Competitive
Power Ventures, Inc.

May 27, 2014

Mr. Rob Feagins
Air Permit Manager
Virginia Department of Environmental Quality
Southwest Regional Office
355-A Deadmore Street
Abingdon, VA 24210

Subject: CPV Smyth Generation Company, LLC – Source Registration No. 11750
Prevention of Significant Deterioration Application
Response to Preliminary Evaluation Letter

Dear Mr. Feagins:

CPV Smyth Generation Company, LLC (CPV Smyth) submitted a Prevention of Significant Deterioration (PSD) permit application to the Virginia Department of Environmental Quality (DEQ) that was received by the DEQ on February 4, 2014. The PSD application is for a proposed 700 megawatt (MW) (nominal) natural gas-fired combined-cycle base-load electric power plant with two Alstom GT24 combustion turbine generators and two heat recovery steam generators (HRSGs). On March 5, 2014, the DEQ completed its initial review and provided a set of comments requesting clarification and additional information on a number of issues. This letter provides a response to each of the DEQ's initial comments on the CPV Smyth PSD application.

1. *The discussion of the applicability of Article 6 permitting and best available control technology (BACT) requirements on page 1-1 of the application should be based on the calculation and presentation of uncontrolled emissions of SO_2 and comparison to the corresponding threshold for the pollutant of 40 tons per year for a new source. Although this threshold is higher than the 25 ton/year threshold possibly used for a modified source, uncontrolled emissions calculations must be performed for maximum operation at 8,760 hours per year for each emissions source (including duct burners). The evaluation of regulated parameters subject to PSD BACT requirements under Article 8 appears to be correct.*

   Potential SO_2 emissions for the proposed project were based on the operating scenario provided in Section 3.3 of the application, which includes a maximum of 3,000 hours per year of duct firing. In accordance with DEQ guidance, potential SO_2 emissions have been recalculated without operating restrictions to determine the applicability of Article 6 to SO_2 emissions. The table below shows that potential unrestricted SO_2 emissions for the project are 18.8 tpy. CPV Smyth will accept federally enforceable operating limits in

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the PSD permit, consistent with Section 3.3 of the application and potential restricted SO_2 emissions for the project will be 16.3 tpy as provided in Table 3-3 in the permit application. The table below and the attached revised Table 3-3, reflect a revised natural gas sulfur content of 0.3 grains per 100 cubic feet of gas as discussed in response to Comment #2.

Potential Unrestricted SO_2 Emissions

Emission Unit	lb/hr	tpy
CT#1	1.80	7.9
CT#2	1.80	7.9
DB#1	0.30	1.3
DB#2	0.30	1.3
Auxiliary Boiler	0.076	0.3
Emergency Generator	0.022	0.1
Emergency Fire Pump	0.003	0.0
TOTALS	**4.3**	**18.8**

2. *Text preceding Table 3-1 on page 3-2 notes that SO_2 emissions (also H_2SO_4 and partly PM-10/PM-2.5) are based on a maximum natural gas sulfur content of 0.5 grains per 100 standard cubic feet (gr/100 scf). Attached Alstom data sheets presume 0.5 gr/100 scf as the sulfur content of the natural gas. This proposed/presumed value does not represent BACT for this project, as will be addressed in paragraphs below. An existing power plant fired by natural gas in this region has been permitted at significantly lower levels of sulfur in the pipeline natural gas serving as fuel.*

   Best Available Control Technology (BACT) is defined under Article 6 as an "emissions limitation based on the maximum degree of reduction." CPV Smyth cannot control the amount of sulfur in the natural gas but rather, can choose to use pipeline quality natural gas as the sole fuel for the project. This decision to restrict the combustion turbines, duct burners and auxiliary boiler to the exclusive use of pipeline quality natural gas as the sole fuel meets the definition of BACT for SO_2 emissions under Article 8 of the DEQ regulations and under 40 CFR 52.21 as it results in the "maximum degree of reduction" achievable for the project.

   The United States Environmental Protection Agency (USEPA) provides a definition of pipeline quality natural gas in the Acid Rain regulations under 40 CFR 72.2 as "pipeline natural gas contains 0.5 grains or less of total sulfur per 100 standard cubic feet." We understand from DEQ that measured levels from the interstate pipeline companies in Virginia have consistently been well below this value. Recently permitted projects in Virginia have included natural gas sulfur limits as low as 0.1 gr/100 scf (Dominion Warren County and Greene Energy Partners/Stonewall LLC) and as high as 0.4 gr/100 scf (Dominion Brunswick County). The DEQ has indicated that these lower limits were based upon historical sulfur content data in the natural gas.

In light of this information, the project has lowered its proposed permit limits for SO_2, H_2SO_4, and $PM_{2.5}$ to reflect a natural gas sulfur content of 0.3 gr/100 scf, consistent with recently permitted projects in Virginia. A revised emissions summary from Alstom, reflecting 0.3 gr/100 scf is attached.

3. *Table 3-1 does not contain the short-term emission rate of 0.00095 lb/MMBtu proposed for sulfuric acid mist (H_2SO_4). It also does not contain the short-term rate proposed for PM/PM-10/PM-2.5 of 0.005 lb/MMBtu. Particulate matter emissions should be characterized as PM-10 and PM-2.5, as all the combustion gas emissions are in this range, and both must include the filterable and condensable fractions as noted in the application.*

   As discussed in the response to Comment #2, Alstom has provided revised guaranteed emission rates based on a natural gas sulfur content of 0.3 gr/100 scf. Using this lower sulfur content as the basis, the maximum H_2SO_4 emission rate is 0.0056 lb/MMBtu, which is consistent with the recently approved Dominion Brunswick County project.

   Using this lower sulfur content as the basis, the maximum $PM/PM_{10}/PM_{2.5}$ emission rate is 0.0032 lb/MMBtu at full load without duct firing, which is consistent with the recently approved Dominion Brunswick County and Greene Energy Partners/Stonewall LLC projects. However, Alstom expects that the $PM/PM_{10}/PM_{2.5}$ emission rate in units of lb/MMBtu will increase at lower operating loads and the duct burners will have a higher $PM/PM_{10}/PM_{2.5}$ emission rate as compared to the combustion turbines. The maximum $PM/PM_{10}/PM_{2.5}$ emission rate at full load with duct firing will be 0.0046 lb/MMBtu, which is consistent with the recently approved Dominion Brunswick County project. Although the $PM/PM_{10}/PM_{2.5}$ emission rate in units of lb/MMBtu will increase at reduced operating loads, the maximum pound per hour emissions occur at full load. To account for all operating conditions, CPV Smyth proposes the following $PM/PM_{10}/PM_{2.5}$ BACT emission rates on the basis that the natural gas sulfur content will be 0.3 gr/100 CF:

   - 0.0032 lb/MMBtu without duct firing at full load
   - 0.0046 lb/MMBtu with duct firing at full load
   - 11.9 lb/hr all operating conditions (-10°F, 100% load with supplemental firing)

   The proposed $PM/PM_{10}/PM_{2.5}$ BACT emission rate includes both the filterable and condensable fractions. All particulate matter from the combustion turbines and duct burners is expected to be $PM_{2.5}$ and, therefore, the emissions of PM, PM_{10} and $PM_{2.5}$ will be equivalent.

4. *Section 3.3 of the application notes that annual emissions delineated in accompanying Table 3-3 for emissions from the combustion turbines are based on 5,760 hours of operation at 100% load without duct burner firing, and 3,000 hours of operation at 100% load with duct burner firing. Annual emissions for the auxiliary boiler are based on 4,000 hours of operation, and the emergency generator and fire pump are each based on 500 hours of operation. These operational constraints must eventually be incorporated as limitations in the development of the draft PSD permit. Annual emissions limits must include start-up and shutdown emissions.*

   CPV Smyth will accept federally enforceable operating limits in the PSD permit, consistent with Section 3.3 of the application. The potential emissions in the attached revised Table 3-3 of the application include startup and shutdown emissions. The supporting calculations in Appendix B of the application show the net increase in

potential emissions on a per turbine basis, which has been added to the steady state potential emissions. Revised pages 12 and 14 of Form 7 are also provided to reflect these revisions.

5. *Facility-wide annual emissions in Table 3-3 should include losses from the aqueous ammonia storage tank for NH_3 total facility emissions. Carbon dioxide equivalent emissions (CO_2e) should include any potential SF_6 emissions as leaks from circuit breakers. Are particulate matter emissions expected from the inlet air cooling equipment? How is the gas compressor powered, and are emissions expected from this unit? What are the sizes of other storage tanks, including any water treatment steps?*

   The facility will use aqueous ammonia at a concentration of 19% for the selective catalytic reduction (SCR) system. The aqueous ammonia will be stored in a sealed vessel with a pressure relief valve to prevent diurnal losses. During tank filling, displaced vapors will be returned to the delivery truck. Therefore, ammonia emissions from the aqueous ammonia tank are expected to be negligible. A standard aqueous ammonia storage tank will be equipped with a pressure relief valve with a setting of 30 pounds per square inch (psi) or higher. EPA TANKS software does not estimate emissions from tanks equipped with a pressure relief valve with a setting greater than 1 psi as emissions from the tank are not expected. As displaced vapors will be returned to the delivery truck, no measurable ammonia emissions are expected from normal operation of the ammonia storage tank.

   The project will also include diesel fuel storage for the emergency generator and fire pump engines. EPA TANKS software was run to estimate any fugitive VOC losses from a 6,000 gallon tank storing diesel fuel. The attached EPA TANKS output shows that potential VOC emissions for the diesel fuel tank would be 2 pounds per year.

   Wastewater treatment prior to discharge is expected to include only pH adjustment. The acid and caustic chemicals used for pH adjustment will have no measurable vapor pressures and, therefore, no measurable fugitive losses as a result of their storage.

   The tank sizes provided in this response are estimates for the purposes of providing general information for these sources. The results of the analysis show that emissions from these sources are minimal and they will be insignificant sources under the DEQ's Operating Permit Program. Final tank sizes will be provided to the DEQ when this information is available as discussed in response to Comment #15.

