calculated from AP-42, vendor data on drift, and TDS data from the water to be used in the tower.

Table 3-3
Potential to Emit – Cooling Tower

Assumptions: 8,760 hours total operation

Pollutant	PTE (TPY)
PM	2.5
PM_{10}	2.5
$PM_{2.5}$	2.5

3.4 *Total Facility Emissions*

This facility will have PTE's as indicated in the table below.

Table 3-4
Potential to Emit – Facility Totals

Pollutant	PTE (TPY)	Significance Limit (TPY)
NO_X	96.6	100
CO	69.5	100
VOCs (as methane)	23.7	50
PM_{10}	56.7	100
$PM_{2.5}$	56.7	100
SO_2	17.6	100
HAPs	9.9	25
Highest HAP	5.7 (Formaldehyde)	10

Documentation of all emission calculations is included in Appendix E.

4.0 Regulatory Review

4.1 *Non-attainment Area Review*

The area in which this source is located is in marginal non-attainment of the 2008 ozone standard. Also, because it is located in the Northeast Ozone Transport Region (NOTR) it is also considered a moderate non-attainment area for ozone. Berks County was until recently a moderate non-attainment area for the 1997 $PM_{2.5}$ standard, but the County was reclassified to a maintenance area on March 4, 2015.

4.2 *Major/Minor Source Review*

The facility is a minor source for all criteria pollutants. Because of the Supreme Court Decision on the Greenhouse Gas Tailoring Rule, it is exempt from PSD for greenhouse gases. The facility is also minor for HAPs.

4.3 *New Source Performance Standards (NSPS)*

4.3.1 40 CFR Part 60 Subpart KKKK - Standards of Performance for Stationary Combustion Turbines

The turbine will be subject to 40 CFR Part 60 Subpart KKKK since the turbine has heat inputs of approximately 2800 MMBTU/hr at ISO conditions. Under Subpart KKKK, new turbines with heat inputs greater than 850 MMBTU/hr must limit NO_X emissions to less than 15 PPM when firing natural gas. This application proposes emission limits of 2.0 PPM on natural gas as BAT. Consequently the NSPS NO_X emission requirements may be streamlined into the anticipated DEP BAT limits.

SO_2 emissions are limited in one of two ways under Subpart KKKK. One method, allowed under §60.4330(a)(2) is "You must not burn in the subject stationary combustion turbine any fuel which contains total potential sulfur emissions in excess of 26 ng SO2/J (0.060 lb SO_2/MMBtu) heat input." With pipeline natural gas limited to a maximum sulfur content of 0.5 gr/100 dscf and a minimum heat density of 950 BTU/scf, based on EPA definitions in 40 CFR §72, natural gas would contain a maximum $7.5E^{-04}$ lb S/MMBTU and SO_2 emissions would be 1.5 E^{-03} lb/MMBTU, which is well below the Subpart KKKK requirement. Thus the Subpart KKKK emission limit can be streamlined into a permit requirement to burn only natural gas in the turbines.

The remaining administrative components of the NSPS are also applicable and will be complied with. The details of these requirements are included in the application form in this submittal.

It is important to note that the duct burners are also subject to KKKK and under this rule are specifically exempt from subpart Db. (40 CFR § 60.4305 (b)).

4.3.2 40 CFR Part 60 Subpart TTTT - Standards of Performance for Greenhouse Gas Emissions for New Stationary Sources: Electric Utility Generating Units (Proposed)

EPA proposed GHG emissions limits for new electric utility steam generating unit on April 13, 2012. This proposed regulation was subsequently withdrawn and a replacement regulation was proposed on January 8, 2014. If finalized as proposed, this would require combined cycle turbines greater than 250 MMBTU/hr heat input, as in this plan approval application, to comply with a GHG emission rate of 1,000 lbs of CO_2/MWh.

Additionally, the facility will need to develop a site specific monitoring plan for CO_2 emissions.

EPA regulations require that if a plan approval is granted during the period from when a rule is proposed until it is finalized, any permits granted in that period must ensure compliance with the proposed rule. In the event the rule is relaxed upon final promulgation, the permit may be amended (from an NSPS standpoint). If the event the emission limits are tightened in the final rule, additional time is given for compliance with the more stringent limit.

Birdsboro Power will be in compliance with the 1,000 lb CO_2/MWh on a running 12-month basis at the first compliance point, which is 12 months after operation begins.

4.3.3 40 CFR Part 60 Subpart IIII—Standards of Performance for Stationary Compression Ignition Internal Combustion Engines

The two emergency engines proposed for this facility will be subject to this regulation. The engines will meet the emission limits applicable to owners and operations of CI emergency engines in §60.4205. Additionally the applicant will comply with the sulfur-in-fuel limits of § 60.4206. Furthermore, the applicant will comply with § 60.4208, which establishes deadlines for installation of earlier model year engines.