   At this time, the design of the circuit breakers and their capacity is not finalized and it is not expected to be finalized prior to issuance of the permit. Consistent with the PSD permits for Dominion's Brunswick County and Greene Energy Partners/Stonewall LLC projects, CPV Smyth has proposed BACT to be an enclosed pressure-circuit breaker with a maximum annual SF_6 leakage rate of 1% per year. These two permits do not contain emission or operational restrictions beyond the maximum leakage rate.

   Since submittal of the permit application, one project was identified with an approved SF_6 leakage rate of 0.5% per year, the Empire District Electric Company, Riverton Station Unit 12 project. A review of the GHG BACT addendum for this project dated March 2013 shows that the additional circuit breakers will have an SF_6 storage capacity of only 58 pounds. These breakers are not comparable to the size required for the CPV Smyth project or other comparable projects. For example, the Dominion Brunswick County project included 11 electrical circuit breakers, each containing 1,645 pounds of

SF_6. Therefore, BACT for similarly sized circuit breakers as those expected for the CPV Smyth project was determined to be a maximum annual SF_6 leakage rate of 1% per year.

Final circuit breaker SF_6 storage capacity will be provided to the DEQ when this information is available as discussed in response to Comment #15.

Particulate matter emissions are not expected from the inlet air cooling equipment. The gas compressor will be electric and, therefore, will not produce any air pollutant emissions. The number and size of other storage tanks, including any water treatment tanks, is not known at this time. The emissions from these tanks will be insignificant and will not have any applicable requirements.

6. *Section 4.14 states that an evaluation of ambient air impacts has been conducted for the potential emissions of three substances from the combustion turbines (acrolein, formaldehyde and cadmium) that are hazardous air pollutants (HAPs), and therefore considered air toxics under 9 VAC 5 Chapter 60 of Virginia's air pollution regulations. Combustion turbine emission rates of these three pollutants exceed the respective toxic exemption thresholds of the regulation. The referenced modeling evaluation is not submitted with this application, which does note that it will be submitted under separate cover with the PSD ambient air modeling analysis. This toxics modeling must consider all emissions of acrolein, formaldehyde and cadmium from the other combustion sources at the proposed facility.*

   Per DEQ guidance, potential emissions of air toxics were recalculated on an unrestricted basis for comparison to the toxic exemption thresholds. In addition, the exemption threshold for soluble nickel was applied rather than the insoluble form. As a result of this revised analysis, estimated potential nickel emissions exceed the respective toxic exemption threshold.

   The dispersion modeling analysis to be provided to the DEQ under separate cover in support of the PSD application will include all sources of acrolein, formaldehyde, nickel and cadmium emissions as identified in the attached revised air toxics applicability table. Please note that the potential HAP emissions presented in Table 3-5 in the application have not changed as these take into account the operating scenario used to calculate potential criteria pollutant emissions in Table 3-3. A revised page 13 of Form 7 is also provided to reflect these revisions.

7. *Proposed BACT for carbon monoxide emissions is 2.0 ppm corrected to 15% O_2 on a 1-hour averaging basis, based on the use of an oxidation catalyst and good combustion practices. Please provide calculations to demonstrate whether this limit compares in stringency on the basis of stipulated operational conditions and averaging period, to the BACT limits established in Virginia for Dominion's Brunswick County and Warren County PSD permits of 1.5 ppmvd at 15% O_2 as a 3-hour rolling average without duct firing, and 2.4 ppmvd at 15% O_2 as a 3-hour rolling average with duct firing. Incorporate into this comparison in some manner, such as a weighted-average, the expected 5,760 hours of operation without duct firing and 3,000 hours with duct firing for the proposed CPV Smyth facility.*

The PSD application proposed BACT limits for carbon monoxide (CO) on a 1-hour averaging basis to be consistent with the averaging period for the CO National Ambient Air Quality Standard (NAAQS) and, therefore, protective of ambient air quality. Emission limits with shorter averaging periods are more stringent than emission limits with longer averaging periods as they limit periods of elevated emissions. For example, a 1.5 ppm limit on a 3-hour averaging basis could include an hour with emissions at 3.0 ppm and two hours with an average emission rate of 0.75 ppm. In this instance, the 1.5 ppm limit on a 3-hour averaging basis could result in a greater ambient impact with regard to the CO NAAQS as compared to a 2.0 ppm limit on a 1-hour averaging basis.

Dominion's Brunswick County and Warren County PSD permit limits of 1.5 ppmvd at 15% O_2 without duct firing and 2.4 ppmvd at 15% O_2 with duct firing on a 3-hour rolling average are not consistent with the averaging period for the CO NAAQS. CPV Smyth believes that 2.0 ppmvd at 15% O_2 with and without duct firing on a 1-hour average basis is more protective of the existing ambient air quality as it is consistent with the averaging period for the CO NAAQS.

The proposed CO BACT emission limits also take into account the performance data of the Alstom GT24 combustion turbine. Dominion's Brunswick County and Warren County projects both include the Mitsubishi M501 GAC combustion turbine, which is a different size class turbine and has different operating characteristics than the Alstom GT24. As discussed in the application, the Alstom GT24 includes a Low Load Operation (LLO) feature that allows operation down to 10% combined cycle power plant load with both CTGs and the STG in operation while meeting the proposed steady-state BACT emission rates. This feature helps to reduce the number of startups and shutdowns for plants operating in cycling mode and thereby reduce emissions during these transient operating periods. The Brunswick County and Warren County PSD permits limit minimum operating load of the Mitsubishi M501 GAC combustion turbine to 50 percent. A review of the Warren County PSD permit application shows relatively high hourly CO emissions during startup and shutdown of the Mitsubishi M501 GAC combustion turbine, with more than 55% of the permitted annual CO emissions occurring during startup and shutdown operation. The engineering analysis for the Greene Energy Partners/Stonewall LLC also shows very high hourly CO emissions during startup and shutdown operation as compared to the Alstom GT24. By comparison, startup and shutdown CO emissions for the Alstom GT24 combustion turbine contribute only 10% of the potential annual CO emissions for the proposed CPV Smyth project.

In order to evaluate emissions from the GT24 combustion turbine on a 3-hour averaging basis to be consistent with recently permitted projects in Virginia, a request was made to Alstom to determine the impact of this longer averaging period on the guaranteed CO emission rates. Alstom concluded that a 3-hour averaging period would not affect the guaranteed emission rates as they had no basis for permit limits for averaging periods higher than 1 hour.

CPV Smyth believes that the proposed CO limits of 2.0 ppmvd at 15% O_2 with and without duct firing on a 1-hour average basis represent case-by-case BACT for the Alstom GT24 combustion turbine. The proposed BACT limits are consistent with the overwhelming majority of recent BACT decisions as identified in Table 5-1 in the application. A decision by USEPA's Environmental Appeals Board (EAB) on March 14, 2014 regarding the La Paloma Energy Center demonstrates that BACT is determined on

a case-by-case basis and different BACT emission limits can be established for different combustion turbine models. The EAB concluded that three separate turbine models could have three separate BACT emission limits and that the permitting authority correctly compared the proposed BACT limits to the range of emission limits that have been accepted as BACT by other PSD permitting authorities. The EAB further concluded that turbine model selection cannot be considered a control technology during the BACT analysis. The permitted CO BACT limits for Dominion's Brunswick County and Warren County projects are based upon the Mitsubishi M501 GAC combustion turbine and, therefore, not directly transferable to the CPV Smyth project. The EAB also cited EPA's GHG Permitting Guidance and NSR Manual in concluding that "the NSR Manual makes clear that permitting authorities are not expected to consider every possible level of control or to impose the highest possible level of control in all circumstances."

The application of the Alstom GT24 combustion turbine with these proposed CO BACT limits will result in lower overall CO emissions, taking into account steady state and transitional operating periods, as compared to the Mitsubishi M501 GAC and GE 7FA combustion turbines as the Alstom GT24 has significantly lower emissions during transitional periods. Due to the expected service of these units, the reductions in emissions during transitional operation are expected to more than offset and minor increase in steady state emissions. The following table compares LLO CO emissions to those for a shutdown and hot startup and a shutdown and warm startup. The comparison shows that LLO operation reduces CO emissions as compared to a shutdown and restart of the Alstom GT24 combustion turbine. Startup and shutdown emissions for the Dominion Brunswick and Dominion Warren projects are also provided to highlight the emissions benefit of the Alstom GT24 for the type of service expected for CPV Smyth.

Comparison of Transitional CO Emissions (lbs/event)

Operating Scenario	Dominion Brunswick[1]	Dominion Warren[1]	CPV Smyth
Shutdown/Warm Start	998	840	88.0
Shutdown/Hot Start	998	1,004	64.0
Transition/LLO/Transition[2]	N/A	N/A	54.8

[1] From permitted lb/hr emissions and a combined duration of 1-hour for a shutdown and startup event
[2] Based upon a maximum holding time at LLO of 12 hours.

The proposed CO BACT limits are also equivalent to the Greene Energy Partners/Stonewall LLC CO BACT limits for a GE 7FA combustion turbine, which is the DEQ's most recent CO BACT determination. For these reasons, CPV Smyth believes that the proposed CO limit of 2.0 ppmvd at 15% O_2 on a 1-hour average basis, with and without duct firing, represents case-by-case BACT for the Alstom GT24 combustion turbine.

8. *Proposed BACT limits for volatile organic compound (VOC) emissions are 1.0 ppm corrected to 15% O_2 on a 1-hour averaging basis without duct firing, and 2.0 ppm corrected to 15% O_2 on a 1-hour averaging basis with duct firing, based on the use of an oxidation catalyst and good combustion practices. Following comments above,*

calculations must be provided to demonstrate whether the proposed limits are at least as stringent on the basis of stipulated operational conditions and averaging period as the VOC limits established as BACT in Virginia for Dominion's Brunswick County and Warren County PSD permits. These limits are 0.7 ppmvd at 15% O_2 as a 3-hour rolling average without duct firing, and 1.6 ppmvd at 15% O_2 as a 3-hour rolling average with duct firing.

Consistent with the response to Comment #7, CPV Smyth believes that the VOC BACT limits proposed on a 1-hour averaging basis are more stringent than those proposed on a 3-hour rolling average for Dominion's Brunswick County and Warren County projects. Similar to CO emissions, a review of the Warren County PSD permit application shows relatively high hourly VOC emissions during startup and shutdown of the Mitsubishi M501 GAC combustion turbine, with more than 80% of the permitted annual VOC emissions occurring during startup and shutdown operation. By comparison, startup and shutdown VOC emissions for the Alstom GT24 combustion turbine proposed for the CPV Smyth project contribute only 21% of the potential annual VOC emissions.

In order to evaluate emissions from the GT24 combustion turbine on a 3-hour averaging basis to be consistent with recently permitted projects in Virginia, a request was made to Alstom to determine the impact of this longer averaging period on the guaranteed VOC emission rates. Alstom concluded that a 3-hour averaging period would not affect the guaranteed emission rates, i.e., they could not lower the VOC guarantee to 0.7 ppmvd at 15% O_2 (without duct firing) and 1.6 ppmvd at 15% O_2 (with duct firing) considering this longer averaging period.

The proposed BACT limits are consistent with the great majority of recent BACT decisions as identified in Table 5-1 in the application. As referenced above for CO, the decision by USEPA's Environmental Appeals Board (EAB) on March 14, 2014 regarding the La Paloma Energy Center reinforces that BACT is determined on a case-by-case basis and different BACT emission limits can be established for different combustion turbine models. The EAB concluded that three separate turbine models could have three separate BACT emission limits and that the permitting authority correctly compared the proposed BACT limits to emission limits that have been accepted as BACT by other PSD permitting authorities. The EAB further concluded that turbine model selection cannot be considered a control technology during the BACT analysis. The permitted VOC BACT limits for Dominion's Brunswick County and Warren County projects are based upon the Mitsubishi M501 GAC combustion turbine and, therefore, not directly transferable to the CPV Smyth project. The EAB also cited EPA's GHG Permitting Guidance and NSR Manual in concluding that "the NSR Manual makes clear that permitting authorities are not expected to consider every possible level of control or to impose the highest possible level of control in all circumstances."

The application of the Alstom GT24 combustion turbine with these proposed VOC BACT limits will result in lower overall VOC emissions, taking into account steady state and transitional operating periods, as compared to the Mitsubishi M501 GAC and GE 7FA combustion turbines. The proposed VOC BACT limits are more stringent than the Greene Energy Partners/Stonewall LLC VOC BACT limits for a GE 7FA combustion turbine, which is the DEQ's most recent VOC BACT determination. For these reasons, CPV Smyth believes that the proposed VOC limits of 1.0 ppmvd at 15% O_2 without duct

firing and 2.0 ppmvd at 15% O_2 with duct firing on a 1-hour average basis, represent case-by-case BACT for the Alstom GT24 combustion turbine.

The above proposed VOC BACT limits are for all steady state operating conditions above 50% operating load. As discussed in the application, the Alstom GT24 unit includes Low Load Operation (LLO) designed for units operating in markets where daily stop/starts and/or parking at low load are required. LLO allows operators to park the entire plant down to approximately 5-10% combined cycle power plant load with both CTGs and the STG in operation while maintaining BACT emission rate levels. However, the VOC emission rate at LLO is 2.0 ppm, which is equivalent to the VOC BACT emission rate with duct firing but higher than the rate without duct firing. The LLO condition is similar to duct firing in that it is a unique operating condition that must be evaluated separately to determine BACT.

The 2.0 ppm VOC emission rate at LLO is the Alstom guarantee for this operating condition. As the project already includes an oxidation catalyst, further emission reductions below the Alstom guarantee are not technically feasible. The only other known project offering LLO operation is the FGE Power project in Westbrook, Texas, which was issued a draft permit with a VOC BACT emission rate of 2.0 ppm for all operating modes. Since the CPV Smyth project has proposed a VOC BACT emission rate of 1.0 ppm for steady state operation above 50% load without duct firing, the proposed BACT emission rates are more stringent than the only other project proposing the Alstom GT24 combustion turbine.

LLO operation is designed to minimize emissions for units that may otherwise have frequent startups and shutdowns. An analysis was conducted to determine the impact of LLO on VOC emissions as compared to a typical shutdown and startup cycle. The following table compares LLO VOC emissions versus those for a shutdown and hot startup and a shutdown and warm startup. Startup and shutdown emissions for the Dominion Brunswick and Dominion Warren projects are also provided to highlight the emissions benefit of the Alstom GT24 for the type of service expected for CPV Smyth.

Comparison of Transitional VOC Emissions (lbs/event)

Operating Scenario	Dominion Brunswick[1]	Dominion Warren[1]	CPV Smyth
Shutdown/Warm Start	821	793.1	94.0
Shutdown/Hot Start	821	906.3	63.8
Transition/LLO/Transition[2]	N/A	N/A	61.2

[1] From permitted lb/hr emissions and a combined duration of 1-hour for a shutdown and startup event
[2] Based upon a maximum holding time at LLO of 12 hours.

As noted in Appendix B in the permit application, the total VOC emissions for the transitional period down to and back up from LLO is 48 pounds. The maximum VOC emission rate at 2.0 ppm at LLO is 1.1 pounds per hour (lb/hr), which is less than one-half of the VOC emission rate of 2.5 lb/hr at 1.0 ppm for full load steady state operation at 59°F without duct firing. It is expected that LLO would occur for periods no longer than 12 hours and, therefore, the maximum VOC emissions for a transition/LLO event are 61.2 pounds. These emissions are lower than the VOC emissions that would occur

from a shutdown and either a hot or warm start. Since LLO provides the greatest reduction in VOC emissions, it meets top-case BACT for VOC emissions for the project.

9. *The proposed BACT limits for sulfur dioxide (SO_2), sulfuric acid mist (H_2SO_4), and particulate matter (PM/PM-10/PM-2.5) emissions are based proportionately on the proposed sulfur content limit of 0.5 gr/100 scf for the pipeline natural gas to be used as fuel for the facility. However, Wolf Hills Energy in Washington County has operated a peaking power facility with natural gas-fired combustion turbines at permitted annual average sulfur content levels of 0.064 gr/100 scf and 0.3 gr/100 scf in the pipeline natural gas from 2001 to the present. The facility was initially permitted in May 2000 at 0.064 gr/100 scf and complied with the limit. The limit was only raised to 0.3 gr/100 scf in September 2006 to be in concert with a PSD permit issued in 2004 for a proposed combined cycle facility in Wythe County. Although the limit is currently 0.3 gr/100 scf, the annual average sulfur content is significantly below this value. Recent Virginia PSD permits for both Greene Energy Partners/Stonewall LLC and Dominion's Warren County facility include a limit of 0.1 gr/100 scf for sulfur content of pipeline natural gas. Therefore, BACT for the proposed CPV Smyth project must be in the range from 0.1 to a maximum of 0.3 gr/100 scf for gas sulfur content.*

   As discussed in the response to Comment #2, the project has revised its proposed permit limits for SO_2, H_2SO_4, and $PM/PM_{10}/PM_{2.5}$ to reflect a maximum sulfur content in natural gas of 0.3 gr/100 scf.

   Monitoring of the natural gas sulfur content is not required under New Source Performance Standard (NSPS) Subpart KKKK, in accordance with 40 CFR 60.4365. Therefore, CPV Smyth proposes to demonstrate compliance with the SO_2, H_2SO_4 and $PM_{2.5}$ permit limits through stack testing.

10. *Section 5.2.4 of the application addresses BACT for PM/PM-10/PM-2.5 particulate matter emissions, and proposes limits for combined filterable and condensable fractions of the same at 12.9 lb/hr with duct firing, 9.4 lb/hr without duct firing, and 0.005 lb/MMBtu (at full load with or without duct firing). The proposed 0.005 lb/MMBtu limit exceeds corresponding limits in recent Virginia PSD permits for combined-cycle power plants. In addition, the proposed limits need to be reduced proportionately for the required reduction in the proposed limit for sulfur content of the natural gas fuel noted above. Limits for PM-10/PM-2.5 emissions in Dominion's Warren County permit are 0.004 lb/MMBtu with duct firing and 0.0027 lb/MMBtu without duct firing. Corresponding limits in Dominion's Brunswick County permit (0.4 gr/100 scf sulfur content limit) are 0.0047 lb/MMBtu with duct firing and 0.0033 lb/MMBtu without duct firing. Other permits listed in Table 5-1, such as the Greene Energy Partners/Stonewall permit (0.00334 lb/MMBtu with and without duct firing), will be used in evaluating proposed BACT limits for particulate matter emissions from the CPV Smyth facility.*

    See response to Comment #3 that shows the revised proposed $PM/PM_{10}/PM_{2.5}$ emissions based on natural gas with a sulfur content at 0.3 gr/100 scf are comparable to recently approved projects in Virginia.

    The CPV Smyth project is proposing the Alstom GT24 combustion turbine. Dominion's Warren County and Brunswick County projects are based upon the Mitsubishi M501 GAC combustion turbine while the Greene Energy Partners/Stonewall project is based upon the GE 7FA turbine. The EAB's recent LaPaloma Energy decision makes clear that

turbine model selection cannot be taken into account when determining BACT for a project. The proposed $PM/PM_{10}/PM_{2.5}$ emission limits represent the lowest $PM/PM_{10}/PM_{2.5}$ emission guarantees provided by Alstom for the GT24 combustion turbine and are consistent with the majority of recent $PM/PM_{10}/PM_{2.5}$ BACT decisions as summarized in Table 5-1 in the permit application.

11. *The proposed SO_2 and H_2SO_4 BACT emissions limits of Sections 5.2.5 and 5.2.6 also need to be reduced in conjunction with a lower limit on sulfur content of the natural gas. The proposed H_2S0_4 limit of 0.00095 lb/MMBtu is significantly higher than limits in the Warren County PSD permit of 0.00013 lb/MMBtu without duct firing, and 0.00025 lb/MMBtu with duct firing. A continuous emission monitoring system (CEMS) or alternative method per 40 CFR 75 will be required to monitor SO_2 emissions to meet acid rain program monitoring requirements.*

    The CPV Smyth project will be subject to the Acid Rain program and will satisfy the monitoring requirements under 40 CFR 75 as noted in Section 4.7 in the application.