4.4 *New Source Review*

The permit application must consider NSR (non-attainment) impacts. As shown in Table 3-3, above, the facility is minor for all NSR pollutants and their precursors (i.e. NO_X and VOCs).

4.5 *Prevention of Significant Deterioration*

The facility is minor for all criteria pollutants and is thus not subject to any PSD requirements. Greenhouse Gases do not trigger PSD for otherwise minor sources.

4.6 *Best Available Technology (BAT) Analysis*

4.6.1 NO_X

A review of the BACT/RACT/LAER clearing house shows that recent permits issued to combined cycle turbines have NO_X permit limits ranging from 2 PPM to 5 PPM on natural gas. All of the recent NGCC turbines in the BACT database rely on dry low NO_X (DLN) control followed by SCR.

The applicant is proposing these same controls as BAT, namely Dry Low NO_X burners followed by SCR, as well as an emission limit equivalent to the lowest found in the BACT/RACT/LAER database of 2.0 PPM. These are the lowest limits that turbine and APC equipment manufacturers will guarantee on combined cycle turbines and these limits are equivalent to what is typically required under LAER for combined cycle facilities. Consequently the applicant proposes NO_X BAT to be 2.0 PPM, a level that would even meet LAER emission limits, if that were an applicable requirement.

4.6.2 $PM/PM_{10}/PM_{2.5}$

The BACT/RACT/LAER database shows that BACT for combined cycle turbines is typically not established, but in the few cases where it has been recently addressed, BACT has been established as natural gas firing (or ultra-low sulfur distillate) firing. The applicant proposes to limit fuels to natural gas as $PM/PM_{10}/PM_{2.5}$ as BAT with a permit limit of 22.0 lb/hr.

4.6.3 Greenhouse Gas GHG

Greenhouse Gas BAT is the most complex issue regarding the BAT determinations. The applicant proposes 1,000 lb-CO_2 MWh as BAT. This is the same limit proposed by EPA as the NSPS limit and DEP has recently permitted other turbines at this level as BAT.

4.6.4 CO

STAPPA/ALAPCO, in 2005, recommended catalytic oxidization for combined cycle turbines, with a limit of 3 PPM CO. This is a limit consistent with what other recently permitted combined cycle facilities have been subject to. Birdsboro Power proposes to use good combustion practices and a catalytic oxidizer to limit CO emissions to 2.0 PPM on a 3-hr rolling average basis, a limit lower than the STAPPA/ALAPCO recommendation.

4.6.5 VOC

VOC BACT in recent permits has been determined as good combustion practices with a catalytic oxidizer. Birdsboro Power proposes to install a catalytic oxidizer and accept emission limits of 1.0 PPM without duct firing and 2.4 PPM with duct firing as BAT.

4.6.6 SO_2

The BACT/RACT/LAER clearing house addresses BACT for SO_2 by limiting sulfur in fuel. The applicant proposes to fire only pipeline quality natural gas as BAT for SO_2.

4.6.7 NH_3

A review of the LAER applications that have installed SCR as well as a review of the most recent PA combined cycle permits shows that 5 PPM is a typical number for ammonia slip. Additionally, this is the number that APC vendors will guarantee on turbines in conjunction with the stringent NO_X limits proposed in this application.

Table 4-1
Summary of Proposed BAT Controls/Limits

Pollutant	Control	Limit	Avg. Time
NO_X	SCR	2.0 PPM	3-hr Rolling
$PM/PM_{10}/PM_{2.5}$	NG Fuel Only	16.0 lb/hr	Stack Test
CO_2	GCP/Eff.	1,000 lb/MWh	12-Month Rolling
CO	Cat/Ox	2.0 PPM	3-hr Rolling
VOCs w/o DB	Cat/Ox	1.0 PPM	Stack Test
VOCs w/ DB	Cat/Ox	2.4 PPM	Stack Test
SO_2	NG fuel only	4.3 lb/hr	Stack Test
NH_3	N/A	5.0 PPM	Stack Test

SCR = Selective Catalytic Reduction
GCP = Good Combustion Practices
NG = Natural Gas
Eff. = Efficiency of Turbine
Cat/Ox= Catalytic Oxidizer

4.7 *National Emissions Standards for Hazardous Air Pollutants (Part 61 NESHAPS)*

Originally promulgated under the 1970 Federal Clean Air Act, National Emission Standards for Hazardous Air Pollutants (NESHAP) apply to seven specific compounds (vinyl chloride, beryllium, mercury, benzene, asbestos, radionuclides, and inorganic arsenic) emitted from specific process (40 CFR 61). However, none of those NESHAP's is applicable to the Birdsboro Power facility.