    See response to Comment #3 that shows the revised H_2SO_4 emissions for natural gas with a sulfur content at 0.3 gr/100 CF are comparable to recently approved projects in Virginia. The H_2SO_4 emissions presented in the response to Comment #3 represent the lowest emissions that can be guaranteed by Alstom for the GT24 combustion turbine and are consistent with the majority of recent BACT decisions as summarized in Table 5-1 in the permit application.

12. *Section 5.2.8 of the application submittal addresses BACT for greenhouse gases. The section does not provide a heat rate value in Btu/kW-hr for comparison to other projects, nor does it provide a figure for net power output for the proposed facility to allow calculation of a greenhouse BACT emission rate on this basis. A BACT emission rate is proposed as 888 lb CO_2e/MW-hr on a gross output basis over a 12-month period. This value also incorporates a proposed overall performance degradation value of 12.0% from design data for the equipment. Justification is not provided as to why this proposal is significantly higher than the 840 lb/MW-hr limit for the Oregon Clean Energy Center in Ohio, which is also on a gross power output basis and includes a 12.8% degradation allowance. The CPV Smyth value is also likely significantly higher than the BACT limit for the Footprint Power Salem Harbor Development project, which is 895 lb CO_2e/MW-hr on a net/grid basis of power delivered to the grid. Gross power output must be cited for the 888 lb/MW-hr limit. The proposed CPV Smyth project must include a CO_2 CEMS on each heat recovery steam generator flue, as required by the Dominion Brunswick County and Greene Energy Partners/Stonewall PSD permits in Virginia.*

    The CPV Smyth project will be subject to the Acid Rain program and will satisfy the monitoring requirements under 40 CFR 75 as noted in Section 4.7 in the application, including a CO_2 CEMS.

    The proposed GHG BACT limit takes into account all operating modes over the course of a full year of operation. The operating scenario used to calculate this composite emission rate is consistent with the scenario in Section 3.3 of the application used to calculate potential annual emissions. This operating scenario includes 3,000 hours per year at full load with duct firing at -10°F and 5,760 hours per year at full load with duct firing at 59°F. The net heat rates at these two operating scenarios, taking into account a 12% degradation factor, are 7,586 Btu/kW-hr (-10°F with duct firing) and 7,341 Btu/kW-

hr (59°F without duct firing). The gross and net power output for all operating scenarios is provided in Appendix B in the application.

The proposed GHG BACT limit of 888 lb CO_2e/MW-hr on a gross output basis over a 12-month period is lower than the DEQ approved GHG BACT limits in the Green Energy Partners/Stonewall and Brunswick County permits. The Green Energy Partners/Stonewall and Brunswick County permits also take into account a 12% degradation factor, which served as the basis for the proposed degradation factor for the CPV Smyth project.

As discussed previously in this response letter, BACT is determined on a case-by-case basis and the operating characteristics of different combustion turbine models can result in different permitted BACT emission rates. The Oregon Clean Energy Center permit is based upon a Siemens SCC6-8000H combustion turbine. The Siemens SCC6-8000H combustion turbine is an "H" class unit and is considerably larger than the "F" class Alstom GT24 proposed for the project. As discussed in Section 5.2.8, Step 4 in the permit application, larger combustion turbines such as "G" and "H" class units are inherently slightly more efficient than "F" class units. The Alstom GT24 "F" class combustion turbine was selected for the CPV Smyth project to match projected demand in the project area and to take advantage of the LLO capability of this combustion turbine. Since BACT is determined on a case-by-case basis, a direct comparison of the Oregon Clean Energy Center project and the CPV Smyth project cannot be made as they are incorporating a different class of combustion turbine. The recent EAB decision in the LaPaloma case makes clear that minor differences in BACT emission rates for different turbine models are acceptable.

The proposed GHG BACT of 888 lb CO_2e/MW-hr on a gross output basis is not higher than the Footprint Power Salem Harbor Development project as the parasitic load is projected to be only 1.5 MW for the project. This parasitic load represents less than 0.3% of the gross output at full load. Accordingly, the CPV Smyth GHG BACT limit is equivalent to 891 lb CO_2e/MW-hr on net basis, which is less than the GHG BACT limit for the Footprint Power Salem Harbor Development project.

Since submittal of the permit application, a draft PSD permit for GHG emissions was issued on March 20, 2014 by EPA Region 6 to FGE Power, LLC located in Westbrook, TX. The permit proposes a GHG BACT limit of 889 lb CO_2e/MW-hr (gross) for the Alstom GT24 combustion turbine on an annual average basis covering all operating modes. This limit is essentially identical to the limit proposed for the CPV Smyth project. The EPA provided comments on the application for the FGE Power project in a letter dated December 23, 2013 noting that lower GHG emission rates were provided in the application of 832 lb CO_2/MWh (net, without duct firing) and 889 lb CO_2/MWh (net, with duct firing). However, these lower emission rates do not account for design, performance, and degradation margins as noted on page 48 of the permit application. Issuance of the draft permit by EPA Region 6 for the FGE Power project further validates the proposed GHG BACT emission limit for the CPV Smyth project.

The only mechanism potentially available to further reduce GHG emissions from the project would be installation of a carbon capture and storage (CCS) system. CCS is a three-step process that includes capturing CO_2 in the exhaust gas from the combustion turbine, transportation of the captured CO_2 to a storage location, and storage of the captured CO_2 in a geologic formation. The EPA has concluded that each of these three

steps is technically feasible. However, CCS has never been installed on a privately funded electric generating project as the costs to install and operate CCS technology are currently excessive.

An Interagency Task Force was created in February 2010, comprised of 14 Executive Departments and Federal Agencies, co-chaired by the Department of Energy (DOE) and the USEPA. The Interagency Task Force was created to study and develop CCS technologies to overcome the cost barriers preventing the commercial implementation of CCS technology. The Interagency Task Force issued a report in August 2010[1] that showed the costs to implement CCS technology on a natural gas combined cycle (NGCC) combustion turbine generating project were excessive. These cost data are the most recent cost guidance provided by the Interagency Task Force.

The Interagency Task Force report provided an estimated capital cost for carbon capture equipment for a 550 MW natural gas-fired combined cycle facility of $340 million, an 80 percent increase in the capital cost of the plant. Scaling these costs up to 700 MW for the proposed CPV Smyth project yields an estimated capital cost for carbon capture equipment of approximately $430 million dollars. In addition, the report states that CCS technology would result in an energy penalty of 15 percent meaning that 15 percent more fuel would be required to meet the design criteria of 700 MW resulting in a 15 percent increase in the other BACT regulated pollutants for the project. The Interagency Task Force report estimates the increase in generating costs for carbon capture equipment at $44 per megawatt hour generated. The CPV Smyth plant will operate in the Pennsylvania-New Jersey-Maryland (PJM) market where current market prices are often less than $40 per megawatt hour. Therefore, according to the cost data in the Interagency Task Force report, the cost to operate just the carbon capture equipment for the CPV Smyth project would often exceed the price that it could sell its electricity, without even considering fuel and other operating costs.

The above CCS cost data is for one of the three steps in the three-step CCS process. After the CO_2 was captured, it would need to be transported to a storage facility and then injected into the geologic formation. Transportation would require either a very large number of trucks or a new pipeline, further adding to the costs for CCS. The storage facility would also charge CPV Smyth a fee for the CO_2 storage, another cost to be added for CCS technology.

The Interagency Task Force report shows that the cost of carbon capture for a NGCC facility is excessive and would make the project economically unviable. Additional costs for transportation and storage further demonstrate that the current costs for CCS are excessive and do not represent GHG BACT for the project.

13. *Startup, shutdown and malfunction emissions must be included in the annual emissions reported for the combustion turbines. The application notes that continuous emission monitoring systems will be provided for NO_x, CO, and ammonia. A CEMS for CO_2 would be required for each heat recovery steam generator flue, as noted in comments on BACT for greenhouse gases above. Expected startup emissions are tabulated in Table 5-4, and Section 5.2.10 defines operational periods and conditions. These are also compiled for NO_x, CO, and VOC in Table 3-4, with lb/hr emissions rates all less than their respective rates for base load operation. Addendum information received from you*

[1] http://www.epa.gov/climatechange/Downloads/ccs/CCS-Task-Force-Report-2010.pdf

by email on February 4, 2014, adds data for start-up and shutdown events, including emissions for particulate matter and sulfuric acid mist. Expected consumption of natural gas fuel required for startups must be incorporated into a fuel consumption value that is also required for each combustion turbine on page 7 of the DEQ Form 7 application included in the Appendix of the application submittal.

The CPV Smyth project will be subject to the Acid Rain program and will satisfy the monitoring requirements under 40 CFR 75 as noted in Section 4.7 in the application, including NO_x, CO, CO_2 and NH_3 CEMS.

The potential annual emissions include startup, shutdown and malfunction emissions as well as emissions resulting from transitional operation from 50% operating load down to LLO operating load. These emissions are included in Table 3-3 and on Form 7 in the application; supporting calculations are provided in Appendix B of the application. For example, Appendix B of the application provides a table showing an increase in annual NO_x emissions of 4.11 tpy per turbine. Accordingly, the potential NO_x emissions per turbine of 74.7 tpy includes 70.6 tpy for steady state operation and 4.1 tpy for startup and shutdown operation.

Maximum fuel consumption for the project will occur during full load operation and not during startup, shutdown, malfunction or transitional operating periods. Page 7 of the DEQ Form 7 requests a throughput limit in terms of either hours per year or fuel throughput per year. As noted in the application, the project is proposed to operate year round with maximum annual operating hours of 8,760 hours per year. As discussed in response to Comment #15, a revised page 7 of Form 7 has been provided with this response letter to show maximum annual natural gas consumption per turbine.

The permits for the Warren County, Brunswick County and Greene Energy Partners/Stonewall LLC projects do not include fuel throughput limits during startup operation and none are proposed for the CPV Smyth project. Consistent with the Warren County, Brunswick County and Greene Energy Partners/Stonewall LLC projects, CPV Smyth proposes to limit the duration of transitional operating periods as summarized in Section 5.2.10 in the application.

14. *The proposed nitrogen oxides (NO_x) emission limit of 2.0 ppm at 15% O_2 on a 1-hour averaging basis is addressed in Section 5.2.1 of the application. This will be achieved with low-NO_x combustors and a selective catalytic reduction (SCR) control system reducing nitrogen oxides to nitrogen and water with the injection of ammonia as a reagent. An emission limit for ammonia slip of 5.0 ppm at 15% O_2 is proposed in Section 5.2.7 for the SCR control system for NO_x emissions. The control technology and the proposed NO_x emission limit appear to represent BACT from an evaluation of other projects, if the limit is also applicable on a dry volumetric (ppmvd) basis. Other Virginia PSD sources have permit limits for ammonia slip on the order of 2 to 5 ppmvd of ammonia emissions.*

The proposed NO_x emission rate is applicable on a dry volumetric (ppmvd) basis. CPV Smyth has proposed an ammonia slip emission limit of 5 ppmvd, within the range of other Virginia PSD sources and the same as that proposed for the Greene Energy Partners/Stonewall LLC and Dominion Brunswick County projects. The proposed ammonia slip limit is discussed in more detail in the response to Comment #17.

15. *When will the information be provided that is noted "to be determined" on the pages of the Virginia DEQ Air Permit Application form? Information such as equipment manufacturer, type and model number will be required before the application can be considered complete. A number of corrections need to be made on the DEQ Form 7 application pages serving as part of Appendix A to the submittal. Page 5 of Form 7 should include latitude and longitude coordinates or UTM coordinates for the proposed facility. The box should also be checked on this page for an Article 6 permit, as the permitting action for this project will include both Article 6 and Article 8 (PSD Major Source) components. The expected natural gas consumption for the combustion turbines must be provided on page 7 of the form. The Form 7 page for storage tanks must be completed and emissions losses from the aqueous ammonia storage tank quantified. Emissions of toxic/HAP pollutants must also be revised on page 13, as noted for Appendix B below. Potential emissions of SF_6 must be added for page 15, based on leakage from circuit breakers at the facility.*

    CPV is working on when the TBD information will be available. The TBD information includes the emergency generator and fire pump engine make and model; SCR and oxidation catalyst make and model; and SCR and oxidation catalyst retention time and pressure drop.

    Page 7 of the DEQ Form 7 requests a throughput limit in terms of either hours per year or fuel throughput per year. As noted in the application, the project is proposed to operate year round with maximum annual operating hours of 8,760 hours per year and this was noted on Form 7. Based upon the operating scenario provided in Section 3.3 in the application, the corresponding maximum natural gas consumption is 17,651 million cubic feet per year per turbine at an average natural gas heat content of 1,028 Btu per cubic foot as provided in 40 CFR 98, Subpart C.

    Revised pages 5 and 7 of Form 7 are attached to this submittal.

    As discussed in response to Comment #5, ammonia emissions from the ammonia storage tank are expected to be negligible and, therefore, not quantified for this application.

    As discussed in response to Comment #16, the potential annual emissions of air toxics presented in the application were reviewed and determined to be correct; no revisions to page 13 of Form 7 are necessary.

    As discussed in response to Comment #5, the SF_6 storage capacity for the circuit breakers is not known at this time. As BACT for this equipment does not include an emission rate based upon the Brunswick County, Warren County and Greene Energy Partners/Stonewall LLC projects, the SF_6 storage capacity of the circuit breaker should not be required for issuance of the permit.

16. *There are differences in the tabulation of calculated potential (should be uncontrolled) air toxics emissions (HAPs in Virginia). Hourly formaldehyde emissions are noted as 0.499 lb/hr for the combustion turbines on the last page of Appendix B, with annual emissions listed as 1.90 tons. Application of this hourly rate for 8760 hours per year yields 2.19 tons per year of formaldehyde. The same discrepancy in the hourly and annual emissions exists for all other HAPs in the table. The table on the preceding page indicates formaldehyde emission rates for the two combustion turbines and the two HRSGs as 0.433 lb/hr and 0.302 lb/hr, respectively. Adding these values yields 0.735*

lb/hr, which multiplied by 8760 hours per year, results in uncontrolled potential emissions for the turbines and HRSGs of 3.22 tons per year (3.51 tons/yr using 0.499 lb/hr for turbines). The basis for the hourly emissions, whether vendor data or EPA's AP-42 emission factors must be clearly identified. Why is the CARB emission factor for formaldehyde of 0.00011 lb/MMBtu chosen over the EPA AP-42 emission factor of 0.00071 lb/MMBtu in the table noting 0.433 lb/hr (should be 0.499 lb/hr) of formaldehyde emissions? Are more conservative metals factors applicable in AP-42? Discrepancies indicate additional HAPs, and also overall higher emissions, exceed respective Virginia toxics exemption levels and are subject to air toxics modeling evaluation. The Green Energy Partners/Stonewall permit is for a facility with similar generating capacity, yet includes state-only enforceable limits for acrolein, formaldehyde, cadmium, chromium and nickel. Exemption levels used by CPV Smyth for nickel and chromium are incorrect.

In the application, potential annual emissions of air toxics are based on the operating scenario presented in Section 3.3 of the application and are presented correctly in the application. As noted in response to Comment #6, potential air toxic emissions have been recalculated without operating restrictions to determine applicability of the DEQ's air toxics regulation to the combustion turbines. As a result, nickel has been added to the list of air toxics that will be included in the modeling analysis to support the CPV Smyth application. A review of the calculations in the application show that the correct exemption levels were applied for all air toxics with the exception of nickel, as noted in response to Comment #6. The attached revised calculations include the same number of significant figures as the DEQ's exemption thresholds to clarify any apparent inconsistencies.

The AP-42 formaldehyde emission factor is believed to be overly conservative and not representative of expected formaldehyde emissions from the Alstom GT24 combustion turbine. The CARB emission factor is believed to be more accurate for current state of the art combustion turbines such as the Alstom GT24 and was, therefore, used to estimate formaldehyde emissions for the project.

17. *Projected emissions of ammonia from the facility are a significant concern from a pollution prevention perspective as precursors of PM-2.5, and possibly with odor concerns. The proposed emissions of ammonia slip from SCR control with the combustion turbines and HRSGs total 130.3 tons per year. In addition, there are potential fugitive emissions of ammonia from the aqueous ammonia storage tank. The ammonia slip emissions are considerably higher than for the other recently permitted combined-cycle power projects in Virginia. Ammonia slip for Dominion's Warren County facility is limited to 2 ppmvd, and projected lb/hr emissions are lower for Dominion's larger proposed Brunswick County facility. The 2 ppmvd ammonia slip value is not atypical for current vendor guarantees, and the Warren County plant is scheduled to be completed in the fall of this year. Any potential odor concerns are governed by 9 VAC 5 Chapter 50 Article 2, which does require application of best available control technology.*

The proposed ammonia slip of 5 ppm is equivalent to the ammonia slip for the Greene Energy Partners/Stonewall LLC and Dominion Brunswick County projects approved by the DEQ. Fugitive emissions of ammonia are expected to be negligible and, therefore, not quantified for the application. USEPA[2] and OSHA[3] list the odor recognition threshold

[2] http://www.epa.gov/oem/docs/chem/ammonia.pdf

for ammonia at 5 to 50 ppm, which is equal to or greater than the stack concentration. Therefore, no odor impacts from ammonia emissions are expected at the proposed ammonia slip level of 5 ppm at 15% O_2.

The potential ammonia emissions in the permit application are based upon Alstom performance data for the proposed ammonia slip emission limit. It is CPV Smyth's understanding that the Dominion Brunswick County project in Virginia has similar permitted slip levels but lower calculated annual ammonia emissions. A review of the DEQ Engineering Analysis for the Dominion Brunswick County project shows a pound per hour ammonia emission rate but does not show the supporting calculations.

In order to verify the Alstom performance data, the ammonia emission rate was calculated in accordance with EPA procedures. Emissions of a pollutant with a known concentration and exhaust oxygen content can be quantified in units of lb/MMBtu in accordance with 40 CFR 60, Appendix B, Method 19, Equation 19-1, as follows:

$$E = C_d \times F_d \times \frac{20.9}{20.9 - \%O_2}$$

Where:

E = Emission rate (lb/million Btu)
C_d = Pollutant concentration, dry basis, (lb/scf)
Fd = Dry volumes of combustion components per unit of heat content, (scf/million Btu).

A concentration in parts per million volume dry basis (ppmvd) can be converted to lb/scf per the following equation:

$$Cd\left(\frac{lb}{scf}\right) = C_d(ppmvd) \times \frac{1\,part}{1{,}000{,}000\,parts} \times \frac{MW\left({}^{lb}/_{lb-mole}\right)}{Molar\ Volume\left({}^{385.3\,dscf}/_{lb-mole}\right)}$$

From the above equations and the Fd of natural gas of 8,710 dscf per million Btu in Table 19-2 in Method 19, it can be calculated that an ammonia concentration of 5 ppmvd at 15% O_2 is equivalent to 0.0068 lb/million Btu. Applying this emission rate to the 100% load at 59°F case with a heat input of 1,968 (HHV) results in an ammonia emission rate of 13.4 pounds per hour, which is marginally above the Alstom guaranteed emission rate of 13.2 pounds per hour. The Alstom guaranteed emission rate is based upon project specific turbine performance and natural gas physical property data and, therefore, differs slightly from the rate calculated using EPA Method 19.

18. *The applicant did not sign and date the Local Governing Body Certification Form.*

A fully executed copy of the Local Governing Body Certification Form signed by CPV Smyth has been submitted to the DEQ; a copy is attached for reference.

If you have any questions regarding this response letter, please contact me at (240) 723-2307.