4.8 *Maximum Available Control Technology Standards*

4.8.1 40 CFR Part 63 Subpart YYYY -National Emission Standard for Hazardous Air Pollutants for Stationary Combustion Turbines

EPA promulgated a Part 63 NESHAP for stationary combustion turbines on August 18, 2004 (Part 63, Subpart YYYY), which had an effective date for new turbines of March 5, 2004. However this MACT standard only applies to stationary combustion turbines at major sources of HAPs; there is no area source component of this regulation. This facility will be a minor source of HAPs and Subpart YYYY is not applicable.

4.8.2 40 CFR Part 63 Subpart ZZZZ - National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines

The two emergency engines at this facility will theoretically be subject to Subpart ZZZZ, the RICE rule. However, since these engines will meet the definition of new stationary rice at an area source, they are subject to §63.6590 (c), which requires compliance with 40 CFR Part 60, Subpart IIII without any further requirement under Part 63 Subpart ZZZZ. Thus compliance with Subpart IIII ensures compliance with Subpart ZZZZ.

4.9 *Title IV Applicability*

This turbine will be an Acid Rain affected unit. Birdsboro Power PA will submit an acid rain permit application, file a certificate of representation for this turbine, develop and submit a Part 75 monitoring plan, and comply with all other requirements of the Acid Rain Regulations.

4.10 *Title V Applicability*

The facility will not be a Title V facility but will apply for a state only operating permit in the time frame required by DEP.

4.11 *Interstate Pollution Transport Reduction Requirements*

This facility will be subject to PA Code 25 §145 Subchapter D (CAIR) requirements. Birdsboro Power will submit a certificate of representation for the turbine, develop and submit a Part 75 monitoring plan, and comply with all other provisions of this rule.

4.12 *Cross States Pollution Air Rule (CSAPR) applicability*

This facility will be subject to CSAPR and will comply with all aspects of that regulation

4.13 *Part 98 GHG Reporting*

As a source category listed in Table A-3 to Subpart A of Part 98, this facility will report GHG emissions to EPA regardless of the amount emitted. The permittee will develop a GHG monitoring plan, register on e-GRRT, and report GHG emissions in accordance with EPA requirements.

4.14 *PA Code 25 § 123.1 - Prohibition of Certain Fugitive Emissions*

These sources are subject to the prohibition of fugitive emissions and will comply with that regulation. There is little potential for fugitive emissions from this facility.

4.15 *PA Code 25 § 123.2 - Fugitive Particulate Matter*

These sources are subject to this provision and will comply. As a natural gas only plant with low traffic volumes on site, the potential for fugitive particulate matter emissions is very small.

4.16 *PA Code 25 § 123.13 – Particulate Matter Emissions*

As a process-type source with exhaust flows greater than 300,000 dscfm the turbine is subject to an emission limit of 0.02 gr/dscm, in accordance with §123.13(c)(1)(iii). In actuality the turbine will emit approximately 0.001 gr/dscm, well below the regulatory level.

4.17 *PA Code 25 §123.21 Sulfur Compound Emissions*

As a process unit this source is subject to 500 PPM SO_2 limits under §123.21(b). In reality, due to combustion only of natural gas, the turbine will emit far below this limit.

4.18 *PA Code 25 §123.31(b) Malodor Emissions*

The facility is subject to the malodor regulation. There is no potential for malodor from this operation and the permittee will comply with the requirement.

4.19 *PA Code 25 §123.41 Visible Emissions*

This regulation limits opacity to less than 20% except for up to three minutes in each hour and limits opacity absolutely to less than 60%. As a natural gas fired turbine, opacity is not expected to be observable and in any case will meet more stringent BAT limits of less than 10% except for up to three minutes in each hour with an absolute limit less than 30%.

5.0 Requested Permit Conditions

5.1 Start-up/Shutdown Language

In recognition of the fact that SCR and catalytic oxidation units only operate properly in a certain temperature window and to allow for operational flexibility for this turbine, and recognizing that steady-state emission limits for CO and NO_X may be impossible to meet during start-up and shut-down, the applicant requests that emission limits be waived during start-up and shut-down conditions. Birdsboro Power understands that that CO and NO_X annual tonnage limits would need to remain below major source thresholds and would include all operating conditions.

In implementing the start-up/shut-down exemption, the applicant proposes the following definitions:

(a) A startup is defined as operation in the period beginning when continuous fuel flow to the combustion turbine is initiated and ending when the combustion turbine achieves compliance with the BAT emission limits.

(b) Shutdown is defined as the period beginning with the lowering of unit load below 40% with the intent of ceasing operation of the unit and ending with the termination of continuous fuel flow to the combustion turbine.

5.2 Turbine Flexibility

As stated in the introduction, this application is based on a Siemens SGT6-8000H turbine and the emissions calculations demonstrating that this is a minor source or based on that turbine. The applicant requests the flexibility to install any equivalent turbine so long as 1) the BAT limits over the defined averaging period established in the plan approval are met, and 2) the mass emissions on a lbs./hr. and tons/yr. basis are no higher than those included in this application.