[3] https://www.osha.gov/SLTC/etools/ammonia_refrigeration/ammonia/

Sincerely,

Gener Gotiangco, P.E.

cc: Peter Podurgiel – CPV
Jon Donovan – CPV
Fred Sellers – Tetra Tech
Steven Babcock – Tetra Tech

ATTACHMENTS

Revised Table 3-3: Facility-Wide Annual Potential Emissions

Pollutant	Unit 1 (CTG & HRSG) (tpy)	Unit 2 (CTG & HRSG) (tpy)	Auxiliary Boiler (tpy)	Emergency Generator (tpy)	Fire Pump (tpy)	Facility Total (tpy)
NO_x	74.7	74.7	2.02	5.29	0.52	157.2
CO	47.7	47.7	6.83	2.89	0.45	105.6
VOC	22.1	22.1	0.94	1.07	0.06	46.3
SO_2	8.1	8.1	0.15	0.005	0.001	16.3
$PM/PM_{10}/PM_{2.5}$	36.0	36.0	0.92	0.17	0.03	73.1
Carbon dioxide equivalent (CO_2e)	1,156,440	1,156,440	21,627	592	90	2,335,189
H_2SO_4	5.1	5.1	0.01	0.0004	0.0001	10.3
Lead (Pb)	4.5E-03	4.5E-03	9.1E-05	2.8E-06	4.2E-07	0.009
NH_3	65.2	65.2	N/A	N/A	N/A	130.3
Total HAPS	4.17	4.17	0.35	0.02	0.004	8.7

Potential VA Air Toxics Emissions
CPV Smyth Generation Company, LLC

HAP	(2) CTG Emission Rates		TLV-TWA	TLV-STEL	Emissions Threshold (lb/hr)	Emissions Threshold (tpy)	Modeling Required?	SAAC 1-Hour	SAAC Annual
	lb/hr	TPY	(mg/m^3)	(mg/m^3)				(ug/m^3)	(ug/m^3)
Acetaldehyde	1.82E-01	7.95E-01	180	270	8.91E+00	2.61E+01	N	N/A	N/A
Acrolein	2.91E-02	1.27E-01	0.23	0.69	2.28E-02	3.34E-02	Y	17.25	0.46
Benzene	5.45E-02	2.39E-01	32		2.11E+00	4.64E+00	N	N/A	N/A
1,3-Butadiene	1.95E-03	8.55E-03	22		1.45E+00	3.19E+00	N	N/A	N/A
Ethylbenzene	1.45E-01	6.36E-01	434	543	1.79E+01	6.29E+01	N	N/A	N/A
Formaldehyde	4.99E-01	2.19E+00	1.2	2.5	8.25E-02	1.74E-01	Y	62.5	2.4
Propylene oxide	1.32E-01	5.77E-01	48		3.17E+00	6.96E+00	N	N/A	N/A
Toluene	5.90E-01	2.59E+00	377	565.00	1.86E+01	5.47E+01	N	N/A	N/A
Xylene	2.91E-01	1.27E+00	434	651	2.15E+01	6.30E+01	N	N/A	N/A
Naphthalene	5.90E-03	2.59E-02	52	79	2.61E+00	7.54E+00	N	N/A	N/A
Arsenic	9.08E-04	3.98E-03	0.2		1.32E-02	2.90E-02	N	N/A	N/A
Beryllium	5.45E-05	2.39E-04	0.002		1.32E-04	2.90E-04	N	N/A	N/A
Cadmium	4.99E-03	2.19E-02	0.05		3.30E-03	7.25E-03	Y	2.5	0.1
Chromium	6.36E-03	2.78E-02	0.5		3.30E-02	7.25E-02	N	N/A	N/A
Chromium VI	1.14E-03	4.97E-03	0.05		3.30E-03	7.25E-03	N	N/A	N/A
Cobalt	3.72E-04	1.63E-03	0.05		3.30E-03	7.25E-03	N	N/A	N/A
Lead	2.22E-03	9.74E-03	0.15		9.90E-03	2.18E-02	N	N/A	N/A
Manganese	1.68E-03	7.36E-03	5		3.30E-01	7.25E-01	N	N/A	N/A
Mercury	1.14E-03	4.97E-03	0.05		3.30E-03	7.25E-03	N	N/A	N/A
Nickel (soluble)	9.53E-03	4.18E-02	0.1		6.60E-03	1.45E-02	Y	5	0.2
Selenium	1.09E-04	4.77E-04	0.2		1.32E-02	2.90E-02	N	N/A	N/A

Vendor Emissions from Combustion Turbines & Duct Burner
CPV Smyth Generation Company, LLC

AMBIENT CONDITIONS:			**100°F**					**90°F**					**59°F**
ALSTOM CASE #:	**#22**	**#21**	**#8**	**#9**	**#10**	**#20**	**#19**	**#3**	**#4**	**#5**	**#11**	**#12**	**#13**
Number of GTs Operating	2	2	2	2	2	2	2	2	2	2	2	2	2
Operating Load	100%	100%	75%	50%	LLOC	100%	100%	75%	50%	LLOC	100%	100%	100%
Fuel Heating Value, Btu/lb (LHV)	20,885	20,885	20,885	20,885	20,885	20,885	20885.00	20,885	20,885	20,885	20,885	20,885	20,885
Fuel Heating Value, Btu/lb (HHV)	23,156	23,156	23,156	23,156	23,156	23,156	23156.00	23,156	23,156	23,156	23,156	23,156	23,156
Eavporative Cooler Status	ON	ON	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF
Duct Burner Status	ON	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Chiller Status	ON	ON	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF
Ambient Relative Humidity, %	100	100	30	30	30.00	100	100.00	50	50	50.00	60	60	60
BAROMETRIC PRESSURE, psia	14.38	14.38	14.38	14.38	15.38	16.38	17.38	18.38	19.38	20.38	15.38	15.38	15.38
GT Heat Input (MMBtu/hr/unit, LHV)	1,827	1,827	1,200	914	355	1,827	1,827	1,245	944	363	1,775	1,347	1,013
GT Heat Input (MMBtu/hr/unit, HHV)	2,026	2,026	1,331	1,013	394	2,026	2,026	1,381	1,047	402	1,968	1,493	1,123
DB Heat Input (MMBtu/hr/unit, LHV)	389	0	0	0	0.00	389	0.00	0	0	0.00	0	0	0
DB Heat Input (MMBtu/hr/unit, HHV)	431	0	0	0	0	431	0	0	0	0	0	0	0
Net Power (kW)	703,900	604,600	385,000	274,900	55,300	711,800	611,400	406,900	290,100	58,600	600,500	449,100	316,800
Gross Power (kW)	705,400	606,100	386,500	276,400	56,800	713,300	612,900	408,400	291,600	60,100	602,000	450,600	318,300
Heat Rate (Btu/kW-hr, gross HHV)	6,966	6,685	6,887	7,333	13,876	6,890	6,611	6,762	7,181	13,380	6,538	6,627	7,057
Heat Rate (Btu/kW-hr, net HHV)	6,981	6,702	6,914	7,373	14,252	6,904	6,627	6,787	7,218	13,723	6,554	6,649	7,090
HRSG STACK EXHAUST GAS													
Exhaust Flow, lb/hr	3,745,747	3,727,139	2,511,261	2,063,268	1,428,654	3,745,747	3727138.90	2,562,907	2,096,519	1,443,985	3,655,834	2,698,747	2,184,041
Stack Temprature, °F	182.7	204.1	178.7	174.2	195.6	178.5	195.5	175.1	170.4	193.8	187.3	173.6	170.2
O_2, Vol. %	10.00%	11.79%	11.87%	12.49%	15.97%	10.00%	11.79%	11.65%	12.28%	15.84%	11.91%	11.67%	12.30%
CO_2, Vol. %	4.93%	4.11%	3.99%	3.71%	2.11%	4.93%	4.11%	4.05%	3.76%	2.13%	4.07%	4.18%	3.89%
H_2O, Vol. %	10.87%	9.26%	9.80%	9.25%	6.17%	10.87%	9.26%	10.38%	9.83%	6.68%	8.98%	9.20%	8.64%
N_2, Vol. %	73.33%	73.96%	73.45%	73.66%	74.85%	73.33%	73.96%	73.04%	73.26%	74.47%	74.15%	74.07%	74.28%
Ar, Vol. %	0.88%	0.88%	0.88%	0.88%	0.90%	0.88%	0.88%	0.87%	0.88%	0.89%	0.89%	0.89%	0.89%
MW, lb/lb-mole	28.22	28.32	28.25	28.28	28.48	28.22	28.32	28.19	28.23	28.43	28.35	28.34	28.37
HRSG EXHAUST STACK EMISSIONS (PER STACK):													
NOX, ppmvd @ 15% O 2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
NOX, lb/hr as NO2	17.8	14.7	9.7	7.4	2.9	17.8	14.7	10.0	7.6	2.9	14.3	10.8	8.1
VOC, ppmvd @ 15% O 2 as CH4	2.0	1.0	1.0	1.0	2.0	2.0	1.0	1.0	1.0	2.0	1.0	1.0	1.0
VOC, lb/hr as CH4	6.2	2.6	1.7	1.3	1.0	6.2	2.6	1.7	1.3	1.0	2.5	1.9	1.4
CO, ppmvd @ 15% O 2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
CO, lb/hr	10.8	8.9	5.9	4.5	1.7	10.8	8.9	6.1	4.6	1.8	8.7	6.6	5.0
SO2, lb/hr	1.9	1.6	1.1	0.8	0.3	1.9	1.6	1.1	0.8	0.3	1.6	1.2	0.9
H2SO4, lb/hr	1.2	1.0	0.7	0.5	0.2	1.2	1.0	0.7	0.5	0.2	1.0	0.8	0.6
H2SO4, lb/MMBtu	0.00049	0.00049	0.00053	0.00049	0.00051	0.00049	0.00049	0.00051	0.00048	0.00050	0.00051	0.00054	0.00053
$PM/PM_{10}/PM_{2.5}$, lb/hr	11.2	6.5	8.3	7.7	1.9	11.2	6.5	8.5	7.8	2.0	6.3	8.5	8.1
$PM/PM_{10}/PM_{2.5}$, lb/MMBtu	0.0046	0.0032	0.0062	0.0076	0.0048	0.0046	0.0032	0.0062	0.0074	0.0050	0.0032	0.0057	0.0072
NH_3, ppmvd @ 15% O 2	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
NH_3, lb/hr	16.5	13.6	8.9	6.8	2.6	16.5	13.6	9.3	7.0	2.7	13.2	10.0	7.5
CO_2, lb/hr	292,032	240,805	158,189	120,456	46,839	292,053	240,790	164,123	124,443	47,791	233,909	177,466	133,485
CH_4, lb/hr	5.42	4.47	2.93	2.23	0.87	5.42	4.47	3.04	2.31	0.89	4.34	3.29	2.48
N_2O, lb/hr	0.54	0.45	0.29	0.22	0.09	0.54	0.45	0.30	0.23	0.09	0.43	0.33	0.25
CO_2e, lb/hr	292,329	241,049	158,350	120,579	46,887	292,350	241,035	164,290	124,569	47,839	234,147	177,647	133,621
CO_2e, lb/MW-hr (gross)	828.8	795.4	819.4	872.5	1650.9	819.7	786.5	804.6	854.4	1592.0	777.9	788.5	839.6

Vendor Emissions from Combustion Tu
CPV Smyth Generation Company, LLC

AMBIENT CONDITIONS:				-10°F		
ALSTOM CASE #:	**#14**	**#23**	**#15**	**#16**	**#17**	**#18**
Number of GTs Operating	2	2	2	2	2	2
Operating Load	LLOC	100%	100%	100%	100%	100%
Fuel Heating Value, Btu/lb (LHV)	20,885	20,885	20,885	20,885	20,885	20,885
Fuel Heating Value, Btu/lb (HHV)	23,156	23,156	23,156	23,156	23,156	23,156
Eavporative Cooler Status	OFF	OFF	OFF	OFF	OFF	OFF
Duct Burner Status	OFF	ON	OFF	OFF	OFF	OFF
Chiller Status	OFF	OFF	OFF	OFF	OFF	OFF
Ambient Relative Humidity, %	60.00	60	60	60	60	60
BAROMETRIC PRESSURE, psia	15.38	19.38	19.38	19.38	19.38	19.38
GT Heat Input (MMBtu/hr/unit, LHV)	380	2,047	2,047	1,535	1,156	404
GT Heat Input (MMBtu/hr/unit, HHV)	422	2,270	2,270	1,702	1,282	448
DB Heat Input (MMBtu/hr/unit, LHV)	0.00	389	0	0	0	0
DB Heat Input (MMBtu/hr/unit, HHV)	0	431	0	0	0	0
Net Power (kW)	61,300	797,700	693,700	516,600	366,900	65,000
Gross Power (kW)	62,800	799,200	695,200	518,100	368,400	66,500
Heat Rate (Btu/kW-hr, gross HHV)	13,432	6,760	6,531	6,571	6,960	13,463
Heat Rate (Btu/kW-hr, net HHV)	13,761	6,773	6,545	6,590	6,989	13,773
HRSG STACK EXHAUST GAS						
Exhaust Flow, lb/hr	1,504,290	4,110,576	4,091,969	3,016,883	2,345,388	1,575,354
Stack Temprature, °F	197.5	167.5	196.7	181.5	171.8	194.5
O_2, Vol. %	16.09%	10.17%	11.82%	11.66%	11.95%	16.19%
CO_2, Vol. %	2.15%	4.96%	4.21%	4.28%	4.15%	2.19%
H_2O, Vol. %	5.26%	9.76%	8.29%	8.42%	8.17%	4.49%
N_2, Vol. %	75.60%	74.22%	74.80%	74.74%	74.84%	76.22%
Ar, Vol. %	0.90%	0.89%	0.89%	0.89%	0.89%	0.91%
MW, lb/lb-mole	28.58	28.34	28.44	28.42	28.44	28.67
HRSG EXHAUST STACK EMISSIONS (PER STACK):						
NOX, ppmvd @ 15% O 2	2.0	2.0	2.0	2.0	2.0	2.0
NOX, lb/hr as NO2	3.1	19.6	16.5	12.3	9.3	3.2
VOC, ppmvd @ 15% O 2 as CH4	2.0	2.0	1.0	1.0	1.0	2.0
VOC, lb/hr as CH4	1.1	6.8	2.9	2.2	1.6	1.1
CO, ppmvd @ 15% O 2	2.0	2.0	2.0	2.0	2.0	2.0
CO, lb/hr	1.9	11.9	10.0	7.5	5.7	2.0
SO2, lb/hr	0.3	2.3	1.8	1.4	1.0	0.4
H2SO4, lb/hr	0.2	1.5	1.1	0.9	0.6	0.2
H2SO4, lb/MMBtu	0.00047	0.00056	0.00048	0.00053	0.00047	0.00045
$PM/PM_{10}/PM_{2.5}$, lb/hr	2.1	11.9	7.3	8.8	8.6	2.2
$PM/PM_{10}/PM_{2.5}$, lb/MMBtu	0.0050	0.0044	0.0032	0.0052	0.0067	0.0049
NH_3, ppmvd @ 15% O 2	5.0	5.0	5.0	5.0	5.0	5.0
NH_3, lb/hr	2.8	18.1	15.2	11.4	8.6	3.0
CO_2, lb/hr	50,130	321,071	269,808	202,307	152,383	53,204
CH_4, lb/hr	0.93	5.96	5.01	3.75	2.83	0.99
N_2O, lb/hr	0.09	0.60	0.50	0.38	0.28	0.10
CO_2e, lb/hr	50,181	321,397	270,082	202,513	152,538	53,258
CO_2e, lb/MW-hr (gross)	1598.1	804.3	777.0	781.8	828.1	1601.8

TANKS 4.0.9d
Emissions Report - Summary Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	CPV Diesel Tank
City:	Smyth
State:	Virginia
Company:	CPV
Type of Tank:	Horizontal Tank
Description:	6,000 gallon diesel tank

Tank Dimensions

Shell Length (ft):		16.00
Diameter (ft):		8.00
Volume (gallons):		6,000.00
Turnovers:		10.00
Net Throughput(gal/yr):		60,000.00
Is Tank Heated (y/n):	N	
Is Tank Underground (y/n):	N	

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Bristol-Johnson City, Tennessee (Avg Atmospheric Pressure = 13.98 psia)

TANKS 4.0.9d
Emissions Report - Summary Format
Liquid Contents of Storage Tank

CPV Diesel Tank - Horizontal Tank
Smyth, Virginia

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Distillate fuel oil no. 2	All	57.26	51.72	62.80	55.51	0.0060	0.0048	0.0072	130.0000			188.00	Option 1: VP50 = .0045 VP60 = .0065

TANKS 4.0.9d
Emissions Report - Summary Format
Individual Tank Emission Totals

Emissions Report for: Annual

CPV Diesel Tank - Horizontal Tank
Smyth, Virginia

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Distillate fuel oil no. 2	1.11	1.01	2.12

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY - AIR PERMITS

LOCAL GOVERNING BODY CERTIFICATION FORM

Facility Name: CPV Smyth Generation Company	Registration Number:
Applicant's Name: CPV Smyth Generation Company, LLC	Name of Contact Person at the site: Gener Gotiangco
Applicant's Mailing address: 8403 Colesville Road Suite 915 Silver Spring, MD 20910	Contact Person Telephone Number: (240) 723-2307

Facility location (also attach map): The proposed Project will be constructed on a 108 acre parcel at a greenfield location in Atkins, VA. Facility site is located in east-central Smyth County, 4 miles east-northeast of Marion, VA, approximately 0.5 miles south of Interstate 81.

Facility type, and list of activities to be conducted: 700 MW combined-cycle natural gas-fired power generating facility with two combustion turbines and associated duct burners. The facility will run as a base load plant with both combustion turbines operating concurrently but the facility will have the capability of operating with a single combustion turbine. Additional plant equipment will include an auxiliary boiler, emergency generator engine, emergency fire pump engine, aqueous ammonia storage tank; air cooled condenser; and various electrical transmission and switching equipment.

The applicant is in the process of completing an application for an air pollution control permit from the Virginia Department of Environmental Quality. In accordance with § 10.1-1321.1. Title 10.1, Code of Virginia (1950), as amended, before such a permit application can be considered complete, the applicant must obtain a certification from the governing body of the county, city or town in which the facility is to be located that the location and operation of the facility are consistent with all applicable ordinances adopted pursuant to Chapter 22 (§§ 15.2-2200 et seq.) of Title 15.2. The undersigned requests that an authorized representative of the local governing body sign the certification below.

Applicant's signature:	Date: 3/25/14

The undersigned local government representative certifies to the consistency of the proposed location and operation of the facility described above with all applicable local ordinances adopted pursuant to Chapter 22 (§§15.2-2200 et seq.) of Title 15.2. of the Code of Virginia (1950) as amended, as follows:

(Check one block)

- [x] The proposed facility is **fully consistent** with all applicable local ordinances.
- [ ] The proposed facility is **inconsistent** with applicable local ordinances; see attached information.

Signature of authorized local government representative:	Date: 1/29/14
Type or print name: Clegg Williams	Title: Building & Zoning Administrator
County, city or town: Smyth County	

[THE LOCAL GOVERNMENT REPRESENTATIVE SHOULD FORWARD THE SIGNED CERTIFICATION TO THE APPROPRIATE DEQ REGIONAL OFFICE AND SEND A COPY TO THE APPLICANT.]

GENERAL INFORMATION

Person Completing Form: Steven Babcock	Date: 04/22/2014	Registration Number:
Company and Division Name: Tetra Tech		FIN: 95-4148514
Mailing Address: 160 Federal St., 3rd Floor Boston, MA 02110		
Exact Source Location – Include Name of City (County) and Full Street Address or Directions: Atkins, VA		
Telephone Number:	No. of Employees:	Property Area at Site:
Person to Contact on Air Pollution Matters – Name and Title: Gener Gotiangco Vice President	Phone Number: (240) 723-2307 Fax: (240) 723-2339 Email: GGotiangco@cpv.com	
Latitude and Longitude Coordinates **OR** UTM Coordinates of Facility: 36° 51' 20.71" N, 81° 24' 47.83" W		

Reason(s) for Submission (Check all that apply):

☐ State Operating Permit

This permit is applied for pursuant to provisions of the Virginia Administrative Code, 9 VAC 5 Chapter 80, Article 5 (SOP)

☒ New Source

☐ Modification of a Source

☐ Relocation of a Source

This permit is applied for pursuant to the following provisions of the Virginia Administrative Code:

- ☒ 9 VAC 5 Chapter 80, Article 6 (Minor Sources)
- ☒ 9 VAC 5 Chapter 80, Article 8 (PSD Major Sources)
- ☐ 9 VAC 5 Chapter 80, Article 9 (Non-Attainment Major Sources)

☐ Amendment to a Permit Dated: _____ Permit Type: ☐ SOP (Art. 5) ☐ NSR (Art. 6, 8, 9)

Amendment Type:

- ☐ Administrative Amendment
- ☐ Minor Amendment
- ☐ Significant Amendment

This amendment is requested pursuant to the provisions of:

☐ 9 VAC 5-80-970 (Art. 5 Adm.)	☐ 9 VAC 5-80-1935 (Art. 8 Adm.)
☐ 9 VAC 5-80-980 (Art. 5 Minor)	☐ 9 VAC 5-80-1945 (Art. 8 Minor)
☐ 9 VAC 5-80-990 (Art. 5 Sig.)	☐ 9 VAC 5-80-1955 (Art. 8 Sig.)
☐ 9 VAC 5-80-1270 (Art. 6 Adm.)	☐ 9 VAC 5-80-2210 (Art. 9 Adm.)
☐ 9 VAC 5-80-1280 (Art. 6 Minor)	☐ 9 VAC 5-80-2220 (Art. 9 Minor)
☐ 9 VAC 5-80-1290 (Art. 6 Sig.)	☐ 9 VAC 5-80-2230 (Art. 9 Sig.)

☐ Other (specify): _____

Explanation of Permit Request (attach documents if needed):

Application for a proposed combined cycle electric generating facility required to obtain a Major NSR Air Permit subject to Prevention of Significant Deterioration requirements. This document contains a detailed description of the project and potential emission estimates for all pollutants.

PROPOSED PERMIT LIMITS FOR CRITERIA POLLUTANTS:

Company Name: CPV Smyth Generation Company, LLC	**Date:** 04/22/2014	**Registration Number:**

Unit Ref. No.	Proposed Permit Limits for Criteria Pollutants															
	PM [a] (Particulate Matter)		**PM-10 [a,b] (10 µM or smaller particulate matter)**		**PM 2.5 [a,b] (2.5 µM or smaller particulate matter)**		**SO_2 (Sulfur Dioxide)**		**NO_X (Nitrogen Oxides)**		**CO (Carbon Monoxide)**		**VOC [a] (Volatile Organic Compounds)**		**Pb (Lead)**	
	lbs/hr	**tons/yr**	**lbs/hr**	**tons/yr**	**lbs/hr**	**tons/yr**	**lbs/hr**	**tons/yr**	**lbs/hr**	**tons/yr**	**lbs/hr**	**tons/yr**	**lbs/hr**	**tons/yr**	**lbs/hr**	**tons/yr**
CT1 & DB1	11.9	36.0	11.9	36.0	11.9	36.0	2.3	8.1	19.6	74.7	11.9	47.7	6.8	22.1	N/A	N/A
CT2 & DB2	11.9	36.0	11.9	36.0	11.9	36.0	2.3	8.1	19.6	74.7	11.9	47.7	6.8	22.1	N/A	N/A
AB	0.46	0.92	0.46	0.92	0.46	0.92	0.13	0.26	1.01	2.02	3.42	6.83	0.47	0.94	N/A	N/A
EG	0.66	0.17	0.66	0.17	0.66	0.17	0.022	0.01	21.2	5.29	11.6	2.89	4.30	1.07	N/A	N/A
FP	0.10	0.03	0.10	0.03	0.10	0.03	0.003	0.001	2.07	0.52	1.81	0.45	0.26	0.06	N/A	N/A
TOTAL:	25.9	73.1	25.9	73.1	25.9	73.1	7.76	26.6	63.5	157.2	40.6	105.6	18.6	46.3		

[X] Estimated Emission Calculations Attached (totals and per Unit Ref. No.)

[a] PM, PM-10, PM 2.5, and VOC should also be split up by component and reported under the Proposed Permit Limits for Toxic Pollutants/HAPs.

[b] PM-10 and PM 2.5 includes filterable and condensable.

PROPOSED PERMIT LIMITS FOR TOXIC POLLUTANTS/HAPS:

Company Name: CPV Smyth Generation Company, LLC	**Date:** 01/27/2014	**Registration Number:**

Unit Ref. No.	Proposed Permit Limits for Toxic/HAP Pollutants*															
	HAP Name: Acrolein **CAS #:** 107028		**HAP Name:** Formaldehyde **CAS #:** 50000		**HAP Name:** Cadmium **CAS #:** 7440439		**HAP Name:** Nickel **CAS #:** 7440020		**HAP Name:** **CAS #:**		**HAP Name:** **CAS #:**		**HAP Name:** **CAS #:**		**HAP Name:** **CAS #:**	
	lbs/hr	**tons/yr**	**lbs/hr**	**tons/yr**	**lbs/hr**	**tons/yr**	**lbs/hr**	**tons/yr**	**lbs/hr**	**tons/yr**	**lbs/hr**	**tons/yr**	**lbs/hr**	**tons/yr**	**lbs/hr**	**tons/yr**
CT1	0.0145	0.064	0.250	1.09	0.0025	0.0109	0.00477	0.021								
CT2	0.0145	0.064	0.250	1.09	0.0025	0.0109	0.00477	0.021								
TOTAL:	0.029	0.127	0.499	2.19	0.0050	0.0219										

[X] Estimated Emission Calculations Attached (totals and per Unit Ref. No.)

*** Specify the name of the toxic pollutant/HAP for each Unit Ref. No. along with the respective CAS Number**. Toxic Pollutant means a pollutant on the designated list in the Form 7 Instructions document. Particulate matter and volatile organic compounds are not toxic pollutants as generic classes of substances, but individual substances within these classes may be toxic pollutants because their toxic properties or because a TLV (tm) has been established.

PROPOSED PERMIT LIMITS FOR OTHER REGULATED POLLUTANTS:

Company Name: CPV Smyth Generation Company, LLC	**Date:** 04/22/2014	**Registration Number:**

Unit Ref. No.	**Proposed Permit Limits for Other Regulated Pollutants***															
	Pollutant Name: Ammonia		**Pollutant Name:** Sulfuric Acid		**Pollutant Name:** CO_2e		**Pollutant Name:**		**Pollutant Name:**		**Pollutant Name:**		**Pollutant Name:**		**Pollutant Name:**	
	lbs/hr	**tons/yr**	**lbs/hr**	**tons/yr**	**lbs/hr**	**tons/yr**	**lbs/hr**	**tons/yr**	**lbs/hr**	**tons/yr**	**lbs/hr**	**tons/yr**	**lbs/hr**	**tons/yr**	**lbs/hr**	**tons/yr**
CT1 & DB1	18.1	65.2	1.5	5.1	321,399	1,156,440										
CT2 & DB2	18.1	65.2	1.5	5.1	321,399	1,156,440										
AB	N/A	N/A	0.01	0.02	10,813	21,627										
EG	N/A	N/A	0.0017	0.0004	2,366	592										
FP	N/A	N/A	0.0003	0.0001	360	90										
TOTAL:	36.2	130.4	3.0	10.2	656,337	2,335,189										

[X] Estimated Emission Calculations Attached (totals and per Unit Ref. No.)

*** Other Regulated Pollutant** include Fluorides, Sulfuric Acid Mist, Hydrogen Sulfide (H_2S), Total Reduced Sulfur (including H_2S), Reduced Sulfur Compounds (including H_2S), Municipal Waste Combustor Organics (measured as total tetra-through octa-chlorinated dibenzo-p-dioxins and dibenzofurans), Municipal

FUEL BURNING EQUIPMENT: (Boilers, Turbines, Kilns, and Other External Combustion Units)

Company Name: CPV Smyth Generation Company, LLC	**Date:** 04/22/2014	**Registration Number:**

Unit Ref. No.	Equipment Manufacturer, Type, and Model Number	Date of Manuf.	Date of Const.	Max. Rated Input Heat Capacity For Each Fuel (Million Btu/hr)	Type of Fuel	Type of Equip. (use Code A)	Usage (use Code B)	Requested Throughput* (hrs/yr OR fuel/yr)	Federal Regulations that Apply
CT1	Alstom GT24 Combustion Turbine #1			2,270 @ -10°F	Natural Gas	19	6	8,760 hrs/yr; 17,651 MMCF/yr of natural gas	40 CFR 60 Subpart KKKK
CT2	Alstom GT24 Combustion Turbine #2			2,270 @ -10°F	Natural Gas	19	6	8,760 hrs/yr; 17,651 MMCF/yr of natural gas	40 CFR 60 Subpart KKKK
DB1	Duct Burner #1 (Vogt or equivalent)			431	Natural Gas	12	6	1,259 MMCF/yr of natural gas	40 CFR 60 Subpart KKKK
DB2	Duct Burner #2 (Vogt or equivalent)			431	Natural Gas	12	6	1,259 MMCF/yr of natural gas	40 CFR 60 Subpart KKKK
AB	CB Nebraska Model NB-300D-70 Auxiliary Boiler (or equivalent)			92.4	Natural Gas	12	4	359.5 MMCF/yr of natural gas	40 CFR 60 Subpart Dc 40 CFR 63 Subpart JJJJJJ

[X] Estimated Emission Calculations Attached (include references of emission factors) and/or Stack Test Results if Available

Code A – Equipment

BOILER TYPE:
1. Pulverized Coal - Wet Bottom
2. Pulverized Coal - Dry Bottom
3. Pulverized Coal - Cyclone Furnace
4. Circulating Fluidized Bed
5. Spreader Stoke
6. Chain or Travelling Grate Stoker
7. Underfeed Stoker
8. Hand Fired Coal
9. Oil, Tangentially Fired
10. Oil, Horizontally Fired (except rotary cup)
11. Gas, Tangentially Fired
12. Gas, Horizontally Fired
13. Wood with Flyash Reinjection
14. Wood without Flyash Reinjection
15. Other (specify) _Natural Gas Heater_____

OTHER COMBUSTION UNITS:
16. Oven / Kiln
17. Rotary Kiln
18. Process Furnace
19. Other (specify) _Combustion Turbine_____

Code B - Usage

1. Steam Production
2. Drying / Curing
3. Space Heating
4. Process Heat
5. Food Processing
6. Electrical Generation
7. Mechanical Work
8. Other (specify) _ _____

***Pick only one option for a requested throughput.**